

<b>Document Title</b>	Collection of constraints on AUTOSAR M1 models
<b>Document Owner</b>	AUTOSAR
<b>Document Responsibility</b>	AUTOSAR
<b>Document Identification No</b>	635

<b>Document Status</b>	published
<b>Part of AUTOSAR Standard</b>	Classic Platform
<b>Part of Standard Release</b>	R25-11

Document Change History			
Date	Release	Changed by	Description
2025-11-27	R25-11	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Updated constraints according to changes in TPS documents</li> </ul>
2024-11-27	R24-11	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Updated constraints according to changes in TPS documents</li> </ul>
2023-11-23	R23-11	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Updated constraints according to changes in TPS documents</li> </ul>
2022-11-24	R22-11	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Updated constraints according to changes in TPS documents</li> </ul>
2021-11-25	R21-11	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Updated constraints according to changes in TPS documents</li> </ul>
2020-11-30	R20-11	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Updated constraints according to changes in TPS documents</li> <li>Removed all SWS constraints</li> <li>Split document into 3 documents, reflecting the standards CP, AP, FO</li> </ul>
2019-11-28	R19-11	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Updated constraints according to changes in SWS and TPS documents</li> <li>Changed Document Status from Final to published</li> </ul>
2018-10-31	4.4.0	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>Completion of constraint context by adding tables and classtables referenced by model constraints to this document</li> </ul>



△

2017-12-08	4.3.1	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation</li> </ul>
2016-11-30	4.3.0	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation</li> </ul>
2015-07-31	4.2.2	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation</li> </ul>
2014-10-31	4.2.1	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>• Editorial changes</li> </ul>
2013-10-31	4.1.2	AUTOSAR Release Management	<ul style="list-style-type: none"> <li>• Updated constraints according to changes in SWS and TPS documents</li> </ul>
2013-03-15	4.1.1	AUTOSAR Administration	<ul style="list-style-type: none"> <li>• Initial Release</li> </ul>

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## References

- [1] General Specification of Basic Software Modules  
AUTOSAR\_CP\_SWS\_BSWGeneral
- [2] Software Component Template  
AUTOSAR\_CP\_TPS\_SoftwareComponentTemplate
- [3] ISO 14229-1 – Unified diagnostic services (UDS) – Part 1: Specification and requirements (Release 2006-12)  
<https://www.iso.org>
- [4] ISO 26021-2 – Road vehicles – End-of-life activation of on-board pyrotechnic devices – Part 2: Communication requirements  
<https://www.iso.org>
- [5] ISO 17356-4: Road vehicles – Open interface for embedded automotive applications – Part 4: OSEK/VDX Communication (COM)
- [6] Collection of blueprints for AUTOSAR M1 models  
AUTOSAR\_FO\_MOD\_GeneralBlueprints
- [7] ISO 10646:2012 – Information technology – Universal Coded Character Set (UCS)  
<https://www.iso.org>
- [8] Specification of COM Based Transformer  
AUTOSAR\_CP\_SWS\_COMBasedTransformer
- [9] SAE J1939-21 Data Link Layer
- [10] Transport Layer Security (TLS) Parameters  
<https://www.iana.org/assignments/tls-parameters/tls-parameters.xhtml>
- [11] Generic Structure Template  
AUTOSAR\_FO\_TPS\_GenericStructureTemplate
- [12] XML Path language (XPath)  
<http://www.w3.org/TR/xpath/>
- [13] ASAM MCD-2 MC (ASAP2 / A2L)  
<http://www.asam.net>  
ASAM\_AE\_MCD-2\_MC\_BS\_V1-7-1.pdf

# 1 Document Information and Content

This auxiliary document provides a collection of constraints for AUTOSAR models. All constraints are copied from template specification from the AUTOSAR Classic Platform, so this document does not introduce any new constraints.

A list of the documents that the constraints originate from can be found in the table of contents. Chapter [2](#) contains the collected constraints, grouped by source documents. All constraints from the same source document are contained within a single section.

## 2 Autosar Model Constraints

### 2.1 CP\_TPS\_BSWModuleDescriptionTemplate

#### [constr\_1275] Applicability of reference `startsOnEvent` for `BswScheduleEvent`

*Imposition time:* IT\_BswMD

[The reference `BswScheduleEvent.startsOnEvent` shall only refer to a `BswSchedulableEntity`.]

#### [constr\_1276] Applicability of reference `startsOnEvent` for `BswOperationInvokedEvent`

*Imposition time:* IT\_BswMD

[The reference `BswOperationInvokedEvent.startsOnEvent` shall only refer to a `BswCalledEntity`.]

#### [constr\_4013] BSW service identifier

*Imposition time:* IT\_BswMD

[For Standardized Interfaces, this identifier is defined in the AUTOSAR Software Specification (SWS) of the module. In case the C-function prototype represented by the entry is not standardized, it still can be used optionally, but its value shall differ from the standardized ones.]

#### [constr\_4014] Call type and execution context

*Imposition time:* IT\_BswMD

[Within a given `BswModuleEntry`, the following constraint holds for its attributes:

- if attribute `callType` is set to value `interrupt`, it is not allowed that attribute `executionContext` is set to either of the values `task` or `hook`
- if attribute `callType` is set to value `scheduled`, it is not allowed that attribute `executionContext` is set to either of the values `interruptCat1` or `interruptCat2`

]

#### [constr\_4015] `calledEntry` constraints for direct calls

*Imposition time:* IT\_BswMD

[The following holds if `callPoint` is aggregated as an instance of `BswDirectCallPoint`:

- `BswModuleEntity.callPoint.calledEntry.executionContext` shall be identical to `BswModuleEntity.implementedEntry.executionContext`
- `BswModuleEntity.callPoint.calledEntry.callType` shall have the value `'regular'` or `'callback'`

]

**[constr\_4016] BswCalledEntity constraints***Imposition time:* IT\_BswMD

[

- `BswCalledEntity.implementedEntry.callType` shall be 'regular' or 'callback'
- `BswCalledEntity.implementedEntry.executionContext` is in general not restricted, but see [constr\_4076] for constraints on the server side of a Client-Server communication.

]

**[constr\_4017] BswSchedulableEntity constraints***Imposition time:* IT\_BswMD

[

- `BswModuleEntity.implementedEntry.callType` shall be 'scheduled'
- `BswModuleEntity.implementedEntry.executionContext` shall be 'task'

]

**[constr\_4018] BswInterruptEntity constraints***Imposition time:* IT\_BswMD

[

- `BswInterruptEntity.implementedEntry.callType` shall be 'interrupt'
- `BswInterruptEntity.implementedEntry.executionContext` shall be 'interruptCat1' if and only if `BswInterruptEntity.interruptCategory` is 'Cat1'
- `BswInterruptEntity.implementedEntry.executionContext` shall be 'interruptCat2' if and only if `BswInterruptEntity.interruptCategory` is 'Cat2'
- A `BswInterruptEvent` shall only trigger a `BswInterruptEntity` where attribute `interruptCategory` is set to `BswInterruptCategory.cat2`.

]



### [constr\_4019] BSW module identifier

*Imposition time:* IT\_BswMD

[[BswModuleDescription.moduleId](#) shall refer to the identifier of the standardized AUTOSAR modules according to [1], if applicable<sup>1</sup>. Otherwise (e.g. for ICC2 clusters) the identifier shall either be empty or chosen differently from the ones given in [1].]

### [constr\_4020] Allowed categories of [BswModuleDescription](#)

*Imposition time:* IT\_BswMD

[

category	Explanation
<b>BSW_MODULE</b>	Specifies a single BSW module (ICC3 granularity).
<b>BSW_CLUSTER</b>	Specifies a BSW module cluster (ICC2 granularity).
<b>LIBRARY</b>	Specifies a Library (not restricted to be used within the BSW).

]

### [constr\_4021] Implementation policy of function pointer target

*Imposition time:* IT\_BswMD

[

A [BswModuleEntry](#) can only be used as target of a function pointer ([SwPointerTargetProps.functionPointerSignature](#)), if its [swServiceImplPolicy](#) is 'standard'.]

### [constr\_4022] [BswModuleEntity](#) only uses the module's interface

*Imposition time:* IT\_BswMD

[

- [BswModuleEntity.implementedEntry](#) shall refer to an element declared as [implementedEntry](#) of the enclosing [BswModuleDescription](#)
- [BswModuleEntity.callPoint.calledEntry](#) - where [callPoint](#) is instantiated from [BswDirectCallPoint](#) - shall refer to an element declared as [expectedEntry](#) or [implementedEntry](#) of the enclosing [BswModuleDescription](#).
- [BswModuleEntity.callPoint.calledEntry](#) - where [callPoint](#) is instantiated from [BswSynchronousServerCallPoint](#) or [BswAsynchronousServerCallPoint](#) - shall refer to an element declared as [requiredClientServerEntry](#) of the enclosing [BswModuleDescription](#).
- [BswModuleEntity.callPoint](#) - where [callPoint](#) is instantiated from [BswAsynchronousServerCallResultPoint](#) - shall refer to an [BswAsynchronousServerCallPoint](#) declared in turn as [callPoint](#) of the same [BswModuleEntity](#).

<sup>1</sup>Note that there may be more than one module in an ECU software with the same identifier, e.g. according to the standard Complex Drivers all have the same identifier.

- `BswModuleEntity.issuedTrigger` shall refer to an element declared as `releasedTrigger` of the enclosing `BswModuleDescription`
- `BswModuleEntity.managedModeGroup` shall refer to an element declared as `providedModeGroup` of the enclosing `BswModuleDescription`
- `BswModuleEntity.accessedModeGroup` shall refer to an element declared as `requiredModeGroup` of the enclosing `BswModuleDescription`
- `BswModuleEntity.dataSendPoint.accessedVariable` shall refer to an element declared as `providedData` of the enclosing `BswModuleDescription`
- `BswModuleEntity.dataReceivePoint.accessedVariable` shall refer to an element declared as `requiredData` of the enclosing `BswModuleDescription`
- an `accessedModeGroup` should be allowed to refer to an element declared as `providedModeGroup`

]

#### [constr\_4023] External trigger shall belong to the interface

*Imposition time:* IT\_BswMD

[A `BswExternalTriggerOccurredEvent` shall refer to a `Trigger` that is declared via `BswModuleDescription.requiredTrigger` for the same module.]

#### [constr\_4024] Semantics of BSW mode switch event

*Imposition time:* IT\_BswMD

[If `BswModeSwitchEvent.activation` has the value `onTransition` `BswModeSwitchEvent` shall refer to two different modes belonging to the same instance of `ModeDeclarationGroup`, their order defining the direction of the transition. In all other cases, `BswModeSwitchEvent` shall refer to exactly one mode.]

#### [constr\_4025] Modes used by BSW mode switch event

*Imposition time:* IT\_BswMD

[The `ModeDeclaration` used by `BswModeSwitchEvent` shall belong to the `ModeDeclarationGroupPrototype` referred as `BswInternalBehavior.entity.accessedModeGroup` of the enclosing `BswInternalBehavior`.]

#### [constr\_4026] Mode group used by BSW mode switch acknowledge event

*Imposition time:* IT\_BswMD

[The `ModeDeclarationGroupPrototype` used by `BswModeSwitchedAckEvent` shall be referred as `BswModuleDescription.providedModeGroup` by the same module.]

**[constr\_4028] Semantics of memory section type***Imposition time:* IT\_BswMD

[`sectionType` shall be semantically compatible to the usage of the enclosing `SwAddrMethod`, this means especially that if `SwAddrMethod` is associated by `ExecutableEntity`-s, the `sectionType` shall be usable as code section, if it is associated by `SwDataDefProps`, `sectionType` shall be usable as data section.]

**[constr\_4029] Measured stack usage***Imposition time:* IT\_BswMD

[The attribute values of `MeasuredStackUsage` shall fulfill:  
`minimumMemoryConsumption` <= `averageMemoryConsumption` <= `maximumMemoryConsumption`]

**[constr\_4030] Measured heap usage***Imposition time:* IT\_BswMD

[The attribute values of `MeasuredHeapUsage` shall fulfill:  
`minimumMemoryConsumption` <= `averageMemoryConsumption` <= `maximumMemoryConsumption`]

**[constr\_4031] Analyzed execution time***Imposition time:* IT\_BswMD

[The attribute values of `AnalyzedExecutionTime` shall fulfill:  
`bestCaseExecutionTime` <= `bestCaseExecutionTime`]

**[constr\_4032] Measured execution time***Imposition time:* IT\_BswMD

[The attribute values of `MeasuredExecutionTime` shall fulfill:  
`minimumExecutionTime` <= `nominalExecutionTime` <= `maximumExecutionTime`]

**[constr\_4033] Simulated execution time***Imposition time:* IT\_BswMD

[The attribute values of `SimulatedExecutionTime` shall fulfill:  
`minimumExecutionTime` <= `nominalExecutionTime` <= `maximumExecutionTime`]

**[constr\_4034] Target and context of MC emulation reference***Imposition time:* IT\_BswMD

[Within one `ImplementationElementInParameterInstanceRef`, the `target` shall refer to a sub-element of the `ParameterDataPrototype` which is referred as `context`.]

**[constr\_4038] `BswModuleDependency` shall refer to a different module***Imposition time:* IT\_BswMD

[

- `BswModuleDescription.bswModuleDependency.targetModuleId` (if given) shall differ from `BswModuleDescription.moduleId`. This does not hold if the value is 254 (used for IO Hardware Abstraction modules) or 255 (used for Complex Driver modules).
- `BswModuleDependency.targetModuleRef` (if given) shall differ from the package location of the `BswModuleDescription` that owns the `BswModuleDependency`.

]

**[constr\_4039] Semantics of `SwcBswMapping`***Imposition time:* IT\_BswMD

[An `SwcBswMapping` is only valid, if the referred `SwcInternalBehavior` is aggregated by a `ServiceSwComponentType`, `EcuAbstractionSwComponentType` or `ComplexDeviceDriverSwComponentType`.]

**[constr\_4040] Synchronized mode groups shall have same type***Imposition time:* IT\_BswMD

[`SwcBswSynchronizedModeGroupPrototype` can only refer to equally typed `ModeDeclarationGroupPrototypes`, i.e. which have identical `ModeDeclarationGroups`.]

**[constr\_4041] Synchronized mode groups shall have same context***Imposition time:* IT\_BswMD

[The mapping defined by `SwcBswSynchronizedModeGroupPrototype` implies that the component providing the one mode group prototype is also mapped to the module which provides the other mode group prototype by means of synchronizing their respective behaviors in `SwcBswMapping`.]

**[constr\_4042] Synchronized triggers shall have same context***Imposition time:* IT\_BswMD

[The mapping defined by `SwcBswSynchronizedTrigger` implies that the component providing the one trigger is also mapped to the module which provides the other trigger by means of synchronizing their respective behaviors in `SwcBswMapping`.]

**[constr\_4043] Period of `BswTimingEvent`***Imposition time:* IT\_BswMD

[`BswTimingEvent.period` shall be greater than 0.]

#### [constr\_4044] Content of **McSwEmulationMethodSupport**

*Imposition time:* IT\_BswMD

[The following constraints hold for the attributes of **McSwEmulationMethodSupport**:

- If **category** is **DOUBLE\_POINTERED**, a **baseReference** shall exist.
- If **category** is **SINGLE\_POINTERED**, a **referenceTable** shall exist.
- If **category** is **INITIALIZED\_RAM**, one or more **elementGroups** shall exist.

]

#### [constr\_4045] **implementationConfigVariant** of preconfigured configuration

*Imposition time:* IT\_BswMD

[An **EcucModuleConfigurationValues** element with the **implementationConfigVariant** set to the value **PreconfiguredConfiguration** shall only be referenced in the role **preconfiguredConfiguration** and no other value for **implementationConfigVariant** is allowed in this role.]

#### [constr\_4046] **implementationConfigVariant** of recommended configuration

*Imposition time:* IT\_BswMD

[An **EcucModuleConfigurationValues** element with the **implementationConfigVariant** set to the value **RecommendedConfiguration** shall only be referenced in the role **recommendedConfiguration** and no other value for **implementationConfigVariant** is allowed in this role.]

#### [constr\_4047] Multiplicity of vendor specific configuration parameters

*Imposition time:* IT\_BswMD

[The association **BswImplementation.vendorSpecificModuleDef** shall be implemented as reference to one or more instances of **EcucModuleDef** if the underlying **BswModuleDescription** has the **category** **BSW\_CLUSTER**. In all other cases, it shall refer to exactly one instance of **EcucModuleDef** (the one belonging to this module).]

#### [constr\_4048] Multiplicity of preconfigured values

*Imposition time:* IT\_BswMD

[The association **BswImplementation.preconfiguredConfiguration** shall be implemented as reference to zero or more different instances of **EcucModuleConfigurationValues** if the underlying **BswModuleDescription** has the **category** **BSW\_CLUSTER**. In all other cases, it shall refer to at most one instance of **EcucModuleConfigurationValues** (the one belonging to this module).]

#### [constr\_4051] **RoleBasedDataAssignment** in BSW

*Imposition time:* IT\_BswMD

[When used in the context of **BswServiceDependency**, the following restriction hold for date references described by **RoleBasedDataAssignment**:

- Within `RoleBasedDataAssignment.usedDataElement`, only the reference `AutosarVariableRef.localVariable` is applicable.
- Within `RoleBasedDataAssignment.usedParameterElement`, only the reference `AutosarParameterRef.localParameter` is applicable.
- The reference `RoleBasedDataAssignment.usedPim` shall not be set.

]

#### [constr\_4052] `BswModuleEntry` returnType direction

*Imposition time:* IT\_BswMD

[

`BswModuleEntry.returnType.direction` shall not have the value **in** or **inout**.]

#### [constr\_4053] `BswModuleEntry` argument direction

*Imposition time:* IT\_BswMD

[

If `BswModuleEntry.argument.direction` has the value **out** or **inout**, the corresponding `BswModuleEntry.argument.swDataDefProps` plus eventually referred `ImplementationDataType` shall be such that they result in a pointer declaration.]

#### [constr\_4054] Unambiguous links to addressing method

*Imposition time:* IT\_BswMD

[

`MemorySection.executableEntity` shall not be defined, if `MemorySection.swAddrMethod` represents a data section. `MemorySection.executableEntity` shall not refer to an `ExecutableEntity` which is linked to a different `SwAddrMethod` than `MemorySection.swAddrMethod`.]

#### [constr\_4056] `BswModuleEntry` with no returnType

*Imposition time:* IT\_BswMD

[

In case of an empty return type ("void" in C) the reference `BswModuleEntry.returnType` shall not be set.]

#### [constr\_4057] `BswModuleEntry` with no argument

*Imposition time:* IT\_BswMD

[

In case of an empty argument list ("void" in C) no reference `BswModuleEntry.argument` shall be set.]

**[constr\_4058] Different mode groups in mapped BSWM and SWC shall have different names**

*Imposition time:* IT\_BswMD

[If an `SwcInternalBehavior` is mapped to a `BswInternalBehavior` the corresponding SWC and BSW module descriptions may not refer to different `ModeDeclarationGroups` having the same `shortName` but different elements. This holds especially if these mode groups are not synchronized but used independently.]

**[constr\_4059] Different mode groups referred by a BSWM shall have different names**

*Imposition time:* IT\_BswMD

[A `BswModuleDescription` may not refer to different `ModeDeclarationGroups` (via `requiredModeGroup` and/or `providedModeGroup`) having the same `shortName` but different elements.]

**[constr\_4060] Allowed values of `Trigger.swImplPolicy` for BSW**

*Imposition time:* IT\_BswMD

[The **only** allowed values for the attribute `Trigger.swImplPolicy` are either `STANDARD` (in which case the `Trigger` processing does not use a queue) or `QUEUED` (in which case the processing of `Triggers` positively uses a queue).]

**[constr\_4061] Completeness of MC emulation reference**

*Imposition time:* IT\_BswMD

[If an `McDataInstance` in the role of a `subElement` of another `McDataInstance` specifies an `instanceInMemory`, then the containing `McDataInstance` shall also specify an `instanceInMemory`. The `target` of the latter (i.e. upper level) `instanceInMemory` shall be identical (including array index, if defined) to the `context` of the first (i.e. lower level) `instanceInMemory`.]

**[constr\_4062] Mandatory symbol for `McDataInstance` root**

*Imposition time:* IT\_BswMD

[`McDataInstances` directly aggregated in `McSupportData` shall have a valid `McDataInstance.symbol`.]

**[constr\_4063] Restrictions of `ModeRequestTypeMap` in BSW**

*Imposition time:* IT\_BswMD

[For every `ModeDeclarationGroup` referenced by a `ModeDeclarationGroup-Prototype` used in a `BswModuleDescription` a `ModeRequestTypeMap` shall exist that points to the `ModeDeclarationGroup` and also to an eligible `ImplementationDataType`.

The `ModeRequestTypeMap` shall be aggregated by a `DataTypeMappingSet` which is referenced from the `BswInternalBehavior` that is aggregated by the `BswModuleDescription`.]



#### [constr\_4064] Synchronized triggers shall implement same policy

*Imposition time:* IT\_BswMD

[The mapping defined by `SwcBswSynchronizedTrigger` is only valid if the attribute `SwcBswSynchronizedTrigger.swcTrigger.swImplPolicy` has the same value as the attribute `SwcBswSynchronizedTrigger.bswTrigger.swImplPolicy`.]

#### [constr\_4065] Allowed values of `BswInternalTriggeringPoint.swImplPolicy`

*Imposition time:* IT\_BswMD

[The **only** allowed values for the attribute `BswInternalTriggeringPoint.swImplPolicy` are either `STANDARD` (in which case the internal trigger processing does not use a queue) or `QUEUED` (in which case the internal trigger processing uses a queue).]

#### [constr\_4066] `BswModeSwitchEvent` and the definition of `ModeTransition`

*Imposition time:* IT\_BswMD

[For each pair of `ModeDeclarations` referenced by a `BswModeSwitchEvent` with attribute `activation` set to `onTransition` a `ModeTransition` shall be defined in the corresponding direction (i.e. from `exitedMode` to `enteredMode`). This constraint shall only apply if the respective `ModeDeclarationGroup` defines at least one `modeTransition`.]

#### [constr\_4068] `McFunctionDataRefSet.flatMapEntry`'s semantic

*Imposition time:* IT\_BswMD

[

- An `McFunctionDataRefSet` aggregated in the role of `McFunction.defCalprmSet` or `McFunction.refCalprmSet` shall only refer to `FlatInstanceDescriptors` that
  - either can be traced down to a `ParameterDataPrototype`
  - or can be traced down to a `VariableDataPrototype` of category `COM_AXIS`, `RES_AXIS`, `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, `CUBE_5` or `VAL_BLK`

and which are declared for calibration access i.e. have an associated `SwDataDefProps.swCalibrationAccess` set to `readWrite` or `readOnly`.

- An `McFunctionDataRefSet` aggregated in the role of `McFunction.inMeasurementSet`, `McFunction.outMeasurementSet` or `McFunction.locMeasurementSet` shall only refer to `FlatInstanceDescriptors` that can be traced down to either a `VariableDataPrototype`, an `ArgumentDataPrototype` or a `ModeDeclarationGroupPrototype` and are declared as measurable i.e. have an associated `SwDataDefProps.swCalibrationAccess` set to `readOnly`.

]



#### [constr\_4069] **McFunctionDataRefSet.mcDataInstance's semantic**

*Imposition time:* IT\_BswMD

[

- An `McFunctionDataRefSet` aggregated in the role of `McFunction.defCalprmSet` or `McFunction.refCalprmSet` shall only refer to `McDataInstances` that are declared for calibration access i.e. are aggregated in the role `McSupportData.mcParameterInstance` or `McSupportData.mcVariableInstance` of category `COM_AXIS`, `RES_AXIS`, `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, `CUBE_5` or `VAL_BLK`.
- An `McFunctionDataRefSet` aggregated in the role of `McFunction.inMeasurementSet`, `McFunction.outMeasurementSet` or `McFunction.locMeasurementSet` shall only refer to `McDataInstances` that are declared as measurable i.e. are aggregated in the role `McSupportData.mcVariableInstance`.

]

#### [constr\_4070] **Applicability of `BswModuleEntity.activationReason`**

*Imposition time:* IT\_BswMD

[An `activationReason` shall not be set

- for instances of `BswInterruptEntity`
- for instances of `BswCalledEntity`

]

#### [constr\_4071] **Synchronized runnables and schedulable entities shall be consistent**

*Imposition time:* IT\_BswMD

[A `SwcBswRunnableMapping` that maps a `RunnableEntity` to a `BswCalledEntity` or `BswSchedulableEntity` is only valid if several attributes of the mapped `RunnableEntity` and `BswSchedulableEntity` are consistent, especially all of the following constraints apply to the attributes of the given instance of `SwcBswRunnableMapping`:

- `swcRunnable.symbol` shall be identical to the symbol of `bswEntity` as defined in [TPS\_BSWMDT\_04138].
- `swcRunnable.minimumStartInterval` shall be identical to `bswEntity.minimumStartInterval`.
- `swcRunnable.canBeInvokedConcurrently` shall be identical to `bswEntity.implementedEntry.isReentrant`.
- `swcRunnable.swAddrMethod` shall either be empty or shall have identical attributes as the `SwAddrMethod` defined via `bswEntity.swAddrMethod`. This is

required to ensure a unique configuration for the memory segment of the underlying code entity.

- `swcRunnable.activationReason` and `bswEntity.activationReason` shall have identical `shortName` if they define the same `bitPosition` and shall have identical `bitPosition` if they define the same `shortName`

]

#### [constr\_4072] Constraints of `SectionNamePrefix.implementedIn`

*Imposition time:* IT\_BswMD

[

- The `SectionNamePrefix` and the `DependencyOnArtifact` connected via this link shall belong to the same `BswImplementation`.
- The `DependencyOnArtifact` referred by this link shall be aggregated by `BswImplementation` in the role `requiredArtifact`.
- The `DependencyOnArtifact` referred by this link shall have the `category` value set to MEMMAP.

]

#### [constr\_4073] `McDataAccessDetails` shall refer to one ECU Extract

*Imposition time:* IT\_BswMD

[Within one given `McDataAccessDetails`, all instances of `System` referenced as the base of any `McDataAccessDetails.variableAccess` or as the base of any `McDataAccessDetails.rteEvent` shall be identical and of `category` ECU\_EXTRACT.]

#### [constr\_4074] Compatibility of `BswModuleClientServerEntry-s`

*Imposition time:* IT\_BswMD

[Two `BswModuleClientServerEntry-s` are compatible if and only if all of the following conditions hold:

- Their synchronicity values are identical. These values are taken from the attribute `isSynchronous` or, if this is undefined, from `encapsulatedEntry.isSynchronous`.
- The two `BswModuleEntry-s` referred as `encapsulatedEntry` have `SwServiceArg`, `returnType`, `serviceId` and `swServiceImplPolicy` identical.

]

#### [constr\_4075] Constraints for `providedData` and `requiredData`

*Imposition time:* IT\_BswMD

[Sender-Receiver communication in BSW is restricted to the pattern of so-called *explicit communication* (in the same way as described for software components in [2])

with queued behavior. This leads to some constraints for the `VariableDataPrototype` referred in the role `BswModuleDescription.providedData` or `BswModuleDescription.requiredData`:

- It shall not have an `initValue`.
- Its `swDataDefProps.swImplPolicy` shall be set to `queued`.
- Its `swDataDefProps.swCalibrationAccess` shall be set to `notAccessible`.

There are no further formal constraints on the attributes of the `VariableDataPrototype` to be used in these roles or on the underlying `AutosarDataPrototype`.]

#### [constr\_4076] Constraints on `BswModuleEntry` used for Client-Server

*Imposition time:* IT\_BswMD

[A `BswModuleEntry` used in the role `BswModuleClientServerEntry.encapsulatedEntry` shall have attribute values as follows:

- `callType` shall be `regular` or `callback`.
- `executionContext` shall be `task`.

]

#### [constr\_4077] Constraints for `BswModuleEntity.reentrancyLevel`

*Imposition time:* IT\_BswMD

[

- If the attribute `isReentrant` of a `BswModuleEntry` referred by an `BswModuleEntity` in the role `implementedEntry` has the value `true`, then the attribute `reentrancyLevel` of the same `BswModuleEntity` (if it exists) can only have the values `singleCoreReentrant` or `multicoreReentrant`.
- If the attribute `isReentrant` of a `BswModuleEntry` referred by an `BswModuleEntity` in the role `implementedEntry` has the values `false`, then there are no restrictions for the values of the attribute `reentrancyLevel` of the same `BswModuleEntity` (if it exists).

]

#### [constr\_4078] Consistent usage of `BswOperationInvokedEvent`

*Imposition time:* IT\_BswMD

[The `BswCalledEntity` referred by the attribute `BswOperationInvokedEvent.startsOnEvent` shall refer to the same `BswModuleEntry` (via its attribute `implementedEntry`) as the `BswOperationInvokedEvent` (via its attribute `entry.encapsulatedEntry`.)]

**[constr\_4079] `calledEntry` constraints for client-server calls***Imposition time:* IT\_BswMD

[

- The `BswModuleClientServerEntry` aggregated as `calledEntry` in a `BswSynchronousServerCallPoint` shall have the attribute `isSynchronous = true`.
- The `BswModuleClientServerEntry` aggregated as `calledEntry` in a `BswAsynchronousServerCallPoint` shall have the attribute `isSynchronous = false`.

]

**[constr\_4080] Existence of reception policy***Imposition time:* IT\_BswMD

[If a `VariableDataPrototype` is referred from a `dataReceivePoint` of any `BswModuleEntity` in a given `BswInternalBehavior`, then exactly one corresponding `BswDataReceptionPolicy` shall be aggregated by this `BswInternalBehavior`.]

**[constr\_4081] Mode group used by BSW mode manager error event***Imposition time:* IT\_BswMD

[The `ModeDeclarationGroupPrototype` used by `BswModeManagerErrorEvent` shall be referred as `BswModuleDescription.providedModeGroup` by the same module.]

**[constr\_4083] `BswDistinguishedPartition` shall be used only in the context of a particular `BswInternalBehavior`***Imposition time:* IT\_BswMD

[All instances of `BswEvent`, `BswModuleCallPoint` and `BswVariableAccess` which refer to a `BswDistinguishedPartition` shall belong to the same `BswInternalBehavior` that also aggregates the referred `BswDistinguishedPartition`.]

**[constr\_4084] Consistency of references of `InternalBehavior`***Imposition time:* IT\_BswMD

[The `SwcInternalBehavior` referenced by `SwcBswMapping.swcBehavior` in the `SwcBswMapping` determined by `SwcImplementation.swcBswMapping` shall be identical to the `SwcInternalBehavior` referenced by `SwcImplementation.behavior`.]

**[constr\_4085] Consistency of references of `InternalBehavior`**

*Imposition time:* IT\_BswMD

[The `BswInternalBehavior` referenced by `SwcBswMapping.bswBehavior` in the `SwcBswMapping` determined by `BswImplementation.swcBswMapping` shall be identical to the `BswInternalBehavior` referenced by `BswImplementation.bswBehavior`.]

**[constr\_4087] Usage of category "MACRO"**

*Imposition time:* IT\_BswMD

[It is only allowed to use the category "MACRO" for `SwServiceArg` if the owning `BswModuleEntry` has its `swServiceImplPolicy` attribute set to macro.]

**[constr\_4088] Existence of `RoleBasedDataTypeAssignment.role` vs. `RoleBasedDataAssignment.role`**

*Imposition time:* IT\_BswMD

[The usage of a `RoleBasedDataTypeAssignment` with attribute `role` set to the value `temporaryRamBlock` is only allowed if no `RoleBasedDataAssignment` defined with attribute `role` set to value `defaultValue` exists in the owning `BswServiceDependency`.]

**[constr\_4089] Association `callbackHeader` is only applicable for BSW modules**

*Imposition time:* IT\_BswMD

[The reference `Code.callbackHeader` is only allowed to be used if the `Code` is aggregated by a `BswImplementation` in the role `codeDescriptor`.]

**[constr\_4090] The `callbackHeader` reference has to be consistent with behavior reference**

*Imposition time:* IT\_BswMD

[The reference `Code.callbackHeader` is only allowed to reference `ServiceNeeds` in the context of the `BswServiceDependency` that in turn is aggregated by a `BswImplementation` via `BswInternalBehavior` that is owning the `Code` in the role `codeDescriptor`.]

**[constr\_4091] `AccessCount.value` needs to be unambiguous**

*Imposition time:* IT\_BswMD

[AUTOSAR model shall define at most one `AccessCount.value` per `countProfile` for a specific `AbstractAccessPoint`.]

**[constr\_4092] Number of `ErrorTracerNeeds` in `BswInternalBehavior`**

*Imposition time:* IT\_BswMD

[A `BswInternalBehavior` shall provide at most one `ErrorTracerNeeds` element.]

**[constr\_4093] Entries linked to `BswModuleEntry`s shall have compatible signature***Imposition time:* IT\_BswMD

[Matching `BswModuleEntry`s according to [TPS\_BSWMDT\_04130] are compatible if the following conditions are fulfilled:

- both or neither of them define a `returnType`
- when the `returnTypes` are defined, the `SwServiceArgs` in the role `returnType` shall be compatible
- both define the same number of compatible arguments in same order

]

**[constr\_4094] compatibility of `SwServiceArg` in role `returnType`***Imposition time:* IT\_BswMD

[`SwServiceArg` in role `returnType` are compatible if they are identically typed]

**[constr\_4095] Compatibility of `SwServiceArg` in role `argument`***Imposition time:* IT\_BswMD

[`SwServiceArg` in role `returnType` are compatible if:

- they are identically typed

and

- if both do have the same `shortName`

]

**[constr\_4096] Matching `BswModuleEntry`s should have compatible attributes***Imposition time:* IT\_BswMD

[Matching `BswModuleEntry`s according to [TPS\_BSWMDT\_04130] should be defined with identical values of the attributes

- `callType`
- `executionContext`
- `isReentrant`
- `isSynchronous`
- `serviceId`
- `swServiceImplPolicy`
- `bswEntryKind`

]

#### [constr\_4097] Limitation on the number of **BswExclusiveAreaPolicys**

*Imposition time:* IT\_BswMD

[An **ExclusiveArea** can only be referenced by at most one **BswExclusiveAreaPolicy**.]

#### [constr\_4098] No mode disabling for **BswOperationInvokedEvent**

*Imposition time:* IT\_BswMD

[A **BswOperationInvokedEvent** shall not have a reference to a **ModeDeclaration** in the role **disabledInMode**.]

#### [constr\_4099] Support of multiple instantiation

*Imposition time:* IT\_BswMD

[If a BSW Module supports multiple instantiation the attribute **vendorApiInfix** is mandatory.]

#### [constr\_4100] Uniqueness of module implementation prefixes

*Imposition time:* IT\_BswMD

[Inside one ECU the Module implementation prefixes (Mip) of BSW Modules shall be unique.]

#### [constr\_4101] Semantics of **McGroupDataRefSet.flatMapEntry**

*Imposition time:* IT\_BswMD

[

- An **McGroupDataRefSet** aggregated in the role of **McGroup.refCalprmSet** or **McGroup.refCalprmSet** shall only refer to **FlatInstanceDescriptors** that can either be traced down to a **ParameterDataPrototype** or can be traced down to a **VariableDataPrototype** of category **COM\_AXIS**, **RES\_AXIS**, **CURVE**, **MAP**, **CUBOID**, **CUBE\_4**, **CUBE\_5** or **VAL\_BLK** and which are declared for calibration access i.e. have an associated **SwDataDefProps.swCalibrationAccess** set to **readWrite** or **readOnly**.
- An **McGroupDataRefSet** aggregated in the role of **McGroup.refMeasurementSet** shall only refer to **FlatInstanceDescriptors** that can be traced down to either a **VariableDataPrototype**, an **ArgumentDataPrototype** or a **ModeDeclarationGroupPrototype** and are declared as measurable i.e. have an associated **SwDataDefProps.swCalibrationAccess** set to **readOnly**.

]

#### [constr\_4102] Semantics of **McGroupDataRefSet.mcDataInstance**

*Imposition time:* IT\_BswMD

[

- An `McGroupDataRefSet` aggregated in the role of `McGroup.refCalprmSet` shall only refer to `McDataInstances` that are declared for calibration access i.e. are aggregated in the role `McSupportData.mcParameterInstance` or `McSupportData.mcParameterInstance` of category `VALUE`, `COM_AXIS`, `RES_AXIS`, `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, `CUBE_5` or `VAL_BLK`.
- An `McGroupDataRefSet` aggregated in the role of `McGroup.refMeasurementSet` shall only refer to `McDataInstances` that are declared as measurable i.e. are aggregated in the role `McSupportData.mcVariableInstance`.

]

#### [constr\_4103] Name convention for `SectionNamePrefix.symbol`

*Imposition time:* IT\_BswMD

[In case a BSW module is split into allocatable memory parts the existing (according to [SWS\_MemMap\_00041]) `SectionNamePrefix.symbol` shall be set in the `<MIP>_<FEATURE>` form, where:

- `<MIP>` : is the capitalized module implementation prefix
- `<FEATURE>` : is the name of the sub-feature in the BSW module denoting the allocatable memory part

]

#### [constr\_4104] Referencing of `MemorySections` to `SectionNamePrefix`

*Imposition time:* IT\_BswMD

[In case a BSW module or Software Component is split into allocatable memory parts all `MemorySections` belonging to the same allocatable memory part shall reference the identical `SectionNamePrefix` representing the allocatable memory part.]

#### [constr\_4105] Use of attribute `task` or `cat2Isr`

*Imposition time:* IT\_BswMD

[Only one of the attributes is allowed to exist. Either `task` or `cat2Isr` should be configured.]

#### [constr\_4106] Restriction for the value of `SwServiceArg.swImplPolicy`

*Imposition time:* IT\_BswMD

[The attribute `SwServiceArg.swImplPolicy` shall only have one of the following values:

- `SwImplPolicyEnum.const`
- `SwImplPolicyEnum.standard`

]



### [constr\_4107] **swImplPolicy** for **SwServiceArg**

*Imposition time:* IT\_BswMD

[The overriding value of attribute **swImplPolicy** of a **SwServiceArg** shall be **standard** or **const**.]

### [constr\_4108] Restriction regarding the value of **SwServiceArg.category**

*Imposition time:* IT\_BswMD

[The attribute **SwServiceArg.category** shall only have the following values:

- **VALUE**<sup>2</sup>
- **DATA\_REFERENCE**
- **FUNCTION\_REFERENCE**
- **TYPE\_REFERENCE**
- **MACRO**

]

### [constr\_9316] Multi instantiated BSW Modules not mappable

*Imposition time:* IT\_BswMD

[In case a BSW Module is multi instantiated in an ECU its **BswImplementations** shall not reference a **SwcBswMapping** in the role **swcBswMapping**.]

### [constr\_9357] Existence of attributes of **McDataInstance** depending on the category

*Imposition time:* IT\_BswMD

[

Attributes of McDataInstance	Attribute Existence per <b>McDataInstance.category</b>													
	VALUE	VAL_BLK	STRUCTURE	UNION	ARRAY	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5
<b>arraySize</b>					1									
<b>displayIdentifier</b>	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
<b>role</b>	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
<b>symbol</b>	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>subElement</b>			1..*	1..*	1..*									
<b>flatMapEntry</b>	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
<b>instanceInMemory</b>	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
<b>mcDataAccessDetails</b>	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1



<sup>2</sup>This option has **very few** valid use cases, e.g. for defining a function pointer in native C notation, for example: `int (*SwCluC_BManif_VoidFncPtrType)(void);`



Attributes of McDataInstance	Attribute Existence per <code>McDataInstance.category</code>													
	VALUE	VAL_BLK	STRUCTURE	UNION	ARRAY	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5
<code>mcDataAssignment</code>	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*
<code>resultingRptSwPrototypingAccess</code>	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
<code>rptImplPolicy</code>	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.compuMethod</code>	0..1	0..1					0..1			0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.unit</code>	0..1	0..1								0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.dataConstr</code>	0..1	0..1			0..1		0..1			0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.swCalprmAxisSet</code>								0..1	0..1	0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.swHostVariable</code>														
<code>resultingProperties.swBitRepresentation</code>														
<code>resultingProperties.baseType</code>	0..1													
<code>resultingProperties.swRecordLayout</code>	0..1	0..1				0..1		1	1	1	1	1	1	1
<code>resultingProperties.additionalNativeTypeQualifier</code>	0..1		0..1	0..1	0..1	0..1		0..1	0..1	0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.stepSize</code>	0..1	0..1			0..1			0..1	0..1	0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.displayPresentation</code>	0..1	0..1			0..1			0..1	0..1	0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.swAlignment</code>														
<code>resultingProperties.swImplPolicy</code>														
<code>resultingProperties.swAddrMethod</code>														
<code>resultingProperties.swIntendedResolution</code>														
<code>resultingProperties.swPointerTargetProps</code>														
<code>resultingProperties.swInterpolationMethod</code>								0..1	0..1	0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.swIsVirtual</code>														
<code>resultingProperties.swValueBlockSize</code>		1												
<code>resultingProperties.swValueBlockSizeMult</code>		1												
<code>resultingProperties.annotation</code>	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*	0..*
<code>resultingProperties.displayFormat</code>	0..1	0..1	0..1	0..1	0..1	0..1	0..1			0..1	0..1	0..1	0..1	0..1
<code>resultingProperties.implementationDataType</code>														





Attributes of McDataInstance	Attribute Existence per <code>McDataInstance.category</code>													
	VALUE	VAL_BLK	STRUCTURE	UNION	ARRAY	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5
<code>resultingProperties.invalid-Value</code>	0..1		0..1		0..1	0..1								
<code>resultingProperties.sw-TextProps</code>						1								

]

**[constr\_10257] Existence of attribute `BswServiceDependency.serviceNeeds`**

*Imposition time:* IT\_BswMD

[For each `BswServiceDependency`, the attribute `serviceNeeds` shall exist.]

**[constr\_10258] Existence of the reference in the role `RoleBasedBswModuleEntryAssignment.assignedEntry`**

*Imposition time:* IT\_BswMD

[For each `RoleBasedBswModuleEntryAssignment`, the reference in the role `assignedEntry` shall exist.]

**[constr\_10259] Existence of attribute `RoleBasedBswModuleEntryAssignment.role`**

*Imposition time:* IT\_BswMD

[For each `RoleBasedBswModuleEntryAssignment`, the attribute `role` shall exist.]

**[constr\_10260] Existence of attribute `BswModuleEntry.callType`**

*Imposition time:* IT\_BswMD

[For each `BswModuleEntry`, the attribute `callType` shall exist.]

**[constr\_10261] Existence of attribute `BswModuleEntry.executionContext`**

*Imposition time:* IT\_BswMD

[For each `BswModuleEntry`, the attribute `executionContext` shall exist.]

**[constr\_10262] Existence of attribute `BswModuleEntry.isReentrant`**

*Imposition time:* IT\_BswMD

[For each `BswModuleEntry`, the attribute `isReentrant` shall exist.]

**[constr\_10263] Existence of attribute `BswModuleEntry.isSynchronous`**

*Imposition time:* IT\_BswMD

[For each `BswModuleEntry`, the attribute `isSynchronous` shall exist.]

**[constr\_10264] Existence of attribute `BswModuleEntry.swServiceImplPolicy`***Imposition time:* IT\_BswMD[For each `BswModuleEntry`, the attribute `swServiceImplPolicy` shall exist.]**[constr\_10265] Existence of attribute `BswEntryRelationshipSet.bswEntryRelationship`***Imposition time:* IT\_BswMD[For each `BswEntryRelationshipSet`, the attribute `bswEntryRelationship` shall exist at least once.]**[constr\_10266] Existence of attribute `BswEntryRelationship.bswEntryRelationshipType`***Imposition time:* IT\_BswMD[For each `BswEntryRelationship`, the attribute `bswEntryRelationshipType` shall exist.]**[constr\_10267] Existence of reference in the role `BswEntryRelationship.from`***Imposition time:* IT\_BswMD[For each `BswEntryRelationship`, the reference in the role `from` shall exist.]**[constr\_10268] Existence of reference in the role `BswEntryRelationship.to`***Imposition time:* IT\_BswMD[For each `BswEntryRelationship`, the reference in the role `to` shall exist.]**[constr\_10269] Existence of the reference in the role `BswModuleClientServerEntry.encapsulatedEntry`***Imposition time:* IT\_BswMD[For each `BswModuleClientServerEntry`, the the reference in the role `encapsulatedEntry` shall exist.]**[constr\_10270] Existence of attribute `AccessCountSet.countProfile`***Imposition time:* IT\_BswMD[For each `AccessCountSet`, the attribute `countProfile` shall exist.]**[constr\_10271] Existence of attribute `AccessCount.value`***Imposition time:* IT\_BswMD[For each `AccessCount`, the attribute `value` shall exist.]**[constr\_10272] Existence of the reference in the role `BswModuleEntity.implementedEntry`***Imposition time:* IT\_BswMD[For each `BswModuleEntity`, the reference in the role `implementedEntry` shall exist.]

**[constr\_10273] Existence of attribute `BswInterruptEntity.interruptCategory`***Imposition time:* IT\_BswMD[For each `BswInterruptEntity`, the attribute `interruptCategory` shall exist.]**[constr\_10274] Existence of attribute `BswInterruptEntity.interruptSource`***Imposition time:* IT\_BswMD[For each `BswInterruptEntity`, the attribute `interruptSource` shall exist.]**[constr\_10275] Existence of the reference in the role `BswDirectCallPoint.calledEntry`***Imposition time:* IT\_BswMD[For each `BswDirectCallPoint`, the reference in the role `calledEntry` shall exist.]**[constr\_10276] Existence of the reference in the role `BswSynchronousServerCallPoint.calledEntry`***Imposition time:* IT\_BswMD[For each `BswSynchronousServerCallPoint`, the reference in the role `calledEntry` shall exist.]**[constr\_10277] Existence of the reference in the role `BswAsynchronousServerCallPoint.calledEntry`***Imposition time:* IT\_BswMD[For each `BswAsynchronousServerCallPoint`, the reference in the role `calledEntry` shall exist.]**[constr\_10278] Existence of the reference in the role `BswAsynchronousServerCallResultPoint.asynchronousServerCallPoint`***Imposition time:* IT\_BswMD[For each `BswAsynchronousServerCallResultPoint`, the reference in the role `asynchronousServerCallPoint` shall exist.]**[constr\_10279] Existence of the reference in the role `BswVariableAccess.accessedVariable`***Imposition time:* IT\_BswMD[For each `BswVariableAccess`, the reference in the role `accessedVariable` shall exist.]

**[constr\_10280] Existence of the reference in the role `BswExclusiveAreaPolicy.exclusiveArea`***Imposition time:* IT\_BswMD

[For each `BswExclusiveAreaPolicy`, the reference in the role `exclusiveArea` shall exist.]

**[constr\_10281] Existence of attribute `BswTimingEvent.period`***Imposition time:* IT\_BswMD

[For each `BswTimingEvent`, the attribute `period` shall exist.]

**[constr\_10282] Existence of the reference in the role `BswInternalTriggerOccurredEvent.eventSource`***Imposition time:* IT\_BswMD

[For each `BswInternalTriggerOccurredEvent`, the reference in the role `eventSource` shall exist.]

**[constr\_10283] Existence of the reference in the role `BswExternalTriggerOccurredEvent.trigger`***Imposition time:* IT\_BswMD

[For each `BswExternalTriggerOccurredEvent`, the reference in the role `trigger` shall exist.]

**[constr\_10284] Existence of attribute `BswModeSwitchEvent.activation`***Imposition time:* IT\_BswMD

[For each `BswModeSwitchEvent`, the attribute `activation` shall exist.]

**[constr\_10285] Existence of the reference in the role `BswModeSwitchedAckEvent.modeGroup`***Imposition time:* IT\_BswMD

[For each `BswModeSwitchedAckEvent`, the reference in the role `modeGroup` shall exist.]

**[constr\_10286] Existence of the reference in the role `BswModeManagerErrorEvent.modeGroup`***Imposition time:* IT\_BswMD

[For each `BswModeManagerErrorEvent`, the reference in the role `modeGroup` shall exist.]

**[constr\_10287] Existence of the reference in the role `BswOperationInvokedEvent.entry`***Imposition time:* IT\_BswMD

[For each `BswOperationInvokedEvent`, the reference in the role `entry` shall exist.]

**[constr\_10288] Existence of the reference in the role `BswAsynchronousServerCallReturnsEvent.eventSource`***Imposition time:* IT\_BswMD

[For each `BswAsynchronousServerCallReturnsEvent`, the reference in the role `eventSource` shall exist.]

**[constr\_10289] Existence of the reference in the role `BswDataReceivedEvent.data`***Imposition time:* IT\_BswMD

[For each `BswDataReceivedEvent`, the reference in the role `data` shall exist.]

**[constr\_10290] Existence of the reference in the role `BswTriggerDirectImplementation.masteredTrigger`***Imposition time:* IT\_BswMD

[For each `BswTriggerDirectImplementation`, the reference in the role `masteredTrigger` shall exist.]

**[constr\_10291] Existence of the reference in the role `BswModeSenderPolicy.providedModeGroup`***Imposition time:* IT\_BswMD

[For each `BswModeSenderPolicy`, the reference in the role `providedModeGroup` shall exist.]

**[constr\_10292] Existence of attribute `BswModeSenderPolicy.queueLength`***Imposition time:* IT\_BswMD

[For each `BswModeSenderPolicy`, the attribute `queueLength` shall exist.]

**[constr\_10293] Existence of attribute `BswModeSwitchAckRequest.timeout`***Imposition time:* IT\_BswMD

[For each `BswModeSwitchAckRequest`, the attribute `timeout` shall exist.]

**[constr\_10294] Existence of the reference in the role `BswModeReceiverPolicy.requiredModeGroup`***Imposition time:* IT\_BswMD

[For each `BswModeReceiverPolicy`, the reference in the role `requiredModeGroup` shall exist.]

**[constr\_10295] Existence of attribute `BswModeReceiverPolicy.supportsAsynchronousModeSwitch`***Imposition time:* IT\_BswMD

[For each `BswModeReceiverPolicy`, the attribute `supportsAsynchronousModeSwitch` shall exist.]

**[constr\_10296] Existence of reference in the role `BswDataReceptionPolicy.receivedData`***Imposition time:* IT\_BswMD

[For each `BswDataReceptionPolicy`, the reference in the role `receivedData` shall exist.]

**[constr\_10297] Existence of attribute `BswQueuedDataReceptionPolicy.queueLength`***Imposition time:* IT\_BswMD

[For each `BswQueuedDataReceptionPolicy`, the attribute `queueLength` shall exist.]

**[constr\_10298] Existence of the reference in the role `SwcBswRunnableMapping.bswEntity`***Imposition time:* IT\_BswMD

[For each `SwcBswRunnableMapping`, the reference in the role `bswEntity` shall exist.]

**[constr\_10299] Existence of the reference in the role `SwcBswRunnableMapping.swcRunnable`***Imposition time:* IT\_BswMD

[For each `SwcBswRunnableMapping`, the reference in the role `swcRunnable` shall exist.]

**[constr\_10300] Existence of the reference in the role `SwcBswSynchronizedTrigger.bswTrigger`***Imposition time:* IT\_BswMD

[For each `SwcBswSynchronizedTrigger`, the reference in the role `bswTrigger` shall exist.]

**[constr\_10301] Existence of the instanceRef in the role `SwcBswSynchronizedTrigger.swcTrigger`***Imposition time:* IT\_BswMD

[For each `SwcBswSynchronizedTrigger`, the instanceRef in the role `swcTrigger` shall exist.]

**[constr\_10302] Existence of attribute `BswImplementation.arReleaseVersion`***Imposition time:* IT\_BswMD

[For each `BswImplementation`, the attribute `arReleaseVersion` shall exist.]



**[constr\_10303] Existence of the reference in the role `BswImplementation.behavior`***Imposition time:* IT\_BswMD[For each `BswImplementation`, the reference in the role `behavior` shall exist.]**[constr\_10304] Existence of attribute `DependencyOnArtifact.usage`***Imposition time:* IT\_BswMD[For each `DependencyOnArtifact`, the attribute `usage` shall exist at least once.]**[constr\_10305] Existence of attribute `WorstCaseStackUsage.memoryConsumption`***Imposition time:* IT\_BswMD[For each `WorstCaseStackUsage`, the attribute `memoryConsumption` shall exist.]**[constr\_10306] Existence of attribute `MeasuredStackUsage.averageMemoryConsumption`***Imposition time:* IT\_BswMD[For each `MeasuredStackUsage`, the attribute `averageMemoryConsumption` shall exist.]**[constr\_10307] Existence of attribute `MeasuredStackUsage.maximumMemoryConsumption`***Imposition time:* IT\_BswMD[For each `MeasuredStackUsage`, the attribute `maximumMemoryConsumption` shall exist.]**[constr\_10308] Existence of attribute `RoughEstimateStackUsage.memoryConsumption`***Imposition time:* IT\_BswMD[For each `RoughEstimateStackUsage`, the attribute `memoryConsumption` shall exist.]**[constr\_10309] Existence of attribute `WorstCaseHeapUsage.memoryConsumption`***Imposition time:* IT\_BswMD[For each `WorstCaseHeapUsage`, the attribute `memoryConsumption` shall exist.]**[constr\_10310] Existence of attribute `MeasuredHeapUsage.averageMemoryConsumption`***Imposition time:* IT\_BswMD[For each `MeasuredHeapUsage`, the attribute `averageMemoryConsumption` shall exist.]

**[constr\_10311] Existence of attribute `MeasuredHeapUsage.maximumMemoryConsumption`***Imposition time:* IT\_BswMD

[For each `MeasuredHeapUsage`, the attribute `maximumMemoryConsumption` shall exist.]

**[constr\_10312] Existence of attribute `RoughEstimateHeapUsage.memoryConsumption`***Imposition time:* IT\_BswMD

[For each `RoughEstimateHeapUsage`, the attribute `memoryConsumption` shall exist.]

**[constr\_10313] Existence of attribute `ExecutionTime.hardwareConfiguration`***Imposition time:* IT\_BswMD

[For each `ExecutionTime`, the attribute `hardwareConfiguration` shall exist.]

**[constr\_10314] Existence of attribute `ExecutionTime.softwareContext`***Imposition time:* IT\_BswMD

[For each `ExecutionTime`, the attribute `softwareContext` shall exist.]

**[constr\_10315] Existence of attribute `HardwareConfiguration.additionalInformation`***Imposition time:* IT\_BswMD

[For each `HardwareConfiguration`, the attribute `additionalInformation` shall exist.]

**[constr\_10316] Existence of attribute `HardwareConfiguration.processorMode`***Imposition time:* IT\_BswMD

[For each `HardwareConfiguration`, the attribute `processorMode` shall exist.]

**[constr\_10317] Existence of attribute `HardwareConfiguration.processorSpeed`***Imposition time:* IT\_BswMD

[For each `HardwareConfiguration`, the attribute `processorSpeed` shall exist.]

**[constr\_10318] Existence of reference `MemorySectionLocation.providedMemory`***Imposition time:* IT\_BswMD

[For each `MemorySectionLocation`, the reference in the role `providedMemory` shall exist.]

**[constr\_10319] Existence of reference `MemorySectionLocation.softwareMemorySection`***Imposition time:* IT\_BswMD

[For each `MemorySectionLocation`, the reference in the role `softwareMemorySection` shall exist.]

**[constr\_10320] Existence of attribute `SoftwareContext.input`***Imposition time:* IT\_BswMD

[For each `SoftwareContext`, the attribute `input` shall exist.]

**[constr\_10321] Existence of attribute `SoftwareContext.state`***Imposition time:* IT\_BswMD

[For each `SoftwareContext`, the attribute `state` shall exist.]

**[constr\_10323] Existence of attribute `AnalyzedExecutionTime.bestCaseExecutionTime`***Imposition time:* IT\_BswMD

[For each `AnalyzedExecutionTime`, the attribute `bestCaseExecutionTime` shall exist.]

**[constr\_10324] Existence of attribute `AnalyzedExecutionTime.worstCaseExecutionTime`***Imposition time:* IT\_BswMD

[For each `AnalyzedExecutionTime`, the attribute `worstCaseExecutionTime` shall exist.]

**[constr\_10325] Existence of attribute `MeasuredExecutionTime.maximumExecutionTime`***Imposition time:* IT\_BswMD

[For each `MeasuredExecutionTime`, the attribute `maximumExecutionTime` shall exist.]

**[constr\_10326] Existence of attribute `MeasuredExecutionTime.minimumExecutionTime`***Imposition time:* IT\_BswMD

[For each `MeasuredExecutionTime`, the attribute `minimumExecutionTime` shall exist.]

**[constr\_10327] Existence of attribute `MeasuredExecutionTime.nominalExecutionTime`***Imposition time:* IT\_BswMD

[For each `MeasuredExecutionTime`, the attribute `nominalExecutionTime` shall exist.]

**[constr\_10328] Existence of the reference in the role `BswEvent.startsOnEvent`***Imposition time:* IT\_BswMD[For each `BswEvent`, the reference in the role `startsOnEvent` shall exist.]**[constr\_10329] Existence of the instanceRef in the role `McDataAccessDetails.variableAccess`***Imposition time:* IT\_BswMD[For each `McDataAccessDetails`, the instanceRef in the role `variableAccess` shall exist at least once.]**[constr\_10330] Existence of attribute `RptServicePoint.symbol`***Imposition time:* IT\_BswMD[For each `RptServicePoint`, the attribute `symbol` shall exist.]**[constr\_10331] Existence of attribute `SimulatedExecutionTime.maximumExecutionTime`***Imposition time:* IT\_BswMD[For each `SimulatedExecutionTime`, the attribute `maximumExecutionTime` shall exist.]**[constr\_10332] Existence of attribute `SimulatedExecutionTime.minimumExecutionTime`***Imposition time:* IT\_BswMD[For each `SimulatedExecutionTime`, the attribute `minimumExecutionTime` shall exist.]**[constr\_10333] Existence of attribute `SimulatedExecutionTime.nominalExecutionTime`***Imposition time:* IT\_BswMD[For each `SimulatedExecutionTime`, the attribute `nominalExecutionTime` shall exist.]**[constr\_10334] Existence of attribute `RoughEstimateOfExecutionTime.additionalInformation`***Imposition time:* IT\_BswMD[For each `RoughEstimateOfExecutionTime`, the attribute `additionalInformation` shall exist.]**[constr\_10335] Existence of attribute `RoughEstimateOfExecutionTime.estimatedExecutionTime`***Imposition time:* IT\_BswMD[For each `RoughEstimateOfExecutionTime`, the attribute `estimatedExecutionTime` shall exist.]

**[constr\_10336] Existence of the reference in the role `SwcBswSynchronizedModeGroupPrototype.bswModeGroup`***Imposition time:* IT\_BswMD

[For each `SwcBswSynchronizedModeGroupPrototype`, the reference in the role `bswModeGroup` shall exist.]

**[constr\_10337] Existence of the instanceRef in the role `SwcBswSynchronizedModeGroupPrototype.swcModeGroup`***Imposition time:* IT\_BswMD

[For each `SwcBswSynchronizedModeGroupPrototype`, the instanceRef in the role `swcModeGroup` shall exist.]

**[constr\_10338] Existence of attribute `MultidimensionalTime.cseCode`***Imposition time:* IT\_BswMD

[For each `MultidimensionalTime`, the attribute `cseCode` shall exist.]

**[constr\_10339] Existence of attribute `MultidimensionalTime.cseCodeFactor`***Imposition time:* IT\_BswMD

[For each `MultidimensionalTime`, the attribute `cseCodeFactor` shall exist.]

**[constr\_10340] Existence of attribute `McSwEmulationMethodSupport.category`***Imposition time:* IT\_BswMD

[For each `McSwEmulationMethodSupport`, the attribute `category` shall exist.]

**[constr\_10341] Existence of attribute `McSwEmulationMethodSupport.shortLabel`***Imposition time:* IT\_BswMD

[For each `McSwEmulationMethodSupport`, the attribute `shortLabel` shall exist.]

**[constr\_10342] Existence of the reference in the role `McParameterElementGroup.ramLocation`***Imposition time:* IT\_BswMD

[For each `McParameterElementGroup`, the reference in the role `ramLocation` shall exist.]

**[constr\_10343] Existence of the reference in the role `McParameterElementGroup.romLocation`***Imposition time:* IT\_BswMD

[For each `McParameterElementGroup`, the reference in the role `romLocation` shall exist.]

**[constr\_10344] Existence of attribute `McParameterElementGroup.shortLabel`***Imposition time:* IT\_BswMD[For each `McParameterElementGroup`, the attribute `shortLabel` shall exist.]**[constr\_10345] Existence of the reference in the role `ImplementationElementInParameterInstanceRef.context`***Imposition time:* IT\_BswMD[For each `ImplementationElementInParameterInstanceRef`, the reference in the role `context` shall exist.]**[constr\_10346] Existence of the reference in the role `ImplementationElementInParameterInstanceRef.target`***Imposition time:* IT\_BswMD[For each `ImplementationElementInParameterInstanceRef`, the reference in the role `target` shall exist.]**[constr\_10347] Existence of the instanceRef in the role `McDataAccessDetails.rteEvent`***Imposition time:* IT\_BswMD[For each `McDataAccessDetails`, the instanceRef in the role `rteEvent` shall exist at least once.]**[constr\_10349] Existence of attribute `RptSupportData.executionContext`***Imposition time:* IT\_BswMD[For each `RptSupportData`, the attribute `executionContext` shall exist at least once.]**[constr\_10350] Existence of attribute `RptSupportData.rptComponent`***Imposition time:* IT\_BswMD[For each `RptSupportData`, the attribute `rptComponent` shall exist at least once.]**[constr\_10351] Existence of attribute `RptSupportData.rptServicePoint`***Imposition time:* IT\_BswMD[For each `RptSupportData`, the attribute `rptServicePoint` shall exist at least once.]**[constr\_10352] Existence of attribute `RptComponent.rptExecutableEntity`***Imposition time:* IT\_BswMD[For each `RptComponent`, the attribute `rptExecutableEntity` shall exist at least once.]

**[constr\_10353] Existence of attribute `RptExecutableEntity.rptExecutableEntityEvent`***Imposition time:* IT\_BswMD

[For each `RptExecutableEntity`, the attribute `rptExecutableEntityEvent` shall exist at least once.]

**[constr\_10354] Existence of attribute `RptExecutableEntity.symbol`***Imposition time:* IT\_BswMD

[For each `RptExecutableEntity`, the attribute `symbol` shall exist.]

**[constr\_10355] Existence of the reference in the role `RptExecutableEntityEvent.executionContext`***Imposition time:* IT\_BswMD

[For each `RptExecutableEntityEvent`, the reference in the role `executionContext` shall exist at least once.]

**[constr\_10356] Existence of attribute `RptExecutableEntityEvent.rptEventId`***Imposition time:* IT\_BswMD

[For each `RptExecutableEntityEvent`, the attribute `rptEventId` shall exist.]

**[constr\_10357] Existence of attribute `RptExecutableEntityEvent.rptExecutableEntityProperties`***Imposition time:* IT\_BswMD

[For each `RptExecutableEntityEvent`, the attribute `rptExecutableEntityProperties` shall exist.]

**[constr\_10358] Existence of the reference in the role `RptExecutableEntityEvent.rptServicePointPost`***Imposition time:* IT\_BswMD

[For each `RptExecutableEntityEvent`, the reference in the role `rptServicePointPost` shall exist at least once.]

**[constr\_10359] Existence of the reference in the role `RptExecutableEntityEvent.rptServicePointPre`***Imposition time:* IT\_BswMD

[For each `RptExecutableEntityEvent`, the reference in the role `rptServicePointPre` shall exist at least once.]

**[constr\_10360] Existence of attribute `RptServicePoint.serviceId`***Imposition time:* IT\_BswMD

[For each `RptServicePoint`, the attribute `serviceId` shall exist.]

### [constr\_10362] Existence of attribute `AliasNameSet.aliasName`

*Imposition time:* IT\_BswMD

[For each `AliasNameSet`, the attribute `aliasName` shall exist at least once.]

### [constr\_10363] Existence of attribute `AliasNameAssignment.shortLabel`

*Imposition time:* IT\_BswMD

[For each `AliasNameAssignment`, the attribute `shortLabel` shall exist.]

## 2.2 CP\_TPS\_DiagnosticExtractTemplate

### [constr\_1324] Existence of attribute `DiagnosticDataIdentifier.representsVin`

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[Within the context of a given `DiagnosticContributionSet`, the attribute `DiagnosticDataIdentifier.representsVin` shall have the value `true` for only a single `DiagnosticDataIdentifier`.]

### [constr\_1325] Allowed attributes of `SwDataDefProps` for `DiagnosticDataElement.swDataDefProps`

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[

Attributes of <code>SwDataDefProps</code>	<code>DiagnosticDataElement.swDataDefProps</code>
<code>additionalNativeTypeQualifier</code>	
<code>annotation</code>	
<code>baseType.baseTypeDefinition.baseTypeEncoding</code>	D
<code>baseType.baseTypeDefinition.baseTypeSize</code>	D
<code>baseType.baseTypeDefinition.byteOrder</code>	D
<code>baseType.baseTypeDefinition.memAlignment</code>	
<code>baseType.baseTypeDefinition.nativeDeclaration</code>	
<code>compuMethod</code>	D
<code>dataConstr</code>	D
<code>displayFormat</code>	D
<code>displayPresentation</code>	
<code>implementationDataType</code>	
<code>invalidValue</code>	
<code>swAddrMethod</code>	
<code>swAlignment</code>	
<code>swBitRepresentation</code>	
<code>swCalibrationAccess</code>	
<code>swCalprmAxisSet</code>	
<code>swComparisonVariable</code>	
<code>swDataDependency</code>	

▽



△

Attributes of <code>SwDataDefProps</code>	<code>DiagnosticDataElement.swDataDefProps</code>
<code>swImplPolicy</code>	
<code>swIntendedResolution</code>	
<code>swInterpolationMethod</code>	
<code>swIsVirtual</code>	
<code>swPointerTargetProps</code>	
<code>swRecordLayout</code>	
<code>swRefreshTiming</code>	
<code>swTextProps</code>	
<code>swValueBlockSize</code>	
<code>unit</code>	D
<code>valueAxisDataType</code>	

]

### [constr\_1326] Existence of a variable-sized array

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The value of the attribute `DiagnosticDataElement.arraySizeSemantics` shall not be set to `ArraySizeSemanticsEnum.variableSize` if the respective `DiagnosticDataElement` is referenced from a `DiagnosticServiceDataMapping`.]

### [constr\_1327] Multiplicity of `DiagnosticEcuInstanceProps.ecuInstance`

*Imposition time:* CP: IT\_DiagDes

[The multiplicity of `DiagnosticEcuInstanceProps.ecuInstance` shall be limited to 1 and the enclosing `DiagnosticContributionSet` shall only refer to at most one `DiagnosticEcuInstanceProps` if the enclosing `DiagnosticContributionSet` is of category `DIAGNOSTICS_ECU_EXTRACT`.]

### [constr\_1328] Consistency of `DiagnosticEcuInstanceProps.ecuInstance` and `DiagnosticServiceTable.ecuInstance`

*Imposition time:* CP: IT\_DiagDes

[Each `DiagnosticServiceTable` referenced by any given `DiagnosticContributionSet` in the role `serviceTable` shall define a reference in the role `DiagnosticServiceTable.ecuInstance` to an `EcuInstance` that is also referenced in the role `DiagnosticEcuInstanceProps.ecuInstance` by a `DiagnosticEcuInstanceProps` referenced by the mentioned `DiagnosticContributionSet` if the respective `DiagnosticContributionSet` is of category `DIAGNOSTICS_ECU_EXTRACT`.]

### [constr\_1329] Existence of concrete sub-classes of `DiagnosticServiceClass` in the context created by a `DiagnosticContributionSet`

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[One of the following mutually exclusive conditions shall apply for the existence of any concrete sub-class of `DiagnosticServiceClass` in the context created by a `DiagnosticContributionSet`:

- The subclass of `DiagnosticServiceClass` (except `DiagnosticCustomServiceClass`) shall only appear once in the context created by a `DiagnosticContributionSet`.
- A `DiagnosticCustomServiceClass` with a given value of attribute `customServiceId` shall only appear once in the context created by a `DiagnosticContributionSet`.
- If the subclass of `DiagnosticServiceClass` (except `DiagnosticCustomServiceClass`) appears multiple times in the context created by a `DiagnosticContributionSet`, then all instances of the sub-class of `DiagnosticServiceClass` shall have identical values for all of their attributes.

In case of aggregations, the number of aggregated elements shall be identical and the values of primitive attributes of aggregated elements shall again be identical.

]

#### **[constr\_1330] Custom service identifier shall not overlap with standardized service identifiers**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The value of the attribute `DiagnosticCustomServiceClass.customServiceId` shall not be set to any of the values reserved for standardized service identifiers as defined by the, see [3, ISO 14229-1].]

#### **[constr\_1331] Existence of `DiagnosticEcuReset.customSubFunctionNumber`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The attribute `DiagnosticEcuReset.customSubFunctionNumber` shall only exist if the value of `DiagnosticEcuReset.category` is outside the standardized set of values as defined by [TPS\_DEXT\_01056].]

#### **[constr\_1332] Value range for `DiagnosticEcuReset.customSubFunctionNumber`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The allowed value for `DiagnosticEcuReset.customSubFunctionNumber` shall always be within the closed interval **0x40 .. 0x7E**.]

#### **[constr\_1333] Existence of attributes of meta-class `DiagnosticMemoryIdentifier`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[If a `DiagnosticMemoryIdentifier` is referenced in the role `memoryRange` by a `DiagnosticRequestDownload` or a `DiagnosticRequestUpload`, then the attributes

- `memoryLowAddress`

- `memoryLowAddressLabel`
- `memoryHighAddress`
- `memoryHighAddressLabel`
- `accessPermission`

shall **not** exist for the referenced `DiagnosticMemoryIdentifier`.]

**[constr\_1334] Existence of `DiagnosticComControl.customSubFunctionNumber`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The attribute `DiagnosticComControl.customSubFunctionNumber` shall only exist if the value of `DiagnosticComControl.category` is outside the standardized set of values as defined by [TPS\_DEXT\_01057].]

**[constr\_1335] Possible values for `DiagnosticComControl.customSubFunctionNumber`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[Given the fulfillment of [constr\_1334], the value of a given `DiagnosticComControl.customSubFunctionNumber` shall always be within the closed interval **0x40 .. 0x5F** (for manufacturer-specific sub-functions) or the closed interval **0x60 .. 0x7E** (for supplier-specific sub-functions).]

**[constr\_1336] Applicable value range for `DiagnosticComControlSpecificChannel.subnetNumber`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The value of attribute `DiagnosticComControlSpecificChannel.subnetNumber` shall be within the closed interval **1 .. 14**.]

**[constr\_1337] Allowed value range for attribute `DiagnosticComControlSubNodeChannel.subNodeNumber`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The value of attribute `DiagnosticComControlSubNodeChannel.subNodeNumber` shall not exceed the closed interval **0 .. 65535**.]

**[constr\_1338] Maximum number of aggregated `DiagnosticReadDataByPeriodicIDClass.periodicRate`**

*Imposition time:* CP: IT\_DiagDes

[The number of aggregated `periodicRate` within the context of one `DiagnosticReadDataByPeriodicIDClass` shall be within the closed interval **1..3**.]

**[constr\_1339] Existence of `DiagnosticRoutine.start`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[In a complete `DiagnosticExtract`, the attribute `DiagnosticRoutine.start` shall always exist for any given `DiagnosticRoutine`.]

**[constr\_1340] Consistency of `DiagnosticServiceSwMapping` with respect to synchronously called `DiagnosticRoutines`**

*Imposition time:* CP: IT\_DiagDes

[Each `DiagnosticServiceSwMapping` that references a `DiagnosticRoutineControl` that only aggregates a `DiagnosticStartRoutine` in the role `start` shall only reference a `SwcServiceDependency` or `BswServiceDependency` that in turn aggregates a `DiagnosticRoutineNeeds` with attribute `diagRoutineType` set to `DiagnosticRoutineTypeEnum.synchronous`.]

**[constr\_1341] Consistency of `DiagnosticServiceSwMapping` with respect to asynchronously called `DiagnosticRoutines`**

*Imposition time:* CP: IT\_DiagDes

[Each `DiagnosticServiceSwMapping` that references a `DiagnosticRoutineControl` that aggregates a `DiagnosticStopRoutine` and/or `DiagnosticRequestRoutineResults` in the role `stop` or `requestResult` shall only reference a `SwcServiceDependency` or `BswServiceDependency` that in turn aggregates a `DiagnosticRoutineNeeds` with attribute `diagRoutineType` set to `DiagnosticRoutineTypeEnum.asynchronous`.]

**[constr\_1342] Possible values for `DiagnosticSecurityAccess.requestSeedId`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The value of the attribute `DiagnosticSecurityAccess.requestSeedId` shall only be set to an odd number<sup>3</sup>.]

The supported value range consists of the following list:

- all odd numbers in the closed interval **0x01 .. 0x41**
- **0x5F** (this corresponds to the case of *end-of-life activation of on-board pyrotechnic devices according to [4, ISO 26021-2]*)
- all odd numbers in the closed interval **0x61 .. 0x7E**

]

<sup>3</sup>The even numbers are reserved for the identification of the corresponding `sendKey` sub-function, as explained by [TPS\_DEXT\_01036].

**[constr\_1343] Simultaneous existence of the attributes `DiagnosticServiceDataMapping.diagnosticDataElement` and `DiagnosticDataByIdentifier.dataIdentifier`***Imposition time:* CP: IT\_DiagDes

[A `DiagnosticServiceDataMapping.diagnosticDataElement` shall also be aggregated by a `DiagnosticDataByIdentifier` in the role `dataIdentifier.dataElement.dataElement`.]

**[constr\_1345] `DiagnosticDataElement` shall not (finally) be aggregated by a `DiagnosticRoutine`***Imposition time:* CP: IT\_DiagDes

[A `DiagnosticDataElement` that is referenced by a `DiagnosticServiceDataMapping` shall not (finally) be aggregated by a `DiagnosticRoutine`.]

**[constr\_1346] Allowed values of `DiagnosticServiceSwMapping.serviceInstance`***Imposition time:* CP: IT\_DiagDes

[The applicability of the `DiagnosticServiceSwMapping` is limited to predefined set of diagnostic services.

By regulation of the AUTOSAR standard, `DiagnosticServiceSwMapping.serviceInstance` shall only point to the following sub-classes of `DiagnosticServiceInstance`:

- `DiagnosticRoutine`
- `DiagnosticSecurityAccess`
- `DiagnosticReadDataByIdentifier`
- `DiagnosticWriteDataByIdentifier`
- `DiagnosticIOControl`

]

**[constr\_1347] Existence of attributes of `DiagnosticServiceSwMapping`***Imposition time:* CP: IT\_DiagDes

[For any given `DiagnosticServiceSwMapping`, **one and only one** of the following references shall exist:

- `DiagnosticServiceSwMapping.mappedFlatSwcServiceDependency`
- `DiagnosticServiceSwMapping.mappedSwcServiceDependencyInSystem`
- `DiagnosticServiceSwMapping.mappedBswServiceDependency`

]

**[constr\_1349] Value of `udsDtcValue` shall be unique**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The value of `DiagnosticTroubleCodeUds.udsDtcValue` shall be unique for all `DiagnosticTroubleCodeUds` that refer to the same `DiagnosticMemoryDestination` via the reference `DiagnosticTroubleCodeUds.troubleCodeProps.diagnosticMemory`.]

**[constr\_1350] Value of `DiagnosticTroubleCodeGroup.groupNumber` shall be unique**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The value of `DiagnosticTroubleCodeGroup.groupNumber` shall be unique to any other DTC and DTC group value.]

**[constr\_1351] Value of `DiagnosticTroubleCodeGroup.groupNumber`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[To be compliant to ISO, the value of `DiagnosticTroubleCodeGroup.groupNumber` shall be set as defined in [3, ISO 14229-1].]

**[constr\_1352] Existence of `maxNumberFreezeFrameRecords` vs. `freezeFrame`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[If the attribute `DiagnosticTroubleCodeProps.maxNumberFreezeFrameRecords` exists then the attribute `DiagnosticTroubleCodeProps.freezeFrame` shall not exist or vice versa.]

**[constr\_1353] Applicability of [constr\_1352]**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[**[constr\_1352]** shall apply in the identical way (either one or the other attribute shall exist) for all `DiagnosticTroubleCodeProps` within the context of all `DiagnosticContributionSets` of category `DIAGNOSTIC_ECU_EXTRACT` that refer to the same `EcuInstance`.]

**[constr\_1354] Existence of attribute `DiagnosticTroubleCodeProps.snapshotRecordContent`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[If one of the attributes `DiagnosticTroubleCodeProps.maxNumberFreezeFrameRecords` or `DiagnosticTroubleCodeProps.freezeFrame` exists then the attribute `DiagnosticTroubleCodeProps.snapshotRecordContent` shall exist.]

**[constr\_1355] Value of `extendedDataRecord.recordNumber`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[To be compliant to ISO, the value of `extendedDataRecord.recordNumber` shall be set in the interval as defined in [3, ISO 14229-1].]

**[constr\_1357] Value of `freezeFrame.recordNumber`***Imposition time:* CP: IT\_DiagDes

[To be compliant to ISO, the value of `freezeFrame.recordNumber` shall be set in the interval as defined in [3, ISO 14229-1].]

**[constr\_1359] Condition for the existence of attribute `DiagnosticDebounceAlgorithmProps.debounceCounterStorage`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[Attribute `debounceCounterStorage` of meta-class `DiagnosticDebounceAlgorithmProps` shall only exist if the aggregation of attribute `debounceAlgorithm` at `DiagnosticDebounceAlgorithmProps` actually aggregates a `DiagnosticDebounceCounterBased`.]

**[constr\_1361] Number of `DiagnosticEventToEnableConditionGroupMapping` elements per `DiagnosticEvent`***Imposition time:* CP: IT\_DiagDes

[The mapping element `DiagnosticEventToEnableConditionGroupMapping` shall be created no more than once per `DiagnosticEvent`.

If several `DiagnosticEventToEnableConditionGroupMapping` elements referring to the same `DiagnosticEvent` are defined, then the Enable Condition Group mapping shall be regarded as defective.]

**[constr\_1362] Number of `DiagnosticEventToStorageConditionGroupMapping` elements per `DiagnosticEvent`***Imposition time:* CP: IT\_DiagDes

[The mapping element `DiagnosticEventToStorageConditionGroupMapping` shall be created no more than once or once per `DiagnosticEvent`.

If several `DiagnosticEventToStorageConditionGroupMapping` elements referring to the same `DiagnosticEvent` are defined, then the Storage Condition Group mapping shall be regarded as defective.]

**[constr\_1378] Value of `DiagnosticMemoryDestinationUserDefined.memoryId`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[Within the scope of one `DiagnosticContributionSet`, no two (or more) `DiagnosticMemoryDestinationUserDefineds` shall exist that share the same value for attribute `DiagnosticMemoryDestinationUserDefined.memoryId`]

**[constr\_1379] Existence of `DiagnosticMemoryDestinationPrimary`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[Within the scope of one `DiagnosticContributionSet` only one `DiagnosticMemoryDestinationPrimary` shall exist.]



**[constr\_1394] Value of `DiagnosticDataElement.maxNumberOfElements` depending on its existence**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[If the attribute `DiagnosticDataElement.maxNumberOfElements` exists then its value shall be greater than 0.]

**[constr\_1405] Value of `DiagnosticProtocol.serviceTable` vs. `DiagnosticServiceTable.protocolKind`**

*Imposition time:* CP: IT\_DiagDes

[If the reference `DiagnosticProtocol.serviceTable` exists then the value of `DiagnosticProtocol.protocolKind` shall be identical to the value of `DiagnosticServiceTable.protocolKind`.]

**[constr\_1406] `DiagnosticServiceTable.diagnosticConnection` vs. `DiagnosticProtocol.diagnosticConnection`**

*Imposition time:* CP: IT\_DiagDes

[If a `DiagnosticServiceTable` exists that fulfills the following conditions:

- reference `DiagnosticServiceTable.diagnosticConnection` exists
- the `DiagnosticServiceTable` is referenced by means of `DiagnosticProtocol.serviceTable`

then all of the `DiagnosticConnections` referenced by means of `DiagnosticServiceTable.diagnosticConnection` shall also be referenced in the role `diagnosticConnection` from a `DiagnosticProtocol` that in turn references the respective `DiagnosticServiceTable` in the role `DiagnosticProtocol.serviceTable`.]

**[constr\_1411] Existence of attribute `DiagnosticMemoryIdentifier.memoryHighAddressLabel` vs. `DiagnosticMemoryIdentifier.memoryHighAddress`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[At most **one** of the attributes in the following list shall exist:

- `DiagnosticMemoryIdentifier.memoryHighAddressLabel`
- `DiagnosticMemoryIdentifier.memoryHighAddress`

]

**[constr\_1412] Existence of `DiagnosticMemoryIdentifier.memoryLowAddressLabel` vs. `DiagnosticMemoryIdentifier.memoryLowAddress`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[At most **one** of the attributes in the following list shall exist:

- `DiagnosticMemoryIdentifier.memoryLowAddressLabel`
- `DiagnosticMemoryIdentifier.memoryLowAddress`



]

**[constr\_1419] Value of `DiagnosticSecurityLevel.accessDataRecordSize`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[If the attribute `DiagnosticSecurityLevel.accessDataRecordSize` exists then its value shall be greater than zero.]

**[constr\_1421] Consistency of `DiagnosticDynamicallyDefineDataIdentifierClass.subfunction`***Imposition time:* CP: IT\_DiagDes

[The values of `DiagnosticDynamicallyDefineDataIdentifierClass.subfunction` shall not repeat, i.e. every value of `DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum` shall at most appear once in the `subfunction` attribute.]

**[constr\_1435] Debouncing in the presence of a `DiagnosticEventPortMapping`***Imposition time:* CP: IT\_DiagDes

[If a `DiagnosticEventPortMapping` exists and the enclosed `DiagnosticEventPortMapping.diagnosticEvent` is also referenced by a `DiagnosticEventToDebounceAlgorithmMapping` then the concrete subclass of the respective `DiagnosticEventToDebounceAlgorithmMapping.debounceAlgorithm` shall be identical to the `DiagnosticEventPortMapping.swcServiceDependencyInSystem/swcFlatServiceDependency.serviceNeeds.diagEventDebounceAlgorithm`.]

**[constr\_1447] Restrictions for the value of `DiagnosticParameterIdentifier.id`***Imposition time:* CP: IT\_DiagDes

[The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of `DiagnosticParameterIdentifier.id`.]

**[constr\_1448] Interval of `DiagnosticParameterIdentifier.id`***Imposition time:* CP: IT\_DiagDes

[The allowed interval for values of `DiagnosticParameterIdentifier.id` shall not exceed [0..255].]

**[constr\_1449] PID shall only carry a fixed-length collection of data***Imposition time:* CP: IT\_DiagDes

[The value of `DiagnosticParameterIdentifier.dataElement.dataElement.arraySizeSemantics` shall not be set to `variableSize`.]

**[constr\_1450] Service mapping for ODB mode 0x01 for [DiagnosticParameterIdentifier](#)***Imposition time:* CP: IT\_DiagDes

[if a [DiagnosticServiceSwMapping](#) or [DiagnosticServiceDataMapping](#) refers to a [DiagnosticRequestCurrentPowertrainData](#) and a [DiagnosticDataElement](#) that is aggregated by a [DiagnosticParameterIdentifier](#) then one of two alternative model configurations shall exist:

- [SwcServiceDependency](#) referenced by the same [DiagnosticServiceSwMapping](#) or [DiagnosticServiceDataMapping](#) shall aggregate an [ObdPidServiceNeeds](#) in the role [serviceNeeds](#).
- The [BswServiceDependencyIdent](#) referenced by the same [DiagnosticServiceSwMapping](#) shall aggregate an [ObdPidServiceNeeds](#) in the role [serviceNeeds](#).

]

**[constr\_1451] Service mapping for OBD mode 0x09 for [DiagnosticInfoType](#)***Imposition time:* CP: IT\_DiagDes

[if a [DiagnosticServiceSwMapping](#) refers to [DiagnosticRequestVehicleInfo](#) and a [DiagnosticDataElement](#) that is aggregated by a [DiagnosticInfoType](#) then one of two alternative model configurations shall exist:

- The [SwcServiceDependency](#) referenced by the same [DiagnosticServiceSwMapping](#) shall aggregate a [ObdInfoServiceNeeds](#) in the role [serviceNeeds](#).
- The [BswServiceDependencyIdent](#) referenced by the same [DiagnosticServiceSwMapping](#) shall aggregate an [ObdInfoServiceNeeds](#) in the role [serviceNeeds](#).

]

**[constr\_1452] Service mapping for OBD mode 0x08 for [DiagnosticInfoType](#)***Imposition time:* CP: IT\_DiagDes

[if a [DiagnosticServiceSwMapping](#) refers to a [DiagnosticRequestControlOfOnBoardDevice](#) then the [SwcServiceDependency](#) referenced by the same [DiagnosticServiceSwMapping](#) shall aggregate an [ObdControlServiceNeeds](#) in the role [serviceNeeds](#).]

**[constr\_1453] References from [DiagnosticFunctionInhibitSource](#)***Imposition time:* CP: IT\_DiagDes

[Each [DiagnosticFunctionInhibitSource](#) may either reference one of the following meta-classes in their respective roles:

- [DiagnosticFimAliasEventMapping](#) in the role [event](#)

- `DiagnosticFimAliasEventGroupMapping` in the role `eventGroup`

]

**[constr\_1454] `DiagnosticFimFunctionMapping` shall only reference a `SwcServiceDependency` that aggregates `FunctionInhibitionNeeds`**

*Imposition time:* CP: IT\_DiagDes

[A `DiagnosticFimFunctionMapping` shall only reference a `SwcServiceDependency` that aggregates `FunctionInhibitionNeeds` in the role `serviceNeeds`.]

**[constr\_1455] Relation of `DiagnosticJ1939Node` to `J1939NmNode`**

*Imposition time:* CP: IT\_DiagDes

[Each `J1939NmNode` shall only be referenced in the role `nmNode` by a single `DiagnosticJ1939Node`.]

**[constr\_1456] Valid interval for attribute `DiagnosticTroubleCodeJ1939.fmi`**

*Imposition time:* CP: IT\_DiagDes

[The value of the attribute `DiagnosticTroubleCodeJ1939.fmi` shall be in the interval 0..31.]

**[constr\_1457] Service-only DTCs shall refer to a common memory section**

*Imposition time:* CP: IT\_DiagDes

[All `DiagnosticTroubleCodeJ1939` with attribute `kind` set to the value `serviceOnly` that reference the same `DiagnosticJ1939Node` shall also reference the same `DiagnosticTroubleCodeProps.diagnosticMemory`.]

**[constr\_1458] Reference to `DiagnosticMemoryDestination`**

*Imposition time:* CP: IT\_DiagDes

[A `DiagnosticMemoryDestination` that is referenced by a `DiagnosticTroubleCodeJ1939.dtcProps.diagnosticMemory` where the value of attribute `DiagnosticTroubleCodeJ1939.kind` is set to `serviceOnly` shall **not be referenced by any other** `DiagnosticTroubleCodeJ1939` where attribute `kind` is set to any other value than `serviceOnly`.]

**[constr\_1460] Restrictions for the value of `DiagnosticInfoType.id`**

*Imposition time:* CP: IT\_DiagDes

[The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of `DiagnosticInfoType.id`.]

**[constr\_1461] Restrictions for the value of `DiagnosticTestRoutineIdentifier.id`**

*Imposition time:* CP: IT\_DiagDes

[The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of `DiagnosticTestRoutineIdentifier.id`.]

**[constr\_1462] Restrictions for the value of `DiagnosticTestResult.testIdentifier.id`**

*Imposition time:* CP: IT\_DiagDes

[The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of `DiagnosticTestResult.testIdentifier.id`.]

**[constr\_1464] Allowed value range of `DiagnosticEnvConditionFormula.nrcValue`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[The value of attribute `DiagnosticEnvConditionFormula.nrcValue` shall be limited to the interval [1..255].]

**[constr\_1466] Allowed values of `compareType` in the context of a `DiagnosticEnvModeCondition`**

*Imposition time:* CP: IT\_DiagDes

[Within the context of a `DiagnosticEnvDataCondition` **only a subset** of the values of `DiagnosticCompareTypeEnum` is supported for the inherited attribute `compareType`, namely:

- `DiagnosticCompareTypeEnum.isEqual`
- `DiagnosticCompareTypeEnum.isNotEqual`

]

**[constr\_1467] References in `DiagnosticEnvModeCondition`**

*Imposition time:* CP: IT\_DiagDes

[In a `DiagnosticEnvModeCondition` the reference `modeElement` shall only point to a `DiagnosticEnvModeElement` that is aggregated inside the same `DiagnosticEnvironmentalCondition` as the `DiagnosticEnvModeCondition` itself.]

**[constr\_1470] Value of `DiagnosticAbstractParameter.bitOffset`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The value of `DiagnosticAbstractParameter.bitOffset` shall only be set to a multiple of 8.]

**[constr\_1472] Existence of `DiagnosticDataIdentifier.supportInfoByte`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The attribute `DiagnosticDataIdentifier.supportInfoByte` **shall not exist** if the value of `DiagnosticDataIdentifier.id` is **outside the range 0xF400-0xF4FF**.]

**[constr\_1509] Value of `extendedDataRecord.recordNumber` shall be unique within primary fault memory**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationPrimary` in the role `diagnosticMemory` there shall be no two `extendedDataRecord.recordNumber` with the same value.]

**[constr\_1511] Value of `extendedDataRecord.recordNumber` shall be unique within user-defined fault memory**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationUserDefined` in the role `diagnosticMemory` there shall be no two `extendedDataRecord.recordNumber` with the same value for any `DiagnosticMemoryDestinationUserDefined` referenced as `DiagnosticTroubleCodeProps.diagnosticMemory` with a given value of `memoryId`.]

**[constr\_1512] `freezeFrame.recordNumber` shall be unique within primary fault memory**

*Imposition time:* CP: IT\_DiagDes

[For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationPrimary` in the role `diagnosticMemory` there shall be no two `freezeFrame.recordNumber` with the same value.]

**[constr\_1514] `freezeFrame.recordNumber` shall be unique within user-defined fault memory**

*Imposition time:* CP: IT\_DiagDes

[For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationUserDefined` in the role `diagnosticMemory` there shall be no two `freezeFrame.recordNumber` with the same value for any `DiagnosticMemoryDestinationUserDefined` referenced as `DiagnosticTroubleCodeProps.diagnosticMemory` with a given value of `memoryId`.]

**[constr\_1552] Meta-class `DiagnosticDataIdentifier` referenced by `DiagnosticDataIdentifierSet`**

*Imposition time:* CP: IT\_DiagDes

[If a `DiagnosticDataIdentifier` is referenced by `DiagnosticDataIdentifierSet`, then the `DiagnosticDataIdentifier` shall fulfill **all of the following conditions**:

- The `DiagnosticDataIdentifier` does **not** aggregate any `DiagnosticParameter` which in turn aggregates (via the aggregation of `DiagnosticParameterIdent`) a `DiagnosticParameterElement`.
- Gaps in between individual elements (i.e. from the begin of an individual `DiagnosticDataElement`, as indicated by `DiagnosticParameter.bitOff-`

set, and the length of the aggregated `DiagnosticDataElement`) or at the end of the `DiagnosticDataIdentifier` (as indicated by attribute `DiagnosticDataIdentifier.didSize`) shall **not** exist.

The individual `DiagnosticDataElement` contained (via the aggregation of `DiagnosticParameter` in the role `dataElement`) in the `DiagnosticDataIdentifier` shall satisfy **one of the following conditions**:

- The `DiagnosticDataElement` does **not** define the attribute `maxNumberOfElements` at all.
- The modeling of attribute `DiagnosticDataElement.arraySizeSemantics` shall follow the description in [TPS\_DEXT\_01001].

]

**[constr\_1584] `DiagnosticDataElement` shall not be used more than once in I/O Control instance**

*Imposition time:* CP: IT\_DiagDes

[A given `DiagnosticDataElement` shall not be used by more than one `DiagnosticServiceDataMapping` that in turn refers to a `DataPrototype` defined in the context of a `DataInterface` that is used to type a `PortPrototype` that in turn is referenced by a `RoleBasedPortAssignment` where attribute `role` is set to the value `IOControlRequest`.]

**[constr\_1590] `DiagnosticEvent` referenced in the role `masterEvent` or `slaveEvent`**

*Imposition time:* CP: IT\_DiagDes

[Any given `DiagnosticEvent` shall at most once be referenced from a `DiagnosticMasterToSlaveEventMapping`.]

**[constr\_1591] `DiagnosticEvent` referenced as `slaveEvent` shall not be reported by diagnostic monitor**

*Imposition time:* CP: IT\_DiagDes

[Any `DiagnosticEvent` that is referenced in the role `DiagnosticMasterToSlaveEventMapping.slaveEvent` shall not be referenced in the role `DiagnosticEventPortMapping.diagnosticEvent` and vice versa.]

**[constr\_1616] Existence of attribute `DiagnosticExtendedDataRecord.customTrigger`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The attribute `DiagnosticExtendedDataRecord.customTrigger` shall only exist if the attribute `DiagnosticExtendedDataRecord.trigger` is set to the value `DiagnosticRecordTriggerEnum.custom`.]

**[constr\_1617] Existence of attribute `DiagnosticFreezeFrame.customTrigger`***Imposition time:* CP: IT\_DiagDes

[The attribute `DiagnosticFreezeFrame.customTrigger` shall only exist if the attribute `DiagnosticFreezeFrame.trigger` is set to the value `DiagnosticRecordTriggerEnum.custom`.]

**[constr\_1623] Restriction on `DiagnosticReadScalingDataByIdentifier.dataIdentifier`***Imposition time:* CP: IT\_DiagDes

[The reference `DiagnosticReadScalingDataByIdentifier.dataIdentifier` shall only refer to a `DiagnosticDataIdentifier`.]

**[constr\_1624] Existence of `DiagnosticDataElement.scalingInfoSize`***Imposition time:* CP: IT\_DiagDes

[The attribute `DiagnosticDataElement.scalingInfoSize` shall only exist if the enclosing `DiagnosticAbstractParameter` is aggregated by a `DiagnosticDataIdentifier` that is referenced by a `DiagnosticReadScalingDataByIdentifier` in the role `DiagnosticReadScalingDataByIdentifier.dataIdentifier`.]

**[constr\_1721] `DiagnosticControlEnableMaskBit.bitNumber` shall be unique***Imposition time:* CP: IT\_DiagDes

[Within the context of the enclosing `DiagnosticIOControl` the value of attribute `DiagnosticIOControl.controlEnableMaskBit.bitNumber` shall be unique.]

**[constr\_1722] Relation between reference `DiagnosticIOControl.dataIdentifier` and attribute `DiagnosticIOControl.controlEnableMaskBit`***Imposition time:* CP: IT\_DiagDes

[Any `DiagnosticDataElement` referenced in the role `DiagnosticIOControl.controlEnableMaskBit.controlledDataElement` shall be defined in the scope of the `DiagnosticDataIdentifier` that is referenced in the role `DiagnosticIOControl.dataIdentifier`.]

**[constr\_1745] Indirect reference to `DiagnosticCommonElement`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[If a `DiagnosticCommonElement` is referenced from within the context of another `DiagnosticCommonElement` and the referencing `DiagnosticCommonElement` is in turn referenced by a `DiagnosticContributionSet` in the role `element` then the referenced `DiagnosticCommonElement` shall also be referenced by the same `DiagnosticContributionSet`.]



**[constr\_1749] Existence of `DiagnosticInfoType.dataElement`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticInfoType`, at least one aggregation of `DiagnosticParameter` in the role `dataElement` shall exist.]

**[constr\_1750] Existence of attribute `DiagnosticParameterIdentifier.pidSize`***Imposition time:* CP: IT\_DiagDes

[Attribute `DiagnosticParameterIdentifier.pidSize` is only relevant if a gap exists at the end of the `DiagnosticParameterIdentifier`. If this gap does not exist, the size of the `DiagnosticParameterIdentifier` can be computed.]

**[constr\_1752] Existence of references owned by `DiagnosticEnableConditionPortMapping`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEnableConditionPortMapping`, only one of the following references

- to `SwcServiceDependency` in the role `swcFlatServiceDependency`
- to `SwcServiceDependency` in the role `swcServiceDependencyInSystem`

may exist.]

**[constr\_1753] Existence of references owned by `DiagnosticStorageConditionPortMapping`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticStorageConditionPortMapping`, only one of the following references

- to `SwcServiceDependency` in the role `swcFlatServiceDependency`
- to `SwcServiceDependency` in the role `swcServiceDependencyInSystem`

may exist.]

**[constr\_1756] Existence of attributes `DiagnosticExtendedDataRecord.trigger` and `update`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticExtendedDataRecord`, attributes `trigger` and `update` shall only exist if at least one `DiagnosticExtendedDataRecordElement` is aggregated by a `DiagnosticExtendedDataRecord` in the role `element` that is referenced in either of the roles

- `DiagnosticEdrSenderPortMapping.recordElement`
- `DiagnosticEdrServerPortMapping.recordElement`



]

**[constr\_1757] Existence of attribute `DiagnosticTroubleCodeUds.udsDtcValue`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticTroubleCodeUds`, attribute `udsDtcValue` shall exist.]**[constr\_1758] Existence of attribute `DiagnosticTroubleCodeObd.obdDTCValue`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticTroubleCodeObd`, attribute `obdDTCValue` shall exist.]**[constr\_1759] Existence of references owned by `DiagnosticOperationCyclePortMapping`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticOperationCyclePortMapping`, only one of the following references

- to `SwcServiceDependency` in the role `swcFlatServiceDependency`
- to `SwcServiceDependency` in the role `swcServiceDependencyInSystem`

shall exist.]

**[constr\_1760] Existence of `DiagnosticExtendedDataRecord.element`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticExtendedDataRecord`, at least one aggregation of `DiagnosticExtendedDataRecordElement` in the role `element` shall exist.]**[constr\_1762] Existence of references owned by `DiagnosticEventPortMapping`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticEventPortMapping`, only one of the references

- to `BswServiceDependency` in the role `bswServiceDependency`
- to `SwcServiceDependency` in the role `swcFlatServiceDependency`
- to `SwcServiceDependency` in the role `swcServiceDependencyInSystem`

shall exist.]

**[constr\_1763] Existence of attribute `DiagnosticPeriodicRate.periodicRateCategory`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticPeriodicRate`, the attribute `periodicRateCategory` shall exist.]

**[constr\_1766] Existence of `DiagEventDebounceCounterBased.counterJumpDownValue`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceCounterBased`, attribute `counterJumpDownValue` shall only exist if attribute `counterJumpDown` exists and is set to `true`.]

**[constr\_1767] Existence of `DiagEventDebounceCounterBased.counterJumpUpValue`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceCounterBased`, attribute `counterJumpUpValue` shall only exist if attribute `counterJumpUp` exists and is set to `true`.]

**[constr\_1768] Existence of attribute `DiagnosticEvent.associatedEventIdentification`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[Attribute `DiagnosticEvent.associatedEventIdentification` shall exist if

- the respective `DiagnosticEvent` is mapped to a `DiagnosticTroubleCodeUds` and
- the reference in the role `DiagnosticTroubleCodeUds.troubleCodeProps.extendedDataRecord` exists and
- the referenced `DiagnosticExtendedDataRecord` aggregates at least one `element` that is also referenced by a `DiagnosticEdrDataProviderMapping` that has attribute `dataProvider` set to the value `DEM_EVENT_ASSOCIATED_IDENTIFICATION`.

]

**[constr\_1772] Unique `DiagnosticSession` and `DiagnosticSecurityLevel` for diagnostic routines that have the same identifier**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[All `DiagnosticAccessPermissions` referenced from `DiagnosticRoutines` where attribute `DiagnosticRoutine.id` has the identical value shall refer to the identical set of `DiagnosticSession` and `DiagnosticSecurityLevel`.]

**[constr\_1780] Existence of attribute `DiagnosticTroubleCodeJ1939.fmi`**

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTroubleCodeJ1939`, attribute `fmi` shall exist.]

**[constr\_1781] Existence of attribute `DiagnosticTroubleCodeJ1939.spn`**

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTroubleCodeJ1939`, attribute `spn` shall exist.]

**[constr\_1790] Existence of attribute `DiagnosticAbstractParameter.bitOffset`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticParameter`, attribute `bitOffset` shall exist.]**[constr\_1791] Existence of attribute `dataElement` vs. `parameterSize` of meta-class `DiagnosticParameter`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticParameter`, exactly **one** of the attributes

- `dataElement` or
- `parameterSize`

shall exist.]

**[constr\_1792] Existence of `DiagnosticDataIdentifier.dataElement`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticDataIdentifier`, the aggregation of `DiagnosticParameter` in the role `dataElement` shall exist at least once.]**[constr\_1793] Existence of attribute `DiagnosticAbstractDataIdentifier.id`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticAbstractDataIdentifier`, attribute `id` shall exist.]**[constr\_1794] Existence of attribute `DiagnosticProtocol.priority`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticProtocol`, attribute `priority` shall exist.]**[constr\_1795] Existence of attribute `DiagnosticProtocol.protocolKind`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticProtocol`, attribute `protocolKind` shall exist.]**[constr\_1797] Existence of attribute `DiagnosticServiceTable.protocolKind`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticServiceTable`, attribute `protocolKind` shall exist.]**[constr\_1798] Existence of `DiagnosticServiceInstance.serviceClass`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes[For each subclass of `DiagnosticServiceInstance`, a reference with the abstract role `serviceClass` shall exist to a matching subclass of `DiagnosticServiceClass`.This rule applies unless a rule for a specific combination of matching sub-classes of `DiagnosticServiceInstance` and `DiagnosticServiceClass` exists.]

**[constr\_1799] Existence of `DiagnosticEnvironmentalCondition.formula`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticEnvironmentalCondition`, the aggregation of `DiagnosticEnvConditionFormula` in the role `formula` shall exist.]

**[constr\_1800] Existence of `DiagnosticEnvConditionFormula.op`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticEnvConditionFormula`, that attribute `op` shall exist.]

**[constr\_1801] Existence of `DiagnosticEnvCompareCondition.compareType`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticEnvCompareCondition`, that attribute `compareType` shall exist.]

**[constr\_1802] Existence of `DiagnosticEnvDataCondition.compareValue`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticEnvDataCondition`, that attribute `compareValue` shall exist.]

**[constr\_1803] Existence of `DiagnosticEnvDataCondition.dataElement`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticEnvDataCondition`, that attribute `dataElement` shall exist.]

**[constr\_1804] Existence of `DiagnosticEnvModeCondition.modeElement`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEnvModeCondition`, that attribute `modeElement` shall exist.]

**[constr\_1805] Existence of `DiagnosticEnvSwcModeElement.mode`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEnvSwcModeElement`, that attribute `mode` shall exist.]

**[constr\_1806] Existence of `DiagnosticEnvBswModeElement.mode`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEnvBswModeElement`, that attribute `mode` shall exist.]

**[constr\_1807] Existence of reference `DiagnosticDataByIdentifier.dataIdentifier`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticDataByIdentifier`, the reference `dataIdentifier` shall exist.]

**[constr\_1808] Existence of reference `DiagnosticDynamicallyDefineDataIdentifier.dataIdentifier`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticDynamicallyDefineDataIdentifier`, the reference to `DiagnosticDynamicDataIdentifier` in the role `dataIdentifier` shall exist.]

**[constr\_1810] Existence of aggregation `DiagnosticReadDataByPeriodicIDClass.periodicRate`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticReadDataByPeriodicIDClass`, the aggregation of `DiagnosticPeriodicRate` in the role `periodicRate` shall exist at least once.]

**[constr\_1811] Existence of attribute `DiagnosticReadDataByPeriodicIDClass.maxPeriodicDidToRead`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticReadDataByPeriodicIDClass`, the attribute `maxPeriodicDidToRead` shall exist at least once.]

**[constr\_1812] Existence of attribute `DiagnosticReadDataByPeriodicIDClass.schedulerMaxNumber`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticReadDataByPeriodicIDClass`, the attribute `schedulerMaxNumber` shall exist at least once.]

**[constr\_1815] Existence of attribute `DiagnosticRoutine.id`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticRoutine`, the attribute `id` shall exist at least once.]

**[constr\_1816] Existence of attribute `DiagnosticSecurityAccess.requestSeedId`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticSecurityAccess`, the attribute `requestSeedId` shall exist at least once.]

**[constr\_1817] Existence of attribute `DiagnosticSecurityAccess.securityLevel`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticSecurityAccess`, the attribute `securityLevel` shall exist at least once.]

**[constr\_1818] Existence of reference `DiagnosticSessionControl.diagnosticSession`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticSessionControl`, the reference to `DiagnosticSession` in the role `diagnosticSession` shall exist.]

**[constr\_1819] Existence of attribute `DiagnosticParameterIdentifier.id`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticParameterIdentifier`, attribute `id` shall exist.]

**[constr\_1820] Existence of reference `DiagnosticRequestCurrentPowertrainData.pid`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticRequestCurrentPowertrainData`, the reference to `DiagnosticParameterIdentifier` in the role `pid` shall exist.]

**[constr\_1821] Existence of reference `DiagnosticRequestPowertrainFreezeFrameData.freezeFrame`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticRequestPowertrainFreezeFrameData`, the reference to `DiagnosticParameterIdentifier` in the role `freezeFrame` shall exist.]

**[constr\_1822] Existence of reference `DiagnosticRequestControlOfOnBoardDevice.testId`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticRequestControlOfOnBoardDevice`, the reference to `DiagnosticParameterIdentifier` in the role `testId` shall exist.]

**[constr\_1823] Existence of attribute `DiagnosticTestRoutineIdentifier.id`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTestRoutineIdentifier`, attribute `id` shall exist.]

**[constr\_1824] Existence of attribute `DiagnosticTestRoutineIdentifier.requestDataSize`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTestRoutineIdentifier`, attribute `requestDataSize` shall exist.]

**[constr\_1825] Existence of attribute `DiagnosticTestRoutineIdentifier.responseDataSize`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTestRoutineIdentifier`, attribute `responseDataSize` shall exist.]

**[constr\_1826] Existence of reference `DiagnosticRequestVehicleInfo.infoType`**

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticRequestVehicleInfo`, the reference to `DiagnosticParameterIdentifier` in the role `infoType` shall exist.]

**[constr\_1827] Existence of attribute `DiagnosticInfoType.id`**

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticInfoType`, attribute `id` shall exist.]

**[constr\_1828] Existence of referenced from `DiagnosticServiceDataMapping`**

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticServiceDataMapping`, the following references shall exist:

- Reference to a `DiagnosticServiceMappingDiagTarget`, i.e. one of
  - Reference to `DiagnosticDataElement` in the role `diagnosticDataElement`
  - Reference to `DiagnosticParameterIdent` in the role `diagnosticParameter`
  - Reference to `DiagnosticParameterElement` in the roles
    - \* `contextElement` (optional)
    - \* `targetElement`
 from within `parameterElementAccess`
- Reference to `DataPrototype` in the role `mappedDataElement`

]

**[constr\_1829] Existence of reference `DiagnosticConnectedIndicator.indicator`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticConnectedIndicator`, the reference to `DiagnosticIndicator` in the role `indicator` shall exist.]

**[constr\_1830] Existence of `DiagnosticTroubleCodeGroup.groupNumber`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticTroubleCodeGroup`, attribute `groupNumber` shall exist.]

**[constr\_1831] Existence of `DiagnosticTroubleCodeProps.priority`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticTroubleCodeProps`, attribute `priority` shall exist.]

**[constr\_1832] Existence of `DiagnosticExtendedDataRecord.recordNumber`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticExtendedDataRecord`, attribute `recordNumber` shall exist.]

**[constr\_1833] Existence of `DiagnosticFreezeFrame.trigger`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticFreezeFrame`, attribute `trigger` shall exist.]

**[constr\_1834] Existence of `DiagnosticCondition.initValue`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticCondition`, attribute `initValue` shall exist.]

**[constr\_1835] Existence of `DiagEventDebounceCounterBased.counterDecrementStepSize`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceCounterBased`, attribute `counterDecrementStepSize` shall Existence.]

**[constr\_1836] Existence of `DiagEventDebounceCounterBased.counterIncrementStepSize`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceCounterBased`, attribute `counterIncrementStepSize` shall exist.]

**[constr\_1837] Existence of `DiagEventDebounceCounterBased.counterFailedThreshold`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceCounterBased`, attribute `counterFailedThreshold` shall exist.]

**[constr\_1838] Existence of `DiagEventDebounceCounterBased.counterPassedThreshold`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceCounterBased`, attribute `counterPassedThreshold` shall exist.]

**[constr\_1839] Existence of attribute `DiagEventDebounceTimeBased.timeFailedThreshold`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceTimeBased`, attribute `timeFailedThreshold` shall exist.]



**[constr\_1840] Existence of attribute `DiagEventDebounceTimeBased.timePassedThreshold`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagEventDebounceTimeBased`, attribute `timePassedThreshold` shall exist.]

**[constr\_1841] Existence of `DiagnosticEnableConditionGroup.enableCondition`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticEnableConditionGroup`, attribute `enableCondition` shall exist.]

**[constr\_1842] Existence of `DiagnosticStorageConditionGroup.storageCondition`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticStorageConditionGroup`, attribute `storageCondition` shall exist.]

**[constr\_1843] Existence of reference `DiagnosticEventPortMapping.diagnosticEvent`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEventPortMapping`, the reference to `DiagnosticEvent` in the role `diagnosticEvent` shall exist.]

**[constr\_1844] Existence of reference `DiagnosticOperationCyclePortMapping.operationCycle`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticOperationCyclePortMapping`, the reference to `DiagnosticOperationCycle` in the role `operationCycle` shall exist.]

**[constr\_1845] Existence of reference `DiagnosticEnableConditionPortMapping.enableCondition`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEnableConditionPortMapping`, the reference to `DiagnosticEnableCondition` in the role `enableCondition` shall exist.]

**[constr\_1846] Existence of reference `DiagnosticStorageConditionPortMapping.diagnosticStorageCondition`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticStorageConditionPortMapping`, the reference to `DiagnosticStorageCondition` in the role `diagnosticStorageCondition` shall exist.]

**[constr\_1847] Existence of reference `DiagnosticEdrDataProviderMapping.extendedDataRecordElement`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticEdrDataProviderMapping`, the reference to `DiagnosticExtendedDataRecordElement` in the role `extendedDataRecordElement` shall exist.]

**[constr\_1848] Existence of attribute `DiagnosticAging.agingCycle`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticAging`, attribute `agingCycle` shall exist.]

**[constr\_1849] Existence of attribute `DiagnosticAging.threshold`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticAging`, attribute `threshold` shall exist.]

**[constr\_1850] Existence of aggregation `DiagnosticTestResult.testIdentifier`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTestResult`, the aggregation of meta-class `DiagnosticTestIdentifier` in the role `testIdentifier` shall exist.]

**[constr\_1851] Existence of reference `DiagnosticTestResult.monitoredIdentifier`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTestResult`, the reference to meta-class `DiagnosticTestIdentifier` in the role `monitoredIdentifier` shall exist.]

**[constr\_1852] Existence of attribute `DiagnosticEcuInstanceProps.obdSupport`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEcuInstanceProps`, attribute `obdSupport` shall exist.]

**[constr\_1853] Existence of attribute `DiagnosticIumprGroup.iumprGroupIdentifier`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticIumprGroup`, attribute `iumprGroupIdentifier` shall exist.]

**[constr\_1854] Existence of attribute `DiagnosticIumprGroupIdentifier.groupId`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticIumprGroupIdentifier`, attribute `groupId` shall exist.]

**[constr\_1855] Existence of attribute `DiagnosticFunctionIdentifierInhibit.inhibitionMask`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticFunctionIdentifierInhibit`, attribute `inhibitionMask` shall exist.]

**[constr\_1856] Existence of attribute `DiagnosticJ1939Spn.spn`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticJ1939Spn`, attribute `spn` shall exist.]

**[constr\_1857] Existence of the reference `DiagnosticEventToTroubleCodeJ1939Mapping.diagnosticEvent`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEventToTroubleCodeJ1939Mapping`, reference `diagnosticEvent` shall exist.]

**[constr\_1858] Existence of the attribute `DiagnosticEventToTroubleCodeJ1939Mapping.troubleCodeJ1939`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEventToTroubleCodeJ1939Mapping`, attribute `troubleCodeJ1939` shall exist.]

**[constr\_1859] Usage of `DiagnosticRecordTriggerEnum.testFailedThisOperationCycle`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The enumeration value `DiagnosticRecordTriggerEnum.testFailedThisOperationCycle` shall only be used in the context of meta-class `DiagnosticFreezeFrame`.]

**[constr\_10024] Existence of reference in the role `DiagnosticSecurityEventReportingModeMapping.dataElement`***Status:* DRAFT*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticSecurityEventReportingModeMapping`, the reference to `DiagnosticDataElement` in the role `dataElement` shall exist.]

**[constr\_10025] Existence of reference in the role `DiagnosticSecurityEventReportingModeMapping.securityEvent`***Status:* DRAFT*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticSecurityEventReportingModeMapping`, the reference to `SecurityEventContextProps` in the role `securityEvent` shall exist.]

**[constr\_10026] Existence of reference in the role `DiagnosticEventToSecurityEventMapping.diagnosticEvent`**

*Status:* DRAFT

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticEventToSecurityEventMapping`, the reference to `DiagnosticEvent` in the role `diagnosticEvent` shall exist.]

**[constr\_10027] Existence of reference in the role `DiagnosticEventToSecurityEventMapping.securityEventProps`**

*Status:* DRAFT

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticEventToSecurityEventMapping`, the reference to `SecurityEventContextProps` in the role `securityEventProps` shall exist.]

**[constr\_10038] Restriction for the usage of `DiagnosticAccessPermission.authenticationEnabled`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[Attribute `DiagnosticAccessPermission.authenticationEnabled` shall not exist if the `DiagnosticAccessPermission` is referenced from

- `DiagnosticRequestCurrentPowertrainData`
- `DiagnosticRequestPowertrainFreezeFrameData`
- `DiagnosticRequestEmissionRelatedDTC`
- `DiagnosticClearResetEmissionRelatedInfo`
- `DiagnosticRequestOnBoardMonitoringTestResults`
- `DiagnosticRequestControlOfOnBoardDevice`
- `DiagnosticRequestVehicleInfo`
- `DiagnosticRequestEmissionRelatedDTCPermanentStatus`
- sub-classes of `DiagnosticAuthentication`

]

**[constr\_10042] Existence of attribute `DiagnosticCommonProps.defaultEndianness`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[One of the following conditions shall be fulfilled:

- `DiagnosticCommonProps.defaultEndianness` exists.
- The attribute `DiagnosticParameter.dataElement.swDataDefProps.baseType.baseTypeDefinition.baseTypeEncoding` exist for **all** `Diag-`

nosticParameters defined in the context of the DiagnosticContributionSet.

]

**[constr\_10043] Existence of attribute DiagnosticCommonProps.resetConfirmedBitOnOverflow**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[Attribute DiagnosticCommonProps.resetConfirmedBitOnOverflow shall exist.]

**[constr\_10044] Existence of attribute DiagnosticCommonProps.occurrenceCounterProcessing**

*Imposition time:* CP: IT\_DiagDes

[If, in the context of a DiagnosticContributionSet, a DiagnosticEdrDataProviderMapping exists where attribute DiagnosticEdrDataProviderMapping.dataProvider is set to the value DEM\_OCCCTR, then attribute DiagnosticCommonProps.occurrenceCounterProcessing shall exist.]

**[constr\_10045] Existence of attribute DiagnosticSecurityAccessClass.securityDelayTimeOnBoot**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[Attribute DiagnosticSecurityAccessClass.securityDelayTimeOnBoot shall exist.]

**[constr\_10084] Existence of DiagnosticIumprToFunctionIdentifierMapping.iumpr**

*Imposition time:* CP: IT\_DiagDes

[For all DiagnosticIumprToFunctionIdentifierMapping, the reference in the role iumpr shall exist.]

**[constr\_10085] Existence of DiagnosticIumprToFunctionIdentifierMapping.functionIdentifier**

*Imposition time:* CP: IT\_DiagDes

[For all DiagnosticIumprToFunctionIdentifierMapping, the reference in the role functionIdentifier shall exist.]

**[constr\_10088] Relation between event and DTC without event combination**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[If attribute DiagnosticCommonProps.typeOfEventCombinationSupported is not configured, then all DiagnosticTroubleCodeUds that refer to a DiagnosticTroubleCodeProps in the role troubleCodeProps that in turn refers to a Diag-

`diagnosticMemoryDestination` in the role `diagnosticMemory` shall only be referenced by at most one `DiagnosticEventToTroubleCodeUdsMapping`.]

**[constr\_10089] Existence of attribute `DiagnosticCommonProps.eventCombinationReportingBehavior`**

*Imposition time:* CP: IT\_DiagDes

[Attribute `DiagnosticCommonProps.eventCombinationReportingBehavior` is always optional and shall be set to the value `DiagnosticEventCombinationReportingBehaviorEnum.reportingInChronologicalOrderOldestFirst` only if attribute `DiagnosticCommonProps.typeOfEventCombinationSupported` is set to the value `DiagnosticEventCombinationBehaviorEnum.eventCombinationOnRetrieval`.

If it is missing, then the reporting order is not specified.]

**[constr\_10091] Mandatory subfunction of diagnostic service `Authentication`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[If the diagnostic service `Authentication` is supported, then the following subfunctions shall be configured:

- De-authentication, formalized by meta-class `DiagnosticDeAuthentication`.
- Proof of ownership, formalized by meta-class `DiagnosticProofOfOwnership`.
- Authentication configuration, formalized by meta-class `DiagnosticAuthenticationConfiguration`.
- One of
  - Verify certificate unidirectional, formalized by meta-class `DiagnosticVerifyCertificateUnidirectional`.
  - Verify certificate bidirectional, formalized by meta-class `DiagnosticVerifyCertificateBidirectional`.

]

**[constr\_10100] Existence of `DiagnosticRoutineControl.routine`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[For each `DiagnosticRoutineControl`, the attribute `routine` shall exist.]

**[constr\_10115] Existence of attributes of `DiagnosticEnvDataElementCondition` if the reference in the role `dataPrototype` exists**

*Imposition time:* CP: IT\_DiagDes

[If the reference in the role `DiagnosticEnvDataElementCondition.dataPrototype` exists, then

- the aggregation in the role `compareValue` shall exist and
- the aggregation in the role `swDataDefProps` shall not exist.

]

**[constr\_10116] Existence of attributes of `DiagnosticEnvDataElementCondition` if the reference in the role `dataPrototype` does not exist**

*Imposition time:* CP: IT\_DiagDes

[If the reference in the role `DiagnosticEnvDataElementCondition.dataPrototype` does **not** exist, then the aggregations in the role

- `compareValue` and
- `swDataDefProps`

shall exist.]

**[constr\_10117] Existence of attributes of `DiagnosticEnvDataElementCondition.swDataDefProps`**

*Imposition time:* CP: IT\_DiagDes

[

Attribute of <code>SwDataDefProps</code>	Attribute Existence
<code>baseType</code>	1
<code>compuMethod</code>	0..1
<code>dataConstr</code>	0..1

]

**[constr\_10122] Existence of attribute `DiagnosticComControlSubNodeChannel.subNodeChannel`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[Attribute `DiagnosticComControlSubNodeChannel.subNodeChannel` shall only exist if the value of `DiagnosticComControl.category` is set to either

- `ENABLE_RX_AND_DISABLE_TX_WITH_ENHANCED_ADDRESS_INFORMATION`  
or
- `ENABLE_RX_AND_TX_WITH_ENHANCED_ADDRESS_INFORMATION`.

]

**[constr\_10364] Usage of `DiagnosticRecordTriggerEnum.testPassed`**

*Imposition time:* CP: IT\_DiagDes

[The enumeration value `DiagnosticRecordTriggerEnum.testPassed` shall only be used in context of `DiagnosticExtendedDataRecord.trigger`.]

### [constr\_10368] Restriction regarding the reference `DiagnosticDataIdentifierSet.diagnosticDataIdentifier`

*Imposition time:* CP: IT\_DiagDes

[A `DiagnosticDataIdentifier` that is referenced in the role `DiagnosticDataIdentifierSet.diagnosticDataIdentifier` shall not aggregate in the role `dataElement` a `DiagnosticParameter` that aggregates in the role `ident` a `DiagnosticParameterIdent` that in turn aggregates in the role `subElement` a `DiagnosticParameterElement`.]

### [constr\_10369] Existence of attributes of `DiagnosticParameterElement` depending on the value of attribute `category`

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[

Value of <code>category</code>	Description	array-Size	subElement	dataElement
LEAF	The <code>DiagnosticParameterElement</code> represents a "leaf" element of a nested structure.	No	No	Yes
ARRAY	The <code>DiagnosticParameterElement</code> represents an array, i.e. references to this <code>DiagnosticParameterElement</code> shall define a value for the attribute <code>index</code> . Arrays of "primitive" types are defined in the context of the <code>DiagnosticDataElement</code>	Yes	Yes, if <code>dataElement</code> does not exist	Yes, if <code>subElement</code> does not exist
STRUCTURE	The <code>DiagnosticParameterElement</code> represents a structure with one or more elements.	No	Yes	No

]

### [constr\_10370] Restriction regarding the role `DiagnosticParameterIdentifier.dataElement`

*Imposition time:* CP: IT\_DiagDes

[A `DiagnosticParameter` that is aggregated by a `DiagnosticParameterIdentifier` in the role `dataElement` shall not aggregate in the role `ident` a `DiagnosticParameterIdent` that in turn aggregates in the role `subElement` a `DiagnosticParameterElement`.]

### [constr\_10412] Existence of attribute `DiagnosticTestIdentifier.id`

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTestIdentifier`, attribute `id` shall exist.]

### [constr\_10413] Existence of attribute `DiagnosticTestIdentifier.uasId`

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTestIdentifier`, attribute `uasId` shall exist.]



**[constr\_10414] Existence of attribute `DiagnosticMeasurementIdentifier.obdMid`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticMeasurementIdentifier`, attribute `obdMid` shall exist.]**[constr\_10418] Existence of attribute `DiagnosticDebounceAlgorithmProps.debounceAlgorithm`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticDebounceAlgorithmProps`, attribute `debounceAlgorithm` shall exist.]**[constr\_10419] Existence of the attribute `DiagnosticCommonProps.resetPendingBitOnOverflow`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes[Attribute `DiagnosticCommonProps.resetPendingBitOnOverflow` shall exist.]**[constr\_10421] Existence of attribute `DiagnosticMemoryDestination.dtcStatusAvailabilityMask`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticMemoryDestination`, attribute `dtcStatusAvailabilityMask` shall exist.]**[constr\_10422] Existence of attribute `DiagnosticMemoryDestination.eventDisplacementStrategy`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticMemoryDestination`, attribute `eventDisplacementStrategy` shall exist.]**[constr\_10423] Existence of attribute `DiagnosticMemoryDestination.maxNumberOfEventEntries`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes[For each `DiagnosticMemoryDestination`, attribute `maxNumberOfEventEntries` shall exist.]**[constr\_10440] Restriction for the minimum value of attribute `DiagnosticSessionControlClass.s3ServerTimeout`***Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes[The value of attribute `DiagnosticSessionControlClass.s3ServerTimeout` shall be **greater than or equal to 5.0**.]

**[constr\_10522] OBD trouble code shall only be placed in primary fault memory***Imposition time:* CP: IT\_DiagDes

[If a `DiagnosticTroubleCodeUds` that is referenced in the role `DiagnosticTroubleCodeUdsToTroubleCodeObdMapping.troubleCodeUds` in turn references a `DiagnosticTroubleCodeProps` in the role `troubleCodeProps`, and if the `DiagnosticTroubleCodeProps` refers to a `DiagnosticMemoryDestination` in the role `diagnosticMemory`, then the referenced `diagnosticMemory` shall be a `DiagnosticMemoryDestinationPrimary`.]

**[constr\_10523] Existence of role `DiagnosticTroubleCodeUdsToTroubleCodeObdMapping.troubleCodeUds`***Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[For each `DiagnosticTroubleCodeUdsToTroubleCodeObdMapping`, the reference in the role `troubleCodeUds` shall exist.]

**[constr\_10524] Existence of role `DiagnosticTroubleCodeUdsToTroubleCodeObdMapping.troubleCodeObd`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticTroubleCodeUdsToTroubleCodeObdMapping`, the reference in the role `troubleCodeObd` shall exist.]

**[constr\_10545] Existence of `DiagnosticParameterIdentifier.dataElement`.***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticParameterIdentifier`, at least one aggregation of `DiagnosticParameter` in the role `DiagnosticParameterIdentifier.dataElement` shall exist.]

**[constr\_10573] Existence of attribute `DiagnosticServiceTable.diagnosticServiceInstance`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticServiceTable`, attribute `diagnosticServiceInstance` shall exist.]

**[constr\_10577] Existence of `DiagnosticResponseOnEventClass.storeEventEnabled`***Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticResponseOnEventClass`, the attribute `storeEventEnabled` shall exist.]

**[constr\_10642] Existence of `DiagnosticEventPortMapping.diagnosticEvent` for one specific `DiagnosticEvent`**

*Imposition time:* CP: IT\_DiagDes

[Each `DiagnosticEvent` shall be referenced **at most once** in the role `DiagnosticEventPortMapping.diagnosticEvent`.]

**[constr\_10645] Value of `DiagnosticEvent.confirmationThreshold` for an n:1 mapping to `DiagnosticTroubleCodeUds`**

*Imposition time:* CP: IT\_DiagDes

[If multiple `DiagnosticEvents` are (by way of multiple `DiagnosticEventToTroubleCodeUdsMappings`) associated with that same `DiagnosticTroubleCodeUds`, then the value of attribute `confirmationThreshold` of **each** of the affected `DiagnosticEvents` shall be **identical**.]

**[constr\_10646] Value of attributes of `DiagnosticConnectedIndicator` for an n:1 mapping to `DiagnosticTroubleCodeUds` where all affected `DiagnosticEvents` transitively refer to the identical `DiagnosticIndicator`**

*Imposition time:* CP: IT\_DiagDes

[If

- multiple `DiagnosticEvents` are (by way of multiple `DiagnosticEventToTroubleCodeUdsMappings`) associated with the same `DiagnosticTroubleCodeUds` **and**
- the target of **all** `connectedIndicator.indicator` is the identical `DiagnosticIndicator`,

then the values of the following attributes and references owned by **all** affected `DiagnosticConnectedIndicators` shall have **the identical value**:

- `behavior`
- `indicatorFailureCycleCounterThreshold`
- `healingCycleCounterThreshold`
- `indicator`

]

**[constr\_10647] In an n:1 mapping between `DiagnosticEvent` and `DiagnosticTroubleCodeUds`, all `DiagnosticEvents` shall be mapped to the same `DiagnosticOperationCycle`**

*Imposition time:* CP: IT\_DiagDes

[If multiple `DiagnosticEvents` are (by way of multiple `DiagnosticEventToTroubleCodeUdsMappings`) mapped to the same `DiagnosticTroubleCodeUds`, then all affected `DiagnosticEvents` shall (by way of multiple `DiagnosticEventTo-`

`OperationCycleMappings`) mapped to the identical `DiagnosticOperationCycle`.]

**[constr\_10665] Existence of attribute `DiagnosticCommonProps.authenticationTimeout`**

*Imposition time:* CP: IT\_DiagDes, AP: IT\_DiagDes

[If the `DiagnosticContributionSet` that aggregates a `DiagnosticCommonProps` also references a `DiagnosticAuthentication` in the role `element`, then attribute `DiagnosticCommonProps.authenticationTimeout` shall exist.]

**[constr\_10676] Allowed attribute of attribute `DiagnosticExtendedDataRecordElement.swDataDefProps`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The only allowed attributes of `SwDataDefProps` aggregated in the role `DiagnosticExtendedDataRecordElement.swDataDefProps` are

- `compuMethod` for the definition of a conversion method from internal to physical representation in the diagnostic client
- `baseType` for the definition of the memory layout of the `DiagnosticExtendedDataRecord`.

None of the other attributes of `SwDataDefProps` shall be used in the context of `DiagnosticExtendedDataRecordElement.swDataDefProps`.]

**[constr\_10677] Allowed values for attribute `DiagnosticExtendedDataRecordElement.swDataDefProps.baseType.baseTypeSize`**

*Imposition time:* AP: IT\_DiagDes, CP: IT\_DiagDes

[The only allowed values filled into attribute values for attribute `DiagnosticExtendedDataRecordElement.swDataDefProps.baseType.baseTypeSize` shall be a multiple of 8.]

**[constr\_10678] Existence of `DiagnosticEdrSenderPortMapping.dataPrototype`**

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEdrSenderPortMapping`, the reference in the role `DiagnosticEdrSenderPortMapping.dataPrototype` shall exist.]

**[constr\_10679] Existence of `DiagnosticEdrSenderPortMapping.recordElement`**

*Imposition time:* CP: IT\_DiagDes

[For each `DiagnosticEdrSenderPortMapping`, the reference in the role `DiagnosticEdrSenderPortMapping.recordElement` shall exist.]

**[constr\_10680] Existence of `DiagnosticEdrServerPortMapping.swcServiceDependencyInSystem` vs. `bswServiceDependency`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticEdrServerPortMapping`, **either** the reference in the role

- `DiagnosticEdrServerPortMapping.swcServiceDependencyInSystem`  
**or**
- `DiagnosticEdrServerPortMapping.bswServiceDependency`

shall exist.]

**[constr\_10681] Existence of `DiagnosticEdrServerPortMapping.recordElement`***Imposition time:* CP: IT\_DiagDes[For each `DiagnosticEdrServerPortMapping`, the reference in the role `DiagnosticEdrServerPortMapping.recordElement` shall exist.]**[constr\_10687] Existence of reference `ISignalPortToDiagnosticEventMapping.iSignalTriggering`***Status:* DRAFT*Imposition time:* CP: IT\_DiagDes[For each `ISignalPortToDiagnosticEventMapping`, the reference to `iSignalTriggering` in the role `iSignalTriggering` shall exist.]**[constr\_10688] Existence of reference `ISignalPortToDiagnosticEventMapping.iSignalPort`***Status:* DRAFT*Imposition time:* CP: IT\_DiagDes[For each `ISignalPortToDiagnosticEventMapping`, the reference to `iSignalPort` in the role `iSignalPort` shall exist.]**[constr\_10689] Restriction for attribute `communicationDirection` of an `ISignalPort` that is referenced by `ISignalPortToDiagnosticEventMapping`***Status:* DRAFT*Imposition time:* CP: IT\_DiagDes[Each `ISignalPort` that is referenced in the role `iSignalPort` by a `ISignalPortToDiagnosticEventMapping` shall set the attribute `communicationDirection` to the value `CommunicationDirectionType.in`.]

## 2.3 CP\_TPS\_ECUConfiguration

**[constr\_3022] `EcucModuleDef` category restriction** [The category definition shall be restricted to exactly the two defined ones:

- `VENDOR_SPECIFIC_MODULE_DEFINITION`
- `STANDARDIZED_MODULE_DEFINITION`

]

**[constr\_3023] Usage of `apiServicePrefix`** [The attribute `apiServicePrefix` is mandatory for VSMDs derived from the CDD and Xfrm StMD. The attribute shall not be provided for VSMDs derived from any other StMDs.]

**[constr\_3091] Multiplicity of `valueConfigClass`** [The multiplicity of the attribute `EcucCommonAttributes.valueConfigClass` shall not exceed 3.]

**[constr\_3092] Usage of `configVariant` and `configClass` attributes** [`configVariant` and `configClass` shall always exist as a pair for each existing `EcucAbstractConfigurationClass` (`EcucValueConfigurationClass` or `EcucMultiplicityConfigurationClass` depending on the context).]

**[constr\_3120] Applicable attributes when `destinationUriNestingContract` is set to `targetContainer`** [If the `destinationUriNestingContract` is set to `targetContainer`, the attribute `container` shall exist exactly once and attributes `parameter` and `reference` shall not exist.]

**[constr\_3200] Restriction on values of `EcucDefinitionElement.relatedTraceItem` in the VSMD** [The value of `EcucDefinitionElement.relatedTraceItem` in the VSMD shall never start with 'ECUC\_'.]

**[constr\_3217] Symbolic name reference shall point only to containers with a symbolic name value defined** [If an `EcucReferenceValue` exists that refers in the role `definition` to an `EcucAbstractInternalReferenceDef` with the attribute `requiresSymbolicNameValue` set to true, then the `EcucContainerValue` that is the target of the reference shall refer to an `EcucParamConfContainerDef` in the role `definition` that contains a definition of an `EcucParameterDef` where the attribute `symbolicNameValue` exists and is set to true. The `EcucContainerValue` shall define an `EcucParameterValue` that refers to an `EcucParameterDef` where the attribute `symbolicNameValue` exists and is set to true.]

**[constr\_3233] `EcucModuleDef` that relies on `EcucCommonAttributes` with `valueConfigClass` set to `Link/PostBuild` of another `EcucModuleDef`** [If one `EcucModuleDef` relies on the `EcucCommonAttributes` (parameters and references) with `valueConfigClass.configClass` set to `Link/PostBuild` of another `EcucModuleDef`, the values of these `EcucCommonAttributes` can only be changed at `Link/PostBuild` time if the corresponding `EcucModuleConfigurationValues` of the using `EcucModuleDef` has the `implementationConfigVariant` set to `VariantLinkTime/VariantPostBuild`, respectively.]

**[constr\_3234] `EcucModuleDef` that relies on `EcucCommonAttributes` with `multiplicityConfigClass` set to `Link/PostBuild` of another `EcucModuleDef`** [If

one `EcucModuleDef` relies on the `EcucCommonAttributes` (parameters and references) with `multiplicityConfigClass.configClass` set to `Link/PostBuild` of another `EcucModuleDef`, the number of instances of these `EcucCommonAttributes` can only be changed at `Link/PostBuild` time if the corresponding `EcucModuleConfigurationValues` of the using `EcucModuleDef` has the `implementationConfigVariant` set to `VariantLinkTime/VariantPostBuild`, respectively.]

**[constr\_3235] `EcucModuleDef` that relies on `EcucContainerDefs` with `multiplicityConfigClass` set to `Link/PostBuild` of another `EcucModuleDef`** [If one `EcucModuleDef` relies on the `EcucContainerDefs` with `multiplicityConfigClass.configClass` set to `Link/PostBuild` of another `EcucModuleDef`, the number of instances of these `EcucContainerDefs` can only be changed at `Link/PostBuild` time if the corresponding `EcucModuleConfigurationValues` of the using `EcucModuleDef` has the `implementationConfigVariant` set to `VariantLinkTime/VariantPostBuild`, respectively.]

**[constr\_3236] `EcucModuleDef` that relies on `EcucCommonAttributes` with `postBuildVariantValue` set to true of another `EcucModuleDef`** [If one `EcucModuleDef` relies on the `EcucCommonAttributes` (parameters and references) with `postBuildVariantValue` set to true of another `EcucModuleDef`, the values of these `EcucCommonAttributes` can only differ in different post-build variants if the implementation of the using `EcucModuleDef` supports post-build variations.]

**[constr\_3237] `EcucModuleDef` that relies on `EcucCommonAttributes` with `postBuildVariantMultiplicity` set to true of another `EcucModuleDef`** [If one `EcucModuleDef` relies on the `EcucCommonAttributes` (parameters and references) with `postBuildVariantMultiplicity` set to true of another `EcucModuleDef`, the number of instances of these `EcucCommonAttributes` can only differ in different post-build variants if the implementation of the using `EcucModuleDef` supports post-build variations.]

**[constr\_3238] `EcucModuleDef` that relies on `EcucContainerDef` with `postBuildVariantMultiplicity` set to true of another `EcucModuleDef`** [If one `EcucModuleDef` relies on the `EcucContainerDefs` with `postBuildVariantMultiplicity` set to true of another `EcucModuleDef`, the number of instances of these `EcucContainerDefs` can only differ in different post-build variants if the implementation of the using `EcucModuleDef` supports post-build variations.]

**[constr\_3307] ShortNames of `PredefinedVariants` referenced by `EcucPostBuildVariantRefs`** [All `PredefinedVariants` that are referenced by `EcucPostBuildVariantRefs` shall have different `shortNames`.]

**[constr\_3449] Impact of `postBuildVariantUsed` value set to FALSE** [If the value of the `EcucModuleConfigurationValues.postBuildVariantUsed` is set to FALSE or if it is not defined, it is not possible to add a post-build variant at post-build configuration time.]



[constr\_3450] **postBuildVariantUsed** value in case of post build **VariationPoints** [If the configuration values of a BSW module contain at least one post build **VariationPoint**, the value of the **postBuildVariantUsed** for the **EcucModuleConfigurationValues** shall be set to TRUE.]

[constr\_3451] **EcucModuleConfigurationValues.postBuildVariantUsed** value setting restriction in case **postBuildVariantSupport** is set to TRUE [If **EcucModuleDef.postBuildVariantSupport** is set to TRUE, then **EcucModuleConfigurationValues.postBuildVariantUsed** can be either TRUE or FALSE.]

[constr\_3452] **EcucModuleConfigurationValues.postBuildVariantUsed** value setting restriction in case **postBuildVariantSupport** is set to FALSE [If **EcucModuleDef.postBuildVariantSupport** is set to FALSE, then **EcucModuleConfigurationValues.postBuildVariantUsed** shall be FALSE.]

[constr\_3570] **EcucDefinitionElement.lowerMultiplicity** always required [The attribute **EcucDefinitionElement.lowerMultiplicity** shall always be defined **when the ECU Configuration Parameter definition is complete.**]

[constr\_3571] **EcucCommonAttributes.origin** always required [The attribute **EcucCommonAttributes.origin** shall always be defined **when the ECU Configuration Parameter definition is complete.**]

[constr\_3572] **EcucParameterDef.symbolicNameValue** always required [The attribute **EcucParameterDef.symbolicNameValue** shall always be defined **when the ECU Configuration Parameter definition is complete.**]

[constr\_3573] **EcucAbstractConfigurationClass.configClass** always required [The attribute **EcucAbstractConfigurationClass.configClass** shall always be defined **when the ECU Configuration Parameter definition is complete.**]

[constr\_3574] **EcucAbstractConfigurationClass.configVariant** always required [The attribute **EcucAbstractConfigurationClass.configVariant** shall always be defined **when the ECU Configuration Parameter definition is complete.**]

[constr\_3575] **EcucEnumerationLiteralDef.origin** always required [The attribute **EcucEnumerationLiteralDef.origin** shall always be defined **when the ECU Configuration Parameter definition is complete.**]

[constr\_3576] **EcucInstanceReferenceDef.destinationContext** always required [The attribute **EcucInstanceReferenceDef.destinationContext** shall always be defined **when the ECU Configuration Parameter definition is complete.**]

[constr\_3577] **EcucInstanceReferenceDef.destinationType** always required [The attribute **EcucInstanceReferenceDef.destinationType** shall always be defined **when the ECU Configuration Parameter definition is complete.**]



[constr\_3578] **EcucForeignReferenceDef.destinationType** always required [The attribute `EcucForeignReferenceDef.destinationType` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3579] **EcucReferenceDef.destination** always required [The attribute `EcucReferenceDef.destination` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3580] **EcucUriReferenceDef.destinationUri** always required [The attribute `EcucUriReferenceDef.destinationUri` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3581] **EcucDestinationUriDefSet.destinationUriDef** always required [The attribute `EcucDestinationUriDefSet.destinationUriDef` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3582] **EcucDestinationUriDef.destinationUriPolicy** always required [The attribute `EcucDestinationUriDef.destinationUriPolicy` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3583] **EcucDestinationUriPolicy.destinationUriNestingContract** always required [The attribute `EcucDestinationUriPolicy.destinationUriNestingContract` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3584] **EcucQuery.ecucQueryExpression** always required [The attribute `EcucQuery.ecucQueryExpression` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3585] **EcucConditionFormula.ecucQuery** always required [The attribute `EcucConditionFormula.ecucQuery` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3586] **EcucConditionFormula.ecucQueryString** always required [The attribute `EcucConditionFormula.ecucQueryString` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3587] **EcucValidationCondition.validationFormula** always required [The attribute `EcucValidationCondition.validationFormula` shall always be defined when the ECU Configuration Parameter definition is complete.]

[constr\_3588] **EcucValueCollection.ecuExtract** always required [The attribute `EcucValueCollection.ecuExtract` shall always be defined at code generation time.]

[constr\_3589] **EcucModuleConfigurationValues.ecucDefEdition** always required [The attribute `EcucModuleConfigurationValues.ecucDefEdition` shall always be defined at code generation time.]

[constr\_3590] **EcucModuleConfigurationValues.implementationConfigVariant** always required [The attribute `EcucModuleConfigurationValues.implementationConfigVariant` shall always be defined at code generation time.]

[constr\_3591] **EcucModuleConfigurationValues.definition** always required [The attribute `EcucModuleConfigurationValues.definition` shall always be defined at code generation time.]

[constr\_3592] **EcucContainerValue.definition** always required [The attribute `EcucContainerValue.definition` shall always be defined at code generation time.]

[constr\_3593] **EcucParameterValue.definition** always required [The attribute `EcucParameterValue.definition` shall always be defined at code generation time.]

[constr\_3594] **EcucNumericalParamValue.value** always required [The attribute `EcucNumericalParamValue.value` shall always be defined at code generation time.]

[constr\_3595] **EcucTextualParamValue.value** always required [The attribute `EcucTextualParamValue.value` shall always be defined at code generation time.]

[constr\_3596] **EcucAddInfoParamValue.value** always required [The attribute `EcucAddInfoParamValue.value` shall always be defined at code generation time.]

[constr\_3597] **EcucAbstractReferenceValue.definition** always required [The attribute `EcucAbstractReferenceValue.definition` shall always be defined at code generation time.]

[constr\_3598] **EcucInstanceReferenceValue.value** always required [The attribute `EcucInstanceReferenceValue.value` shall always be defined at code generation time.]

[constr\_3599] **EcucReferenceValue.value** always required [The attribute `EcucReferenceValue.value` shall always be defined at code generation time.]

#### [constr\_3793] Usage of `KeepLocalPduBuffer`

*Status:* DRAFT

[All Pdus that belong to the same Pdu flow shall have `KeepLocalPduBuffer` either set to `TRUE` or set to `FALSE`.]

#### [constr\_3794] Usage of `PduBufferAlignment`

*Status:* DRAFT

[All `Pdus` that belong to the same `Pdu` flow shall have `PduBufferAlignment` either set to `TRUE` or set to `FALSE`.]

**[constr\_5015] Multiplicity of `multiplicityConfigClass`** [The multiplicity of the attribute `EcucCommonAttributes.multiplicityConfigClass` shall not exceed 3.]

**[constr\_5059] Ordering of `MetaDataItems` of a `MetaDataType`** [The `MetaDataItems` of a `MetaDataType` shall be ordered according to their `MetaDataItemLength`. `MetaDataItems` with greater `MetaDataItemLength` going first.]

**[constr\_5108] `CddModuleId` range restriction** [The range of `CddModuleId` is restricted to the value 255 and to the range of values 2048..4095.]

**[constr\_5325] Existence of `upperMultiplicityInfinite` and `upperMultiplicity` is mutually exclusive** [The existence of the elements `upperMultiplicityInfinite` and `upperMultiplicity` shall be mutually exclusive.]

**[constr\_5342] `EcucDefinitionElement.upperMultiplicity` or `EcucDefinitionElement.upperMultiplicityInfinite` always required** [Exactly one of the attributes `EcucDefinitionElement.upperMultiplicity` or `EcucDefinitionElement.upperMultiplicityInfinite` shall always be defined **when the ECU Configuration Parameter definition is complete.**]

**[constr\_5345] Restriction for a reference destination in case of multiple aggregated `EcucParamConfContainerDefs`** [An `EcucReferenceDef` or `EcucChoiceReferenceDef` is not allowed to reference an `EcucParamConfContainerDef` as destination if

- this `EcucParamConfContainerDef` is aggregated by several `EcucParamConfContainerDefs` as `subContainer` and
- the `EcucParamConfContainerDef` structures in which the referenced `EcucParamConfContainerDef` is aggregated are different compared to the `EcucParamConfContainerDef` structure in which the `EcucReferenceDef` or `EcucChoiceReferenceDef` is located in.

]

**[constr\_5365] Origin information in parameter and reference definitions** [Each instance of the subclass of `EcucCommonAttributes` or `EcucContainerDef` shall provide a value for the `origin` attribute and this attribute shall be either:

- `'AUTOSAR_ECUC'` - in case that the parameter definition is standardized by AUTOSAR

- vendor specific value - in case that the parameter definition is vendor specific. For vendor specific origins no rules are defined by AUTOSAR and the vendor is free to choose the value (e.g. 'VendorXYZ\_v1.3').

]

**[constr\_5500] Applicability of the `multiplicityConfigClass` attribute** [The `multiplicityConfigClass` attribute is applicable only to `EcucContainerDefs` which have `upperMultiplicity` greater than `lowerMultiplicity`.]

**[constr\_5502] Introduction of new `EcucParameterValues` of type `EcucFunctionNameDef` at post-build time** [In case a new `EcucParameterValues` of type `EcucFunctionNameDef` (see [TPS\_ECUC\_02033]) is introduced at post-build time, its value shall be one of the existing function names (e.g. callouts). This means that it is not allowed to introduce new functions at post-build time.]

**[constr\_5504] Removing an instance of the `EcucContainerDef` at post-build time** [Only instances of `EcucContainerDefs` with `multiplicityConfigClass.configClass` set to `PostBuild` in the `multiplicityConfigClass.configVariant VariantPostBuild` which are not referenced or are exclusively referenced by `EcucAbstractReferenceDefs` with `valueConfigClass.configClass` set to `PostBuild` in the `valueConfigClass.configVariant VariantPostBuild` and have been introduced at post-build time (not part of the initial configuration before post-build updates) can be removed at post-build time.]

**[constr\_5505] Configuration class of the elements of the `EcucQueryExpression`** [The elements of the `EcucQueryExpression` involved in one calculation formula shall have lower or equal configuration class (where `PreCompile` configuration class is considered to be the lowest and `PostBuild` the highest) with respect to the context element in which the calculation is performed (e.g. a `Link` configuration parameter can not calculate its value based on a `PostBuild` parameters value).]

**[constr\_5506] Applicability of `postBuildVariantMultiplicity` attribute** [The `postBuildVariantMultiplicity` attribute of `EcucContainerDef` is applicable only to `EcucContainerDefs` which have `upperMultiplicity` greater than `lowerMultiplicity`.]

**[constr\_5507] Value of `EcucContainerDef.postBuildVariantMultiplicity` if `postBuildVariantSupport` is set to false** [If `postBuildVariantSupport` is set to false, every `EcucContainerDef` in this `EcucModuleDef` with `upperMultiplicity` greater than `lowerMultiplicity` shall have its `postBuildVariantMultiplicity` attribute set to false.]

**[constr\_5508] Applicability of `postBuildVariantMultiplicity` attribute** [The `postBuildVariantMultiplicity` attribute is applicable only to `EcucCommonAttributes` which have `upperMultiplicity` greater than `lowerMultiplicity`.]

**[constr\_5509] Value of `postBuildVariantMultiplicity` if `postBuildVariantSupport` is set to `false`** [If `postBuildVariantSupport` is set to `false`, every `EcucCommonAttributes` in this `EcucModuleDef` with `upperMultiplicity` greater than `lowerMultiplicity` shall have its `postBuildVariantMultiplicity` attribute set to `false`.]

**[constr\_5510] Value of `postBuildVariantValue` if `postBuildVariantSupport` is set to `false`** [If `postBuildVariantSupport` is set to `false`, every `EcucCommonAttributes` in this `EcucModuleDef` shall have its `postBuildVariantValue` attribute set to `false`.]

**[constr\_5512] `postBuildVariantValue` attribute of `symbolicNameValue` parameters** [The values of `EcucParameterDefs` with `symbolicNameValue` attribute set to `true` shall have their `postBuildVariantValue` set to `false`.]

**[constr\_5514] Applicability of the `multiplicityConfigClass` attribute** [The `multiplicityConfigClass` attribute is applicable only to `EcucCommonAttributes` which have `upperMultiplicity` greater than `lowerMultiplicity`.]

**[constr\_5520] `valueConfigClass` attribute of `symbolicNameValue` parameters** [The values of `EcucParameterDefs` with `symbolicNameValue` attribute set to `true` shall have their `valueConfigClass.configClass` set to `PreCompile` or `PublishedInformation` for all `valueConfigClass.configVariants`.]

**[constr\_5521] `multiplicityConfigClass` attribute of `symbolicNameValue` parameters** [For the cases defined in [constr\_5514], the values of `EcucParameterDefs` with `symbolicNameValue` attribute set to `true` shall have their `multiplicityConfigClass.configClass` set to `PreCompile` for all `multiplicityConfigClass.configVariants`.]

**[constr\_5522] `postBuildVariantMultiplicity` attribute of `symbolicNameValue` parameters** [For the cases defined in [constr\_5508], the values of `EcucParameterDefs` with `symbolicNameValue` attribute set to `true` shall have their `postBuildVariantMultiplicity` set to `false`.]

**[constr\_5523] Allowed `configClasses` for paired `configVariants`** [`PublishedInformation configClass` is supported by all `configVariants` where [TPS\_ECUC\_02071] applies. Additionally, `VariantPreCompile configVariant` supports `PreCompile configClass`, `VariantLinkTime configVariant` supports `PreCompile` and `Link configClasses`, and `VariantPostBuild configVariant` supports `PreCompile`, `Link` and `PostBuild configClasses`.]

**[constr\_13000] Existence of reference in the role `EcucContainerDef.destinationUri` for an `EcucContainerDef` aggregated in the role `EcucDestinationUriPolicy.container`** [If an `EcucContainerDef` is **exclusively** aggregated in the role `EcucDestinationUriPolicy.container`, then it shall not define a reference in the role `destinationUri`.]

## 2.4 CP\_TPS\_ECUResourceTemplate

**[constr\_3500] category of HwAttributeDef shall not be extended** [In contrast to the general rule that `category` can be extended by user-specific values it is **not allowed** to extend the meaning of the attribute `category` of meta-class `HwAttributeDef`]

**[constr\_3511] HwType shall not have a reference to another HwType** [A `HwType` (being a `HwDescriptionEntity`) shall not have a reference to another `HwType` in the role `hwType`. The definition of `HwTypes` is not hierarchical.]

**[constr\_3512] No support of multiple instantiation** [An essential constraint is that each `HwElement` can only be target of one `nestedElement` reference. This means that there is no concept of multiple instantiation of hardware elements. If the same hardware element shall be used several times (using the `nestedElement` reference) each occurrence has to have its own description. This is also true for nested elements of the referenced nested element.]

**[constr\_3513] Scope of connections** [Each hardware connection shall only connect features which both are in the hierarchical scope of the hardware element. The hierarchical scope encloses

- all features belonging to the hardware element containing the connection
- all features belonging to hardware elements which are referenced directly and indirectly in the `nestedElement` relation from the hardware element containing connection.

]

**[constr\_11001] Multiplicity of HwAttributeValue.hwAttributeDef** [For each `HwAttributeValue` the reference in the role `hwAttributeDef` shall exist.]

**[constr\_11002] Multiplicity of HwElementConnector.hwElement** [For each `HwElementConnector` there shall exist exactly 2 references in the role `hwElement`.]

**[constr\_11003] Multiplicity of HwPinGroupConnector.hwPinGroup** [For each `HwPinGroupConnector` there shall exist exactly 2 references in the role `hwPinGroup`.]

**[constr\_11004] Multiplicity of HwPinConnector.hwPin** [For each `HwPinConnector` there shall exist exactly 2 references in the role `hwPin`.]

**[constr\_11005] Multiplicity of HwAttributeDef.isRequired** [For each `HwAttributeDef` the attribute `isRequired` shall exist.]



## 2.5 CP\_TPS\_SoftwareComponentTemplate

### [constr\_1004] Mapping of **ApplicationDataTypes** in the scope of single **AtomicSwComponentTypes**

*Imposition time:* CP: IT\_CpgExe

[In the scope of `AtomicSwComponentType.internalBehavior.dataTypeMapping`, each `ApplicationDataType` shall be mapped to exactly one `ImplementationDataType`.]

### [constr\_1005] Compatibility of **ImplementationDataTypes** mapped to the same **ApplicationDataType**

*Imposition time:* CP: IT\_CpgExe

[It is required that `ImplementationDataTypes` which are taken for connecting corresponding elements of `PortInterfaces` and thus refer to compatible `ApplicationDataTypes` are also compatible among each other (so that RTE is able to cope with possible connections by converting the data accordingly).]

### [constr\_1006] Applicable data categories, depending on specific model elements related to data definition properties

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

Category	Applicable to ...											Use Case	Description			
	ApplicationArrayDataType	ApplicationRecordDataType	ApplicationPrimitiveDataType	ApplicationRecordElement	ApplicationArrayElement	ApplicationValueSpecification	ApplicationRuleBasedValueSpecification	ImplementationDataType	ImplementationDataTypeElement	SwSystemconst	McDataInstance	Calibration	Measurement	Communication Port Interfaces	RTE + BSW	
VALUE			x	x	x	x		x	x	x	x	x	x	x	x	Contains a single value.
VAL_BLK			x	x	x	x	x				x	x		x		A value block defines values stored together within one calibration parameter object. It is similar to an value array but it stores the values by means of an axis instead (only important for calibration data handling).





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Category	Applicable to ...										Use Case	Description
	ApplicationArrayDataType	ApplicationRecordDataType	ApplicationPrimitiveDataType	ApplicationRecordElement	ApplicationArrayElement	ApplicationValueSpecification	ApplicationRuleBasedValueSpecification	ImplementationDataType	ImplementationDataTypeElement	SwSystemconst	McDataInstance	Calibration Measurement Communication Port Interfaces RTE + BSW
COM_AXIS			x	x	x	x	x				x	<p>An axis definition as separate calibration parameter which can be referenced by any <a href="#">CURVE</a>, <a href="#">MAP</a>, <a href="#">CUBOID</a>, <a href="#">CUBE_4</a>, and <a href="#">CUBE_5</a>.</p> <p>The benefits by using a common axis is that it saves memory space; because it is stored only one time and can be used in multiple <a href="#">CURVES</a>, <a href="#">MAPS</a>, <a href="#">CUBOIDS</a>, <a href="#">CUBE_4s</a>, and <a href="#">CUBE_5s</a>.</p>
RES_AXIS			x	x	x	x	x				x	<p>A <a href="#">RES_AXIS</a> (rescale axis) is also a shared axis like <a href="#">COM_AXIS</a>, the difference is that this kind of axis can be used for rescaling.</p> <p>Note that the <a href="#">RES_AXIS</a> is by nature a <a href="#">CURVE</a> which is used to implement a non linear scaling (rescale) of the axis.</p> <p>In addition to saving memory space via the shared usage like a <a href="#">COM_AXIS</a>, it can compress a huge range to a non-linear distributed axis points thus retaining the required accuracy.</p>
CURVE			x	x	x	x	x				x	<p>Calibration parameter with one input value and one output value. That means output values can be defined depending on the input value. The granularity of implemented functionality can be changed by using different number of axis points.</p> <p>A <a href="#">CURVE</a> has always one input axis and one output axis. The output axis is a characteristic of the curve and every time present but the input axis can be defined within the curve definition or separately.</p>
MAP			x	x	x	x	x				x	<p>Calibration parameter with two input values and one output value. That means output values can be defined depending on the input values.</p> <p>The granularity of implemented functionality can be changed by using different number of axis points for y- and x-axis. A <a href="#">MAP</a> has always two input axes and one output axis.</p> <p>The output axis is a characteristic of the <a href="#">MAP</a> and every time present but the input axes can be defined within the <a href="#">MAP</a> definition or separately.</p>





Category	Applicable to ...											Use Case	Description		
	ApplicationArrayDataType	ApplicationRecordDataType	ApplicationPrimitiveDataType	ApplicationRecordElement	ApplicationArrayElement	ApplicationValueSpecification	ApplicationRuleBasedValueSpecification	ImplementationDataType	ImplementationDataTypeElement	SwSystemconst	McDataInstance	Calibration	Measurement	Communication Port Interfaces	RTE + BSW
CUBOID			x	x	x	x	x				x	x		x	Calibration parameter with three input values and one output value. That means output values can be defined depending on the input values. The granularity of implemented functionality can be changed by using different number of axis points for the input axes. A CUBOID has always three input axes and one output axis. The output axis is a characteristic of the CUBOID and every time present but the input axes can be defined within the CUBOID definition or separately.
CUBE_4			x	x	x	x	x				x	x		x	Calibration parameter with four input values and one output value. That means output values can be defined depending on the input values. The granularity of implemented functionality can be changed by using different number of axis points for the input axes. A CUBE_4 has always four input axes and one output axis. The output axis is a characteristic of the CUBE_4 and every time present but the input axes can be defined within the CUBE_4 definition or separately.
CUBE_5			x	x	x	x	x				x	x		x	Calibration parameter with five input values and one output value. That means output values can be defined depending on the input values. The granularity of implemented functionality can be changed by using different number of axis points for the input axes. A CUBE_5 has always five input axes and one output axis. The output axis is a characteristic of the CUBE_5 and every time present but the input axes can be defined within the CUBE_5 definition or separately.

## [constr\_1007] Allowed attributes of SwDataDefProps for Application-DataTypes

Imposition time: CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[

Attributes of SwDataDefProps	Attribute Existence per ApplicationDataType.category												
	VALUE	VAL_BLK	STRUCTURE	ARRAY	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5
additionalNativeTypeQualifier													
annotation	*	*	*	*	*	*	*	*	*	*	*	*	*
baseType													
compuMethod	0..1	0..1				0..1			0..1	0..1	0..1	0..1	0..1
dataConstr.dataConstrRule.physConstrs	0..1	0..1		0..1		0..1			0..1	0..1	0..1	0..1	0..1
dataConstr.dataConstrRule.internalConstrs	d/c <sup>5</sup>	d/c		d/c		d/c			d/c	d/c	d/c	d/c	d/c
displayFormat	0..1	0..1		0..1	0..1	0..1			0..1	0..1	0..1	0..1	0..1
displayPresentation	0..1	0..1		0..1			0..1	0..1	0..1	0..1	0..1	0..1	0..1
implementationDataType													
invalidValue	0..1				0..1								
stepSize	0..1	0..1		0..1			0..1	0..1	0..1	0..1	0..1	0..1	0..1
swAddrMethod	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
swAlignment													
swBitRepresentation													
swCalibrationAccess	0..1	0..1	0..1	0..1	0..1	0..1	1	1	1	1	1	1	1
swCalprmAxisSet							1	1	1	1	1	1	1
swComparisonVariable													
swDataDependency													
swHostVariable													
swImplPolicy	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
swIntendedResolution	0..1												
swInterpolationMethod	0..1						0..1	0..1	0..1	0..1	0..1	0..1	0..1
swIsVirtual													
swPointerTargetProps													
swRecordLayout	0..1	0..1 <sup>6</sup>			0..1		1	1	1	1	1	1	1
swRefreshTiming	0..1	0..1			0..1	0..1							
swTextProps					1								
swValueBlockSize		1											
swValueBlockSizeMult		1											
unit	0..1	0..1							0..1	0..1	0..1	0..1	0..1
valueAxisDataType		0..1					0..1	0..1	0..1	0..1	0..1	0..1	0..1

]

<sup>5</sup>don't care

<sup>6</sup>This is required by [TPS\_SWCT\_01179].

## [constr\_1009] SwDataDefProps applicable to ImplementationDataTypes

Imposition time: CP: IT\_CpgExe

Attributes of SwDataDefProps	Root Element				Attribute Existence per Category						
	ImplementationDataType	ImplementationDataTypeElement	SwPointerTargetProps	SwServiceArg	VALUE	DATA_REFERENCE	FUNCTION_REFERENCE	TYPE_REFERENCE	STRUCTURE	UNION	ARRAY
additionalNativeTypeQualifier	x	x	x	x	0..1	0..1	0..1	0..1	0..1	0..1	0..1
annotation	x	x	x	x	*	*	*	*	*	*	*
baseType	x	x	x	x	1						
compuMethod	x	x	x	x	0..1			0..1			
dataConstr.dataConstrRule.physConstrs	x	x	x	x	d/c <sup>7</sup>			d/c			d/c
dataConstr.dataConstrRule.internalConstrs	x	x	x	x	0..1			0..1			0..1
displayFormat	x	x			0..1				0..1	0..1	0..1
displayPresentation	x	x			0..1						0..1
implementationDataType	x	x	x	x				1			
invalidValue	x	x	x		0..1			0..1	0..1 <sup>8</sup>		0..1 <sup>9</sup>
stepSize	x	x			0..1						
swAddrMethod	x	x	x		0..1	0..1	0..1	0..1	0..1	0..1	0..1
swAlignment	x				0..1	0..1	0..1		0..1	0..1	0..1
swBitRepresentation											
swCalibrationAccess	x	x			0..1			0..1	0..1	0..1	0..1
swCalprmAxisSet											
swComparisonVariable											
swDataDependency											
swHostVariable											
swImplPolicy	x		x	x	0..1	0..1	0..1	0..1	0..1	0..1	0..1
swIntendedResolution											
swInterpolationMethod											
swIsVirtual											
swPointerTargetProps	x	x	x	x		1	1				



<sup>7</sup>don't care

<sup>8</sup>There is a use case for the definition of an `invalidValue` for category `ARRAY` and therefore category `STRUCTURE` is also supported for the sake of symmetry.

<sup>9</sup>This represents an exception such that it would make sense to use an entire `ArrayValueSpecification` as the `invalidValue` because a string semantically is more than just a bunch of characters in a row.



Attributes of SwDataDefProps	Root Element				Attribute Existence per Category						
	ImplementationDataType	ImplementationDataTypeElement	SwPointerTargetProps	SwServiceArg	VALUE	DATA_REFERENCE	FUNCTION_REFERENCE	TYPE_REFERENCE	STRUCTURE	UNION	ARRAY
swPointerTargetProps .swDataDefProps	x	x	x	x		1					
swPointerTargetProps .functionPointerSignature	x	x	x	x			1				
swRecordLayout											
swRefreshTiming	x	x	x	x	0..1				0..1	0..1	0..1
swTextProps											
swValueBlockSize											
swValueBlockSizeMult											
unit											
valueAxisDataType											

#### [constr\_1010] If **nativeDeclaration** does not exist

*Imposition time:* CP: IT\_CpgExe

[If **nativeDeclaration** does not exist in the **SwBaseType**, it is required that the **shortName** (e.g. "uint8") of the corresponding **ImplementationDataType** is equal to a name of one of the Platform or Standard Types predefined in AUTOSAR code.]

#### [constr\_1011] **category** of **SwBaseType**

*Imposition time:* CP: IT\_CpgExe

[For the attribute **SwBaseType.category** only the values **FIXED\_LENGTH** and **VOID** are supported.]

#### [constr\_1012] Value of **category** is **FIXED\_LENGTH**

*Imposition time:* CP: IT\_CpgExe

[If

- the value of the attribute **SwBaseType.category** is set to **FIXED\_LENGTH** and
- the **SwBaseType** is **not** referenced in the role **ApplicationPrimitive-DataType.swDataDefProps.swTextProps.baseType**,

then the attribute **baseTypeSize** shall be filled with content.]

## [constr\_1015] Prioritization of SwDataDefProps

Imposition time: CP: IT\_CpgExe

Attributes of SwDataDefProps	Usage For			Place of Setting										
	RTE	A2L	Other Usage	ApplicationDataType	ImplementationDataType	DataPrototype	InstantiationDataDefProps	ParameterAccess	SwServiceArg	FlatInstanceDescriptor	McDataInstance	SwSystemconst	PerInstanceMemory	ComSpec networkRepresentation
additionalNativeTypeQualifier	x		x		D	I			D		S			
annotation			x	D	A	A	A	A	D		A	D		A
baseType	x	x	x		D	I	I	I	D		S	M		D
compuMethod	x	x	x	D	AI	I	I		I	AI	S	D		D
dataConstr	x	x	x	D	C	D	D	I	D		S	D		
displayFormat		x		D	D	D	D	I	D		S	D		
displayPresentation	x	x	x	D	D	D	D				S			
implementationDataType	x		x		D	I	I	I	D					
invalidValue	x	x		D	D	I	I				S			D
stepSize		x		D	D	D	D	D		D	S			
swAddrMethod	x	x	x	D	D	D	D			D			D	
swAlignment	x		x		D	D	D							
swBitRepresentation		x	x								D			
swCalibrationAccess	x	x		D	D	D	D		D	D	S	D		
swCalprmAxisSet	x	x		D		I	I	I			S			
swCalprmAxisSet.swCalprmAxis /SwAxisGrouped.swCalprmRef		x					D	D			S			
swCalprmAxisSet.swCalprmAxis /SwAxisIndividual.swVariableRef		x					D	D			S			
swCalprmAxisSet.swCalprmAxis /SwAxisGrouped.sharedAxisType		x		D							S			
swCalprmAxisSet.swCalprmAxis /SwAxisIndividual.inputVariableType		x		D							S			
swCalprmAxisSet/SwAxisIndividual.unit		opt.		D		I	I	I	I		S			
swComparisonVariable		x						D			S			
swDataDependency		x	x			D	D				S			
swHostVariable		x	x								D			
swImplPolicy	x		x	D	D	D			D					





Attributes of SwDataDefProps	Usage For			Place of Setting										
	RTE	A2L	Other Usage	ApplicationDataType	ImplementationDataType	DataPrototype	InstantiationDataDefProps	ParameterAccess	SwServiceArg	FlatInstanceDescriptor	McDataInstance	SwSystemconst	PerInstanceMemory	ComSpec networkRepresentation
swIntendedResolution			x	D <sup>10</sup>										
swInterpolationMethod			x	D	I	D	D	D			S			
swIsVirtual		x				D	D				S			
swPointerTargetProps			x		D	I			D					
swRecordLayout	x	x	x	D		I	I	I			S			
swRefreshTiming		x		D	D	D	D		D	D	D			
swTextProps		x	x	D	I	I	I	I			S			
swValueBlockSize		x	x	D	I	I	I	I			S			
swValueBlockSizeMult		x	x	D	I	I	I	I			S			
unit		x	x	D	I	I	I		I		S	D		
valueAxisDataType		x	x	D	I	I	I	I			S			

## [constr\_1016] Restriction of invalidValue for ImplementationDataType and ImplementationDataTypeElement

Imposition time: CP: IT\_CpgExe

[invalidValue for ImplementationDataType and ImplementationDataTypeElement is restricted to be either a compatible NumericalValueSpecification, TextValueSpecification (caution, [constr\_1284] applies) or a ConstantReference that in turn points to a compatible ValueSpecification.]

<sup>10</sup>swIntendedResolution is used only in an early phase of the definition of data types, namely in the context of the definition of so-called blueprints. To that extent, swIntendedResolution represents a non-binding requirement that shall later be considered for the definition of an appropriate CompuMethod.

### [constr\_1017] Supported combinations of `swImplPolicy` and `swCalibrationAccess`

*Imposition time:* CP: IT\_CpgExe

[

<code>swImplPolicy</code>	<code>swCalibrationAccess</code>		
	<code>notAccessible</code>	<code>readOnly</code>	<code>readWrite</code>
<code>fixed</code>	yes	not supported	not supported
<code>const</code>	yes	yes	not supported
<code>standard</code>	yes	yes	yes
<code>queued</code>	yes	not supported	not supported
<code>measurementPoint</code>	not supported	yes	not supported

]

### [constr\_1018] `dataElement` with `swImplPolicy` set to `measurementPoint` shall not be referenced by a `VariableAccess` aggregated by `RunnableEntity` in the role `dataReadAccess`

*Imposition time:* CP: IT\_CpgExe

[Due to the nature of `dataElements` characterized by setting the `swImplPolicy` to `measurementPoint`, such `dataElements` shall not be referenced by a `VariableAccess` aggregated by `RunnableEntity` in the role `dataReadAccess`.]

### [constr\_1020] `ParameterDataPrototype` needs to be of compatible data type as referenced in `sharedAxisType`

*Imposition time:* CP: IT\_CpgExe

[Finally, the `ParameterDataPrototype` assigned in `swCalprmRef` shall be typed by data type compatible to `sharedAxisType`.]

### [constr\_1022] Limits shall be defined for each direction of `CompuMethod`

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[In the scope of a `CompuMethod`, if both aggregations in the role `compuInternalToPhys` and `compuPhysToInternal` exist, then for all

- `compuInternalToPhys.compuScale` and
- `compuPhysToInternal.compuScale`

the attributes `lowerLimit` and `upperLimit` shall exist.]

### [constr\_1024] Stepwise definition of `CompuMethods`

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[In a bound model, the intervals (i.e. determined by attributes `CompuScale.lowerLimit` and `CompuScale.upperLimit`) defined by `CompuScales` used in the context of a given `CompuMethod` of all values of `category` except `BITFIELD_TEXTTABLE` shall **not** overlap.



For `CompuMethods` of category `BITFIELD_TEXTTABLE`, the combination of the interval created by attributes `CompuScale.upperLimit`, `CompuScale.lowerLimit` and `CompuScale.mask` shall be unique in the context of the enclosing `CompuMethod`.]

#### [constr\_1026] Compatibility of `Units`

*Imposition time:* CP: `IT_CpgExe`, AP: `IT_BefAraApiGen`

[If a `SwDataDefProps` references a `Unit` and the `SwDataDefProps` has a reference to either of/or both

- a `CompuMethod` that in turn references a `Unit`
- a `DataConstr` that in turn references a `Unit`

then the `Units` referenced from

- `SwDataDefProps`
- `SwDataDefProps.compuMethod`
- `SwDataDefProps.dataConstr`

shall be compatible.]

#### [constr\_1029] `ConstantSpecificationMapping` and `ConstantSpecification`

*Imposition time:* CP: `IT_CpgExe`

[It is required that the `ConstantSpecification` referenced from a `ConstantSpecificationMapping` in the role `applConstant` shall fulfill the criteria defined in [TPS\_SWCT\_01871] (i.e. be defined in the *application domain*, `applConstant`) and the other `ConstantSpecification` referenced in the role `implConstant` shall fulfill the criteria defined in [TPS\_SWCT\_01872] (i.e. be defined in the *implementation domain*, `implConstant`).]

#### [constr\_1033] Communication scenarios for sender/receiver communication

*Imposition time:* CP: `IT_CompSwcT`

[For sender/receiver communication, it is not allowed to create a communication scenario where n sender are connected to m receivers where m and n are **both** greater than 1.]

#### [constr\_1035] Recursive definition of `CompositionSwComponentType`

*Imposition time:* CP: `IT_CompSwcT`, AP: `IT_BefAraApiGen`

[The recursive definition of a `CompositionSwComponentType` that eventually contains a `SwComponentPrototype` typed by the same `CompositionSwComponentType` shall not be feasible.]

### [constr\_1036] Connect kinds of **PortInterfaces**

*Imposition time:* CP: IT\_RteGen

[It shall not be possible to connect **PortPrototypes** typed by **PortInterfaces** of different kinds.

Subclasses of **DataInterface** make an exception to this rule and can be used for creating connections to each other.]

### [constr\_1037] Client shall not be connected to multiple servers

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[A client shall not be connected to multiple servers such that an operation call would be handled by more than one server.]

### [constr\_1038] Reference to **ApplicationError**

*Imposition time:* CP: IT\_CpgExe

[A **possibleError** referenced by a **ClientServerOperation** shall be owned by the **ClientServerInterface** that also owns the **ClientServerOperation**.]

### [constr\_1039] Relevance of **swImplPolicy**

*Imposition time:* CP: IT\_RteGen

[It is not possible to define a mapping between an element where the **swImplPolicy** is set to **queued** and another element where the **swImplPolicy** is set differently.]

### [constr\_1043] Allowed combinations of a specific **Type of PortInterface**, a specific **Type of PortPrototype**, and a specific **Type of ComSpec**

*Imposition time:* CP: IT\_CpgExe

[

Type of <b>PortPrototype</b>	Type of ComSpec	Role of Element	Type of <b>PortInterface</b>	Role of Type-Ref
PPortPrototype	NonqueuedSender-ComSpec	dataElement	SenderReceiverInterface	providedInterface
PPortPrototype	QueuedSenderComSpec	dataElement	SenderReceiverInterface	providedInterface
RPortPrototype	Nonqueue-dReceiverComSpec	dataElement	SenderReceiverInterface	requiredInterface
RPortPrototype	QueuedReceiverComSpec	dataElement	SenderReceiverInterface	requiredInterface
PRPortPrototype	NonqueuedSenderComSpec	dataElement	SenderReceiverInterface	providedRequiredInterface
PRPortPrototype	Nonqueue-dReceiverComSpec	dataElement	SenderReceiverInterface	providedRequiredInterface
PRPortPrototype	QueuedReceiverComSpec	dataElement	SenderReceiverInterface	providedRequiredInterface
PRPortPrototype	QueuedSenderComSpec	dataElement	SenderReceiverInterface	providedRequiredInterface
PPortPrototype	NvProvideComSpec	nvData	NvDataInterface	providedInterface

▽



Type of PortPrototype	Type of ComSpec	Role of Element	Type of PortInterface	Role of Type-Ref
RPortPrototype	NvRequireComSpec	nvData	NvDataInterface	requiredInterface
PRPortPrototype	NvProvideComSpec	nvData	NvDataInterface	providedRequiredInterface
PRPortPrototype	NvRequireComSpec	nvData	NvDataInterface	providedRequiredInterface
PPortPrototype	ModeSwitchSenderComSpec	modeGroup	ModeSwitchInterface	providedInterface
RPortPrototype	ModeSwitchReceiverComSpec	modeGroup	ModeSwitchInterface	requiredInterface
PRPortPrototype	ModeSwitchSenderComSpec	modeGroup	ModeSwitchInterface	providedRequiredInterface
PRPortPrototype	ModeSwitchReceiverComSpec	modeGroup	ModeSwitchInterface	providedRequiredInterface
PPortPrototype	ParameterProvideComSpec	parameter	ParameterInterface	providedInterface
RPortPrototype	ParameterRequireComSpec	parameter	ParameterInterface	requiredInterface
PPortPrototype	ServerComSpec	operation	ClientServerInterface	providedInterface
RPortPrototype	ClientComSpec	operation	ClientServerInterface	requiredInterface
PRPortPrototype	ServerComSpec	operation	ClientServerInterface	providedRequiredInterface
PRPortPrototype	ClientComSpec	operation	ClientServerInterface	providedRequiredInterface

#### [constr\_1044] Applicability of DataFilter

Imposition time: CP: IT\_CpgExe

[According to the origin of DataFilter, i.e. [5, ISO 17356-4], DataFilters can only be applied to values with an integer base type.]

#### [constr\_1046] Applicability of [TPS\_SWCT\_01845]

Imposition time: CP: IT\_CpgExe

[TPS\_SWCT\_01845] applies **only** if the value of the attribute isService is set to false.]

#### [constr\_1047] Compatibility of ApplicationPrimitiveDataTypes

Imposition time: CP: IT\_RteGen

[Instances of ApplicationPrimitiveDataType are compatible if and only if one of the following conditions applies:

1. All the following sub conditions apply:
  - (a) They have the same category.
  - (b) The swDataDefProps (after consideration of [constr\_1015]) attached to the M1 data types are compatible.

2. In the context of using the `ApplicationPrimitiveDataType`, a `DataPrototypeMapping` exists that refers to a `DataPrototype` typed by one of the `ApplicationPrimitiveDataTypes` in the role `firstDataPrototype` and to another `DataPrototype` typed by the other `ApplicationPrimitiveDataType` in the role `secondDataPrototype`.
3. In the context of using the `ApplicationPrimitiveDataType`, a `DataPrototypeMapping` exists that refers to a `DataPrototype` typed by the `ApplicationPrimitiveDataType` in the role `secondDataPrototype` and to another `DataPrototype` typed by an `ApplicationCompositeDataType` in the role `firstDataPrototype` and additionally for the side of the `ApplicationCompositeDataType` a corresponding `ApplicationCompositeDataTypeSubElementRef` exists in the role `firstElement` that in turn references an `ApplicationCompositeElementDataPrototype`.

]

**[constr\_1048] Compatibility of `ApplicationRecordDataTypes`***Imposition time:* CP: IT\_RteGen

[Instances of `ApplicationRecordDataTypes` are compatible if and only if one of the following conditions applies:

1. All *elements at the same record position* are of compatible `AutosarDataTypes` (either `ApplicationCompositeDataTypes` or `ApplicationPrimitiveDataTypes`).
2. For each `ApplicationRecordDataType.element`, the attribute `isOptional` shall either
  - not exist on both sides or
  - be set to the value `false` if it only exists on one side or
  - have the identical value on both sides.
3. In the context of a `DataPrototypeMapping`, for each `ApplicationRecordElement` of the required `ApplicationRecordDataType` a `SubElementMapping` exists such that a `ApplicationCompositeDataTypeSubElementRef` in the role `firstElement` or `secondElement` exists that references the required `ApplicationRecordElement` **and** a corresponding `ApplicationCompositeDataTypeSubElementRef` exists in the **other** role (i.e. `secondElement` or `firstElement`) that in turn references an `ApplicationRecordElement` of the provided `ApplicationRecordDataType`.

]

**[constr\_1049] Compatibility of [ApplicationArrayDataTypes](#)***Imposition time:* CP: IT\_RteGen

[Instances of [ApplicationArrayDataType](#) are compatible if and only if one of the following conditions applies:

1. All the following sub conditions apply:
  - (a) Their [elements](#) are of a compatible [AutosarDataTypes](#) (either [ApplicationCompositeDataTypes](#) or [ApplicationPrimitiveDataTypes](#)).
  - (b) The attributes [maxNumberOfElements](#) and [arraySizeSemantics](#) (given the existence) have identical values.
2. In the context of a [DataPrototypeMapping](#), for the [ApplicationArrayElement](#) of the required [ApplicationArrayDataType](#) a [SubElementMapping](#) exists such that a [ApplicationCompositeDataTypeSubElementRef](#) in the role [firstElement](#) or [secondElement](#) exists that references the required [ApplicationArrayElement](#) **and** a corresponding [ApplicationCompositeDataTypeSubElementRef](#) exists in the **other** role (i.e. [secondElement](#) or [firstElement](#)) that in turn references an [ApplicationArrayElement](#) of the provided [ApplicationArrayDataType](#).

]

**[constr\_1050] Extended compatibility of [ImplementationDataTypes](#)***Imposition time:* CP: IT\_RteGen

[Instances of [ImplementationDataType](#) are compatible if and only if after all type-references are resolved one of the following rules apply:

1. The two [ImplementationDataTypes](#) are compatible according to [\[constr\\_10667\]](#).
2. In the context of using the [ImplementationDataType](#), a [DataPrototypeMapping](#) exists that refers to a [DataPrototype](#) typed by one of the [ImplementationDataTypes](#) in the role [firstDataPrototype](#) and to another [DataPrototype](#) typed by the other [ImplementationDataType](#) in the role [secondDataPrototype](#).
3. In the context of using the [ImplementationDataType](#), a [DataPrototypeMapping](#) exists that refers to a [DataPrototype](#) typed by the [ImplementationDataTypes](#) in the role [secondDataPrototype](#) and to another [DataPrototype](#) typed by an [ImplementationDataType](#) with a [subElement](#) in the role [firstDataPrototype](#) and additionally for the side of the [ImplementationDataType](#) with a [subElement](#) a corresponding [ImplementationDataTypeSubElementRef](#) exists in the role [firstElement](#) that in turn references an [ImplementationDataTypeElement](#).

]

## [constr\_1051] Compatibility of `SwDataDefProps`

*Imposition time:* CP: IT\_RteGen

[`SwDataDefProps` are compatible if and only if:

1. They refer to compatible `Unit` definitions, or neither of them has an associated `Unit`.
2. They refer to compatible conversion methods or neither of them associates such a method.
3. They both aggregate a `ValueSpecification` in the role `invalidValue` or neither of them aggregates a `ValueSpecification` in the role `invalidValue`.
4. If existent (see previous condition), one of the following conditions apply to `ValueSpecifications` aggregated in the role `invalidValue` for being considered compatible (after following and resolving indirections created by `ConstantReference`):
  - (a) both are `ApplicationValueSpecifications` and the values are compatible according to [TPS\_GST\_02501].
  - (b) both are `NumericalValueSpecifications` and the values are compatible according to [TPS\_GST\_02501].
  - (c) both are `TextValueSpecifications` and the values are identical.
  - (d) both are `ArrayValueSpecifications` and the values are effectively identical, e.g. if one `ArrayValueSpecification` specifies all values explicitly and the other `ArrayValueSpecification` specifies values based on a rule then the yield of both `ArrayValueSpecifications` (i.e. element for element) shall be identical.
  - (e) both are `RecordValueSpecifications` and the values are identical.
  - (f) if one is a `NumericalValueSpecification` and the other one is an `ApplicationValueSpecification` then the check for compatibility shall apply the `CompuMethod` on the physical value such that a comparison on the implementation level becomes possible. [TPS\_GST\_02501] applies<sup>11</sup>.
5. They refer to compatible data constraints `dataConstr`.
6. They refer to compatible `swRecordLayouts`
7. They refer to compatible `swTextProps`, or neither of them references `SwTextProps` in the role `swTextProps`.

All other attributes (e.g. `swCalibrationAccess` do not affect compatibility).]

<sup>11</sup>if one is a `NumericalValueSpecification` and the other one is an `ApplicationValueSpecification` and the application of the `CompuMethod` on the side of the `ApplicationValueSpecification` does not yield a valid number, a comparison is not possible.

### [constr\_1052] Compatibility of **Units**

*Imposition time:* CP: IT\_RteGen

[Two **Unit** definitions are compatible if and only if:

1. They have compatible (see [TPS\_GST\_02501]) values of attributes **factorSiToUnit** and **offsetSiToUnit**.
2. One of the following conditions is fulfilled:
  - They refer to compatible definitions of **PhysicalDimension**.
  - Neither of them associates a **PhysicalDimension**.
  - One **Unit** refers to a **PhysicalDimension** with **shortName** **NoDimension** where all exponents are set to 0 and the other **Unit** does not refer to a **PhysicalDimension**.

]

### [constr\_1053] Compatibility of **PhysicalDimensions** in the context of the creation of a **SwConnector**

*Imposition time:* CP: IT\_RteGen

[In the context of the creation of a **SwConnector**, two **PhysicalDimension** definitions are compatible if and only if the values of

- **lengthExp**
- **massExp**
- **timeExp**
- **currentExp**
- **temperatureExp**
- **molarAmountExp**
- **luminousIntensityExp**

are identical and **either**

- the **shortNames** are identical **or**
- a **PhysicalDimensionMapping** exists that maps one of the **PhysicalDimensions** in the role **firstPhysicalDimension** and the other **PhysicalDimension** in the role **secondPhysicalDimension**.

]

#### [constr\_1054] No **DataConstr** available at the provider

*Imposition time:* CP: IT\_RteGen

[If the provider defines no constraints, it is only compatible with a receiver which also defines no constraints at all.]

#### [constr\_1055] **ImplementationDataType** has category **VALUE**

*Imposition time:* CP: IT\_CpgExe

[The attributes **baseType** shall refer to a compatible **SwBaseType**.]

#### [constr\_1056] **ImplementationDataType** has category **TYPE\_REFERENCE**

*Imposition time:* CP: IT\_CpgExe

[The **ImplementationDataTypes** referenced by the attributes **SwDataDefProps.implementationDataType** shall be compatible.]

#### [constr\_1057] **ImplementationDataType** has category **DATA\_REFERENCE**

*Imposition time:* CP: IT\_CpgExe

[The attributes **SwDataDefProps.swPointerTargetProps** shall have identical **targetCategory** and shall refer to **SwDataDefProps** where all attributes are identical.]

#### [constr\_1058] **ImplementationDataType** has category **FUNCTION\_REFERENCE**

*Imposition time:* CP: IT\_CpgExe

[The attributes **SwDataDefProps.swPointerTargetProps.functionPointerSignature** shall refer to **BswModuleEntry**s which each resolve to the **same function signature**.]

#### [constr\_1059] Compatibility of data types with category **VALUE**

*Imposition time:* CP: IT\_RteGen

[An **ApplicationDataType** of category **VALUE** shall (after all indirections created by **ImplementationDataTypes** of category **TYPE\_REFERENCE** are resolved) only be mapped/connected to an **ImplementationDataType** which also has category **VALUE**.]

#### [constr\_1060] Compatibility of data types with category **ARRAY**, **VAL\_BLK**

*Imposition time:* CP: IT\_CpgExe

[

<b>ApplicationDataType</b>	<b>ImplementationDataType: Array of uint8</b>	<b>ImplementationDataType: Array of other</b>
<b>ApplicationArrayDataType</b> of category <b>ARRAY</b> , <b>VAL_BLK</b> , <b>arraySizeSemantics = fixedSize</b>	<b>ImplementationDataType</b> of category <b>ARRAY</b> , with <b>ImplementationDataTypeElement</b> with <b>arraySizeSemantics = fixedSize</b>	<b>ImplementationDataType</b> of category <b>ARRAY</b> , with <b>ImplementationDataTypeElement</b> with <b>arraySizeSemantics = fixedSize</b>







ApplicationArrayType of category ARRAY, VAL_BLK, arraySizeSemantics = variableSize	ImplementationDataType of category ARRAY, with ImplementationDataTypeElement with arraySizeSemantics = variableSize or Variable-Size Array Data Type	Variable-Size Array Data Type
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]

### [constr\_1061] Compatibility of data types with category STRUCTURE

*Imposition time:* CP: IT\_CpgExe

[An ApplicationDataType of category STRUCTURE shall (after all indirections created by ImplementationDataTypes of category TYPE\_REFERENCE are resolved) only be mapped/connected to an ImplementationDataType of category STRUCTURE.]

### [constr\_1063] Compatibility of data types with category BOOLEAN

*Imposition time:* CP: IT\_CpgExe

[An ApplicationDataType of category BOOLEAN shall (after all indirections created by ImplementationDataTypes of category TYPE\_REFERENCE are resolved) only be mapped/connected to an ImplementationDataType of category VALUE.]

### [constr\_1064] Compatibility of data types with category COM\_AXIS, RES\_AXIS, CURVE, MAP, CUBOID, CUBE\_4, or CUBE\_5

*Imposition time:* CP: IT\_CpgExe

[An ApplicationDataType of category

- COM\_AXIS,
- RES\_AXIS,
- CURVE,
- MAP,
- CUBOID,
- CUBE\_4, or
- CUBE\_5

shall (after all indirections created by ImplementationDataTypes of category TYPE\_REFERENCE are resolved) only be mapped/connected to an ImplementationDataType of category

- STRUCTURE or
- ARRAY.

]

### [constr\_1066] Forbidden mappings to **ImplementationDataType**

*Imposition time:* CP: IT\_CpgExe

[An **ApplicationDataType** shall never be mapped to

- an **ImplementationDataType** of category
  - UNION,
  - DATA\_REFERENCE, or
  - FUNCTION\_REFERENCE,
- or to an **ImplementationDataType** that contains subElements of category
  - UNION,
  - DATA\_REFERENCE, or
  - FUNCTION\_REFERENCE.

]

### [constr\_1068] Compatibility of **VariableDataPrototypes** or **ParameterDataPrototypes** typed by primitive data types

*Imposition time:* CP: IT\_RteGen

[Two **VariableDataPrototypes** or **ParameterDataPrototypes** of **ApplicationPrimitiveDataTypes** or **ImplementationDataTypes** of category VALUE, BOOLEAN, or STRING are compatible if and only if one of the following conditions applies:

1. All the following subconditions apply:
  - (a) They are typed by (read "refer to") compatible **AutosarDataTypes**
  - (b) The two **VariableDataPrototypes** or **ParameterDataPrototypes** have identical **shortNames**. This is required to map **VariableDataPrototypes** in unordered **SenderReceiverInterfaces**, **NvDataInterfaces** and **ParameterInterfaces**.
  - (c) The attribute **swImplPolicy** is either set to **queued** for both or none of the **VariableDataPrototypes**.
2. In the context of a **DataPrototypeMapping**, one of the applicable **VariableDataPrototypes** or **ParameterDataPrototypes** is referenced by the **DataPrototypeMapping** in the role **firstDataPrototype** and the other **VariableDataPrototypes** or **ParameterDataPrototypes** is referenced by the same **DataPrototypeMapping** in the role **secondDataPrototype**.

]

### [constr\_1069] Compatibility of **PortPrototypes** of different **DataInterfaces** in the context of **AssemblySwConnectors**

*Imposition time:* CP: IT\_RteGen

[**PortPrototypes** of different **DataInterfaces** are compatible if and only if

1. One of the following conditions applies:

- (a) For each **VariableDataPrototype** or **ParameterDataPrototype** defined in the context of the **DataInterface** of the required **PortPrototype** a compatible (see [constr\_1068]) **VariableDataPrototype** or **ParameterDataPrototype** exists in the **DataInterface** of the provided **PortPrototype**.

The **shortNames** of **VariableDataPrototypes** and **ParameterDataPrototypes** are used to identify the pair.

- (b) A **VariableAndParameterInterfaceMapping.dataMapping** exists for which the following conditions apply:
  - i. It is referenced by the corresponding **SwConnector**.
  - ii. It references one of the two **VariableDataPrototypes** or **ParameterDataPrototypes** in the role **firstDataPrototype** and the other in the role **secondDataPrototype**.

2. For each such pair, the values of their **isService** attributes are identical.

]

### [constr\_1070] Compatibility of **PortPrototypes** of different **DataInterfaces** in the context of **DelegationSwConnectors**

*Imposition time:* CP: IT\_RteGen

[**PortPrototypes** of different **DataInterfaces** are compatible if and only if

1. One of the following conditions applies:

- (a) For each **VariableDataPrototype** or **ParameterDataPrototype** defined in the context of the **DataInterface** of the required inner **PortPrototype** a compatible **VariableDataPrototype** or **ParameterDataPrototype** exists in the **DataInterface** of the required outer **PortPrototype**.

The **shortName** of **VariableDataPrototypes** and **ParameterDataPrototypes** are used to identify the pair.

[constr\_1071] defines which **PortInterface** elements are compatible depending on the **PortInterface** type and the **swImplPolicy** attributes of the **PortInterface** elements.

- (b) A **VariableAndParameterInterfaceMapping.dataMapping** exists for which the following conditions apply:

- i. It is referenced by the corresponding `SwConnector`.
  - ii. It references one of the two `VariableDataPrototypes` or `ParameterDataPrototypes` in the role `firstDataPrototype` and the other in the role `secondDataPrototype`.
2. One of the following conditions applies:
  - (a) For at least one `VariableDataPrototype` or `ParameterDataPrototype` defined in the context of the `SenderReceiverInterface`, `NvDataInterface` or `ParameterInterface` of the provided inner `PortPrototype`, a compatible `VariableDataPrototype` or `ParameterDataPrototype` exists in the `SenderReceiverInterface`, `NvDataInterface` or `ParameterInterface` of the provided outer `PortPrototype`.

The `shortNames` of `VariableDataPrototypes` and `ParameterDataPrototypes` are used to identify the pair.

[[constr\\_1071](#)] defines which `PortInterface` elements are compatible depending on the `PortInterface` type and the `swImplPolicy` attributes of the `PortInterface` elements.
  - (b) A `VariableAndParameterInterfaceMapping.dataMapping` exists for which the following conditions apply:
    - i. It is (if a corresponding `SwConnector` already exists) referenced by the corresponding `SwConnector`.
    - ii. It references one of the two `VariableDataPrototypes` or `ParameterDataPrototypes` in the role `firstDataPrototype` and the other in the role `secondDataPrototype`.
3. For each such pair, the values of their `isService` attributes are identical.
4. For each such pair, either
  - (a) no meta-data are defined on both sides or
  - (b) both sides define a `SenderReceiverInterface.metaDataItemSet` and the content of the aggregated `MetaDataItemSet` is identical on both sides.

In this context, "identical" means that the respective `MetaDataItemSets` define ordered collections of `MetaDataItems` where the corresponding `MetaDataItem.metaDataItemType.value` have identical content.

]

## [constr\_1071] compatibility of **ParameterDataPrototype** and **VariableDataPrototype**

*Imposition time:* CP: IT\_RteGen

[

Provided Port Required Outer Port Provided Inner Port Required Outer Port			Required Port / Required Inner Port / Provided Outer Port / Provided Outer Port					
PortInterface			Prm			S/R		NvD
Interface Element			PDP			VDP		VDP
SwImplPolicyEnum			fixed	const	standard	standard	queued	standard
Prm	PDP	fixed	yes	yes	yes	yes	no	yes
		const	no	yes	yes	yes	no	yes
		standard	no	no	yes	yes	no	yes
S/R	VDP	standard	no	no	no	yes	no	yes
		queued	no	no	no	no	yes	no
NvD	VDP	standard	no	no	no	yes	no	yes

]

## [constr\_1072] Compatibility of **ModeSwitchInterfaces** in the context of an **AssemblySwConnector**

*Imposition time:* CP: IT\_RteGen

[PortPrototypes of different ModeSwitchInterfaces are compatible if and only if

1. One of the following conditions applies:
  - (a) For the ModeDeclarationGroupPrototype defined in the context of the ModeSwitchInterface of the required PortPrototype a compatible ModeDeclarationGroupPrototype exists in the ModeSwitchInterface of the provided PortPrototype.
  - (b) A ModeInterfaceMapping.modeMapping exists for which the following conditions apply:
    - i. It is referenced by the corresponding SwConnector.
    - ii. It references one of the two ModeDeclarationGroupPrototypes in the role firstModeGroup and the other in the role secondModeGroup.
2. For each such pair, the values of their isService attributes are identical.

]

### [constr\_1073] Compatibility of **ModeSwitchInterfaces** in the context of an **DelegationSwConnector**

*Imposition time:* CP: IT\_RteGen

[**PortPrototypes** of different **ModeSwitchInterfaces** are compatible if and only if

1. One of the following conditions applies:
  - (a) For the **ModeDeclarationGroupPrototype** defined in the context of the **ModeSwitchInterface** of the inner **PortPrototype** a compatible **ModeDeclarationGroupPrototype** exists in the **ModeSwitchInterface** of the outer **PortPrototype**.
  - (b) A **ModeInterfaceMapping.modeMapping** exists for which the following conditions apply:
    - i. It is referenced by the corresponding **SwConnector**.
    - ii. It references one of the two **ModeDeclarationGroupPrototypes** in the role **firstModeGroup** and the other in the role **secondModeGroup**.
2. For each such pair, the values of their **isService** attributes are identical.

]

### [constr\_1074] Compatibility of **ModeDeclarationGroupPrototypes**

*Imposition time:* CP: IT\_RteGen

[**ModeDeclarationGroupPrototypes** are compatible if and only if one of the following conditions applies:

1. They are typed by (read "refer to") compatible **ModeDeclarationGroups**.
2. A **ModeDeclarationGroupPrototypeMapping** exists that identifies the differently named **ModeDeclarationGroupPrototypes** that correlate with each other. [constr\_1210] applies.

]

### [constr\_1075] Compatibility of **ModeDeclarationGroups**

*Imposition time:* CP: IT\_RteGen

[**ModeDeclarationGroups** are compatible if and only if one of the following conditions applies:

1. All the following subconditions apply:
  - (a) They define an identical number of **ModeDeclarations**.
  - (b) Each **ModeDeclaration** on the required side corresponds to a **ModeDeclaration** on the provided side with an identical **shortName**.

- (c) The `initialModes` on both sides refer to `ModeDeclarations` with identical `shortNames`.
- (d) The attribute `ModeDeclarationGroup.modeUserErrorBehavior.errorReactionPolicy` has identical values on both sides.
- (e) The attribute `ModeDeclarationGroup.modeManagerErrorBehavior.errorReactionPolicy` has identical values on both sides.
- (f) The attribute `ModeDeclarationGroup.modeUserErrorBehavior.defaultMode` either does not exist on both sides or refers on both sides to `ModeDeclarations` with identical `shortNames`.
- (g) The attribute `ModeDeclarationGroup.modeManagerErrorBehavior.defaultMode` either does not exist on both sides or refers on both sides to `ModeDeclarations` with identical `shortNames`.
- (h) one of the following subconditions applies:
  - the attribute `category` has the value `ALPHABETIC_ORDER` on both sides.
  - the attribute `category` has the value `EXPLICIT_ORDER` on both sides **and** the matching `ModeDeclarations` according to 1(b) have the identical values of the attributes `ModeDeclaration.value` **and** also the value of `ModeDeclarationGroup.onTransitionValue` matches on both sides.

2. A `ModeDeclarationMapping` is applied which identifies the corresponding `ModeDeclarations`.

In addition, the compatibility of corresponding `ModeTransitions` shall be checked, i.e. [constr\_1194] and [constr\_1245] apply.]

### [constr\_1076] Compatibility of `ArgumentDataPrototypes`

*Imposition time:* CP: IT\_RteGen

[Two `ArgumentDataPrototypes` are compatible if and only if

1. They are typed by compatible `AutosarDataTypes` **or** a `ClientServerOperationMapping.argumentMapping` exists that references one `ArgumentDataPrototype` in the role `firstDataPrototype` and the other `ArgumentDataPrototype` in the role `secondDataPrototype`.
2. They have the same value of the argument `direction` (`in`, `out` or `inout`), i.e. [constr\_1268] applies.

]

### [constr\_1077] Compatibility of **ApplicationErrors**

*Imposition time:* CP: IT\_RteGen

[Two **ApplicationErrors** are compatible if and only if one of the following conditions applies:

1. All the following subconditions apply:
  - (a) They have the same **shortName**.
  - (b) They have the same attributes. Especially the **errorCode** shall be identical in both **ApplicationErrors**.
2. A **ClientServerInterfaceMapping.errorMapping** exists that references one of the **ApplicationErrors** in the role **firstApplicationError** and the other **ApplicationErrors** in the role **secondApplicationError**.

]

### [constr\_1078] Compatibility of **ClientServerOperations**

*Imposition time:* CP: IT\_RteGen

[Two **ClientServerOperations** are considered compatible if their signatures match. In particular, they are compatible if and only if

1. They have the same number of **ArgumentDataPrototypes**.
2. The n-th arguments of both **ClientServerOperations** are compatible. This implies ordering of **ArgumentDataPrototypes**.
3. They have identical values of attribute **diagArgIntegrity** or the attribute **diagArgIntegrity** does not exist on both sides.
4. They have the same **shortName** (again allows for mapping in **PortInterfaces**).
5. The required **ClientServerOperation** specifies a compatible **ApplicationError** for each **ApplicationError** that is possibly raised by the provided **ClientServerOperation**, maybe more. Thereby, **ClientServerOperations** that refer to a **possibleError** that represents the value **E\_OK** are compatible to **ClientServerOperations** that do refer to **possibleErrors** where none of them represents the value **E\_OK**.

]

### [constr\_1079] Compatibility of **ClientServerInterfaces** in the context of an **AssemblySwConnector**

*Imposition time:* CP: IT\_RteGen

[**ClientServerInterfaces** are compatible if and only if

1. One of the following conditions applies:



- (a) For each `ClientServerOperation` defined in the context of the `ClientServerInterface` of the required `PortPrototype` a compatible `ClientServerOperation` exists in the `ClientServerInterface` of the provided `PortPrototype`. The `shortNames` of `ClientServerOperations` are used to identify the pair.
  - (b) A `ClientServerInterfaceMapping.operationMapping` exists for which the following conditions apply:
    - i. It is referenced by the corresponding `SwConnector`.
    - ii. It references one of the two `ClientServerOperations` in the role `firstOperation` and the other in the role `secondOperation`.
2. For each such pair, the values of their `isService` attributes are identical.

]

**[constr\_1080] Compatibility of `ClientServerInterfaces` in the context of an `DelegationSwConnector`**

*Imposition time:* CP: IT\_RteGen

[`ClientServerInterfaces` are compatible if and only if

- 1. One of the following conditions applies:
  - (a) For each `ClientServerOperation` defined in the context of the `ClientServerInterface` of the required inner `PortPrototype` a compatible `ClientServerOperation` exists in the `ClientServerInterface` of the required outer `PortPrototype`. The `shortNames` of `ClientServerOperations` are used to identify the pair.
  - (b) A `ClientServerInterfaceMapping.operationMapping` exists for which the following conditions apply:
    - i. It is referenced by the corresponding `SwConnector`.
    - ii. It references one of the two `ClientServerOperations` in the role `firstOperation` and the other in the role `secondOperation`.
- 2. One of the following conditions applies:
  - (a) For at least one `ClientServerOperation` defined in the context of the `ClientServerInterface` of the provided inner `PortPrototype` a compatible `ClientServerOperation` exists in the `ClientServerInterface` of the provided outer `PortPrototype`. The `shortNames` of `ClientServerOperations` are used to identify the pair.
  - (b) A `ClientServerInterfaceMapping.operationMapping` exists for which the following conditions apply:
    - i. It is referenced by the corresponding `SwConnector`.

- ii. It references one of the two `ClientServerOperations` in the role `firstOperation` and the other in the role `secondOperation`.
- 3. For each such pair, the values of their `isService` attributes are identical.

]

#### [constr\_1081] Compatibility of `TriggerInterfaces` in the context of an `AssemblySwConnector`

*Imposition time:* CP: IT\_RteGen

[`TriggerInterfaces` are compatible if and only if

1. One of the following conditions applies:
  - (a) For each `Trigger` defined in the context of the `TriggerInterface` of the required `PortPrototype` a compatible `Trigger` exists in the `TriggerInterface` of the provided `PortPrototype`. The `shortNames` of `Trigger` are used to identify the pair.
  - (b) A `TriggerInterfaceMapping.triggerMapping` exists for which the following conditions apply:
    - i. It is referenced by the corresponding `SwConnector`.
    - ii. It references one of the two `Triggers` in the role `firstTrigger` and the other in the role `secondTrigger`.
2. For each such pair, the values of their `isService` attributes are identical.

]

#### [constr\_1082] Compatibility of `TriggerInterfaces` in the context of an `DelegationSwConnector`

*Imposition time:* CP: IT\_RteGen

[`TriggerInterfaces` are compatible if and only if all the following conditions apply:

1. One of the following subconditions applies:
  - (a) For each `Trigger` defined in the context of the `TriggerInterface` of the **required** inner `PortPrototype` a compatible `Trigger` exists in the `TriggerInterface` of the **required** outer `PortPrototype`. The `shortNames` of `Trigger` are used to identify the pair.
  - (b) For at least one `Trigger` defined in the context of the `TriggerInterface` of the **provided** outer `PortPrototype` a compatible `Trigger` exists in the `TriggerInterface` of the **provided** inner `PortPrototype`. The `shortNames` of `Trigger` are used to identify the pair.
  - (c) A `TriggerInterfaceMapping.triggerMapping` exists for which all the following conditions apply:
    - i. It is referenced by the corresponding `SwConnector`.

- ii. It references one of the two `Triggers` in the role `firstTrigger` and the other in the role `secondTrigger`.

2. For each such pair, the values of their `isService` attributes are identical.

]

### [constr\_1083] Compatibility of `Triggers`

*Imposition time:* CP: IT\_RteGen

[`Triggers` are compatible if one of the following conditions is fulfilled:

- They have an identical `shortName`.
- A `TriggerMapping` exists that references one of the `Triggers` in the role `firstTrigger` and the other `Trigger` in the role `secondTrigger`.

]

### [constr\_1084] delegation of a provided outer `PortPrototype`

*Imposition time:* CP: IT\_RteGen

[The delegation of a provided outer `PortPrototype` is properly defined if the following criteria are fulfilled:

1. For each `VariableDataPrototype` or `ParameterDataPrototype` present in the

- `SenderReceiverInterface`,
- `NvDataInterface`, or
- `ParameterInterface`

of the provided outer `PortPrototype`, at least one connection via

- `DelegationSwConnector` to a provided inner `PortPrototype` **or**
- `PassThroughSwConnector` to a required outer `PortPrototype`

with a compatible `VariableDataPrototype` or `ParameterDataPrototype` in the

- `SenderReceiverInterface`,
- `NvDataInterface`, or
- `ParameterInterface`

of the

- provided inner `PortPrototype` **or**
- required outer `PortPrototype`

exists.

Either the `shortNames` of `VariableDataPrototypes` or `ParameterDataPrototypes` are used to identify the pair, or a `PortInterfaceMapping` defines which differently named `PortInterface` elements correlate with each other.

2. For each `VariableDataPrototype` provided by a `PRPortPrototype` that is typed by a

- `SenderReceiverInterface` or
- `NvDataInterface`

and that is referenced in the role `outerPort` by a `DelegationSwConnector`, a corresponding `VariableDataPrototype` owned by an `innerPort` shall be provided by either

- a `PPortPrototype` or
- a `PRPortPrototype`.

Either the `shortNames` of `VariableDataPrototypes` are used to identify the pair, or a `PortInterfaceMapping` defines which differently named `PortInterface` elements correlate with each other.

3. For the `ModeDeclarationGroupPrototype` present in the `ModeSwitchInterface` of the provided outer `PortPrototype`, exactly one connection via

- `DelegationSwConnector` to a provided inner `PortPrototype` **or**
- `PassThroughSwConnector` to a required outer `PortPrototype`

with a compatible `ModeDeclarationGroupPrototype` in the `ModeSwitchInterface` of the

- provided inner `PortPrototype` **or**
- required outer `PortPrototype`

exists.

Either the `shortNames` of `ModeDeclarationGroupPrototypes` are used to identify the pair, or a `PortInterfaceMapping` defines which differently named `PortInterface` elements correlate with each other.

4. For each `ClientServerOperation` present in the `ClientServerInterface` of the provided outer `PortPrototype`, exactly one connection via

- `DelegationSwConnector` to a provided inner `PortPrototype` **or**
- `PassThroughSwConnector` to a required outer `PortPrototype`

with a compatible `ClientServerOperation` in the `ClientServerInterface` of the

- provided inner `PortPrototype` **or**

- required outer `PortPrototype`

exists.

Either the `shortNames` of `ClientServerOperations` are used to identify the pair, or a `PortInterfaceMapping` defines which differently named `PortInterface` elements correlate with each other.

5. For each `Trigger` present in the `TriggerInterface` of the provided outer `PortPrototype`, exactly one connection via

- `DelegationSwConnector` to a provided inner `PortPrototype` **or**
- `PassThroughSwConnector` to a required outer `PortPrototype`

with a compatible `Trigger` in the `TriggerInterface` of the provided

- inner `PortPrototype` **or**
- required outer `PortPrototype`

exists.

Either the `shortNames` of `Triggers` are used to identify the pair, or a `PortInterfaceMapping` defines which differently named `PortInterface` elements correlate with each other.

]

#### [constr\_1085] Compatibility in the case of a flat ECU extract

*Imposition time:* CP: IT\_EcuExt

[`PortPrototypes` of different

- `SenderReceiverInterfaces`,
- `NvDataInterfaces`, and
- `ParameterInterfaces`

are compatible if and only if for at least one

- `VariableDataPrototype` **or**
- `ParameterDataPrototype`

defined in the context of the

- `SenderReceiverInterfaces`,
- `NvDataInterfaces`, and
- `ParameterInterfaces`

of the `RPortPrototype`, a compatible

- `VariableDataPrototype` **or**

- `ParameterDataPrototype`

exists in the

- `SenderReceiverInterfaces`,
- `NvDataInterfaces`, and
- `ParameterInterfaces`

of the provided `PortPrototype`.

The compatibility of `PortInterface` elements depends on the kind of `PortInterface` and the `swImplPolicy` attributes of the `PortInterface` elements.

Either the `shortNames` of `VariableDataPrototypes` and `ParameterDataPrototypes` are used to identify the pair, or a `PortInterfaceMapping` defines which differently named `PortInterface` elements correlate with each other.]

#### [constr\_1086] **SwConnector** between two specific **PortPrototypes**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Each pair of `PortPrototypes` can only be connected by one and only one `SwConnector`.]

#### [constr\_1087] **AssemblySwConnector** inside **CompositionSwComponentType**

*Imposition time:* CP: IT\_CompSwcT

[An `AssemblySwConnector` owned by a specific `CompositionSwComponentType` shall only connect `PortPrototypes` of `SwComponentPrototypes` that are owned by the same `CompositionSwComponentType`.]

#### [constr\_1088] **DelegationSwConnector** inside **CompositionSwComponentType**

*Imposition time:* CP: IT\_CompSwcT

[A `DelegationSwConnector` owned by a specific `CompositionSwComponentType` shall only connect a `PortPrototype` of a `SwComponentPrototype` that is owned by the same `CompositionSwComponentType` that also owns the connected delegation `PortPrototype`.]

#### [constr\_1091] **RTEEvents** that may reference a **WaitPoint**

*Imposition time:* CP: IT\_CpgExe

[A `WaitPoint` shall only be referenced from the listed `RTEEvents`:

- `DataReceivedEvent`
- `DataSendCompletedEvent`
- `ModeSwitchedAckEvent`
- `AsynchronousServerCallReturnsEvent`

]

**[constr\_1092] Restrictions for the `ParameterSwComponentType`***Imposition time:* CP: IT\_CpgExe[The following restrictions exist for a `ParameterSwComponentType`:

- it shall never aggregate a `SwcInternalBehavior` and
- the only aggregated `PortPrototypes` shall be `PPortPrototypes` of type `ParameterInterface`.

]

**[constr\_1093] Definition of textual strings***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[An `ApplicationPrimitiveDataType` of category `STRING` shall have a `swTextProps` which determines the `arraySizeSemantics` and `swMaxTextSize`.]**[constr\_1095] Values of `nDataSets` vs. `reliability`***Imposition time:* CP: IT\_RteGen[If the value of `nDataSets` is greater than 0, the value of `reliability` shall not be set to `errorCorrection`.]**[constr\_1096] `SwcModeSwitchEvent` and `WaitPoint`***Imposition time:* CP: IT\_CpgExe[A `RunnableEntity` that has a `WaitPoint` shall not be referenced by a `SwcModeSwitchEvent`.]**[constr\_1097] `RunnableEntity` that has a `WaitPoint`***Imposition time:* CP: IT\_RteGen[A `RunnableEntity` that has a `WaitPoint` shall not be referenced by an `RTEEvent` that has a reference in the role `disabledMode`.]**[constr\_1098] Mode switch and mode disabling***Imposition time:* CP: IT\_RteGen[A `SwcModeSwitchEvent` shall not simultaneously reference to the same `ModeDeclaration` in both the roles `mode` and `disabledMode`.]**[constr\_1100] Unconnected `RPortPrototype` typed by a `DataInterface`***Imposition time:* CP: IT\_RteGen[For any element in an unconnected `RPortPrototype` typed by a `DataInterface`, there shall be a `requiredComSpec` that defines an `initValue`.]

**[constr\_1101] Mode-related communication***Imposition time:* CP: IT\_RteGen

[An `RPortPrototype` typed by `ModeSwitchInterface` shall not be referenced by more than one `SwConnector`.]

**[constr\_1102] `ApplicationError` in the scope of one `SwComponentType`***Imposition time:* CP: IT\_CpgExe

[If a `SwComponentType` has `PortPrototypes` typed by different `ClientServerInterfaces` with equal `shortName` and `ApplicationErrors` defined then the following condition applies: `ApplicationErrors` with the same `shortName` shall have identical values of `errorCodes`.]

**[constr\_1103] `NonqueuedReceiverComSpec` and `enableUpdate`***Imposition time:* CP: IT\_CpgExe

[A `NonqueuedReceiverComSpec` that has the value of attribute `enableUpdate` set to `true` may not reference a `dataElement` that in turn is referenced by a `VariableAccess` in the role `dataReadAccess`.]

**[constr\_1104] Trigger communication shall not implement an n:1 pattern***Imposition time:* CP: IT\_RteGen

[An `RPortPrototype` typed by a `TriggerInterface` shall not be connected to `PortPrototypes` typed by `TriggerInterfaces` such that a given `Trigger` in the `TriggerInterface` of the `RPortPrototype` is connected to more than one compatible (see [constr\_1081], [constr\_1082], and [constr\_1251]) `Trigger` in the `TriggerInterfaces` of the connected `PortPrototypes`.]

**[constr\_1105] Value of `arraySize`***Imposition time:* CP: IT\_CpgExe

[The value of the attribute `arraySize` of an `ImplementationDataTypeElement` owned by an `ImplementationDataType` or `ImplementationDataTypeElement` of category `ARRAY` shall be greater than 0 unless attribute `ImplementationDataTypeElement.arraySizeHandling` exists and is set to the value `inheritedFromArrayElementTypeSize`.]

**[constr\_1106] Structure shall have at least one element***Imposition time:* CP: IT\_CpgExe

[An `ImplementationDataType` or `ImplementationDataTypeElement` of category `STRUCTURE` shall own at least one `ImplementationDataTypeElement`.]

**[constr\_1107] Union shall have at least one element***Imposition time:* CP: IT\_CpgExe

[An `ImplementationDataType` or `ImplementationDataTypeElement` of category `UNION` shall own at least one `ImplementationDataTypeElement`.]



#### [constr\_1108] Existence and value of attribute **ApplicationError.errorCode**

*Imposition time:* CP: IT\_CpgExe

[Attribute **ApplicationError.errorCode** shall exist and its value shall not exceed the closed interval 1..63.

The following exception applies: **only** if attribute **possibleError** is supposed to represent the error code **E\_OK**, the value 0 shall be allowed.]

#### [constr\_1109] Mapping of **SwComponentPrototypes** typed by a **SensorActuatorSwComponentType**

*Imposition time:* CP: IT\_RteGen

[A **SwComponentPrototype** typed by a **SensorActuatorSwComponentType** needs to be mapped and run on exactly that ECU that contains the **HwElement** corresponding to the **HwType** that its **SensorActuatorSwComponentType** refers to in case it accesses the hardware via the I/O hardware abstraction layer.]

#### [constr\_1126] Compatibility of **DataConstrs**

*Imposition time:* CP: IT\_RteGen

[The **DataConstr** (e.g. the limits) defined by the type of the providing data element shall be within the constraints defined by the type of the requiring data element.

For client-server communication, the following rules apply:

- For **arguments** with attribute **direction** set to the value **in**, the client shall take the role of the *provider* and the server shall take the role of the *requiring side*.
- For **arguments** with attribute **direction** set to the value **inout** the **DataConstr** shall be equal on both sides.
- For **arguments** with attribute **direction** set to the value **out**, the server shall take the role of the *provider* and the client shall take the role of the *requiring side*.

]

#### [constr\_1128] Queue length of **ClientServerOperations** associated with the same **RunnableEntity**

*Imposition time:* CP: IT\_CpgExe

[If two or more **OperationInvokedEvents** reference a single **RunnableEntity** the value of the **ServerComSpec** attribute **queueLength** shall be **identical** for all **ServerComSpecs** owned by **PPortPrototypes** of the enclosing **SwComponentType** that reference one of the **ClientServerOperations** that are also referenced by the **OperationInvokedEvents**.]

**[constr\_1129] `swImplPolicy` and `NonqueuedReceiverComSpec`***Imposition time:* CP: IT\_CpgExe

[The attribute `swImplPolicy` of a `dataElement` referenced by a `NonqueuedReceiverComSpec` **shall not** be set to the value `queued`.]

**[constr\_1130] `swImplPolicy` and `QueuedReceiverComSpec`***Imposition time:* CP: IT\_CpgExe

[The attribute `swImplPolicy` of a `dataElement` referenced by a `QueuedReceiverComSpec` **shall** be set to the value `queued`.]

**[constr\_1131] `swImplPolicy` and `NonqueuedSenderComSpec`***Imposition time:* CP: IT\_CpgExe

[The attribute `swImplPolicy` of a `dataElement` referenced by a `NonqueuedSenderComSpec` **shall not** be set to the value `queued`.]

**[constr\_1132] `swImplPolicy` and `QueuedSenderComSpec`***Imposition time:* CP: IT\_CpgExe

[The attribute `swImplPolicy` of a `dataElement` referenced by a `QueuedSenderComSpec` **shall** be set to the value `queued`.]

**[constr\_1134] Allowed structure of `TEXTTABLE`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The existence of `physConstrs` is not allowed and `compuInternalToPhys` shall exist with `compuScales` consisting of `upperLimit` and `lowerLimit`.]

**[constr\_1135] Limit of `vt` in `BITFIELD_TEXTTABLE`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The separator for splitting the string representing the value is "|" and is therefore forbidden to appear in `vt`.]

**[constr\_1137] Applicability of `ParameterInterface`***Imposition time:* CP: IT\_CpgExe

[A `PPortPrototype` typed by a `ParameterInterface` can **only** be owned by a `ParameterSwComponentType` or a `CompositionSwComponentType`.]

**[constr\_1138] `SwcServiceDependency.assignedPort` and `DiagEventDebounceMonitorInternal`***Imposition time:* CP: IT\_RteGen

[If a `SwcServiceDependency` aggregates `DiagnosticEventNeeds` in the role `serviceNeeds`, then an `assignedPort` with attribute `role` set to the value `Call-backGetFaultDetectCounter` shall only exist if the monitor implements internal debouncing, i.e. concrete subclass `DiagEventDebounceMonitorInternal` is aggregated in the role `DiagnosticEventNeeds.diagEventDebounceAlgorithm`.]

**[constr\_1140] Combination of `invalidValue` with the attribute `handleInvalid`**

*Imposition time:* CP: IT\_CpgExe

[The combination of setting the attribute `handleInvalid` of the meta-class `InvalidationPolicy` owned by `SenderReceiverInterface` to value `replace` **and** of setting the value of the attribute `initValue` owned by a corresponding `NonqueuedReceiverComSpec` effectively to the value of the `invalidValue` (owned by a corresponding `SwDataDefProps`) is not supported.]

**[constr\_1141] Applicability of the `scope` attribute**

*Imposition time:* CP: IT\_CpgExe

[The attribute `scope` of meta-class `VariableAccess` shall **only** be applied with respect to the aggregation of `VariableAccess` in the following roles:

- `dataReadAccess`
- `dataWriteAccess`
- `dataSendPoint`
- `dataReceivePointByValue`
- `dataReceivePointByArgument`

]

**[constr\_1142] `category` of `CompuMethod` shall not be extended**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[In contrast to the general rule that `category` can be extended by user-specific values it is **not allowed** to extend the meaning of the attribute `category` of meta-class `CompuMethod`.]

**[constr\_1144] `SensorActuatorSwComponentType`, `EcuAbstractionSwComponentType`, and `ComplexDeviceDriverSwComponentType` may only reference a `HwType`**

*Imposition time:* CP: IT\_CpgExe

[The attribute `sensorActuator` of `SensorActuatorSwComponentType`, the attribute `hardwareElement` of `EcuAbstractionSwComponentType`, and the attribute `hardwareElement` of `ComplexDeviceDriverSwComponentType` may **only** reference a `HwType`. References to other subclasses of `HwDescriptionEntity` are not allowed.]

**[constr\_1146] Applicability of a `symbol` for a `CompuScale` in C code**

*Imposition time:* CP: IT\_CpgExe

[The `symbol` attribute shall only be provided for `CompuScales` where the `category` of the enclosing `CompuMethod` is one of the following:

- `TEXTTABLE`

- SCALE\_LINEAR\_AND\_TEXTTABLE
- SCALE\_RATIONAL\_AND\_TEXTTABLE
- BITFIELD\_TEXTTABLE

]

**[constr\_1147] Standardized values for the attribute `category` of meta-class `PortGroup`**

*Imposition time:* CP: IT\_CompSwcT

[The following values of the attribute `category` of meta-class `PortGroup` are reserved by the AUTOSAR standard:

- `MODE_MANAGEMENT`: This represents the usage of the `PortGroup` for the purpose of mode management
- `PARTIAL_NETWORKING`: This represents the usage of the `PortGroup` for the purpose of partial networking

.]

**[constr\_1148] `PortInterfaces` of `PortPrototypes` used to connect to `NvBlockSwComponentTypes`**

*Imposition time:* CP: IT\_RteGen

[`PortInterfaces` of `PortPrototypes` used to connect to `NvBlockSwComponentTypes` as well as the `PortInterfaces` used in the context of `NvBlockSwComponentTypes` shall **always** set the value of the attribute `isService` to `false`.]

**[constr\_1149] `PortPrototypes` used for NV data management**

*Imposition time:* CP: IT\_RteGen

[A `PortPrototype` typed by a `ClientServerInterface` used for NV data management, i.e. the interaction of `ApplicationSwComponentTypes` with `NvBlockSwComponentTypes`, shall be typed by `ClientServerInterfaces` that are compatible to the particular `ClientServerInterfaces` derived from [6, AUTOSAR MODE General Blueprints]. [constr\_1148] applies.

This rule shall be imposed.]

**[constr\_1150] Usage of `valueType` for `PortDefinedArgumentValue`**

*Imposition time:* CP: IT\_RteGen

[The `valueType` (typically this boils down to integer values used to specify an "id") associated with `PortDefinedArgumentValue` shall be of `category` `VALUE` or `TYPE_REFERENCE`. The latter case is only supported if the value of `category` of the target data type is set to `VALUE`.]

**[constr\_1151] Applicability of [PortInterfaceMapping](#)**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[A [PortInterfaceMapping](#) is only applicable and valid for a [SwConnector](#) if the two [PortPrototypes](#) which are referenced by the [SwConnector](#) are typed by the same two [PortInterfaces](#) which are mapped by the [PortInterfaceMapping](#).]

**[constr\_1152] category of [ApplicationArrayElement](#) and [AutosarDataType](#) referenced in the role [type](#) shall be kept in sync**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The value of [category](#) of an [ApplicationArrayElement](#) shall always be identical to the value of [category](#) of the [AutosarDataType](#) referenced by the [ApplicationArrayElement](#).]

**[constr\_1153] Applicability of compatibility requirements for [CompuScales](#)**

*Imposition time:* CP: IT\_RteGen

[Compatibility requirements for [CompuScales](#) shall only apply for [CompuScales](#) where the [category](#) of the enclosing [CompuMethod](#) is one of the following:

- TEXTTABLE
- SCALE\_LINEAR\_AND\_TEXTTABLE
- SCALE\_RATIONAL\_AND\_TEXTTABLE
- TAB\_NOINTP
- BITFIELD\_TEXTTABLE
- LINEAR
- RAT\_FUNC
- IDENTICAL

]

**[constr\_1154] Compatibility of [CompuScales](#) for sender-receiver communication and similar use cases**

*Imposition time:* CP: IT\_RteGen

[For sender-receiver communication and similar use cases, it is required that the set of [CompuScales](#) defined in the [CompuMethod](#) of the provider of the communication (i.e. on the side of the [PPortPrototype](#)) shall be a subset of the set of [CompuScales](#) defined in the [CompuMethod](#) on the required side (i.e. on the side of the [RPortPrototype](#)).]

**[constr\_1155] Compatibility of [CompuScales](#) for client-server communication**

*Imposition time:* CP: IT\_RteGen

[For client-server communication, the following rules apply:

For **arguments** of direction **IN** the **CompuScales** defined in the **CompuMethod** of the client (i.e. on the side of the **RPortPrototype**) shall be a subset of the set of **CompuScales** defined in the **CompuMethod** supported at the server (i.e. on the side of the **PPortPrototype**).

For **arguments** of the direction **OUT** the set of **CompuScales** defined in the **CompuMethod** of the server (i.e. on the side of the **PPortPrototype**) shall be a subset of the set of **CompuScales** defined in the **CompuMethod** supported at the client (i.e. on the side of the **RPortPrototype**).

For **arguments** of direction **INOUT** the set of **CompuScales** defined in the **CompuMethod** of server and client shall be identical.]

#### [constr\_1156] Relevance of "names" of **CompuScales**

*Imposition time:* CP: IT\_RteGen

[**CompuScales** which contribute to tabular conversion by having a **compuConst** are compatible **if and only if** the "names" of the **compuScales**, (namely **shortLabel**, **vt** and **symbol**, according to the priority rules communicated in [TPS\_SWCT\_01431]) are equal.

If the scale has no **compuConst**, "names" of **CompuScales** are not relevant for compatibility.]

#### [constr\_1158] Applicable **categorys** for attribute **ImplementationDataType.swDataDefProps.compuMethod**

*Imposition time:* CP: IT\_CpgExe

[

	IDENTICAL	LINEAR	SCALE_LINEAR	SCALE_LINEAR_AND_TEXTTABLE	RAT_FUNC	SCALE_RATIONAL_AND_TEXTTABLE	TEXTTABLE	TAB_NOINTP	BITFIELD_TEXTTABLE
VALUE							x		x
TYPE_REFERENCE							x		x

]

**[constr\_1159] Consistency of `VariableAndParameterInterfaceMapping` with respect to the referenced `DataInterfaces`***Imposition time:* CP: IT\_RteGen

[Within one `VariableAndParameterInterfaceMapping` all `firstDataPrototypes` shall belong to one and only one `DataInterface` and all `secondDataPrototypes` shall belong to one other and only one other `DataInterface`.]

**[constr\_1161] Applicability of the attribute `Ref.index`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The usage of attribute `Ref.index` is limited to references to the following meta-classes:

- `ApplicationArrayElement`
- Sub-classes of `AbstractImplementationDataTypeElement`.

]

**[constr\_1163] Compatibility of `CompuMethods`***Imposition time:* CP: IT\_RteGen

[Two `CompuMethod` definitions are compatible if and only if all attributes **except**

- `shortName`
- `desc`
- `introduction`
- `longName`
- `adminData`
- `annotation`
- `displayFormat`

are **identical and** the `compuScales` and `units` are compatible.]

**[constr\_1164] Number of `arguments` owned by a `RunnableEntity`***Imposition time:* CP: IT\_CpgExe

[If a given `RunnableEntity` owns `RunnableEntityArguments` in the role `argument`, then the number of these `RunnableEntityArguments` shall be identical to the number of applicable `portArgValues` of the `PortAPIOption` that references the `PortPrototype` that in turn is referenced by the `OperationInvokedEvent` that references the `RunnableEntity` **plus** the number of `ArgumentDataPrototypes` aggregated in the role `argument` by the `ClientServerOperation` referenced by said `OperationInvokedEvent`.]

**[constr\_1165] Applicability of `RunnableEntityArgument`***Imposition time:* CP: IT\_CpgExe

[The existence of a `RunnableEntityArgument` is limited to `RunnableEntity`s triggered by a `ClientServerOperation`.]

**[constr\_1166] Restrictions of `ModeRequestTypeMap`***Imposition time:* CP: IT\_CpgExe

[For every `ModeDeclarationGroup` referenced by a `ModeDeclarationGroup-Prototype` used in a `PortPrototype` typed by a `ModeSwitchInterface` a `ModeRequestTypeMap` shall exist that points to the `ModeDeclarationGroup` and also to an eligible `ImplementationDataType`.

The `ModeRequestTypeMap` shall be aggregated by a `DataTypeMappingSet` which is referenced from the `SwcInternalBehavior` that is owned by the `Application-SwComponentType` that also owns the `PortPrototype`.]

**[constr\_1167] `ImplementationDataTypes` used as `ModeRequestTypeMap.implementationDataType`***Imposition time:* CP: IT\_CpgExe

[The `ImplementationDataType` referenced by a `ModeRequestTypeMap` shall either be

- of category `VALUE` or
- of category `TYPE_REFERENCE` that in turn references an `ImplementationDataType` of category `VALUE`.

The `baseType` referenced by the `ImplementationDataType` shall have set the value of the attribute `BaseTypeDirectDefinition.baseTypeEncoding` to `NONE`.]

**[constr\_1168] Compatibility of `ImplementationDataTypes` used in the `ModeRequestTypeMap`***Imposition time:* CP: IT\_RteGen

[Both `ImplementationDataTypes` shall fulfill [constr\_1167].

In addition to that, the possible numbers used for representing `ModeDeclarations` on the side of the mode manager shall match the supported range of the `ImplementationDataType` used for representing `ModeDeclarations` on the side of the mode user (see [constr\_1075]).]

**[constr\_1169] Allowed values for `Trigger.swImplPolicy`***Imposition time:* CP: IT\_CpgExe

[The **only** allowed values for the attribute `Trigger.swImplPolicy` are either `STANDARD` (in which case the `Trigger` processing does not use a queue) or `QUEUED` (in which case the processing of `Triggers` positively uses a queue).]



**[constr\_1172] Allowed values of `SwCalibrationAccessEnum` for `ModeDeclarationGroupPrototype`***Imposition time:* CP: IT\_CpgExe

[The only allowed values of `swCalibrationAccess` aggregated by `ModeDeclarationGroupPrototype` are

- `notAccessible` and
- `readOnly`.

]

**[constr\_1173] Applicability of `AutosarParameterRef` referencing a `VariableDataPrototype`***Imposition time:* CP: IT\_CpgExe

[A reference from `AutosarParameterRef` to `VariableDataPrototype` is **only** applicable if the `AutosarParameterRef` is used in the context of `SwAxisGrouped`.]

**[constr\_1174] `PortInterfaces` used in the context of `CompositionSwComponentTypes` cannot refer to AUTOSAR services***Imposition time:* CP: IT\_CompSwcT

[`CompositionSwComponentTypes` shall not own `PortPrototypes` typed by `PortInterfaces` where the attribute `isService` is set to `true`.]

**[constr\_1175] Depending on its `category`, `CompuMethod` shall refer to a `unit`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[As a `CompuMethod` specifies the conversion between the physical world and the numerical values, it shall refer to a `unit` unless the `CompuMethod`'s `category` is one of `TEXTTABLE`, `BITFIELD_TEXTTABLE`, or `IDENTICAL`.]

**[constr\_1176] Compatibility of `CompuScales` of `category` `LINEAR` and `RAT_FUNC`***Imposition time:* CP: IT\_RteGen

[`CompuScales` of `category` `LINEAR` and `RAT_FUNC` are considered compatible if they yield the same conversion.]

**[constr\_1177] Allowed `targetCategory` for `SwPointerTargetProps`***Imposition time:* CP: IT\_CpgExe

[If the value of attribute `targetCategory` exists, then it shall be set to one of the following values:

- `TYPE_REFERENCE`
- `FUNCTION_REFERENCE`

- **VALUE** (only applicable if the `SwPointerTargetProps.swDataDefProps` refers to a `SwBaseType` where attribute `nativeDeclaration` is set to the value "void")

]

**[constr\_1178] Existence of attributes of `SwDataDefProps` in the context of `ImplementationDataType`**

*Imposition time:* CP: IT\_CpgExe

[For the sake of removing possible sources of ambiguity, `SwDataDefProps` used in the context of `ImplementationDataType` can **only have one of**

- `baseType`
- `swPointerTargetProps`
- `implementationDataType`

]

**[constr\_1181] Numerical values used in `ModeDeclaration.value` and `ModeDeclarationGroup.onTransitionValue`**

*Imposition time:* CP: IT\_CpgExe

[The numerical values used to define the `value` attributes and the `onTransitionValue` attribute of a `ModeDeclarationGroup` shall not overlap.]

**[constr\_1182] Allowed values for `InternalTriggeringPoint.swImplPolicy`**

*Imposition time:* CP: IT\_RteGen

[The **only** allowed values for the attribute `swImplPolicy` of meta-class `InternalTriggeringPoint` are either STANDARD (in which case the processing of the internal triggering does not use a queue) or QUEUED (in which case the processing of internal triggering positively uses a queue).]

**[constr\_1184] Consistency of `rootDataPrototype` and `base` in the context of `ApplicationCompositeElementInPortInterfaceInstanceRef`**

*Imposition time:* CP: IT\_RteGen

[The `rootDataPrototype` referenced by `ApplicationCompositeElementInPortInterfaceInstanceRef` shall be owned by the applicable subclass of `DataInterface` referenced in the role `base`.

This implies that the `rootDataPrototype` shall be a `ParameterDataPrototype` if the `base` is a `ParameterInterface`. Otherwise, the `rootDataPrototype` shall be a `VariableDataPrototype`.]

### [constr\_1185] Consistency of data types in the context of **ApplicationCompositeElementInPortInterfaceInstanceRef**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[The definition of attributes `contextDataPrototype` and `targetDataPrototype` shall (via the type-prototype pattern) be enclosed in the context of the definition of the data type used to type `rootDataPrototype`.]

### [constr\_1186] Consistency of data types in the context of **ArVariableInImplementationDataInstanceRef**

*Imposition time:* CP: IT\_RteGen

[The definition of attributes `contextDataPrototype` and `targetDataPrototype` shall be enclosed in the context of the definition of the data type used to type `rootVariableDataPrototype`.]

### [constr\_1187] Compatibility of **VariableDataPrototypes** or **ParameterDataPrototypes** typed by composite data types

*Imposition time:* CP: IT\_RteGen

[DataPrototypes of `ApplicationCompositeDataTypes` or `ImplementationDataTypes` of category `STRUCTURE` or `ARRAY` are compatible if one of the following conditions evaluates to true:

1. The underlying `ApplicationCompositeDataTypes` or `ImplementationDataTypes` of category `STRUCTURE` or `ARRAY` are identical
2. The underlying `ApplicationCompositeDataTypes` or `ImplementationDataTypes` of category `STRUCTURE` or `ARRAY` fulfill the following condition:
  - They consist of the same number of elements **and**
  - They are composed of compatible `AutosarDataTypes` (either `ApplicationCompositeDataTypes` or `ImplementationDataTypes` of category `STRUCTURE` or `ARRAY` **OR** `ApplicationPrimitiveDataTypes` or `ImplementationDataTypes` of category `VALUE`, `BOOLEAN`, or `STRING`) **in the same order and**
  - All attributes match exactly, except for the `shortName` of the M1 `AutosarDataType`.
3. In the context of a `DataPrototypeMapping`, for each `ApplicationCompositeElementDataPrototype` of the required `DataPrototype` a `SubElementMapping` exists such that a `ApplicationCompositeDataTypeSubElementRef` in the role `firstElement` or `secondElement` exists that references the required `ApplicationCompositeElementDataPrototype` **and** a corresponding `ApplicationCompositeDataTypeSubElementRef` exists in the **other** role (i.e. `secondElement` or `firstElement`) that in turn references an `ApplicationCompositeElementDataPrototype` of the provided `ApplicationCompositeDataType`.

4. If and only if the `DataPrototype` is **not** typed by an `ApplicationDataType` but by an `ImplementationDataType`: in the context of a `DataPrototypeMapping`, for each `ImplementationDataTypeElement` of the required `DataPrototype` a `SubElementMapping` exists such that a `ImplementationDataTypeSubElementRef` in the role `firstElement` or `secondElement` exists that references the required `ImplementationDataTypeElement` **and** a corresponding `ImplementationDataTypeSubElementRef` exists in the **other** role (i.e. `secondElement` or `firstElement`) that in turn references an `ImplementationDataTypeElement` of the provided `ImplementationDataType`.

]

#### [constr\_1188] Existence of `ReceiverComSpec.replaceWith`

*Imposition time:* CP: IT\_CpgExe

[The aggregation of `VariableAccess` in the role `ReceiverComSpec.replaceWith` shall exist **if and only if at least one of the following conditions is fulfilled**:

- Attribute `ReceiverComSpec.handleOutOfRange` is set to the value `externalReplacement`.
- Attribute `SenderReceiverInterface.invalidationPolicy.handleInvalid` is set to the value `externalReplacement`.

]

#### [constr\_1190] Only one mapping for composite to primitive use case

*Imposition time:* CP: IT\_RteGen

[In the case described by [TPS\_SWCT\_01195] only one `subElementMapping` shall exist at the enclosing `DataPrototypeMapping`.]

#### [constr\_1191] Value of `Limit` shall yield a numerical value

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[After all variability is bound, the content obtained from a limit shall yield a numerical value.]

#### [constr\_1192] Compatibility of "IDENTICAL" to "RAT\_FUNC" or "LINEAR"

*Imposition time:* CP: IT\_RteGen

[Similar to [constr\_1176], a `CompuScale` where the `category` of the enclosing `CompuMethod` is set to `IDENTICAL` is considered compatible to a `CompuScale` where the `category` of the enclosing `CompuMethod` is set to `RAT_FUNC` or `LINEAR` if the following rule applies:

$$int = \frac{N_0 + N_1 * phys + N_i * phys^i}{D_0 + D_1 * phys + D_i * phys^i} = phys$$

**[constr\_1193] ModeDeclaration shall be referenced by at least one ModeTransition in the role enteredMode**

*Imposition time:* CP: IT\_RteGen

[For each ModeDeclaration at least one ModeTransition shall reference the ModeDeclaration in the role enteredMode.

This constraint shall apply **only** if there is at least one ModeTransition defined in the context of the enclosing ModeDeclarationGroup and it shall **not** apply to the initialMode.]

**[constr\_1194] Identical ModeTransitions**

*Imposition time:* CP: IT\_RteGen

[Two ModeDeclarationGroups contain identical modeTransitions if and only if

1. For each ModeTransition defined in the context of the mode provider one ModeTransition with the same shortName is defined in the context of the mode user.
2. Each pair of ModeTransitions in both ModeDeclarationGroups identified by their respective shortName have identical targets (in terms of the shortName of the referenced ModeDeclaration) of the references enteredMode and exitedMode.

]

**[constr\_1195] SwcModeSwitchEvent and the definition of ModeTransition**

*Imposition time:* CP: IT\_RteGen

[For each pair of ModeDeclarations referenced by a SwcModeSwitchEvent with attribute activation set to onTransition a ModeTransition shall be defined in the corresponding direction (i.e. from exitedMode to enteredMode). This constraint shall only apply if the respective ModeDeclarationGroup defines at least one modeTransition.]

**[constr\_1196] Existence of networkRepresentation vs. compositeNetworkRepresentation**

*Imposition time:* CP: IT\_CpgExe

[If a ReceiverComSpec or SenderComSpec aggregates networkRepresentation it shall **not** aggregate compositeNetworkRepresentation (and vice versa).]

**[constr\_1197] Existence of compositeNetworkRepresentation shall be comprehensive**

*Imposition time:* CP: IT\_CpgExe

[If at least one compositeNetworkRepresentation exists then for each leaf ApplicationCompositeElementDataPrototype of the affected Application-

`CompositeDataType` exactly one `compositeNetworkRepresentation` shall be defined.

For each such `compositeNetworkRepresentation`, attributes `leafElement` and `networkRepresentation` shall exist.]

**[constr\_1200] Queued communication is not applicable for `dataElements` owned by `PRPortPrototype`**

*Imposition time:* CP: IT\_CpgExe

[The `swImplPolicy` shall not be set to `queued` for any `dataElement` owned by a `PRPortPrototype`.]

**[constr\_1202] Supported connections by `AssemblySwConnector` between `PortPrototypes` typed by a `SenderReceiverInterface` or `NvDataInterface`**

*Imposition time:* CP: IT\_CompSwcT

[

	<code>RPortPrototype</code>	<code>PPortPrototype</code>	<code>PRPortPrototype</code>
<code>RPortPrototype</code>	No	Yes	Yes
<code>PPortPrototype</code>	Yes	No	Yes
<code>PRPortPrototype</code>	Yes	Yes	Yes

]

**[constr\_1203] Supported connections by `DelegationSwConnector` between `PortPrototypes` typed by a `SenderReceiverInterface` or `NvDataInterface`**

*Imposition time:* CP: IT\_CompSwcT

[

<code>innerPort</code>	<code>outerPort</code>		
	<code>RPortPrototype</code>	<code>PPortPrototype</code>	<code>PRPortPrototype</code>
<code>RPortPrototype</code>	Yes	No	Yes
<code>PPortPrototype</code>	No	Yes	Yes
<code>PRPortPrototype</code>	Yes	Yes	Yes

]

**[constr\_1204] Supported connections by `AssemblySwConnector` between `PortPrototypes` typed by a `ClientServerInterface`, `ModeSwitchInterface`, or `TriggerInterface`**

*Imposition time:* CP: IT\_CompSwcT

[

	<code>RPortPrototype</code>	<code>PPortPrototype</code>	<code>PRPortPrototype</code>
<code>RPortPrototype</code>	No	Yes	Yes
<code>PPortPrototype</code>	Yes	No	No



△

PRPortPrototype	Yes	No	No
-----------------	-----	----	----

]

**[constr\_1205] Supported connections by [DelegationSwConnector](#) between [PortPrototypes](#) typed by a [ClientServerInterface](#), [ModeSwitchInterface](#), or [TriggerInterface](#)**

*Imposition time:* CP: IT\_CompSwcT

[

innerPort	outerPort		
	RPortPrototype	PPortPrototype	PRPortPrototype
RPortPrototype	Yes	No	No
PPortPrototype	No	Yes	No
PRPortPrototype	No	Yes	No

]

**[constr\_1209] Mapping of [ModeDeclarations](#) of mode user to [ModeDeclaration](#) of mode manager**

*Imposition time:* CP: IT\_RteGen

[A configuration that maps **several** [ModeDeclarations](#) representing modes of a mode user to **one** [ModeDeclaration](#) representing a mode of a mode manager shall be rejected.]

**[constr\_1210] Mapping of [ModeDeclarations](#) of mode user to all [ModeDeclarations](#) of mode manager**

*Imposition time:* CP: IT\_RteGen

[If a [ModeDeclarationMapping](#) exists that references a [ModeDeclaration](#) representing a mode of the mode manager, then [ModeDeclarationMappings](#) shall exist that map all modes of the mode manager to modes of the mode user.]

**[constr\_1219] Invalidation depends on the value of [swImplPolicy](#)**

*Imposition time:* CP: IT\_CpgExe

[If the value of [swImplPolicy](#) of a [SenderReceiverInterface.dataElement](#) is set to the value [SwImplPolicyEnum.queued](#), then the enclosing [SenderReceiverInterface](#) shall not aggregate in the role [invalidationPolicy](#) an [InvalidationPolicy](#)

- that references the [dataElement](#) and
- where the value of [InvalidationPolicy.handleInvalid](#) is set to anything else than [HandleInvalidEnum.dontInvalidate](#).

]

**[constr\_1220] Compatibility of `SwBaseType`***Imposition time:* CP: IT\_RteGen

[Two `SwBaseTypes` are compatible if and only if attributes

- `baseTypeSize` respectively
- `byteOrder`,
- `memAlignment`,
- `baseTypeEncoding`, and
- `nativeDeclaration`

have identical values.]

**[constr\_1221] `DataPrototype` is typed by an `ApplicationPrimitiveDataType`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If a `DataPrototype` is typed by an `ApplicationPrimitiveDataType`, its `initValue` shall be provided by an `ApplicationValueSpecification`.

If the underlying `ApplicationPrimitiveDataType` represents an enumeration, the value provided shall match to one of the applicable text values (`vt`, `shortLabel`, `symbol`) defined by the applicable `CompuScales`.]

**[constr\_1222] `category` of an `AutosarDataType` used to type a `DataPrototype` is set to `STRING`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If the `category` of an `AutosarDataType` used to type a `DataPrototype` is set to `STRING`, the `ApplicationValueSpecification` used to initialize the `DataPrototype` shall be of `category STRING`.]

**[constr\_1223] `DataPrototype` is typed by an `ApplicationRecordDataType`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If a `DataPrototype` is typed by an `ApplicationRecordDataType`, the corresponding `initValue` shall be provided by a `RecordValueSpecification`.]

**[constr\_1224] `DataPrototype` is typed by an `ApplicationArrayDataType`***Imposition time:* CP: IT\_CpgExe

[If a `DataPrototype` is typed by an `ApplicationArrayDataType`, the corresponding `initValue` shall be provided by an `ArrayValueSpecification` (that may contain an `ApplicationRuleBasedValueSpecification`).]



**[constr\_1225] `DataPrototype` is typed by an `ImplementationDataType` that references a `CompuMethod` of category `TEXTTABLE` or `BITFIELD_TEXTTABLE`**

*Imposition time:* CP: IT\_CpgExe

[If a `DataPrototype` is typed by an `ImplementationDataType` that references a `CompuMethod` of category `TEXTTABLE` or `BITFIELD_TEXTTABLE` the applicable `ValueSpecification` shall be a `TextValueSpecification`.

In this case the value provided shall match to one of the applicable text values (`vt`, `shortLabel`, `symbol`) defined by the applicable `CompuScales`.]

**[constr\_1226] Applicable range for `ExecutableEntityActivationReason.bitPosition`**

*Imposition time:* CP: IT\_CpgExe

[The value of attribute `ExecutableEntityActivationReason.bitPosition` shall be in the range of 0 .. 31.]

**[constr\_1227] Value of attribute `ExecutableEntityActivationReason.bitPosition` shall be unique**

*Imposition time:* CP: IT\_CpgExe

[The value of attributes `ExecutableEntityActivationReason.bitPosition` and `ExecutableEntityActivationReason.symbol` shall be unique in the context of the enclosing `RunnableEntity`.]

**[constr\_1228] `RTEEvent` that is referenced by a `WaitPoint` in the role `trigger` shall not reference `ExecutableEntityActivationReason`**

*Imposition time:* CP: IT\_RteGen

[An `RTEEvent` that is referenced by a `WaitPoint` in the role `trigger` shall not reference `ExecutableEntityActivationReason` in the role `activationReason-Representation`.]

**[constr\_1229] `category` of `ImplementationDataType` boils down to `VALUE`**

*Imposition time:* CP: IT\_CpgExe

[An `ImplementationDataType` qualifies as an Integral Primitive Type if and only if either

- its `category` is `VALUE` or `TYPE_REFERENCE` that eventually boils down to `VALUE` or
- its `category` is `ARRAY` and it has only one `subElement` and one of the following conditions applies:
  - `subElement.category` is set to `VALUE` or `TYPE_REFERENCE` that eventually boils down to `VALUE` and the `subElement` refers to a `SwBaseType` where `baseTypeSize` is set to the value 8 and the `baseTypeEncoding` is set to `NONE`.

- `subElement.category` is set to `TYPE_REFERENCE` and the `swDataDefProps.implementationDataType` literally represents the Platform Data Type named "uint8".
- `subElement.category` is set to `TYPE_REFERENCE` and the attribute `swDataDefProps.implementationDataType.shortName` is set to "uint8" and `swDataDefProps.baseType.baseTypeDefinition.nativeDeclaration` does not exist.

]

**[constr\_1230] `ApplicationDataType` that qualifies for Integral Primitive Type**

*Imposition time:* CP: IT\_CpgExe

[An `ApplicationDataType` qualifies as an Integral Primitive Type if and only if **all** the following conditions apply:

- `ApplicationDataType.category` is set to `BOOLEAN`, `VALUE`, `STRING`, or `ARRAY`
- in the applicable scope a `DataTypeMap` is available that refers to the given `ApplicationDataType`
- the found `DataTypeMap` refers to an `ImplementationDataType` that fulfills the requirements of [constr\_1229]

]

**[constr\_1231] `ConsistencyNeeds` aggregated by `CompositionSwComponentType`**

*Imposition time:* CP: IT\_CompSwcT

[If `ConsistencyNeeds` are aggregated by a `CompositionSwComponentType` the associations stereotyped `<<instanceRef>>` may only refer to context and target elements within the context of this `CompositionSwComponentType`.]

**[constr\_1232] `ConsistencyNeeds` aggregated by `AtomicSwComponentType`**

*Imposition time:* CP: IT\_CpgExe

[If `ConsistencyNeeds` are aggregated by a `AtomicSwComponentType` the associations stereotyped `<<instanceRef>>` may only refer to context and target elements within the context of this `AtomicSwComponentType`.]

**[constr\_1233] `InstantiationTimingEventProps` shall only reference `TimingEvent`**

*Imposition time:* CP: IT\_RteGen

[An `InstantiationTimingEventProps` shall only reference `TimingEvent` in the role `refinedEvent`. A reference to other kinds of `RTEEvents` is not supported.]

**[constr\_1234] Value of `RunnableEntity.symbol`***Imposition time:* CP: IT\_RteGen

[The value of a `RunnableEntity.symbol` owned by an `NvBlockSwComponentType` that is triggered by an `OperationInvokedEvent` shall only be taken from the set of API names associated with the `NvM`.]

**[constr\_1237] Scope of mapped `ClientServerOperations` in the context of a `ClientServerOperationMapping`***Imposition time:* CP: IT\_RteGen

[All `ClientServerOperations` referenced by a `ClientServerOperationMapping` in the role `firstOperation` shall belong to exactly one `ClientServerInterface`.

All `ClientServerOperations` referenced by a `ClientServerOperationMapping` in the role `secondOperation` shall belong to exactly one other `ClientServerInterface`.]

**[constr\_1238] Scope of mapped `ApplicationErrors` in the context of a `ClientServerOperationMapping`***Imposition time:* CP: IT\_RteGen

[All `ApplicationErrors` referenced by a `ClientServerApplicationErrorMapping` in the role `firstApplicationError` shall belong to exactly one `ClientServerInterface`.

All `ApplicationErrors` referenced by a `ClientServerApplicationErrorMapping` in the role `secondApplicationError` shall belong to exactly one other `ClientServerInterface`.]

**[constr\_1240] Consistency of `ArgumentDataPrototypes` within the context of a `ClientServerOperationMapping`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Unless a `ClientServerOperationMapping.firstToSecondDataTransformation` exists, for each `argument` owned by

- a `ClientServerOperationMapping.firstOperation` and
- `ClientServerOperationMapping.secondOperation`,

a reference in the role

- `ClientServerOperationMapping.argumentMapping.firstDataPrototype` or
- `ClientServerOperationMapping.argumentMapping.secondDataPrototype`

shall exist, originated by one of the `ClientServerOperationMapping.argumentMappings` owned by the mentioned `ClientServerOperationMapping`.]

**[constr\_1241] Compound Primitive Data Types and `invalidValue`**

*Imposition time:* CP: IT\_CpgExe

[Compound Primitive Data Types that have set the value of `category` other than `STRING` shall **not** define `invalidValue`.]

**[constr\_1242] Restriction of `invalidValue` for `ApplicationPrimitiveDataType` of `category STRING`**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[`invalidValue` for `ApplicationPrimitiveDataType` of `category STRING` ([constr\_1241] applies) is restricted to be either a compatible `ApplicationValueSpecification` or a `ConstantReference` that in turn points to a compatible `ApplicationValueSpecification`.]

**[constr\_1243] `NumericalOrText` shall either define `vf` or `vt`**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[Within the context of one `NumericalOrText`, **either** the attribute `vf` **or** the attribute `vt` shall be defined. The existence of both attributes at the same time is not permitted.]

**[constr\_1244] `DataPrototypes` used in application software shall not be typed by `C enums`**

*Imposition time:* CP: IT\_CpgExe

[A `ImplementationDataType` that is used to type a `DataPrototype` owned by an `AtomicSwComponentType` shall not set `swDataDefProps.additionalNativeTypeQualifier` to `enum`.]

**[constr\_1245] Consideration of `ModeTransitions` for the compatibility of `ModeDeclarationGroups`**

*Imposition time:* CP: IT\_RteGen

[One of the following conditions for the consideration of `ModeTransitions` for the compatibility of `ModeDeclarationGroups` shall apply:

- **Either** the mode provider **or** the mode user define `ModeTransitions`.
- The `ModeTransitions` defined in the context of the mode provider are **identical** to the `ModeTransitions` defined in the context of the mode user **or** a `ModeDeclarationMapping` mapping is applied.

]

**[constr\_1246] Consistency of `firstMode` and `secondMode` in the scope of one `ModeDeclarationMappingSet`**

*Imposition time:* CP: IT\_RteGen

[Within the scope of one `ModeDeclarationMappingSet`,

- all `firstModes` shall belong to one and only one `ModeDeclarationGroup` and

- all `secondModes` shall belong to one and only one **other** `ModeDeclarationGroup`.

]

**[constr\_1247] Consistency of `ModeDeclarationMappingSet` with respect to the referenced `firstModeGroup` and `secondModeGroup`**

*Imposition time:* CP: IT\_RteGen

[If a `ModeDeclarationGroupPrototypeMapping.modeDeclarationMappingSet` exists, then

- the `ModeDeclarationGroup` owning the `modeDeclarations` referenced in the role `firstMode` shall be the `type` of the `ModeDeclarationGroupPrototypeMapping.firstModeGroup` and
- the `ModeDeclarationGroup` owning the `modeDeclarations` referenced in the role `secondMode` shall be the `type` of the `ModeDeclarationGroupPrototypeMapping.secondModeGroup`.

]

**[constr\_1248] Compatibility of `PortPrototypes` of different `DataInterfaces` in the context of a `PassThroughSwConnector`**

*Imposition time:* CP: IT\_RteGen

[`PortPrototypes` of different `DataInterfaces` are considered compatible if and only if

1. For **at least one** `VariableDataPrototype` or `ParameterDataPrototype` defined in the context of the `DataInterface` of the required outer `PortPrototype` a compatible `VariableDataPrototype` or `ParameterDataPrototype` exists in the `DataInterface` of the provided outer `PortPrototype`.

**Either** the `shortName` of `VariableDataPrototypes` and `ParameterDataPrototypes` are used to identify the pair **or** a `PortInterfaceMapping` exists that defines which differently named elements of `PortInterfaces` correlate with each other.

2. For each such pair, the values of the `PortInterface.isService` attributes are identical.

]

**[constr\_1249] Compatibility of `ModeSwitchInterfaces` in the context of a `PassThroughSwConnector`**

*Imposition time:* CP: IT\_RteGen

[`PortPrototypes` of different `ModeSwitchInterfaces` are considered compatible if and only if

1. For the `ModeDeclarationGroupPrototype` defined in the context of the `ModeSwitchInterface` of the required outer `PortPrototype` a compatible `ModeDeclarationGroupPrototype` exists in the `ModeSwitchInterface` of the provided outer `PortPrototype`.

Either the `shortNames` of the `ModeDeclarationGroupPrototypes` are used to identify the pair or a `ModeInterfaceMapping` exists that maps the corresponding `ModeDeclarationGroupPrototypes`.

2. For each such pair, the values of the `PortInterface.isService` attributes are identical.

]

#### [constr\_1250] Compatibility of `ClientServerInterfaces` in the context of a `PassThroughSwConnector`

*Imposition time:* CP: IT\_RteGen

[`PortPrototypes` of different `ClientServerInterfaces` are considered compatible if and only if

1. For **at least one** `ClientServerOperation` defined in the context of the `ClientServerInterface` of the provided outer `PortPrototype` a compatible `ClientServerOperation` exists in the `ClientServerInterface` of the required outer `PortPrototype`.

Either the `shortNames` of the `ClientServerOperations` are used to identify the pair or a `ClientServerInterfaceMapping` exists that maps the corresponding `ClientServerOperations`.

2. For each such pair, the values of the `PortInterface.isService` attributes are identical.

]

#### [constr\_1251] Compatibility of `PortPrototypes` of `TriggerInterfaces` in the context of a `PassThroughSwConnector`

*Imposition time:* CP: IT\_RteGen

[`PortPrototypes` of different `TriggerInterfaces` are considered compatible if and only if

1. For **at least one** `Trigger` defined in the context of the `TriggerInterface` of the required outer `PortPrototype` a compatible `Trigger` exists in the `TriggerInterface` of the provided outer `PortPrototype`.

Either the `shortName` of `Triggers` are used to identify the pair or a `TriggerInterfaceMapping` exists that refers to one of the `Triggers` in the role `firstTrigger` and to the other in the role `secondTrigger`.

2. For each such pair, the values of the `PortInterface.isService` attributes are identical.

]

**[constr\_1252] Creation of a loop involving a `PassThroughSwConnector` is not allowed***Imposition time:* CP: IT\_CompSwcT

[A `PassThroughSwConnector` is not allowed if the required outer `PortPrototype` is directly or indirectly connected to the provided outer `PortPrototype` without the placement of a `SwComponentPrototype` typed by an `AtomicSwComponentType` in the chain of `SwConnectors`.]

**[constr\_1253] Allowed multiplicities for attributes of `VariationPointProxy` depending on the applicable binding time and the value of `VariationPointProxy.category`***Imposition time:* CP: IT\_CpgExe

[

BindingTime	category	Allowed Attribute Multiplicity
PreBuild	VALUE	valueAccess [1], implementationDataType [0..1]
	CONDITION	conditionAccess [1]
PostBuild	VALUE	postBuildValueAccess [1], implementationDataType [1]
	CONDITION	postBuildVariantCondition [1..*], conditionAccess [0..1]

]

**[constr\_1254] Definition of a pointer to a pointer***Imposition time:* CP: IT\_CpgExe

[AUTOSAR does **not** support the definition of a pointer to a pointer by defining an `ImplementationDataType` of category `DATA_REFERENCE` that aggregates `SwDataDefProps` in the role `swDataDefProps` that in turn aggregate `SwPointerTargetProps` in the role `swPointerTargetProps` with attribute `targetCategory` set to `DATA_REFERENCE` that in turn aggregates `SwDataDefProps` in the role `swDataDefProps` that aggregates `SwPointerTargetProps` in the role `swPointerTargetProps` that references an `ImplementationDataType` of category e.g. `VALUE`.]

**[constr\_1255] `ApplicationPrimitiveDataTypes` of category `BOOLEAN` and `STRING`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If a `Unit` is referenced from within `SwDataDefProps` and/or `PhysConstrs` owned by an `ApplicationPrimitiveDataTypes` of category `BOOLEAN` and `STRING` it is required that this `Unit` represents a meaningless unit, i.e. the referenced `physicalDimension` shall not define any exponent value other than 0.]



**[constr\_1256] Acknowledgement feedback in n:1 writer case***Imposition time:* CP: IT\_CpgExe

[Within the scope of one `SwcInternalBehavior`, it is **not** allowed that two or more aggregated `RunnableEntity`s own either `dataSendPoints` or `dataWriteAccesses` that in turn point to the identical `accessedVariable.autosarVariable.targetDataPrototype` if the attribute `transmissionAcknowledge` exists in the context of the `SenderComSpec` owned by the `dataSendPoint.accessedVariable.autosarVariable.portPrototype` (or the respective construct for `dataWriteAccess`) that also refers to said `dataElement`.]

**[constr\_1257] No `WaitPoints` allowed***Imposition time:* CP: IT\_RteGen

[A `RunnableEntity` referenced by an `InitEvent` in the role `startOnEvent` shall not aggregate a.]

**[constr\_1258] Value of `minimumStartInterval` for `RunnableEntity`s triggered by an `InitEvent`***Imposition time:* CP: IT\_RteGen

[The value of the attribute `ExecutableEntity.minimumStartInterval` for a `RunnableEntity`s that is triggered by an `InitEvent` shall always be set to 0.]

**[constr\_1259] Aggregation of `AsynchronousServerCallPoint` and `AsynchronousServerCallResultPoint`***Imposition time:* CP: IT\_RteGen

[A `RunnableEntity` referenced by an `InitEvent` in the role `startOnEvent` may aggregate an `AsynchronousServerCallPoint` but it shall not aggregate an `AsynchronousServerCallResultPoint`.]

**[constr\_1260] No mode disabling for `InitEvents`***Imposition time:* CP: IT\_RteGen

[An `InitEvent` shall not have a reference to a `ModeDeclaration` in the role `disabledMode`.]

**[constr\_1263] Existence of `ModeErrorBehavior.defaultMode`***Imposition time:* CP: IT\_RteGen

[The optional attribute `ModeErrorBehavior.defaultMode` shall exist if the value of the attribute `ModeErrorBehavior.errorReactionPolicy` is set to `defaultMode`.]



**[constr\_1268] `ArgumentDataPrototype.direction` shall be preserved in a `ClientServerOperationMapping`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Within the context of a `ClientServerOperationMapping`, the value of the argument `ArgumentDataPrototype.direction` of two mapped `ArgumentDataPrototype` shall be identical.]

**[constr\_1269] Number of `arguments` shall be preserved in a `ClientServerOperationMapping`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Within the context of a `ClientServerOperationMapping`, the number of `arguments` of `firstOperation` and `secondOperation` shall be identical.]

**[constr\_1270] `ArgumentDataPrototype` shall be mapped only once in a `ClientServerOperationMapping`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Within the context of a `ClientServerOperationMapping`, each `argument` shall only be referenced **once** in the role `firstDataPrototype` or `secondDataPrototype`.]

**[constr\_1271] `RecordValueSpecification.fields` shall be identical to the number of `ApplicationRecordDataType.elements`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The initialization of a `DataPrototype` typed by an `ApplicationRecordDataType` by means of a `RecordValueSpecification` shall exactly match the structure of the `ApplicationRecordDataType`.

For this means, it is required that the number of `RecordValueSpecification.fields` shall be identical to the number of `ApplicationRecordDataType.elements`.]

**[constr\_1272] `RecordValueSpecification.fields` shall be identical to the number of `subElements` of `ImplementationDataType` of category `STRUCTURE`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The initialization of an `DataPrototype` typed by an `ImplementationDataType` of category `STRUCTURE` by means of a `RecordValueSpecification` shall exactly match the structure of the `ImplementationDataType` of category `STRUCTURE`.

For this means, it is required that the number of `RecordValueSpecification.fields` shall be identical to the number of `ImplementationDataType.subElements`.]

**[constr\_1273] Rules for the initialization of `ApplicationArrayDataType` by means of `ArrayValueSpecification`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The following rules apply for the initialization of a `DataPrototype` typed by an `ApplicationArrayDataType` by means of an `ArrayValueSpecification`:

- If the attribute `ApplicationArrayDataType.element.arraySizeSemantics` is set to **fixedSize** then the `ArrayValueSpecification` shall exactly match the structure of the `ApplicationArrayDataType`.

This means that the number of `ArrayValueSpecification.elements` shall be identical to the value of `ApplicationArrayDataType.element.maxNumberOfElements`.

- If the attribute `ApplicationArrayDataType.element.arraySizeSemantics` is set to **variableSize** and the `ArrayValueSpecification` **does not define** attribute `intendedPartialInitializationCount` then `ArrayValueSpecification` shall **exactly** match the structure of the `ApplicationArrayDataType`.

This means that the number of `ArrayValueSpecification.elements` shall be identical to the value of `ApplicationArrayDataType.element.maxNumberOfElements`.

- If the attribute `ApplicationArrayDataType.element.arraySizeSemantics` is set to **variableSize** and the `ArrayValueSpecification` specifies a value for attribute `intendedPartialInitializationCount` then `ArrayValueSpecification` shall contain **exactly** `intendedPartialInitializationCount` elements.

This includes the case that the value of `intendedPartialInitializationCount` is set to 0 (i.e. "empty" initialization) and the case that the `intendedPartialInitializationCount` is set to the value of the respective `ApplicationArrayElement.maxNumberOfElements` (i.e. "full" initialization).

]

**[constr\_1274] Rules for the initialization of array-shaped `ImplementationDataType` with a fixed size by means of `ArrayValueSpecification`***Imposition time:* CP: IT\_CpgExe

[The following rule applies for the initialization of a `DataPrototype` typed by an `ImplementationDataType` of category ARRAY where attribute `ImplementationDataType.subElement.arraySizeSemantics` is set to **fixedSize** by means of an `ArrayValueSpecification`: the `ArrayValueSpecification` shall exactly match the structure of the `ImplementationDataType`.

This means that the number of `ArrayValueSpecification.elements` shall be identical to the value of `ImplementationDataType.subElement.arraySize`.]

**[constr\_1277] `SwDataDefProps.swImplPolicy` of a `VariableDataPrototype` referenced by a `VariableAccess` aggregated in the role `dataReceivePointByValue`***Imposition time:* CP: IT\_CpgExe

[The `SwDataDefProps.swImplPolicy` of a `VariableDataPrototype` referenced by a `VariableAccess` aggregated in the role `dataReceivePointByValue` shall not be set to `queued`.]

**[constr\_1278] `PhysConstrs` references a `Unit`***Imposition time:* CP: IT\_RteGen

[`DataConstrs` are only compatible if the `DataConstr.dataConstrRule.physConstrs.unit` are compatible or neither `DataConstr.dataConstrRule.physConstrs.unit` exist.]

**[constr\_1279] Unmapped elements of `ApplicationCompositeDataTypes` or `ImplementationDataTypes` and the attribute `swImplPolicy`***Imposition time:* CP: IT\_RteGen

[If the attribute `swImplPolicy` is set to `queued`, then it is not allowed to have unmapped elements of `ApplicationCompositeDataTypes` or `ImplementationDataTypes` of category `STRUCTURE` or `ARRAY` on the "target" end.]

**[constr\_1280] Unmapped `dataElement` on the "target" end shall have an `initValue`***Imposition time:* CP: IT\_RteGen

[If elements of `ApplicationCompositeDataTypes` or `ImplementationDataTypes` of category `STRUCTURE` or `ARRAY` are not considered in a `SubElementMapping` and the `NonqueuedReceiverComSpec` is aggregated by an `AbstractRequiredPortPrototype` referenced by the "target" end, then the enclosing `dataElement` shall have an `initValue`.]

**[constr\_1282] Restriction concerning the usage of `RuleBasedValueSpecification` or a `ReferenceValueSpecification` for the specification of an `invalidValue`***Imposition time:* CP: IT\_CpgExe

[The aggregation of a `RuleBasedValueSpecification` or a `ReferenceValueSpecification` for the definition of a `ApplicationPrimitiveDataType.swDataDefProps.invalidValue` is not supported.]

**[constr\_1284] Limitation of the use of `TextValueSpecification`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[`TextValueSpecification` shall **only** be used in the context of an `AutosarDataType` that references a `CompuMethod` in the role `ImplementationDataType.swDataDefProps.compuMethod` of category `TEXTTABLE` and `BITFIELD_TEXTTABLE`.]

**[constr\_1285] Applicability of roles vs. PortPrototypes***Imposition time:* CP: IT\_RteGen

[The aggregation of AutosarVariableRef aggregated by NvBlockDataMapping in the roles writtenNvData, writtenReadNvData, or readNvData is subject to limitation, depending on the applicable subclass of PortPrototype:

- The role writtenNvData shall only be used if the corresponding PortPrototype is a RPortPrototype
- The role writtenReadNvData shall only be used if the corresponding PortPrototype is a PRPortPrototype
- The role readNvData shall only be used if the corresponding PortPrototype is a PPortPrototype

]

**[constr\_1286] serverArgumentImplPolicy and ArgumentDataPrototype typed by primitive data types***Imposition time:* CP: IT\_CpgExe

[The value of the attribute ArgumentDataPrototype.serverArgumentImplPolicy shall **not** be set to useVoid for an ArgumentDataPrototype of direction in that is typed by an AutosarDataType that boils down to a primitive C data type (see [TPS\_SWCT\_01565]).]

**[constr\_1287] Compatibility of SenderReceiverInterfaces with respect to invalidationPolicy***Imposition time:* CP: IT\_RteGen

[VariableDataPrototypes defined in the context of the SenderReceiverInterface are only compatible if the invalidationPolicies have the same value.]

## [constr\_1288] Allowed Attributes vs. category for DataPrototypes typed by ImplementationDataTypes

Imposition time: CP: IT\_CpgExe

Attributes of SwDataDefProps	Root Element			Attribute Existence per Category						
	DataPrototype	InstantiationDataDefProps	ParameterAccess	VALUE	DATA_REFERENCE	FUNCTION_REFERENCE	TYPE_REFERENCE	STRUCTURE	UNION	ARRAY
additionalNativeTypeQualifier										
annotation	x	x	*	*	*	*	*	*	*	*
baseType										
compuMethod										
dataConstr.dataConstrRule.physConstrs	x	x		d/ C <sup>12</sup>			d/c			d/c
dataConstr.dataConstrRule.internalConstrs	x	x		0..1			0..1			0..1
displayFormat	x	x		0..1			0..1	0..1	0..1	0..1
displayPresentation	x	x		0..1			0..1			0..1
implementationDataType										
invalidValue										
stepSize	x	x		0..1						0..1
swAddrMethod	x	x		0..1	0..1	0..1	0..1	0..1	0..1	0..1
swAlignment	x	x		0..1	0..1	0..1	0..1	0..1	0..1	0..1
swBitRepresentation										
swCalibrationAccess	x	x		0..1			0..1	0..1	0..1	0..1
swCalprmAxisSet										
swComparisonVariable										
swDataDependency										
swHostVariable										
swImplPolicy	x			0..1	0..1	0..1	0..1	0..1	0..1	0..1
swIntendedResolution										
swInterpolationMethod										
swIsVirtual										
swPointerTargetProps										
swPointerTargetProps.swDataDefProps										
swPointerTargetProps.functionPointerSignature										
swRecordLayout										
swRefreshTiming	x	x		0..1			0..1	0..1	0..1	0..1
swTextProps										
swValueBlockSize										



<sup>12</sup>don't care



Attributes of SwDataDefProps	Root Element			Attribute Existence per Category						
	DataPrototype	InstantiationDataDefProps	ParameterAccess	VALUE	DATA_REFERENCE	FUNCTION_REFERENCE	TYPE_REFERENCE	STRUCTURE	UNION	ARRAY
swValueBlockSizeMult										
unit										
valueAxisDataType										

### [constr\_1289] Allowed Attributes vs. **category** for **DataPrototypes** typed by **ApplicationDataTypes**

Imposition time: CP: IT\_CpgExe, AP: IT\_BefAraApiGen

Attributes of SwDataDefProps	Root El.			Attribute Existence per Category												
	DataPrototype	InstantiationDataDefProps	ParameterAccess	VALUE	VAL_BLK	STRUCTURE	ARRAY	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5
additionalNativeTypeQualifier				*	*	*	*	*	*	*	*	*	*	*	*	*
annotation	X	X	X													
baseType																
compuMethod																
dataConstr.dataConstrRule.physConstrs	x	x		0..1	0..1		0..1		0..1			0..1	0..1	0..1	0..1	0..1
dataConstr.dataConstrRule.internalConstrs	x	x		d/c <sup>13</sup>	d/c		d/c		d/c			d/c	d/c	d/c	d/c	d/c
displayFormat	x	x		0..1	0..1		0..1	0..1	0..1			0..1	0..1	0..1	0..1	0..1
displayPresentation	x	x		0..1	0..1		0..1			0..1	0..1	0..1	0..1	0..1	0..1	0..1
implementationDataType																
invalidValue																
stepSize	x	x	x	0..1	0..1		0..1			0..1	0..1	0..1	0..1	0..1	0..1	0..1
swAddrMethod	x	x		0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1



<sup>13</sup>don't care



Attributes of SwDataDefProps	Root El.			Attribute Existence per Category												
	DataPrototype	InstantiationDataDefProps	ParameterAccess	VALUE	VAL_BLK	STRUCTURE	ARRAY	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5
swAlignment	x	x		0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
swBitRepresentation																
swCalibrationAccess	x	x		0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
swCalprmAxisSet																
swCalprmAxisSet.swCalprmAxis/SwAxis-Grouped.swCalprmRef		x	x				0..1					0..1	0..1	0..1	0..1	0..1
swCalprmAxisSet.swCalprmAxis/SwAxis-Individual.swVariableRef		x	x				0..1			0..1	0..1	0..1	0..1	0..1	0..1	0..1
swCalprmAxisSet.swCalprmAxis/SwAxis-Grouped.sharedAxisType																
swCalprmAxisSet.swCalprmAxis/SwAxis-Individual.inputVariableType																
swCalprmAxisSet.swCalprmAxis/SwAxis-Individual.unit																
swComparisonVariable			x									0..1	0..1	0..1	0..1	0..1
swDataDependency	x	x		0..1								0..1	0..1	0..1	0..1	0..1
swHostVariable																
swImplPolicy	x			0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1
swIntendedResolution																
swInterpolationMethod	x	x	x	0..1						0..1	0..1	0..1	0..1	0..1	0..1	0..1
swIsVirtual	x	x		0..1					0..1			0..1	0..1	0..1	0..1	0..1
swPointerTargetProps																
swRecordLayout																
swRefreshTiming	x	x		0..1	0..1			0..1	0..1							
swTextProps																
swValueBlockSize																
swValueBlockSizeMult																
unit																
valueAxisDataType																

### [constr\_1290] Limitation on the number of PPortComSpecs in the context of one PPortPrototype

Imposition time: CP: IT\_CpgExe

[Within the context of one PPortPrototype, there can only be **one** (sub-class of) PPortComSpec that references a given

- dataElement (in the case of SenderComSpec),
- operation (in the case of ServerComSpec),

- `modeGroup` (in the case of `ModeSwitchSenderComSpec`),
- `variable` (in the case of `NvProvideComSpec`), or
- `parameter` (in the case of `ParameterProvideComSpec`).

]

**[constr\_1291] Limitation on the number of `RPortComSpecs` in the context of one `RPortPrototype`**

*Imposition time:* CP: IT\_CpgExe

[Within the context of one `RPortPrototype`, there can only be **one** `RPortComSpec` that references a given

- `dataElement` (in the case of `ReceiverComSpec`),
- `operation` (in the case of `ClientComSpec`),
- `modeGroup` (in the case of `ModeSwitchReceiverComSpec`),
- `variable` (in the case of `NvRequireComSpec`), or
- `parameter` (in the case of `ParameterRequireComSpec`).

]

**[constr\_1292] Limitation on the number of `RPortComSpecs`/`PPortComSpecs` in the context of one `PRPortPrototype`**

*Imposition time:* CP: IT\_CpgExe

[Within the context of one `PRPortPrototype`, there can only be **one** `RPortComSpec` and **one** `PPortComSpec` that references a given

- `dataElement` (in the case of `ReceiverComSpec`/`SenderComSpec`),
- `operation` (in the case of `ClientComSpec`/`ServerComSpec`),
- `modeGroup` (in the case of `ModeSwitchReceiverComSpec`/`ModeSwitch-SenderComSpec`), or
- `variable` (in the case of `NvRequireComSpec`/`NvProvideComSpec`).

]

**[constr\_1295] `PortInterfaces` and category `DATA_REFERENCE`**

*Imposition time:* CP: IT\_CpgExe

[A `DataPrototype` defined in the context of a `PortInterface` used by an

- `ApplicationSwComponentType` or
- `SensorActuatorSwComponentType`



that is (after potential indirections via `TYPE_REFERENCE` are resolved) either typed by or mapped to an `ImplementationDataType` of category `DATA_REFERENCE` shall only be used if either the provider or the requester of the information represents

- a `ServiceSwComponentType`,
- a `ComplexDeviceDriverSwComponentType`,
- a `ParameterSwComponentType`,
- an `NvBlockSwComponentType`, or
- an `EcuAbstractionSwComponentType`.

]

**[constr\_1296] DataPrototypes used as `explicitInterRunnableVariable` or `implicitInterRunnableVariable` and category `DATA_REFERENCE`**

*Imposition time:* CP: IT\_CpgExe

[A `VariableDataPrototype` shall not be aggregated by `SwcInternalBehavior` in either the role:

- `explicitInterRunnableVariable`, or
- `implicitInterRunnableVariable`

if the `VariableDataPrototype` (after potential indirections via `TYPE_REFERENCE` are resolved) is either typed by, or mapped to, an:

- `ImplementationDataType` of category `DATA_REFERENCE`, or
- `ImplementationDataType` that contains `subElements` that (after potential indirections via `TYPE_REFERENCE` are resolved) are of category `DATA_REFERENCE`.

]

**[constr\_1298] Existence of attributes if category of a `ModeDeclarationGroup` is set to `EXPLICIT_ORDER`**

*Imposition time:* CP: IT\_CpgExe

[The attributes `ModeDeclarationGroup.onTransitionValue` and `ModeDeclaration.value` (for each `ModeDeclaration`) shall be set if the category of a `ModeDeclarationGroup` is set to `EXPLICIT_ORDER`.]

**[constr\_1299] Existence of attributes if category of a `ModeDeclarationGroup` is set to other than `EXPLICIT_ORDER`**

*Imposition time:* CP: IT\_CpgExe

[The attributes `ModeDeclarationGroup.onTransitionValue` or `ModeDeclaration.value` (for any `ModeDeclaration`) shall **not** be set if the category of a `ModeDeclarationGroup` is set to any value **other than** `EXPLICIT_ORDER`.]

**[constr\_1300] Primitive `DataPrototype` on the "source" end shall not be mapped to element of a composite data type on the "target" end of the `SwConnector`**

*Imposition time:* CP: IT\_RteGen

[The usage of `DataPrototypeMapping` or `SubElementMapping` does not support the following configuration:

- The `AutosarDataPrototype` contained in the `PortPrototype` on the "source" end of an `SwConnector` is typed by an `ApplicationPrimitiveDataType` of category `VALUE` or `ImplementationDataType` of category `VALUE` or category `TYPE_REFERENCE` that eventually resolves to category `VALUE`.
- The `DataPrototypeMapping` aggregates a `subElementMapping` that refers to a `ImplementationDataTypeElement` or `ApplicationCompositeElementDataPrototype` contained in the `PortPrototype` on the "target" end.

]

**[constr\_1301] Existence of `RoleBasedDataTypeAssignment.role` vs. `RoleBasedDataAssignment.role`**

*Imposition time:* CP: IT\_RteGen

[The usage of a `RoleBasedDataTypeAssignment` with attribute `role` set to the value `temporaryRamBlock` is only allowed if no `RoleBasedDataAssignment` defined with attribute `role` set to value `defaultValue` exists in the owning `SwServiceDependency`.]

**[constr\_1302] Restriction of data invalidation**

*Imposition time:* CP: IT\_CpgExe

[Data invalidation is only applicable for one of the following cases applicable on the **receiving** side:

1. `VariableDataPrototypes` typed by either an `ApplicationPrimitiveDataType` or an `ImplementationDataType` of category `VALUE` or `TYPE_REFERENCE` that boils down to category `VALUE` that have defined an `invalidValue`.
2. `VariableDataPrototypes` typed by either an `ApplicationCompositeDataType` or an `ImplementationDataType` of category `STRUCTURE`, or `ARRAY` or of category `TYPE_REFERENCE` that boils down to category `STRUCTURE`, or `ARRAY` that have **at least one** primitive element with an `invalidValue`.

]

**[constr\_1303] Applicability of `TextTableMapping` depending on the value of `CompuMethod.category`**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[If a `DataPrototypeMapping` aggregates a `TextTableMapping` then only certain combinations of the value of the applicable `CompuMethod.category` are supported:

- `category` of `firstDataPrototype`: TEXTTABLE,  
  `category` of `secondDataPrototype`: TEXTTABLE
- `category` of `firstDataPrototype`: SCALE\_LINEAR\_AND\_TEXTTABLE,  
  `category` of `secondDataPrototype`: TEXTTABLE
- `category` of `firstDataPrototype`: TEXTTABLE,  
  `category` of `secondDataPrototype`: SCALE\_LINEAR\_AND\_TEXTTABLE
- `category` of `firstDataPrototype`: BITFIELD\_TEXTTABLE,  
  `category` of `secondDataPrototype`: TEXTTABLE
- `category` of `firstDataPrototype`: TEXTTABLE,  
  `category` of `secondDataPrototype`: BITFIELD\_TEXTTABLE
- `category` of `firstDataPrototype`: BITFIELD\_TEXTTABLE,  
  `category` of `secondDataPrototype`: BITFIELD\_TEXTTABLE

]

**[constr\_1304] Existence of attribute `bitfieldTextTableMaskFirst`**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[The attribute `bitfieldTextTableMaskFirst` shall be defined **only if** the `firstDataPrototype` of a `DataPrototypeMapping` refers to a `CompuMethod` that has the value of `category` set to BITFIELD\_TEXTTABLE.]

**[constr\_1305] Existence of attribute `bitfieldTextTableMaskSecond`**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[The attribute `bitfieldTextTableMaskSecond` shall be defined **only if** the `secondDataPrototype` of a `DataPrototypeMapping` refers to a `CompuMethod` that has the value of `category` set to BITFIELD\_TEXTTABLE.]

**[constr\_1306] Limitation of `TextTableMapping` for `CompuMethods` that have the value of `category` set to BITFIELD\_TEXTTABLE**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[For any `TextTableMapping` where both `firstDataPrototype` and `secondDataPrototype` refer to `CompuMethods` that have the value of `category` set to BITFIELD\_TEXTTABLE **and** where the attribute `TextTableMapping.valuePair` exists the value of attribute `TextTableMapping.identicalMapping` shall be set to false.]

**[constr\_1307] Consistency of values and masks in `TextTableMapping`**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[If a `TextTableMapping` element defines bit masks as `bitfieldTextTableMaskFirst` or `bitfieldTextTableMaskSecond` then all contained `TextTableMapping.valuePair.firstValues` as well as all `TextTableMapping.valuePair.secondValues` shall **not** specify a value that would be ruled out when - depending on the given value of `TextTableMapping.mappingDirection` - the relevant bit mask is applied.]

**[constr\_1308] Existence of `NvBlockNeeds.cyclicWritingPeriod`**

*Imposition time:* CP: IT\_RteGen

[The attribute `NvBlockNeeds.cyclicWritingPeriod` shall exist if and only if the attribute `NvBlockNeeds.storeCyclic` exists and its value is set to `true`.]

**[constr\_1309] Existence of `NvBlockDescriptor.timingEvent`**

*Imposition time:* CP: IT\_RteGen

[The attribute `NvBlockDescriptor.timingEvent` shall exist if and only if the `NvBlockDescriptor.nvBlockNeeds.storeCyclic` exists and is set to the value `true`.]

**[constr\_1310] Existence of attributes of meta-class `NvBlockNeeds`**

*Imposition time:* CP: IT\_RteGen

[If in the context of an `ApplicationSwComponentType` the attribute `SwcServiceDependency.serviceNeeds` is implemented by an `NvBlockNeeds` then the following attributes

- `NvBlockNeeds.storeCyclic`
- `NvBlockNeeds.cyclicWritingPeriod`
- `NvBlockNeeds.storeEmergency`
- `NvBlockNeeds.storeImmediate`
- `NvBlockNeeds.storeOnChange`

shall only exist if in the context of the same `SwcServiceDependency` a `SwcServiceDependency.assignedPort` exists that has the attribute `role` set to the value `NvDataPort`.]

**[constr\_1311] Appearance of safety-related possible values of `SwAddrMethod.option`**

*Imposition time:* CP: IT\_RteGen

[Any given collection of values stored in the attribute `SwAddrMethod.option` according to [TPS\_SWCT\_01456] shall at most include a single value out of the following list:

- **safetyQM**
- **safetyAsilA**
- **safetyAsilB**
- **safetyAsilC**
- **safetyAsilD**

]

#### [constr\_1312] **PortPrototypes** typed by a **ParameterInterface**

*Imposition time:* CP: IT\_CpgExe

[PortPrototypes typed by a ParameterInterface can either be PPortPrototypes or RPortPrototypes. The usage of PPortPrototypes that are typed by a ParameterInterface is not supported.]

#### [constr\_1313] **Completeness of TextTableMapping** for the values of a given bit mask on the sender side

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[If a DataPrototypeMapping contains one or more TextTableMapping(s) where the DataPrototype on the **sender side** refers to a CompuMethod of category BITFIELD\_TEXTTABLE then all DataPrototypeMapping.textTableMapping shall aggregate a collection of TextTableMapping.valuePair where each possible value of the **sender bit mask**<sup>14</sup> is represented by exactly one TextTableValuePair.firstValue ([TPS\_SWCT\_01163]) or TextTableValuePair.secondValue ([TPS\_SWCT\_01164]).]

#### [constr\_1314] **Profile VSA\_LINEAR** for **ApplicationArrayDataType**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If the dynamicArraySizeProfile of ApplicationArrayDataType is set to VSA\_LINEAR, the contained ApplicationArrayElement shall fulfill **all** the following conditions:

- The attribute ApplicationArrayElement.arraySizeSemantics shall set to the value **variableSize**.
- The attribute ApplicationArrayElement.maxNumberOfElements shall be defined.
- The attribute ApplicationArrayElement.arraySizeHandling shall be set to the value **allIndicesSameArraySize**.

<sup>14</sup>Depending on the applicable case this means either bitfieldTextTableMaskFirst (applies if [TPS\_SWCT\_01163] is in place) or bitfieldTextTableMaskSecond for the case of [TPS\_SWCT\_01164].

- The `ApplicationArrayElement` shall be typed by an `ApplicationDataType` that is not an `ApplicationArrayDataType` where the attribute `dynamicArraySizeProfile` exists.

]

#### [constr\_1315] Profile `VSA_SQUARE` for `ApplicationArrayDataType`

*Imposition time:* CP: `IT_CpgExe`, AP: `IT_BefAraApiGen`

[If the `dynamicArraySizeProfile` of `ApplicationArrayDataType` is set to `VSA_SQUARE`, the contained `ApplicationArrayElement` shall fulfill **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall not be defined.
- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `inheritedFromArrayElementTypeSize`.
- The `ApplicationArrayElement` shall be typed by an `ApplicationArrayDataType`.

The referred `ApplicationArrayDataType` shall refer over a chain (under consideration of the number of dimensions of the "root" `ApplicationArrayDataType`) of nested `ApplicationArrayDataTypes` with `ApplicationArrayElements` to an `ApplicationDataType` that is **not** an `ApplicationArrayDataType` where the attribute `dynamicArraySizeProfile` exists.

The last `ApplicationArrayDataType` in that chain shall have an `ApplicationArrayElement` that fulfills **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall be defined.
- The attribute `ApplicationArrayElement.arraySizeHandling` set to the value `allIndicesSameArraySize`.

All `ApplicationArrayDataTypes` before shall have an `ApplicationArrayElement` that fulfills **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall not be defined.

- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `inheritedFromArrayElementTypeSize`.
- The `ApplicationArrayElement` shall be typed by an `ApplicationArrayDataType`.

]

#### [constr\_1316] Profile `VSA_RECTANGULAR` for `ApplicationArrayDataType`

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If the `dynamicArraySizeProfile` of `ApplicationArrayDataType` is set to `VSA_RECTANGULAR` the contained `ApplicationArrayElement` shall fulfill **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall be defined.
- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.
- The `ApplicationArrayElement` shall be typed by an `ApplicationArrayDataType`.

The referred `ApplicationArrayDataType` shall refer over a chain (under consideration of the number of dimensions of the "root" `ApplicationArrayDataType`) of nested `ApplicationArrayDataTypes` with `ApplicationArrayElements` to an `ApplicationDataType` that is **not** an `ApplicationArrayDataType` where the attribute `dynamicArraySizeProfile` exists.

The last `ApplicationArrayDataType` in that chain shall have an `ApplicationArrayElement` that fulfills **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall be defined.
- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

All `ApplicationArrayDataTypes` before shall have an `ApplicationArrayElement` that fulfills **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall set to the value `variableSize`
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall be defined.



- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.
- The `ApplicationArrayElement` shall be typed by an `ApplicationArrayDataType`.

]

#### [constr\_1317] Profile `VSA_FULLY_FLEXIBLE` for `ApplicationArrayDataType`

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If the `dynamicArraySizeProfile` of `ApplicationArrayDataType` is set to `VSA_FULLY_FLEXIBLE`, the contained `ApplicationArrayElement` shall fulfill **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall be defined.
- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `allIndicesDifferentArraySize`.
- The `ApplicationArrayElement` shall be typed by an `ApplicationArrayDataType`.

The referred `ApplicationArrayDataType` shall refer over a chain (under consideration of the number of dimensions of the "root" `ApplicationArrayDataType`) of nested `ApplicationArrayDataTypes` with `ApplicationArrayElements` to an `ApplicationDataType` that is **not** an `ApplicationArrayDataType` where the attribute `dynamicArraySizeProfile` exist.

The last `ApplicationArrayDataType` in that chain shall have an `ApplicationArrayElement` that fulfills **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall be defined.
- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

All `ApplicationArrayDataTypes` before shall have an `ApplicationArrayElement` that fulfills **all** the following conditions:

- The attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ApplicationArrayElement.maxNumberOfElements` shall be defined.



- The attribute `ApplicationArrayElement.arraySizeHandling` shall be set to the value `allIndicesDifferentArraySize`.
- The `ApplicationArrayElement` shall be typed by an `ApplicationArray-DataType`.

]

**[constr\_1318] Profile VSA\_LINEAR for ImplementationDataType***Imposition time:* CP: IT\_CpgExe

[If the value of attribute `ImplementationDataType.dynamicArraySizeProfile` is set to `VSA_LINEAR`, the `ImplementationDataType` shall aggregate a VSA Payload `ImplementationDataTypeElement` that fulfills all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall not be defined.
- The attribute `ImplementationDataTypeElement.category` shall be set to `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySize` shall not be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall not be defined.

The VSA Payload `ImplementationDataTypeElement` shall immediately aggregate another `ImplementationDataTypeElement` that shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

]

**[constr\_1319] Profile VSA\_SQUARE for ImplementationDataType***Imposition time:* CP: IT\_CpgExe

[If the value of attribute `ImplementationDataType.dynamicArraySizeProfile` is set to `VSA_SQUARE`, the `ImplementationDataType` shall aggregate a VSA Payload `ImplementationDataTypeElement` that fulfills all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall not be defined.

- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySize` shall not be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall not be defined.

The VSA Payload `ImplementationDataTypeElement` shall immediately aggregate another `ImplementationDataTypeElement` (representing the first dimension) that shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySize` shall not be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `inheritedFromArrayElementTypeSize`.

All **intermediate** `ImplementationDataTypeElements` in the aggregation chain that do not terminate the chain shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySize` shall not be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `inheritedFromArrayElementTypeSize`.

The **terminating** `ImplementationDataTypeElement` in the aggregation chain shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

]

**[constr\_1320] Profile VSA\_RECTANGULAR for ImplementationDataType**

*Imposition time:* CP: IT\_CpgExe

[If the value of attribute `ImplementationDataType.dynamicArraySizeProfile` is set to `VSA_RECTANGULAR`, the `ImplementationDataType` shall aggregate a VSA Payload `ImplementationDataTypeElement` that fulfills all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall not be defined.
- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySize` shall not be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall not be defined.

The VSA Payload `ImplementationDataTypeElement` shall immediately aggregate another `ImplementationDataTypeElement` (representing the first dimension) that shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

All **intermediate** `ImplementationDataTypeElements` in the aggregation chain that do not terminate the chain shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

The **terminating** `ImplementationDataTypeElement` in the aggregation chain shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

]

#### [constr\_1321] Profile VSA\_FULLY\_FLEXIBLE for `ImplementationDataType`

*Imposition time:* CP: IT\_CpgExe

[If the value of attribute `ImplementationDataType.dynamicArraySizeProfile` is set to the value `VSA_FULLY_FLEXIBLE`, the `ImplementationDataType` shall aggregate a VSA Payload `ImplementationDataTypeElement` that fulfills all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall not be defined.
- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySize` shall not be defined
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall not be defined.

The VSA Payload `ImplementationDataTypeElement` shall immediately aggregate another `ImplementationDataTypeElement` (representing the first dimension) that shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.category` shall be set to `STRUCTURE`
- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesDifferentArraySize`.

The `ImplementationDataTypeElement` shall aggregate another `ImplementationDataTypeElement` that fulfills the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall not be defined.

- The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
- The attribute `ImplementationDataTypeElement.arraySize` shall not be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall not be defined.

The **aggregation chain is continued** by a (possible empty) sequence of a pair of `ImplementationDataTypeElements` with the following characteristics:

- The first `ImplementationDataTypeElement` in the pair shall fulfill all the following conditions:
  - The attribute `ImplementationDataTypeElement.category` shall be set to `STRUCTURE`.
  - The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
  - The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
  - The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesDifferentArraySize`.
- The second `ImplementationDataTypeElement` in the pair shall fulfill all the following conditions:
  - The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall not be defined.
  - The attribute `ImplementationDataTypeElement.category` shall be set to the value `ARRAY`.
  - The attribute `ImplementationDataTypeElement.arraySize` shall not be defined.
  - The attribute `ImplementationDataTypeElement.arraySizeHandling` shall not be defined.

The **terminating** `ImplementationDataTypeElement` in the aggregation chain shall fulfill all the following conditions:

- The attribute `ImplementationDataTypeElement.arraySizeSemantics` shall be set to the value `variableSize`.
- The attribute `ImplementationDataTypeElement.arraySize` shall be defined.
- The attribute `ImplementationDataTypeElement.arraySizeHandling` shall be set to the value `allIndicesSameArraySize`.

]

**[constr\_1322] Size Indicator for undefined `dynamicArraySizeProfile`***Imposition time:* CP: IT\_CpgExe

[If the `ImplementationDataType.dynamicArraySizeProfile` does not exist but the `ImplementationDataType` is mapped to an `ApplicationArrayDataType` where the attribute `ApplicationArrayDataType.dynamicArraySizeProfile` exists, then the `ImplementationDataType` shall have the category `STRUCTURE`, representing a Variable-Size Array Data Type with Size Indicator enabled.]

**[constr\_1363] Existence of attributes of `DiagnosticValueNeeds`***Imposition time:* CP: IT\_CpgExe

[if `DiagnosticValueNeeds` is aggregated by a `SwcServiceDependency` in the role `serviceNeeds` then the attributes

- `DiagnosticValueNeeds.diagnosticValueAccess`
- `DiagnosticValueNeeds.dataLength`
- `DiagnosticValueNeeds.fixedLength`

shall **not** exist.]

**[constr\_1375] Existence of attributes of `CompuMethod` and related meta-classes depending on the value of the `category`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[

	Attribute Existence per Category									
	IDENTICAL	LINEAR	SCALE_LINEAR	RAT_FUNC	SCALE_RAT_FUNC	TEXTTABLE	BITFIELD_TEXTTABLE	SCALE_LINEAR_AND_TEXTTABLE	SCALE_RATIONAL_AND_TEXTTABLE	TAB_NOINTP
<b>Attributes of <code>CompuMethod</code></b>										
<code>compuInternalToPhys</code>		D(1)	D(1)	D(2)	D(2)	D	D	D(8)	D(2)	D
<code>compuPhysToInternal</code>		D(1)	D(1)	D(2)	D(2)				D(2,3)	
<code>displayFormat</code>	0..1	0..1	0..1	0..1	0..1			0..1	0..1	0..1
<b>Attributes of meta-classes related to <code>CompuMethod</code></b>										
<code>compuDefaultValue</code>		O(6)	O(6)	O(6)	O(6)	O(6)	O(6)	O(6)	O(6)	O(6)





CompuScale		D/ 1..1	D/ 1..n	D/ 1..1	D/ 1..n	D/ 1..n	D/ 1..n	D/ 1..n	D/ 1..n	D/1..n
CompuScale.compuInverseValue				O(2)	O(2)	O(5)		O(2,5)	O(2,5)	O(5)
CompuScale.lowerLimit		O	D	D(4)	D(4)	D	D	D	D(4)	D
CompuScale.mask							D			
CompuScale.shortLabel						O(7)	O(7)	O(7)	O(7)	
CompuScale.a2lDisplayText						O	O	O	O	
CompuScale.symbol						O(7)	O(7)	O(7)	O(7)	
CompuScale.upperLimit		O	D	D(4)	D(4)	D	D	D	D(4)	D
CompuConst						D/vt	D/vt	D/vt	D/vt	D/vt or vf
CompuRationalCoeffs		D	D	D	D			D	D	
CompuRationalCoeffs.compuDenominator		D/1 <sub>v</sub>	D/1 <sub>v</sub>	D	D			D/1 <sub>v</sub>	D	
CompuRationalCoeffs.compuNumerator		D/2 <sub>v</sub>	D/2 <sub>v</sub>	D	D			D/2 <sub>v</sub>	D	

#### [constr\_1381] Appearance of core-related possible values of [SwAddrMethod.option](#)

Imposition time: CP: IT\_RteGen

[Any given collection of values stored in the attribute [SwAddrMethod.option](#) according to [TPS\_SWCT\_01456] shall at most include a single value out of the following list:

- `coreGlobal`
- `coreLocal`

#### [constr\_1382] Mutually exclusive existence of attributes [SwVariableRefProxy.autosarVariable](#) vs. [SwVariableRefProxy.mcDataInstanceVar](#)

Imposition time: CP: IT\_CpgExe

[In any given AUTOSAR model, the aggregations [SwVariableRefProxy.autosarVariable](#) and [SwVariableRefProxy.mcDataInstanceVar](#) shall never exist at the same time.]

#### [constr\_1383] Existence of [CompuMethod](#) and [DataConstr](#) for [ImplementationDataTypes](#) of category `TYPE_REFERENCE`

Imposition time: CP: IT\_CpgExe

[The existence of [ImplementationDataType.swDataDefProps.compuMethod](#) and [ImplementationDataType.swDataDefProps.dataConstr](#) for [ImplementationDataTypes](#) of category `TYPE_REFERENCE` is only allowed, if the respective [ImplementationDataType](#), after all type references are resolved, ends up in an [ImplementationDataType](#) of category `VALUE`.]

**[constr\_1384] Definition of `invalidValue` for `DataPrototype` typed by `ApplicationPrimitiveDataType` of category `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, `CUBE_5`, `COM_AXIS`, `RES_AXIS`, and `VAL_BLK`**

*Imposition time:* CP: IT\_CpgExe

[An `invalidValue` shall not be specified for a `DataPrototype` typed by `ApplicationPrimitiveDataType` of category `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, `CUBE_5`, `COM_AXIS`, `RES_AXIS`, and `VAL_BLK`.]

**[constr\_1385] `DataPrototype` is typed by an `ImplementationDataType`**

*Imposition time:* CP: IT\_CpgExe

[If a `DataPrototype` is typed by an `ImplementationDataType`, its `initValue` shall not be provided by an `ApplicationValueSpecification`.]

**[constr\_1386] `PortDefinedArgumentValue` shall only be defined for `AbstractProvidedPortPrototype`**

*Imposition time:* CP: IT\_RteGen

[A `PortAPIOption` which aggregates at least one `PortDefinedArgumentValue` in the role `portArgValue` shall reference an `AbstractProvidedPortPrototype` typed by a `ClientServerInterface` in the role `port`.]

**[constr\_1388] `VariationPointProxy` of category `VALUE` shall not mix "pre-build" and "post-build" use-cases**

*Imposition time:* CP: IT\_CpgExe

[If the value of `category` of the `VariationPointProxy` is set to `VALUE` then there can only be one value yield from the evaluation of a `VariationPointProxy`. In other words, a `VariationPointProxy` of category `VALUE` shall not mix the "pre-build" and "post-build" use-cases.]

**[constr\_1389] Restriction regarding the value of `category` of `VariationPointProxy.implementationDataType`**

*Imposition time:* CP: IT\_CpgExe

[`VariationPointProxy.implementationDataType` shall not be of category `STRUCTURE`, `ARRAY`, `UNION`, `FUNCTION_REFERENCE`, and `DATA_REFERENCE`.

The `VariationPointProxy.implementationDataType` shall be of category `VALUE` or `TYPE_REFERENCE` that, after all references are resolved, yields an `ImplementationDataType` of category `VALUE`.]

**[constr\_1390] Restriction to the value of `SenderReceiverInterface.invalidationPolicy.handleInvalid`**

*Imposition time:* CP: IT\_CpgExe

[If the value of `SenderReceiverInterface.invalidationPolicy.handleInvalid` is set to any value other than `HandleInvalidEnum.dontInvalidate` then



the `invalidValue` shall not be within the interval defined by the `CompuMethod` of the applicable `dataElement`.]

**[constr\_1391] Compatibility of `Units` in the context of assignment using an `ApplicationValueSpecification`**

*Imposition time:* CP: IT\_CpgExe

[If an `ApplicationValueSpecification` is used in the context of an assignment to an `AutosarDataPrototype`, then the `ApplicationValueSpecification.swValueCont.unit` shall be compatible to the `Unit` used in the definition of the given `AutosarDataPrototype`, i.e. `AutosarDataType.swDataDefProps.unit`.]

**[constr\_1392] Compatibility of `Units` in the context of assignment using an `ApplicationRuleBasedValueSpecification`**

*Imposition time:* CP: IT\_CpgExe

[If an `ApplicationRuleBasedValueSpecification` is used in the context of an assignment to an `AutosarDataPrototype` then the `ApplicationRuleBasedValueSpecification.swValueCont.unit` shall be compatible to the `Unit` used in the definition of the given `AutosarDataPrototype`, i.e. `AutosarDataType.swDataDefProps.unit`.]

**[constr\_1393] Existence of `RuleBasedValueCont.unit`**

*Imposition time:* CP: IT\_CpgExe

[For every `RuleBasedValueCont`, the reference `unit` shall exist.]

**[constr\_1395] `NvBlockDataMapping` shall be complete**

*Imposition time:* CP: IT\_RteGen

[If an `NvBlockDataMapping` refers to *sub-elements* or *leaf* elements of the `NvDataInterface.nvData` in the context of a particular `PortPrototype`, then **all remaining sub-elements** or *leaf* elements **shall effectively be mapped** according to [TPS\_SWCT\_01659] by means of a collection of `NvBlockDataMappings`.]

**[constr\_1396] Restriction for the value of attribute `category` for non-terminating `ImplementationDataTypeElements` taken to model a Variable-Size Array Data Type**

*Imposition time:* CP: IT\_CpgExe

[The value of attribute `category` for non-terminating `ImplementationDataTypeElements` taken to model a Variable-Size Array Data Type shall **not** be set to `TYPE_REFERENCE`.]

**[constr\_1397] Existence of attributes of `TransformerHardErrorEvent`**

*Imposition time:* CP: IT\_CpgExe

[For any given `TransformerHardErrorEvent`, **either** the attribute `TransformerHardErrorEvent.operation` **or** `TransformerHardErrorEvent.requiredTrigger` shall exist.]

**[constr\_1398] Existence of attributes of `BaseTypeDirectDefinition`***Imposition time:* CP: IT\_CpgExe

[If the value of attribute `BaseTypeDirectDefinition.baseTypeEncoding` is set to UTF-16 then the attribute `BaseTypeDirectDefinition.byteOrder` shall exist.

The only allowed values of `BaseTypeDirectDefinition.byteOrder` in this case are `mostSignificantByteFirst` and `mostSignificantByteLast`.]

**[constr\_1399] Standardized values of `ModeDeclarationGroup.category`***Imposition time:* CP: IT\_CpgExe

[The AUTOSAR standard defines the following values of the attribute `ModeDeclarationGroup.category` with a standardized meaning:

- `EXPLICIT_ORDER`
- `ALPHABETIC_ORDER`

[TPS\_SWCT\_01010] defines the meaning of these values.

It is **not allowed** to define any custom or project-specific value of the attribute `ModeDeclarationGroup.category`.]

**[constr\_1400] Reference to a specific `DataTransformation`***Imposition time:* CP: IT\_RteGen

[A specific `DataTransformation` shall only be referenced by either

- a `DataPrototypeMapping` in the role `firstToSecondDataTransformation` (and potentially `secondToFirstDataTransformation`) **or**
- an `ISignal` in the role `dataTransformation` **or**
- an `ISignalGroup` in the role `comBasedSignalGroupTransformation` **or**
- a `ClientServerOperationMapping` in the role `firstToSecondDataTransformation`

]

**[constr\_1401] Restrictions on the relation between `DataPrototypeMapping` and `DataTransformation`***Imposition time:* CP: IT\_RteGen

[A `VariableDataPrototype` in the context of a `PortPrototype` shall **not** be referenced by a `DataPrototypeMapping` that references a `DataTransformation` while a `DataMapping` exists that points to this `VariableDataPrototype` (via the `SystemSignal`) that also refers to an `ISignal` that in turn references a `DataTransformation`.]

**[constr\_1402] Applicability of core-related possible values of `SwAddrMethod.option` related to `SwAddrMethod.sectionInitializationPolicy`***Imposition time:* CP: IT\_CpgExe

[If the attribute `SwAddrMethod.option` is set to `coreLocal` then the attribute `SwAddrMethod.sectionInitializationPolicy` of the same `SwAddrMethod` respectively the `MemorySection.swAddrMethod` shall be either set to `INIT` or `CLEARED`.]

**[constr\_1403] `NvBlockDataMappings` to a given `nvData` shall be unambiguous***Imposition time:* CP: IT\_RteGen

[If an `NvBlockDataMapping` exists that **directly** and **completely** maps a specific `NvDataInterface.nvData` in the context of a particular `PortPrototype`, then **no** other `NvBlockDataMapping` which maps sub-elements of the `NvDataInterface.nvData` shall exist.]

**[constr\_1404] All `NvDataInterface.nvData` of `PortPrototypes` in the context of a specific `SwcServiceDependency` shall be mapped to the same `NvBlockDescriptor`***Imposition time:* CP: IT\_RteGen

[In the context of a given `SwcServiceDependency` (which, in turn, is owned by an `AtomicSwComponentType`), **all** `NvDataInterface.nvData` of `PortPrototypes` referenced by a `RoleBasedPortAssignment` with attribute `RoleBasedPortAssignment.role` set to `NvDataPort` shall be connected (either directly or via the definition of suitable `PortInterfaceMappings`) to `NvDataInterface.nvData` (on the side of the `NvBlockSwComponentType`) that are **completely mapped** (via `NvBlockDataMappings`) to the identical `NvBlockDescriptor.ramBlock`.]

**[constr\_1407] Definition of `SwDataDefProps.dataConstr` depending on the capabilities of the data type***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.dataConstr` according to [constr\_1288] and [constr\_1289] is only supported for a `DataPrototype` of category `ARRAY` if the corresponding `ApplicationArrayDataType` or `ImplementationDataType` of category `ARRAY` also supports the specification of a `SwDataDefProps.dataConstr`.]

**[constr\_1408] Definition of `SwDataDefProps.displayFormat` depending on the capabilities of the data type***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.displayFormat` according to [constr\_1288] and [constr\_1289] is only supported for a `DataPrototype` of category `ARRAY` if the corresponding `ApplicationArrayDataType` or `ImplementationDataType` of category `ARRAY` also supports the specification of a `SwDataDefProps.displayFormat`.]

**[constr\_1409] Definition of `SwDataDefProps.dataConstr` depending on the capabilities of the element data type**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.dataConstr` according to [constr\_1007] and [constr\_1009] is only supported for an `ApplicationArrayDataType` or an `ImplementationDataType` of category `ARRAY` if the aggregated `ApplicationArrayDataType.element` or `ImplementationDataType.subElement` also supports the specification of a `SwDataDefProps.dataConstr`.]

**[constr\_1410] Definition of `SwDataDefProps.displayFormat` depending on the capabilities of the element data type**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.displayFormat` according to [constr\_1007] and [constr\_1009] is only supported for an `ApplicationArrayDataType` or an `ImplementationDataType` of category `ARRAY` if the aggregated `ApplicationArrayDataType.element` or `ImplementationDataType.subElement` also supports the specification of a `SwDataDefProps.displayFormat`.]

**[constr\_1413] Definition of `SwDataDefProps.stepSize` depending on the capabilities of the data type**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.stepSize` according to [constr\_1288] and [constr\_1289] is only supported for a `DataPrototype` of category `ARRAY` if the corresponding `ApplicationArrayDataType` or `ImplementationDataType` of category `ARRAY` also supports the specification of a `SwDataDefProps.stepSize`.]

**[constr\_1414] Definition of `SwDataDefProps.stepSize` depending on the capabilities of the element data type**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.stepSize` according to [constr\_1007] and [constr\_1009] is only supported for an `ApplicationArrayDataType` or an `ImplementationDataType` of category `ARRAY` if the aggregated `ApplicationArrayDataType.element` or `ImplementationDataType.subElement` also supports the specification of a `SwDataDefProps.stepSize`.]

**[constr\_1415] Supported values of `ModeSwitchEventTriggeredActivity.role`**

*Imposition time:* CP: IT\_RteGen

[The only supported value of `ModeSwitchEventTriggeredActivity.role` is `WriteBlock`.]

**[constr\_1416] Existence of `ApplicationArrayElement.maxNumberOfElements`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The attribute `ApplicationArrayElement.maxNumberOfElements` shall exist for all `ApplicationArrayElements` defined in the scope of an `ApplicationArrayDataType` where the attribute `ApplicationArrayDataType.dynamicArraySizeProfile` does not exist.]

**[constr\_1417] Invalid connection between `NvBlockSwComponentType` and other `AtomicSwComponentType` (I)***Imposition time:* CP: IT\_RteGen

[A configuration where an `RPortPrototype` owned by an `AtomicSwComponentType` is simultaneously and directly connected to `AbstractProvidedPortPrototypes` of a collection of `AtomicSwComponentTypes` where at least one in the collection is an `NvBlockSwComponentType` for a matching set of `dataElements` in all these `PortPrototypes` shall be considered invalid.]

**[constr\_1418] Invalid connection between `NvBlockSwComponentType` and other `AtomicSwComponentType` (II)***Imposition time:* CP: IT\_RteGen

[A configuration where a `PRPortPrototype` owned by an `AtomicSwComponentType` is connected to a `PPortPrototype` owned by an `NvBlockSwComponentType` for a matching set of `dataElements` in all these `PortPrototypes` shall be considered invalid.]

**[constr\_1420] Existence of `SwAxisIndividual.inputVariableType`***Imposition time:* CP: IT\_CpgExe

[If the reference `SwAxisIndividual.inputVariableType` does not exist then either:

- `SwAxisIndividual.dataConstr`
- `SwAxisIndividual.unit`

or

- `SwAxisIndividual.dataConstr`
- `SwAxisIndividual.compuMethod.unit`

shall exist.]

**[constr\_1422] Value of `category` is `VOID`***Imposition time:* CP: IT\_CpgExe

[If the value of the attribute `SwBaseType.category` is set to `VOID` then the attribute `baseTypeSize` and `baseTypeEncoding` shall not exist.]

### [constr\_1423] Completeness of references `ArVariableInImplementationDataInstanceRef.contextDataPrototype`

*Imposition time:* CP: IT\_CpgExe

[The reference `ArVariableInImplementationDataInstanceRef.contextDataPrototype` shall be defined for

- each *leaf* (i.e. the end of a chain of aggregating elements) `ImplementationDataTypeElement` of category `TYPE_REFERENCE` in a chain of referencing `ImplementationDataTypes` which is not the `targetDataPrototype`
- and each `ImplementationDataTypeElement` owned by an `ImplementationDataType` or `ImplementationDataTypeElement` of category `ARRAY` in a chain of referencing `ImplementationDataTypes`

starting from the `ImplementationDataTypes` of the `rootVariableDataPrototype` down to the leaf `ImplementationDataTypeElement` which is typed (directly or indirectly via `ImplementationDataType` of category `TYPE_REFERENCE`) by the `ImplementationDataType` of the `targetDataPrototype`.]

### [constr\_1424] Existence of `ArVariableInImplementationDataInstanceRef.contextDataPrototype`

*Imposition time:* CP: IT\_CpgExe

[The attribute `ArVariableInImplementationDataInstanceRef.contextDataPrototype` shall only exist for an `ImplementationDataTypeElement` category `TYPE_REFERENCE` or `ARRAY`.]

### [constr\_1425] Definition of `swCalprmAxisSet.swCalprmAxis` / `SwAxisIndividual.swVariableRef` depending on the capabilities of the data type

*Imposition time:* CP: IT\_CpgExe

[The definition of a `swCalprmAxisSet.swCalprmAxis` / `SwAxisIndividual.swVariableRef` in the context of an `InstantiationDataDefProps` or a `ParameterAccess` is only supported for a `DataPrototype` of category `ARRAY` if the data type of the `ApplicationArrayElement` also supports the specification of a `swCalprmAxisSet.swCalprmAxis` / `SwAxisIndividual.swVariableRef` according to [constr\_1289].

Thereby, multiple `ApplicationArrayDataTypes` might be nested to express multiple array dimensions.]

### [constr\_1426] Consistency of array sizes for axes and input variable array

*Imposition time:* CP: IT\_CpgExe

[The number of array dimension defined by `ApplicationArrayDataTypes` and the values of the `maxNumberOfElements` attributes for the array of elements of category `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, `CUBE_5`, `COM_AXIS`, or `RES_AXIS` shall be **identical** to the number of array dimension and according value of the `maxNumberOf`

Elements of the `VariableDataPrototype` referenced by `SwAxisIndividual.swVariableRef.autosarVariable`.]

**[constr\_1427] Definition of `swCalprmAxisSet.swCalprmAxis` / `SwAxisGrouped.swCalprmRef` depending on the capabilities of the data type**

*Imposition time:* CP: IT\_CpgExe

[The definition of a `swCalprmAxisSet.swCalprmAxis` / `SwAxisGrouped.swCalprmRef` in the context of an `InstantiationDataDefProps` or a `ParameterAccess` is only supported for a `DataPrototype` of category `ARRAY` if the data type of the `ApplicationArrayElement` also supports the specification of a `swCalprmAxisSet.swCalprmAxis` / `SwAxisGrouped.swCalprmRef` according to [constr\_1289].

Thereby, multiple `ApplicationArrayDataTypes` might be nested to express multiple array dimensions.]

**[constr\_1428] Consistency of array sizes for arrays of elements of category `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, or `CUBE_5` arrays and used group axes arrays**

*Imposition time:* CP: IT\_CpgExe

[The number of array dimension defined by `ApplicationArrayDataTypes` and the values of attribute `maxNumberOfElements` attributes for the array of elements of category `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, or `CUBE_5` needs to be identical to the number of array dimension and according value of the `maxNumberOfElements` of the `DataPrototype` referenced by `SwAxisGrouped.swCalprmRef.arParameter`.]

**[constr\_1429] Access to data within `PortPrototypes` from within `RunnableEntities`**

*Imposition time:* CP: IT\_CpgExe

[For a `VariableAccess` that is aggregated in the roles

- `RunnableEntity.dataWriteAccess`
- `RunnableEntity.dataReadAccess`
- `RunnableEntity.dataSendPoint`
- `RunnableEntity.dataReceivePointByArgument`
- `RunnableEntity.dataReceivePointByValue`

the existence of the following attributes is not allowed:

- `VariableAccess.accessedVariable.autosarVariable.contextDataPrototype`
- `VariableAccess.accessedVariable.autosarVariable.rootVariableDataPrototype`



- `VariableAccess.accessedVariable.autosarVariableInImpl-Datatype`
- `VariableAccess.accessedVariable.localVariable`

In other words: in this case, only the references

- `VariableAccess.accessedVariable.autosarVariable.portPrototype` and
- `VariableAccess.accessedVariable.autosarVariable.targetDataPrototype`

shall exist and the latter shall **exclusively** refer to a `VariableDataPrototype` that is aggregated as either

- `SenderReceiverInterface.dataElement` or
- `NvDataInterface.nvData`.

]

#### [constr\_1430] Access to local data from within `RunnableEntity`s

*Imposition time:* CP: IT\_CpgExe

[For `VariableAccess` that is aggregated in the roles

- `RunnableEntity.writtenLocalVariable`
- `RunnableEntity.readLocalVariable`

the existence of the following attributes is not allowed:

- `VariableAccess.accessedVariable.autosarVariableInImpl-Datatype`
- `VariableAccess.accessedVariable.autosarVariable`

In other words, **only** the reference `VariableAccess.accessedVariable.localVariable` shall be used in this case.]

#### [constr\_1431] Access to parameters from within `RunnableEntity`s

*Imposition time:* CP: IT\_CpgExe

[For a `ParameterAccess` that is aggregated in the role `RunnableEntity.parameterAccess` the existence of the following attributes is not allowed:

- `ParameterAccess.accessedParameter.autosarParameter.contextDataPrototype`
- `ParameterAccess.accessedParameter.autosarParameter.rootParameterDataPrototype`

In other words: in this case, **one** of the following alternatives is allowed to exist:



- a combination of
  - `ParameterAccess.accessedParameter.autosarParameter.port-Prototype` and
  - `ParameterAccess.accessedParameter.autosarParameter.targetDataPrototype` that **exclusively** refers to a `ParameterDataPrototype` aggregated by a `ParameterInterface` in the role `parameter`.
- `ParameterAccess.accessedParameter.localParameter` that refers to a `ParameterDataPrototype` that is either aggregated as
  - `InternalBehavior.constantMemory` or
  - `SwcInternalBehavior.perInstanceParameter` or
  - `SwcInternalBehavior.sharedParameter`.

]

#### [constr\_1432] Multiplicity of `CommunicationBufferLocking`

*Imposition time:* CP: IT\_RteGen

[In a concrete aggregated set of `PortAPIOption.supportedFeature`, `CommunicationBufferLocking` shall exist.]

#### [constr\_1434] `CompuScales` shall not have identical `CompuScale Value Symbolic Names`

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[In a `CompuMethod` that is subject to [constr\_1146], no two `CompuScales` shall have identical `CompuScale Value Symbolic Names` (according to [TPS\_SWCT\_01696]).]

#### [constr\_1438] `ApplicationArrayElement.indexDataType` needs to refer to a `CompuMethod` of category `TEXTTABLE`

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The reference `ApplicationArrayElement.indexDataType` shall only point to an `ApplicationPrimitiveDataType` that in turn refers to a `CompuMethod` of category `TEXTTABLE`.]

#### [constr\_1439] Requirements on `ApplicationArrayElement` if attribute `indexDataType` exists

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If `ApplicationArrayElement.indexDataType` exists then the attribute `ApplicationArrayElement.arraySizeSemantics` shall be set to the value `fixedSize` and attribute `arraySizeHandling` shall not exist.]

**[constr\_1440] Size of the `CompuMethod` of category `TEXTTABLE` referenced by `ApplicationArrayElement.indexDataType`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The interval defined by the `CompuScales` contained in the `CompuMethod` referenced by `ApplicationArrayElement.indexDataType` shall start at 0 and include all integer values until `ApplicationArrayElement.maxNumberOfElements` - 1.]

**[constr\_1442] category `TYPE_REFERENCE` shall not be used for modeling the "payload" of a `Wrapped Union Data Type`***Imposition time:* CP: IT\_CpgExe

[For the modeling of the "payload" part of a `Wrapped Union Data Type` it shall not be possible to use an `ImplementationDataTypeElement` of category `TYPE_REFERENCE` that finally (i.e. after all possible indirections are resolved) boils down to category `UNION`.]

**[constr\_1444] Limited applicability of `Wrapped Union Data Type`***Imposition time:* CP: IT\_CpgExe

[There is no support for the usage of `Wrapped Union Data Type` in `PortInterfaceMappings`, and `Diagnostics`.]

**[constr\_1445] Initialization of the `Member Selector` of a `Wrapped Union Data Type`***Imposition time:* CP: IT\_CpgExe

[The `initValue` for the `Member Selector` shall **never be set to any value other than 1**.]

**[constr\_1446] No definition of `invalidValue` for a `Wrapped Union Data Type`***Imposition time:* CP: IT\_CpgExe

[The definition of an `invalidValue` for a `DataPrototype` typed by a `Wrapped Union Data Type` is not supported.]

**[constr\_1468] Limitation on the number of `SwcExclusiveAreaPolicys`***Imposition time:* CP: IT\_CpgExe

[An `ExclusiveArea` shall only be referenced by **at most** one `SwcExclusiveAreaPolicy`.]

**[constr\_1469] Applicability of constraints depending on the existence of a data transformation***Imposition time:* CP: IT\_RteGen

[`[constr_1269]`, `[constr_1270]`, `[constr_1268]`, and `[constr_1240]` shall **not** apply under the following conditions:

- A reference from the respective `ClientServerOperationMapping` to a `DataTransformation` in the role `firstToSecondDataTransformation` exists.
- The value of the attribute `dataTransformationKind` of the referenced `DataTransformation` is set to `DataTransformationKindEnum.asymmetricFromByteArray` or `DataTransformationKindEnum.asymmetricToByteArray`.

]

#### [constr\_1516] Completeness of references `ArParameterInImplementationDataInstanceRef.contextDataPrototype`

*Imposition time:* CP: IT\_CpgExe

[The reference `ArParameterInImplementationDataInstanceRef.contextDataPrototype` shall be defined for

- each *leaf* (i.e. the end of a chain of aggregating elements) `ImplementationDataTypeElement` of category `TYPE_REFERENCE` in a chain of referencing `ImplementationDataTypes` which is not the `targetDataPrototype`
- and each `ImplementationDataTypeElement` owned by an `ImplementationDataType` or `ImplementationDataTypeElement` of category `ARRAY` in a chain of referencing `ImplementationDataTypes`

starting from the `ImplementationDataTypes` of the `rootParameterDataPrototype` down to the leaf `ImplementationDataTypeElement` which is typed (directly or indirectly via `ImplementationDataType` of category `TYPE_REFERENCE`) by the `ImplementationDataType` of the `targetDataPrototype`.]

#### [constr\_1517] Existence of `ArParameterInImplementationDataInstanceRef.contextDataPrototype`

*Imposition time:* CP: IT\_CpgExe

[The attribute `ArParameterInImplementationDataInstanceRef.contextDataPrototype` shall only exist for an `ImplementationDataTypeElement` category `TYPE_REFERENCE` or `ARRAY`.]

#### [constr\_1518] Consistency of data types in the context of `ArParameterInImplementationDataInstanceRef`

*Imposition time:* CP: IT\_RteGen

[The definition of attributes `contextDataPrototype` and `targetDataPrototype` shall be enclosed in the context of the definition of the data type used to type `rootParameterDataPrototype`.]

### [constr\_1519] Existence of attributes vs. category of **ApplicationValueSpecification**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

Attribute of <b>ApplicationValueSpecification</b>	Attribute Existence per Category										
	VALUE	VAL_BLK	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5
<b>swValueCont</b>	D	D	D	D	D	D	D	D	D	D	D
<b>swValueCont.unit</b>	O	O	O	O	O	O	O	O	O	O	O
<b>swValueCont.swValuesPhys</b>	D	D	D	D	D	D	D	D	D	D	D
<b>swValueCont.swArraysizes</b>		D			D	D	D	D	D	D	D
<b>swAxisCont</b>						D	O(1)	O(1)	O(1)	O(1)	O(1)
<b>swAxisCont.unit</b>						O	O	O	O	O	O
<b>swAxisCont.category</b>						D	D	D	D	D	D
<b>swAxisCont.swAxisIndex</b>						D	D	D	D	D	D
<b>swAxisCont.swArraysizes</b>						D	D	D	D	D	D
<b>swAxisCont.swValuesPhys</b>						D	O(1)	O(1)	O(1)	O(1)	O(1)

### [constr\_1520] Semantics of **ObdRatioServiceNeeds.rateBasedMonitoredEvent**

*Imposition time:* CP: IT\_RteGen

[In the context of an **SwcServiceDependency**, each **DiagnosticEventNeeds** referenced in the role **rateBasedMonitoredEvent** shall only be referenced by at most a single **ObdRatioServiceNeeds**.]

### [constr\_1521] Reference from **AsynchronousServerCallReturnsEvent** to **AsynchronousServerCallResultPoint**

*Imposition time:* CP: IT\_CpgExe

[In the context of a **RunnableEntity**, a given **AsynchronousServerCallResultPoint** shall only be referenced by one **AsynchronousServerCallReturnsEvent** in the role **eventSource**.]

### [constr\_1523] No mode disabling for **OperationInvokedEvents**

*Imposition time:* CP: IT\_RteGen

[An **OperationInvokedEvent** shall not have a reference to a **ModeDeclaration** in the role **disabledMode**.]

### [constr\_1538] Restriction for reference **ReceiverComSpec.dataElement**

*Imposition time:* CP: IT\_CpgExe

[The reference **ReceiverComSpec.dataElement** shall not refer to an **ArgumentDataPrototype** or **ParameterDataPrototype**.]

### [constr\_1539] Restriction for [SenderComSpec.dataElement](#)

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The reference [SenderComSpec.dataElement](#) **shall not** refer to an [ArgumentDataPrototype](#) or [ParameterDataPrototype](#).]

### [constr\_1540] Existence of [ClientComSpec.operation](#)

*Imposition time:* CP: IT\_CpgExe

[The reference [ClientComSpec.operation](#) **shall exist** if the [AbstractRequiredPortPrototype](#) that owns the [ClientComSpec](#) is typed by a [ClientServerInterface](#).]

### [constr\_1541] Existence of [ServerComSpec.operation](#)

*Imposition time:* CP: IT\_CpgExe

[The reference [ServerComSpec.operation](#) **shall exist** if the [AbstractProvidedPortPrototype](#) that owns the [ServerComSpec](#) is typed by a [ClientServerInterface](#).]

### [constr\_1544] Standardized values and multiplicities for the modeling of [SwAxisIsGeneric](#) for the definition of a fix axis

*Imposition time:* CP: IT\_CpgExe

[

category of <a href="#">swAxisType</a>	category of <a href="#">SwGenericAxisParamType</a>	Multiplicity of <a href="#">swGenericAxisParam</a>	Multiplicity of <a href="#">vf</a>
FIX_AXIS_PAR	OFFSET	1	1
	SHIFT	1	1
FIX_AXIS_PAR_DIST	OFFSET	1	1
	DISTANCE	1	1
FIX_AXIS_PAR_LIST	LIST	1	1..*

]

### [constr\_1545] No initialization for fix axis

*Imposition time:* CP: IT\_CpgExe

[An [ApplicationValueSpecification](#) taken to initialize an [ApplicationPrimitiveDataType](#) that contains a fix axis shall not contain initial values for the axis index of the fix axis inside the [ApplicationPrimitiveDataType](#).]

### [constr\_1583] [PortInterfaceMapping](#) for [DataPrototype](#) typed by Compound Primitive Data Type

*Imposition time:* CP: IT\_CpgExe

[There is one very limited use case to apply [PortInterfaceMapping](#) for a [DataPrototype](#) typed by a Compound Primitive Data Type: adjustment of the [shortName](#) of the [DataPrototype](#). Everything else is **not supported**.]

**[constr\_1592] Definition of `SwDataDefProps.displayPresentation` depending on the capabilities of the data type**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.displayPresentation` according to [constr\_1288] and [constr\_1289] shall only be applied for a `DataPrototype` of category `ARRAY` if the corresponding `ApplicationArrayDataType` or `ImplementationDataType` of category `ARRAY` supports the specification of a `SwDataDefProps.displayPresentation`.]

**[constr\_1602] Definition of `SwDataDefProps.displayPresentation` depending on the capabilities of the element**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The definition of a `SwDataDefProps.displayPresentation` according to [constr\_1007] and [constr\_1009] is only supported for an `ApplicationArrayDataType` or an `ImplementationDataType` of category `ARRAY` if the aggregated `ApplicationArrayDataType.element` or `ImplementationDataType.subElement` also supports the specification of a `SwDataDefProps.displayPresentation`.]

**[constr\_1607] Only Wrapped Union Data Types in `PortInterface`**

*Imposition time:* CP: IT\_CpgExe

[Within the scope of a `PortInterface` the usage of a Union data type is only supported

- for `Wrapped Union Data Types`.
- for a `PortInterface` that is used to type a `PortPrototype` that does not appear as a context in an `instanceRef` owned by a `DataMapping`. See also [constr\_1441].

.]

**[constr\_1608] Existence of `rootParameterDataPrototype`**

*Imposition time:* CP: IT\_CpgExe

[The reference `rootParameterDataPrototype` shall exist if and only if

- `AutosarDataType` of the `autosarParameter` is a composite data type and
- `targetDataPrototype` refers to a `DataPrototype` inside the `rootParameterDataPrototype`.

]

**[constr\_1609] Existence of `rootVariableDataPrototype`**

*Imposition time:* CP: IT\_CpgExe

[The reference `rootVariableDataPrototype` shall exist if and only if

- the `AutosarDataType` of the `autosarVariable` is a composite data type and
- the `targetDataPrototype` refers to a `DataPrototype` inside the `root-VariableDataPrototype`.

]

**[constr\_1610] Existence of `SwDataDefProps.swValueBlockSize` and `SwDataDefProps.swValueBlockSizeMult`**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Attributes `SwDataDefProps.swValueBlockSize` and `SwDataDefProps.swValueBlockSizeMult` shall not exist at the same time in the context of a given `SwDataDefProps`.]

**[constr\_1611] Existence of `ImplementationDataTypeSubElementRef.implementationDataTypeElement` as opposed to `ImplementationDataTypeSubElementRef.parameterImplementationDataTypeElement`**

*Imposition time:* CP: IT\_RteGen

[For any given `ImplementationDataTypeSubElementRef`, either the aggregation

- `ImplementationDataTypeSubElementRef.implementationDataTypeElement` or
- `ImplementationDataTypeSubElementRef.parameterImplementationDataTypeElement`

]

**[constr\_1622] Value of `TimingEvent.offset` vs. `TimingEvent.period`**

*Imposition time:* CP: IT\_RteGen

[If a value is defined for attribute `TimingEvent.offset` then this value shall be greater than 0 and less or equal than the value of attribute `TimingEvent.period` of the respective `TimingEvent`.]

**[constr\_1631] Applicability of `DataPrototypeMapping.secondToFirstDataTransformation`**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[The reference to `DataTransformation` in the role `DataPrototypeMapping.secondToFirstDataTransformation` shall only exist if reference `DataPrototypeMapping.firstToSecondDataTransformation` exists and refers to a `DataTransformation` where attribute `dataTransformationKind` exists and is **not** set to the value `symmetric`.]

### [constr\_1632] Restriction for [firstToSecondDataTransformation](#) and [secondToFirstDataTransformation](#)

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[If both the reference [firstToSecondDataTransformation](#) and the reference [secondToFirstDataTransformation](#) exist in the context of the same [DataPrototypeMapping](#) then

- the [firstToSecondDataTransformation](#) shall refer to a [DataTransformation](#) with attribute [dataTransformationKind](#) set to [asymmetricToByteArray](#) and
- the [secondToFirstDataTransformation](#) shall refer to a [DataTransformation](#) with attribute [dataTransformationKind](#) set to [asymmetricFromByteArray](#).

]

### [constr\_1634] Allowed combinations of [ApplicationDataType.category](#) vs. [CompuMethod.category](#)

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[

	IDENTICAL	LINEAR	SCALE_LINEAR	SCALE_LINEAR_AND_TEXTTABLE	RAT_FUNC	SCALE_RATIONAL_AND_TEXTTABLE	TEXTTABLE	TAB_NOINTP	BITFIELD_TEXTTABLE
VALUE	X	X	X	X	X	X	X	X	X
VAL_BLK	X	X	X	X	X	X	X	X	X
BOOLEAN							X		
CURVE	X	X	X	X	X	X	X	X	X
MAP	X	X	X	X	X	X	X	X	X
CUBOID	X	X	X	X	X	X	X	X	X
CUBE_4	X	X	X	X	X	X	X	X	X
CUBE_5	X	X	X	X	X	X	X	X	X

]



### [constr\_1635] Relevance of attribute `isOptional`

*Imposition time:* CP: IT\_RteGen

[If a `SubElementMapping` is defined for the elements of a structured data type then the attribute `isOptional`<sup>15</sup> shall either not exist for the `firstElement` and `secondElement` or it shall have the identical value for the `firstElement` and `secondElement`.]

### [constr\_1636] Mapping of data types that represent an Optional Element Structure

*Imposition time:* CP: IT\_CpgExe

[An `ApplicationRecordDataType` with at least one `element` where attribute `isOptional` is set to `true` shall only be mapped to an `ImplementationDataType` that fulfills the structural requirements to represent an Optional Element Structure (see [TPS\_SWCT\_01774]).]

### [constr\_1637] Existence of `ImplementationDataTypeElement.isOptional` vs. `ImplementationDataType.isStructWithOptionalElement`

*Imposition time:* CP: IT\_CpgExe

[If one `ImplementationDataType.subElement` sets attribute `isOptional` to the value `true` then the enclosing `ImplementationDataType` shall also set attribute `isStructWithOptionalElement` to `true`.]

### [constr\_1638] First `ImplementationDataTypeElement` of `ImplementationDataType` that represents an Optional Element Structure

*Imposition time:* CP: IT\_CpgExe

[The first `ImplementationDataTypeElement` of `ImplementationDataType` that represents an Optional Element Structure, i.e. the `availabilityBit-field` according to [TPS\_SWCT\_01774], shall not set attribute `isOptional` to `true`.]

### [constr\_1639] `ImplementationDataTypeElement` with attribute `isOptional` set to `True`

*Imposition time:* CP: IT\_CpgExe

[An `ImplementationDataTypeElement` where attribute `isOptional` is set to `True` shall set the value of attribute `category` to either of the following values:

- `VALUE`
- `TYPE_REFERENCE`

]

<sup>15</sup>this is valid for both `ApplicationRecordElement` and `ImplementationDataTypeElement`

**[constr\_1640] No use of Optional Element Structure for interaction with the diagnostic stack***Imposition time:* CP: IT\_RteGen

[An `SwcServiceDependency` that aggregates a diagnostic-related subclass of `ServiceNeeds` shall not refer to any `PortPrototype` by means of either a `RoleBasedPortAssignment` or `RoleBasedDataAssignment` where the respective `PortInterface` contains any `DataPrototype` typed by an Optional Element Structure.]

**[constr\_1662] Compatibility of `ApplicationRecordDataType` and `ImplementationDataType` that both represent an Optional Element Structure***Imposition time:* CP: IT\_CpgExe

[An `ApplicationRecordDataType` that represents an Optional Element Structure shall (after all indirections created by `ImplementationDataTypes` of category `TYPE_REFERENCE` are resolved) only be mapped/connected to an `ImplementationDataType` of category `STRUCTURE` that represents an Optional Element Structure if corresponding pairs of elements have the same value of the attribute `isOptional`.]

**[constr\_1679] Existence of attribute `RoleBasedDataAssignment.usedDataElement.localVariable` for `RoleBasedDataAssignment.role = signalBasedDiagnostics`***Imposition time:* CP: IT\_RteGen

[If the attribute `RoleBasedDataAssignment.role` is set to the value `signalBasedDiagnostics` then the reference `RoleBasedDataAssignment.usedDataElement.localVariable` shall not exist.]

**[constr\_1680] Existence of attribute `RoleBasedDataAssignment.usedDataElement.localVariable` for `RoleBasedDataAssignment.role = AppModeRequestInterface`***Imposition time:* CP: IT\_RteGen

[If the attribute `RoleBasedDataAssignment.role` is set to the value `AppModeRequestInterface`, then the reference `RoleBasedDataAssignment.usedDataElement.localVariable` shall not exist.]

**[constr\_1681] Existence of attribute `RoleBasedDataAssignment.usedDataElement.localVariable` for `RoleBasedDataAssignment.role = VerificationStatus`***Imposition time:* CP: IT\_RteGen

[If the attribute `RoleBasedDataAssignment.role` is set to the value `VerificationStatus` then the reference `RoleBasedDataAssignment.usedDataElement.localVariable` shall not exist.]

**[constr\_1682] Existence of the attribute `RoleBasedDataAssignment.usedDataElement.localVariable` for the value `RoleBasedDataAssignment.role = V2xFacVdp`**

*Imposition time:* CP: IT\_RteGen

[If the attribute `RoleBasedDataAssignment.role` is set to the value `V2xFacVdp` then the reference `RoleBasedDataAssignment.usedDataElement.localVariable` shall not exist.]

**[constr\_1694] Allowed target of `SwDataDefProps.implementationDataType`**

*Imposition time:* CP: IT\_CpgExe

[The reference `SwDataDefProps.implementationDataType` shall only refer to an `ImplementationDataType`. Any other subclass of `AbstractImplementationDataType` is not supported as a reference target.]

**[constr\_1712] Existence of attribute `ArrayValueSpecification.intendedPartialInitializationCount`**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[An `ArrayValueSpecification` where attribute `intendedPartialInitializationCount` exists shall only be applied for the initialization of an `ApplicationArrayDataType` where attribute `arraySizeSemantics` is set to `variableSize`.]

**[constr\_1713] `NvBlockDescriptor.writingStrategy.usedDataElement` shall refer to `AutosarDataPrototype`**

*Imposition time:* CP: IT\_RteGen

[The reference `NvBlockDescriptor.writingStrategy.usedDataElement` shall only refer to an `AutosarDataPrototype`.]

**[constr\_1714] `AutosarDataPrototype` shall only be referenced by a single `NvBlockDescriptor.writingStrategy`**

*Imposition time:* CP: IT\_RteGen

[If an `AutosarDataPrototype` in the context of a `PortPrototype` is referenced from a `NvBlockDescriptor.writingStrategy` then this `AutosarDataPrototype` shall not be referenced from any other `NvBlockDescriptor.writingStrategy`.]

**[constr\_1715] Possible values of attribute `NvBlockDescriptor.writingStrategy.role`**

*Imposition time:* CP: IT\_RteGen

[The attribute `NvBlockDescriptor.writingStrategy.role` shall only have one of the following values (see [TPS\_SWCT\_01586]):

- `storeAtShutdown`
- `storeImmediate`

- **storeOnChange**

]

**[constr\_1716] Consistency of attribute `NvBlockDescriptor.writingStrategy.role` set to `storeAtShutdown`**

*Imposition time:* CP: IT\_RteGen

[The existence of `NvBlockDescriptor.writingStrategy` where attribute `role` is set to `storeAtShutdown` is only supported if `NvBlockDescriptor.nvBlockNeeds.storeAtShutdown` exists and is set to `true`.]

**[constr\_1717] Consistency of attribute `NvBlockDescriptor.writingStrategy.role` set to `storeImmediate`**

*Imposition time:* CP: IT\_RteGen

[The existence of `NvBlockDescriptor.writingStrategy` where attribute `role` is set to `storeImmediate` is only supported if `NvBlockDescriptor.nvBlockNeeds.storeImmediate` exists and is set to `true`.]

**[constr\_1718] Inheritance of `SwDataDefProps.dataConstr` from an array data type to the array elements**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[A `SwDataDefProps.dataConstr` specified for an `ApplicationArrayDataType` or `ImplementationDataType` of category `ARRAY` applies to all array leaf elements represented by (potentially multiple levels of) `ApplicationArrayDataType.element` or `ImplementationDataType.subElement`.

In this case, the `ApplicationArrayDataType.element` or `ImplementationDataType.subElement` shall not have an own `SwDataDefProps.dataConstr`. This also applies for multi-dimensional array data types.]

**[constr\_1719] Inheritance of `SwDataDefProps.displayFormat` from an array data type to the array elements**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[A `SwDataDefProps.displayFormat` specified for an `ApplicationArrayDataType` or `ImplementationDataType` of category `ARRAY` applies to all array leaf elements represented by (potentially multiple levels of) `ApplicationArrayDataType.element` or `ImplementationDataType.subElement`.

In this case, the `ApplicationArrayDataType.element` or `ImplementationDataType.subElement` shall not have an own `SwDataDefProps.displayFormat`. This also applies for multi-dimensional array data types.]

### [constr\_1720] Inheritance of **SwDataDefProps.stepSize** from an array data type to the array elements

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[A **SwDataDefProps.stepSize** specified for an **ApplicationArrayDataType** or **ImplementationDataType** of category **ARRAY** applies to all array leaf elements represented by (potentially multiple levels of) **ApplicationArrayDataType.element** or **ImplementationDataType.subElement**.

In this case, the **ApplicationArrayDataType.element** or **ImplementationDataType.subElement** shall not have an own **SwDataDefProps.stepSize**. This also applies for multi-dimensional array data types.]

### [constr\_1724] Usage of attribute **ClientServerOperation.diagArgIntegrity**

*Imposition time:* CP: IT\_RteGen

[With the exception of the context of a **ServiceSwComponentType**, the attribute **ClientServerOperation.diagArgIntegrity** shall only have the value **true** if the **ClientServerInterface** containing the respective **ClientServerOperation** is used to type a **PPortPrototype** that is referenced by a **RoleBasedPortAssignment** aggregated by a **SwcServiceDependency** that in turn aggregates **DiagnosticRoutineNeeds**.]

### [constr\_1726] Ordering of **MetaDataItemSet.metaDataItem**

*Imposition time:* CP: IT\_CpgExe

[The ordering of the elements of **MetaDataItemSet.metaDataItem** shall be **descending** with respect to the value of **MetaDataItem.length**, such that the **MetaDataItem** with the largest value of attribute **length** is located in the first position and the **MetaDataItem** with the smallest value of attribute **length** is located in the last position.]

### [constr\_1735] Limitation of the aggregation of **AutosarVariableRef** in the context of an **NvBlockDataMapping** owned by a **BulkNvDataDescriptor**

*Imposition time:* CP: IT\_RteGen

[Any **NvBlockDataMapping** owned by a **BulkNvDataDescriptor** shall only aggregate an **AutosarVariableRef** in the role **readNvData** and **nvRamBlockElement** (that in turn refers to the **BulkNvDataDescriptor.bulkNvBlock**).]

### [constr\_1741] Restriction to explicit sending semantics for the usage of **DataServices** in the context of a **SwcServiceDependency** that aggregates **DiagnosticValueNeeds** that in turn is referenced by a **DiagnosticIoControlNeeds**

*Imposition time:* CP: IT\_RteGen

[A **dataElement**

- that is referenced by a **RoleBasedDataAssignment** (where the attribute **role** is set to **signalBasedDiagnostics**) owned by a **SwcServiceDependency**

that aggregates `DiagnosticValueNeeds` that in turn is referenced by a `DiagnosticIoControlNeeds`

- **shall also be referenced** by a `VariableAccess` aggregated in the role `dataSendPoint` by a given `RunnableEntity` that in turn belongs to the enclosing `SwcInternalBehavior`.
- **shall not be referenced** by a `VariableAccess` aggregated in the role `dataWriteAccess` by a given `RunnableEntity` that in turn belongs to the enclosing `SwcInternalBehavior`.

]

#### [constr\_1754] Aggregation of `NumericalRuleBasedValueSpecification`

*Imposition time:* CP: IT\_CpgExe

[Each `ArrayValueSpecification` shall only aggregate at most one `NumericalRuleBasedValueSpecification` in the role element.

If one `NumericalRuleBasedValueSpecification` is aggregated then it shall be the only aggregated element, i.e. no further `ValueSpecification` shall exist in the same aggregation where an `NumericalRuleBasedValueSpecification` is aggregated.]

#### [constr\_1755] Aggregation of `CompositeRuleBasedValueSpecification`

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[Each `ArrayValueSpecification` shall only aggregate at most one `CompositeRuleBasedValueSpecification` in the role element.

If one `CompositeRuleBasedValueSpecification` is aggregated then it shall be the only aggregated element, i.e. no further `ValueSpecification` shall exist in the same aggregation where an `CompositeRuleBasedValueSpecification` is aggregated.]

#### [constr\_1771] Existence of `SwValueCont.unit`

*Imposition time:* CP: IT\_CpgExe

[For every `SwValueCont`, the reference `unit` shall exist]

#### [constr\_1773] Value of attribute `dataSendPoint.returnValueProvision`

*Imposition time:* CP: IT\_CpgExe

[All `RunnableEntity.dataSendPoint` that refer to the same `accessedVariable` shall define the identical value for attribute `returnValueProvision`.]

**[constr\_1774] Value of attribute `dataReceivePointByArgument.returnValueProvision`***Imposition time:* CP: IT\_CpgExe

[All `RunnableEntity.dataReceivePointByArgument` that refer to the same `accessedVariable` shall define the identical value for attribute `returnValueProvision`.]

**[constr\_1775] Value of attribute `serverCallPoint.returnValueProvision`***Imposition time:* CP: IT\_CpgExe

[All `RunnableEntity.serverCallPoint` that refer to the same `operation` shall define the identical value of attribute `returnValueProvision`.]

**[constr\_1776] Value of attribute `asynchronousServerCallResultPoint.returnValueProvision`***Imposition time:* CP: IT\_CpgExe

[All `RunnableEntity.asynchronousServerCallResultPoint` that refer to the same `AsynchronousServerCallPoint.operation` shall define the identical value of attribute `returnValueProvision`.]

**[constr\_1777] Value of attribute `externalTriggeringPoint.returnValueProvision`***Imposition time:* CP: IT\_CpgExe

[All `RunnableEntity.externalTriggeringPoint` that refer to the same `trigger` shall define the identical value of attribute `returnValueProvision`.]

**[constr\_1778] Value of attribute `modeSwitchPoint.returnValueProvision`***Imposition time:* CP: IT\_CpgExe

[All `RunnableEntity.modeSwitchPoint` that refer to the same `modeGroup` shall define the identical value of attribute `returnValueProvision`.]

**[constr\_1779] Scope of the definition of an `AbstractRuleBasedValueSpecification`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[An `AbstractRuleBasedValueSpecification` shall only be defined in the context of an `ArrayValueSpecification` or a `ConstantSpecification`. If the `AbstractRuleBasedValueSpecification` is defined in the context of a `ConstantSpecification` then a reference to this `ConstantSpecification` shall only be created in the context of an `ArrayValueSpecification`.]



**[constr\_1783] Existence of attribute `ImplementationDataTypeElement.arrayImplPolicy`***Imposition time:* CP: IT\_CpgExe

[Attribute `ImplementationDataTypeElement.arrayImplPolicy` shall only exist if the enclosing `ImplementationDataType` or `ImplementationDataTypeElement` is of category ARRAY.]

**[constr\_1860] Multiplicity of `DelegationSwConnector.innerPort`***Imposition time:* CP: IT\_CompSwcT

[For each `DelegationSwConnector`, the reference `DelegationSwConnector.innerPort` shall exist.]

**[constr\_1861] Multiplicity of `DelegationSwConnector.outerPort`***Imposition time:* CP: IT\_CompSwcT

[For each `DelegationSwConnector`, the reference `DelegationSwConnector.outerPort` shall exist.]

**[constr\_1862] Multiplicity of `PassThroughSwConnector.requiredOuterPort`***Imposition time:* CP: IT\_CompSwcT, AP: IT\_BefAraApiGen

[For each `PassThroughSwConnector`, the reference `PassThroughSwConnector.requiredOuterPort` shall exist.]

**[constr\_1863] Multiplicity of `PassThroughSwConnector.providedOuterPort`***Imposition time:* CP: IT\_CompSwcT, AP: IT\_BefAraApiGen

[For each `PassThroughSwConnector`, the reference `PassThroughSwConnector.providedOuterPort` shall exist.]

**[constr\_1864] Multiplicity of `InstantiationRTEEventProps.refinedEvent`***Imposition time:* CP: IT\_RteGen

[For each `InstantiationRTEEventProps`, the instance-reference `InstantiationRTEEventProps.refinedEvent` shall exist.]

**[constr\_1865] Existence of `InvalidationPolicy.dataElement`***Imposition time:* CP: IT\_CpgExe

[For each `InvalidationPolicy`, the reference `InvalidationPolicy.dataElement` shall exist.]

**[constr\_1866] Existence of `MetaDataItem.length`***Imposition time:* CP: IT\_CpgExe

[For each `MetaDataItem`, attribute `length` shall exist.]



**[constr\_1867] Existence of `MetaDataItem.metaDataItemType`***Imposition time:* CP: IT\_CpgExe[For each `MetaDataItem`, attribute `metaDataItemType` shall exist.]**[constr\_1868] Existence of `MetaDataItemSet.dataElement`***Imposition time:* CP: IT\_CpgExe[For each `MetaDataItemSet` that aggregates at least one `metaDataItem`, at least one reference to a `dataElement` shall exist.]**[constr\_1869] Existence of attribute `ArgumentDataPrototype.direction`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `ArgumentDataPrototype`, attribute `direction` shall be defined.]**[constr\_1871] Existence of attribute `ModeRequestTypeMap.implementationDataType`***Imposition time:* CP: IT\_CpgExe[For each `ModeRequestTypeMap`, attribute `implementationDataType` shall exist.]**[constr\_1872] Existence of attribute `ModeRequestTypeMap.modeGroup`***Imposition time:* CP: IT\_CpgExe[For each `ModeRequestTypeMap`, attribute `modeGroup` shall exist.]**[constr\_1873] Existence of `DataPrototypeMapping.firstDataPrototype`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `DataPrototypeMapping`, the reference in the role `firstDataPrototype` shall exist.]**[constr\_1874] Existence of `DataPrototypeMapping.secondDataPrototype`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `DataPrototypeMapping`, the reference in the role `secondDataPrototype` shall exist.]**[constr\_1875] Existence of reference `ClientServerOperationMapping.firstOperation`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `ClientServerOperationMapping`, the reference in the role `firstOperation` shall exist.]

**[constr\_1876] Existence of reference `ClientServerOperationMapping.secondOperation`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[For each `ClientServerOperationMapping`, the reference in the role `secondOperation` shall exist.]

**[constr\_1877] Existence of reference `ModeDeclarationGroupPrototypeMapping.firstModeGroup`***Imposition time:* CP: IT\_RteGen

[For each `ModeDeclarationGroupPrototypeMapping`, the reference in the role `firstModeGroup` shall exist.]

**[constr\_1878] Existence of reference `ModeDeclarationGroupPrototypeMapping.secondModeGroup`***Imposition time:* CP: IT\_RteGen

[For each `ModeDeclarationGroupPrototypeMapping`, the reference in the role `secondModeGroup` shall exist.]

**[constr\_1879] Existence of reference `ModeDeclarationMapping.firstMode`***Imposition time:* CP: IT\_RteGen

[For each `ModeDeclarationMapping`, at least one reference `firstMode` shall exist.]

**[constr\_1880] Existence of reference `ModeDeclarationMapping.secondMode`***Imposition time:* CP: IT\_RteGen

[For each `ModeDeclarationMapping`, the reference `secondMode` shall exist.]

**[constr\_1881] Existence of reference `TriggerMapping.firstTrigger`***Imposition time:* CP: IT\_RteGen

[For each `TriggerMapping`, the reference `firstTrigger` shall exist.]

**[constr\_1882] Existence of reference `TriggerMapping.secondTrigger`***Imposition time:* CP: IT\_RteGen

[For each `TriggerMapping`, the reference `secondTrigger` shall exist.]

**[constr\_1883] Existence of `ApplicationCompositeDataTypeSubElementRef.applicationCompositeElement`***Imposition time:* CP: IT\_RteGen

[For each `ApplicationCompositeDataTypeSubElementRef`, the reference `applicationCompositeElement` shall exist.]

**[constr\_1884] Existence of attribute `TextTableMapping.identicalMapping`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `TextTableMapping`, the attribute `identicalMapping` shall exist.]**[constr\_1885] Existence of attribute `TextTableMapping.mappingDirection`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `TextTableMapping`, the attribute `mappingDirection` shall exist.]**[constr\_1886] Existence of attribute `TextTableValuePair.firstValue`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `TextTableValuePair`, the attribute `firstValue` shall exist.]**[constr\_1887] Existence of attribute `TextTableValuePair.secondValue`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen[For each `TextTableValuePair`, the attribute `secondValue` shall exist.]**[constr\_1888] Existence of attribute `DataTransformation.executeDespiteDataUnavailability`***Imposition time:* CP: IT\_RteGen[For each `DataTransformation`, the attribute `executeDespiteDataUnavailability` shall exist.]**[constr\_1889] Existence of attribute `QueuedReceiverComSpec.queueLength`***Imposition time:* CP: IT\_CpgExe[For each `QueuedReceiverComSpec`, attribute `queueLength` shall exist.]**[constr\_1890] Existence of attribute `DataFilter.dataFilterType`***Imposition time:* CP: IT\_CpgExe[For each `DataFilter`, attribute `dataFilterType` shall exist.]**[constr\_1892] Existence of attribute `TransmissionAcknowledgementRequest.timeout`***Imposition time:* CP: IT\_CpgExe[For each `TransmissionAcknowledgementRequest`, attribute `timeout` shall exist.]**[constr\_1894] Existence of attribute `ModeSwitchSenderComSpec.queueLength`***Imposition time:* CP: IT\_CpgExe[For each `ModeSwitchSenderComSpec`, attribute `queueLength` shall exist.]

**[constr\_1895] Existence of attribute `ModeSwitchSenderComSpec.modeGroup`***Imposition time:* CP: IT\_CpgExe[For each `ModeSwitchSenderComSpec`, attribute `modeGroup` shall exist.]**[constr\_1896] Existence of attribute `ModeSwitchReceiverComSpec.modeGroup`***Imposition time:* CP: IT\_CpgExe[For each `ModeSwitchReceiverComSpec`, attribute `modeGroup` shall exist.]**[constr\_1897] Existence of reference `ParameterProvideComSpec.parameter`***Imposition time:* CP: IT\_CpgExe[For each `ParameterProvideComSpec`, the reference `parameter` shall exist.]**[constr\_1898] Existence of reference `ParameterRequireComSpec.parameter`***Imposition time:* CP: IT\_CpgExe[For each `ParameterRequireComSpec`, the reference `parameter` shall exist.]**[constr\_1899] Existence of reference `NvRequireComSpec.variable`***Imposition time:* CP: IT\_CpgExe[For each `NvRequireComSpec`, the reference `variable` shall exist.]**[constr\_1900] Existence of reference `NvProvideComSpec.variable`***Imposition time:* CP: IT\_CpgExe[For each `NvProvideComSpec`, the reference `variable` shall exist.]**[constr\_1903] Existence of reference `DataTypeMap.applicationDataType`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `DataTypeMap`, reference `applicationDataType` shall exist.]**[constr\_1904] Existence of reference `DataTypeMap.implementationDataType`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `DataTypeMap`, reference `implementationDataType` shall exist.]**[constr\_1905] Existence of attribute `SwTextProps.arraySizeSemantics`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `SwTextProps`, attribute `arraySizeSemantics` shall exist.]**[constr\_1906] Existence of attribute `SwTextProps.swMaxTextSize`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `SwTextProps`, attribute `swMaxTextSize` shall exist.]

**[constr\_1907] Existence of attribute `ApplicationArrayDataType.element`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `ApplicationArrayDataType`, the aggregation of `ApplicationArrayElement` in the role `element` shall exist.]

**[constr\_1908] Existence of attribute `ApplicationRecordDataType.element`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `ApplicationRecordDataType`, the aggregation of `ApplicationRecordElement` in the role `element` shall exist.]

**[constr\_1909] Existence of attribute `ImplementationProps.symbol`***Imposition time:* CP: IT\_CpgExe

[For each `ImplementationProps`, the attribute `symbol` shall exist.]

**[constr\_1910] Existence of attribute `BaseType.baseTypeDefinition`***Imposition time:* CP: IT\_CpgExe

[For each `BaseType` (which will be utilized in the form of `SwBaseType`), the aggregation in the role `baseTypeDefinition` shall exist.]

**[constr\_1911] Existence of `ArVariableInImplementationDataInstanceRef.targetDataPrototype`***Imposition time:* CP: IT\_CpgExe

[For each `ArVariableInImplementationDataInstanceRef`, the reference `targetDataPrototype` shall exist.]

**[constr\_1912] Existence of reference `ArParameterInImplementationDataInstanceRef.targetDataPrototype`***Imposition time:* CP: IT\_CpgExe

[For each `ArParameterInImplementationDataInstanceRef`, the reference `targetDataPrototype` shall exist.]

**[constr\_1913] Existence of attribute `CompuRationalCoeffs.compuDenominator`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `CompuRationalCoeffs`, the attribute `compuDenominator` shall exist.]

**[constr\_1914] Existence of attribute `CompuRationalCoeffs.compuNumerator`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `CompuRationalCoeffs`, the attribute `compuNumerator` shall exist.]

**[constr\_1915] Existence of attribute `PhysicalDimensionMapping.firstPhysicalDimension`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `PhysicalDimensionMapping`, attribute `firstPhysicalDimension` shall exist.]

**[constr\_1916] Existence of attribute `PhysicalDimensionMapping.secondPhysicalDimension`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `PhysicalDimensionMapping`, attribute `secondPhysicalDimension` shall exist.]

**[constr\_1917] Existence of `ConstantSpecification.valueSpec`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `ConstantSpecification`, the aggregation of `ValueSpecification` in the role `valueSpec` shall exist.]

**[constr\_1918] Existence of `RecordValueSpecification.field`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `RecordValueSpecification`, the aggregation of `ValueSpecification` in the role `field` shall exist.]

**[constr\_1919] Existence of `TextValueSpecification.value`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `TextValueSpecification`, attribute `value` shall exist.]

**[constr\_1920] Existence of `NumericalValueSpecification.value`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `NumericalValueSpecification`, attribute `value` shall exist.]

**[constr\_1921] Existence of `ReferenceValueSpecification.referenceValue`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `ReferenceValueSpecification`, attribute `referenceValue` shall exist.]

**[constr\_1922] Existence of `ApplicationRuleBasedValueSpecification.category`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `ApplicationRuleBasedValueSpecification`, attribute `category` shall exist.]

**[constr\_1923] Existence of `RuleBasedAxisCont.ruleBasedValues`***Imposition time:* CP: IT\_CpgExe[For each `RuleBasedAxisCont`, attribute `ruleBasedValues` shall exist.]**[constr\_1924] Existence of `RuleBasedValueCont.ruleBasedValues`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `RuleBasedValueCont`, attribute `ruleBasedValues` shall exist.]**[constr\_1925] Existence of `NumericalRuleBasedValueSpecification.ruleBasedValues`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `NumericalRuleBasedValueSpecification`, attribute `ruleBasedValues` shall exist.]**[constr\_1926] Existence of `RuleBasedValueSpecification.rule`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `RuleBasedValueSpecification`, attribute `rule` shall exist.]**[constr\_1927] Existence of `RuleBasedValueSpecification.arguments`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `RuleBasedValueSpecification`, the aggregation of `RuleArguments` in the role `arguments` shall exist.]**[constr\_1928] Existence of `CompositeRuleBasedValueSpecification.rule`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `CompositeRuleBasedValueSpecification`, attribute `rule` shall exist.]**[constr\_1929] Existence of `CompositeRuleBasedValueSpecification.argument`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `CompositeRuleBasedValueSpecification`, the aggregation of `CompositeValueSpecification` in the role `argument` shall exist.]**[constr\_1930] Existence of `ConstantReference.constant`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen[For each `ConstantReference`, attribute `constant` shall exist.]**[constr\_1931] Existence of `ConstantSpecificationMapping.applConstant`***Imposition time:* CP: IT\_CpgExe[For each `ConstantSpecificationMapping`, the reference to meta-class `ConstantSpecification` in the role `applConstant` shall exist.]

**[constr\_1932] Existence of `ConstantSpecificationMapping.implConstant`***Imposition time:* CP: IT\_CpgExe

[For each `ConstantSpecificationMapping`, the reference to meta-class `ConstantSpecification` in the role `implConstant` shall exist.]

**[constr\_1933] Existence of `CalibrationParameterValue.initializedParameter`***Imposition time:* CP: IT\_CpgExe

[For each `CalibrationParameterValue`, the reference to meta-class `ConstantSpecification` in the role `initializedParameter` shall exist.]

**[constr\_1935] Existence of attribute `SwcInternalBehavior.supportsMultipleInstantiation`***Imposition time:* CP: IT\_CpgExe

[For each `SwcInternalBehavior`, attribute `supportsMultipleInstantiation` shall exist.]

**[constr\_1936] Existence of attribute `RunnableEntity.symbol`***Imposition time:* CP: IT\_CpgExe

[For each `RunnableEntity`, attribute `symbol` shall exist.]

**[constr\_1938] Existence of attribute `RunnableEntityArgument.symbol`***Imposition time:* CP: IT\_CpgExe

[For each `RunnableEntityArgument`, attribute `symbol` shall exist.]

**[constr\_1939] Existence of attribute `ExecutableEntityActivationReason.bitPosition`***Imposition time:* CP: IT\_CpgExe

[For each `ExecutableEntityActivationReason`, attribute `bitPosition` shall exist.]

**[constr\_1940] Existence of attribute `AsynchronousServerCallReturnsEvent.eventSource`***Imposition time:* CP: IT\_CpgExe

[For each `AsynchronousServerCallReturnsEvent`, attribute `eventSource` shall exist.]

**[constr\_1941] Existence of attribute `DataSendCompletedEvent.eventSource`***Imposition time:* CP: IT\_CpgExe

[For each `DataSendCompletedEvent`, attribute `eventSource` shall exist.]



**[constr\_1942] Existence of attribute `DataWriteCompletedEvent.eventSource`***Imposition time:* CP: IT\_CpgExe[For each `DataWriteCompletedEvent`, attribute `eventSource` shall exist.]**[constr\_1943] Existence of attribute `DataReceivedEvent.data`***Imposition time:* CP: IT\_CpgExe[For each `DataReceivedEvent`, attribute `data` shall exist.]**[constr\_1944] Existence of attribute `DataReceiveErrorEvent.data`***Imposition time:* CP: IT\_CpgExe[For each `DataReceiveErrorEvent`, attribute `data` shall exist.]**[constr\_1945] Existence of attribute `OperationInvokedEvent.operation`***Imposition time:* CP: IT\_CpgExe[For each `OperationInvokedEvent`, attribute `operation` shall exist.]**[constr\_1946] Existence of attribute `SwcModeSwitchEvent.activation`***Imposition time:* CP: IT\_RteGen[For each `SwcModeSwitchEvent`, attribute `activation` shall exist.]**[constr\_1947] Existence of reference `SwcModeSwitchEvent.mode`***Imposition time:* CP: IT\_RteGen[For each `SwcModeSwitchEvent`, the reference to `ModeDeclaration` in the role `mode` shall exist.]**[constr\_1948] Existence of attribute `ModeSwitchedAckEvent.eventSource`***Imposition time:* CP: IT\_RteGen[For each `ModeSwitchedAckEvent`, attribute `eventSource` shall exist.]**[constr\_1949] Existence of attribute `ExternalTriggerOccurredEvent.trigger`***Imposition time:* CP: IT\_RteGen[For each `ExternalTriggerOccurredEvent`, attribute `trigger` shall exist.]**[constr\_1950] Existence of attribute `InternalTriggerOccurredEvent.eventSource`***Imposition time:* CP: IT\_RteGen[For each `InternalTriggerOccurredEvent`, the attribute `eventSource` shall exist.]

**[constr\_1951] Existence of attribute `WaitPoint.timeout`***Imposition time:* CP: IT\_RteGen[For each `WaitPoint`, attribute `timeout` shall exist.]**[constr\_1952] Existence of reference `WaitPoint.trigger`***Imposition time:* CP: IT\_CpgExe[For each `WaitPoint`, the reference to `RTEEvent` in the role `trigger` shall exist.]**[constr\_1953] Existence of attribute `SwcExclusiveAreaPolicy.apiPrinciple`***Imposition time:* CP: IT\_RteGen[For each `SwcExclusiveAreaPolicy` that refers to an `exclusiveArea`, attribute `apiPrinciple` shall exist.]**[constr\_1954] Existence of attribute `VariableAccess.accessedVariable`***Imposition time:* CP: IT\_CpgExe[For each `VariableAccess`, attribute `accessedVariable` shall exist.]**[constr\_1955] Existence of attribute `ServerCallPoint.operation`***Imposition time:* CP: IT\_CpgExe[For each `ServerCallPoint`, attribute `operation` shall exist.]**[constr\_1956] Existence of attribute `ServerCallPoint.timeout`***Imposition time:* CP: IT\_RteGen[For each `ServerCallPoint`, attribute `timeout` shall exist.]**[constr\_1957] Existence of attribute `AsynchronousServerCallResultPoint.asynchronousServerCallPoint`***Imposition time:* CP: IT\_CpgExe[For each `AsynchronousServerCallResultPoint`, the reference to `AsynchronousServerCallPoint` in the role `asynchronousServerCallPoint` shall exist.]**[constr\_1958] Existence of attribute `ParameterAccess.accessedParameter`***Imposition time:* CP: IT\_CpgExe[For each `ParameterAccess`, attribute `accessedParameter` shall exist.]**[constr\_1959] Existence of attribute `InstantiationDataDefProps.swDataDefProps`***Imposition time:* CP: IT\_CpgExe[For each `InstantiationDataDefProps`, attribute `swDataDefProps` shall exist.]

**[constr\_1960] Existence of attribute `PortAPIOption.port`***Imposition time:* CP: IT\_CpgExe[For each `PortAPIOption`, attribute `port` shall exist.]**[constr\_1961] Existence of attribute `PortDefinedArgumentValue.value`***Imposition time:* CP: IT\_RteGen[For each `PortDefinedArgumentValue`, attribute `value` shall exist.]**[constr\_1962] Existence of attribute `PortDefinedArgumentValue.valueType`***Imposition time:* CP: IT\_RteGen[For each `PortDefinedArgumentValue`, attribute `valueType` shall exist.]**[constr\_1963] Existence of attribute `CommunicationBufferLocking.supportBufferLocking`***Imposition time:* CP: IT\_RteGen[For each `CommunicationBufferLocking`, attribute `supportBufferLocking` shall exist.]**[constr\_1964] Existence of attribute `PerInstanceMemory.type`***Imposition time:* CP: IT\_CpgExe[For each `PerInstanceMemory`, attribute `type` shall exist.]**[constr\_1965] Existence of attribute `PerInstanceMemory.typeDefinition`***Imposition time:* CP: IT\_CpgExe[For each `PerInstanceMemory`, attribute `typeDefinition` shall exist.]**[constr\_1966] Existence of attribute `Implementation.swVersion`***Imposition time:* CP: IT\_RteGen[For each `Implementation`, attribute `swVersion` shall exist.]**[constr\_1967] Existence of attribute `Implementation.vendorId`***Imposition time:* CP: IT\_RteGen[For each `Implementation`, attribute `vendorId` shall exist.]**[constr\_1968] Existence of attribute `Implementation.codeDescriptor`***Imposition time:* CP: IT\_RteGen[For each `Implementation`, at least one aggregation of `Code` in the role `codeDescriptor` shall exist.]**[constr\_1969] Existence of attribute `SwcImplementation.behavior`***Imposition time:* CP: IT\_RteGen[For each `SwcImplementation`, attribute `behavior` shall exist.]

**[constr\_1970] Existence of attribute `PerInstanceMemorySize.alignment`***Imposition time:* CP: IT\_RteGen[For each `PerInstanceMemorySize`, attribute `alignment` shall exist.]**[constr\_1971] Existence of attribute `PerInstanceMemorySize.perInstanceMemory`***Imposition time:* CP: IT\_RteGen[For each `PerInstanceMemorySize`, the reference to `PerInstanceMemory` in the role `perInstanceMemory` shall exist.]**[constr\_1972] Existence of attribute `PerInstanceMemorySize.size`***Imposition time:* CP: IT\_RteGen[For each `PerInstanceMemorySize`, attribute `size` shall exist.]**[constr\_1973] Existence of attribute `ModeDeclarationGroup.initialMode`***Imposition time:* CP: IT\_CpgExe[For each `ModeDeclarationGroup`, the reference to `ModeDeclaration` in the role `initialMode` shall exist.]**[constr\_1974] Existence of attribute `ModeDeclarationGroup.modeDeclaration`***Imposition time:* CP: IT\_CpgExe[For each `ModeDeclarationGroup`, at least one `ModeDeclaration` shall be aggregated in the role `modeDeclaration`.]**[constr\_1975] Existence of attribute `ModeTransition.enteredMode`***Imposition time:* CP: IT\_RteGen[For each `ModeTransition`, the reference to `ModeDeclaration` in the role `enteredMode` shall exist.]**[constr\_1976] Existence of attribute `ModeTransition.exitedMode`***Imposition time:* CP: IT\_RteGen[For each `ModeTransition`, the reference to `ModeDeclaration` in the role `exitedMode` shall exist.]**[constr\_1977] Existence of attribute `ModeErrorBehavior.errorReactionPolicy`***Imposition time:* CP: IT\_RteGen[For each `ModeErrorBehavior`, the attribute `errorReactionPolicy` shall exist.]

**[constr\_1978] Existence of attribute `SwcModeManagerErrorEvent.modeGroup`***Imposition time:* CP: IT\_RteGen

[For each `SwcModeManagerErrorEvent`, the instance reference to `ModeDeclaration` in the role `modeGroup` shall exist.]

**[constr\_1979] Existence of the reference `SwcBswMapping.bswBehavior`***Imposition time:* CP: IT\_RteGen

[For each `SwcBswMapping`, the reference to `BswInternalBehavior` in the role `bswBehavior` shall exist.]

**[constr\_1980] Existence of the reference `SwcBswMapping.swcBehavior`***Imposition time:* CP: IT\_RteGen

[For each `SwcBswMapping`, the reference to `BswInternalBehavior` in the role `swcBehavior` shall exist.]

**[constr\_1981] Existence of attribute `NvBlockDescriptor.nvBlockNeeds`***Imposition time:* CP: IT\_RteGen

[For each `NvBlockDescriptor`, attribute `nvBlockNeeds` shall exist.]

**[constr\_1982] Existence of attribute `ModeSwitchEventTriggeredActivity.role`***Imposition time:* CP: IT\_RteGen

[For each `ModeSwitchEventTriggeredActivity`, attribute `role` shall exist.]

**[constr\_1983] Existence of attribute `ModeSwitchEventTriggeredActivity.swcModeSwitchEvent`***Imposition time:* CP: IT\_RteGen

[For each `ModeSwitchEventTriggeredActivity`, attribute `swcModeSwitchEvent` shall exist.]

**[constr\_1984] Existence of instance reference `NvBlockDataMapping.nvRamBlockElement`***Imposition time:* CP: IT\_RteGen

[For each `NvBlockDataMapping`, the instance reference to `ModeDeclaration` in the role `nvRamBlockElement` shall exist.]

**[constr\_1985] Existence of the reference `SupervisedEntityNeeds.toleratedFailedCycles`***Imposition time:* CP: IT\_RteGen

[For each `SupervisedEntityNeeds`, the reference to `BswInternalBehavior` in the role `toleratedFailedCycles` shall exist.]

**[constr\_1986] Existence of the reference `DiagnosticRoutineNeeds.diagRoutineType`***Imposition time:* CP: IT\_RteGen

[For each `DiagnosticRoutineNeeds`, the attribute `diagRoutineType` shall exist.]

**[constr\_1987] Existence of instance reference `RapidPrototypingScenario.hostSystem`***Imposition time:* CP: IT\_RteGen

[For each `RapidPrototypingScenario`, the instance reference to `ModeDeclaration` in the role `hostSystem` shall exist.]

**[constr\_1988] Existence of attribute `RptProfile.maxServicePointId`***Imposition time:* CP: IT\_RteGen

[For each `RptProfile`, attribute `maxServicePointId` shall exist.]

**[constr\_1989] Existence of attribute `RptProfile.minServicePointId`***Imposition time:* CP: IT\_RteGen

[For each `RptProfile`, attribute `minServicePointId` shall exist.]

**[constr\_1990] Existence of attribute `RptProfile.servicePointSymbolPost`***Imposition time:* CP: IT\_RteGen

[For each `RptProfile`, attribute `servicePointSymbolPost` shall exist.]

**[constr\_1991] Existence of attribute `RptProfile.servicePointSymbolPre`***Imposition time:* CP: IT\_RteGen

[For each `RptProfile`, attribute `servicePointSymbolPre` shall exist.]

**[constr\_1992] Existence of attribute `RptProfile.stimEnabler`***Imposition time:* CP: IT\_RteGen

[For each `RptProfile`, attribute `stimEnabler` shall exist.]

**[constr\_1993] Existence of attribute `RptImplPolicy.rptEnablerImplType`***Imposition time:* CP: IT\_RteGen

[For each `RptImplPolicy`, attribute `rptEnablerImplType` shall exist]

**[constr\_1994] Existence of attribute `RptImplPolicy.rptPreparationLevel`***Imposition time:* CP: IT\_RteGen

[For each `RptImplPolicy`, attribute `rptPreparationLevel` shall exist]

**[constr\_1995] Existence of attribute `RptSwPrototypingAccess.rptHookAccess`***Imposition time:* CP: IT\_RteGen[For each `RptSwPrototypingAccess`, attribute `rptHookAccess` shall exist.]**[constr\_1996] Existence of attribute `RptSwPrototypingAccess.rptReadAccess`***Imposition time:* CP: IT\_RteGen[For each `RptSwPrototypingAccess`, attribute `rptReadAccess` shall exist.]**[constr\_1997] Existence of attribute `RptSwPrototypingAccess.rptWriteAccess`***Imposition time:* CP: IT\_RteGen[For each `RptSwPrototypingAccess`, attribute `rptWriteAccess` shall exist.]**[constr\_1998] Existence of attribute `RptExecutableEntityProperties.maxRptEventId`***Imposition time:* CP: IT\_RteGen[For each `RptExecutableEntityProperties`, attribute `maxRptEventId` shall exist.]**[constr\_1999] Existence of attribute `RptExecutableEntityProperties.minRptEventId`***Imposition time:* CP: IT\_RteGen[For each `RptExecutableEntityProperties`, attribute `minRptEventId` shall exist.]**[constr\_2000] Compatibility of `ClientServerOperations` triggering the same `RunnableEntity`***Imposition time:* CP: IT\_CpgExe[The `ClientServerOperations` are considered compatible if

- the number of `arguments` (which can be `ArgumentDataPrototypes` or related `PortDefinedArgumentValues`) is equal and
- the corresponding `arguments` (i.e. first `argument` on both sides, second `argument` on both sides, etc.) are compatible or both are typed by "new-world" Variable-Size Array Data Types where the data types of the array elements are compatible (but the array sizes may differ).
- and the respective values of `PortAPIOption.errorHandling` are identical.

In particular, this means that:

- for combinations of `ArgumentDataPrototypes` and `ArgumentDataPrototypes` where the `serverArgumentImplPolicy` is set to `useArgumentType` the referred `ImplementationDataTypes` shall be compatible.

In case of data types of category `STRUCTURE` all by order matching `ImplementationDataTypeElements` shall be named equally.

- for combinations of `PortDefinedArgumentValues` and `ArgumentDataPrototypes` where the `serverArgumentImplPolicy` is set to `useArgumentType` the referred `ImplementationDataTypes` shall be compatible.

In case of `ImplementationDataTypeElements` of category `STRUCTURE` all by order matching `ImplementationDataTypeElements` of the structure shall be named equally.

- for `ArgumentDataPrototypes` where the `serverArgumentImplPolicy` is set to `useVoid` an arbitrary `ImplementationDataType` is referred to.

In addition, it is required that the **return value defined on both sides shall match** (in terms of `Std_ReturnType` vs. `void`) and also the `possibleErrors` are compatible.]

**[constr\_2002] Referenced `VariableDataPrototype` from `AutosarVariableRef` of `VariableAccess` in role `dataReadAccess`**

*Imposition time:* CP: IT\_CpgExe

[A `VariableAccess` in the role `dataReadAccess` shall refer to an `RPortPrototype` or `PRPortPrototype` that is typed by either a `SenderReceiverInterface` or a `NvDataInterface`.]

**[constr\_2003] Referenced `VariableDataPrototype` from `AutosarVariableRef` of `VariableAccess` in role `dataWriteAccess`**

*Imposition time:* CP: IT\_CpgExe

[A `VariableAccess` in the role `dataWriteAccess` shall refer to a `PPortPrototype` or `PRPortPrototype` that is typed by either a `SenderReceiverInterface` or a `NvDataInterface`.]

**[constr\_2004] Referenced `VariableDataPrototype` from `AutosarVariableRef` of `VariableAccess` in role `dataSendPoint`**

*Imposition time:* CP: IT\_CpgExe

[A `VariableAccess` in the role `dataSendPoint` shall refer to a `PPortPrototype` or `PRPortPrototype` that is typed by either a `SenderReceiverInterface` or a `NvDataInterface`.]



**[constr\_2005] Referenced `VariableDataPrototype` from `AutosarVariableRef` of `VariableAccess` in role `dataReceivePointByValue` or `dataReceivePointByArgument`**

*Imposition time:* CP: IT\_CpgExe

[A `VariableAccess` in the role `dataReceivePointByValue` or `dataReceivePointByArgument` shall refer to an `RPortPrototype` or `PRPortPrototype` that is typed by either a `SenderReceiverInterface` or an `NvDataInterface`.]

**[constr\_2006] Number of `AsynchronousServerCallResultPoint` referencing to one `AsynchronousServerCallPoint`**

*Imposition time:* CP: IT\_CpgExe

[The `AsynchronousServerCallPoint` may be referenced by at most one `AsynchronousServerCallResultPoint`.

If the reference exists, this means that only the `RunnableEntity` with this `AsynchronousServerCallResultPoint` can fetch the result of the asynchronous server invocation of this particular `AsynchronousServerCallPoint`.]

**[constr\_2007] Consistency of `typeDefinition` attribute**

*Imposition time:* CP: IT\_CpgExe

[All `PerInstanceMemorys` of the same `SwcInternalBehavior` with identical `type` attribute shall define an identical `typeDefinition` attribute as well.]

**[constr\_2009] Supported kinds of `PortPrototypes` of a `NvBlockSwComponentType`**

*Imposition time:* CP: IT\_RteGen

[With respect to external communication, `NvBlockSwComponentType` is limited to the definition of the following kinds of `PortPrototype`:

- `PortPrototypes` typed by either `NvDataInterfaces` or `ClientServerInterfaces`
- `RPortPrototypes` typed by `ModeSwitchInterfaces`

]

**[constr\_2010] Connections between `SwComponentPrototypes` of type `NvBlockSwComponentType`**

*Imposition time:* CP: IT\_RteGen

[The existence of `SwConnectors` that refer to `PortPrototypes` belonging to `SwComponentPrototypes` where both are typed by `NvBlockSwComponentType` is not permitted.]

**[constr\_2011] Connections between `SwComponentPrototypes` typed by `NvBlockSwComponentType` and `SwComponentPrototypes` typed by other `AtomicSwComponentTypes`**

*Imposition time:* CP: IT\_RteGen

[A `PortPrototype` typed by an `NvDataInterface` owned by a `SwComponentPrototype` typed by an `NvBlockSwComponentType` shall be connected to a `PortPrototype` typed by **either** an `NvDataInterface` **or** a `SenderReceiverInterface` owned by a `SwComponentPrototype` that is typed by an other subclass of `AtomicSwComponentType`.]

**[constr\_2012] Compatibility of `ImplementationDataTypes` used for `ramBlock` and `romBlock`**

*Imposition time:* CP: IT\_RteGen

[The `ramBlock` and the `romBlock` shall have compatible `ImplementationDataTypes` to ensure, that the NVRAM Block default values in the ROM Block can be copied into the RAM Block.]

**[constr\_2013] Compatibility of `ImplementationDataTypes` for `NvBlockDataMapping`**

*Imposition time:* CP: IT\_RteGen

[Unless both the attribute `bitfieldTextTableMaskNvBlockDescriptor` and attribute `bitfieldTextTableMaskPortPrototype` is defined in the context of a given `NvBlockDataMapping`, the `NvBlockDataMapping` is only valid if the `ImplementationDataType` of the referenced `VariableDataPrototype` or `ImplementationDataTypeElement` in the role `nvRamBlockElement` is compatible to the `ImplementationDataType` used to type the `DataPrototype` aggregated by `NvBlockDataMapping` in the role `writtenNvData`, `writtenReadNvData`, or `readNvData`.]

**[constr\_2014] Limitation of `NvBlockDescriptor.clientServerPort.role`**

*Imposition time:* CP: IT\_RteGen

[The value of attribute `NvBlockDescriptor.clientServerPort.role` shall be set to a valid name of one of the Standardized AUTOSAR (client/server) Interfaces used for the NVRAM Manager, as described by [TPS\_SWCT\_02501], [TPS\_SWCT\_02502], [TPS\_SWCT\_02503] and [TPS\_SWCT\_02504].]

**[constr\_2015] Limitation of `SwcInternalBehavior` of a `NvBlockSwComponentType`**

*Imposition time:* CP: IT\_RteGen

[The `SwcInternalBehavior` of a `NvBlockSwComponentType` is only permitted to define

- `OperationInvokedEvents`

- `RunnableEntity`s triggered by `OperationInvokedEvents` (server `RunnableEntity`s)
- `RunnableEntity`s which defines only the mandatory attributes `symbol` and `canBeInvokedConcurrently`
- `PortAPIOptions` defining `PortDefinedArgumentValues`
- `TimingEvents` (which may include references to `ModeDeclarations` in the role `disabledMode`)
- `DataReceivedEvents` (which may include references to `ModeDeclarations` in the role `disabledMode`)
- `SwcModeSwitchEvents`
- `RunnableEntity`s triggered by `TimingEvents`
- `RunnableEntity`s triggered by `DataReceivedEvents`
- `RunnableEntity`s triggered by `SwcModeSwitchEvents`
- `DataTypeMappingSet`

]

**[constr\_2016] Connections between `SwComponentPrototypes` of type `ServiceProxySwComponentType`**

*Imposition time:* CP: IT\_RteGen

[A connection between `PortPrototypes` belonging to `SwComponentPrototypes` where both are typed by `ServiceProxySwComponentType` is not permitted.]

**[constr\_2017] Ports of `ServiceProxySwComponentTypes`**

*Imposition time:* CP: IT\_RteGen

[`ServiceProxySwComponentType` is only permitted to define

- `RPortPrototypes` that are typed by `SenderReceiverInterface` or
- `PortPrototypes` that are typed by a `PortInterface` where the `isService` attribute is set to true.

]

**[constr\_2018] Supported remote communication of a `ServiceProxySwComponentType`**

*Imposition time:* CP: IT\_RteGen

[For remote communication, `ServiceProxySwComponentType` can have only `RPortPrototypes` typed by `SenderReceiverInterfaces` in a 1:n communication scenario.]

**[constr\_2019] ServiceSwComponentType shall have service ports only***Imposition time:* CP: IT\_RteGen

[In the case of `ServiceSwComponentType`, all aggregated `PortPrototypes` need to have an `«isOfType»` relationship to a `PortInterface` which has its `isService` attribute set to `true`.

The exceptions described in

- [TPS\_SWCT\_01572],
- [TPS\_SWCT\_01579],
- [TPS\_SWCT\_01831] and
- [TPS\_SWCT\_01580]

apply.]

**[constr\_2020] dataReadAccess can not be used for queued communication***Imposition time:* CP: IT\_CpgExe

[The `swImplPolicy` of the `VariableDataPrototype` referenced by a `VariableAccess` in role `dataReadAccess` shall **not** be set to `queued`.]

**[constr\_2021] WaitPoint referencing a DataReceivedEvent can not be used for non-queued communication***Imposition time:* CP: IT\_CpgExe

[A `WaitPoint` referencing a `DataReceivedEvent` is permitted **if and only if** the `swImplPolicy` of the `VariableDataPrototype` referenced by this `DataReceivedEvent` is set to `queued`.]

**[constr\_2022] Mutually exclusive use of SynchronousServerCallPoints and AsynchronousServerCallPoints***Imposition time:* CP: IT\_CpgExe

[A `ClientServerOperation` of a particular `RPortPrototype` shall be mutually exclusive referenced by either a `SynchronousServerCallPoints` or an `AsynchronousServerCallPoints`.]

**[constr\_2023] Consistency of timeout values***Imposition time:* CP: IT\_RteGen

[The `timeout` values of all `ServerCallPoints` referencing the same instance of `ClientServerOperation` in a `RPortPrototype` shall be identical.]

**[constr\_2024] enableTakeAddress is restricted to single instantiation***Imposition time:* CP: IT\_CpgExe

[The definition of a `PortAPIOption` with `enableTakeAddress` set to `true` is only permitted for software-components where the attribute `SwcInternalBehavior.supportsMultipleInstantiation` is set to `false`.]

**[constr\_2026] Referenced `VariableDataPrototype` from `AutosarVariableRef` of `VariableAccess` in role `writtenLocalVariable` and `readLocalVariable`***Imposition time:* CP: IT\_CpgExe

[A `VariableDataPrototype` in the `localVariable` reference needs to be owned by the same `SwcInternalBehavior` as this `RunnableEntity` belongs to, and the referenced `VariableDataPrototype` has to be defined in the role `implicitInterRunnableVariable` or `explicitInterRunnableVariable`.]

**[constr\_2027] `SwcServiceDependency` shall be defined for service ports only***Imposition time:* CP: IT\_RteGen

[A `PortPrototype` that is referenced by a `SwcServiceDependency` via `assignedPort` or via `assignedData` shall be typed by a `PortInterface` that has `isService` set to `true`.

This rule does **not** apply to `PortPrototypes` referenced by a `RoleBasedPortAssignment` where the attribute `role` is set to any of the following values:

- `NvMService`
- `NvMNotifyJobFinished`
- `NvMNotifyInitBlock`
- `NvMAdmin`
- `NvMMirror`
- `NvDataPort`

Furthermore, the rule does **not** apply to the case described in [TPS\_SWCT\_01579], [TPS\_SWCT\_01831], [TPS\_SWCT\_01580], and [TPS\_SWCT\_01572].]

**[constr\_2028] staticMemory is restricted to single instantiation***Imposition time:* CP: IT\_RteGen

[The `staticMemory` is only supported if the attribute `supportsMultipleInstantiation` of the owning `SwcInternalBehavior` is set to `false`.]

**[constr\_2030] AsynchronousServerCallResultPoint combined with Wait-Point shall belong to the same RunnableEntity***Imposition time:* CP: IT\_CpgExe

[A `WaitPoint` referencing a `AsynchronousServerCallReturnsEvent` as well as a `AsynchronousServerCallResultPoint` referenced by said `AsynchronousServerCallReturnsEvent` shall be aggregated by the same `RunnableEntity`.]

**[constr\_2031] Value of `TimingEvent.period` shall be greater than 0***Imposition time:* CP: IT\_RteGen

[Attribute `TimingEvent.period` shall exist and its value shall be greater than 0.]

**[constr\_2033] Timeout of `DataSendCompletedEvent`***Imposition time:* CP: IT\_RteGen

[The `timeout` value of a `WaitPoint` associated with a `DataSendCompletedEvent` shall have the same value as the corresponding value of `TransmissionAcknowledgementRequest.timeout`.]

**[constr\_2034] `SwAddrMethod` referenced by `RunnableEntity`s, `BswCalledEntity`s, or `BswSchedulableEntity`s***Imposition time:* CP: IT\_CpgExe

[`RunnableEntity`s, `BswCalledEntity`s, and `BswSchedulableEntity`s shall not reference a `SwAddrMethod` which attribute `memoryAllocationKeywordPolicy` is set to `addrMethodShortNameAndAlignment`.]

**[constr\_2035] `swImplPolicy` for `VariableDataPrototype` in `SenderReceiverInterface`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `VariableDataPrototype` owned by a `SenderReceiverInterface` shall be either `standard`, `queued`, or `measurementPoint`.]

**[constr\_2036] `swImplPolicy` for `VariableDataPrototype` in `NvDataInterface`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `VariableDataPrototype` owned by a `NvDataInterface` shall be `standard`.]

**[constr\_2037] `swImplPolicy` for `VariableDataPrototype` in the role `ramBlock`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `VariableDataPrototype` aggregated in the role `NvBlockDescriptor.ramBlock` shall be `standard`.]

**[constr\_2038] `swImplPolicy` for `VariableDataPrototype` in the role `implicitInterRunnableVariable`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `VariableDataPrototype` aggregated in the role `SwcInternalBehavior.implicitInterRunnableVariable` shall be `standard`.]

**[constr\_2039] `swImplPolicy` for `VariableDataPrototype` in the role `explicitInterRunnableVariable`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `VariableDataPrototype` aggregated in the role `SwcInternalBehavior.explicitInterRunnableVariable` shall be `standard`.]

**[constr\_2040] `swImplPolicy` for `VariableDataPrototype` in the role `arTypedPerInstanceMemory`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `VariableDataPrototype` aggregated in the role `SwcInternalBehavior.arTypedPerInstanceMemory` shall be `standard` or `measurementPoint`.]

**[constr\_2041] `swImplPolicy` for `VariableDataPrototype` in the role `staticMemory`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `VariableDataPrototype` aggregated in the role `InternalBehavior.staticMemory` shall be `standard` or `measurementPoint`.]

**[constr\_2042] `swImplPolicy` for `ParameterDataPrototype` in `ParameterInterface`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `ParameterDataPrototype` owned by a `ParameterInterface` shall be either `standard`, `const`, or `fixed`.]

**[constr\_2043] `swImplPolicy` for `ParameterDataPrototype` in the role `romBlock`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` a `ParameterDataPrototype` aggregated in the role `NvBlockDescriptor.romBlock` shall be `standard`.]

**[constr\_2044] `swImplPolicy` for `ParameterDataPrototype` in the role `sharedParameter`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `ParameterDataPrototype` aggregated in the role `SwcInternalBehavior.sharedParameter` shall be `standard` or `const`.]

**[constr\_2045] `swImplPolicy` for `ParameterDataPrototype` in the role `perInstanceParameter`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `ParameterDataPrototype` in the role `SwcInternalBehavior.perInstanceParameter` shall be `standard` or `const`.]

**[constr\_2046] `swImplPolicy` for `ParameterDataPrototype` in the role `constantMemory`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of a `ParameterDataPrototype` aggregated in the role `InternalBehavior.constantMemory` shall be `standard`, `const`, or `fixed`.]

**[constr\_2047] `swImplPolicy` for `ArgumentDataPrototype`***Imposition time:* CP: IT\_CpgExe

[The overriding value of attribute `swImplPolicy` of an `ArgumentDataPrototype` shall be `standard`.]

**[constr\_2049] Different `ModeDeclarationGroups` shall have different `shortNames`.***Imposition time:* CP: IT\_CpgExe

[A software component is not allowed to type multiple `PortPrototypes` with `ModeSwitchInterfaces` where the contained `ModeDeclarationGroupPrototypes` are referencing `ModeDeclarationGroups` with identical `shortNames` but different `ModeDeclarations`.]

**[constr\_2050] Mandatory information of a `SwAxisCont`***Imposition time:* CP: IT\_CpgExe

[If the attribute `swAxisCont` is defined for an `ApplicationValueSpecification` the `SwAxisCont` shall define

- one `swAxisIndex` value and
- one `swArraysize` value



per dimension, even in the case when the owning [ApplicationValueSpecification](#) defines only the content of a single dimensional object of (for example) [category CURVE](#).]

**[constr\_2052] Values of [swArraysize](#) and the number of values provided by [swValuesPhys](#) shall be consistent.**

*Imposition time:* CP: IT\_ValSpec, AP: IT\_ValSpec

[[swValuesPhys](#) shall define as many values as the attribute [swArraysize](#) (if this attribute exists) defines.

In other words, in the bound model the number of descendants ([v](#), or [vf](#), or [vt](#), or [vtf](#)) shall be identical to the number of elements of the related [DataPrototype](#) typed by an [ApplicationPrimitiveDataType](#).

If several [swArraysize](#) values are provided, the values have to be multiplied in order to get the total number of [swValuesPhys](#) values.]

**[constr\_2053] Consistency between [role](#) IUMPRNumerator and [ObdRatioServiceNeeds.connectionType](#)**

*Imposition time:* CP: IT\_RteGen

[If a [SwcServiceDependency](#) with a [ObdRatioServiceNeeds](#) is defined and the attribute [connectionType](#) of the contained [ObdRatioServiceNeeds](#) is set to [ObdRatioConnectionKindEnum.apiUse](#), a [RoleBasedPortAssignment](#) with the [role](#) value IUMPRNumerator shall be defined.

If the attribute [connectionType](#) of the contained [ObdRatioServiceNeeds](#) is set to [ObdRatioConnectionKindEnum.observer](#), the [role](#) value IUMPRNumerator is not applicable.]

**[constr\_2054] Valid targets of [rptSystem](#)**

*Imposition time:* CP: IT\_RteGen

[The [System](#) referenced in the role [rptSystem](#) shall be of [category](#) RPT\_SYSTEM.]

**[constr\_2055] Valid targets of [byPassPoint](#) and [rptHook](#) reference, depending on the value of attribute [category](#)**

*Imposition time:* CP: IT\_RteGen

[

Category	Meaning	Specific properties
SW_COMPONENT_PROTOTYPE	Adds one <a href="#">SwComponentPrototype</a> to an Rapid Prototyping Scenario.	The <a href="#">byPassPoint</a> and <a href="#">rptArHook</a> shall reference a <a href="#">SwComponentPrototypes</a> .
DATA_PROTOTYPE	Adds one instance of a <a href="#">DataPrototype</a> to an Rapid Prototyping Scenario.	The <a href="#">byPassPoint</a> and <a href="#">rptArHook</a> shall reference a <a href="#">DataPrototype</a> instances in <a href="#">Port-Prototypes</a> .

▽



<b>RUNNABLE_ENTITY</b>	Adds one <a href="#">RunnableEntity</a> to an Rapid Prototyping Scenario.	The <a href="#">byPassPoint</a> and <a href="#">rptArHook</a> shall reference a <a href="#">RunnableEntity</a> instances.
<b>ACCESS_POINTS</b>	Adds one <a href="#">VariableAccess</a> , <a href="#">ParameterAccess</a> , <a href="#">ServerCallPoint</a> , <a href="#">AsynchronousServerCallResultPoint</a> , <a href="#">InternalTriggeringPoint</a> , <a href="#">ModeSwitchPoint</a> , <a href="#">ModeAccessPoint</a> or <a href="#">ExternalTriggeringPoint</a> to a Rapid Prototyping Scenario.	The <a href="#">byPassPoint</a> and <a href="#">rptArHook</a> shall reference a <a href="#">VariableAccess</a> , <a href="#">ParameterAccess</a> , <a href="#">ServerCallPoint</a> , <a href="#">AsynchronousServerCallResultPoint</a> , <a href="#">InternalTriggeringPoint</a> , <a href="#">ModeSwitchPoint</a> , <a href="#">ModeAccessPoint</a> or <a href="#">ExternalTriggeringPoint</a> instances.

]

### [constr\_2056] Consistency of [RapidPrototypingScenario](#) with respect to [rptSystem](#) and [rptArHook](#) references

*Imposition time:* CP: IT\_RteGen

[Within one [RapidPrototypingScenario](#) all [rptSystem](#) references shall point to instances in one and only one [System](#), and if existent, all [rptArHook](#) shall point to instances in one other and only one other [System](#).]

### [constr\_2057] Mandatory information of a [RuleBasedAxisCont](#)

*Imposition time:* CP: IT\_CpgExe

[If the attribute [swAxisCont](#) is defined for an [ApplicationRuleBasedValueSpecification](#) the [RuleBasedAxisCont](#) shall define one [swAxisIndex](#) value and one [swArraysize](#) value per dimension, even in the case when the owning [ApplicationRuleBasedValueSpecification](#) defines only the content of a single dimensional object like a [CURVE](#).]

### [constr\_2058] Mandatory information of a [RuleBasedValueCont](#)

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[If the attribute [swValueCont](#) is defined for an [ApplicationRuleBasedValueSpecification](#) the [RuleBasedValueCont](#) shall always define the attribute [swArraysize](#) if the [ApplicationRuleBasedValueSpecification](#) is of category [CURVE](#), [MAP](#), [CUBOID](#), [CUBE\\_4](#), [CUBE\\_5](#), [COM\\_AXIS](#), [RES\\_AXIS](#), or [VAL\\_BLK](#).]

### [constr\_2535] Target of an [autosarParameter](#) in [AutosarParameterRef](#) shall refer to a parameter

*Imposition time:* CP: IT\_CpgExe

[Except for the specifically described cases where [constr\_1173], applies the target of [autosarParameter](#) (which in fact is an instance ref) in [AutosarParameterRef](#) shall either be or be nested in [ParameterDataPrototype](#). This means that the target shall either be a [ParameterDataPrototype](#) or an [ApplicationCompositeElementDataPrototype](#) that in turn is owned by a [ParameterDataPrototype](#).]

**[constr\_2536] Target of an `autosarVariable` in `AutosarVariableRef` shall refer to a variable**

*Imposition time:* CP: IT\_CpgExe

[The target of `autosarVariable` (which in fact is an instance ref) in `AutosarVariableRef` shall either be or be nested in `VariableDataPrototype`. This means that the target shall either be a `VariableDataPrototype` or an `ApplicationCompositeElementDataPrototype` that in turn is owned by a `VariableDataPrototype`.]

**[constr\_2544] Limits need to be consistent**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[

- The limits of `ApplicationDataType` shall be inside the definition range of the `CompuMethod`

The `CompuMethod` needs to be applicable for limits of an `ApplicationDataType`. The reason is that the internal representation of the limits for the `ApplicationDataType` are calculated by applying the `CompuMethod`.

- The such defined internal limits of the `ApplicationDataType` shall be within or equal the `internalConstrs` of the mapped `ImplementationDataType`.
- The limits of the `ImplementationDataType` shall be within or equal to the limits defined by the size of the `BaseType`.

]

**[constr\_2545] `invalidValue` shall fit in the specified ranges**

*Imposition time:* CP: IT\_CpgExe

[The `invalidValue` shall be in the range of the `ImplementationDataType`.]

**[constr\_2549] Units of input axis shall be consistent**

*Imposition time:* CP: IT\_CpgExe

[All `Units` specified in the context of one input axis according to [TPS\_SWCT\_01502] shall be compatible.]

**[constr\_2550] Units of value axis shall be consistent**

*Imposition time:* CP: IT\_CpgExe

[All `Units` specified in the context of one value axis according to [TPS\_SWCT\_01497] shall be the same.]

**[constr\_2561] Application of `DataConstrRule.constrLevel`**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[`DataConstrRule.constrLevel` is limited to

0: This represents so called "hard limits". They shall always be specified.

1: This represents so called "soft limits". Soft limits may be violated after confirmation by the user of an MCD-System.

Other values may exist, but the semantics is outside the AUTOSAR scope.]

**[constr\_3688] Existence of attribute `RoleBasedDataAssignment.usedDataElement.localVariable` for `RoleBasedDataAssignment.role = ServerServiceOffer`**

*Imposition time:* CP: IT\_RteGen

[If the attribute `RoleBasedDataAssignment.role` is set to the value `ServerServiceOffer`, then the reference `RoleBasedDataAssignment.usedDataElement.localVariable` shall not exist.]

**[constr\_3689] Existence of attribute `RoleBasedDataAssignment.usedDataElement.localVariable` for `RoleBasedDataAssignment.role = ClientEventSubscription`**

*Imposition time:* CP: IT\_RteGen

[If the attribute `RoleBasedDataAssignment.role` is set to the value `ClientEventSubscription`, then the reference `RoleBasedDataAssignment.usedDataElement.localVariable` shall not exist.]

**[constr\_4002] Unambiguous mapping of modes to data types**

*Imposition time:* CP: IT\_CpgExe

[Within one `DataTypeMappingSet`, a `ModeDeclarationGroup` shall not be mapped to different `ImplementationDataTypes`.]

**[constr\_4003] Semantics of `SwcModeSwitchEvent`**

*Imposition time:* CP: IT\_RteGen

[If the value of `SwcModeSwitchEvent.activation` is `onTransition`, then `SwcModeSwitchEvent` shall refer to two different `ModeDeclarations` belonging to the same instance of `ModeDeclarationGroup`.

Their order defines the direction of the transition from one mode into another. In all other cases `SwcModeSwitchEvent` shall refer to exactly one `ModeDeclaration`.]

**[constr\_4004] Context of `SenderReceiverAnnotation`**

*Imposition time:* CP: IT\_CpgExe

[A `SenderReceiverAnnotation` shall only be aggregated by a `PortPrototype` typed by a `SenderReceiverInterface`.]

**[constr\_4005] Context of [ClientServerAnnotation](#)***Imposition time:* CP: IT\_CpgExe

[A [ClientServerAnnotation](#) shall only be aggregated by a [PortPrototype](#) typed by a [ClientServerInterface](#).]

**[constr\_4006] Context of [ParameterPortAnnotation](#)***Imposition time:* CP: IT\_CpgExe

[A [ParameterPortAnnotation](#) shall only be aggregated by a [PPortPrototype](#) owned by a [ParameterSwComponentType](#).]

**[constr\_4007] Context of [ModePortAnnotation](#)***Imposition time:* CP: IT\_CpgExe

[A [ModePortAnnotation](#) shall only be aggregated by a [PortPrototype](#) typed by a [ModeSwitchInterface](#).]

**[constr\_4008] Context of [TriggerPortAnnotation](#)***Imposition time:* CP: IT\_CpgExe

[A [TriggerPortAnnotation](#) shall only be aggregated by a [PortPrototype](#) typed by a [TriggerInterface](#).]

**[constr\_4009] Context of [NvDataPortAnnotation](#)***Imposition time:* CP: IT\_CpgExe

[An [NvDataPortAnnotation](#) shall only be aggregated by a [PortPrototype](#) typed by an [NvDataInterface](#).]

**[constr\_4010] Context of [DelegatedPortAnnotation](#)***Imposition time:* CP: IT\_CompSwcT

[A [DelegatedPortAnnotation](#) shall only be aggregated by a [PortPrototype](#) aggregated by a [CompositionSwComponentType](#).]

**[constr\_4012] Timeout of [ModeSwitchedAckEvent](#)***Imposition time:* CP: IT\_RteGen

[The timeout value of a [WaitPoint](#) associated with a [ModeSwitchedAckEvent](#) shall be equal to the corresponding [ModeSwitchedAckRequest.timeout](#).]

**[constr\_4082] [RunnableEntity.reentrancyLevel](#) shall not be set.***Imposition time:* CP: IT\_CpgExe

[The optional attribute [reentrancyLevel](#) shall not be set for a [RunnableEntity](#). This attribute would define more specific reentrancy features than the mandatory attribute [canBeInvokedConcurrently](#). These features are currently only supported for Basic Software.]

**[constr\_5234] Existence of attribute `E2EProfileCompatibilityProps.transitToInvalidExtended` is mandatory for each `EndToEndTransformationComSpecProps`***Imposition time:* CP: IT\_RteGen

[For each `EndToEndTransformationComSpecProps`, a reference in the role `e2eProfileCompatibilityProps` to meta-class `E2EProfileCompatibilityProps` shall exist and the referenced `E2EProfileCompatibilityProps` shall define a value for the attribute `transitToInvalidExtended`.]

**[constr\_10000] Existence of attribute `RptExecutableEntityProperties.rptExecutionControl`***Imposition time:* CP: IT\_RteGen

[For each `RptExecutableEntityProperties`, attribute `rptExecutionControl` shall exist.]

**[constr\_10001] Existence of attribute `RptExecutableEntityProperties.rptServicePoint`***Imposition time:* CP: IT\_RteGen

[For each `RptExecutableEntityProperties`, attribute `rptServicePoint` shall exist.]

**[constr\_10005] Existence of attribute `NotAvailableValueSpecification.defaultPattern`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `NotAvailableValueSpecification`, attribute `defaultPattern` shall exist.]

**[constr\_10006] Valid interval of attribute `NotAvailableValueSpecification.defaultPattern`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[The valid interval for attribute `NotAvailableValueSpecification.defaultPattern` is 0..255.]

**[constr\_10009] Aggregation of `ApplicationRuleBasedValueSpecification`***Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[Each `ArrayValueSpecification` shall only aggregate at most one `ApplicationRuleBasedValueSpecification` in the role element.

If one `ApplicationRuleBasedValueSpecification` is aggregated then it shall be the only aggregated element, i.e. no further `ValueSpecification` shall exist in the same aggregation where an `ApplicationRuleBasedValueSpecification` is aggregated.]

**[constr\_10016] Applicability of `OsTaskExecutionEvent`***Imposition time:* CP: IT\_CpgExe

[An `OsTaskExecutionEvent` is only applicable for a `SwcInternalBehavior` in the context of a `ComplexDeviceDriverSwComponentType`, `EcuAbstractionSwComponentType`, or `ServiceSwComponentType`.]

**[constr\_10018] Existence of attribute `SwAxisCont.swAxisIndex`***Imposition time:* CP: IT\_CpgExe

[For each `SwAxisCont`, attribute `swAxisIndex` shall exist.]

**[constr\_10019] Existence of attribute `SwAxisCont.swValuesPhys`***Imposition time:* CP: IT\_CpgExe

[For each `SwAxisCont`, attribute `swValuesPhys` shall exist.]

**[constr\_10020] Existence of attribute `RoleBasedDataTypeAssignment.usedImplementationDataType`***Imposition time:* CP: IT\_RteGen

[For each `RoleBasedDataTypeAssignment`, attribute `usedImplementationDataType` shall exist.]

**[constr\_10032] Restrictions for the usage of `ServiceDependency.diagnosticRelevance`***Imposition time:* CP: IT\_RteGen

[The attribute `ServiceDependency.diagnosticRelevance` shall only be used for a `SwcServiceDependency` that aggregates a `BswMgrNeeds`.]

**[constr\_10033] Existence of `MemorySection.swAddrmethod`***Imposition time:* CP: IT\_CpgExe

[For each `MemorySection`, attribute `swAddrmethod` shall existence.]

**[constr\_10034] Existence of `MemorySection.alignment`***Imposition time:* CP: IT\_CpgExe

[For each `MemorySection`, attribute `alignment` shall exist if the attribute `MemorySection.swAddrmethod.memoryAllocationKeywordPolicy` is set to `MemoryAllocationKeywordPolicyType.addrMethodShortNameAndAlignment`.]

**[constr\_10040] Value of `ApplicationValueSpecification.swAxisCont.category`***Imposition time:* CP: IT\_CpgExe

[The value of attribute `ApplicationValueSpecification.swAxisCont.category` shall not be set to `fixAXIS`.]



#### [constr\_10041] Value of **ApplicationRuleBasedValueSpecification.swAxisCont.category**

*Imposition time:* CP: IT\_CpgExe

[The value of **ApplicationValueSpecification.swAxisCont.category** shall not be set to **fixAXIS**]

#### [constr\_10067] Creation of **AssemblySwConnector** for service communication

*Imposition time:* CP: IT\_RteGen

[If an **AssemblySwConnector** is created between two **PortPrototypes** and the affected **PortInterfaces** set the attribute **isService** to the value **true**, then at least one of the **SwComponentPrototypes** shall be typed by a **ServiceSwComponentType**.]

#### [constr\_10068] Standardized values for **SectionInitializationPolicyType**

*Imposition time:* CP: IT\_CpgExe

[The following values for **SectionInitializationPolicyType** are reserved by the AUTOSAR standard:

**INIT** To be used for (explicitly or not explicitly) initialized variables.

**CLEARED** To be used for not explicitly initialized variables.

**POWER-ON-CLEARED** To be used for variables that are not explicitly initialized (cleared) during normal start-up. Instead these are cleared only after power on reset.

]

#### [constr\_10071] Allowed multiplicities of **SenderComSpec** attributes for communication between **ApplicationSwComponentType** and **NvBlockSwComponentType**

*Imposition time:* CP: IT\_RteGen

[

Sender	<b>ApplicationSwComponentType</b>	
Receiver	<b>NvBlockSwComponentType</b>	
Queuing Configuration	non-queued	queued
<b>SenderComSpec.transmissionAcknowledge</b>	d/c	
<b>SenderComSpec.dataElement</b>	1	
<b>SenderComSpec.handleOutOfRange</b>	d/c	
<b>SenderComSpec.usesEndToEndProtection</b>	d/c	
<b>SenderComSpec.transmissionProps.dataUpdatePeriod</b>	0..1	
<b>SenderComSpec.transmissionProps.minimumSendInterval</b>	0..1	
<b>SenderComSpec.transmissionProps.transmissionMode</b>	0..1	
<b>SenderComSpec.networkRepresentation</b>	d/c	
<b>SenderComSpec.compositeNetworkRepresentation</b>	d/c	





△

Sender	ApplicationSwComponentType	
Receiver	NvBlockSwComponentType	
Queuing Configuration	non-queued	queued
NonqueuedSenderComSpec.dataFilter	d/c	
NonqueuedSenderComSpec.initValue	0..1	

]

[constr\_10072] Allowed multiplicities of **SenderComSpec** attributes for communication between **NvBlockSwComponentType** and **ApplicationSwComponentType**

Imposition time: CP: IT\_RteGen

[

Sender	NvBlockSwComponentType	
Receiver	ApplicationSwComponentType	
Queuing Configuration	non-queued	queued
ReceiverComSpec.replaceWith	0	
ReceiverComSpec.dataElement	1	
ReceiverComSpec.receptionProps.dataUpdatePeriod	0	
ReceiverComSpec.receptionProps.timeout	0	
ReceiverComSpec.receptionProps.comHandlerTaskMappingEnabled	0	
ReceiverComSpec.receptionProps.invalidValueBitfieldErrorsEnabled	0	
ReceiverComSpec.receptionProps.outOfRangeBitfieldErrorsEnabled	0	
ReceiverComSpec.handleOutOfRange	0	
ReceiverComSpec.handleOutOfRangeStatus	0	
ReceiverComSpec.transformationComSpecProps	0	
ReceiverComSpec.networkRepresentation	0	
ReceiverComSpec.compositeNetworkRepresentation	0	
QueuedReceiverComSpec.queueLength		
NonqueuedReceiverComSpec.filter	0	
NonqueuedReceiverComSpec.timeoutSubstitutionValue	0	
NonqueuedReceiverComSpec.initValue	0..1	
NonqueuedReceiverComSpec.aliveTimeout	0	
NonqueuedReceiverComSpec.enableUpdate	0	
NonqueuedReceiverComSpec.handleDataStatus	0	
NonqueuedReceiverComSpec.handleNeverReceived	0..1	
NonqueuedReceiverComSpec.handleTimeoutType	0	
NonqueuedReceiverComSpec.returnNoNewDataEnabled	0	
NonqueuedReceiverComSpec.transportErrorCountEnabled	0	
NonqueuedReceiverComSpec.valueErrorCountEnabled	0	

]

#### [constr\_10073] Existence of **DataReceiveErrorEvent**

*Imposition time:* CP: IT\_CpgExe

[A **DataReceiveErrorEvent** shall only exist if it latest refers to a given **VariableDataPrototype** in the role **data** where either

- the **VariableDataPrototype** is referenced from a **NonqueuedReceiverComSpec** in the role **dataElement** and the attribute **aliveTimeout** of the **NonqueuedReceiverComSpec** exists and is set to a value > 0 or
- the **VariableDataPrototype** is aggregated by a **SenderReceiverInterface** where attribute **invalidationPolicy.handleInvalid** exists and is set to the value **keep**.

]

#### [constr\_10074] Consistency of attribute **NvBlockDescriptor.writingStrategy.role** set to **storeOnChange**

*Imposition time:* CP: IT\_RteGen

[The existence of **NvBlockDescriptor.writingStrategy** where attribute **role** is set to **storeOnChange** is only supported if **NvBlockDescriptor.nvBlockNeeds.storeOnChange** exists and is set to **true**.]

#### [constr\_10075] Existence of **CompositeRuleBasedValueSpecification.argument** vs. **compoundPrimitiveArgument**

*Imposition time:* CP: IT\_CpgExe

[For every **CompositeRuleBasedValueSpecification**, at most one of the aggregations

- **argument**
- **compoundPrimitiveArgument**

]

#### [constr\_10087] Restriction for the existence of a **SubElementMapping**

*Imposition time:* CP: IT\_RteGen

[The existence of a **DataPrototypeMapping.subElementMapping** is only supported if the **PortPrototypes** that are referenced by the respective **SwConnector** are typed by a **DataInterface**.]

#### [constr\_10096] Shared axis shall not be a fixed axis

*Imposition time:* CP: IT\_CpgExe

[An **ApplicationPrimitiveDataType** of category **COM\_AXIS** shall not contain the definition of an **SwCalprmAxis** of category **FIX\_AXIS**.]

**[constr\_10097] Buffer locking is only supported if `returnValueProvision` is set to `returnValueProvided`**

*Imposition time:* CP: IT\_CpgExe

[Setting the value of attribute `PortAPIOption.supportedFeature.supportBufferLocking` to value `supportsBufferLocking` is only supported if the `AbstractAccessPoints` that refer to values in the respective `PortAPIOption.port` do **not** define `AbstractAccessPoint.returnValueProvision` **or** set the value of `AbstractAccessPoint.returnValueProvision` to `returnValueProvided`.]

**[constr\_10099] Allowed values of the attribute `SwDataDefProps.swImplPolicy` vs. `DataPrototypes` and their roles**

*Imposition time:* CP: IT\_CpgExe

Attribute of <code>SwImplPolicyEnum</code>	<code>VariableDataPrototype</code>								<code>ParameterDataPrototype</code>				Misc.
	<code>VariableDataPrototype</code> in <code>SenderReceiverInterface</code>	<code>VariableDataPrototype</code> in <code>VariableDataPrototype</code>	<code>VariableDataPrototype</code> in <code>VariableDataPrototype</code>	<code>VariableDataPrototype</code> in <code>VariableDataPrototype</code>	<code>VariableDataPrototype</code> in <code>VariableDataPrototype</code>	<code>VariableDataPrototype</code> in <code>VariableDataPrototype</code>	<code>VariableDataPrototype</code> in <code>VariableDataPrototype</code>	<code>VariableDataPrototype</code> in <code>VariableDataPrototype</code>	<code>ParameterDataPrototype</code> in <code>ParameterDataPrototype</code>	<code>ParameterDataPrototype</code> in <code>ParameterDataPrototype</code>	<code>ParameterDataPrototype</code> in <code>ParameterDataPrototype</code>	<code>ParameterDataPrototype</code> in <code>ParameterDataPrototype</code>	<code>ParameterDataPrototype</code> in <code>ParameterDataPrototype</code>
<code>const</code>									X		X	X	
<code>fixed</code>									X				X
<code>measurementPoint</code>	X						X	X					
<code>queued</code>	X												
<code>standard</code>	X	X	X	X	X	X	X	X	X	X	X	X	X

**[constr\_10104] `RoleBasedPortAssignment` where attribute `role` is set to `CallbackGetFaultDetectCounter` shall refer to a `PPortPrototype` in the role `portPrototype`**

*Imposition time:* CP: IT\_RteGen

[If a `SwcServiceDependency` aggregates both

- a `DiagnosticEventNeeds` that in turn aggregates `DiagEventDebounceMonitorInternal` in the role `diagEventDebounceAlgorithm` and
- a `RoleBasedPortAssignment` in the role `assignedPort` where attribute `role` is set to `CallbackGetFaultDetectCounter`,

then the target of the reference `SwcServiceDependency.assignedPort.portPrototype` shall be a `PPortPrototype`.]

**[constr\_10118] Structural consistency of the modeling of [InvalidationPolicy](#)***Imposition time:* CP: IT\_CpgExe

[A [dataElement](#) referenced by an [InvalidationPolicy](#) shall be owned by the [SenderReceiverInterface](#) that also owns the [InvalidationPolicy](#).]

**[constr\_10119] [SenderReceiverInterface.dataElement](#) shall be referenced by at most one [InvalidationPolicy](#)***Imposition time:* CP: IT\_CpgExe

[Any [SenderReceiverInterface.dataElement](#) shall be referenced by at most one [InvalidationPolicy](#) in the role [InvalidationPolicy.dataElement](#).]

**[constr\_10120] Structural consistency of the modeling of [MetaDataItemSet](#)***Imposition time:* CP: IT\_CpgExe

[A [dataElement](#) referenced by an [MetaDataItemSet](#) in the role [dataElement](#) shall be owned by the [SenderReceiverInterface](#) that also owns the [Meta-DataItemSet](#).]

**[constr\_10121] [SenderReceiverInterface.dataElement](#) shall be referenced by at most one [MetaDataItemSet](#)***Imposition time:* CP: IT\_CpgExe

[Any [SenderReceiverInterface.dataElement](#) shall be referenced by at most one [MetaDataItemSet](#) in the role [MetaDataItemSet.dataElement](#).]

**[constr\_10123] Existence of attribute [DtcStatusChangeNotificationNeeds.notificationTime](#)***Imposition time:* CP: IT\_RteGen

[Attribute [DtcStatusChangeNotificationNeeds.notificationTime](#) shall only exist if the enclosing [SwcServiceDependency](#) contains a [RoleBasedPortAssignment](#) where attribute role is set to the value [ClearDtcNotification](#).]

**[constr\_10196] Definition of [invalidValue](#) for [DataPrototype](#) is typed by an [ImplementationDataType](#) that references a [CompuMethod](#) of category TEXTTABLE or BITFIELD\_TEXTTABLE***Imposition time:* CP: IT\_CpgExe

[If an [invalidValue](#) is defined for a [DataPrototype](#) that is typed by an [ImplementationDataType](#) that references or inherits (see [\[constr\\_1015\]](#)) a [CompuMethod](#) of category TEXTTABLE or BITFIELD\_TEXTTABLE, the applicable [ValueSpecification](#) shall be a [TextValueSpecification](#) if the value fits into the intervals defined by the [CompuMethod](#).

In this case the value provided shall match to one of the applicable text values ([vt](#), [shortLabel](#), [symbol](#)) defined by the applicable [CompuScales](#).]

**[constr\_10372] Relation between *Type of PortPrototype*, *Type of ComSpec*, and *Type of PortInterface***

*Imposition time:* CP: IT\_CpgExe

[With respect to [constr\_1043], if a *Type of PortPrototype* aggregates a *Type of ComSpec*, then the *Type of PortPrototype* shall

- reference a *Type of PortInterface* in the role *Role of Type-Ref* and
- the *Role of Element* that is referenced from the *Type of ComSpec* shall be aggregated by the exact same *Type of PortInterface* that is also referenced by the enclosing *Type of PortPrototype* in the role *Role of Type-Ref*.

]

**[constr\_10373] *ImplementationDataType* of category **VALUE** shall not refer to *SwBaseType* of category **VOID****

*Imposition time:* CP: IT\_CpgExe

[An *ImplementationDataType* where attribute *category* is set to **VALUE** shall not reference (in the role *swDataDefProps.baseType*) a *SwBaseType* where attribute *category* is set to **VOID**.]

**[constr\_10383] Supported value encodings for *SwBaseType* in the context of *PortInterfaces* where attribute *isService* is set to **false****

*Imposition time:* CP: IT\_CpgExe

[The supported value encodings for the usage within a *PortInterface* where attribute *isService* is set to **false** are:

- 2C: Two's complement
- IEEE754: floating-point numbers
- ISO-8859-1: single-byte coded character
- ISO-8859-2: single-byte coded character
- WINDOWS-1252: single-byte coded character
- UTF-8: UCS Transformation Format 8
- UTF-16: Character encoding for Unicode code points based on 16 bit code units, see [7, ISO 10646]
- UCS-2: Universal Character Set 2
- NONE: Unsigned Integer
- **BOOLEAN**: This represents an integer to be interpreted as boolean.

]

**[constr\_10415] Initial value on the level of an [ImplementationDataTypeElement](#) where attribute [isOptional](#) is set to the value `True`**

*Imposition time:* CP: IT\_CpgExe

[The initial value used on the level of an [ImplementationDataTypeElement](#) where attribute [isOptional](#) is set to the value `True` shall **not** be initialized using a [NotAvailableValueSpecification](#).]

**[constr\_10424] Reference from [MemorySection](#) to [ExecutableEntity](#)**

*Imposition time:* CP: IT\_CpgExe

[Each [ExecutableEntity](#) shall only be referenced by exactly one [MemorySection](#).]

**[constr\_10433] Existence of attributes of [ApplicationDataType](#) depending on the [category](#)**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

Attributes of Application-DataType	Owner				Attribute Existence per ApplicationDataType.category													
	ApplicationRecordDataType	ApplicationRecordElement	ApplicationArrayDataType	ApplicationArrayElement	VALUE	VAL_BLK	STRUCTURE	ARRAY	STRING	BOOLEAN	COM_AXIS	RES_AXIS	CURVE	MAP	CUBOID	CUBE_4	CUBE_5	
element	x						1..*											
isOptional		x					0..1											
element			x					1										
dynamicArraySizeProfile			x					0..1										
arraySizeHandling				x				0..1										
arraySizeSemantics				x				0..1										
maxNumberOfElements				x				1										
swDataDefProps	x	x	x	x	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	0..1	

# [constr\_10434] Existence of attributes of **ImplementationDataType** depending on the **category**

Imposition time: CP: IT\_CpgExe

[

Attributes of ImplementationDataType	Attribute Existence per Category						
	VALUE	DATA_REFERENCE	FUNCTION_REFERENCE	TYPE_REFERENCE	STRUCTURE	UNION	ARRAY
dynamicArraySizeProfile							0..1
isStructWithOptionalElement					0..1		
typeEmitter	0..1	0..1	0..1	0..1	0..1	0..1	0..1
symbolProps	0..1	0..1	0..1	0..1	0..1	0..1	0..1
swDataDefProps	0..1	0..1	0..1	0..1	0..1	0..1	0..1
subElement					1..*	1..*	1
subElement.isOptional					0..1		
subElement.arraySize							0..1
subElement.arraySizeSemantics							0..1
subElement.arraySizeHandling							0..1
subElement.arrayImplPolicy							0..1

]

# [constr\_10435] Existence of attributes of **ImplementationDataTypeElement** depending on the **category**

Imposition time: CP: IT\_CpgExe

[

Attributes of ImplementationDataTypeElement	Attribute Existence per Category						
	VALUE	DATA_REFERENCE	FUNCTION_REFERENCE	TYPE_REFERENCE	STRUCTURE	UNION	ARRAY
swDataDefProps	0..1	0..1	0..1	0..1	0..1	0..1	0..1
subElement					1..*	1..*	1
subElement.isOptional					0..1		
subElement.arraySize							0..1
subElement.arraySizeSemantics							0..1
subElement.arraySizeHandling							0..1
subElement.arrayImplPolicy							0..1

]

**[constr\_10439] Initialization of a `DataPrototype` typed by a Compound Primitive Data Type***Imposition time:* CP: IT\_CpgExe

[If a `DataPrototype` that is typed by a Compound Primitive Data Type according to [TPS\_SWCT\_01179] needs to be initialized by a constant value, then the initialization shall only be provided in the form of an `ApplicationValueSpecification`.]

**[constr\_10502] Number of elements of `ApplicationValueSpecification.swValueCont.swArraysize` vs. `ApplicationValueSpecification.category`***Imposition time:* CP: IT\_ValSpec, AP: IT\_ValSpec

[

Value of <code>category</code>	Number of values in <code>swValueCont.swArraysize</code>
<code>CURVE</code>	1
<code>MAP</code>	2
<code>CUBOID</code>	3
<code>CUBE_4</code>	4
<code>CUBE_5</code>	5
<code>COM_AXIS</code>	1
<code>RES_AXIS</code>	1
<code>VAL_BLK</code>	1..*

]

**[constr\_10503] `ApplicationValueSpecification` where attribute `category` is set to `MAP`, `CUBOID`, `CUBE_4`, or `CUBE_5` and `ROW_DIR SwRecordLayout`***Imposition time:* CP: IT\_ValSpec

[In the context of an `ApplicationValueSpecification` where attribute `category` is set to `MAP`, `CUBOID`, `CUBE_4`, or `CUBE_5` that is applied to a `DataPrototype` typed by an `ApplicationPrimitiveDataType` where the `swDataDefProps.swRecordLayout` refers to a `SwRecordLayout` with a `ROW_DIR` approach, the value of `ApplicationValueSpecification.swValueCont.swArraysize.v[i]` (i.e., counting up from the first element of `swArraysize.v`) shall be identical to the number of axis points of the respective `SwCalprmAxisSet.swCalprmAxis` where attribute `swAxisIndex` is set to  $i$ :

- If the respective `SwCalprmAxis` is a `SwAxisGrouped`, then the number of axis points shall be retrieved from the attribute `subElement.arraySize` of the `ImplementationDataType` that is referenced by a `DataTypeMap` that also references the `ApplicationDataType` referenced in the role `SwAxisGrouped.sharedAxisType`.
- If the respective `SwCalprmAxis` is a `SwAxisIndividual`, the number of axis points is identical to the value of attribute `SwAxisIndividual.swMaxAxisPoints`.



]

**[constr\_10504]** **ApplicationValueSpecification** where attribute **category** is set to **VAL\_BLK** and **ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSizeMult** exists for **ROW\_DIR SwRecordLayout**

*Imposition time:* CP: IT\_ValSpec

[If the attribute **ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSizeMult** exists, then the value of **ApplicationValueSpecification.swValueCont.swArraysize** can be identical to the value of **ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSizeMult** if the referenced **ApplicationPrimitiveDataType.swDataDefProps.swRecordLayout** defines a row-first **ROW\_DIR**.]

**[constr\_10505]** **ApplicationValueSpecification** where attribute **category** is set to **MAP**, **CUBOID**, **CUBE\_4**, or **CUBE\_5** and **COLUMN\_DIR SwRecordLayout**

*Imposition time:* CP: IT\_ValSpec

[In the context of an **ApplicationValueSpecification** where attribute **category** is set to **MAP**, **CUBOID**, **CUBE\_4**, or **CUBE\_5** that is applied to a **DataPrototype** typed by an **ApplicationPrimitiveDataType** where the **swDataDefProps.swRecordLayout** refers to a **SwRecordLayout** with a **COLUMN\_DIR** approach, the value of **ApplicationValueSpecification.swValueCont.swArraysize.v[-i]** (i.e., counting down from the last element of **swArraysize.v**) shall be identical to the number of axis points of the respective **SwCalprmAxisSet.swCalprmAxis** where attribute **swAxisIndex** is set to **i**:

- If the respective **SwCalprmAxis** is a **SwAxisGrouped**, then the number of axis points shall be retrieved from the attribute **subElement.arraySize** of the **ImplementationDataType** that is referenced by a **DataTypeMap** that also references the **ApplicationDataType** referenced in the role **SwAxisGrouped.sharedAxisType**.
- If the respective **SwCalprmAxis** is a **SwAxisIndividual**, the number of axis points is identical to the value of attribute **SwAxisIndividual.swMaxAxisPoints**.

]

**[constr\_10506]** **ApplicationValueSpecification** where attribute **category** is set to **VAL\_BLK** and **ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSizeMult** exists for **COLUMN\_DIR SwRecordLayout**

*Imposition time:* CP: IT\_ValSpec

[If the attribute **ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSizeMult** exists, then the value of **ApplicationValueSpecification.swValueCont.swArraysize** can be taken over from the reversed values of **ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSizeMult** if

the referenced `ApplicationPrimitiveDataType.swDataDefProps.swRecordLayout` defines a column-first `COLUMN_DIR` layout.]

**[constr\_10507] `ApplicationValueSpecification` where attribute `category` is set to `VAL_BLK` and `ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSize` exists**

*Imposition time:* CP: `IT_ValSpec`, AP: `IT_ValSpec`

[If the attribute `ApplicationPrimitiveDataType.swDataDefProps.swValueBlockSize` exists, then the value of `ApplicationValueSpecification.swValueCont.swArraysize` shall contain a single `v` and the value of `v` shall be identical to the value of attribute `swValueBlockSize`.]

**[constr\_10520] Multiplicity of `AssemblySwConnector.provider`**

*Imposition time:* CP: `IT_CompSwcT`

[For each `AssemblySwConnector`, the reference `AssemblySwConnector.provider` shall exist.]

**[constr\_10521] Multiplicity of `AssemblySwConnector.requester`**

*Imposition time:* CP: `IT_CompSwcT`

[For each `AssemblySwConnector`, the reference `AssemblySwConnector.requester` shall exist.]

**[constr\_10525] Existence of attribute `ApplicationValueSpecification.category`**

*Imposition time:* CP: `IT_CpgExe`, AP: `IT_BefAraApiGen`

[For each `ApplicationValueSpecification`, attribute `category` shall exist.]

**[constr\_10527] Existence of `RoleBasedDataAssignment.usedDataElement.autosarVariable` for `RoleBasedDataAssignment.role = ramBlock`**

*Imposition time:* CP: `IT_RteGen`

[If the attribute `RoleBasedDataAssignment.role` is set to the value `ramBlock`, then the reference `RoleBasedDataAssignment.usedDataElement.autosarVariable` shall not exist.]

**[constr\_10529] Existence of `AsynchronousServerCallResultPoint` for `AsynchronousServerCallPoint` where attribute `timeout` is defined**

*Imposition time:* CP: `IT_CpgExe`

[For each `AsynchronousServerCallPoint` where attribute `timeout` exists, an `AsynchronousServerCallResultPoint` shall exist that references the `AsynchronousServerCallPoint` in the role `asynchronousServerCallPoint`.]

**[constr\_10532] Restriction for `SenderComSpec.transmissionProps.onChangeDataPrototype`**

*Imposition time:* CP: IT\_CpgExe

[If the `SenderComSpec.dataElement` refers to an `AutosarDataPrototype` aggregated by a `SenderReceiverInterface` in the role `dataElement`, then a `DataPrototypeReference` aggregated in the role `SenderComSpec.transmissionProps.onChangeDataPrototype` shall only exist as

- a `DataPrototypeInPortInterfaceRef` that aggregates a `DataPrototypeInSenderReceiverInterfaceInstanceRef` in the role `dataPrototypeInSenderReceiverInterface` or
- an `ImplementationDataTypeElementInPortInterfaceRef`.

]

**[constr\_10533] Existence of `TransmissionComSpecProps.onChangeDataPrototype.dataPrototypeInSenderReceiverInterface.rootDataPrototypeInSr`**

*Imposition time:* CP: IT\_CpgExe

[If all of the following conditions apply:

- the `SenderComSpec.dataElement` refers to an `AutosarDataPrototype` aggregated by a `SenderReceiverInterface` in the role `dataElement` and
- the aggregation in the role `TransmissionComSpecProps.onChangeDataPrototype.dataPrototypeInSenderReceiverInterface` exists,

then the aggregation in the role `TransmissionComSpecProps.onChangeDataPrototype.dataPrototypeInSenderReceiverInterface.rootDataPrototypeInSr` shall **not** exist.]

**[constr\_10534] Existence of `TransmissionComSpecProps.onChangeDataPrototype.rootDataPrototype`**

*Imposition time:* CP: IT\_CpgExe

[If all of the following conditions apply:

- the `SenderComSpec.dataElement` refers to an `AutosarDataPrototype` aggregated by a `SenderReceiverInterface` in the role `dataElement` and
- the aggregation in the role `TransmissionComSpecProps.onChangeDataPrototype` exists,

then the aggregation in the role `TransmissionComSpecProps.onChangeDataPrototype.rootDataPrototype` shall **not** exist]

**[constr\_10538] Existence of attribute `ReceiverComSpec.dataElement`**

*Imposition time:* CP: IT\_CpgExe

[For each `ReceiverComSpec`, attribute `dataElement` shall exist.]

**[constr\_10539] Existence of attribute `SenderComSpec.dataElement`**

*Imposition time:* CP: IT\_CpgExe, AP: IT\_BefAraApiGen

[For each `SenderComSpec`, attribute `dataElement` shall exist.]

**[constr\_10542] `RunnableEntity` is referenced by an `OperationInvokedEvent`**

*Imposition time:* CP: IT\_CpgExe

[A `RunnableEntity` that is referenced by one or more (according to [TPS\_SWCT\_01225]) `OperationInvokedEvents` in the role `startOnEvent` shall **not** be referenced in the same role (`startOnEvent`) by any other subclass of `RTEEvent`.]

**[constr\_10543] Uniqueness of reference `PortAPIOption.port`**

*Imposition time:* CP: IT\_CpgExe

[Any `PortPrototype` may be referenced **at most once** in the role `PortAPIOption.port`.]

**[constr\_10544] Ownership of reference `PortAPIOption.port`**

*Imposition time:* CP: IT\_CpgExe

[A `PortPrototype` referenced in the role `PortAPIOption.port` shall be owned by the same `AtomicSwComponentType` that also owns the `SwcInternalBehavior` that in turn owns the `PortAPIOption` from which the `PortPrototype` is referenced.]

**[constr\_10558] `SwBaseType` associated with corresponding `ApplicationRecordElement` and `ImplementationDataTypeElement`**

*Imposition time:* CP: IT\_CpgExe

[If

- an `ApplicationRecordElement` is implicitly (i.e. by position in the enclosing `ApplicationRecordDataType`) mapped to an `ImplementationDataTypeElement` of category `VALUE` and
- the `ApplicationRecordElement` typed by an `ApplicationPrimitiveDataType` and a `DataTypeMap` exists that maps the `ApplicationPrimitiveDataType` to an `ImplementationDataType` of category `VALUE`,

then the affected `ImplementationDataType` of category `VALUE` shall reference the **identical** `SwBaseType` as the affected `ImplementationDataTypeElement`.]

**[constr\_10559] Uniqueness of `DataPrototypeMapping.firstDataPrototype` and `secondDataPrototype`**

*Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Within the context of a `VariableAndParameterInterfaceMapping`, **no two** `DataPrototypeMappings` shall exist where the targets of the combination of references in the roles `firstDataPrototype` and `secondDataPrototype` are identical.]

**[constr\_10560] Uniqueness of `ClientServerOperationMapping.firstOperation` and `secondOperation`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Within the context of a `ClientServerInterfaceMapping`, **no two** `ClientServerOperationMappings` shall exist where the targets of the combination of references in the roles `firstOperation` and `secondOperation` are identical.]

**[constr\_10561] Uniqueness of `ClientServerApplicationErrorMapping.firstApplicationError` and `secondApplicationError`***Imposition time:* CP: IT\_RteGen, AP: IT\_BefAraApiGen

[Within the context of a `ClientServerInterfaceMapping`, **no two** `ClientServerApplicationErrorMappings` shall exist where the targets of the combination of references in the roles `firstApplicationError` and `secondApplicationError` are identical.]

**[constr\_10562] Uniqueness of `ModeDeclarationGroupPrototypeMapping.firstModeGroup` and `secondModeGroup`***Imposition time:* CP: IT\_RteGen

[Within the context of a `ModeInterfaceMapping`, **no two** `ModeDeclarationGroupPrototypeMappings` shall exist where the targets of the combination of references in the roles `firstModeGroup` and `secondModeGroup` are identical.]

**[constr\_10563] Uniqueness of `ModeDeclarationMapping.firstMode` and `secondMode`***Imposition time:* CP: IT\_RteGen

[Within the context of a `ModeDeclarationMappingSet`, **no two** `ModeDeclarationMappings` shall exist where the targets of the combination of references in the roles `firstMode` and `secondMode` are identical.]

**[constr\_10564] Uniqueness of `TriggerMapping.firstTrigger` and `secondTrigger`***Imposition time:* CP: IT\_RteGen

[Within the context of a `TriggerInterfaceMapping`, **no two** `TriggerMappings` shall exist where the targets of the combination of references in the roles `firstTrigger` and `secondTrigger` are identical.]

**[constr\_10565] Uniqueness of `SubElementMapping.firstElement` and `secondElement`***Imposition time:* CP: IT\_RteGen

[Within the context of a `DataPrototypeMapping`, **no two** `SubElementMappings` shall exist where the targets of the combination of references in the roles `firstElement` and `secondElement` are identical.]

**[constr\_10575] No multiple instantiation of `NvBlockSwComponentType`***Imposition time:* CP: IT\_RteGen

[For each `NvBlockSwComponentType`, attribute `internalBehavior.supportsMultipleInstantiation` shall **always** be set to false.]

**[constr\_10606] Existence of `ConstantSpecificationMapping` or `CalibrationParameterValue` for `ApplicationValueSpecification` or `ApplicationRuleBasedValueSpecification` of category `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, and `CUBE_5`***Imposition time:* CP: IT\_RteGen

[Any `ApplicationValueSpecification` or `ApplicationRuleBasedValueSpecification` of category `CURVE`, `MAP`, `CUBOID`, `CUBE_4`, and `CUBE_5` shall be referenced from

- a `ConstantSpecificationMapping` in the role `applConstant` and/or
- a `CalibrationParameterValue` in the role `applInitValue`.

]

**[constr\_10607] Number of `ConstantSpecificationMappings` that are allowed to reference a `ApplicationValueSpecification` or `ApplicationRuleBasedValueSpecification` in the context of an `InternalBehavior`***Imposition time:* CP: IT\_RteGen

[Within the collection of all `ConstantSpecificationMappings` owned by `ConstantSpecificationMappingSets` referenced by a single `InternalBehavior`, at most one `ConstantSpecificationMapping` shall refer to any given `ApplicationValueSpecification` or `ApplicationRuleBasedValueSpecification`.]

**[constr\_10608] Number of `ConstantSpecificationMappings` that are allowed to reference a `ApplicationValueSpecification` or `ApplicationRuleBasedValueSpecification` in the context of a `ParameterSwComponentType`***Imposition time:* CP: IT\_RteGen

[Within the collection of all `ConstantSpecificationMappings` owned by `ConstantSpecificationMappingSets` referenced by a single `ParameterSwComponentType`, at most one `ConstantSpecificationMapping` shall refer to any given `ApplicationValueSpecification` or `ApplicationRuleBasedValueSpecification`.]

**[constr\_10610] Compatibility of `PhysicalDimensions` in the context is the creation of an `ApplicationValueSpecification`***Imposition time:* CP: IT\_CpgExe

[In the context of the creation of an `ApplicationValueSpecification`, two `PhysicalDimension` definitions are compatible if and only if the values of

- `lengthExp`
- `massExp`
- `timeExp`
- `currentExp`
- `temperatureExp`
- `molarAmountExp`
- `luminousIntensityExp`

are identical and **either**

- the `shortNames` are identical **or**
- a `PhysicalDimensionMapping` exists that maps one of the `PhysicalDimensions` in the role `firstPhysicalDimension` and the other `PhysicalDimension` in the role `secondPhysicalDimension`.

]

**[constr\_10632] Compatibility of `SwTextProps`***Imposition time:* CP: IT\_RteGen

[Two `SwTextProps` are compatible **if and only if** they have identical values of attributes

- `arraySizeSemantics`
- `swMaxTextSize`

**and** the following attributes of the reference in the role `baseType` are identical:

- `baseTypebaseTypeDefinition.baseTypeEncoding`
- `baseTypebaseTypeDefinition.baseTypeSize`
- `baseTypebaseTypeDefinition.byteOrder`

]

**[constr\_10667] Simple compatibility of `ImplementationDataTypes`***Imposition time:* CP: IT\_RteGen

[Instances of `ImplementationDataType` are compatible if, after all type-references are resolved, all of the following rules apply:



1. They have the same `category`.
2. They have the identical structure (this refers to `ImplementationDataTypeElement` and their `subElements`).
3. The attributes `arraySize` and `arraySizeSemantics` have (given the existence) identical values.
4. For each `ImplementationDataType.subElement`, the attribute `isOptional` shall either
  - not exist on both sides or
  - be set to the value `false` if it only exists on one side or
  - have the identical value on both sides.
5. The `swDataDefProps` (after consideration of [constr\_1015]) attached to the M1 data types are compatible.

]

**[constr\_10668] Restriction for the existence of attributes of `RunnableEntityArgument` for port-defined argument values**

*Imposition time:* CP: IT\_CpgExe

[Any `RunnableEntity.argument` that corresponds (based on the order index) to a port-defined argument value shall not define any of

- the reference in the role `implementationDataType` or
- the attribute `serverArgumentImplPolicy`.

]

**[constr\_10669] Existence of reference `RunnableEntityArgument.implementationDataType`**

*Imposition time:* CP: IT\_CpgExe

[For each `RunnableEntityArgument` that represents an argument of a `ClientServerOperation`, the reference in the role `implementationDataType` shall exist .]

**[constr\_10670] Compatibility between the corresponding `ClientServerOperation.argument` and `RunnableEntity.argument`**

*Imposition time:* CP: IT\_CpgExe

[If a `ClientServerOperation` is referenced in the role `operation` by an `OperationInvokedEvent` that in turn references a `RunnableEntity` in the role `startOnEvent` and if the `RunnableEntity` owns `RunnableEntityArguments` in the role `argument`, the corresponding (i.e. same position in the ordered collection of arguments) `ClientServerOperation.argument` and `RunnableEntity.argument` shall fulfill the following conditions:



- The `ImplementationDataType` associated with the `ClientServerOperation.argument` and the `ImplementationDataType` referenced in the role `RunnableEntity.argument.implementationDataType` shall be compatible according to [constr\_10667].
- The attribute `ClientServerOperation.argument.direction` and `RunnableEntity.argument.direction` shall have the same value.

]

#### [constr\_10671] `ReceptionComSpecProps.comHandlerTaskMappingEnabled` vs. implicit data read access

*Imposition time:* IT\_CpgExe

[If the `ReceiverComSpec.dataElement` is referenced by a `VariableAccess` that is aggregated by `RunnableEntity` in the `dataReadAccess` role (which translates to implicit data read access), then `ReceptionComSpecProps.comHandlerTaskMappingEnabled` shall not be set to `true`.]

#### [constr\_10672] Applicability of `transportErrorCountEnabled`, `valueErrorCountEnabled`, `returnNoNewDataEnabled`

*Imposition time:* CP: IT\_CpgExe

[The attributes

- `NonqueuedReceiverComSpec.transportErrorCountEnabled`,
- `NonqueuedReceiverComSpec.valueErrorCountEnabled`, and
- `NonqueuedReceiverComSpec.returnNoNewDataEnabled`

shall only exist if the attribute `ReceptionComSpecProps.comHandlerTaskMappingEnabled` is set to `true`.]

#### [constr\_10673] Existence of `ReceptionComSpecProps.comHandlerTaskMappingEnabled` vs. `ReceptionComSpecProps.timeout`

*Imposition time:* CP: IT\_CpgExe

[In each `ReceptionComSpecProps`, **at most one** of the attributes

- `comHandlerTaskMappingEnabled` (timeout monitoring by the "COM handler") and
- `timeout` (timeout monitoring by the application software)

shall exist.]

#### [constr\_10674] Existence of attribute `ReceptionComSpecProps.outOfRangeBitfieldErrorsEnabled`

*Imposition time:* CP: IT\_CpgExe

[Attribute `ReceptionComSpecProps.outOfRangeBitfieldErrorsEnabled` shall only exist if the `ReceiverComSpec.dataElement` is typed by either

- an `ApplicationRecordDataType` or
- an `ImplementationDataType` where (after the removal of all indirections) attribute `category` is set to the value `STRUCTURE`.

]

**[constr\_10675] Existence of attribute `ReceptionComSpecProps.invalidValueBitfieldErrorsEnabled`**

*Imposition time:* CP: IT\_CpgExe

[Attribute `ReceptionComSpecProps.invalidValueBitfieldErrorsEnabled` shall only exist if the `ReceiverComSpec.dataElement` is typed by either

- an `ApplicationRecordDataType` or
- an `ImplementationDataType` where (after the removal of all indirections) attribute `category` is set to the value `STRUCTURE`.

]

## 2.6 CP\_TPS\_SystemTemplate

**[constr\_1198] `TriggerToSignalMapping.systemSignals` eligible for a `TriggerToSignalMapping` in case no `DataTransformation` is used**

*Imposition time:* CP: IT\_EcuExt, AP: IT\_Mani

[The `ISignal` that is referenced by a `SystemSignal` that in turn is referenced by a `TriggerToSignalMapping` in the role `systemSignal` shall have the length attribute set to 0 if the `ISignal` does not reference a `DataTransformation` in the role `dataTransformation`.]

**[constr\_1199] `ISignals` relating to `systemSignals` eligible for a `TriggerToSignalMapping` shall use update bit in case no `DataTransformation` is used**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_Mani

[An `ISignal`

- that is used to reference a `systemSignal` that in turn is referenced by a `TriggerToSignalMapping` and
- does not reference a `DataTransformation` in the role `dataTransformation`

shall be referenced by an `ISignalToIPduMapping` where the attribute `updateIndicationBitPosition` is defined.]

**[constr\_1265] DoIpGidSynchronizationNeeds can only exist once per ECU\_EXTRACT**

*Imposition time:* CP: IT\_EcuExt

[Within the context of one `System` of `category` ECU\_EXTRACT, there can only be at most one `DoIpGidSynchronizationNeeds`.]

**[constr\_1266] DoIpGidNeeds can only exist once per ECU\_EXTRACT**

*Imposition time:* CP: IT\_EcuExt

[Within the context of one `System` of `category` ECU\_EXTRACT, there can only be at most one `DoIpGidNeeds`.]

**[constr\_1267] DoIpActivationLineNeeds can only exist once per ECU\_EXTRACT**

*Imposition time:* CP: IT\_EcuExt

[Within the context of one `System` of `category` ECU\_EXTRACT, there can only be at most one `DoIpActivationLineNeeds`.]

**[constr\_1367] periodicResponseUdt.periodicResponseUdt shall only refer to a DcmIPdu**

*Imposition time:* CP: IT\_SysDesc

[If the role `periodicResponseUdt` exists then every `PduTriggering` referenced in the role `periodicResponseUdt` shall only refer to a `DcmIPdu`.]

**[constr\_1368] Limitation of the target of references from DiagnosticConnection**

*Imposition time:* CP: IT\_SysDesc

[`DiagnosticConnection` shall only reference (via the indirection created by `TpConnectionIdent`) the following sub-classes of the meta-class `TpConnection`:

- `CanTpConnection`
- `FlexrayTpConnection`
- `FlexrayArTpConnection`
- `DoIpTpConnection`

]

**[constr\_1369] CommunicationConnectors shall be attached to the same CommunicationCluster**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[All `CommunicationConnectors` referenced from `GlobalTimeMaster` and `GlobalTimeSlaves` aggregated in one `GlobalTimeDomain` shall be referenced in the role `commConnector` by the same `PhysicalChannel` aggregated by the same `CommunicationCluster`.]

**[constr\_1370] Consistency of `GlobalTimeDomain`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The `GlobalTimeSlave` referenced in the role `GlobalTimeGateway.slave` and the `GlobalTimeMaster` referenced in the role `GlobalTimeGateway.master` shall **not** be aggregated by the same `GlobalTimeDomain`.]

**[constr\_1371] Consistency of attribute `host`***Imposition time:* CP: IT\_SysDesc

[Within the context of an aggregating `GlobalTimeDomain`, the `CommunicationConnectors` referenced in the role `GlobalTimeGateway.master.communicationConnector` and `GlobalTimeGateway.slave.communicationConnector` shall be aggregated by the same `EcuInstance` that is referenced in the role `GlobalTimeGateway.host`.]

**[constr\_1372] Consistency of attribute `pduTriggering`***Imposition time:* CP: IT\_SysDesc

[Within the context of an aggregating `GlobalTimeDomain`, the `pduTriggering` shall be owned by `PhysicalChannel` that is also referencing the `CommunicationConnectors` referenced in the roles `GlobalTimeSlave.communicationConnector` and `GlobalTimeMaster.communicationConnector`.]

**[constr\_1373] `GlobalTimeMaster` with attribute `isSystemWideGlobalTimeMaster` set to `TRUE`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[`GlobalTimeMaster` with attribute `isSystemWideGlobalTimeMaster` set to `TRUE` shall not be referenced in the role `GlobalTimeGateway.master`.]

**[constr\_1374] Only fan-out possible for `GlobalTimeGateway`***Imposition time:* CP: IT\_SysDesc

[For all `GlobalTimeGateways` that refer to the same `EcuInstance` the condition applies that no two `GlobalTimeGateways` shall refer to the same `GlobalTimeMaster`.]

**[constr\_1387] Transmission of Variable-Size Array Data Types by means of a Transformer***Imposition time:* CP: IT\_SysDesc

[If a Transformer is used for the transmission of a Variable-Size Array Data Types then the Variable-Size Array Data Type shall be a "new-world" variable-size array data type according to [TPS\_SWCT\_01644] and [TPS\_SWCT\_01645]. "Old-world" dynamic-size array data types according to [TPS\_SWCT\_01641] and [TPS\_SWCT\_01642] are not supported.]

**[constr\_1441] In AUTOSAR, the transmission of union data types over the network is only supported by the SOME/IP Transformer**

*Imposition time:* CP: IT\_SysDesc

[If an `ImplementationDataType` according to [TPS\_SWCT\_01700], i.e. of category `STRUCT` that encloses an `ImplementationDataTypeElement` of category `UNION`, is used to directly or (via a `DataTypeMap`) indirectly type an `AutosarDataPrototype` and the latter is mapped to a `SystemSignal` then the `ISignal` that references that `SystemSignal` shall aggregate `SOMEIPTransformationISignalProps` in the role `transformationISignalProps`.]

**[constr\_1641] Consistent assignment of TLV data ids to `ApplicationRecordDataType`**

*Imposition time:* CP: IT\_SysDesc

[For every `ApplicationRecordDataType` where direct members set the attribute `ApplicationRecordElement.isOptional` to the value `True` references to all direct members of this `ApplicationRecordDataType` shall be created on the basis of the definition of `TlvDataIdDefinition`.]

**[constr\_1642] Consistent assignment of TLV data ids to `ImplementationDataType` or `ImplementationDataTypeElement`**

*Imposition time:* CP: IT\_SysDesc

[For every `ImplementationDataType` or `ImplementationDataTypeElement` of category `STRUCTURE` where direct members set the attribute `ImplementationDataTypeElement.isOptional` to the value `True` references to all direct members of this `ImplementationDataType` resp `ImplementationDataTypeElement` shall be created on the basis of the definition of `TlvDataIdDefinition`.]

**[constr\_1643] Completeness of the existence of a set of `TlvDataIdDefinition.tlvArguments`**

*Imposition time:* CP: IT\_SysDesc

[If the reference `TlvDataIdDefinition.tlvArguments` exists for one argument of a given `ClientServerOperation` then further `TlvDataIdDefinition.tlvArguments` shall exist for all arguments of the given `ClientServerOperation` and all affected `TlvDataIdDefinitions` shall be referenced by the same `SOMEIPTransformationISignalProps` via `TlvDataIdDefinitionSet`.]

**[constr\_1644] Completeness of the existence of a set of `TlvDataIdDefinition.tlvRecordElements`**

*Imposition time:* CP: IT\_SysDesc

[If the reference `TlvDataIdDefinition.tlvRecordElement` exists for one element of a given `ApplicationRecordDataType` then further `TlvDataIdDefinition.tlvRecordElement` shall exist for all elements of the given `ApplicationRecordDataType` and all affected `TlvDataIdDefinitions` shall be referenced by

the same `SOMEIPTransformationISignalProps` via `TlvDataIdDefinitionSet`.]

**[constr\_1645] Completeness of the existence of a set of `TlvDataIdDefinition.tlvImplementationDataTypeElements`**

*Imposition time:* CP: IT\_SysDesc

[Completeness of the existence of a set of `TlvDataIdDefinition.tlvImplementationDataTypeElements` If the reference `TlvDataIdDefinition.tlvImplementationDataTypeElement` exists for one `subElement` of a given `ImplementationDataType` or `ImplementationDataTypeElement` then further `TlvDataIdDefinition.tlvImplementationDataTypeElement` shall exist for all `subElements` of the given `ImplementationDataType` or `ImplementationDataTypeElement` and all affected `TlvDataIdDefinitions` shall be referenced by the same `SOMEIPTransformationISignalProps` via `TlvDataIdDefinitionSet`.]

**[constr\_1646] Scope of the uniqueness of the value of `TlvDataIdDefinition.id` for references to `ArgumentDataPrototype`**

*Imposition time:* CP: IT\_SysDesc

[For all `TlvDataIdDefinition` that are referencing `ArgumentDataPrototypes` of a given `ClientServerOperation` in the role `tlvArgument` the attribute `TlvDataIdDefinition.id` shall exist and have a unique value in the context of respective `arguments` of the enclosing `ClientServerOperation` where attribute `direction` is set to the value `in/inout` or `out/inout`.

Note: an `argument` where attribute `direction` is set to the value `in` may have the same data id as an `argument` where attribute `direction` is set to the value `out` since the two are transferred in separate messages.]

**[constr\_1647] Scope of the uniqueness of the value of `TlvDataIdDefinition.id` for references to `ApplicationRecordElement`**

*Imposition time:* CP: IT\_SysDesc

[For all `TlvDataIdDefinition` that are referencing `ApplicationRecordElements` of a given `ApplicationDataType` in the role `tlvRecordElement` the attribute `TlvDataIdDefinition.id` shall exist and have a unique value in the context of respective enclosing `ApplicationRecordDataType`.]

**[constr\_1648] Scope of the uniqueness of the value of `TlvDataIdDefinition.id` for references to `ImplementationDataTypeElement`**

*Imposition time:* CP: IT\_SysDesc

[For all `TlvDataIdDefinition` that are referencing `ImplementationDataTypeElements` of a given `ImplementationDataType/ImplementationDataTypeElement` in the role `tlvImplementationDataTypeElement` the attribute `TlvDataIdDefinition.id` shall exist and have a unique value in the context of respective enclosing `ImplementationDataType` or `ImplementationDataTypeElement`.]

**[constr\_1649] TlvDataIdDefinition referencing ArgumentDataPrototype***Imposition time:* CP: IT\_SysDesc

[Each `ArgumentDataPrototype` shall be referenced at most once in the role `tlvArgument` in the context of the same `SOMEIPTransformationISignalProps`.]

**[constr\_1650] TlvDataIdDefinition referencing ApplicationRecordElement***Imposition time:* CP: IT\_SysDesc

[Each `ApplicationRecordElement` shall be referenced at most once in the role `tlvRecordElement` in the context of the same `SOMEIPTransformationISignalProps`.]

**[constr\_1651] TlvDataIdDefinition referencing ImplementationDataTypeElement***Imposition time:* CP: IT\_SysDesc

[Each `ImplementationDataTypeElement` shall be referenced at most once in the role `tlvImplementationDataTypeElement` in the context of the same `SOMEIPTransformationISignalProps`.]

**[constr\_1652] Definition of static length fields sizes in case of TLV usage***Imposition time:* CP: IT\_SysDesc

[If `TlvDataIdDefinitions` are defined for a `SOMEIPTransformationISignalProps`, the attributes `sizeOfArrayLengthFields`, `sizeOfStructLengthFields`, `sizeOfStringLengthFields` and `sizeOfUnionLengthFields` shall be greater than 0.]

**[constr\_1653] Identical values for length fields sizes in case of TLV usage***Imposition time:* CP: IT\_SysDesc

[If `TlvDataIdDefinitions` are defined for a `SOMEIPTransformationISignalProps`, the attributes `sizeOfArrayLengthFields`, `sizeOfStructLengthFields`, `sizeOfStringLengthFields` and `sizeOfUnionLengthFields` shall have an identical value.]

**[constr\_1654] No definition of length field sizes on DataPrototype level in case of TLV usage***Imposition time:* CP: IT\_SysDesc

[If `TlvDataIdDefinitions` are defined for a `SOMEIPTransformationISignalProps`, the attributes `sizeOfArrayLengthFields`, `sizeOfStructLengthFields` and `sizeOfUnionLengthFields` shall not be defined on `DataPrototype` level but only on `ISignal` level.]



**[constr\_1655] The mutual existence of `LinMasters` in the `LinSlave` `EcuExtract`**

*Imposition time:* CP: IT\_EcuExt

[A `LinMaster` shall not be part of the `EcuExtract` of a corresponding `LinSlave`.]

**[constr\_1656] No application-level write access to `LinErrorResponse.responseError` on Lin slave**

*Imposition time:* CP: IT\_SysDesc

[The `SystemSignal` referenced in the role `systemSignal` by the `ISignal` referenced by the `ISignalTriggering` that in turn is referenced in the role `LinErrorResponse.responseError` shall not be referenced by a `DataMapping` that allows for writing to the `SystemSignal`.]

**[constr\_1657] Existence of `LinPhysicalChannel.scheduleTable`**

*Imposition time:* CP: IT\_SysDesc

[In any given `Ecu Extract` that contains a `LinSlave`, the `LinPhysicalChannel` that relates to the respective `LinSlave` via `commConnector.commController` shall not aggregate a `LinScheduleTable`.]

**[constr\_1669] Existence of `PduTriggering.secOcCryptoServiceMapping`**

*Imposition time:* CP: IT\_SysDesc

[The reference `PduTriggering.secOcCryptoServiceMapping` shall only exist if the `PduTriggering` also references a `SecuredIPdu` in the role `iPdu`.]

**[constr\_1670] Prohibition of usage of `TlsCryptoMapping` in case of UDP socket connections**

*Imposition time:* CP: IT\_SysDesc

[A `TlsCryptoServiceMapping` may only be referenced by an `ApplicationEndpoint` in the role `tlsCryptoMapping` if that `ApplicationEndpoint` aggregates a `TcpTp` in the role `tpConfiguration`.]

**[constr\_1671] Supported values of `TlsCryptoServiceMapping.category`**

*Imposition time:* CP: IT\_SysDesc

[The only supported values of attribute `TlsCryptoServiceMapping.category` are:

- **TLS\_SERVER:** the `TlsCryptoServiceMapping` assumes the role of the *server* in the TLS connection.
- **TLS\_CLIENT:** the `TlsCryptoServiceMapping` assumes the role of the *client* in the TLS connection.

]



**[constr\_1672] Existence of `TlsCryptoCipherSuite.certificate` and `TlsCryptoCipherSuite.pskIdentity` in the server role**

*Imposition time:* CP: IT\_SysDesc

**[Either**

- the reference to `CryptoServiceCertificate` in the role `TlsCryptoCipherSuite.certificate`
- the aggregation of `TlsPskIdentity` in the role `TlsCryptoCipherSuite.pskIdentity`

**shall** exist if the `TlsCryptoCipherSuite` is aggregated by a `TlsCryptoServiceMapping` that has attribute `category` set to the value `TLS_SERVER`.]

**[constr\_2025] Uniqueness of `symbol` attributes**

*Imposition time:* CP: IT\_EcuExt

[With the exception of `RunnableEntities` that are subject to [constr\_1234] (`RunnableEntities` owned by `NvBlockSwComponentTypes`), in the context of a single `EcuInstance` the values of the `RunnableEntity.symbol` in combination with the attribute `symbol` of the meta-class `SymbolProps` owned by `AtomicSwComponentType` of all deployed `RunnableEntities` shall be unique such that no two (or more) combinations of `RunnableEntity.symbol` and the `symbol` of the meta-class `SymbolProps` owned by `AtomicSwComponentType` in the role `symbolProps` share the same value.]

**[constr\_3000] valid `SenderRecCompositeTypeMappings`**

*Imposition time:* CP: IT\_EcuExt

[All `SenderRecRecordElementMappings` or `SenderRecArrayElementMappings` aggregated in the context of a given `SenderReceiverToSignalGroupMapping` shall reference a `SystemSignal` that is also referenced in the role `systemSignal` by the `SystemSignalGroup` that is referenced by the enclosing `SenderReceiverToSignalGroupMapping` in the role `signalGroup`.]

**[constr\_3002] valid `swcToImplMapping`**

*Imposition time:* CP: IT\_EcuExt

[The referenced `SwcImplementation` refers to a `SwcInternalBehavior` that is part of a `AtomicSwComponentType`. The same `AtomicSwComponentType` shall be the type of the referenced `SwComponentPrototype`.

`SwcToImplMapping.componentImplementation.behavior.component == SwcToImplMapping.component.type]`

**[constr\_3003] Number of CAN channels**

*Imposition time:* CP: IT\_SysDesc

[CAN clusters shall aggregate exactly one `PhysicalChannel`.]

**[constr\_3004] Clustering and separation shall be exclusive***Imposition time:* CP: IT\_SysDesc

[Clustering and separation shall be exclusive, i.e. it SHALL NOT be possible that two `SwComponentPrototypes` A and B are associated both by a `ComponentClustering` and by a `ComponentSeparation` at the same time.]

**[constr\_3005] valid `EcuResourceEstimation`***Imposition time:* CP: IT\_SysDesc

[The same `EcuInstance` shall be referenced directly from the `EcuResourceEstimation` and from the `SwcToEcuMapping`:

`EcuResourceEstimation.swCompToEcuMapping.ecuInstance == EcuResourceEstimation.ecuInstance]`

**[constr\_3006] valid `EcuMapping`***Imposition time:* CP: IT\_SysDesc

[The referenced `hwCommunicationController` and `hwCommunicationPort` shall be part of the referenced `ecu`.

`ECUMapping.ecu.nestedElement` contains `ECUMapping.commControllerMapping.hwCommunicationController`

`ECUMapping.ecu.nestedElement` contains `ECUMapping.hwPortMapping.hwCommunicationPort]`

**[constr\_3007] `selectorFieldCodes` for dynamic part alternatives***Imposition time:* CP: IT\_SysDesc

[The `selectorFieldCodes` for the dynamic part alternatives within one `MultiplexedIPdu` shall differ from each other.]

**[constr\_3008] `EcuInstance` subelements***Imposition time:* CP: IT\_SysDesc

[The `CommunicationConnector` and the `CommunicationController` that is referenced by the `CommunicationConnector` shall be owned by the same `EcuInstance`.]

**[constr\_3009] Overlapping of `ISignals` is prohibited***Imposition time:* CP: IT\_SysDesc

[`ISignals` mapped to an `ISignalIPdu` shall not overlap.]

**[constr\_3010] `ISignalIPdu` length shall not be exceeded***Imposition time:* CP: IT\_SysDesc

[The combined length of all `ISignals` and `updateIndicationBitPositions` that are mapped into an `ISignalIPdu` shall not exceed the defined `Pdu length`.]

**[constr\_3011] Overlapping of updateIndicationBits of ISignals is prohibited***Imposition time:* CP: IT\_SysDesc

[The `updateIndicationBitPosition` for an `ISignal` in an `ISignalIPdu` shall not overlap with other `updateIndicationBitPositions` or `ISignal` locations.]

**[constr\_3012] Overlapping of Pdus is prohibited***Imposition time:* CP: IT\_SysDesc

[`Pdus` mapped to a `FlexrayFrame` shall NOT overlap.]

**[constr\_3013] FlexrayFrame length shall not be exceeded***Imposition time:* CP: IT\_SysDesc

[The combined length of all `Pdus` that are mapped into a `FlexrayFrame` shall not exceed the defined `FlexrayFrame` length.]

**[constr\_3014] Overlapping of updateIndicationBits for Pdus is prohibited***Imposition time:* CP: IT\_SysDesc

[The `updateIndicationBitPosition` for a `Pdu` in a `FlexrayFrame` shall NOT overlap with other `updateIndicationBitPositions` and `Pdu` locations.]

**[constr\_3015] Number of LIN channels***Imposition time:* CP: IT\_SysDesc

[LIN clusters shall aggregate exactly one `LinPhysicalChannel`.]

**[constr\_3018] Number of FlexRay channels***Imposition time:* CP: IT\_SysDesc

[A `FlexrayCluster` shall use either one `FlexrayPhysicalChannel` with `channelName` set to either `channelA` or `channelB` or else two `FlexrayPhysicalChannels` with one `channelName channelA` and one `channelName channelB`.]

**[constr\_3019] In the flat ECU extract each required interface shall be satisfied by connected provided interfaces***Imposition time:* CP: IT\_EcuExt

[In case of the flat `System` with `category ECU_EXTRACT` all `VariableDataPrototypes` specified by the `SenderReceiverInterface` of the `RPortPrototype` need to be supplied by some of the `PPortPrototypes` being connected with `SwConnectors`.]

**[constr\_3020] communicationDirection of containedISignalIPduGroups***Imposition time:* CP: IT\_SysDesc

[The value of the attribute `communicationDirection` of `containedISignalIPduGroup` shall be identical to the value of the attribute `communicationDirection` of the enclosing `ISignalIPduGroup`.]

### [constr\_3021] Mapping of SensorActuatorSwComponents to SensorActuatorHwElements

*Status:* OBSOLETE

*Imposition time:* CP: IT\_EcuExt

[Only `SwComponentPrototypes` that are typed by `SensorActuatorSwComponentType` shall be mapped to a `HwElement` with `category` `SensorActuator` via the `controlledHwElement` relation.]

### [constr\_3025] Usage of NPdus in TpConnections

*Imposition time:* CP: IT\_SysDesc

[In case several `TpConnections` use the same Frame ID for their communication needs only one `NPdu` element per Frame Id shall exist. This constraint applies for all supported AUTOSAR transport protocols (CanTp, LinTp, FrTp, FrArTp and J1939Tp).]

### [constr\_3027] Existence of ecuExtractVersion

*Imposition time:* CP: IT\_EcuExt

[In case the category of the System is `SYSTEM_EXTRACT` or `ECU_EXTRACT` the `ecuExtractVersion` attribute shall be defined.]

### [constr\_3028] FibexElements

*Imposition time:* CP: IT\_SysDesc

[Each `FibexElement` that is used in the System Description shall be referenced by the `System` element in the role `FibexElement`.]

### [constr\_3029] Assign-Frame command usage

*Imposition time:* CP: IT\_SysDesc

[For the LIN 2.0 Assign-Frame command the `LinConfigurableFrame` list shall be used. For the LIN 2.1 Assign-Frame-PID-Range command the `LinOrderedConfigurableFrame` list shall be used.]

### [constr\_3030] valid relationship between ECUMapping and EcuInstance

*Imposition time:* CP: IT\_SysDesc

[If an `EcuInstance` is assigned to a `HwElement` the `EcuInstance` shall belong to the same `System` as the `ECUMapping`.]

### [constr\_3031] Complete System Description does not have ports on the outermost composition

*Imposition time:* CP: IT\_SysDesc

[In a complete `System` with `category` `ABSTRACT_SYSTEM_DESCRIPTION` or `System` with `category` `SYSTEM_DESCRIPTION` this outermost `CompositionSwComponentType` has the unique feature that it doesn't have any outside ports, but all the SWC contained in it are connected to each other and fully specified by their `SwComponentTypes`, `PortPrototypes`, `PortInterfaces`, `VariableDataPrototypes`, `InternalBehavior` etc.]

**[constr\_3036] Pdus in CAN and LIN Frames***Imposition time:* CP: IT\_SysDesc

[CAN Frames and LIN Frames shall only contain one Pdu.]

**[constr\_3037] maximum Frame frameLength for CAN and LIN***Imposition time:* CP: IT\_SysDesc

[For CAN and LIN the maximum frameLength is 8 bytes and 64 bytes in case of CAN FD.]

**[constr\_3038] maximum Frame frameLength for FlexRay***Imposition time:* CP: IT\_SysDesc

[For FlexRay the maximum frameLength is 254 bytes.]

**[constr\_3039] pncIdentifier range***Imposition time:* CP: IT\_SysDesc

[The pncIdentifier value shall be in the range of 8..63 for normal CAN and in the range of 8..511 for CAN FD, FlexRay and Ethernet.]

**[constr\_3040] Restriction of pncIdentifier values***Imposition time:* CP: IT\_SysDesc

[The pncIdentifier value shall be within the range described by pncVectorOffset and pncVectorLength.]

**[constr\_3044] CBV configuration in case partial network is used***Imposition time:* CP: IT\_SysDesc

[In case a partial network is used the control bit vector (CBV) shall be defined in Byte 0 of the NmPdu (nmCbvPosition = 0).]

**[constr\_3045] Signal content evaluation vs. Mode evaluation***Imposition time:* CP: IT\_SysDesc

[The mode evaluation and the signal content evaluation shall not be used in the same IPdu. A mix of these two types is not allowed.]

**[constr\_3046] Consistency of TransmissionModeCondition.iSignalInIPdu***Imposition time:* CP: IT\_SysDesc

[The ISignalToIPduMapping referenced by the TransmissionModeCondition in the role iSignalInIPdu shall belong to the same ISignalIPdu as the TransmissionModeCondition.]

**[constr\_3047] Uniqueness of macMulticastAddresses***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[A macMulticastAddress shall be unique in a particular EthernetCluster.]

**[constr\_3048] Range of `vlanIdentifier`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The allowed values of `vlanIdentifier` range from 0 to 4095.]

**[constr\_3050] `J1939Cluster` uses exactly one `CanPhysicalChannel`***Imposition time:* CP: IT\_SysDesc

[A `J1939Cluster` shall aggregate exactly one `CanPhysicalChannel`.]

**[constr\_3051] Restriction of `ISignalMapping` references***Imposition time:* CP: IT\_SysDesc

[If the `sourceSignal` references an `ISignal` then the `targetSignal` shall also reference an `ISignal`.]

**[constr\_3052] Complete `ISignalMapping` of `ISignalGroup` signals***Imposition time:* CP: IT\_SysDesc

[If an `ISignalMapping` to an `ISignal` that is a member of a `ISignalGroup` exists then (see [TPS\_SYST\_01120]) an `ISignalMapping` to the enclosing `ISignalGroup` shall exist as well.]

**[constr\_3053] Complete `ISignalMapping` of target `ISignalGroup`***Imposition time:* CP: IT\_SysDesc

[If an `ISignalGroup` is referenced by a `targetSignal` then [TPS\_SYST\_02162] applies for each of the contained `ISignal` of that `ISignalGroup`.]

**[constr\_3057] Maximal one `BusspecificNmEcu` per `NmEcu` and bus system is allowed to be defined***Imposition time:* CP: IT\_SysDesc

[For each `NmEcu`, at most one `BusspecificNmEcu` per bus system (FlexRay/Can/Udp/J1939) is allowed to be defined.]

**[constr\_3058] References from `SenderRecArrayElementMapping` and from `SenderRecRecordElementMapping` to `SystemSignals` are not allowed within a `SenderReceiverCompositeElementToSignalMapping`***Imposition time:* CP: IT\_EcuExt

[The reference from `SenderRecArrayElementMapping` to `SystemSignal` and from `SenderRecRecordElementMapping` to `SystemSignal` shall not exist if the enclosing `SenderRecCompositeTypeMapping` is owned by a `SenderReceiverCompositeElementToSignalMapping`.]

## [constr\_3060] Allowed Attributes for `networkRepresentationProps` and `physicalProps`

Imposition time: CP: IT\_SysDesc

Attributes of SwDataDefProps	SystemSignal.physicalProps	ISignal.networkProps
<code>additionalNativeTypeQualifier</code>	NA	NA
<code>annotation</code>	NA	NA
<code>baseType</code>	NA	D
<code>baseType.category</code>	NA	M
<code>BaseTypeDirectDefinition.baseTypeEncoding</code>	NA	D
<code>BaseTypeDirectDefinition.byteOrder</code>	NA	NA
<code>BaseTypeDirectDefinition.baseTypeSize</code>	NA	0..1
<code>BaseTypeDirectDefinition.memAlignment</code>	NA	NA
<code>BaseTypeDirectDefinition.nativeDeclaration</code>	NA	NA
<code>compuMethod</code>	D	I
<code>dataConstr</code>	D	M
<code>displayFormat</code>	D	M
<code>implementationDataType</code>	NA	NA
<code>invalidValue</code>	NA	D
<code>stepSize</code>	NA	NA
<code>swAddrMethod</code>	NA	NA
<code>swAlignment</code>	NA	NA
<code>swBitRepresentation</code>	NA	NA
<code>swCalibrationAccess</code>	NA	NA
<code>swCalprmAxisSet</code>	NA	NA
<code>swComparisonVariable</code>	NA	NA
<code>swDataDependency</code>	NA	NA
<code>swHostVariable</code>	NA	NA
<code>swImplPolicy</code>	NA	NA
<code>swIntendedResolution</code>	NA	NA
<code>swInterpolationMethod</code>	NA	NA
<code>swIsVirtual</code>	NA	NA
<code>swPointerTargetProps</code>	NA	NA
<code>swRecordLayout</code>	NA	NA
<code>swRefreshTiming</code>	NA	NA
<code>swTextProps</code>	D	NA
<code>swValueBlockSize</code>	NA	NA
<code>unit</code>	D	M
<code>valueAxisDataType</code>	NA	NA

## [constr\_3062] The `EcuInstance` that is referenced from a specific `CouplingElement` shall be connected to the same `EthernetCluster` as the specific `CouplingElement`

Imposition time: CP: IT\_SysDesc, AP: IT\_SysDes

The `EcuInstance` referenced from a specific `CouplingElement` in the role `ecuInstance` shall be connected via the `CommunicationConnector` and a `EthernetPhysicalChannel` that refers the `CommunicationConnector` to the `Eth-`



ernetCluster referenced by the specific CouplingElement in the role communicationCluster.]

**[constr\_3067] initValue defined in the context of ISignal**

*Imposition time:* CP: IT\_SysDesc

[The definition of an `initValue` in the context of an `ISignal` shall only be a `NumericalValueSpecification`, `TextValueSpecification` or `ArrayValueSpecification` that aggregates elements of type `NumericalValueSpecification` or `TextValueSpecification`.]

**[constr\_3068] DoIpPowerModeStatusNeeds in the category ECU\_EXTRACT**

*Imposition time:* CP: IT\_EcuExt

[If and only if DoIP (i.e. any of the subclasses of `DoIpServiceNeeds` are present) is used on an Ecu then the `DoIpPowerModeStatusNeeds` shall exist exactly once in a `System` of category `ECU_EXTRACT`.]

**[constr\_3069] Allowed CanNmCluster.nmNidPosition values**

*Imposition time:* CP: IT\_SysDesc

[If defined, the value of `CanNmCluster.nmNidPosition` shall only be set to either 0 or 1.]

**[constr\_3070] Allowed CanNmCluster.nmCbvPosition values**

*Imposition time:* CP: IT\_SysDesc

[If defined, the value of `CanNmCluster.nmCbvPosition` shall only be set to either 0 or 1.]

**[constr\_3071] CanNmCluster.nmCbvPosition and CanNmCluster.nmNidPosition shall never have the same value**

*Imposition time:* CP: IT\_SysDesc

[`CanNmCluster.nmCbvPosition` and `CanNmCluster.nmNidPosition` shall never have the same value.]

**[constr\_3073] nmVoteInformation only valid for FrNm**

*Imposition time:* CP: IT\_SysDesc

[The `nmVoteInformation` attribute is only valid for FrNm.]

**[constr\_3074] No TransmissionAcknowledgementRequest for multiple senders**

*Imposition time:* CP: IT\_EcuExt

[If more than one `SenderComSpec` exist (in different `PortPrototypes` on atomic level) that refer to data elements effectively mapped to the same `SystemSignal` it is not allowed that any `SenderComSpec` aggregates `transmissionAcknowledge`.]



**[constr\_3078] Allowed `UdpNmCluster.nmNidPosition` values**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `UdpNmCluster.nmNidPosition` shall only be set to either 0 or 1.]

**[constr\_3079] Allowed `UdpNmCluster.nmCbvPosition` values**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `UdpNmCluster.nmCbvPosition` shall only be set to either 0 or 1.]

**[constr\_3080] `UdpNmCluster.nmCbvPosition` and `UdpNmCluster.nmNidPosition` shall never have the same value**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[`UdpNmCluster.nmCbvPosition` and `UdpNmCluster.nmNidPosition` shall never have the same value.]

**[constr\_3081] Value of category in `GeneralPurposePdu`**

*Imposition time:* CP: IT\_SysDesc

[The attribute `category` of `GeneralPurposePdu` can have the following values:

- SD (Service Discovery)
- GLOBAL\_TIME
- DoIP

]

**[constr\_3082] Value of category in `GeneralPurposeIPdu`**

*Imposition time:* CP: IT\_SysDesc

[The attribute `category` of `GeneralPurposeIPdu` can have the following values:

- XCP
- SOMEIP\_SEGMENTED\_IPDU
- DLT
- IDS
- VDP

]

**[constr\_3083] Exactly one `AtomicSwComponentType` on an `EcuInstance` may use `GeneralCallbackEventDataChanged` / `GeneralCallbackEventStatusChange`**

*Imposition time:* CP: IT\_EcuExt

[The Dem only supports exactly one `AtomicSwComponentType` using `GeneralCallbackEventDataChanged` / `GeneralCallbackEventStatusChange` on one `EcuInstance`.]

**[constr\_3084] Service port in the role `PowerTakeOff`**

*Imposition time:* CP: IT\_EcuExt

[Within the context of one `EcuInstance`, there can only be one service port that uses the role `PowerTakeOff` in the `RoleBasedPortAssignment.role`.]

**[constr\_3085] Service port in the role `CallbackDCMRequestServices`**

*Imposition time:* CP: IT\_EcuExt

[Within the context of one `EcuInstance`, there can only be one service port that uses the role `CallbackDCMRequestServices` in the `RoleBasedPortAssignment.role`.]

**[constr\_3086] Role of `SystemSignal` in n:1 sender-receiver communication**

*Imposition time:* CP: IT\_EcuExt

[In case of n:1 communications

- if `DataTransformation` is used each sender shall be mapped to the same `SystemSignal`
- if `DataTransformation` is not used each sender shall be mapped
  - to the same `SystemSignal` in case of a primitive `DataType` on the sender side,
  - to the same `SystemSignalGroup` in case of a composite `DataType` on the sender side.

]

**[constr\_3090] `TpSdu` transmission on a `PhysicalChannel`**

*Imposition time:* CP: IT\_SysDesc

[The `IPdu` that is referenced by a `TpConnection` in the role `tpSdu` shall be referenced by exactly one `PduTriggering` aggregated on the `PhysicalChannel` of the `TpConnection`.]

**[constr\_3094] Consistent `ISignalPort.communicationDirection` for `ISignalTriggerings` of `ISignalGroups` and contained `ISignals`**

*Imposition time:* CP: IT\_SysDesc

[In case the `ISignals` contained in an `ISignalGroup` are referenced by an `ISignalTriggering`, the `communicationDirection` of the `ISignalPort` ref-

erenced by the `ISignal`'s `ISignalTriggering` shall be identical to the `communicationDirection` of the `ISignalPort` referenced by the containing `ISignalGroup`'s `ISignalTriggering`.]

**[constr\_3095] `canControllerFdAttributes` and `canControllerFdRequirements` are mutually exclusive**

*Imposition time:* CP: IT\_SysDesc

[The existence of `canControllerFdAttributes` and `canControllerFdRequirements` is mutually exclusive.]

**[constr\_3096] Allowed values for `diagnosticMessageType`**

*Imposition time:* CP: IT\_SysDesc

[The allowed values of `diagnosticMessageType` range from 1..60.]

**[constr\_3097] Overlapping of segments of one `MultiplexedIPdu` is not allowed**

*Imposition time:* CP: IT\_SysDesc

[The segments defined by the `SegmentPosition` elements of one and the same `MultiplexedIPdu` - aggregated via `StaticPart` and `DynamicPart` - shall not overlap.]

**[constr\_3098] Defined segments of one `MultiplexedIPdu` shall not exceed the length of the `MultiplexedIPdu`**

*Imposition time:* CP: IT\_SysDesc

[The segments defined by the `SegmentPosition` elements of one and the same `MultiplexedIPdu` - aggregated via `StaticPart` and `DynamicPart` - shall not exceed the length of the `MultiplexedIPdu`.]

**[constr\_3099] Defined segments in a `DynamicPart` shall not exceed the length of any `DynamicPartAlternative.iPdu`**

*Imposition time:* CP: IT\_SysDesc

[The segments defined by the `SegmentPosition` elements aggregated in the `DynamicPart` of a `MultiplexedIPdu` shall not exceed the length of any `DynamicPartAlternative.iPdu`.]

**[constr\_3100] Defined segments in a `StaticPart` shall not exceed the length of the `StaticPart.iPdu`**

*Imposition time:* CP: IT\_SysDesc

[The segments defined by the `SegmentPosition` elements aggregated in the `StaticPart` of a `MultiplexedIPdu` shall not exceed the length of the `StaticPart.iPdu`.]

**[constr\_3101] Signal representation of selector field for `DynamicPartAlternative`***Imposition time:* CP: IT\_SysDesc

[Every `ISignalIPdu` that is referenced by the `DynamicPartAlternative` shall contain an `ISignal` that represents the selector field. The selector field signal shall be located at the position that is described by the `selectorFieldLength` and `selectorFieldStartPosition`.]

**[constr\_3102] Restriction on usage of `J1939NodeName` attributes***Imposition time:* CP: IT\_SysDesc

[`EcuInstances` that are referenced by the same `CanPhysicalChannel` of a `J1939Cluster` via `commConnector` shall not aggregate two `J1939Nodes` with identical `J1939NodeName` attributes.]

**[constr\_3103] Range of `ecuInstance`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `ecuInstance` range from 0 to 7.]

**[constr\_3104] Range of `function`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `function` range from 0 to 255.]

**[constr\_3105] Range of `functionInstance`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `functionInstance` range from 0 to 31.]

**[constr\_3106] Range of `identityNumber`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `identityNumber` range from 0 to 2097151.]

**[constr\_3107] Range of `industryGroup`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `industryGroup` range from 0 to 7.]

**[constr\_3108] Range of `manufacturerCode`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `manufacturerCode` range from 0 to 2047.]

**[constr\_3109] Range of `vehicleSystem`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `vehicleSystem` range from 0 to 127.]

**[constr\_3110] Range of `vehicleSystemInstance`***Imposition time:* CP: IT\_SysDesc

[The allowed values of `vehicleSystemInstance` range from 0 to 15.]

**[constr\_3111] `returnSignal` in `ClientServerToSignalMapping` is mandatory***Imposition time:* CP: IT\_EcuExt

[A `ClientServerToSignalMapping` shall always have a `returnSignal` defined.]

**[constr\_3112] Invalidation support for partial mapping of a data element typed by composite data type***Imposition time:* CP: IT\_EcuExt

[If a `VariableDataPrototype` with a composite data type in a `PPortPrototype` is mapped to a `SystemSignalGroup` and only a subset of elements of the composite data type that are primitives is mapped to separate `SystemSignals` of the `SystemSignalGroup` then at least one mapped primitive shall have an `invalidValue` defined.]

**[constr\_3113] `AbstractEthernetFrame` shall not have a `PduToFrameMapping`***Imposition time:* CP: IT\_SysDesc

[It is not allowed to map `Pdus` into `AbstractEthernetFrames`.]

**[constr\_3114] `FlatInstanceDescriptors` pointing to the same `ParameterDataPrototype` shall have different `postBuildVariantConditions`***Imposition time:* CP: IT\_EcuExt

[`FlatInstanceDescriptors` that are pointing as an `atpTarget` to the same `ParameterDataPrototype` instance shall have different `postBuildVariantConditions`.]

**[constr\_3115] `FlatInstanceDescriptors` pointing to the same `ParameterDataPrototype` instance***Imposition time:* CP: IT\_EcuExt

[When several `FlatInstanceDescriptors` point to the same `ParameterDataPrototype` instance as an `atpTarget` in the context of a `ParameterInterface` the different `FlatInstanceDescriptors` shall point to the `PPortPrototype` of the owning `ParameterSwComponentType`. In this case the `PPortPrototype` typed by the `ParameterInterface` is part of the context of the according `AnyInstanceRef`.]

**[constr\_3116] Overlap of `ClientIdRanges` in the context of the enclosing System***Imposition time:* CP: IT\_SysDesc

[The `ClientIdRange` defined for an `EcuInstance` shall not overlap with the `ClientIdRange` of any other `EcuInstance` in the context of the enclosing System.]

**[constr\_3117] Allowed value of attribute `clientId`***Imposition time:* CP: IT\_SysDesc

[Within the context of one `ClientIdDefinition`, the value of attribute `clientId` shall be in the range of `ClientIdRange.lowerLimit` and `ClientIdRange.upperLimit` for the `ClientIdRange` that is aggregated by the `EcuInstance` onto which the `SwComponentPrototypes` included in the `ClientIdDefinition.clientServerOperation` are mapped.]

**[constr\_3118] Valid reference target for `ClientIdDefinition.clientServerOperation.contextPort`***Imposition time:* CP: IT\_SysDesc

[In the context of the definition of a `ClientIdDefinition`, the reference `clientServerOperation.contextPort` shall only refer to an `RPortPrototype`.]

**[constr\_3121] The length of transformer chains is limited to 255 transformers***Imposition time:* CP: IT\_SysDesc

[The maximum number of `DataTransformation.transformerChain` references in the context of one `DataTransformation` shall be limited to 255.]

**[constr\_3122] At most one transformer of each transformer class inside a transformer chain***Imposition time:* CP: IT\_SysDesc

[If the value of a `transformerClass` of a `TransformationTechnology` referenced by a `DataTransformation` does not equal `custom`, it shall be different from all other `transformerClass` values of `TransformationTechnologies` referenced by the same `DataTransformation`.]

**[constr\_3123] Serializer transformer shall be the first in a chain***Imposition time:* CP: IT\_SysDesc

[A serializer transformer (`TransformationTechnology` with attribute `transformerClass` set to `serializer`) shall be the first transformer in a transformer chain.]

**[constr\_3124] Applicability of `needsOriginalData`***Imposition time:* CP: IT\_SysDesc

[The attribute `needsOriginalData` of a `TransformationTechnology` shall only be used for the non-first transformers in the transformer chain.]

**[constr\_3125] Value of attribute `inPlace` for the first transformer in a chain***Imposition time:* CP: IT\_SysDesc

[The attribute `inPlace` shall be set to `false` if the `TransformationTechnology` of the `BufferProperties` is referenced as first reference in the ordered list of references `transformerChain` from a `DataTransformation`.]

**[constr\_3127] Certain ISignals always need a reference to DataTransformation***Imposition time:* CP: IT\_SysDesc

[An ISignal which references a SystemSignal which is referenced by a SystemSignalGroup in the role transformingSystemSignal shall always reference a DataTransformation.]

**[constr\_3128] SOME/IP transformer configuration***Imposition time:* CP: IT\_SysDesc

[For each TransformationDescription variant that is a SOMEIPTransformationDescription

- attribute protocol of TransformationTechnology shall be set to SOMEIP
- attribute version of TransformationTechnology shall be set to 1.0.0
- attribute transformerClass of TransformationTechnology shall be set to serializer
- attribute headerLength of BufferProperties shall be set to 64 (bits).

]

**[constr\_3129] Byte Order of SOME/IP transformer***Imposition time:* CP: IT\_SysDesc

[The attribute byteOrder of SOMEIPTransformationDescription shall be different from opaque.]

**[constr\_3130] Range of Interface Version***Imposition time:* CP: IT\_SysDesc

[The value of the attribute interfaceVersion shall be in the range [0; 255]]

**[constr\_3132] Required COM Based Transformation for comBasedSignalGroupTransformation***Imposition time:* CP: IT\_SysDesc

[If a ISignalGroup has a reference to the DataTransformation element in the role comBasedSignalGroupTransformation then this DataTransformation shall be the handled by the COM Based Transformer [8].]

**[constr\_3133] physicalLayerType of connected CouplingPorts***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The physicalLayerType of two CouplingPorts which are connected via a CouplingPortConnection shall be equal.]

**[constr\_3134] The connection of two `CouplingPorts` with `connectionNegotiationBehavior` set to `master` is forbidden***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The `connectionNegotiationBehavior` of two `CouplingPorts` which are connected via a `CouplingPortConnection` shall not be both set to `master`.]

**[constr\_3135] The connection of two `CouplingPorts` with `connectionNegotiationBehavior` set to `slave` is forbidden***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The `connectionNegotiationBehavior` of two `CouplingPorts` which are connected via a `CouplingPortConnection` shall not be both set to `slave`.]

**[constr\_3136] Allowed payload of `SecuredIPdus`***Imposition time:* CP: IT\_SysDesc

[`SecuredIPdus` are allowed to reference `PduTriggerings` of `ISignalIPdus`, `ContainerIPdus`, `DcmIPdus`, `MultiplexedIPdus`, `GeneralPurposeIPdus` with category `SOMEIP_SEGMENTED_IPDU` and `UserDefinedIPdus`.]

**[constr\_3137] `IPduPort.rxSecurityVerification` is configurable on the receiver side***Imposition time:* CP: IT\_SysDesc

[The `IPduPort.rxSecurityVerification` attribute shall only be used in `IPduPorts` with the `communicationDirection` = `in`.]

**[constr\_3138] `IPduPort.rxSecurityVerification` validness***Imposition time:* CP: IT\_SysDesc

[The `IPduPort.rxSecurityVerification` information is only valid for `SecuredIPdus`.]

**[constr\_3140] No `ByteOrderEnum.opaque` allowed for `System.containerIPduHeaderByteOrder`***Imposition time:* CP: IT\_SysDesc

[The values of `System.containerIPduHeaderByteOrder` are restricted to `ByteOrderEnum.mostSignificantByteFirst` and `ByteOrderEnum.mostSignificantByteLast`. I.e. the value `ByteOrderEnum.opaque` is not allowed.]

**[constr\_3141] Only `IPdus` shall be part of a `ContainerIPdu`***Imposition time:* CP: IT\_SysDesc

[The `PduTriggering` which is referenced in the role `ContainerIPdu.containedPduTriggering` or `ContainerIPdu.containedIPduTriggeringProps.containedPduTriggering` shall refer to a subclass of an `IPdu` in the role `PduTriggering.iPdu`.]



**[constr\_3142] Mandatory `headerIdLongHeader` for `longHeader`**

*Imposition time:* CP: IT\_SysDesc

[For each `IPdu` which is assigned to a `ContainerIPdu` in the role `ContainerIPdu`.  
`containedPduTriggering` or `ContainerIPdu.containedIPduTriggering-  
Props.containedPduTriggering` with `ContainerIPdu.headerType = long-  
Header` the `ContainedIPduProps.headerIdLongHeader` shall be defined.]

**[constr\_3143] Mandatory `headerIdShortHeader` for `shortHeader`**

*Imposition time:* CP: IT\_SysDesc

[For each `IPdu` which is assigned to a `ContainerIPdu` in the role `ContainerIPdu`.  
`containedPduTriggering` or `ContainerIPdu.containedIPduTriggering-  
Props.containedPduTriggering` with `ContainerIPdu.headerType = short-  
Header` the `ContainedIPduProps.headerIdShortHeader` shall be defined.]

**[constr\_3144] Mandatory `IPdu.containedIPduProps` for contained `IPdus`**

*Imposition time:* CP: IT\_SysDesc

[For each `IPdu` which is assigned to a `ContainerIPdu` in the role `ContainerIPdu`.  
`containedPduTriggering`, the `IPdu.containedIPduProps` shall be defined.]

**[constr\_3146] Partial Networking timing constraint**

*Imposition time:* CP: IT\_SysDesc

[For Partial Networking the following timing constraints shall be ensured:

- CAN / Ethernet:  $(pnResetTime + pncPrepareSleepTimer) < nmNetwork-  
Timeout$
- FlexRay:  $(pnResetTime + pncPrepareSleepTimer) < nmReadySleepTime$

]

**[constr\_3148] `executeDespiteDataUnavailability` setting in case an E2E Transformer is used**

*Imposition time:* CP: IT\_SysDesc

[A transformer chain using E2E shall be configured with `DataTransformation.ex-  
ecuteDespiteDataUnavailability = TRUE`.]

**[constr\_3149] `TransformationTechnology.needsOriginalData` settings for E2E Transformer**

*Imposition time:* CP: IT\_SysDesc

[The `TransformationTechnology.needsOriginalData` attribute of a `Trans-  
formationTechnology` element of an E2E transformer shall be set to FALSE.]

**[constr\_3151] `BufferProperties.headerLength` settings for an E2E transformer used in combination with a SOME/IP transformer**

*Imposition time:* CP: IT\_SysDesc

[The `BufferProperties.headerLength` for an E2E transformer located in a transformer chain with a SOME/IP transformer shall be configured with the following values depending on the value of the `EndToEndTransformationDescription.profile-Name` attribute:

1. PROFILE\_01: `BufferProperties.headerLength` = 16 bits
2. PROFILE\_02: `BufferProperties.headerLength` = 16 bits
3. PROFILE\_04: `BufferProperties.headerLength` = 96 bits
4. PROFILE\_05: `BufferProperties.headerLength` = 24 bits
5. PROFILE\_06: `BufferProperties.headerLength` = 40 bits
6. PROFILE\_07: `BufferProperties.headerLength` = 160 bits
7. PROFILE\_08: `BufferProperties.headerLength` = 128 bits
8. PROFILE\_11: `BufferProperties.headerLength` = 16 bits
9. PROFILE\_22: `BufferProperties.headerLength` = 16 bits
10. PROFILE\_04m: `BufferProperties.headerLength` = 128 bits
11. PROFILE\_07m: `BufferProperties.headerLength` = 192 bits
12. PROFILE\_08m: `BufferProperties.headerLength` = 160 bits
13. PROFILE\_44: `BufferProperties.headerLength` = 96 bits
14. PROFILE\_44m: `BufferProperties.headerLength` = 128 bits

]

**[constr\_3152] `BufferProperties.headerLength` settings for any transformer used in combination with a COM Based transformer**

*Imposition time:* CP: IT\_SysDesc

[A transformer used in a transformer chain with a COM Based transformer shall be configured with the following values:

- `BufferProperties.headerLength` = 0

]

### [constr\_3153] E2E header field reservation required by COM Based transformer

*Imposition time:* CP: IT\_SysDesc

[A COM Based transformer that is used in a transformer chain with an E2E transformer requires that the following amount of space is allocated for the E2E header fields using a proper [ISignalGroup](#) layout according to [TPS\_SYST\_02068]:

**PROFILE\_01:** if `dataIdMode == lower12Bit`: 16 bits

**PROFILE\_01:** if `dataIdMode != lower12Bit`: 12 bits

**PROFILE\_02:** 16 bits

**PROFILE\_04:** 96 bits

**PROFILE\_05:** 24 bits

**PROFILE\_06:** 40 bits

**PROFILE\_07:** 160 bits

**PROFILE\_08:** 128 bits

**PROFILE\_11:** if `dataIdMode == lower12Bit`: 16 bits

**PROFILE\_11:** if `dataIdMode == all16Bit`: 12 bits

**PROFILE\_22:** 16 bits

**PROFILE\_04m:** 128 bits

**PROFILE\_07m:** 192 bits

**PROFILE\_08m:** 160 bits

**PROFILE\_44:** 96 bits

**PROFILE\_44m:** 128 bits

**PROFILE\_76:** 40 bits

]

### [constr\_3155] Allowed values for [EndToEndTransformationDescription.upperHeaderBitsToShift](#)

*Imposition time:* CP: IT\_SysDesc

[The value of of the [EndToEndTransformationDescription.upperHeaderBitsToShift](#) attribute depends on the used serializing transformer:

**COM based transformer:** 0 (no bits are shifted)

**SOME/IP transformer:** 64 (to support the header shift of SOME/IP).

**Custom transformer:** no restriction (depends on header length and placement of custom transformer)

]

**[constr\_3156] Allowed values for `EndToEndTransformationISignalProps.dataId` in PROFILE\_01 and PROFILE\_11***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01 or PROFILE\_11 then the value of the `EndToEndTransformationISignalProps.dataId` attribute shall be in the range of 0-65535.]

**[constr\_3157] Allowed values for `EndToEndTransformationISignalProps.dataId` in PROFILE\_01 and PROFILE\_11 in case `dataIdMode` is set to `lower12Bit`***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01 or PROFILE\_11 and the value of `EndToEndTransformationDescription.dataIdMode` attribute has a value of `lower12Bit` then the value of the `EndToEndTransformationISignalProps.dataId` attribute shall be in the range of 256-65535.]

**[constr\_3158] Allowed values for `EndToEndTransformationDescription.maxDeltaCounter` in PROFILE\_01 and PROFILE\_11***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01 or PROFILE\_11 then the attribute `maxDeltaCounter` shall be in the range 1-14.]

**[constr\_3159] Allowed values for `EndToEndTransformationDescription.maxDeltaCounter` in PROFILE\_04, PROFILE\_04m, PROFILE\_44 and PROFILE\_44m***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_04, PROFILE\_04m, PROFILE\_44, or PROFILE\_44m the value of `maxDeltaCounter` attribute shall be in the range 1-65535.]

**[constr\_3160] `EndToEndTransformationISignalProps.dataId` in PROFILE\_02 and PROFILE\_22***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_02 or PROFILE\_22 then the multiplicity of the `dataId` attribute shall be 16 and the value of each instance shall be in the range 0..255.]

**[constr\_3161] `EndToEndTransformationISignalProps.dataLength` in PROFILE\_01, PROFILE\_02, PROFILE\_05, PROFILE\_11, PROFILE\_22***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01, PROFILE\_02, PROFILE\_05, PROFILE\_11, or PROFILE\_22 then the multiplicity of the `EndToEndTransformationISignalProps.dataLength` attribute shall be 1.]

**[constr\_3162] `EndToEndTransformationISignalProps.minDataLength` and `EndToEndTransformationISignalProps.maxDataLength` in PROFILE\_01, PROFILE\_02, PROFILE\_05, PROFILE\_11, PROFILE\_22***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01, PROFILE\_02, PROFILE\_05, PROFILE\_11, or PROFILE\_22 then the multiplicity of the attributes `EndToEndTransformationISignalProps.minDataLength` and `EndToEndTransformationISignalProps.maxDataLength` shall be 0.]

**[constr\_3163] `EndToEndTransformationISignalProps.minDataLength` and `EndToEndTransformationISignalProps.maxDataLength` in PROFILE\_04, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, and PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_04, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 then the multiplicity of the attributes `EndToEndTransformationISignalProps.minDataLength` and `EndToEndTransformationISignalProps.maxDataLength` shall be 1.]

**[constr\_3164] `EndToEndTransformationISignalProps.dataLength` in PROFILE\_04, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, and PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_04, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 then the multiplicity of the attribute `EndToEndTransformationISignalProps.dataLength` shall be 0.]

**[constr\_3165] Effect of `EndToEndTransformationDescription.upperHeaderBitsToShift` value in PROFILE\_01, PROFILE\_11***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01 or PROFILE\_11 and the serializing transformer is different than the ComBasedTransformer then:

1. `EndToEndTransformationDescription.crcOffset` shall be set to the same value of `upperHeaderBitsToShift`.
2. `EndToEndTransformationDescription.counterOffset` shall be set to the value of `upperHeaderBitsToShift` + 8.
3. (if used) `EndToEndTransformationDescription.dataIdNibbleOffset` shall be set to the value of `upperHeaderBitsToShift` + 12.

]

**[constr\_3166] `EndToEndTransformationDescription.upperHeaderBitsToShift` in PROFILE\_02***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_02 then the value of the `upperHeaderBitsToShift` attribute shall be 0.]

**[constr\_3167] Effect of `EndToEndTransformationDescription.upperHeaderBitsToShift` value in PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m and PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 the value of the `EndToEndTransformationDescription.offset` attribute shall be equal to the value of the `EndToEndTransformationDescription.upperHeaderBitsToShift` attribute.]

**[constr\_3169] `EndToEndTransformationDescription.offset` value in PROFILE\_02, PROFILE\_22 and PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_02, PROFILE\_22, or PROFILE\_76 then the value of the `EndToEndTransformationDescription.offset` attribute shall be 0.]

**[constr\_3172] Effect of `EndToEndTransformationDescription.profileBehavior` value in PROFILE\_01***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01 and the value of the `profileBehavior` attribute is R4\_2 then:

- the value of the `EndToEndTransformationDescription.maxNoNewOrRepeatedData` attribute shall be 14.
- the value of the `EndToEndTransformationDescription.syncCounterInit` attribute shall be 1.

]

**[constr\_3173] Effect of `EndToEndTransformationDescription.profileBehavior` value in PROFILE\_02***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_02 and the value of the `profileBehavior` attribute is R4\_2 then:

- the value of the `EndToEndTransformationDescription.maxNoNewOrRepeatedData` attribute shall be 15.
- the value of the `EndToEndTransformationDescription.syncCounterInit` attribute shall be 1.

]

**[constr\_3174] `EndToEndTransformationDescription` settings not allowed in PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_11, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m and PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_11, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 then:

1. the multiplicity of the `EndToEndTransformationDescription.maxNoNewOrRepeatedData` attribute shall be 0.
2. the multiplicity of the `EndToEndTransformationDescription.syncCounterInit` attribute shall be 0.
3. the multiplicity of the `EndToEndTransformationDescription.profileBehavior` attribute shall be 0.

]

**[constr\_3182] Restriction on `TransformationTechnology.transformation-DescriptionVariationPoint`***Imposition time:* CP: IT\_SysDesc

[The `EndToEndTransformationDescription.profileName` attribute shall not be subject to variability for a given `ISignal` / `ISignalGroup`, i.e., the value of the `EndToEndTransformationDescription.profileName` attribute shall be the same in all different variants.]

**[constr\_3183] `ISignalGroup` with `transformationISignalProps`***Imposition time:* CP: IT\_SysDesc

[An `ISignalGroup` that aggregates `transformationISignalProps` shall reference the `DataTransformation` in the role `comBasedSignalGroupTransformation`.]

**[constr\_3184] Only one `EndToEndTransformationISignalProps.dataId` element in PROFILE\_01 and PROFILE\_11***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_01 or PROFILE\_11 then the multiplicity of the `EndToEndTransformationISignalProps.dataId` attribute shall be 1.]

**[constr\_3185] Multiplicity of `EndToEndTransformationDescription.dataIdMode` in PROFILE\_01 and PROFILE\_11***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to PROFILE\_01 or PROFILE\_11 then the multiplicity of the `EndToEndTransformationDescription.dataIdMode` attribute shall be 1.]

**[constr\_3186] Multiplicity of `EndToEndTransformationDescription.dataIdMode` in PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to a value of PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 then the multiplicity of the `EndToEndTransformationDescription.dataIdMode` attribute shall be 0.]



**[constr\_3187] Multiplicity of `EndToEndTransformationDescription.counterOffset` in PROFILE\_01 and PROFILE\_11***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to PROFILE\_01 or PROFILE\_11 then the multiplicity of the `EndToEndTransformationDescription.counterOffset` attribute shall be 1.]

**[constr\_3188] Multiplicity of `EndToEndTransformationDescription.counterOffset` in PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to a value of PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 then the multiplicity of the `EndToEndTransformationDescription.counterOffset` attribute shall be 0.]

**[constr\_3189] Multiplicity of `EndToEndTransformationDescription.crcOffset` in PROFILE\_01 and PROFILE\_11***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to PROFILE\_01 or PROFILE\_11 then the multiplicity of the `EndToEndTransformationDescription.crcOffset` attribute shall be 1.]

**[constr\_3190] Multiplicity of `EndToEndTransformationDescription.crcOffset` in PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, PROFILE\_76***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to a value of PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 then the multiplicity of the `EndToEndTransformationDescription.crcOffset` attribute shall be 0.]

**[constr\_3191] Multiplicity of `EndToEndTransformationDescription.dataIdNibbleOffset` in PROFILE\_01, PROFILE\_11 and `dataIdMode` equal to `lower12Bit`***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to PROFILE\_01 or PROFILE\_11 and the value of the `EndToEndTransformationDescription.dataIdMode` attribute is set to `lower12Bit` then the multiplicity

of the `EndToEndTransformationDescription.dataIdNibbleOffset` attribute shall be 1.]

**[constr\_3192] Multiplicity of `EndToEndTransformationDescription.dataIdNibbleOffset` in PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m and PROFILE\_76 or `dataIdMode` different from `lower12Bit`**

*Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to a value of PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 or the `EndToEndTransformationDescription.dataIdMode` attribute is set to value different from `lower12Bit` then the multiplicity of the `EndToEndTransformationDescription.dataIdNibbleOffset` attribute shall be 0.]

**[constr\_3193] Multiplicity of `EndToEndTransformationDescription.offset` in PROFILE\_01 and PROFILE\_11**

*Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to PROFILE\_01 or PROFILE\_11 then the multiplicity of the `EndToEndTransformationDescription.offset` attribute shall be 0.]

**[constr\_3194] Multiplicity of `EndToEndTransformationDescription.offset` in PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, PROFILE\_76**

*Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute is set to a value PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_08, PROFILE\_22, PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, PROFILE\_44, PROFILE\_44m, or PROFILE\_76 then the multiplicity of the `EndToEndTransformationDescription.offset` attribute shall be 1.]

**[constr\_3195] Allowed values for `EndToEndTransformationDescription.maxDeltaCounter` in PROFILE\_02 and PROFILE\_22**

*Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_02 or PROFILE\_22 then the attribute `maxDeltaCounter` shall be in the range 1-15.]

**[constr\_3196] Allowed values for `EndToEndTransformationDescription.maxDeltaCounter` in PROFILE\_05***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_05 then the attribute `maxDeltaCounter` shall be in the range 1-255.]

**[constr\_3197] Allowed values for `EndToEndTransformationDescription.maxDeltaCounter` in PROFILE\_06***Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_06 then the attribute `maxDeltaCounter` shall be in the range 1-255.]

**[constr\_3198] Uniqueness of `PncMapping.shortLabel`***Imposition time:* CP: IT\_SysDesc

[If the optional `shortLabel` attribute is used it shall be unique in the `System` scope.]

**[constr\_3199] `ISignal` that has `dataTypePolicy` set to `transformingISignal` shall reference a `DataTransformation`***Imposition time:* CP: IT\_SysDesc

[In a complete model every `ISignal` that has `dataTypePolicy` set to `transformingISignal` shall reference a `DataTransformation`.]

**[constr\_3202] `LinFrameTriggering` to `LinUnconditionalFrame` reference restriction in `LinEventTriggeredFrame` context***Imposition time:* CP: IT\_SysDesc

[Within a `PhysicalChannel` a `LinUnconditionalFrame` shall be referenced by only one `LinFrameTriggering` to allow a derivation of the identifier of a substituted Frame if the `LinUnconditionalFrame` is referenced by a `LinEventTriggeredFrame` in the role `linUnconditionalFrame`.]

**[constr\_3203] `LinFrameTriggering` to `LinSporadicFrame` reference restriction in `LinSporadicFrame` context***Imposition time:* CP: IT\_SysDesc

[Within a `PhysicalChannel` a `LinUnconditionalFrame` shall be referenced by only one `LinFrameTriggering` to allow a derivation of the identifier of a substituted Frame if the `LinUnconditionalFrame` is referenced by a `LinSporadicFrame` in the role `substitutedFrame`.]

**[constr\_3204] LinUnconditionalFrames associated with a LinSporadicFrame***Imposition time:* CP: IT\_SysDesc

[A `LinUnconditionalFrame` associated with a `LinSporadicFrame` shall not be allocated in the same `LinScheduleTable` as the `LinSporadicFrame`.]

**[constr\_3205] Existence of FramePort for a FrameTriggering that references a LinSporadicFrame***Imposition time:* CP: IT\_SysDesc

[A `FrameTriggering` that references a `LinSporadicFrame` shall not have a reference to a `FramePort`.]

**[constr\_3206] Existence of FramePort for a FrameTriggering that references a LinEventTriggeredFrame***Imposition time:* CP: IT\_SysDesc

[A `FrameTriggering` that references a `LinEventTriggeredFrame` shall not have a reference to a `FramePort`.]

**[constr\_3208] executeDespiteDataUnavailability usage restriction***Imposition time:* CP: IT\_SysDesc

[In the set of more than one `ISignal` which reference the same `SystemSignal` in the role `systemSignal`, there shall be no `ISignal` which references a `DataTransformation` where `executeDespiteDataUnavailability` is set to true.]

**[constr\_3209] CanFrameTriggerings with identical PGN***Imposition time:* CP: IT\_SysDesc

[For all `CanFrameTriggerings` where the attribute `identifier` contains the identical PGN (as defined in section 5.2 Protocol Data Unit in [9]) the attribute `j1939requestable` shall also have an identical value.]

**[constr\_3210] J1939TpPgs with identical pgm value***Imposition time:* CP: IT\_SysDesc

[For all `J1939TpPgs` where the attribute `pgm` has an identical value the attribute `requestable` shall also have an identical value.]

**[constr\_3211] PduTriggerings with triggerIPduSendCondition***Imposition time:* CP: IT\_SysDesc

[Only `PduTriggerings` with references to `ISignalIPdus` are allowed to contain a `triggerIPduSendCondition`.]

**[constr\_3212] Limitation of `DolpTpConnection.tpSdu`***Imposition time:* CP: IT\_SysDesc

[`DoIpTpConnection` shall only reference `PduTriggerings` of `DcmIPdus` or `UserDefinedIPdus` in the role `tpSdu`.]

**[constr\_3213] `TransformationISignalProps.csErrorReaction` setting in case that the `serializer transformerClass` and Client/Server communication is used***Imposition time:* CP: IT\_SysDesc

[In `TransformationISignalProps` the attribute `csErrorReaction` shall be set if the `TransformationISignalProps` specifies the details for a `TransformationTechnology` with `transformerClass` equal to `serializer` and the `ISignal` that aggregates the `TransformationISignalProps` transports a client/server communication.]

**[constr\_3214] `TransformationISignalProps.csErrorReaction` setting in case that a `transformerClass` different from `serializer` is used or the Client/Server communication is not used***Imposition time:* CP: IT\_SysDesc

[In `TransformationISignalProps` the attribute `csErrorReaction` shall not be used if the `TransformationISignalProps` specifies the details for a `TransformationTechnology` with `transformerClass` not equal to `serializer` or the `ISignal` that aggregates the `TransformationISignalProps` does not transport a client/server communication.]

**[constr\_3215] `TransformationTechnology.version` and `TransformationTechnology.protocol` settings for request and response of a client/server communication on the same `TransformationTechnology`***Imposition time:* CP: IT\_SysDesc

[`TransformationTechnology.version` and `TransformationTechnology.protocol` shall be identical for `ISignals` that are derived from the same `ClientServerOperation` and `TransformationTechnology`. This means that all `ISignals` that refer to `ClientServerToSignalMapping.callSignal` or to `ClientServerToSignalMapping.returnSignal` of the same `ClientServerToSignalMapping` and `TransformationTechnology` shall have the same `TransformationTechnology.protocol` and `TransformationTechnology.version` defined.]

**[constr\_3218] Range of Size of Array Length Fields***Imposition time:* CP: IT\_SysDesc

[The value of attribute `sizeofArrayLengthFields` of `SOMEIPTransformationISignalProps` shall be either 0, 1, 2 or 4.]

**[constr\_3219] The mutual existence of `LinSlaves` in the `LinMaster` `EcuExtract`***Imposition time:* CP: IT\_EcuExt

[`LinSlaves` shall not be part of the `EcuExtract` of the corresponding `LinMaster`.]

**[constr\_3220] Range of Size of Structure Length Fields***Imposition time:* CP: IT\_SysDesc

[The value of attribute `sizeofStructLengthFields` of `SOMEIPTransformationISignalProps` shall be either 0, 1, 2 or 4.]

**[constr\_3221] Range of Size of Union Length Fields***Imposition time:* CP: IT\_SysDesc

[The value of attribute `sizeofUnionLengthFields` of `SOMEIPTransformationISignalProps` shall be either 0, 1, 2 or 4.]

**[constr\_3222] No `ByteOrderEnum.opaque` allowed for `PduToFrameMapping.packingByteOrder`***Imposition time:* CP: IT\_SysDesc

[The values of `PduToFrameMapping.packingByteOrder` are restricted to `ByteOrderEnum.mostSignificantByteFirst` and `ByteOrderEnum.mostSignificantByteLast`. I.e. the value `ByteOrderEnum.opaque` is not allowed.]

**[constr\_3223] No `ByteOrderEnum.opaque` allowed for `MultiplexedIPdu.selectorFieldByteOrder`***Imposition time:* CP: IT\_SysDesc

[The values of `MultiplexedIPdu.selectorFieldByteOrder` are restricted to `ByteOrderEnum.mostSignificantByteFirst` and `ByteOrderEnum.mostSignificantByteLast`. I.e. the value `ByteOrderEnum.opaque` is not allowed.]

**[constr\_3224] No `ByteOrderEnum.opaque` allowed for `SegmentPosition.segmentByteOrder`***Imposition time:* CP: IT\_SysDesc

[The values of `SegmentPosition.segmentByteOrder` are restricted to `ByteOrderEnum.mostSignificantByteFirst` and `ByteOrderEnum.mostSignificantByteLast`. I.e. the value `ByteOrderEnum.opaque` is not allowed.]

**[constr\_3225] `LinFrameTriggering.linChecksum` not allowed for `LinSporadicFrames`***Imposition time:* CP: IT\_SysDesc

[The `linChecksum` attribute of a `LinFrameTriggering` that references a `LinSporadicFrame` shall not be set.]

**[constr\_3226] `LinFrameTriggering.linChecksum` for `LinEventTriggeredFrames`**

*Imposition time:* CP: IT\_SysDesc

[Within a `PhysicalChannel` the `linChecksum` attribute of a `LinFrameTriggering` that references a `LinEventTriggeredFrame` shall have the same value as the `linChecksum` attribute of each `LinFrameTriggering` that references a `LinUnconditionalFrame` that in turn is referenced by that `LinEventTriggeredFrame`.]

**[constr\_3227] `NmNode.nmPassiveModeEnabled` setting**

*Imposition time:* CP: IT\_SysDesc

[`NmNode.nmPassiveModeEnabled` shall be set to the same value in all `NmClusters` with the same bus protocol in the scope of one `NmEcu`.]

**[constr\_3229] `SwComponentPrototype` mapped to an `ApplicationPartition` and `EcuInstance`**

*Imposition time:* CP: IT\_EcuExt

[If the `SwcToEcuMapping.ecuInstance` exists then a `SwComponentPrototype` that is mapped to an `ApplicationPartition` via the `SwcToApplicationPartitionMapping` shall only be mapped by an `ApplicationPartitionToEcuPartitionMapping` to an `EcuPartition` that is aggregated by the `EcuInstance` referenced by means of `SwcToEcuMapping.ecuInstance`.]

**[constr\_3230] Usage of `SenderRecRecordElementMapping.applicationRecordElement`**

*Imposition time:* CP: IT\_EcuExt

[`SenderRecRecordElementMapping.applicationRecordElement` shall only be used if the referenced context element (`VariableDataPrototype` that is referenced by the `SenderReceiverToSignalGroupMapping.dataElement`) is typed by an `ApplicationDataType`.]

**[constr\_3231] Usage of `IndexedArrayElement.applicationArrayElement`**

*Imposition time:* CP: IT\_EcuExt

[`IndexedArrayElement.applicationArrayElement` shall only be used if the referenced context element (`VariableDataPrototype` that is referenced by the `SenderReceiverToSignalGroupMapping.dataElement`) is typed by an `ApplicationDataType`.]

**[constr\_3232] `ApplicationPartition` is allowed to be mapped to only one `EcuPartition`**

*Imposition time:* CP: IT\_EcuExt

[Each `ApplicationPartition` shall be mapped at most once to an `EcuPartition` via the `ApplicationPartitionToEcuPartitionMapping`.]



#### [constr\_3243] **FrameTriggering.pduTriggering** condition

*Imposition time:* CP: IT\_SysDesc

[A **FrameTriggering** shall reference a **PduTriggering** if the **PduTriggering** references a **Pdu** that is referenced by a **PduToFrameMapping** which in turn is aggregated by the **Frame** that is referenced by that **FrameTriggering**.]

#### [constr\_3244] Usage of **SenderRecRecordElementMapping.implementationRecordElement**

*Imposition time:* CP: IT\_EcuExt

[**SenderRecRecordElementMapping.implementationRecordElement** shall only be used if the referenced context element (**VariableDataPrototype** that is referenced by the **SenderReceiverToSignalGroupMapping.dataElement**) is typed by an **ImplementationDataType**.]

#### [constr\_3245] Usage of **IndexedArrayElement.implementationArrayElement**

*Imposition time:* CP: IT\_EcuExt

[**IndexedArrayElement.implementationArrayElement** shall only be used if the referenced context element (**VariableDataPrototype** that is referenced by the **SenderReceiverToSignalGroupMapping.dataElement**) is typed by an **ImplementationDataType**.]

#### [constr\_3246] **Frame.packingByteOrder** mix within a **Frame** is not allowed

*Imposition time:* CP: IT\_SysDesc

[All **PduToFrameMappings** within a **Frame** shall have the same **packingByteOrder** value.]

#### [constr\_3247] Byte order mix within a **MultiplexedIPdu** is not allowed

*Imposition time:* CP: IT\_SysDesc

[The **segmentByteOrder** of all **SegmentPositions** and the **selectorFieldByteOrder** shall have the same value in the **MultiplexedIPdu**.]

#### [constr\_3248] Category of **HwElement** for **ECUMapping**

*Imposition time:* CP: IT\_SysDesc

[The **HwElement** which is referenced from **ECUMapping** in the role **ecu** shall be of category **MicroController**]

#### [constr\_3249] Category of **HwElement** for **SwcToEcuMapping**

*Status:* OBSOLETE

*Imposition time:* CP: IT\_EcuExt

[The **HwElement** which is referenced from **SwcToEcuMapping** in the role **processingUnit** shall be of category "ProcessingUnit".]



**[constr\_3250] PduTriggering.iSignalTriggering condition***Imposition time:* CP: IT\_SysDesc

[A `PduTriggering` shall reference an `ISignalTriggering` if the `ISignalTriggering` references an `ISignal` or an `ISignalGroup` that is referenced by an `ISignalToIPduMapping` which in turn is aggregated by the `Pdu` that is referenced by that `PduTriggering`.]

**[constr\_3252] ISignalTriggering.iSignalPort reference condition***Imposition time:* CP: IT\_SysDesc

[An `ISignalTriggering` shall only reference an `ISignalPort` if the `CommunicationConnector` aggregating that `ISignalPort` is referenced by the `PhysicalChannel` which in turn aggregates that `ISignalTriggering`.]

**[constr\_3253] PduTriggering.iPduPort reference condition***Imposition time:* CP: IT\_SysDesc

[A `PduTriggering` shall only reference an `IPduPort` if the `CommunicationConnector` aggregating that `IPduPort` is referenced by the `PhysicalChannel` which in turn aggregates that `PduTriggering`.]

**[constr\_3254] FrameTriggering.framePort reference condition***Imposition time:* CP: IT\_SysDesc

[A `FrameTriggering` shall only reference a `FramePort` if the `CommunicationConnector` aggregating that `FramePort` is referenced by the `PhysicalChannel` which in turn aggregates that `FrameTriggering`.]

**[constr\_3255] FrameTriggering.pduTriggering reference condition with regard to the PhysicalChannel***Imposition time:* CP: IT\_SysDesc

[A `FrameTriggering` shall only reference a `PduTriggering` in the role `pduTriggering` if both the `FrameTriggering` and `PduTriggering` are aggregated by the same `PhysicalChannel`.]

**[constr\_3256] PduTriggering.iSignalTriggering reference condition with regard to the PhysicalChannel***Imposition time:* CP: IT\_SysDesc

[A `PduTriggering` shall only reference an `ISignalTriggering` in the role `iSignalTriggering` if both the `PduTriggering` and `ISignalTriggering` are aggregated by the same `PhysicalChannel`.]

**[constr\_3258] Restriction on `ISignal.length` in case `iSignalType` is set to `array`***Imposition time:* CP: IT\_SysDesc

[If `ISignal.iSignalType` is set to `array` then `ISignal.length` shall be a multiple of 8.]

**[constr\_3261] `GlobalTimeDomain.pduTriggering` category***Imposition time:* CP: IT\_SysDesc

[The `Pdu` that is referenced by the `PduTriggering` that in turn is referenced by `GlobalTimeDomain` in the role `pduTriggering` shall be a `GeneralPurposePdu` of category `GLOBAL_TIME`.]

**[constr\_3262] `ConsumedEventGroup.eventGroupIdentifier` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ConsumedEventGroup.eventGroupIdentifier` is mandatory.]

**[constr\_3263] Restriction of usage of `SwToEcuMapping` in a `System`***Imposition time:* CP: IT\_SysDesc

[For all `SwToEcuMappings` in a `System` the following restriction applies: No two `SwToEcuMappings` shall have the exact same reference to

- `SwComponentPrototype`
- `EcuInstance`

]

**[constr\_3264] Server side `ClientServerToSignalMappings` in case of a n:1 inter-ECU client-server communication***Imposition time:* CP: IT\_SysDesc

[If within the `System` with `category` `SYSTEM_DESCRIPTION` or `SYSTEM_EXTRACT` the `ClientServerToSignalMappings` for inter-ECU n:1 client-server communication are placed on the provider (server) side, then each of these `ClientServerToSignalMappings` shall (in the hierarchy of `SwComponentPrototypes`) refer to a "unique communication path" w.r.t. the `EcuInstances` the client `SwComponentPrototypes` are mapped to.]

**[constr\_3265] `TransformationTechnology.hasInternalState` setting for an E2E transformer***Imposition time:* CP: IT\_SysDesc

[The value of `hasInternalState` shall be set to true for a `TransformationTechnology` with `transformerClass` set to `safety`.]

**[constr\_3266] TransformationTechnology.hasInternalState setting for a SOME/IP Transformer***Imposition time:* CP: IT\_SysDesc

[The value of `hasInternalState` shall be set to true for a SOME/IP Transformer if the `ISignal` that is referencing this transformer is mapped into an `ISignalIPdu` and this `ISignalIPdu` is referenced by a `PduTriggering` that in turn is referenced by a `SomeipTpConnection` in the role `tpSdu` or `tpConcurrentProcessingSdu`.]

**[constr\_3267] PduTriggerings in Service Discovery StaticSocketConnections***Imposition time:* CP: IT\_SysDesc

[SD `StaticSocketConnections` defined according to [TPS\_SYST\_02414] and [TPS\_SYST\_02415] shall only refer to `PduTriggerings` which point to `GeneralPurposePdus` of category SD.]

**[constr\_3268] Service Discovery StaticSocketConnection aggregation by a SocketAddress***Imposition time:* CP: IT\_SysDesc

[Each SD `StaticSocketConnection` defined according to [TPS\_SYST\_02414] and [TPS\_SYST\_02415] shall be aggregated by a `SocketAddress` that in turn aggregates an `ApplicationEndpoint` that defines a `Udp Port`.]

**[constr\_3269] Service Discovery StaticSocketConnection remoteAddress reference to a TpPort***Imposition time:* CP: IT\_SysDesc

[Each SD `StaticSocketConnection` defined according to [TPS\_SYST\_02414] and [TPS\_SYST\_02415] shall refer with the `remoteAddress` reference to an `ApplicationEndpoint` with `Udp Port portNumber` set to 0. This means that any remote port number is accepted for receiving and for sending, i.e., that the remote port number is configured at runtime.]

**[constr\_3270] Service Discovery StaticSocketConnection.remoteAddress reference to an IP Address***Imposition time:* CP: IT\_SysDesc

[Each SD `StaticSocketConnection` defined according to [TPS\_SYST\_02414] and [TPS\_SYST\_02415] shall refer with the `remoteAddress` reference to an `ApplicationEndpoint` that points to a `NetworkEndpoint` that defines an IP Address ANY (IPv4 or IPv6). This means that any remote IP address is accepted for receiving and for sending, i.e., that the remote IP address is configured at runtime.]

**[constr\_3272] `SoConIPduIdentifier.headerId` setting for SD `StaticSocketConnections`**

*Imposition time:* CP: IT\_SysDesc

[The `SoConIPduIdentifier.headerId` of SD `StaticSocketConnections` defined in [TPS\_SYST\_02414] and [TPS\_SYST\_02415] shall always be set to 0xFFFF8100 for SD messages.]

**[constr\_3273] Service Discovery multicast `StaticSocketConnection`'s aggregation by an `ApplicationEndpoint`**

*Imposition time:* CP: IT\_SysDesc

[The SD `StaticSocketConnection` for multicast defined in [TPS\_SYST\_02415] shall be aggregated by an `ApplicationEndpoint` that points to a `NetworkEndpoint` that defines an IP Multicast Address.]

**[constr\_3274] Service Discovery unicast `StaticSocketConnection`'s aggregation by an `ApplicationEndpoint`**

*Imposition time:* CP: IT\_SysDesc

[The SD `StaticSocketConnection` for unicast defined in [TPS\_SYST\_02414] shall be aggregated by an `ApplicationEndpoint` that points to a `NetworkEndpoint` that defines an IP Unicast Address.]

**[constr\_3276] Prohibition of usage of `allowedIPv6ExtHeaders` in IPv4 `SocketAddress`**

*Imposition time:* CP: IT\_SysDesc

[IPv4 `SocketAddress` shall not define `allowedIPv6ExtHeaders`. An IPv4 `SocketAddress` aggregates an `ApplicationEndpoint` that refers to a `NetworkEndpoint` that has an `Ipv4Configuration` as `networkEndpointAddress`.]

**[constr\_3277] Restriction of usage of `IPv6ExtHeaderFilterLists` in IPv6 `SocketAddress`**

*Imposition time:* CP: IT\_SysDesc

[All `SocketAddresses` related to the same IPv6 `NetworkEndpoint` shall all reference either no or exactly the same `IPv6ExtHeaderFilterList` with the `allowedIPv6ExtHeaders` attribute.]

**[constr\_3278] Usage of `SOMEIPTransformationProps.sizeOfArrayLengthField`**

*Imposition time:* CP: IT\_SysDesc

[The attribute `sizeOfArrayLengthField` of `SOMEIPTransformationProps` shall only be defined if the `DataPrototypeTransformationProps` is defined for a static size array according to [TPS\_SYST\_02121].]

**[constr\_3279] Usage of `SOMEIPTransformationProps.sizeOfStructLengthField`***Imposition time:* CP: IT\_SysDesc

[The attribute `sizeOfStructLengthField` of `SOMEIPTransformationProps` shall only be defined if the `DataPrototypeTransformationProps` is defined for a structure according to [TPS\_SYST\_02121].]

**[constr\_3280] Usage of `SOMEIPTransformationProps.sizeOfUnionLengthField`***Imposition time:* CP: IT\_SysDesc

[The attribute `sizeOfUnionLengthField` of `SOMEIPTransformationProps` shall only be defined if the `DataPrototypeTransformationProps` is defined for a union according to [TPS\_SYST\_02121].]

**[constr\_3281] Usage of `SOMEIPTransformationProps.alignment`***Imposition time:* CP: IT\_SysDesc

[The attribute `alignment` of `SOMEIPTransformationProps` shall only be defined if the `DataPrototypeTransformationProps` is defined for a variable data length data element according to [TPS\_SYST\_02121].]

**[constr\_3282] SOME/IP Transformation settings for arrays in the context of an `ISignal`***Imposition time:* CP: IT\_SysDesc

[In the context of an `ISignal` the usage of `DataPrototypeTransformationProps.transformationProps.sizeOfArrayLengthField` is only allowed if the `SOMEIPTransformationISignalProps.sizeOfArrayLengthFields` is not defined.]

**[constr\_3283] SOME/IP Transformation settings for structures in the context of an `ISignal`***Imposition time:* CP: IT\_SysDesc

[In the context of an `ISignal` the usage of `DataPrototypeTransformationProps.transformationProps.sizeOfStructLengthField` is only allowed if the `SOMEIPTransformationISignalProps.sizeOfStructLengthFields` is not defined.]

**[constr\_3284] SOME/IP Transformation settings for unions in the context of an `ISignal`***Imposition time:* CP: IT\_SysDesc

[In the context of an `ISignal` the usage of `DataPrototypeTransformationProps.transformationProps.sizeOfUnionLengthField` is only allowed if the `SOMEIPTransformationISignalProps.sizeOfUnionLengthFields` is not defined.]

**[constr\_3285] Alignment of variable data length data elements in the context of an ISignal**

*Imposition time:* CP: IT\_SysDesc

[The definition of `DataPrototypeTransformationProps.transformationProps.alignment` is only allowed if the `SOMEIPTransformationDescription.alignment` is not defined.]

**[constr\_3297] Prohibition of usage of `allowedTcpOptions` in Udp `SocketAddress`**

*Imposition time:* CP: IT\_SysDesc

[Udp `SocketAddress` shall not define `allowedTcpOptions`. A Udp `SocketAddress` aggregates an `ApplicationEndpoint` that has a `UdpTp` defined as `tpConfiguration`.]

**[constr\_3298] `Ipv6Configuration.ipv6Address` range in case of `enableAnycast`**

*Imposition time:* CP: IT\_SysDesc

[If `Ipv6Configuration.enableAnycast` is set to true then the `Ipv6Configuration.ipv6Address` needs to be in the unicast addressing range.]

**[constr\_3311] Usage of `SocketAddress.flowLabel`**

*Imposition time:* CP: IT\_SysDesc

[`SocketAddress.flowLabel` shall only be used if the aggregated `ApplicationEndpoint` refers to a `NetworkEndpoint` with an `Ipv6Configuration`.]

**[constr\_3312] Consistency of `vlanPriority` and `EthernetCommunicationConnector`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[A `GlobalTimeEthMaster` refers to an `EthernetCommunicationConnector` in the role `communicationConnector`. If that `EthernetCommunicationConnector` is referenced by an `EthernetPhysicalChannel` in the role `commConnector` and the `EthernetPhysicalChannel` has a `vLan` tag defined via the `VlanConfig` then the `GlobalTimeDomain` of the `GlobalTimeEthMaster` shall aggregate `EthGlobalTimeDomainProps` in the role `globalTimeDomainProperty` and the attribute `EthGlobalTimeDomainProps.vlanPriority` shall exist.]

**[constr\_3313] E2E transformer configuration**

*Imposition time:* CP: IT\_SysDesc

[For each `TransformationDescription` variant that is a `EndToEndTransformationDescription`

- attribute `protocol` of `TransformationTechnology` shall be set to E2E
- attribute `version` of `TransformationTechnology` shall be set to 1.0.0

- attribute `transformerClass` of `TransformationTechnology` shall be set to `safety`

]

**[constr\_3316] Allowed values for `EndToEndTransformationDescription.maxDeltaCounter` in PROFILE\_07, PROFILE\_08, PROFILE\_07m and PROFILE\_08m**

*Imposition time:* CP: IT\_SysDesc

[If the `EndToEndTransformationDescription.profileName` attribute has a value of PROFILE\_07, PROFILE\_08, PROFILE\_07m, or PROFILE\_08m the value of `maxDeltaCounter` attribute shall be in the range 1-4'294'967'295.]

**[constr\_3317] Assuring the same data interpretation on the sender and receiver sides in case of serialization based on the `ImplementationDataTypes`**

*Imposition time:* CP: IT\_SysDesc

[In order to assure the same interpretation of the serialized data by the SOME/IP transformers on the sender and receiver sides in case of serialization based on either a primitive or a composite `ImplementationDataType`, the same `SwBaseType` shall be defined

- for this primitive `DataPrototype` or
- for each primitive `DataPrototype` of the leaf elements of the composite `DataPrototype` starting from the first element until and including the last element that is requested by the receiver,

by the `ImplementationDataTypes` that either types the corresponding `PortPrototypes` on the top level Software Composition of the communicating `EcuInstances`, or it is mapped to the `ApplicationDataType` that types it.]

**[constr\_3318] Allowed use of `ISignal.networkRepresentationProps`**

*Imposition time:* CP: IT\_SysDesc

[If a reference from `ISignal` to `DataTransformation` in the role `dataTransformation` exists, this `ISignal` SHALL NOT aggregate `SwDataDefProps` in the role `networkRepresentationProps`.]

**[constr\_3319] Existence of `DataPrototypeTransformationProps.networkRepresentationProps`**

*Imposition time:* CP: IT\_SysDesc

[`ISignal.transformationISignalProps.dataPrototypeTransformationProps.networkRepresentationProps` shall either

- not exist at all or
- shall be defined for all leaf elements of the root `DataPrototype` transmitted in the `ISignal`



]

**[constr\_3322] Consistent setting of `SoConIPduIdentifier.pduCollectionSemantics` in the context of one `SocketAddress`**

*Imposition time:* CP: IT\_SysDesc

[The value of the attribute `SoConIPduIdentifier.pduCollectionSemantics` shall be identical for all referenced `SoConIPduIdentifiers` within the context of a given `SocketAddress`.]

**[constr\_3323] Relation between `NmCluster.nmPncParticipation` and `PncMapping.pncGroup`**

*Imposition time:* CP: IT\_SysDesc

[If a `PncMapping` references an `ISignalIPduGroup` in role `pncGroup` which in turn

- contains (either directly or via one of its subordinate `ISignalIPduGroups` referenced in role `containedISignalIPduGroup`) `ISignalIPdus` that are referenced by a `PduTriggering` in role `ipdu` which in turn
- is composed by a `PhysicalChannel` in role `pduTriggering` which in turn
- is composed by `CommunicationCluster` in role `physicalChannel` which in turn
- is referenced by an `NmCluster` in role `communicationCluster`,

then this `NmCluster` shall have its `nmPncParticipation` attribute set to TRUE unless the `PhysicalChannel` is referenced in the role `managedPhysicalChannel`.]

**[constr\_3324] Category of `SecureCommunicationFreshnessProps` and `SecureCommunicationAuthenticationProps`**

*Imposition time:* CP: IT\_SysDesc

[`SecureCommunicationFreshnessProps` that is referenced by a `SecuredIPdu` in the role `freshnessProps` shall have the same `category` value as the `SecureCommunicationAuthenticationProps` that is referenced by the same `SecuredIPdu` in the role `authenticationProps`.]



**[constr\_3325] [SecureCommunicationFreshnessProps](#), [SecureCommunicationAuthenticationProps](#) and [CryptoServicePrimitive](#) attribute value settings for standardized AUTOSAR security profiles**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

Attributes	PROFILE_01	PROFILE_02	PROFILE_03
<a href="#">algorithmFamily</a>	CRYPTO_ALGOFAM_AES	CRYPTO_ALGOFAM_AES	CRYPTO_ALGOFAM_AES
<a href="#">algorithmMode</a>	CRYPTO_ALGOMODE_CM MAC	CRYPTO_ALGOMODE_CM MAC	CRYPTO_ALGOMODE_CM MAC
<a href="#">length</a>	128 bits	128 bits	128 bits
<a href="#">authInfoTxLength</a>	24 bits	24 bits	28 bits
<a href="#">freshnessValueLength</a>	Not specified	0 bits	64 bits
<a href="#">freshnessValueTxLength</a>	8 bits	0 bits	4 bits

**[constr\_3326] Allowed values for [EndToEndTransformationDescription.dataIdMode](#) in PROFILE\_11**

*Imposition time:* CP: IT\_SysDesc

[If the [EndToEndTransformationDescription.profileName](#) attribute has a value of PROFILE\_11 then the value of the [EndToEndTransformationDescription.dataIdMode](#) attribute shall be set to [all16Bit](#) or [lower12Bit](#).]

**[constr\_3327] Effect of [EndToEndTransformationDescription.upperHeaderBitsToShift](#) value in PROFILE\_22**

*Imposition time:* CP: IT\_SysDesc

[If the [EndToEndTransformationDescription.profileName](#) attribute has a value of PROFILE\_22 and the serializing transformer is different than the ComBased Transformer, then [EndToEndTransformationDescription.offset](#) shall be set to the same value of [upperHeaderBitsToShift](#).]

**[constr\_3328] [SomeipTpConnection.transportPdu](#) reference restriction**

*Imposition time:* CP: IT\_SysDesc

[A [PduTriggering](#) that is referenced by a [SomeipTpConnection](#) in the role [transportPdu](#) shall reference a [GeneralPurposeIPdu](#) with category SOMEIP\_SEGMENTED\_IPDU in the role [iPdu](#).]

**[constr\_3329] [SomeipTpConnection.tpSdu](#) reference restriction**

*Imposition time:* CP: IT\_SysDesc

[A [PduTriggering](#) that is referenced by a [SomeipTpConnection](#) in the role [tpSdu](#) shall reference an [IPdu](#) in the role [iPdu](#).]

**[constr\_3330] Same `transportPdu` shall not be used in different `SomeipTpConnections`***Imposition time:* CP: IT\_SysDesc

[A `PduTriggering` that is referencing a `GeneralPurposeIPdu` with category `SOMEIP_SEGMENTED_IPDU` in the role `iPdu` shall be referenced at most once by a `SomeipTpConnection` in the role `transportPdu`.]

**[constr\_3331] Standardized values for the attribute `category` of meta-class `EthernetCommunicationConnector`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The following values of the attribute `category` of meta-class `EthernetCommunicationConnector` are reserved by the AUTOSAR standard:

- WIRED: This represents the usage of the `EthernetCommunicationConnector` in case of a wired ethernet connection
- WIRELESS: This represents the usage of the `EthernetCommunicationConnector` in case of a wireless ethernet connection
- CAN\_XL: This represents the tunneling of Ethernet frames handled by the `EthernetCommunicationConnector` through CAN XL.

]

**[constr\_3332] Standardized values for the attribute `category` of meta-class `EthernetCommunicationController`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The following values of the attribute `category` of meta-class `EthernetCommunicationController` are reserved by the AUTOSAR standard:

- WIRED: This represents the usage of the `EthernetCommunicationController` in case of a wired ethernet connection
- WIRELESS: This represents the usage of the `EthernetCommunicationController` in case of a wireless ethernet connection
- CAN\_XL: This represents the tunneling of Ethernet frames handled by the `EthernetCommunicationController` through CAN XL.

]

**[constr\_3333] Standardized values for the attribute `category` of meta-class `EthernetPhysicalChannel`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The following values of the attribute `category` of meta-class `EthernetPhysicalChannel` are reserved by the AUTOSAR standard:

- WIRED: This represents the usage of the `EthernetPhysicalChannel` in case of a wired ethernet connection

- WIRELESS: This represents the usage of the `EthernetPhysicalChannel` in case of a wireless ethernet connection

]

**[constr\_3334] Allowed references between `EthernetPhysicalChannel` and `EthernetCommunicationConnector`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[An `EthernetPhysicalChannel` is only allowed to reference `EthernetCommunicationConnectors` in the role `commConnector` that have the same `category` value as the referencing `EthernetPhysicalChannel`.]

**[constr\_3335] Allowed references between `EthernetCommunicationConnector` and `EthernetCommunicationController`**

*Imposition time:* CP: IT\_SysDesc

[An `EthernetCommunicationConnector` is only allowed to reference an `EthernetCommunicationController` in the role `commController` that has the same `category` value as the referencing `EthernetCommunicationConnector`.]

**[constr\_3336] `EthernetPhysicalChannel.soAdConfig` in case of WIRELESS `EthernetPhysicalChannel`**

*Imposition time:* CP: IT\_SysDesc

[If `EthernetPhysicalChannel` has the `category` `WIRELESS` then the `EthernetPhysicalChannel` shall not aggregate the `SoAdConfig`.]

**[constr\_3337] `IPduPort.useAuthDataFreshness` is configurable on the receiver side**

*Imposition time:* CP: IT\_SysDesc

[The `IPduPort.useAuthDataFreshness` attribute shall only be used in `IPduPorts` with the `communicationDirection` = in.]

**[constr\_3338] `IPduPort.useAuthDataFreshness` validness**

*Imposition time:* CP: IT\_SysDesc

[The `IPduPort.useAuthDataFreshness` information is only valid for `SecuredIPdus`.]

**[constr\_3339] Relation between `authDataFreshnessStartPosition`, `authDataFreshnessLength` and `useAuthDataFreshness`**

*Imposition time:* CP: IT\_SysDesc

[If `authDataFreshnessStartPosition` and `authDataFreshnessLength` are set to a value for a `SecuredIPdu` then the `useAuthDataFreshness` shall be set as well to a value on all `IPduPorts` with `communicationDirection` = in that are referenced by a `PduTriggering` of the `SecuredIPdu`.]

**[constr\_3364] `headerLength` shall be a multiple of 8**

*Imposition time:* CP: IT\_SysDesc

[The header length in bits specified by `headerLength` shall be a multiple of 8.]

**[constr\_3365] `EthernetPhysicalChannels` with different `category` values are not allowed within an `EthernetCluster`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[A mix of `EthernetPhysicalChannels` with different `category` values within an `EthernetCluster` is currently not supported by AUTOSAR.]

**[constr\_3373] Limitation on the number of `PhysicalChannels` that are referencing a `CommunicationConnector`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[A `CommunicationConnector` shall only be referenced by at most one `PhysicalChannel`.]

**[constr\_3378] Maximal one `AliasNameAssignment` allowed per `FlatInstanceDescriptor`**

*Imposition time:* CP: IT\_EcuExt

[In a given instance of `AliasNameSet` in the bound system there shall be at most one `aliasName` per `FlatInstanceDescriptor`.]

**[constr\_3379] Multiple `SocketAddress` entries with the same IP Address, Protocol and Port in the context of a given `EcuInstance`**

*Imposition time:* CP: IT\_SysDesc

[If there are two or more `SocketAddress` entities within the scope of one `SoAdConfig` in the scope of one `EcuInstance` that have the same static (fixed at configuration time) IP Address, Protocol and Port in the aggregated `ApplicationEndpoint` and `NetworkEndpoint`, (e.g., 192.168.1.1, Tcp and 10000, respectively) then only one of these `SocketAddress` elements shall be referenced by `ProvidedServiceInstances/ConsumedServiceInstances` in the role `localUnicastAddress`.]

**[constr\_3383] Standardized values for the attribute `category` of meta-class `GeneralPurposeConnection`**

*Imposition time:* CP: IT\_SysDesc

[The following values of the attribute `category` of meta-class `GeneralPurposeConnection` are reserved by the AUTOSAR standard:

- XcpChannel

]

**[constr\_3384] PduTriggerings referenced by GeneralPurposeConnection shall be defined on the same PhysicalChannel**

*Imposition time:* CP: IT\_SysDesc

[The PduTriggerings that are referenced by the GeneralPurposeConnection in the role pduTriggering shall be defined on the same PhysicalChannel.]

**[constr\_3385] XcpChannel is allowed to reference exactly two PduTriggerings**

*Imposition time:* CP: IT\_SysDesc

[In case that the category of meta-class GeneralPurposeConnection is set to the value XcpChannel the GeneralPurposeConnection is allowed to reference exactly two PduTriggerings in the role pduTriggering.]

**[constr\_3386] XcpChannel is only allowed to reference PduTriggerings of GeneralPurposeIPdus with category XCP**

*Imposition time:* CP: IT\_SysDesc

[In case that the category of meta-class GeneralPurposeConnection is set to the value XcpChannel the GeneralPurposeConnection is allowed to reference PduTriggerings of GeneralPurposeIPdus with category XCP.]

**[constr\_3399] Existence of securedAreaOffset and securedAreaLength**

*Imposition time:* CP: IT\_SysDesc

[If the securedAreaOffset is defined then the securedAreaLength shall be defined as well and vice versa.]

**[constr\_3402] Mandatory offset if noHeader is used**

*Imposition time:* CP: IT\_SysDesc

[For each IPdu which is assigned to a ContainerIPdu in the role ContainerIPdu.containedPduTriggering or ContainerIPdu.containedIPduTriggeringProps.containedPduTriggering with ContainerIPdu.headerType = noHeader the ContainedIPduProps.offset shall be defined.]

**[constr\_3403] Usage of ContainerIPdu.rxAcceptContainedIPdu if noHeader is used**

*Imposition time:* CP: IT\_SysDesc

[If the ContainerIPdu.headerType is set to noHeader then the ContainerIPdu.rxAcceptContainedIPdu attribute value shall be set to acceptConfigured.]

**[constr\_3404] Usage of ContainedIPduProps.updateIndicationBitPosition**

*Imposition time:* CP: IT\_SysDesc

[ContainedIPduProps.updateIndicationBitPosition is only allowed to be set to a value if the headerType of the ContainerIPdu that contains the IPdu with

`ContainerIPdu.containedPduTriggering` or `ContainerIPdu.containedIPduTriggeringProps.containedPduTriggering` is set to `noHeader`.]

**[constr\_3405] Dynamic Length IPdu inside of a static configured Container-IPdu**

*Imposition time:* CP: IT\_SysDesc

[Only the last contained IPdu (according to the `ContainedIPduProps.offset`) of a `ContainerIPdu` with static container layout (i.e., a `ContainerIPdu` with `headerType` set to `noHeader`) is allowed to be a dynamic length IPdu (i.e., a contained IPdu that at runtime may exhibit a length different from the one statically configured via `Pdu.length` of the respective `Pdu`). All other contained IPdus of a `ContainerIPdu` with static container layout have to be static length IPdus.]

**[constr\_3406] All signals before `authDataFreshnessStartPosition` shall have a static length**

*Imposition time:* CP: IT\_SysDesc

[In case that

- an `ISignalIPdu` is referenced by the `SecuredIPdu` with the `payload` reference via the `PduTriggering` and
- the `authDataFreshnessStartPosition` and `authDataFreshnessLength` define the area in the `ISignalIPdu` that is taken to verify and generate the Freshness then

all `ISignals` that are mapped into the `ISignalIPdu` in front of the configured `authDataFreshnessStartPosition` shall have a static length.]

**[constr\_3407] Freshness Value in Authentic IPdu is not allowed to be used in case of ContainerIPdu with a dynamic layout**

*Imposition time:* CP: IT\_SysDesc

[If a `ContainerIPdu` that is referenced by the `SecuredIPdu` with the `payload` reference via the `PduTriggering` contains a dynamic layout (i.e. `ContainerIPdu.headerType` is set to `longHeader` or `shortHeader`) and multiple contained IPdus then each `IPduPort` that is referenced by the `PduTriggering` of the `SecuredIPdu` shall have the attribute `useAuthDataFreshness` set to `false`.]

**[constr\_3436] Value range of `minimumTxContainerQueueSize` and `minimumRxContainerQueueSize`**

*Imposition time:* CP: IT\_SysDesc

[If defined, the value of `minimumTxContainerQueueSize` and `minimumRxContainerQueueSize` shall be in the range of 0..255.]

**[constr\_3437] `invalidValue` defined in the context of `ISignal`***Imposition time:* CP: IT\_SysDesc

[The definition of `SwDataDefProps.invalidValue` aggregated by an `ISignal` in the role `networkRepresentationProps` shall only be a `NumericalValueSpecification`, `TextValueSpecification` or `ArrayValueSpecification` that aggregates elements of type `NumericalValueSpecification` or `TextValueSpecification`.]

**[constr\_3438] `timeoutSubstitutionValue` defined in the context of `ISignal`***Imposition time:* CP: IT\_SysDesc

[The definition of an `timeoutSubstitutionValue` in the context of an `ISignal` shall only be a `NumericalValueSpecification`, `TextValueSpecification` or `ArrayValueSpecification` that aggregates elements of type `NumericalValueSpecification` or `TextValueSpecification`.]

**[constr\_3448] Restriction for usage of `Pdu.hasDynamicLength`***Imposition time:* CP: IT\_SysDesc

[The `Pdu.hasDynamicLength` attribute is only relevant for `UserDefinedPdu`s, `UserDefinedIPdu`s, `J1939DcmIPdu`s.]

**[constr\_3454] Unique `headerIdLongHeader` for `acceptConfigured`***Imposition time:* CP: IT\_SysDesc

[For a `ContainerIPdu` with `ContainerIPdu.rxAcceptContainedIPdu = RxAcceptContainedIPduEnum.acceptConfigured` and `ContainerIPdu.headerType = longHeader` the following shall apply: All referenced `IPdu`s (via `ContainerIPdu.containedPduTriggering` or `ContainerIPdu.containedIPduTriggeringProps.containedPduTriggering`) shall have a unique `ContainedIPduProps.headerIdLongHeader` within the scope of this `ContainerIPdu`.]

**[constr\_3455] Unique `headerIdShortHeader` for `acceptConfigured`***Imposition time:* CP: IT\_SysDesc

[For a `ContainerIPdu` with `ContainerIPdu.rxAcceptContainedIPdu = RxAcceptContainedIPduEnum.acceptConfigured` and `ContainerIPdu.headerType = shortHeader` the following shall apply: All referenced `IPdu`s (via `ContainerIPdu.containedPduTriggering` or `ContainerIPdu.containedIPduTriggeringProps.containedPduTriggering`) shall have a unique `ContainedIPduProps.headerIdShortHeader` within the scope of this `ContainerIPdu`.]



**[constr\_3456] Existence of `ProvidedServiceInstance.loadBalancingPriority` and `ProvidedServiceInstance.loadBalancingWeight`**

*Imposition time:* CP: IT\_SysDesc

[The attributes `ProvidedServiceInstance.loadBalancingPriority` and `ProvidedServiceInstance.loadBalancingWeight` shall either not exist or be defined both.]

**[constr\_3457] Uniqueness of `ConsumedEventGroup.eventGroupIdentifier` in the scope of a `ConsumedServiceInstance`**

*Imposition time:* CP: IT\_SysDesc

[Each `ConsumedEventGroup` that is aggregated by a `ConsumedServiceInstance` shall have a unique `eventGroupIdentifier` value in the scope of the aggregating `ConsumedServiceInstance`.]

**[constr\_3458] `FlatInstanceDescriptor.rtePluginProps` shall only reference a `EcucContainerValue` representing a `RteRipsPlugin`**

*Imposition time:* CP: IT\_EcuExt

[`FlatInstanceDescriptor.rtePluginProps` shall only reference an `EcucContainerValue` which defines the identity of the RTE Implementation Plug-In. This requires that the according `EcucContainerValue`'s `definition` references a `EcucContainerDef` having a `destinationUri` set to `/AUTOSAR/EcucDestinationUriDefSets/RteRipsUriDefSet/RteRipsPlugin`]

**[constr\_3460] Full definition of `transferProperty` for group signal**

*Imposition time:* CP: IT\_SysDesc

[If at least one of the `ISignals` belonging to an `ISignalGroup` has a `transferProperty` defined (via their respective `ISignalToIPduMapping`) then all other `ISignals` belonging to the same `ISignalGroup` shall have a `transferProperty` defined as well.]

**[constr\_3461] TransferProperty for group signals if `ISignalGroup` has `transferProperty=pending`**

*Imposition time:* CP: IT\_SysDesc

[If the `ISignalToIPduMapping` refers to an `ISignalGroup` in the role `iSignalGroup` and

the `transferProperty` is set to `pending` then  
the group signals of this `ISignalGroup` shall either

- have no `transferProperty` defined (via their respective `ISignalToIPduMapping`) or
- every `ISignal` belonging to the `ISignalGroup` shall have the `transferProperty=pending` defined.

]



**[constr\_3464] Allowed Pdu type on `BusMirrorChannelMapping.targetChannel`***Imposition time:* CP: IT\_SysDesc

[Each `PduTriggering` that is referenced by `BusMirrorChannelMapping` in the role `targetPduTriggering` is only allowed to reference a `GeneralPurposeIPdu` of category `BUS_MIRRORING`.]

**[constr\_3465] Identical `BusMirrorChannel.busMirrorNetworkId` for `BusMirrorChannels` referencing the same `PhysicalChannel`***Imposition time:* CP: IT\_SysDesc

[The attribute `BusMirrorChannel.busMirrorNetworkId` shall be identical in all `BusMirrorChannels` that are referencing the same `PhysicalChannel` in the scope of the `System`.]

**[constr\_3466] Unique `BusMirrorChannel.busMirrorNetworkIds` for each specialization of `PhysicalChannel`***Imposition time:* CP: IT\_SysDesc

[The attribute `BusMirrorChannel.busMirrorNetworkId` associated with `PhysicalChannels` that have the same specialization (e.g. all `CanPhysicalChannels`) shall have unique `BusMirrorChannel.busMirrorNetworkIds` within the scope of the `System`.]

**[constr\_3467] `CanPhysicalChannel` as destination channel of `BusMirrorChannelMappingCan`***Imposition time:* CP: IT\_SysDesc

[The `BusMirrorChannel` that is aggregated by `BusMirrorChannelMappingCan` shall only reference a `CanPhysicalChannel` in the role `targetChannel`.]

**[constr\_3468] `BusMirrorChannelMappingCan.targetPduTriggering` restriction***Imposition time:* CP: IT\_SysDesc

[`BusMirrorChannelMappingCan` is allowed to reference only one single `PduTriggering` in the role `targetPduTriggering`.]

**[constr\_3469] `CanFrameTriggering.txMask` setting for the destination frame***Imposition time:* CP: IT\_SysDesc

[The `CanFrameTriggering` of a `Frame` that contains a `Pdu` of which the `PduTriggering` is referenced by `BusMirrorChannelMappingCan` in the role `targetPduTriggering` shall set the `txMask` to 0.]

### [constr\_3470] PaddingValue used to transmit the Pdu on a Can-Fd destination bus

*Imposition time:* CP: IT\_SysDesc

[In case that the `BusMirrorChannelMappingCan` references a `PduTriggering` in the role `targetPduTriggering` and

- the `CanFrameTriggering` of the `Frame` that contains this `targetPduTriggering` has the `canFrameTxBehavior` set to `canFd` and
- the `CanFrameTriggering` has a reference to an "out" `FramePort` (i.e. the Frame is transmitted by an Ecu on a Can-Fd destination bus) and
- the `CommunicationController` of the transmitting `EcuInstance` that is referenced via the `CommunicationConnector` by the `PhysicalChannel` on which the `targetPduTriggering` is located then the `CanControllerFdConfiguration.paddingValue` or `CanControllerFdConfigurationRequirements.paddingValue` shall have the value 0.

]

### [constr\_3471] `FlexrayPhysicalChannel` as destination channel of `BusMirrorChannelMappingFlexray`

*Imposition time:* CP: IT\_SysDesc

[The `BusMirrorChannel` that is aggregated by `BusMirrorChannelMappingFlexray` shall only reference a `FlexrayPhysicalChannel` in the role `targetChannel`.]

### [constr\_3472] Number of `BusMirrorChannels` derived for one `FlexrayCluster`

*Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, only one `BusMirrorChannel` shall be derived. I.e. if both channels A and B are derived, only one of the two `FlexrayPhysicalChannels` of one `FlexrayCluster` shall be referenced by a `BusMirrorChannel` in the `System`.]

### [constr\_3473] `BusMirrorChannelMappingFlexray.targetPduTriggering` restriction

*Imposition time:* CP: IT\_SysDesc

[The `FlexrayFrameTriggering` of a `Frame` that contains a `Pdu` of which the `PduTriggering` is referenced by `BusMirrorChannelMappingFlexray` in the role `targetPduTriggering` shall have the `allowDynamicLSduLength` attribute set to `true`.]

**[constr\_3474] EthernetPhysicalChannel as destination channel of BusMirrorChannelMappingIp***Imposition time:* CP: IT\_SysDesc

[The `BusMirrorChannel` that is aggregated by `BusMirrorChannelMappingIp` shall only reference an `EthernetPhysicalChannel` in the role `targetChannel`.]

**[constr\_3475] BusMirrorChannelMappingIp.targetPduTriggering restriction***Imposition time:* CP: IT\_SysDesc

[`BusMirrorChannelMappingIp` is allowed to reference only one single `PduTriggering` in the role `targetPduTriggering`.]

**[constr\_3476] UserDefinedPhysicalChannel as destination channel of BusMirrorChannelMappingUserDefined***Imposition time:* CP: IT\_SysDesc

[The `BusMirrorChannel` that is aggregated by `BusMirrorChannelMappingUserDefined` shall only reference a `UserDefinedPhysicalChannel` in the role `targetChannel`.]

**[constr\_3477] BusMirrorChannelMappingUserDefined.targetPduTriggering restriction***Imposition time:* CP: IT\_SysDesc

[`BusMirrorChannelMappingUserDefined` is allowed to reference only one single `PduTriggering` in the role `targetPduTriggering`.]

**[constr\_3479] PhysicalChannel is not allowed to be a managedPhysicalChannel and a managing PhysicalChannel***Imposition time:* CP: IT\_SysDesc

[If a `PhysicalChannel` is referenced in role `managedPhysicalChannel`, then it shall not be the source of another `managedPhysicalChannel` relation.]

**[constr\_3480] PhysicalChannel shall be referenced in the role managedPhysicalChannel only once***Imposition time:* CP: IT\_SysDesc

[A `PhysicalChannel` shall be referenced in the role `managedPhysicalChannel` only up to once.]

**[constr\_3481] UdpNmCluster is not allowed to reference a managedPhysicalChannel in the role vlan***Imposition time:* CP: IT\_SysDesc

[If an `EthernetPhysicalChannel` is target of a `managedPhysicalChannel` reference, then no `UdpNmCluster` shall reference this `managedPhysicalChannel` in the role `vlan`.]

**[constr\_3482] `NmCluster` is not allowed to reference a `CommunicationCluster` that aggregates a `managedPhysicalChannel`**

*Imposition time:* CP: IT\_SysDesc

[If a `PhysicalChannel`, except `EthernetPhysicalChannel`, is target of a `managedPhysicalChannel`, then the aggregating `CommunicationCluster` shall not be referenced by any `NmCluster` in the role `communicationCluster`.]

**[constr\_3484] `PncMapping` that refers a `managedPhysicalChannel` shall also refer the managing `PhysicalChannel`**

*Imposition time:* CP: IT\_SysDesc

[If a `PncMapping` refers to a `PhysicalChannel` (either directly in the role `physicalChannel` or indirectly by referencing an `ISignalIPduGroup` in the role `pncGroup`) and this `PhysicalChannel` is referenced in the role `managedPhysicalChannel`, then the according managing `PhysicalChannel` (the source of the `managedPhysicalChannel` reference) shall also be referenced by the `PncMapping` (either directly in the role `physicalChannel` or indirectly by referencing an `ISignalIPduGroup` in the role `pncGroup`).]

**[constr\_3488] Value range of `ContainedIPduProps.priority`**

*Imposition time:* CP: IT\_SysDesc

[If defined, the value of `ContainedIPduProps.priority` shall be in the range of 0..255.]

**[constr\_3489] `ContainedIPduProps.priority` is only applicable if a `ContainerIPdu` header is used**

*Imposition time:* CP: IT\_SysDesc

[`ContainedIPduProps.priority` is only applicable if the `headerType` of the `ContainerIPdu` is set to `shortHeader` or `longHeader`.]

**[constr\_3490] `ContainedIPduProps.priority` is only applicable if `collectionSemantics` is set to `lastIsBest`**

*Imposition time:* CP: IT\_SysDesc

[`ContainedIPduProps.priority` is only applicable if `ContainedIPduProps.collectionSemantics` is set to `lastIsBest`.]

**[constr\_3501] Role of `SystemSignal` in 1:n communication**

*Imposition time:* CP: IT\_EcuExt

[In case of 1:n communication the `VariableDataPrototype` in the `PPortPrototype` of the `SwComponentPrototype` shall be mapped to only one `SystemSignal`.]

**[constr\_3506] Mapping of composite data type to `SystemSignals` in `SystemSignalGroup`**

*Imposition time:* CP: IT\_EcuExt

[Either all or a subset of elements of a composite data type shall be mapped to `SystemSignals` which shall be members of one `SystemSignalGroup` if no data transformation (except COM Based Transformer) is used.

There are two exceptions to this rule:

- it is allowed to map an array `VariableDataPrototype` consisting of `UINT8` elements to exactly one `SystemSignal` in the context of one `SenderReceiverToSignalMapping` (see [TPS\_SYST\_01037]).
- in case the COM Based Transformer [8] is used it is the integral part of the approach to have a fixed mapping of the individual elements of composite data types to `SystemSignals` in a `SystemSignalGroup` ([TPS\_SYST\_02058]).

]

**[constr\_3508] Value of `nmReadySleepTime`**

*Imposition time:* CP: IT\_SysDesc

[The `nmReadySleepTime` value shall be a multiple of `cycle * nmRepetitionCycle`.]

**[constr\_3514] No two `ISignalToIPduMappings` shall reference the identical `ISignal`**

*Imposition time:* CP: IT\_SysDesc

[No two `ISignalToIPduMappings` shall reference the identical `ISignal` in the role `iSignal` in the scope of one System.]

**[constr\_3515] Fully filled `EthernetPriorityRegeneration` table**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[In case the `CouplingPortDetails.ethernetPriorityRegeneration` is defined it shall contain exactly 8 elements of `EthernetPriorityRegeneration`, one for each value of `ingressPriority` (0-7).]

**[constr\_3516] limitation of `Frame.frameLength` for CAN L-PDUs**

*Imposition time:* CP: IT\_SysDesc

[The `Frame.frameLength` of CAN PDUs shall be restricted to

- 0..8 for classic CAN L-PDUs;
- 0..8, 12, 16, 20, 24, 32, 48, 64 for CAN FD L-PDUs and
- 1..2048 for CAN XL L-PDUs.

]

**[constr\_3517] Consistent setting of `ContainedIPduProps.collectionSemantics` in the context of one `ContainerIPdu`**

*Imposition time:* CP: IT\_SysDesc

[The value of the attribute `ContainedIPduProps.collectionSemantics` shall be identical for all contained `IPdus` within the context of a given `ContainerIPdu`.]

**[constr\_3518] Range of `CanControllerFdConfiguration.paddingValue` and `CanControllerFdConfigurationRequirements.paddingValue`**

*Imposition time:* CP: IT\_SysDesc

[The value given for `CanControllerFdConfiguration.paddingValue` and `CanControllerFdConfigurationRequirements.paddingValue` shall be in the range from 0 to 255.]

**[constr\_3519] Value of `category` of `GlobalTimeDomain`**

*Imposition time:* CP: IT\_SysDesc

[The attribute `category` of `GlobalTimeDomain` can have the following value:

- SYNCHRONIZED: this time base does not depend on the existence of another time base

]

**[constr\_3521] `defaultVlan` and `vlanMembership`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If a `CouplingPort` refers to an `EthernetPhysicalChannel` in the role `defaultVlan` the `CouplingPort` shall also have a `vlanMembership` defined. This `VlanMembership` shall point to the same `EthernetPhysicalChannel` in the role `vlan` as the `defaultVlan`.]

**[constr\_3523] `CouplingPort` and `PncMapping` in the scope of an `EthernetPhysicalChannel`**

*Imposition time:* CP: IT\_SysDesc

[If

- a `CouplingPort` referring to an `EthernetPhysicalChannel` – via a `VlanMembership` – references at least one `PncMapping`
- and that `PncMapping` contains PDUs – via the assignment of `PncMapping.pncGroup` – that are transported on this `EthernetPhysicalChannel`

then every `CouplingPort` referring to that `EthernetPhysicalChannel` shall reference at least one `PncMapping` as well.]

**[constr\_3524] Definition of `couplingPortRole` on `CouplingPort` for managed `CouplingElement`**

*Imposition time:* CP: IT\_SysDesc

[A managed `CouplingElement` shall have either

- at most one `CouplingPort` with `couplingPortRole` set to `hostPort` or
- at least one `CouplingPort` with `couplingPortRole` set to `upLinkPort`.

]

**[constr\_3525] Connection of `CouplingPort` with `couplingPortRole` set to `upLinkPort`**

*Imposition time:* CP: IT\_SysDesc

[A `CouplingPort` with `couplingPortRole` set to `upLinkPort` shall be connected to exactly one other `CouplingPort` with `couplingPortRole` set to `upLinkPort`.]

**[constr\_3533] `EndToEndTransformationISignalProps.dataLength` shall be a multiple of 8**

*Imposition time:* CP: IT\_SysDesc

[The value of `EndToEndTransformationISignalProps.dataLength`, `EndToEndTransformationISignalProps.maxDataLength`, and `EndToEndTransformationISignalProps.minDataLength` shall be a multiple of 8.]

**[constr\_3534] `EthernetPhysicalChannel` shall only be referenced by one `VlanMembership`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[An `EthernetPhysicalChannel` shall only be referenced by one `VlanMembership` in the role `VlanMembership.vlan` in the scope of one `CouplingPort`.]

**[constr\_3535] `EthernetCommunicationController` shall aggregate at most one `CouplingPort`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[An `EthernetCommunicationController` is allowed to aggregate at most one `CouplingPort`.]

**[constr\_3545] Mandatory reference to a `Pnc` in case of `anyPartialNetworkActive` or `allPartialNetworksActive`**

*Imposition time:* CP: IT\_SysDesc

[If the `SignalServiceTranslationProps.serviceControl` equals `anyPartialNetworkActive` or `allPartialNetworksActive`, then the reference `SignalServiceTranslationProps.controlPnc` shall point to at least one `PncMappingIdent`.]

**[constr\_3546] Mandatory reference to a `ConsumedEventGroup` in case of `serviceControl`***Imposition time:* CP: IT\_SysDesc

[For a provided translated service instance, if the `SignalServiceTranslationProps.serviceControl` equals `serviceDiscovery` then the reference `SignalServiceTranslationProps.controlConsumedEventGroup` shall point to at least one `ConsumedEventGroup`.]

**[constr\_3548] EndToEnd profile for both ends of `safeTranslation`***Imposition time:* CP: IT\_SysDesc

[If the `SignalServiceTranslationEventProps.safeTranslation` equals true then both, the signal-based payload as well as the service-oriented payload shall have an EndToEnd profile defined.]

**[constr\_3549] Secure payload for both ends in case of `secureTranslation`***Imposition time:* CP: IT\_SysDesc

[If the `SignalServiceTranslationEventProps.secureTranslation` equals true then both, the signal-based payload as well as the service-oriented payload shall have a secure communication defined.]

**[constr\_3559] `ConsumedServiceInstance.blocklistedVersion` is restricted to the usage of `minorVersion`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[The `majorVersion` attribute shall not be used in the `SomeipServiceVersion` that is aggregated by the `ConsumedServiceInstance` in the role `blocklistedVersion`.]

**[constr\_3560] `minimumMinorVersion` and `ConsumedServiceInstance.minorVersion` value***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[The `ConsumedServiceInstance.minorVersion` shall not have the value ANY if `versionDrivenFindBehavior = minimumMinorVersion`.]

**[constr\_3600] Setting of `EthernetCommunicationController.slaveActAsPassiveCommunicationSlave`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The attribute `EthernetCommunicationController.slaveActAsPassiveCommunicationSlave` may only be set to TRUE, if the following conditions apply:

- the `EthernetCommunicationController` is not referenced by any `NmNode` in the role `controller`



- the `EthernetCommunicationController` aggregates at least one `CouplingPort`
- the `couplingPortRole` of that `CouplingPort` is set to `standardPort`
- the `physicalLayerType` of that `CouplingPort` is set to either `_100BASE_T1`, `_1000BASE_T1` or `_10BASE_T1S`

In all other cases the attribute `slaveActAsPassiveCommunicationSlave` shall be set to `FALSE` or shall not be defined.]

#### **[constr\_3601] Mandatory attributes of `EthernetWakeupSleepOnDataLineConfig`**

*Imposition time:* CP: `IT_EcuExt`, AP: `IT_SysDes`

[The following attributes of `EthernetWakeupSleepOnDataLineConfig` shall be defined:

- `wakeupLocalEnabled`
- `wakeupRemoteEnabled`

]

#### **[constr\_3602] Existence of `wakeupForwardLocalEnabled`**

*Imposition time:* CP: `IT_SysDesc`, AP: `IT_SysDes`

[The attribute `wakeupForwardLocalEnabled` shall be defined if `wakeupRemoteEnabled` is set to `TRUE`.]

#### **[constr\_3603] Existence of `wakeupLocalDurationTime`**

*Imposition time:* CP: `IT_SysDesc`, AP: `IT_SysDes`

[The attribute `wakeupLocalDurationTime` shall be defined if `wakeupForwardLocalEnabled` is set to `TRUE`.]

#### **[constr\_3604] Existence of `wakeupForwardRemoteEnabled`**

*Imposition time:* CP: `IT_SysDesc`, AP: `IT_SysDes`

[The attribute `wakeupForwardRemoteEnabled` shall be defined if `wakeupLocalEnabled` is set to `TRUE`.]

#### **[constr\_3605] Existence of `wakeupLocalDetectionTime`**

*Imposition time:* CP: `IT_SysDesc`, AP: `IT_SysDes`

[The attribute `wakeupLocalDetectionTime` shall be defined if `wakeupForwardRemoteEnabled` is set to `TRUE`.]

**[constr\_3606] Values of `wakeupLocalDurationTime` and `wakeupLocalDetectionTime`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, then the value of `wakeupLocalDurationTime` shall be greater than the value of `wakeupLocalDetectionTime`.]

**[constr\_3607] Existence of `sleepRepetitionDelayOfSleepRequest`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The attribute `sleepRepetitionDelayOfSleepRequest` shall be defined if `sleepRepetitionsOfSleepRequest` is defined and has a value greater than 0.]

**[constr\_3608] Existence of `wakeupRepetitionDelayOfWakeupRequest`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The attribute `wakeupRepetitionDelayOfWakeupRequest` shall only be defined if `wakeupRepetitionsOfWakeupRequest` is defined and has a value greater than 0.]

**[constr\_3609] Values of `wakeupLocalDurationTime` in the context of a `CouplingElement`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[All `CouplingPorts` which have the reference `wakeupSleepOnDatalineConfig` defined and

- where the `CouplingPorts` are aggregated by the same `CouplingElement` and
- where the referenced `EthernetWakeupSleepOnDatalineConfig` has the attribute `wakeupLocalDurationTime` defined

shall refer to `EthernetWakeupSleepOnDatalineConfigs` where the value of `wakeupLocalDurationTime` is identical for all referencing `CouplingPorts`.]

**[constr\_3610] Values of `wakeupLocalDetectionTime` in the context of a `CouplingElement`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[All `CouplingPorts` which have the reference `wakeupSleepOnDatalineConfig` defined and

- where the `CouplingPorts` are aggregated by the same `CouplingElement` and
- where the referenced `EthernetWakeupSleepOnDatalineConfig` has the attribute `wakeupLocalDetectionTime` defined

shall refer to `EthernetWakeupSleepOnDatalineConfigs` where the value of `wakeupLocalDetectionTime` is identical for all referencing `CouplingPorts`.]

**[constr\_3611] Existence of `EthernetCommunicationController.slaveQualifiedUnexpectedLinkDownTime`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The attribute `slaveQualifiedUnexpectedLinkDownTime` shall be defined if `slaveActAsPassiveCommunicationSlave` is set to TRUE.]

**[constr\_3615] Existence of `EthernetCluster.couplingPortSwitchoffDelay`***Imposition time:* CP: IT\_SysDesc

[The attribute `EthernetCluster.couplingPortSwitchoffDelay` shall be defined if at least one `EcuInstance` connected to that `EthernetCluster` has the attribute `ethSwitchPortGroupDerivation` set to TRUE.]

**[constr\_3616] Value of `EthernetCluster.couplingPortSwitchoffDelay`***Imposition time:* CP: IT\_SysDesc

[If defined, the value of `EthernetCluster.couplingPortSwitchoffDelay` shall be greater than `UdpNmCluster.nmNetworkTimeout` + `UdpNmCluster.nmWaitBusSleepTime` of the respective `EthernetCluster`.]

**[constr\_3617] Existence of `EthernetCluster.couplingPortStartupActiveTime`***Imposition time:* CP: IT\_SysDesc

[The attribute `EthernetCluster.couplingPortStartupActiveTime` shall be defined if at least one `EcuInstance` connected to that `EthernetCluster` has the attribute `ethSwitchPortGroupDerivation` set to TRUE.]

**[constr\_3618] Value of `EthernetCluster.couplingPortStartupActiveTime`***Imposition time:* CP: IT\_SysDesc

[If defined, the value of `EthernetCluster.couplingPortStartupActiveTime` shall be greater than `UdpNmCluster.nmNetworkTimeout` + `UdpNmCluster.nmWaitBusSleepTime` of the respective `EthernetCluster`.]

**[constr\_3620] `GlobalTimeDomain.networkSegmentId` only applicable to Global Time sub domains***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The aggregation `GlobalTimeDomain.networkSegmentId` shall only be defined if the `GlobalTimeDomain` is itself referenced in the role `GlobalTimeDomain.globalTimeSubDomain`.]

**[constr\_3621] Value range of `GlobalTimeDomain.networkSegmentId`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `GlobalTimeDomain.networkSegmentId` shall be in the range 0..255.]

**[constr\_3651] No `element` in case `translationTarget` is primitive**

*Imposition time:* CP: IT\_SysDesc

[If `SignalServiceTranslationEventProps.translationTarget` refers to a `VariableDataPrototype` that is typed by a primitive `AutosarDataType` then the reference `SignalServiceTranslationElementProps.element` shall not be defined.]

**[constr\_3652] Allowed sub-classes of `DataPrototypeReference` in the context of signal/service translation**

*Imposition time:* CP: IT\_SysDesc

[If a `DataPrototypeReference` in the role `SignalServiceTranslationElementProps.element` is used then following sub-classes are supported:

- if the reference target is typed by an `ApplicationDataType` then the `DataPrototypeInSenderReceiverInterfaceInstanceRef` shall be used and shall target an `ApplicationCompositeElementDataPrototype`.
- if the reference target is typed by an `ImplementationDataType` then the `ImplementationDataTypeElementInPortInterfaceRef` shall be used.

]

**[constr\_3653] Consistent `translationTarget` and `element` in case `ApplicationDataType` is used**

*Imposition time:* CP: IT\_SysDesc

[If the `SignalServiceTranslationEventProps.translationTarget` refers to a `VariableDataPrototype` that is typed by an `ApplicationDataType` (`targetDataPrototype` of the `VariableDataPrototypeInSystemInstanceRef`) then every `SignalServiceTranslationElementProps.element` reference that is defined in the context of the `SignalServiceTranslationEventProps` shall have that `VariableDataPrototype` as the `rootDataPrototypeInSr` of the `DataPrototypeInSenderReceiverInterfaceInstanceRef`.]

**[constr\_3654] Consistent `translationTarget` and `element` in case `ImplementationDataType` is used**

*Imposition time:* CP: IT\_SysDesc

[If the `SignalServiceTranslationEventProps.translationTarget` refers to a `VariableDataPrototype` that is typed by an `ImplementationDataType` (`targetDataPrototype` of the `VariableDataPrototypeInSystemInstanceRef`) then every `SignalServiceTranslationElementProps.element` reference that is defined in the context of the `SignalServiceTranslationEventProps` shall have that `VariableDataPrototype` as the `rootDataPrototype` of the `ImplementationDataTypeElementInPortInterfaceRef`.]

**[constr\_3655] Supported filter types for primitive `SignalServiceTranslationElementProps`**

*Imposition time:* CP: IT\_SysDesc

[If the target for `SignalServiceTranslationElementProps` is defined as primitive according to [TPS\_SYST\_03062] then the following values for `dataFilterType` are supported:

- `always`
- `maskedNewDiffersMaskedOld`
- `maskedNewDiffersX`
- `maskedNewEqualsX`
- `never`
- `newIsOutside`
- `newIsWithin`
- `oneEveryN.`

]

**[constr\_3656] Supported filter types for composite `SignalServiceTranslationElementProps`**

*Imposition time:* CP: IT\_SysDesc

[If the target for `SignalServiceTranslationElementProps` is defined as composite according to [TPS\_SYST\_03062] then the following values for `dataFilterType` are supported:

- `always`
- `never`
- `oneEveryN.`

]

**[constr\_3668] Existence of `TlsCryptoCipherSuite.cipherSuiteShortLabel`**

*Imposition time:* CP: IT\_SysDesc

[If a `TlsCryptoCipherSuite.cipherSuiteShortLabel` is defined then:

- the attribute `TlsCryptoCipherSuite.cipherSuiteId` shall be defined as well
- the value of `TlsCryptoCipherSuite.cipherSuiteShortLabel` shall match the *Description* value corresponding to the *Value* field defined in `TlsCryptoCipherSuite.cipherSuiteId` according to `TlsCryptoCipherSuite` Parameter set defined in [10].

]

**[constr\_3669] `eventMulticastSubscriptionAddress` shall refer to a multicast address**

*Imposition time:* CP: IT\_SysDesc

[The reference `ConsumedServiceInstance.eventMulticastSubscriptionAddress` shall refer to an `ApplicationEndpoint` which in turn refers to a `NetworkEndpoint` that represents a multicast address.]

**[constr\_3670] No support for parallel `localUnicastAddress` and `eventMulticastSubscriptionAddress`**

*Imposition time:* CP: IT\_SysDesc

[If a `eventMulticastSubscriptionAddress` is defined for a `ConsumedServiceInstance` then there shall not be a `localUnicastAddress` defined at the same `ConsumedServiceInstance`.]

**[constr\_3671] `remoteMulticastSubscriptionAddress` shall refer to a multicast address**

*Imposition time:* CP: IT\_SysDesc

[The reference `ProvidedServiceInstance.remoteMulticastSubscriptionAddress` shall refer to an `ApplicationEndpoint` which in turn refers to a `NetworkEndpoint` that represents a multicast address.]

**[constr\_3672] No support for methods in multicast subscription at the client**

*Imposition time:* CP: IT\_SysDesc

[If a `ConsumedServiceInstance` aggregates a `PduActivationRoutingGroup` in the role `methodActivationRoutingGroup`, then the `ConsumedServiceInstance` shall not define a `eventMulticastSubscriptionAddress`.]

**[constr\_3673] No support for methods in multicast subscription at the server static configuration**

*Imposition time:* CP: IT\_SysDesc

[If a `ProvidedServiceInstance` aggregates a `PduActivationRoutingGroup` in the role `methodActivationRoutingGroup`, then the `ProvidedServiceInstance.remoteMulticastSubscriptionAddress` shall not be defined.]

**[constr\_3685] Allowed values for each element of `pncFilterArrayMask`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The value for each element of `CommunicationConnector.pncFilterArrayMask` shall be in the range between 0 and 255.]

**[constr\_3686] Allowed number of entries for `pncFilterArrayMask`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The number of `CommunicationConnector.pncFilterArrayMask` elements shall be:

- `NmCluster.pncClusterVectorLength`, if defined
- `System.pncVectorLength`, otherwise.

]

**[constr\_3687] Limited value range for `NmCluster.pncClusterVectorLength`***Imposition time:* CP: IT\_SysDesc

[The value of `NmCluster.pncClusterVectorLength` shall be equal or smaller than `System.pncVectorLength`.]

**[constr\_3695] `canControllerXlAttributes` and `canControllerXlRequirements` are mutually exclusive***Imposition time:* CP: IT\_SysDesc

[The existence of `canControllerXlAttributes` and `canControllerXlRequirements` is mutually exclusive.]

**[constr\_3696] Mandatory attributes of `CanControllerXlConfiguration`***Imposition time:* CP: IT\_SysDesc

[A `CanControllerConfiguration` configuring a CAN XL controller shall aggregate `CanControllerXlConfiguration` with the following attributes defined:

- `errorSignalingEnabled`
- `propSeg`
- `syncJumpWidth`
- `timeSeg1`
- `timeSeg2`
- `trcvPwmModeEnabled`

]

**[constr\_3697] Latest existence time of `CanControllerXlConfiguration` and `CanControllerXlConfigurationRequirements`***Imposition time:* CP: IT\_SysDesc

[In case that a CAN XL controller is configured, then either `CanControllerXlConfiguration` or `CanControllerXlConfigurationRequirements` shall exist within their aggregating class `CanControllerConfiguration` or `CanControllerConfigurationRequirements`.]

#### [constr\_3698] Value of **errorSignalingEnabled**

*Imposition time:* CP: IT\_SysDesc

[The attribute **errorSignalingEnabled** shall be set to FALSE if **trcvPwmModeEnabled** is set to TRUE.]

#### [constr\_3699] Existence of **pwmL**

*Imposition time:* CP: IT\_SysDesc

[The attribute **pwmL** shall be defined if **trcvPwmModeEnabled** is set to TRUE.]

#### [constr\_3700] Existence of **pwmO**

*Imposition time:* CP: IT\_SysDesc

[The attribute **pwmO** shall be defined if **trcvPwmModeEnabled** is set to TRUE.]

#### [constr\_3701] Existence of **pwmS**

*Imposition time:* CP: IT\_SysDesc

[The attribute **pwmS** shall be defined if **trcvPwmModeEnabled** is set to TRUE.]

#### [constr\_3702] Relevant attributes of EthernetCommunicationController for CAN\_XL

*Imposition time:* CP: IT\_SysDesc

[If the category of **EthernetCommunicationController** is equal to CAN\_XL, then only the following attributes of this meta-class are relevant:

- **macLayerType**
- **macUnicastAddress**

]

#### [constr\_3703] Reference to CanControllerXlConfiguration in case of category CAN\_XL

*Imposition time:* CP: IT\_SysDesc

[If the category of **EthernetCommunicationController** is equal to CAN\_XL, then the reference **canXlConfig** of **EthernetCommunicationController** shall refer to the **CanCommunicationController** aggregating the **CanControllerConfiguration** which in turn aggregates the **CanControllerXlConfiguration** that is used for tunneling of the Ethernet frames associated with the aforementioned **EthernetCommunicationController**.]

#### [constr\_3704] Existence of **CanXlFrameTriggeringProps**

*Imposition time:* CP: IT\_SysDesc

[If the class **CanXlFrameTriggeringProps** is aggregated by a **CanFrameTriggering**, then the **CanCommunicationController** – which is referenced through **commController** by a **CanCommunicationConnector** which in turn is referenced



through `commConnector` by a `CanPhysicalChannel` that aggregates the aforementioned `CanFrameTriggering` – shall aggregate at least one of

- `CanControllerConfiguration` with `CanControllerXlConfiguration` aggregated or
- `CanControllerConfigurationRequirements` with `CanControllerXl-ConfigurationRequirements` aggregated.

]

#### [constr\_3705] Allowed values for `priorityId`

*Imposition time:* CP: IT\_SysDesc

[The value for `priorityId` shall be in the range between 0 and 2047.]

#### [constr\_3706] Allowed values for `sduType`

*Imposition time:* CP: IT\_SysDesc

[The value for `sduType` shall be in the range between 0 and 255.]

#### [constr\_3707] Allowed values for `vcid`

*Imposition time:* CP: IT\_SysDesc

[The value for `vcid` shall be in the range between 0 and 255.]

#### [constr\_3708] No UDP network management in case of Ethernet tunneling through CAN XL

*Imposition time:* CP: IT\_SysDesc

[For an `EthernetPhysicalChannel` that is connected to an `EthernetCommunicationController` of category CAN\_XL (i.e. an `EthernetPhysicalChannel` tunneled through CAN XL), no UDP network management shall be configured.]

#### [constr\_3713] Allowed values for `acceptanceField`

*Imposition time:* CP: IT\_SysDesc

[The value for `acceptanceField` shall be in the range between 0 and 4294967295.]

#### [constr\_3714] Multiple top level PNC-coordinators shall be allowed

*Imposition time:* CP: IT\_SysDesc

[Multiple top level PNC-coordinators shall only be allowed if no network path across all networks exist that connects a `CommunicationConnector` with `pncGatewayType` `PncGatewayTypeEnum.active` to another `CommunicationConnector` with `pncGatewayType` `PncGatewayTypeEnum.active` where both `CommunicationConnectors` belong to different top level PNC-coordinators.]

**[constr\_3716] SecuredIPdu.dynamicRuntimeLengthHandling for dynamic length Pdu***Imposition time:* CP: IT\_SysDesc

[If a `PduTriggering` is referenced from a `SecuredIPdu` in the role `payload` and the `Pdu` referenced by the `PduTriggering` in the role `iPdu` qualifies according to [TPS\_SYST\_03085] to be of dynamic length, then the `SecuredIPdu` shall have the attribute `SecuredIPdu.dynamicRuntimeLengthHandling` set to true.]

**[constr\_3717] SecuredIPdu.dynamicRuntimeLengthHandling for gateway operation with IPduMapping.pduMaxLength defined***Imposition time:* CP: IT\_SysDesc

[If a `PduTriggering` refers to a `SecuredIPdu` in the role `iPdu` and that `PduTriggering` is used in an `IPduMapping` where a `pduMaxLength` value is defined (either in the role `IPduMapping.sourceIPdu` or `TargetIPduRef.targetIPdu`), then the `SecuredIPdu` shall have the attribute `SecuredIPdu.dynamicRuntimeLengthHandling` set to true.]

**[constr\_3718] Minimum length of SecuredIPdus***Imposition time:* CP: IT\_SysDesc

[If a `SecuredIPdu` has the attribute `useAsCryptographicIPdu` set to false, then the `length` attribute of that `SecuredIPdu` shall be at least the sum of the `payload Pdu.length` and `SecuredIPdu.authenticationProps.authInfoTxLength`.]

**[constr\_3726] Upper multiplicity of aggregation in the role CouplingPort.macSecProps***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[In the context of `CouplingPort`, the aggregation in the role `macSecProps` shall exist at most once.]

**[constr\_3735] Existence of DdsCpServiceInstance.ddsServiceQosProfile***Imposition time:* CP: IT\_EcuExt

[For each `DdsCpServiceInstance`, the reference in the role `ddsServiceQosProfile` shall exist.

Note: This profile applies to the all 4 topics used for methods and fields defined into the `DdsCpServiceInstance` (e.g `ddsMethodRequestTopic`, `ddsMethodReplyTopic`), `ddsFieldRequestTopic`, `ddsFieldReplyTopic`.)]

**[constr\_3736] ISignal that has dataTypePolicy set to ddsSignal shall be referenced by a DdsCpISignalToDdsTopicMapping***Imposition time:* CP: IT\_SysDesc

[Every `ISignal` that has `dataTypePolicy` set to `ddsSignal` shall be referenced by a `DdsCpISignalToDdsTopicMapping`.]

**[constr\_3737] ISignal referenced from DdsCpISignalToDdsTopicMapping**

*Imposition time:* CP: IT\_SysDesc

[Every ISignal that has dataTypePolicy set to any value different to ddsSignal shall NOT be referenced by a DdsCpISignalToDdsTopicMapping.]

**[constr\_3739] Value of ISignal.dataTypePolicy for all ISignals associated with a DdsCpServiceInstance**

*Imposition time:* CP: IT\_EcuExt

[For all ISignals that are referenced by an ISignalToIPduMapping where the enclosing ISignalIPdu is only referenced by PduTriggerings that are in turn referenced in one of the roles:

- DdsServiceInstanceEventCp.eventTriggering
- DdsServiceInstanceOperationCp.operationRequestTriggering
- DdsServiceInstanceOperationCp.operationResponseTriggering

The value of attribute ISignal.dataTypePolicy shall be set to ddsService.]

**[constr\_3740] Existence of DdsServiceInstanceEventCp.ddsEventTopic**

*Imposition time:* CP: IT\_EcuExt

[For each DdsServiceInstanceEventCp, the reference in the role ddsEventTopic shall exist.]

**[constr\_3741] Exclusive setting of channelSynchronousWakeup or pncSynchronousWakeup**

*Imposition time:* CP: IT\_SysDesc

[At most one of EcuInstance.channelSynchronousWakeup or EcuInstance.pncSynchronousWakeup shall be set to TRUE.]

**[constr\_3742] Value for createEcuWakeupSource in the context of a CommunicationCluster**

*Imposition time:* CP: IT\_SysDesc

[The attribute CommunicationConnector.createEcuWakeupSource shall be set to the same value for all CommunicationConnectors in the scope of one EcuInstance which are referenced by PhysicalChannels that belong to the same CommunicationCluster.]

**[constr\_3743] Allowed values for IEEE1722TpConnection.uniqueStreamId**

*Status:* DRAFT

*Imposition time:* CP: IT\_SysDesc

[The value for IEEE1722TpConnection.uniqueStreamId shall be in the range between 0 and 65535.]

**[constr\_3744] Allowed values for `IEEE1722TpConnection.version`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[The value for `IEEE1722TpConnection.version` shall be in the range between 0 and 7.]

**[constr\_3745] `category` of `GeneralPurposePdu` referenced in the role `IEEE1722TpConnection.pdu`***Status:* DRAFT*Imposition time:* CP: IT\_EcuExt

[The `GeneralPurposePdu` referenced by the `PduTriggering` which in turn is referenced in the role `pdu` by the `IEEE1722TpConnection` shall have the `category` set to `IEEE1722TP`.]

**[constr\_3746] `category` of `GeneralPurposePdu` referenced in the role `IEEE1722TpAvConnection.sdu`***Status:* DRAFT*Imposition time:* CP: IT\_EcuExt

[The `GeneralPurposePdu` referenced by the `PduTriggering` which in turn is referenced in the role `IEEE1722TpAvConnection.sdu` by the `IEEE1722TpAvConnection` shall have the `category` set to `IEEE1722TP_STREAM`.]

**[constr\_3747] Existence of attribute `IEEE1722TpConnection.uniqueStreamId`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[For each `IEEE1722TpConnection`, the attribute `uniqueStreamId` shall exist.]

**[constr\_3748] Existence of attribute `IEEE1722TpConnection.macAddressStreamId`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[For each `IEEE1722TpConnection`, the attribute `macAddressStreamId` shall exist.]

**[constr\_3749] Existence of attribute `IEEE1722TpConnection.version`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[For each `IEEE1722TpConnection`, the attribute `version` shall exist.]

**[constr\_3750] Existence of attribute `IEEE1722TpConnection.pdu`***Status:* DRAFT*Imposition time:* CP: IT\_EcuExt

[For each `IEEE1722TpConnection`, the reference `pdu` shall exist.]

**[constr\_3751] Allowed values for `IEEE1722TpAcfBus.busId`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[The value for `IEEE1722TpAcfBus.busId` shall be in the range between 0 and 31.]**[constr\_3752] Existence of attribute `IEEE1722TpAcfBus.busId`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[For each `IEEE1722TpAcfBus`, the attribute `busId` shall exist.]**[constr\_3753] Existence of attribute `IEEE1722TpAcfLinPart.linIdentifier`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[For each `IEEE1722TpAcfLinPart`, the attribute `linIdentifier` shall exist.]**[constr\_3754] Existence of attribute `IEEE1722TpAcfCan.messageType`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[For each `IEEE1722TpAcfCan`, the attribute `messageType` shall exist.]**[constr\_3755] Consistent aggregation of `IEEE1722TpAcfCanPart`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[An `IEEE1722TpAcfCan` shall only aggregate `IEEE1722TpAcfCanParts` in the role `IEEE1722TpAcfCan.acfPart`.]**[constr\_3756] Consistent aggregation of `IEEE1722TpAcfLinPart`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[An `IEEE1722TpAcfLin` shall only aggregate `IEEE1722TpAcfLinParts` in the role `IEEE1722TpAcfLin.acfPart`.]**[constr\_3757] Allowed values for `IEEE1722TpAcfLinPart.linIdentifier`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[The value for `IEEE1722TpAcfLinPart.linIdentifier` shall be in the range between 0 and 63.]**[constr\_3758] Allowed values for `IEEE1722TpAcfCanPart.canIdentifier`***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc[The value for `IEEE1722TpAcfCanPart.canIdentifier` shall be in the range between 0 and 536870911.]

**[constr\_3759] Existence of attribute `IEEE1722TpAcfCanPart.canIdentifier` for `IEEE1722Tp` ACF stream transmission***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[If an `IEEE1722TpAcfCanPart` is part of an `IEEE1722TpAcfConnection` which, according to [TPS\_SYST\_03109], is transmitted in that `IEEE1722TpAcfConnection` and

the `IEEE1722TpAcfCanPart` refers to a `PduTriggering` in the role `sdu` which in turn refers to a `Pdu` that is NOT a `GeneralPurposePdu` of category `IEEE1722TP_ID_RANGE`,

then the attribute `IEEE1722TpAcfCanPart.canIdentifier` shall exist.]

**[constr\_3760] Existence of attribute `IEEE1722TpAcfCanPart.canIdentifierRange` or `canIdentifierMask` for `IEEE1722Tp` ACF stream reception***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc

[If an `IEEE1722TpAcfCanPart` is part of an `IEEE1722TpAcfConnection` which, according to [TPS\_SYST\_03110], is received in that `IEEE1722TpAcfConnection` and

the `IEEE1722TpAcfCanPart` refers to a `PduTriggering` in the role `sdu` which in turn refers to a `Pdu` that is NOT a `GeneralPurposePdu` of category `IEEE1722TP_ID_RANGE`,

then the attribute `IEEE1722TpAcfCanPart.canIdentifierRange` or `canIdentifierMask` shall exist.]

**[constr\_3761] Identical `EthernetPhysicalChannel` owning `PduTriggerings` referenced by `IEEE1722TpConnection.pdu` and `IEEE1722TpAvConnection.sdu`***Status:* DRAFT*Imposition time:* CP: IT\_EcuExt

[The `PduTriggerings` referenced in the roles `IEEE1722TpConnection.pdu` and `IEEE1722TpAvConnection.sdu` shall be owned by the same `EthernetPhysicalChannel`.]

**[constr\_3762] Usage of `CouplingElementSwitchDetails` only on an Ethernet switch***Status:* DRAFT*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If a `CouplingElement` aggregates a `CouplingElementSwitchDetails` in the role `CouplingElement.couplingElementDetails`, then that `CouplingElement` shall have the attribute `couplingType` set to the value `CouplingElementEnum.switch`.]

### [constr\_3763] Allowed value for **maxDeltaCounter** in the context of a **profile-Name**

*Imposition time:* CP: IT\_SysDesc

[An **EndToEndTransformationComSpecProps** that is associated with an **EndToEndTransformationDescription** as described in [TPS\_SYST\_02275] shall not contain a **maxDeltaCounter** value that is outside the value range imposed by the profile defined in **EndToEndTransformationDescription.profileName**.

The profile specific value ranges are listed in [constr\_3158], [constr\_3195], [constr\_3159], [constr\_3196], [constr\_3197], and [constr\_3316].]

### [constr\_3764] Applicability of **CouplingPort.macAddressVlanAssignment**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The aggregation **CouplingPort.macAddressVlanAssignment** shall only exist if the **CouplingPort** is aggregated by a **CouplingElement** with **couplingType** = **CouplingElementEnum.switch**.]

### [constr\_3765] Applicability of **MacAddressVlanMembership.vlan**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The reference **MacAddressVlanMembership.vlan** shall only exist if the **CouplingPort** aggregating this **MacAddressVlanMembership** is aggregated by a **CouplingElement** with **switchMacAddressLearningMode** = **SwitchMacAddressLearningEnum.independentVlanLearning**.]

### [constr\_3766] Valid **MacAddressVlanMembership.vlan** target **EthernetPhysicalChannel**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If an **EthernetPhysicalChannel** is referenced by a **CouplingPort.macAddressVlanAssignment.vlan**, then that **EthernetPhysicalChannel** shall also be referenced by the same **CouplingPort** via **CouplingPort.vlanMembership.vlan**]

### [constr\_3767] **NmNode.nmVariant** setting to **slavePassive**

*Imposition time:* CP: IT\_SysDesc

[**NmNode.nmVariant** shall only be set to **NmVariantEnum.slavePassive** if an **EthernetCommunicationController** is referenced in the role **NmNode.controller** and the attribute **slaveActAsPassiveCommunicationSlave** in the referenced **EthernetCommunicationController** is set to true.]

### [constr\_3768] **NmNode.nmVariant** setting to **slaveActive**

*Imposition time:* CP: IT\_SysDesc

[**NmNode.nmVariant** shall only be set to **NmVariantEnum.slaveActive** if a **LinSlave** is referenced in the role **NmNode.controller**.]



**[constr\_3769] NmNode.nmVariant setting to full***Imposition time:* CP: IT\_SysDesc

[NmNode.nmVariant shall only be set to NmVariantEnum.full if a CommunicationController is referenced in the role NmNode.controller and the attribute nmPassiveModeEnabled in the referenced NmEcu is not present or is set to false.]

**[constr\_3770] NmNode.nmVariant setting to passive***Imposition time:* CP: IT\_SysDesc

[NmNode.nmVariant shall only be set to NmVariantEnum.passive if a CommunicationController is referenced in the role NmNode.controller and the attribute nmPassiveModeEnabled in the referenced NmEcu is set to true.]

**[constr\_3771] Range of NmCluster.nmLightTimeout***Imposition time:* CP: IT\_SysDesc

[The value given for NmCluster.nmLightTimeout shall be in the range from 0 to 255.]

**[constr\_3781] Each PNC assigned to multiple PhysicalChannels shall have a top level PNC-Coordinator***Imposition time:* CP: IT\_SysDesc

[In a System, if a PNC is assigned to multiple PhysicalChannels according to [TPS\_SYST\_03080], then this PNC shall have at least one top level PNC-Coordinator according to [TPS\_SYST\_03082].]

**[constr\_3782] Consistent framePreemptionSupport setting in the scope of one CouplingPortConnection***Imposition time:* CP: IT\_SysDesc

[For each CouplingPortConnection the value of CouplingPort.couplingPortDetails.framePreemptionSupport shall be identical for both, CouplingPortConnection.firstPort and CouplingPortConnection.secondPort.]

**[constr\_3783] Definition of CouplingPortFifo.trafficClassPreemptionSupport only in context of an Ethernet switch***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If a CouplingPort is aggregated by a CouplingElement with CouplingElement.couplingType equal to CouplingElementEnum.switch and CouplingPort.couplingPortDetails.framePreemptionSupport is set to true, then the attribute CouplingPortFifo.trafficClassPreemptionSupport shall be defined.]



**[constr\_3784] Applicable `CouplingPortFifo` as predecessor for `portScheduler` = `enhancedTrafficShaper`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[A `CouplingPortScheduler` with `CouplingPortScheduler.portScheduler` equals to `EthernetCouplingPortSchedulerEnum.enhancedTrafficShaper` shall only refer to `CouplingPortFifo` in the role `CouplingPortScheduler.predecessor` where the `CouplingPortFifo` has a `CouplingPortFifo.shaper` of kind `CouplingPortEnhancedTrafficShaper`.]

**[constr\_3785] Exclusive definition of `etsAvailableBandwidthInPercent` or `etsAvailableBandwidthInWeightValue`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[A `CouplingPortEnhancedTrafficShaper` shall either define an `CouplingPortEnhancedTrafficShaper.etsAvailableBandwidthInPercent` or an `CouplingPortEnhancedTrafficShaper.etsAvailableBandwidthInWeightValue` value, but not both.]

**[constr\_3786] Consistent usage of either `etsAvailableBandwidthInPercent` or `etsAvailableBandwidthInWeightValue` for `portScheduler` = `enhancedTrafficShaper`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[All the `CouplingPortFifo` referenced by the same `CouplingPortScheduler` with `CouplingPortScheduler.portScheduler` equals to `EthernetCouplingPortSchedulerEnum.enhancedTrafficShaper` (according to [constr\_3784]) shall define in their `CouplingPortEnhancedTrafficShaper` the same kind of value. All shall use either an `CouplingPortEnhancedTrafficShaper.etsAvailableBandwidthInPercent` or an `CouplingPortEnhancedTrafficShaper.etsAvailableBandwidthInWeightValue` value.]

**[constr\_3787] Existence of `CouplingPortTrafficClassAssignment.trafficClass`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[Every `CouplingPortTrafficClassAssignment` shall have a `trafficClass` attribute defined.]

**[constr\_3788] Existence of `CouplingPortFifo.assignedTrafficClass`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[For each `CouplingPortFifo`, exactly one value of attribute `CouplingPortFifo.assignedTrafficClass` shall exist.]

**[constr\_3789] Allowed values for `CouplingPortFifo.assignedTrafficClass`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The allowed values for `CouplingPortFifo.assignedTrafficClass` are 0..65535.]

**[constr\_3790] Existence of `CouplingPortDetails.defaultTrafficClass`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[For each `CouplingPortDetails`, the attribute `CouplingPortDetails.defaultTrafficClass` shall exist.]

**[constr\_3791] Allowed values for `CouplingPortDetails.defaultTrafficClass`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The allowed values for `CouplingPortDetails.defaultTrafficClass` are 0..65535.]

**[constr\_3792] `FrameMapping` between identical bus systems**

*Status:* DRAFT

*Imposition time:* CP: IT\_SysDesc

[The `FrameTriggerings` referenced in the role `sourceFrame` and `targetFrame` shall be owned by `PhysicalChannels` which in turn are owned by `CommunicationClusters` of the same kind.]

**[constr\_3796] Applicable attributes of `IEEE1722TpIidcConnection` for category IIDC**

*Status:* DRAFT

*Imposition time:* CP: IT\_SysDesc

[If the `category` of an `IEEE1722TpIidcConnection` is set to IIDC, then the collection of attributes shall be restricted to the following list:

- `iidcChannel`
- `iidcSy`
- `iidcTag`
- `iidcTCode`

]

**[constr\_3797] Applicable attributes of `IEEE1722TpIidcConnection` for category IEC61883**

*Status:* DRAFT

*Imposition time:* CP: IT\_SysDesc

[If the `category` of an `IEEE1722TpIidcConnection` is set to IEC61883, then the collection of attributes shall be restricted to the following list:

- `iidcChannel`
- `iidcDataBlockSize`
- `iidcFractionNumber`
- `iidcSourcePacketHeader`

- `iidcStreamFormat`
- `iidcSy`
- `iidcTag`
- `iidcTCode`

]

#### [constr\_3799] DDS Fire & Forget Method definition

*Imposition time:* CP: IT\_EcuExt

[If a `DdsServiceInstanceOperationCp` represents a fire & forget method, then only the reference `DdsServiceInstanceOperationCp.operationRequestTriggering` shall exist and the reference in the role `DdsServiceInstanceOperationCp.operationResponseTriggering` shall not exist.]

#### [constr\_3800] Existence of `DdsCpServiceInstance.discoveryType`

*Imposition time:* CP: IT\_EcuExt

[For each `DdsCpServiceInstance`, the attribute in the role `discoveryType` shall exist.]

#### [constr\_3801] Existence of `DdsCpServiceInstance.serviceInterfaceId`

*Imposition time:* CP: IT\_EcuExt

[For each `DdsCpServiceInstance`, the attribute in the role `serviceInterfaceId` shall exist.]

#### [constr\_3802] Existence of `DdsCpServiceInstance.majorVersion`

*Imposition time:* CP: IT\_EcuExt

[For each `DdsCpServiceInstance`, the attribute in the role `AbstractServiceInstance.majorVersion` shall exist.]

#### [constr\_3803] Existence of `DdsCpServiceInstance.serviceMinorVersion`

*Imposition time:* CP: IT\_EcuExt

[For each `DdsCpServiceInstance`, the attribute in the role `serviceMinorVersion` shall exist.]

#### [constr\_3804] Existence of `DdsCpServiceInstance.transportProtocol`

*Imposition time:* CP: IT\_EcuExt

[For each `DdsCpServiceInstance`, the attribute in the role `transportProtocol` shall exist.]

**[constr\_3805] Existence of `DdsServiceInstanceEventCp.eventTriggering`***Imposition time:* CP: IT\_EcuExt

[For each `DdsServiceInstanceEventCp`, the reference in the role `eventTriggering` shall exist.]

**[constr\_3806] Existence of `DdsServiceInstanceOperationCp.operationRequestTriggering`***Imposition time:* CP: IT\_EcuExt

[For each `DdsServiceInstanceOperationCp`, the reference in the role `operationRequestTriggering` shall exist.]

**[constr\_3807] Existence of `DdsServiceInstanceFieldCp` reference***Imposition time:* CP: IT\_EcuExt

[For each `DdsServiceInstanceFieldCp`, at least one of the references in the role

- `notifier`
- `getter`
- `setter`

shall exist.]

**[constr\_3808] Existence of `DdsCpProvidedServiceInstance.providedServiceInstanceId`***Imposition time:* CP: IT\_EcuExt

[For each `DdsCpServiceInstance`, the attribute in the role `providedServiceInstanceId` shall exist.]

**[constr\_3809] Existence of `DdsCpConsumedServiceInstance.requiredServiceInstanceId`***Imposition time:* CP: IT\_EcuExt

[For each `DdsCpConsumedServiceInstance`, the attribute in the role `requiredServiceInstanceId` shall exist.]

**[constr\_3810] Value range of `DdsCpProvidedServiceInstance.providedServiceInstanceId`***Imposition time:* CP: IT\_SysDesc

[The value of `DdsCpProvidedServiceInstance.providedServiceInstanceId` shall be in the range of 0..65534.]

**[constr\_3811] `DdsCpProvidedServiceInstance.localUnicastAddress` shall be IP Unicast***Imposition time:* CP: IT\_SysDesc

[If defined, the `DdsCpProvidedServiceInstance.localUnicastAddress` shall point to an IP Unicast address.]

**[constr\_3812] `DdsCpProvidedServiceInstance.staticRemoteUnicastAddress` shall be IP Unicast***Imposition time:* CP: IT\_SysDesc

[If defined, the `DdsCpProvidedServiceInstance.staticRemoteUnicastAddress` shall point to an IP Unicast address.]

**[constr\_3813] `DdsCpProvidedServiceInstance` unicast address references target***Imposition time:* CP: IT\_SysDesc

[Each of the following references:

- `localUnicastAddress`
- `staticRemoteUnicastAddress`

If specified, shall refer to an `ApplicationEndpoint` defining a UDP Port]

**[constr\_3814] Multiple `SocketAddress` entries with the same IP Address and Port in the context of a given `EcuInstance`***Imposition time:* CP: IT\_SysDesc

[If there are two or more `SocketAddress` entities within the scope of one `SoAdConfig` in the scope of one `EcuInstance` that have the same static (fixed at configuration time) IP Address and Port in the aggregated `ApplicationEndpoint` and `NetworkEndpoint`, (e.g., 192.168.1.1 and 7431, respectively) then:

- only one of these `SocketAddress` elements shall be referenced by `DdsCpProvidedServiceInstances` or `DdsCpConsumedServiceInstances` in the role `localUnicastAddress`.
- only one of these `SocketAddress` elements shall be referenced by `DdsCpProvidedServiceInstances` or `DdsCpConsumedServiceInstances` in the role `staticRemoteUnicastAddress`.

]

**[constr\_3815] DDS Service communication is restricted to one VLAN***Imposition time:* CP: IT\_SysDesc

[`ApplicationEndpoints` elements that are referenced by:

- `localUnicastAddress` and `staticRemoteUnicastAddress` shall belong to the same VLAN.

]

**[constr\_3816] Value range of `DdsCpConsumedServiceInstance.requiredServiceInstanceId`**

*Imposition time:* CP: IT\_SysDesc

[The value of `DdsCpConsumedServiceInstance.requiredServiceInstanceId` shall be in the range of 0..65534 or "ALL".]

**[constr\_3817] `DdsCpConsumedServiceInstance.localUnicastAddress` shall be IP Unicast**

*Imposition time:* CP: IT\_SysDesc

[If defined, the `DdsCpConsumedServiceInstance.localUnicastAddress` shall point to an IP Unicast address.]

**[constr\_3818] `DdsCpConsumedServiceInstance.staticRemoteUnicastAddress` shall be IP Unicast**

*Imposition time:* CP: IT\_SysDesc

[If defined, the `DdsCpConsumedServiceInstance.staticRemoteUnicastAddress` shall point to an IP Unicast address.]

**[constr\_3819] `DdsCpConsumedServiceInstance` unicast address references target**

*Imposition time:* CP: IT\_SysDesc

[

- `localUnicastAddress`
- `staticRemoteUnicastAddress`

If specified, shall refer to an `ApplicationEndpoint` defining a UDP Port.]

**[constr\_3820] DDS Service communication is restricted to one VLAN**

*Imposition time:* CP: IT\_SysDesc

[`ApplicationEndpoints` elements that are referenced by:

- `localUnicastAddress` and `staticRemoteUnicastAddress` shall belong to the same VLAN.

]

**[constr\_3821] DDS transformer configuration**

*Imposition time:* CP: IT\_SysDesc

[For each `TransformationDescription` variant that is a `DdsTransformationDescription`

- attribute `protocol` of `TransformationTechnology` shall be set to `Dds`

- attribute `version` of `TransformationTechnology` shall be set to `1.0.0`
- attribute `transformerClass` of `TransformationTechnology` shall be set to `serializer`
- attribute `hasInternalState` of `TransformationTechnology` shall be set to `false`
- attribute `needsOriginalData` of `TransformationTechnology` shall be set to `true`
- attribute `dataTransformationKind` of `DataTransformation` shall be set to `DataTransformationKindEnum.symmetric`
- attribute `executeDespiteDataUnavailability` of `DataTransformation` shall be set to `true`
- attribute `headerLength` of `BufferProperties` shall be set to `0` (bits)

]

#### [constr\_3822] No further transformers in scope of the DDS transformer

*Imposition time:* CP: IT\_SysDesc

[If a `DataTransformation` references a `TransformationTechnology` in the role `transformerChain` and that `TransformationTechnology` aggregates a `DdsTransformationDescription` in the role `transformationDescription`, then that `DataTransformation` shall not reference any other `TransformationTechnology`.]

#### [constr\_3824] No `explicitWakeupChannel` reference for `channelSynchronousWakeup = TRUE`

*Imposition time:* IT\_SysDesc

[If `EcuInstance.channelSynchronousWakeup` is set to `TRUE` for an `EcuInstance`, then all `CommunicationConnectors` aggregated in the role `connector` shall not define any `CommunicationConnector.explicitWakeupChannel` reference.]

#### [constr\_4000] Local communication of mode switches

*Imposition time:* CP: IT\_EcuExt

[Ports with `ModeSwitchInterfaces` cannot be connected across ECU boundaries.]

#### [constr\_5030] Uniqueness of `LinOrderedConfigurableFrame.index`

*Imposition time:* CP: IT\_SysDesc

[`LinOrderedConfigurableFrame.index` shall always be set and be unique in the context of the aggregating `LinCommunicationConnector`.]

**[constr\_5031] Uniqueness of `FramePid.index`***Imposition time:* CP: IT\_SysDesc

[`FramePid.index` shall always be set and be unique in the context of the aggregating `AssignFrameIdRange`.]

**[constr\_5032] Maximal one `NmConfig` per `System` is allowed to be defined***Imposition time:* CP: IT\_SysDesc

[Each `System` element is allowed to reference at most one `NmConfig` element with the `fibexElement` reference.]

**[constr\_5049] Ethernet switch packet to traffic class assignment restriction***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[Every `CouplingPortTrafficClassAssignment` shall have at least one `priority` attribute defined.]

**[constr\_5050] VariableDataPrototype of COM Based Transformer***Imposition time:* CP: IT\_SysDesc

[The `VariableDataPrototype` of [TPS\_SYST\_02058] shall be typed by an `ApplicationRecordDataType` or an `ImplementationDataType` of category STRUCTURE.]

**[constr\_5051] Existence of `CanFrameTriggering.identifier` in case of bus mirror target***Imposition time:* CP: IT\_SysDesc

[The `CanFrameTriggering` of a `Frame` that contains a `Pdu` of which the `PduTriggering` is referenced by `BusMirrorChannelMappingCan` in the role `targetPduTriggering` shall not define an `identifier`.]

**[constr\_5053] Existence of `ISignalPort.handleInvalid`***Imposition time:* CP: IT\_SysDesc

[If the `ISignalPort` has a `networkRepresentationProps.invalidValue` defined then the `ISignalPort.communicationDirection` shall equal `in`.]

**[constr\_5054] `externalReplacement` not applicable for `ISignalPort.handleInvalid`***Imposition time:* CP: IT\_SysDesc

[In the context of `ISignalPort.handleInvalid` the value `externalReplacement` shall not be used.]

**[constr\_5055] `DataMapping` of elements of `PRPortPrototypes` is not supported***Imposition time:* CP: IT\_EcuExt

[A `DataMapping` shall not map elements of `PRPortPrototypes` to `SystemSignals`]



**[constr\_5058] Value range for `CryptoServiceQueue.queueSize`***Imposition time:* CP: IT\_SysDesc

[If the `CryptoServiceQueue.queueSize` is defined it shall have a value which is equal or greater than 1.]

**[constr\_5060] Mapping of a `SecuredIPdu` into a `LinFrame` is not allowed***Imposition time:* CP: IT\_SysDesc

[The mapping of a `SecuredIPdu` into a `LinFrame` with a `PduToFrameMapping` is not allowed.]

**[constr\_5061] `EthernetCommunicationConnectors` and referencing `SocketAddresses` shall be in the same VLAN***Imposition time:* CP: IT\_SysDesc

[Each `EthernetCommunicationConnector` that is referenced by a `SocketAddress` in the role `connector` or `multicastConnector` shall be referenced by the same `EthernetPhysicalChannel` that aggregates the `SoAdConfig` that in turn aggregates the `SocketAddress`.]

**[constr\_5062] SOME/IP `ProvidedServiceInstances` of the same serviceInterface on one `EcuInstance`***Imposition time:* CP: IT\_SysDesc

[Different `ProvidedServiceInstances` with the same `serviceIdentifier` and the same `majorVersion` and different `instanceIdentifiers` shall not be mapped to the same UDP/TCP port number and IP address combination that is represented by referenced `ApplicationEndpoint` and its referenced `NetworkEndpoint`.]

**[constr\_5063] `ProvidedServiceInstance.serviceIdentifier` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ProvidedServiceInstance.serviceIdentifier` is mandatory.]

**[constr\_5064] `ProvidedServiceInstance.majorVersion` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ProvidedServiceInstance.majorVersion` is mandatory.]

**[constr\_5065] `ProvidedServiceInstance.minorVersion` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ProvidedServiceInstance.minorVersion` is mandatory.]

**[constr\_5066] `ProvidedServiceInstance.instanceIdentifier` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ProvidedServiceInstance.instanceIdentifier` is mandatory.]

**[constr\_5067] `ProvidedServiceInstance` shall be unique in respect of `serviceIdentifier`, `instanceIdentifier`, `majorVersion`**

*Imposition time:* CP: IT\_SysDesc

[On a VLAN each `ProvidedServiceInstance` shall have a different `serviceIdentifier`, `instanceIdentifier` and `majorVersion` value combination.]

**[constr\_5068] `ProvidedServiceInstance.localUnicastAddress` shall be IP Unicast**

*Imposition time:* CP: IT\_SysDesc

[If defined, the `ProvidedServiceInstance.localUnicastAddress` shall point to an IP Unicast address.]

**[constr\_5069] `ProvidedServiceInstance.remoteUnicastAddress` shall be IP Unicast**

*Imposition time:* CP: IT\_SysDesc

[The `ProvidedServiceInstance.remoteUnicastAddress` shall point to an IP Unicast address.]

**[constr\_5071] `EventHandler.eventMulticastAddress` reference target**

*Imposition time:* CP: IT\_SysDesc

[The `ApplicationEndpoint` that is referenced by an `EventHandler` in the role `eventMulticastAddress` shall reference a `NetworkEndpoint` that defines an IP Multicast Address.]

**[constr\_5072] `EventHandler` without defined `eventMulticastAddress`**

*Imposition time:* CP: IT\_SysDesc

[If an `EventHandler` that is aggregated by a `ProvidedServiceInstance` does not have a defined `eventMulticastAddress` then the `multicastThreshold` shall be set to the value 0 (IP Unicast only).]

**[constr\_5073] `PduActivationRoutingGroup` with `eventGroupControlType` set to `activationUnicast` or `triggerUnicast` or `activationAndTriggerUnicast` that is aggregated by an `EventHandler`**

*Imposition time:* CP: IT\_SysDesc

[An `EventHandler` that aggregates a `PduActivationRoutingGroup` with the `PduActivationRoutingGroup.eventGroupControlType` set to `activationUnicast` or `triggerUnicast` or `activationAndTriggerUnicast` shall be aggregated by a `ProvidedServiceInstance` that has a `localUnicastAddress` reference that points to an IP Unicast Address.]

**[constr\_5074] PduActivationRoutingGroup with eventGroupControlType set to activationMulticast that is aggregated by an EventHandler***Imposition time:* CP: IT\_SysDesc

[An EventHandler that aggregates a PduActivationRoutingGroup with the PduActivationRoutingGroup.eventGroupControlType set to activationMulticast shall have an eventMulticastAddress reference that points to a "remote" IP Multicast Address. The ProvidedServiceInstance that aggregates the EventHandler shall have a localUnicastAddress reference to a "local" UDP ApplicationEndpoint.]

**[constr\_5075] Allowed references of SoConIPduIdentifiers by PduActivationRoutingGroup with eventGroupControlType set to activationMulticast and allowed SoConIPduIdentifier references***Imposition time:* CP: IT\_SysDesc

[A PduActivationRoutingGroup with eventGroupControlType set to activationMulticast is allowed to reference SoConIPduIdentifiers only in the iPduIdentifierUdp role.]

**[constr\_5076] PduActivationRoutingGroup with iPduIdentifierTcp reference that is aggregated by a ProvidedServiceInstance***Imposition time:* CP: IT\_SysDesc

[If the PduActivationRoutingGroup contains the iPduIdentifierTcp reference then the aggregating ProvidedServiceInstance shall contain a localUnicastAddress reference to an ApplicationEndpoint that defines a TCP address.]

**[constr\_5077] PduActivationRoutingGroup with iPduIdentifierUdp reference that is aggregated by a ProvidedServiceInstance***Imposition time:* CP: IT\_SysDesc

[If the PduActivationRoutingGroup contains the iPduIdentifierUdp reference then the aggregating ProvidedServiceInstance shall contain a localUnicastAddress reference to an ApplicationEndpoint that defines a UDP address.]

**[constr\_5078] PduTriggerings referenced by a PduActivationRoutingGroup shall be on the same VLAN as the referencing PduActivationRoutingGroup***Imposition time:* CP: IT\_SysDesc

[Each PduTriggering referenced by a PduActivationRoutingGroup via SoConIPduIdentifier shall be aggregated by the same VLAN (EthernetPhysicalChannel) to which the AbstractServiceInstance that aggregates the PduActivationRoutingGroup belongs via the localUnicastAddress.]

**[constr\_5079] Service communication is restricted to one VLAN***Imposition time:* CP: IT\_SysDesc

[All `SocketAddress` elements that are referenced by a `AbstractServiceInstance` with the `localUnicastAddress` and `remoteUnicastAddress` shall belong to the same VLAN (`EthernetPhysicalChannel`).]

**[constr\_5080] `ApplicationEndpoints` referenced by `EventHandlers` and by the aggregating `ProvidedServiceInstance` shall be in the same VLAN***Imposition time:* CP: IT\_SysDesc

[The `ApplicationEndpoint` that is referenced by an `EventHandler` in the role `eventMulticastAddress` shall belong to the same VLAN (`EthernetPhysicalChannel`) as the `ApplicationEndpoint` that is referenced by the `localUnicastAddress` reference from the `ProvidedServiceInstance` that aggregates the `EventHandler`.]

**[constr\_5081] `ConsumedServiceInstance.serviceIdentifier` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ConsumedServiceInstance.serviceIdentifier` is mandatory.]

**[constr\_5082] `ConsumedServiceInstance.majorVersion` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ConsumedServiceInstance.majorVersion` is mandatory.]

**[constr\_5083] `ConsumedServiceInstance.minorVersion` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ConsumedServiceInstance.minorVersion` is mandatory.]

**[constr\_5084] `ConsumedServiceInstance.instanceIdentifier` is mandatory***Imposition time:* CP: IT\_SysDesc

[The `ConsumedServiceInstance.instanceIdentifier` is mandatory.]

**[constr\_5085] `ConsumedServiceInstance.localUnicastAddress` shall be IP Unicast***Imposition time:* CP: IT\_SysDesc

[If defined, the `ConsumedServiceInstance.localUnicastAddress` shall point to an IP Unicast address.]

**[constr\_5086] `ConsumedServiceInstance.remoteUnicastAddress` shall be IP Unicast***Imposition time:* CP: IT\_SysDesc

[The `ConsumedServiceInstance.remoteUnicastAddress` shall point to an IP Unicast address.]

**[constr\_5087] PduActivationRoutingGroup with eventGroupControlType set to activationUnicast or triggerUnicast or activationAndTriggerUnicast that is referenced by a ConsumedEventGroup**

*Imposition time:* CP: IT\_SysDesc

[A ConsumedEventGroup that aggregates a PduActivationRoutingGroup with the PduActivationRoutingGroup.eventGroupControlType set to activationUnicast or triggerUnicast or activationAndTriggerUnicast shall be aggregated by a ConsumedServiceInstance that has a localUnicastAddress reference that points to an IP Unicast Address.]

**[constr\_5088] PduActivationRoutingGroup with iPduIdentifierTcp reference that is aggregated by a ConsumedServiceInstance**

*Imposition time:* CP: IT\_SysDesc

[If the PduActivationRoutingGroup contains the iPduIdentifierTcp reference then the aggregating ConsumedServiceInstance shall contain a localUnicastAddress reference to an ApplicationEndpoint that defines a TCP address.]

**[constr\_5089] PduActivationRoutingGroup with iPduIdentifierUdp reference that is aggregated by a ConsumedServiceInstance**

*Imposition time:* CP: IT\_SysDesc

[If the PduActivationRoutingGroup contains the iPduIdentifierUdp reference then the aggregating ConsumedServiceInstance shall contain a localUnicastAddress reference to an ApplicationEndpoint that defines a UDP address.]

**[constr\_5090] ApplicationEndpoints referenced by ConsumedEventGroups and by the aggregating ConsumedServiceInstance shall be in the same VLAN**

*Imposition time:* CP: IT\_SysDesc

[The ApplicationEndpoint that is referenced by an ConsumedEventGroup in the role eventMulticastAddress shall belong to the same VLAN (EthernetPhysicalChannel) as the ApplicationEndpoint that is referenced by the localUnicastAddress reference from the ConsumedServiceInstance that aggregates the ConsumedEventGroup.]

**[constr\_5091] Relevance of tcpRole attribute**

*Imposition time:* CP: IT\_SysDesc

[The attribute tcpRole shall only exist if the StaticSocketConnection is aggregated by a SocketAddress that defines a TCP Port in the aggregated ApplicationEndpoint.]

**[constr\_5092] Local and remoteAddress of a StaticSocketConnection shall define the same transport protocol**

*Imposition time:* CP: IT\_SysDesc

[The transport protocol that is defined by the `SocketAddress` that aggregates the `StaticSocketConnection` shall be the same in the `SocketAddress` that is referenced by the same `StaticSocketConnection` in the role `remoteAddress`.]

**[constr\_5093] `pncGatewayType` and `PhysicalChannel`**

*Imposition time:* CP: IT\_SysDesc

[When multiple `CommunicationConnectors` with `pncGatewayType` set to a value other than `none` are referenced by the same `PhysicalChannel` then only up to one `CommunicationConnector` shall have the `pncGatewayType` set to `active`.]

**[constr\_5094] `pncGatewayType` and ECU**

*Imposition time:* CP: IT\_SysDesc

[When an ECU is connected to more than one `PhysicalChannel` and has a relation to a Partial Network then all `CommunicationConnectors` of this ECU where this Partial Network is related to shall have the `pncGatewayType` value either set to `none` or to a value different than `none` (i.e. `active` or `passive`).]

**[constr\_5095] Relationship between the timing behavior of the `ConsumedEventGroup` retry and the timing behavior of an Offer message**

*Imposition time:* CP: IT\_SysDesc

[The timing behavior for a retry to a `ConsumedEventGroup` (`subscribeEventgroupRetryMax`, `subscribeEventgroupRetryDelay`) shall not overlap to the timing behavior (`SomeipSdServerServiceInstanceConfig.offerCyclicDelay`) of the corresponding `ProvidedServiceInstance`.]

**[constr\_5096] `ConsumedEventGroup` with value `subscribeEventgroupRetryMax` set to 255**

*Imposition time:* CP: IT\_SysDesc

[Retry to a `ConsumedEventGroup` with value `subscribeEventgroupRetryMax` set to 255 is only allowed if the `SomeipSdServerServiceInstanceConfig.offerCyclicDelay` is set 0 and `serviceOfferTimeToLive` is set to 0xffff of the corresponding `ProvidedServiceInstance`.]

**[constr\_5097] `DltLogChannel.txPduTriggering` and `DltLogChannel.rxPduTriggering` shall point to `GeneralPurposeIPdus` of category DLT**

*Imposition time:* CP: IT\_SysDesc

[`DltLogChannel` shall only reference `PduTriggerings` that are pointing to `GeneralPurposeIPdus` of category DLT in the roles `txPduTriggering` and `rxPduTriggering`.]

### [constr\_5100] Compatibility of two **MetaDataItemSets**

*Imposition time:* CP: IT\_SysDesc

[Under the condition that sender and receiver typed by a **SenderReceiverInterface** use meta-data and are mapped to the same **EcuInstance** the following condition applies: two **MetaDataItemSets** are compatible if all of the following conditions are fulfilled:

- They aggregate the same number of **MetaDataItems**.
- The value of **MetaDataItem.length** of corresponding **MetaDataItems** is identical.
- The value of **MetaDataItem.metaDataItemType** of corresponding **MetaDataItems** is identical.

]

### [constr\_5101] Consistent Definition of meta-data

*Imposition time:* CP: IT\_SysDesc

[If the **dataElement** referenced by a **SenderReceiverToSignalMapping** is also referenced by a **MetaDataItemSet** in the role **dataElement** and the mapping via **SystemSignal**, **ISignal**, and **ISignalToIPduMapping** down to an **ISignalIPdu** exists then all other **dataElements** that are also mapped to the same **ISignalIPdu** shall either

- not be referenced by a **MetaDataItemSet** in the role **dataElement** (i.e. does not make use of meta-data) or
- the definition of meta-data in the context of the affected **SenderReceiverInterfaces** is compatible (according to the definition of compatible specification of meta-data described in [constr\_5100]).

]

### [constr\_5104] Assignment of a **FlexrayFrame** where **allowDynamicLSduLength** is set to true

*Imposition time:* CP: IT\_SysDesc

[**FlexrayFrames** which are referenced by a **FlexrayFrameTriggering** where **allowDynamicLSduLength** is set to true shall always be assigned to the dynamic segment.]

### [constr\_5105] Mapping of **Pdu** with dynamic length in a **FlexrayFrame**

*Imposition time:* CP: IT\_SysDesc

[Only the last **Pdu** in a **FlexrayFrame** is allowed to qualify according to [TPS\_SYST\_03085] to be of dynamic length.]



**[constr\_5106] `ISignalGroup` and `ISignal` referenced from `ISignalTriggering`**

*Imposition time:* CP: IT\_SysDesc

[Either an `ISignalGroup` and all `ISignals` referenced from the `ISignalGroup` are also referenced from `ISignalTriggerings` aggregated at the same `PhysicalChannel` or neither the `ISignalGroup` nor any of the `ISignals` referenced by the `ISignalGroup` shall be referenced from `ISignalTriggerings`.]

**[constr\_5110] Search for a collection of `ServiceInstances` is not supported**

*Imposition time:* CP: IT\_SysDesc

[The `ConsumedServiceInstance.instanceIdentifier` is not allowed to be set to the value ANY or ALL.]

**[constr\_5111] Existence of references `TlvDataIdDefinition.tlvArgument`, `TlvDataIdDefinition.tlvRecordElement`, and `TlvDataIdDefinition.tlvImplementationDataTypeElement`**

*Imposition time:* CP: IT\_SysDesc

[For each `TlvDataIdDefinition`, only one out of the following references shall exist:

- reference to `ArgumentDataPrototype` in the role `tlvArgument`
- reference to `ApplicationRecordElement` in the role `tlvRecordElement`
- reference to `ImplementationDataTypeElement` in the role `tlvImplementationDataTypeElement`.

]

**[constr\_5112] `ImplementationDataType` needs to be defined if a "new-world" variable-size `ApplicationArrayDataType` is mapped to a single `SystemSignal`**

*Imposition time:* CP: IT\_EcuExt

[A `SenderReceiverInterface.dataElement` that is typed by a "new-world" variable-size `ApplicationArrayDataType` according to [TPS\_SWCT\_01644] (see definition in Software Component Template [2]) is only allowed to be mapped to a single `SystemSignal` by the `SenderReceiverToSignalMapping` if a `DataTypeMap` exists that points to both the `ApplicationArrayDataType` and an `ImplementationDataType` that fulfills the conditions of a "new-world" dynamic size array data type according to [TPS\_SWCT\_01645] (see definition in Software Component Template [2]).]



**[constr\_5113] Mapping of "old-world" variable size arrays to a single [SystemSignal](#) is not supported.**

*Imposition time:* CP: IT\_EcuExt

[The [SenderReceiverToSignalMapping](#) is not allowed to map a [dataElement](#) that is typed by an "old-world" variable size array defined by [TPS\_SWCT\_01641] and [TPS\_SWCT\_01642] (see definition in Software Component Template [2]) to a single [SystemSignal](#).]

**[constr\_5114] Semantics of [InterpolationRoutine.isDefault](#)**

*Imposition time:* CP: IT\_SysDesc

[For each [SwRecordLayout](#) that is referenced by one or more [InterpolationRoutineMappings](#) that are aggregated by [InterpolationRoutineMappingSets](#) that are referenced from a [System](#) in the role [interpolationRoutineMappingSet](#), only one of the collection of aggregated [InterpolationRoutines](#) shall have attribute [isDefault](#) set to True.]

**[constr\_5116] Uniqueness of the symbols of software-components and BSW modules**

*Imposition time:* CP: IT\_EcuExt

[For all [SwComponentPrototypes](#) typed by an [ApplicationSwComponentType](#), [NvBlockSwComponentType](#) or [SensorActuatorSwComponentType](#) mapped to a given [EcuInstance](#) by means of [SwcToEcuMapping](#) respectively [SwcToApplicationPartitionMapping](#) and [ApplicationPartitionToEcuPartitionMapping](#) the following restriction applies:

The symbolic name of an [AtomicSwComponentType](#) referenced by a respective [SwComponentPrototype](#) in the role [type](#) shall not overlap with the module implementation prefix (MIP) of any of the basic software-modules existing on the [EcuInstance](#).

The symbolic name of an [AtomicSwComponentType](#) is derived from the value of

- [AtomicSwComponentType.symbol](#), or if this attribute does not exist
- [AtomicSwComponentType.shortName](#).

]

**[constr\_5117] Client-Server communication over Ethernet**

*Imposition time:* CP: IT\_SysDesc

[A [SystemSignal](#) that is referenced by a [ClientServerToSignalMapping](#) in the role [callSignal](#) or [returnSignal](#) shall only be referenced by an [ISignal](#) that in turn is referenced by an [ISignalTriggering](#) aggregated by an [EthernetPhysicalChannel](#).]

**[constr\_5118] Value range of `UdpProps.udpTtl`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `UdpProps.udpTtl` shall be in the range of 1..255.]**[constr\_5119] Value range of `TcpProps.tcpTtl`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `TcpProps.tcpTtl` shall be in the range of 1..255.]**[constr\_5120] Value range of `TcpProps.tcpDelayedAckTimeout`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `TcpProps.tcpDelayedAckTimeout` shall be in the range of 0..0.5.]**[constr\_5121] Value range of `TcpProps.tcpSynMaxRtx`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `TcpProps.tcpSynMaxRtx` shall be in the range of 0..255.]**[constr\_5122] Value range of `TcpProps.tcpMaxRtx`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `TcpProps.tcpMaxRtx` shall be in the range of 0..255.]**[constr\_5123] Value range of `TcpProps.tcpKeepAliveProbesMax`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `TcpProps.tcpKeepAliveProbesMax` shall be in the range of 0..65535.]**[constr\_5124] Value range of `TcpProps.tcpReceiveWindowMax`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `TcpProps.tcpReceiveWindowMax` shall be in the range of 0..65535.]**[constr\_5125] Value range of `TcpIpIcmpv4Props.tcpIpIcmpV4Ttl`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `TcpIpIcmpv4Props.tcpIpIcmpV4Ttl` shall be in the range of 1..255.]**[constr\_5126] Value range of `Ipv4ArpProps.tcpIpArpNumGratuitousArpOnStartup`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If defined, the value of `Ipv4ArpProps.tcpIpArpNumGratuitousArpOnStartup` shall be in the range of 0..255.]

**[constr\_5127] Value range of `Ipv4FragmentationProps.tcpIpIpNumFragments`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv4FragmentationProps.tcpIpIpNumFragments` shall be in the range of 0..255.]

**[constr\_5128] Value range of `Ipv4FragmentationProps.tcpIpIpNumReassDgrams`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv4FragmentationProps.tcpIpIpNumReassDgrams` shall be in the range of 0..65535.]

**[constr\_5129] Value range of `Ipv6FragmentationProps.tcpIpIpReassemblyBufferCount`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6FragmentationProps.tcpIpIpReassemblyBufferCount` shall be in the range of 0..255.]

**[constr\_5130] Value range of `Ipv6FragmentationProps.tcpIpIpReassemblyBufferSize`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6FragmentationProps.tcpIpIpReassemblyBufferSize` shall be in the range of 1500..65535.]

**[constr\_5131] Value range of `Ipv6FragmentationProps.tcpIpIpReassemblyTimeout`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6FragmentationProps.tcpIpIpReassemblyTimeout` shall be in the range of 0.001..100.]

**[constr\_5132] Value range of `Ipv6FragmentationProps.tcpIpIpReassemblySegmentCount`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6FragmentationProps.tcpIpIpReassemblySegmentCount` shall be in the range of 1..255.]

**[constr\_5133] Value range of `Ipv6FragmentationProps.tcpIpIpTxFragmentBufferCount`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6FragmentationProps.tcpIpIpTxFragmentBufferCount` shall be in the range of 1..1000.]

**[constr\_5134] Value range of `Ipv6FragmentationProps.tcpIpIpTxFragmentBufferSize`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6FragmentationProps.tcpIpIpTxFragmentBufferSize` shall be in the range of 1500..65535.]

**[constr\_5135] Value range of `Dhcpv6Props.tcpIpDhcpV6CnfDelayMin` and `Dhcpv6Props.tcpIpDhcpV6CnfDelayMax`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Dhcpv6Props.tcpIpDhcpV6CnfDelayMin` and the value of `Dhcpv6Props.tcpIpDhcpV6CnfDelayMax` shall be in the range of 0..100 and the value of `Dhcpv6Props.tcpIpDhcpV6CnfDelayMax` shall be greater than the value of `Dhcpv6Props.tcpIpDhcpV6CnfDelayMin`.]

**[constr\_5136] Value range of `Dhcpv6Props.tcpIpDhcpV6InfDelayMin` and `Dhcpv6Props.tcpIpDhcpV6InfDelayMax`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Dhcpv6Props.tcpIpDhcpV6InfDelayMin` and the value of `Dhcpv6Props.tcpIpDhcpV6InfDelayMax` shall be in the range of 0..100 and the value of `Dhcpv6Props.tcpIpDhcpV6InfDelayMax` shall be greater than the value of `Dhcpv6Props.tcpIpDhcpV6InfDelayMin`.]

**[constr\_5137] Value range of `Dhcpv6Props.tcpIpDhcpV6SolDelayMin` and `Dhcpv6Props.tcpIpDhcpV6SolDelayMax`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Dhcpv6Props.tcpIpDhcpV6SolDelayMin` and the value of `Dhcpv6Props.tcpIpDhcpV6SolDelayMax` shall be in the range of 0..100 and the value of `Dhcpv6Props.tcpIpDhcpV6SolDelayMax` shall be greater than the value of `Dhcpv6Props.tcpIpDhcpV6SolDelayMin`.]

**[constr\_5138] Value range of `Ipv6NdpProps.tcpIpNdpSlaacDadNumberOfTransmissions`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpSlaacDadNumberOfTransmissions` shall be in the range of 0..254.]

**[constr\_5139] Value range of `Ipv6NdpProps.tcpIpNdpSlaacDadRetransmissionDelay`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpSlaacDadRetransmissionDelay` shall be in the range of 0..10.]

**[constr\_5140] Value range of `Ipv6NdpProps.tcpIpNdpDefaultReachableTime`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpDefaultReachableTime` shall be in the range of 0..120.]

**[constr\_5141] Value range of `Ipv6NdpProps.tcpIpNdpDefaultRetransTimer`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpDefaultRetransTimer` shall be in the range of 0..60.]

**[constr\_5142] Value range of `Ipv6NdpProps.tcpIpNdpNumUnicastSolicitations`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpNumUnicastSolicitations` shall be in the range of 0..255.]

**[constr\_5143] Value range of `Ipv6NdpProps.tcpIpNdpNumMulticastSolicitations`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpNumMulticastSolicitations` shall be in the range of 0..255.]

**[constr\_5144] Value range of `Ipv6NdpProps.tcpIpNdpDelayFirstProbeTimeValue`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpDelayFirstProbeTimeValue` shall be in the range of 0..60.]

**[constr\_5145] Value range of `Ipv6NdpProps.tcpIpNdpMinRandomFactor`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpMinRandomFactor` shall be in the range of 0..100.]

**[constr\_5146] Value range of `Ipv6NdpProps.tcpIpNdpMaxRandomFactor`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpMaxRandomFactor` shall be in the range of 0..100.]

**[constr\_5147] Value range of `Ipv6NdpProps.tcpIpNdpDestinationCacheSize`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpDestinationCacheSize` shall be in the range of 1..254.]

**[constr\_5148] Value range of `Ipv6NdpProps.tcpIpNdpPrefixListSize`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpPrefixListSize` shall be in the range of 1..254.]

**[constr\_5149] Value range of `Ipv6NdpProps.tcpIpNdpDefaultRouterListSize`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpDefaultRouterListSize` shall be in the range of 2..254.]

**[constr\_5151] Value range of `Ipv6NdpProps.tcpIpNdpMaxRtrSolicitations`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpMaxRtrSolicitations` shall be in the range of 0..255.]

**[constr\_5152] Value range of `Ipv6NdpProps.tcpIpNdpMaxRtrSolicitationDelay`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpMaxRtrSolicitationDelay` shall be in the range of 0.001..60.]

**[constr\_5153] Value range of `Ipv6NdpProps.tcpIpNdpRtrSolicitationInterval`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `Ipv6NdpProps.tcpIpNdpRtrSolicitationInterval` shall be in the range of 0.001..60.]

**[constr\_5154] Value range of `TcpIpIcmpv6Props.tcpIpIcmpV6HopLimit`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `TcpIpIcmpv6Props.tcpIpIcmpV6HopLimit` shall be in the range of 1..255.]

**[constr\_5157] Mixing of Point-To-Point and Multi-Drop is not allowed in a `CouplingPortConnection`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The `CouplingPortConnection` is allowed to reference a `CouplingPort` either:

- in the role `firstPort` and/or `secondPort` or
- in the role `nodePort`

]

**[constr\_5158] Usage of `plcaProps` only allowed on 10BASE-T1S networks***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[A `CouplingPort` is allowed to aggregate `plcaProps` only if:

- the `CouplingPort.physicalLayerType` is set to 10BASE-T1S
- the `CouplingPort.macLayerType` is set to xMII
- the `CouplingPort` is referenced by a `CouplingPortConnection` with the `nodePort` reference.

]

**[constr\_5159] Mandatory `CouplingPortConnection` settings if multi-drop feature is used***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If a `CouplingPortConnection` uses the `nodePort` reference then the attribute `CouplingPortConnection.plcaLocalNodeCount` and the attribute `CouplingPortConnection.plcaTransmitOpportunityTimer` shall be set to a value.]**[constr\_5160] Mandatory `PlcaProps` settings if multi-drop feature is used***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If a `CouplingPort` is referenced by a `CouplingPortConnection` in the role `nodePort` then the `CouplingPort` shall aggregate the `PlcaProps` and the following attributes shall be set to a value:

- `plcaMaxBurstCount`
- `plcaMaxBurstTimer`
- `plcaLocalNodeId`

]

**[constr\_5162] Valid `TextTableMapping` in the context of `Sender-RecRecordElementMapping`***Imposition time:* CP: IT\_EcuExt[The aggregation of a `TextTableMapping` at `SenderRecRecordElementMapping` is only valid if the `SenderRecRecordElementMapping` also references a `SystemSignal` in the role `systemSignal`.]**[constr\_5163] Existence of attribute `IPSecRule.headerType`***Imposition time:* CP: IT\_SysDesc[For each `IPSecRule`, the attribute `headerType` shall exist.]



**[constr\_5164] Existence of attribute `IPSecRule.ipProtocol`***Imposition time:* CP: IT\_SysDesc[For each `IPSecRule`, the attribute `ipProtocol` shall exist.]**[constr\_5165] Existence of attribute `IPSecRule.policy`***Imposition time:* CP: IT\_SysDesc[For each `IPSecRule`, the attribute `policy` shall exist.]**[constr\_5166] Existence of `IPduMapping.pduMaxLength`***Imposition time:* CP: IT\_SysDesc[If several `IPduMappings` refer to the same `PduTriggering` in `IPduMapping.sourceIPdu`, then all of these `IPduMappings` shall provide either no `IPduMapping.pduMaxLength` value, or the same `IPduMapping.pduMaxLength` value.]**[constr\_5167] `pncGatewayType` and ECU over the whole system***Imposition time:* CP: IT\_SysDesc[Only one PNC Gateway ECU in the whole System shall exist that sets on all its `CommunicationConnectors` the `pncGatewayType` to `active`.]**[constr\_5168] `pncGatewayType passive` and connected ECUs***Imposition time:* CP: IT\_SysDesc[For all `CommunicationConnectors` with `pncGatewayType` set to `passive` belonging to one PNC Gateway ECU, all connected counterpart `CommunicationConnectors`, where `pncGatewayType` is set to `active` shall belong to one ECU, if `dynamicPncToChannelMappingEnabled` is set to TRUE for at least one of the affected `CommunicationConnectors`.]**[constr\_5170] `nmPassiveModeEnabled` and `dynamicPncToChannelMappingEnabled`***Imposition time:* CP: IT\_SysDesc[If `nmPassiveModeEnabled` is set to TRUE on a `NmNode` then `dynamicPncToChannelMappingEnabled` shall be set to FALSE on the according `CommunicationConnector` referring to the same `CommunicationController`.]**[constr\_5175] `RtePluginProps` shall reference at least one `EcucContainerValue` representing a `RteRipsPlugin`***Imposition time:* CP: IT\_EcuExt[If a `FlatInstanceDescriptor` owns are `RtePluginProps` this `RtePluginProps` shall define the `associatedRtePlugin` reference and/or the `associatedCrossSwClusterComRtePlugin` reference.]



**[constr\_5176] Existence of `CpSoftwareCluster` of category `HOST_SOFTWARE_CLUSTER` on one `EcuInstance`***Imposition time:* CP: IT\_SwCluSysDesc

[On each `EcuInstance`, exactly one `CpSoftwareCluster` of category `HOST_SOFTWARE_CLUSTER` shall exist.]

**[constr\_5177] Validity of reference `CpSoftwareClusterToEcuInstanceMapping.swCluster`***Imposition time:* CP: IT\_SwCluSysDesc

[A `CpSoftwareClusterToEcuInstanceMapping` that references a given `CpSoftwareCluster` in the role `CpSoftwareClusterToEcuInstanceMapping.swCluster` shall be aggregated by the same `System` (in the role `System.mapping.swMapping`) that also refers to the referenced `CpSoftwareCluster` in the role `System.swCluster`.]

**[constr\_5178] Existence of attribute `CpSoftwareClusterResource.globalResourceId`***Imposition time:* CP: IT\_ResPool

[For each `CpSoftwareClusterResource`, attribute `globalResourceId` shall exist.]

**[constr\_5179] Existence of attribute `CpSoftwareClusterResource.isMandatory`***Imposition time:* CP: IT\_ResPool

[For each `CpSoftwareClusterResource`, attribute `isMandatory` shall exist.]

**[constr\_5180] Allowed values for `CpSoftwareClusterResource.globalResourceId`***Imposition time:* CP: IT\_ResPool

[Attribute `CpSoftwareClusterResource.globalResourceId` shall not be set to 0.]

**[constr\_5181] Existence of attribute `CpSoftwareClusterServiceResource.category`***Imposition time:* CP: IT\_ResPool

[For each `CpSoftwareClusterServiceResource`, attribute `category` shall exist.]

**[constr\_5182] `PRPortPrototypes` are excluded as `CpSoftwareCluster` interfaces**

*Imposition time:* CP: IT\_SwCluSysDesc

[A `CpSoftwareClusterCommunicationResource` is not allowed to be mapped by a `PortElementToCommunicationResourceMapping` to an element of a `PortInterface` in the context of a `PRPortPrototype`.]

**[constr\_5183] `PortElementToCommunicationResourceMapping` shall reference exactly one element of a `PortInterface`**

*Imposition time:* CP: IT\_SwCluSysDesc

[For any given `PortElementToCommunicationResourceMapping`, either the reference

- `parameterDataPrototype` or
- `modeDeclarationGroupPrototype` or
- `trigger` or
- `clientServerOperation` or
- `variableDataPrototype`

shall exist.]

**[constr\_5184] `CpSoftwareClusterServiceResource` can be provided only once on an `EcuInstance`**

*Imposition time:* CP: IT\_SwCluSysDesc

[A `CpSoftwareClusterServiceResource` shall not be mapped by several `CpSoftwareClusterToResourceMappings` to `CpSoftwareClusters` in the `provider` role if the `CpSoftwareClusters` are mapped to the same `EcuInstance` by `CpSoftwareClusterToEcuInstanceMappings`.]

**[constr\_5185] Existence of attribute `BinaryManifestProvideResource.globalResourceId`**

*Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestProvideResource`, attribute `globalResourceId` shall exist.]

**[constr\_5186] Existence of attribute `BinaryManifestProvideResource.resourceGuardValue`**

*Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestProvideResource`, attribute `resourceGuardValue` shall exist.]

**[constr\_5187] Existence of attribute `BinaryManifestProvideResource.supportsMultipleNotifierSets`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestProvideResource`, attribute `supportsMultipleNotifierSets` shall exist.]

**[constr\_5188] Existence of attribute `BinaryManifestProvideResource.numberOfNotifierSets`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestProvideResource`, attribute `numberOfNotifierSets` shall exist.]

**[constr\_5189] Existence of reference `BinaryManifestProvideResource.resourceDefinition`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestProvideResource`, the reference in the role `resourceDefinition` shall exist.]

**[constr\_5190] Existence of aggregation `BinaryManifestProvideResource.item`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestProvideResource`, the aggregation in the role `item` shall exist at least once.]

**[constr\_5191] Consequence of attribute `BinaryManifestProvideResource.item.category`***Imposition time:* CP: IT\_BinObjMetaData

[The following values of attribute `BinaryManifestProvideResource.item.category` shall require the existence of aggregations:

- If `category` is set to `PROVIDER_HANDLE` and the attribute `isUnused` is not set to true then the aggregation `BinaryManifestProvideResource.item.value` shall exist
- If `category` is set to `NOTIFIER_HANDLE` and the attribute `isUnused` is not set to true then the aggregation `BinaryManifestProvideResource.item.defaultValue` shall exist
- If `category` is set to `AUXILARY_ACTUAL_NUMBER_NOTIFIER_SETS` then the aggregation `BinaryManifestProvideResource.item.defaultValue` shall exist

]

**[constr\_5192] Existence of attribute `BinaryManifestRequireResource.globalResourceId`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestRequireResource`, attribute `globalResourceId` shall exist.]

**[constr\_5193] Existence of attribute `BinaryManifestRequireResource.resourceGuardValue`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestRequireResource`, attribute `resourceGuardValue` shall exist.]

**[constr\_5194] Existence of reference `BinaryManifestRequireResource.resourceDefinition`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestRequireResource`, the reference in the role `resourceDefinition` shall exist.]

**[constr\_5195] Existence of aggregation `BinaryManifestRequireResource.item`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestRequireResource`, the aggregation in the role `item` shall exist at least once.]

**[constr\_5196] Consequence of attribute `BinaryManifestRequireResource.item.category`***Imposition time:* CP: IT\_BinObjMetaData

[The following values of attribute `BinaryManifestRequireResource.item.category` shall require the existence of aggregations:

- If `category` is set to `PROVIDER_HANDLE` then the aggregation `BinaryManifestRequireResource.item.defaultValue` shall exist
- If `category` is set to `NOTIFIER_HANDLE` then the aggregation `BinaryManifestRequireResource.item.value` shall exist

]

**[constr\_5197] Existence of aggregation `BinaryManifestResourceDefinition.itemDefinition`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestResourceDefinition`, the aggregation in the role `itemDefinition` shall exist at least once.]

**[constr\_5198] Allowed `BinaryManifestResource.resourceDefinition`***Imposition time:* CP: IT\_BinObjMetaData

[An `BinaryManifestResourceDefinition` shall only be referenced from a `BinaryManifestResource` that is aggregated in the same `CpSoftwareClusterBinaryManifestDescriptor` as the referenced `BinaryManifestResourceDefinition`.]

**[constr\_5199] Consequence of attribute `BinaryManifestItem.auxiliaryField.category`***Imposition time:* CP: IT\_BinObjMetaData

[If attribute `BinaryManifestItem.auxiliaryField.category` is set to value `AUXILARY_CONNECTED_SW_CLUSTER_ID` then attribute `BinaryManifestItem.auxiliaryField.defaultValue` shall exist.]

**[constr\_5200] Existence of attribute `BinaryManifestItemDefinition.category`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestItemDefinition`, attribute `category` shall exist.]

**[constr\_5201] Existence of attribute `BinaryManifestItemDefinition.size`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestItemDefinition`, attribute `size` shall exist.]

**[constr\_5202] Existence of attribute `BinaryManifestItemNumericalValue.value`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestItemNumericalValue`, attribute `value` shall exist.]

**[constr\_5203] Existence of attribute `BinaryManifestItemPointerValue.symbol`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestItemPointerValue`, attribute `symbol` shall exist.]

**[constr\_5204] Existence of attribute `BinaryManifestMetaDataField.category`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestMetaDataField`, attribute `category` shall exist.]

**[constr\_5205] Existence of attribute `BinaryManifestMetaDataField.size`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestMetaDataField`, attribute `size` shall exist.]

**[constr\_5206] Existence of attribute `BinaryManifestMetaDataField.symbol`***Imposition time:* CP: IT\_BinObjMetaData[For each `BinaryManifestMetaDataField`, attribute `symbol` shall exist .]**[constr\_5207] Existence of attribute `BinaryManifestMetaDataField.address`***Imposition time:* CP: IT\_BinObjMetaData[For each `BinaryManifestMetaDataField`, attribute `address` shall exist.]**[constr\_5208] Existence of `System.swCluster`***Imposition time:* CP: IT\_SwCluSysDesc[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.swCluster` shall exist at least once.]**[constr\_5209] Existence of reference `CpSoftwareCluster.swComponentAssignment.swComponent`***Imposition time:* CP: IT\_SwCluSysDesc[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.swCluster.swComponentAssignment.swComponent` shall exist.]**[constr\_5210] Existence of reference `SystemMapping.portElementToComResourceMapping`***Imposition time:* CP: IT\_SwCluSysDesc[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.mapping.portElementToComResourceMapping` shall exist at least once.]**[constr\_5211] Existence of reference `PortElementToCommunicationResourceMapping.communicationResource`***Imposition time:* CP: IT\_SwCluSysDesc[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.mapping.portElementToComResourceMapping.communicationResource` shall exist at least once.]**[constr\_5212] Existence of reference `SystemMapping.resourceToApplicationPartitionMapping`***Imposition time:* CP: IT\_SwCluSysDesc[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.mapping.resourceToApplicationPartitionMapping` shall exist.]

**[constr\_5213] Existence of reference `CpSoftwareClusterResourceToApplicationPartitionMapping.applicationPartition`***Imposition time:* CP: IT\_SwCluSysDesc

[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.mapping.resourceToApplicationPartitionMapping.applicationPartition` shall exist.]

**[constr\_5214] Existence of reference `CpSoftwareClusterResourceToApplicationPartitionMapping.resource`***Imposition time:* CP: IT\_SwCluSysDesc

[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.mapping.resourceToApplicationPartitionMapping.resource` shall exist.]

**[constr\_5215] Existence of reference `CpSoftwareClusterToResourceMapping.serviceResource`***Imposition time:* CP: IT\_SwCluSysDesc

[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, the reference `System.mapping.softwareClusterToResourceMapping.serviceResource` shall exist.]

**[constr\_5216] Existence of reference `CpSoftwareClusterToResourceMapping.requester` and/or `provider`***Imposition time:* CP: IT\_SwCluSysDesc

[In a `System` with `category` `SW_CLUSTER_SYSTEM_DESCRIPTION`, at least one of the references `System.mapping.softwareClusterToResourceMapping.requester` or `System.mapping.softwareClusterToResourceMapping.provider` shall exist.]

**[constr\_5217] Existence of attribute `BinaryManifestMetaDataField.value`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestMetaDataField` of `category` `IMMUTABLE_TABLES_CHECKSUM`, attribute `value` shall exist.]

**[constr\_5218] Existence of attribute `BinaryManifestItemPointerValue.address`***Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestItemPointerValue`, attribute `address` shall exist.]

**[constr\_5219] `CpSoftwareCluster` shall only be mapped to one `EcuInstance`***Imposition time:* CP: IT\_SwCluSysDesc

[Within the context of one `CpSoftwareCluster`, for all `CpSoftwareCluster.swComponentAssignment.swComponent` (and nested instances of `SwComponent-`

Prototypes) that are referenced by a [SwcToEcuMapping](#) in the role [component](#) the following condition shall be fulfilled: all referencing [SwcToEcuMappings](#) shall refer to the same [EcuInstance](#) in the role [ecuInstance](#) and this [EcuInstance](#) shall also be referenced in the role [ecuInstance](#) by all [CpSoftwareClusterToEcuInstanceMappings](#) that also refer to said [CpSoftwareCluster](#) in the role [swCluster](#).]

**[constr\_5220] Multiplicity of [EndToEndTransformationISignalProps.sourceId](#) in PROFILE\_04m, PROFILE\_07m, PROFILE\_08m and PROFILE\_44m**

*Imposition time:* CP: IT\_SysDesc

[If the [EndToEndTransformationDescription.profileName](#) attribute is set to PROFILE\_04m, PROFILE\_07m, PROFILE\_08m, or PROFILE\_44m then the multiplicity of the [EndToEndTransformationISignalProps.sourceId](#) attribute shall be 1.]

**[constr\_5221] Multiplicity of [EndToEndTransformationISignalProps.sourceId](#) in PROFILE\_01, PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_11, PROFILE\_22, and PROFILE\_76**

*Imposition time:* CP: IT\_SysDesc

[If the [EndToEndTransformationDescription.profileName](#) attribute is set to PROFILE\_01, PROFILE\_02, PROFILE\_04, PROFILE\_05, PROFILE\_06, PROFILE\_07, PROFILE\_11, PROFILE\_22, or PROFILE\_76 then the multiplicity of the [EndToEndTransformationISignalProps.sourceId](#) attribute shall be 0.]

**[constr\_5222] Mandatory elements of [UdpNmCluster](#)**

*Imposition time:* CP: IT\_SysDesc

[The following attributes shall always be defined for the [UdpNmCluster](#):

- [nmMsgCycleTime](#)
- [nmMessageTimeoutTime](#)
- [nmNetworkTimeout](#)
- [nmRemoteSleepIndicationTime](#)
- [nmRepeatMessageTime](#)
- [nmWaitBusSleepTime](#)
- [communicationCluster](#)

]

**[constr\_5223] Mandatory elements of [UdpNmNode](#)**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The following attributes shall always be defined for the [UdpNmNode](#):



- `nmMsgCycleOffset`

]

**[constr\_5224] `UdpNmNode.nmMsgCycleOffset` < `UdpNmCluster.nmMsgCycleTime`**

*Imposition time:* CP: `IT_SysDesc`, AP: `IT_SysDes`

[The value of `UdpNmNode.nmMsgCycleOffset` shall be smaller than the value of `UdpNmCluster.nmMsgCycleTime`.]

**[constr\_5225] `UdpNmCluster.nmNetworkTimeout` multiple of `UdpNmCluster.nmMsgCycleTime`**

*Imposition time:* CP: `IT_SysDesc`, AP: `IT_SysDes`

[The value of `UdpNmCluster.nmNetworkTimeout` shall be  $n * \text{UdpNmCluster.nmMsgCycleTime}$  with  $n > 1$ .]

**[constr\_5226] `UdpNmCluster.nmRepeatMessageTime` multiple of `UdpNmCluster.nmMsgCycleTime`**

*Imposition time:* CP: `IT_SysDesc`, AP: `IT_SysDes`

[The value of `UdpNmCluster.nmRepeatMessageTime` shall be  $n * \text{UdpNmCluster.nmMsgCycleTime}$ .]

**[constr\_5229] Existence of attribute `E2EProfileCompatibilityProps.transitToInvalidExtended` is mandatory for each `EndToEndTransformationDescription`**

*Imposition time:* CP: `IT_SysDesc`

[For each `EndToEndTransformationDescription`, a reference to `E2EProfileCompatibilityProps` in the role `e2eProfileCompatibilityProps` shall exist and the referenced `E2EProfileCompatibilityProps` shall define a value for the attribute `transitToInvalidExtended`.]

**[constr\_5231] Allowed values for `SOMEIPTransformationProps.alignment` and `SOMEIPTransformationDescription.alignment`**

*Imposition time:* CP: `IT_SysDesc`

[The valid values for `SOMEIPTransformationProps.alignment` and `SOMEIPTransformationDescription.alignment` shall be 8, 16, 32, 64, 128 or 256.]

**[constr\_5232] Triggering in case of application writing the selector field signal**

*Imposition time:* CP: `IT_SysDesc`

[If

- the `ISignal` representing the selector field is referenced by an `ISignalTriggering` and that `ISignalTriggering` refers to an `ISignalPort` where the `communicationDirection` is set to `out` and

- the `ISignal` representing the selector field is referring to a `SystemSignal` and that `SystemSignal` is either
  - referenced by a `SenderReceiverToSignalMapping` in the role `system-Signal` or
  - part of a `SystemSignalGroup` that in turn is referenced by a `Sender-ReceiverToSignalGroupMapping`

then any `ISignal` other than the `ISignal` representing the selector field shall be mapped into that dynamic part alternative `ISignalIPdu` using the `transferProperty` set to `pending`.]

### **[constr\_5233] Usage of `invalidValue` in case of application writing the selector field signal**

*Imposition time:* CP: `IT_SysDesc`

[If

- the `ISignal` representing the selector field is referenced by an `ISignalTriggering` and that `ISignalTriggering` refers to an `ISignalPort` where the `communicationDirection` is set to `out` and
- the `ISignal` representing the selector field is referring to a `SystemSignal` and that `SystemSignal` is either
  - referenced by a `SenderReceiverToSignalMapping` in the role `system-Signal` or
  - part of a `SystemSignalGroup` that in turn is referenced by a `Sender-ReceiverToSignalGroupMapping`

then

- the `ISignal` representing the selector field shall either
  - define no invalid value (`ISignal.networkRepresentationProps.invalidValue`) or
  - the `invalidValue` defined shall be different than any of the defined selector field values for that `MultiplexedIPdu`.

]

### **[constr\_5235] Maximum `Frame.frameLength` of the used bus protocol shall not be exceeded**

*Imposition time:* CP: `IT_SysDesc`

[The `Pdu.length` used for an `IPdu` and the `IPduMapping.pduMaxLength` used for a `targetIPdu` shall not exceed the limitation of the maximum `Frame.frameLength` of the used bus protocol (e.g. CAN2.0 max. `Frame.frameLength` == 8Byte, CAN-FD `Frame.frameLength` == 64byte).]

**[constr\_5236] Restriction of `IPduMapping.pduMaxLength`**

*Imposition time:* CP: IT\_SysDesc

[`IPduMapping.pduMaxLength` shall be equal or greater than the maximum `Pdu.length` of `sourceIPdu` and `targetIPdu`. For a N:1 routing and 1:N routing, respectively, the maximum `Pdu.length` of all involved `Pdu`s shall be used to evaluate a proper `IPduMapping.pduMaxLength`.]

**[constr\_5244] Value of attribute `SOMEIPTransformationISignalProps.sizeOfArrayLengthFields`**

*Imposition time:* CP: IT\_SysDesc

[If attribute `SOMEIPTransformationISignalProps.sizeOfArrayLengthFields` is configured, then the value of attribute `SOMEIPTransformationISignalProps.sizeOfArrayLengthFields` shall be at least as high as the number of bytes required to fit the maximum result of the individual length field computation of all variable-size arrays that are transported in the SOME/IP message.

In other words, for each variable-size array contained in the SOME/IP message, the numerical value of *maximum number of elements \* sizeof(data type of array element)* shall be computed which yields the maximum number of bytes required to store the individual variable-size array.

The size of the attribute `SOMEIPTransformationISignalProps.sizeOfArrayLengthFields` shall be set such that the highest value (or bigger) obtained from the individual computations for the contained variable-size arrays can fit into the length field. The unit of attribute `SOMEIPTransformationISignalProps.sizeOfArrayLengthFields` is bytes.]

**[constr\_5245] Value of attribute `SOMEIPTransformationISignalProps.sizeOfStringLengthFields`**

*Imposition time:* CP: IT\_SysDesc

[If attribute `SOMEIPTransformationISignalProps.sizeOfStringLengthFields` is configured, then the value of attribute `SOMEIPTransformationISignalProps.sizeOfStringLengthFields` shall be at least as high as the number of bytes required to fit the maximum result of the individual length field computation of all strings that are transported in the SOME/IP message.

In other words, for each string contained in the SOME/IP message, the numerical value of *maximum number of characters in the string \* maximum number of code units per character (of the used character encoding) \* maximum number of bytes per code unit (of the used character encoding)* shall be computed which yields the maximum number of bytes required to store the individual string.

The size of the attribute `SOMEIPTransformationISignalProps.sizeOfStringLengthFields` shall be set such that the highest value (or bigger) obtained from the individual computations for the contained strings can fit into the length field. The unit of attribute `SOMEIPTransformationISignalProps.sizeOfStringLengthFields` is bytes.]

**[constr\_5246] SOME/IP Transformation settings for strings in the context of an `ISignal`**

*Imposition time:* CP: IT\_SysDesc

[In the context of an `ISignal` the usage of `DataPrototypeTransformationProps.transformationProps.sizeOfStringLengthField` is only allowed if the `SOMEIPTransformationISignalProps.sizeOfStringLengthFields` is not defined.]

**[constr\_5247] Value of attribute `DataPrototypeTransformationProps.transformationProps.sizeOfArrayLengthField`**

*Imposition time:* CP: IT\_SysDesc

[If the configuration of length field is done using `DataPrototypeTransformationProps.transformationProps.sizeOfArrayLengthField` then the value of attribute `DataPrototypeTransformationProps.transformationProps.sizeOfArrayLengthField` shall be at least as high as the number of bytes required to fit the result of the expression *maximum number of elements \* sizeof(data type of array element)*.]

**[constr\_5248] Value of attribute `DataPrototypeTransformationProps.transformationProps.sizeOfStringLengthField`**

*Imposition time:* CP: IT\_SysDesc

[If the configuration of length field is done using `DataPrototypeTransformationProps.transformationProps.sizeOfStringLengthField` then the value of attribute `DataPrototypeTransformationProps.transformationProps.sizeOfStringLengthField` shall be at least as high as the number of bytes required to fit the result of the expression *maximum number of characters in the string \* maximum number of code units per character (of the used character encoding) \* maximum number of bytes per code unit (of the used character encoding)*.]

**[constr\_5249] Existence of `Pdu.length`**

*Imposition time:* CP: IT\_SysDesc

[For each `Pdu`, the attribute `length` shall exist.]

**[constr\_5251] `CouplingPort.connectionNegotiationBehavior` shall exist**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The attribute `CouplingPort.connectionNegotiationBehavior` shall be defined.]

**[constr\_5252] `LinSlaveConfig.protocolVersion` shall exist**

*Imposition time:* CP: IT\_SysDesc

[The attribute `LinSlaveConfig.protocolVersion` shall exist.]

**[constr\_5253] Value range of `ISignal.length`***Imposition time:* CP: IT\_SysDesc

[The value of `ISignal.length` shall be in the range of 0..34359738360 Bits.]

**[constr\_5254] Value range of `MultiplexedIPdu.selectorFieldLength`***Imposition time:* CP: IT\_SysDesc

[The value of `MultiplexedIPdu.selectorFieldLength` shall be in the range of 1..16 Bits.]

**[constr\_5258] `TriggerToSignalMapping.systemSignals` eligible for a `TriggerToSignalMapping` in case `DataTransformation` is used***Imposition time:* CP: IT\_SysDesc

[The `ISignal` that is referenced by a `SystemSignal` that in turn is referenced by a `TriggerToSignalMapping` in the role `systemSignal` shall have its `length` attribute set to the value of `BufferProperties.headerLength` attribute of the respective `TransformationTechnology` if the `ISignal` references a `DataTransformation` in the role `dataTransformation` that in turn references the `TransformationTechnology`.]

**[constr\_5259] `PduTriggerings` and `FrameTriggerings` of `SecuredIPdu` with `useAsCryptographicIPdu = true`***Imposition time:* CP: IT\_SysDesc

[In case that a `SecuredIPdu` is defined with `useAsCryptographicIPdu = true` as described by [TPS\_SYST\_02173] then:

- the `PduTriggering` of the `AuthenticPdu`
- the `PduTriggering` of the `CryptographicPdu`
- the `FrameTriggering` that references the `Frame` to which the `AuthenticPdu` is mapped
- the `FrameTriggering` that references the `Frame` to which the `CryptographicPdu` is mapped

shall be aggregated by the same `PhysicalChannel`.]

**[constr\_5262] `SystemSignal` used for Trigger communication shall not be part of any `SystemSignalGroup`***Imposition time:* CP: IT\_EcuExt

[A `SystemSignal` that is target of a `TriggerToSignalMapping` in the role `systemSignal` shall not be referenced by a `SystemSignalGroup` in the role `systemSignal`.]

**[constr\_5263] NetworkEndpoint.networkEndpointAddress restriction for IPv4**

*Imposition time:* CP: IT\_SysDesc

[A NetworkEndpoint shall not aggregate several Ipv4Configurations that have their ipv4AddressSource set to fixed.]

**[constr\_5264] NetworkEndpoint.networkEndpointAddress restriction for IPv6**

*Imposition time:* CP: IT\_SysDesc

[A NetworkEndpoint shall not aggregate several Ipv6Configurations that have their ipv6AddressSource set to fixed.]

**[constr\_5265] NetworkEndpoint.networkEndpointAddress restriction**

*Imposition time:* CP: IT\_SysDesc

[A NetworkEndpoint shall not aggregate an Ipv4Configuration and an Ipv6Configuration as networkEndpointAddress at the same time.]

**[constr\_5266] VariableDataPrototype of NvDataInterface shall not be mapped to a SystemSignal**

*Imposition time:* CP: IT\_EcuExt

[A VariableDataPrototype that is aggregated by a NvDataInterface shall not be referenced by

- SenderReceiverToSignalGroupMapping in the role dataElement and
- SenderReceiverToSignalMapping in the role dataElement.

]

**[constr\_5267] VariableDataPrototype of NvDataInterface shall not be mapped to a SystemSignal via a delegation to a PortPrototype with a SenderReceiverInterface**

*Imposition time:* CP: IT\_EcuExt

[If a VariableDataPrototype that is aggregated by a

- SenderReceiverInterface and that SenderReceiverInterface is referenced by a PortPrototype of a Composition and
- that PortPrototype is connected by a delegation connector with an inner PortPrototype of a NvBlockSwComponentType and
- that PortPrototype is typed by a NvDataInterface

then this PortPrototype shall not be referenced by:

- SenderReceiverToSignalGroupMapping in the role dataElement and
- SenderReceiverToSignalMapping in the role dataElement.

]

**[constr\_5268] Existence of `ContainedIPduProps.containedPduTriggering` reference**

*Imposition time:* CP: IT\_SysDesc

[If a `ContainedIPduProps` is aggregated at the `ContainerIPdu` in the role `ContainerIPdu.containedIPduTriggeringProps` then the reference `ContainedIPduProps.containedPduTriggering` shall exist.]

**[constr\_5269] Exclusion of `ContainedIPduProps.containedPduTriggering` reference**

*Imposition time:* CP: IT\_SysDesc

[If a `ContainedIPduProps` is aggregated at the `IPdu` in the role `IPdu.containedIPduProps` then the reference `ContainedIPduProps.containedPduTriggering` shall NOT exist.]

**[constr\_5270] Exclusive usage of `ContainerIPdu.containedPduTriggering` and `ContainerIPdu.containedIPduTriggeringProps`**

*Imposition time:* CP: IT\_SysDesc

[A `ContainerIPdu` shall only have either `ContainerIPdu.containedPduTriggering` OR `ContainerIPdu.containedIPduTriggeringProps` defined.]

**[constr\_5271] Existence of attribute `BinaryManifestItem.isUnused`**

*Imposition time:* CP: IT\_BinObjMetaData

[For each `BinaryManifestItem`, the attribute `isUnused` shall exist.]

**[constr\_5272] Value of attribute `BinaryManifestItem.isUnused`**

*Imposition time:* CP: IT\_BinObjMetaData

[The attribute `BinaryManifestItem.isUnused` shall only be permitted to be set to true if the related `BinaryManifestItemDefinition` has its attribute `isOptional` set to true.]

**[constr\_5273] One `ISignalTriggering` pair allowed per `EthernetPhysicalChannel` for a `ClientServerOperation`**

*Imposition time:* CP: IT\_SysDesc

[For each `EthernetPhysicalChannel` at most one pair of

- `ISignalTriggering` that refers to an `ISignal` that in turn refers to a `SystemSignal` that is referenced by a specific `ClientServerToSignalMapping` in the role `callSignal`
- `ISignalTriggering` that refers to an `ISignal` that in turn refers to a `SystemSignal` that is referenced by the same `ClientServerToSignalMapping` in the role `returnSignal`



shall exist, if the respective `ISignalTriggerings` are not referenced by a `SomeipTpConnection` in the role `tpConcurrentProcessingSdu`]

**[constr\_5274] `ISignalTriggerings` that represent the `callSignal` and `returnSignal` of the same `ClientServerOperation` on a `PhysicalChannel` shall be referenced by the same `ClientServerToSignalMapping`**

*Imposition time:* CP: IT\_SysDesc

[If on an `EthernetPhysicalChannel` an `ISignalTriggering` that refers to an `ISignal` that in turn refers to a `SystemSignal` that is referenced by a specific `ClientServerToSignalMapping` in the role `callSignal` is defined, then another `ISignalTriggering` shall be aggregated by the same `EthernetPhysicalChannel` and that `ISignalTriggering` shall refer to an `ISignal` that in turn refers to a `SystemSignal` that is referenced by the same `ClientServerToSignalMapping` in the role `returnSignal`, and vice versa.]

**[constr\_5306] Restriction of `DltLogChannel.logChannelId` attribute value**

*Imposition time:* CP: IT\_SysDesc

[The `DltLogChannel.logChannelId` attribute value shall be composed of maximum four ASCII characters.]

**[constr\_5307] Existence of `DltLogChannel.logChannelId`**

*Imposition time:* CP: IT\_SysDesc

[For each `DltLogChannel`, the attribute `logChannelId` shall be defined.]

**[constr\_5308] Existence of `DltLogChannel.nonVerboseMode`**

*Imposition time:* CP: IT\_SysDesc

[For each `DltLogChannel`, the attribute `nonVerboseMode` shall be defined.]

**[constr\_5309] Existence of `DltConfig.sessionIdSupport`**

*Imposition time:* CP: IT\_SysDesc

[For each `DltConfig`, the attribute `sessionIdSupport` shall be defined.]

**[constr\_5310] Existence of `DltConfig.timestampSupport`**

*Imposition time:* CP: IT\_SysDesc

[For each `DltConfig`, the attribute `timestampSupport` shall be defined.]

**[constr\_5311] Existence of `DltLogChannel.logTraceDefaultLogThreshold`**

*Imposition time:* CP: IT\_SysDesc

[For each `DltLogChannel`, the attribute `logTraceDefaultLogThreshold` shall be defined.]



**[constr\_5312] Existence of `DltLogChannel.defaultTraceState`***Imposition time:* CP: IT\_SysDesc

[For each `DltLogChannel`, the attribute `defaultTraceState` shall be defined.]

**[constr\_5313] Existence of `DltLogChannel.txPduTriggering`***Imposition time:* CP: IT\_SysDesc

[For each `DltLogChannel`, the reference to `PduTriggering` in the role `txPduTriggering` shall be defined.]

**[constr\_5314] `DltLogChannel.txPduTriggering` and `rxPduTriggering` shall be on the same network***Imposition time:* CP: IT\_SysDesc

[The `PduTriggerings` that are referenced by a `DltLogChannel` in the role `txPduTriggering` and `rxPduTriggering` shall be aggregated by the same `PhysicalChannel`.]

**[constr\_5315] `FlexrayArTpConnections` within the same `FlexrayArTpChannel` not allowed to have the same address information***Imposition time:* CP: IT\_SysDesc

[`FlexrayArTpConnections` that are aggregated by the same or reverse `FlexrayArTpChannel` are not allowed to reference the same pair of `FlexrayArTpNodes`.]

**[constr\_5319] TCP endpoint using `TLS_SERVER` role can only serve provided service instances***Imposition time:* CP: IT\_SysDesc

[An `ApplicationEndpoint` that refers to `TlsCryptoServiceMapping` with category `TLS_SERVER` in the role `tlsCryptoMapping` is only allowed to be referenced by `ProvidedServiceInstances` in the role `localUnicastAddress` in case that the `ProvidedServiceInstance` does not have a `remoteUnicastAddress` defined.]

**[constr\_5320] TCP endpoint using `TLS_CLIENT` role can only serve consumed service instances***Imposition time:* CP: IT\_SysDesc

[An `ApplicationEndpoint` that refers to `TlsCryptoServiceMapping` with category `TLS_CLIENT` in the role `tlsCryptoMapping` is only allowed to be referenced by `ConsumedServiceInstances` in the role `localUnicastAddress` in case that the `ConsumedServiceInstance` does not have a `remoteUnicastAddress` defined.]

**[constr\_5321] Value range of `Pdu.length`***Imposition time:* CP: IT\_SysDesc

[The value of `Pdu.length` shall be in the range of 0..4294967295 Bytes.]

**[constr\_5322] Value range of `ISignalToIPduMapping.startPosition`***Imposition time:* CP: IT\_SysDesc

[The value of `ISignalToIPduMapping.startPosition` shall be in the range of 0..4294967295 Bits.]

**[constr\_5323] Value range of `ISignalToIPduMapping.updateIndicationBitPosition`***Imposition time:* CP: IT\_SysDesc

[The value of `ISignalToIPduMapping.updateIndicationBitPosition` shall be in the range of 0..4294967295 Bits.]

**[constr\_5326] Each local `SocketAddress` of an `EcuInstance` shall reference an `EthernetCommunicationConnector` in the role `connector` or `multicastConnector`***Imposition time:* CP: IT\_SysDesc

[If an `EcuInstance` uses a `SocketAddress` as local address, the `SocketAddress` shall refer to an `EthernetCommunicationConnector` of the `EcuInstance`, either via `SocketAddress.connector` if the `SocketAddress` represents a unicast address, or via `SocketAddress.multicastConnector` if the `SocketAddress` represents a multicast address.]

**[constr\_5327] Existence of attribute `CpSoftwareCluster.category`***Imposition time:* CP: IT\_SwCluSysDesc

[For each `CpSoftwareCluster`, attribute `category` shall exist.]

**[constr\_5328] Ecu Extract shall only contain outerPort `DataMappings`***Imposition time:* CP: IT\_EcuExt

[The System with category `ECU_EXTRACT` shall only contain `DataMappings` for `VariableDataPrototypes`, `ClientServerOperations` or `Triggers` that are referenced in the context of a `PortPrototype` of the `SwComponentType` that in turn is referenced by the `RootSwCompositionPrototype`.]

**[constr\_5329] `SynchronousServerCallPoints` for cross cluster communication are not supported***Imposition time:* CP: IT\_SwCluSysDesc

[A `ClientServerOperation` in the context of `PortPrototype` which is referenced by a `PortElementToCommunicationResourceMapping` in the role `clientServerOperation` is not allowed

- to be referenced by a `SynchronousServerCallPoint.operation` or
- to be connected to another `ClientServerOperation` in the context of a `PortPrototype` that in turn is referenced by `SynchronousServerCallPoint.operation`

]

**[constr\_5330] ServiceInterface elements shall belong to exactly one ServiceInterface**

*Imposition time:* CP: IT\_SysDesc

[If an element like

- a `VariableDataPrototype` that represents a `ServiceInterface` event
- a `ClientServerOperation` that represents a `ServiceInterface` method
- a `Collection` with `collectionSemantics` `SO_SERVICE_FIELD` that represents a `ServiceInterface` field
- a `Collection` with `collectionSemantics` `SO_SERVICE_FIRE_AND_FORGET_METHOD` that represents a "fire & forget" method

is referenced in the role `element` by a `Collection` that has the `collectionSemantics` set to `SO_SERVICE_INTERFACE` then this element shall not be referenced by any other `Collection` element that has the `collectionSemantics` `SO_SERVICE_INTERFACE` in the scope of the `System`.]

**[constr\_5331] No IP multicast in case of TCP**

*Imposition time:* CP: IT\_SysDesc

[The `ApplicationEndpoint` that is referenced in the role `eventMulticastAddress` from an `EventHandler` is only allowed to aggregate `UdpTp` in the role `tpConfiguration`.]

**[constr\_5334] Supported values for `CryptoServiceKey.length`**

*Imposition time:* CP: IT\_SysDesc

[The values defined for `CryptoServiceKey.length` shall be multiple of 8.]

**[constr\_5335] `CpSoftwareCluster.softwareClusterId` shall be unique in the scope of an `EcuInstance`**

*Imposition time:* CP: IT\_SwCluSysDesc

[The `softwareClusterId` shall be unique for each `CpSoftwareCluster` that is mapped to the same `EcuInstance` with the `CpSoftwareClusterToEcuInstanceMapping`.]

**[constr\_5336] Existence of `CpSoftwareCluster.softwareClusterId`**

*Imposition time:* CP: IT\_SwCluSysDesc

[For each `CpSoftwareCluster`, attribute `softwareClusterId` shall exist.]

**[constr\_5337]** All **CpSoftwareClusterToEcuInstanceMappings** that are referencing the same **EcuInstance** shall define the same **machineId**

*Imposition time:* CP: IT\_SysDesc

[All **CpSoftwareClusterToEcuInstanceMappings** that define a **machineId** and are referencing the same **EcuInstance** in the role **ecuInstance** shall have the same **CpSoftwareClusterToEcuInstanceMapping.machineId** value set.]

**[constr\_5344]** Applicable **transferProperty** for **GroupSignal** and **ISignalGroup**

*Imposition time:* CP: IT\_SysDesc

<b>transferProperty</b> on <b>ISignalGroup</b>	<b>transferProperty</b> on <b>Group Signals</b>	<b>Semantic</b>
• not set	Not set or <b>pending</b> for all Group Signals	Update of the Signal Group and update of Group Signals will not trigger transmission of the <b>ISignalIPdu</b> .
	Subset of Group Signals has <b>transferProperty</b> set to either <b>triggered</b> or <b>triggeredWithoutRepetition</b> and the other Group Signals have <b>transferProperty</b> either not set or set to <b>pending</b> .	Update of Signal Group marks the <b>ISignalIPdu</b> for transmission.
	Subset of Group Signals has <b>transferProperty</b> set to either <b>triggeredOnChange</b> or <b>triggeredOnChangeWithoutRepetition</b> and the other Group Signals have <b>transferProperty</b> either not set or set to <b>pending</b> .	Update of Signal Group and change of a Group Signal that has <b>transferProperty</b> set to <b>triggeredOnChange</b> or <b>triggeredOnChangeWithoutRepetition</b> causes immediate transmission of the <b>ISignalIPdu</b> .
• <b>pending</b>	Not set or <b>pending</b> for all Group Signals	Update of the Signal Group and update of Group Signals will not trigger transmission of the <b>ISignalIPdu</b> . See [TPS_SYST_02199].
• <b>triggered</b> • <b>triggeredWithoutRepetition</b>	Not set or <b>pending</b> for all Group Signals	Update of the Signal Group marks the <b>ISignalIPdu</b> for transmission. See [TPS_SYST_02199].
	Subset of Group Signals has <b>transferProperty</b> set to either <b>triggered</b> or <b>triggeredWithoutRepetition</b> and the other Group Signals have <b>transferProperty</b> either not set or set to <b>pending</b> .	Update of Signal Group marks the <b>ISignalIPdu</b> for transmission. See [TPS_SYST_02200].
• <b>triggeredOnChange</b> • <b>triggeredOnChangeWithoutRepetition</b>	Not set or <b>pending</b> for all Group Signals	Update of Signal Group causes immediate transmission of the <b>ISignalIPdu</b> . See [TPS_SYST_02199].





	Subset of Group Signals has transfer Property set to either <code>triggeredOnChange</code> or <code>triggeredOnChangeWithoutRepetition</code> and the other Group Signals have <code>transferProperty</code> either not set or set to <code>pending</code> .	Update of Signal Group and change of a Group Signal that has <code>transferProperty</code> set to <code>triggeredOnChange</code> or <code>triggeredOnChangeWithoutRepetition</code> causes immediate transmission of the <code>ISignalIPdu</code> . See [TPS_SYST_02200].
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If the `ISignalToIPduMapping` refers to an `ISignalGroup` in the role `iSignalGroup` and the `ISignalIPdu` has an `EventControlledTiming` aggregated at the `TransmissionModeTiming` then combinations of `transferProperty` attribute settings for the `ISignalGroup` and the included `ISignals` are supported as defined in this table.

]

**[constr\_5359] `CpSoftwareClusterBinaryManifestDescriptor.softwareClusterId` shall be identical to `CpSoftwareCluster.softwareClusterId`**

*Imposition time:* CP: IT\_BinObjMetaData

[The `CpSoftwareClusterBinaryManifestDescriptor.softwareClusterId` shall be identical to `CpSoftwareCluster.softwareClusterId` in case that the `softwareClusterId` is set in the `CpSoftwareCluster` that is referenced via `CpSoftwareClusterBinaryManifestDescriptor.cpSoftwareCluster`.]

**[constr\_5360] Cross cluster communication involving `NvBlockSwComponentType` is not supported**

*Imposition time:* CP: IT\_SwCluSysDesc

[A `PortElementToCommunicationResourceMapping` that is referencing a `CpSoftwareClusterCommunicationResource` in the role `communicationResource` is not allowed to reference:

- a `VariableDataPrototype` in the role `variableDataPrototype` that is defined in the context of a `PortPrototype` of a `NvBlockSwComponentType` typed by a `NvDataInterface` or
- a `VariableDataPrototype` in the role `variableDataPrototype` which is connected to another `VariableDataPrototype` that is defined in the context of a `PortPrototype` of a `NvBlockSwComponentType` and typed by a `NvDataInterface` or
- a `ClientServerOperation` in the role `clientServerOperation` that is defined in the context of a `PortPrototype` of a `NvBlockSwComponentType` typed by a `ClientServerInterface` or
- a `ClientServerOperation` in the role `clientServerOperation` which is connected to another `ClientServerOperation` that is defined in the context of a `PortPrototype` of a `NvBlockSwComponentType` typed by a `ClientServerInterface`

]

**[constr\_5361] MACsec configuration is allowed only on switch ports**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[Only a `CouplingElement` with `couplingType` set to `switch` is allowed to aggregate a `CouplingPort` that in turn aggregates the `MacSecProps` in the role `macSecProps`.]

**[constr\_5362] Relation between `ContainerIPdu` and contained `PduTriggerings` on sender side**

*Imposition time:* CP: IT\_SysDesc

[In the scope of one `EcuInstance`, if a `PduTriggering` has a reference to an `IPduPort` where attribute `communicationDirection` is set to the value `out`, then that `PduTriggering` shall only be referenced at most once by any of

- `ContainerIPdu.containedPduTriggering`
- `ContainerIPdu.containedIPduTriggeringProps.containedPduTriggering`.

]

**[constr\_5369] Consistency between `SwcToApplicationPartitionMapping` and `CpSoftwareClusterToApplicationPartitionMapping`**

*Imposition time:* CP: IT\_SwCluSysDesc

[If a `CpSoftwareClusterToApplicationPartitionMapping` exists between a `CpSoftwareCluster` and an `ApplicationPartition`, then all `SwComponentPrototypes` mapped to that `ApplicationPartition` by `SwcToApplicationPartitionMapping` shall be assigned to this `CpSoftwareCluster` (via `CpSoftwareCluster.swComponentAssignment` or `CpSoftwareCluster.swComposition`).]

**[constr\_5370] Restriction for `SystemSignalToCommunicationResourceMapping` in case a `DataMapping` is defined for the mapped `SystemSignal`**

*Imposition time:* CP: IT\_SwCluSysDesc

[If a `DataMapping` to a `SystemSignal` exists for the port element (e.g. `VariableDataPrototype`, `ClientServerOperation`) that is mapped by the `PortElementToCommunicationResourceMapping` to a `CpSoftwareClusterCommunicationResource` and a `SystemSignalToCommunicationResourceMapping` exists for the same `SystemSignal` then the `SystemSignalToCommunicationResourceMapping` shall map this `SystemSignal` to the same `CpSoftwareClusterCommunicationResource`.]

**[constr\_5371] Restriction for `SystemSignalGroupToCommunicationResourceMapping` in case a `DataMapping` is defined for the mapped `SystemSignalGroup`**

*Imposition time:* CP: IT\_SwCluSysDesc

[If a `SenderReceiverToSignalGroupMapping` to a `SystemSignalGroup` exists for the `VariableDataPrototype` that is mapped by the `PortElementToCommunicationResourceMapping` to a `CpSoftwareClusterCommunicationResource` and a `SystemSignalGroupToCommunicationResourceMapping` exists for the same `SystemSignalGroup` then the `SystemSignalGroupToCommunicationResourceMapping` shall map this `SystemSignalGroup` to the same `CpSoftwareClusterCommunicationResource`.]

**[constr\_5374] `IPdu` shall only be referenced once from a `FlexrayTpConnection` in the role `directTpSdu` or `reversedTpSdu` on a `FlexrayCluster`**

*Imposition time:* CP: IT\_SysDesc

[Each `IPdu` that is referenced in the role `directTpSdu` or `reversedTpSdu` from a `FlexrayTpConnection` that is aggregated by a `FlexrayTpConfig` that references a `FlexrayCluster` shall not be referenced a second time in the role `directTpSdu` or `reversedTpSdu` from any `FlexrayTpConnection` that is aggregated by a `FlexrayTpConfig` that references the same `FlexrayCluster`.]

**[constr\_5375] `IPdu` shall only be referenced once from a `FlexrayArTpConnection` in the role `directTpSdu` or `reversedTpSdu` on a `FlexrayCluster`**

*Imposition time:* CP: IT\_SysDesc

[Each `IPdu` that is referenced in the role `directTpSdu` or `reversedTpSdu` from a `FlexrayArTpConnection` that is aggregated by a `FlexrayArTpConfig` that references a `FlexrayCluster` shall not be referenced a second time in the role `directTpSdu` or `reversedTpSdu` from any `FlexrayArTpConnection` that is aggregated by a `FlexrayArTpConfig` that references the same `FlexrayCluster`.]

**[constr\_5376] `IPdu` shall only be referenced once from a `CanTpConnection` in the role `tpSdu` on a `CanCluster`**

*Imposition time:* CP: IT\_SysDesc

[Each `IPdu` that is referenced in the role `tpSdu` from a `CanTpConnection` that is aggregated by a `CanTpConfig` that references a `CanCluster` shall not be referenced in the role `tpSdu` from a different `CanTpConnection` that is aggregated by a `CanTpConfig` that references the same `CanCluster`.]

**[constr\_5377] `IPdu` shall only be referenced once from a `LinTpConnection` in the role `linTpNSdu` on a `LinCluster`**

*Imposition time:* CP: IT\_SysDesc

[Each `IPdu` that is referenced in the role `linTpNSdu` from a `LinTpConnection` that is aggregated by a `LinTpConfig` that references a `LinCluster` shall not be refer-



enced in the role `linTpNSdu` from a different `LinTpConnection` that is aggregated by a `LinTpConfig` that references the same `LinCluster`.]

**[constr\_5378] `PduTriggering` shall only be referenced once from a `SomeipTpConnection` in the role `tpSdu` or `tpConcurrentProcessingSdu`**

*Imposition time:* CP: IT\_SysDesc

[Each `PduTriggering` that is referenced in the role `tpSdu` or `tpConcurrentProcessingSdu` from a `SomeipTpConnection` shall not be referenced in the role `tpSdu` or `tpConcurrentProcessingSdu` from a different `SomeipTpConnection`.]

**[constr\_5379] `IPdu` shall only be referenced once from a `J1939TpPg` in the role `sdu` on a `J1939Cluster`**

*Imposition time:* CP: IT\_SysDesc

[Each `IPdu` that is referenced in the role `sdu` from a `J1939TpPg` that is aggregated by a `J1939TpConfig` that references a `J1939Cluster` shall not be referenced in the role `sdu` from a different `J1939TpPg` that is aggregated by a `J1939TpConfig` that references the same `J1939Cluster`.]

**[constr\_5380] Assignment of the same event `Pdu` to several `EventHandlers` is forbidden in case one of the `EventHandlers` has the `multicastThreshold` set to a value greater than 0 in the context of an `EcuInstance`**

*Imposition time:* CP: IT\_SysDesc

[`SoConIPduIdentifiers` with the same `headerId` shall not be referenced by `PduActivationRoutingGroups` of different `EventHandlers` if

- one or several of these `EventHandlers` has the `multicastThreshold` set to a value > 0 and
- all these `EventHandlers` are aggregated by `ProvidedServiceInstances` that reference `ApplicationEndpoints` with the `localUnicastAddress` reference that in turn are aggregated by `SocketAddresses` which contain a reference to the same `EthernetCommunicationConnector` in the role `connector` (i.e. the `EventHandlers` are located on the same `EcuInstance`).

except for the case that all these `EventHandlers` have the `multicastThreshold` set to the value 1.]

**[constr\_5382] Relation between the value of attributes `offerCyclicDelay` and `serviceOfferTimeToLive` in the context of a `SomeipSdServerServiceInstanceConfig`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[In the context of any given `SomeipSdServerServiceInstanceConfig`, if the value of attribute `offerCyclicDelay` exists, it shall be less or equal to the value of attribute `serviceOfferTimeToLive`.]



**[constr\_5383] Relation between the value of attributes `initialRepetitionsBaseDelay` and `initialRepetitionsMax` and `serviceOfferTimeToLive` in the context of a `SomeipSdServerServiceInstanceConfig`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[In the context of any given `SomeipSdServerServiceInstanceConfig`, if the value of attribute `initialRepetitionsMax` in `initialOfferBehavior` is greater than zero, the value of attribute `serviceOfferTimeToLive` shall be greater or equal to `initialRepetitionsBaseDelay * 2initialRepetitionsMax`.]

**[constr\_5384] Existence of `BusMirrorChannelMapping.mirroringProtocol`**

*Imposition time:* CP: IT\_SysDesc

[For each `BusMirrorChannelMapping`, the attribute `mirroringProtocol` shall exist.]

**[constr\_5385] Reception of `UserData` inside of a `NmPdu` by Applications is not supported**

*Imposition time:* CP: IT\_SysDesc

[A `SystemSignal` that is referenced by an `ISignal` that in turn is mapped via an `ISignalToIPduMapping` into a `NmPdu` shall not be mapped by a `DataMapping` that references a `RPortPrototype` with the `contextPort` reference in the `VariableDataPrototypeInSystemInstanceRef` that the `DataMapping` aggregates.]

**[constr\_5389] Dependency between `globalTimeTxPeriod` and `globalTimePortRole`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The attribute `EthGlobalTimeManagedCouplingPort.globalTimeTxPeriod` shall only be set to a value if the attribute `EthGlobalTimeManagedCouplingPort.globalTimePortRole` is set to `timeMaster` or `dynamic`.]

**[constr\_5390] The `globalTimePortRole` shall not be configured to `timeSlave` several times in the same `GlobalTimeDomain`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[The attribute `globalTimePortRole` shall not be set to `timeSlave` for two or more `EthGlobalTimeManagedCouplingPorts` that are aggregated by the same `GlobalTimeDomain` (via `globalTimeDomainProperty`).]

**[constr\_5393] Existence of `clientId`**

*Imposition time:* CP: IT\_SysDesc

[For each `ClientIdDefinition`, the attribute `clientId` shall exist.]

**[constr\_5394] Existence of `clientServerOperation`***Imposition time:* CP: IT\_SysDesc

[For each `ClientIdDefinition`, the attribute `clientServerOperation` shall exist.]

**[constr\_5395] Existence of `physicalChannel`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[Each `CommunicationCluster` shall aggregate at least one `PhysicalChannel` in the role `physicalChannel`.]

**[constr\_5396] Existence of `ClientIdRange.lowerLimit`***Imposition time:* CP: IT\_SysDesc

[For each `ClientIdRange`, the attribute `lowerLimit` shall exist.]

**[constr\_5397] Existence of `ClientIdRange.upperLimit`***Imposition time:* CP: IT\_SysDesc

[For each `ClientIdRange`, the attribute `upperLimit` shall exist.]

**[constr\_5398] Existence of `CommunicationConnector.commController`***Imposition time:* CP: IT\_SysDesc

[For each `CommunicationConnector`, the reference in the role `commController` shall exist.]

**[constr\_5399] Existence of `ecu`***Imposition time:* CP: IT\_SysDesc

[For each `ECUMapping`, the reference to `HwElement` in the role `ecu` shall exist.]

**[constr\_5400] Existence of `ecuInstance`***Imposition time:* CP: IT\_SysDesc

[For each `ECUMapping`, the reference to `EcuInstance` in the role `ecuInstance` shall exist.]

**[constr\_5401] Existence of `communicationController`***Imposition time:* CP: IT\_SysDesc

[For each `CommunicationControllerMapping`, the reference to `CommunicationController` in the role `communicationController` shall exist.]

**[constr\_5402] Existence of `hwCommunicationController`***Imposition time:* CP: IT\_SysDesc

[For each `CommunicationControllerMapping`, the reference to `HwElement` in the role `hwCommunicationController` shall exist.]

**[constr\_5403] Existence of `communicationConnector`***Imposition time:* CP: IT\_SysDesc

[For each `HwPortMapping`, the reference to `CommunicationConnector` in the role `communicationConnector` shall exist.]

**[constr\_5404] Existence of `hwCommunicationPort`***Imposition time:* CP: IT\_SysDesc

[For each `HwPortMapping`, the reference to `HwPinGroup` in the role `hwCommunicationPort` shall exist.]

**[constr\_5405] Existence of `actionPointOffset`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, the attribute `actionPointOffset` shall exist.]

**[constr\_5406] Existence of `bit`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, the attribute `bit` shall exist.]

**[constr\_5407] Existence of `casRxLowMax`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster` the attribute `casRxLowMax` shall exist.]

**[constr\_5408] Existence of `coldStartAttempts`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, the attribute `coldStartAttempts` shall exist.]

**[constr\_5409] Existence of `cycle`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, the attribute `cycle` shall exist.]

**[constr\_5410] Existence of `cycleCountMax`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, the attribute `cycleCountMax` shall exist.]

**[constr\_5412] Existence of `dynamicSlotIdlePhase`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, the attribute `dynamicSlotIdlePhase` shall exist.]

**[constr\_5414] Existence of `listenNoise`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayCluster`, the attribute `listenNoise` shall exist.]

**[constr\_5415] Existence of `macroPerCycle`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `macroPerCycle` shall exist.]**[constr\_5416] Existence of `macrotickDuration`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `macrotickDuration` shall exist.]**[constr\_5417] Existence of `maxWithoutClockCorrectionFatal`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `maxWithoutClockCorrectionFatal` shall exist.]**[constr\_5418] Existence of `maxWithoutClockCorrectionPassive`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `maxWithoutClockCorrectionPassive` shall exist.]**[constr\_5419] Existence of `minislotActionPointOffset`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `minislotActionPointOffset` shall exist.]**[constr\_5420] Existence of `minislotDuration`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `minislotDuration` shall exist.]**[constr\_5421] Existence of `networkIdleTime`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `networkIdleTime` shall exist.]**[constr\_5422] Existence of `networkManagementVectorLength`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `networkManagementVectorLength` shall exist.]**[constr\_5423] Existence of `numberOfMinislots`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `numberOfMinislots` shall exist.]

**[constr\_5424] Existence of `numberOfStaticSlots`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `numberOfStaticSlots` shall exist.]**[constr\_5425] Existence of `offsetCorrectionStart`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `offsetCorrectionStart` shall exist.]**[constr\_5426] Existence of `payloadLengthStatic`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `payloadLengthStatic` shall exist.]**[constr\_5428] Existence of `staticSlotDuration`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `staticSlotDuration` shall exist.]**[constr\_5429] Existence of `symbolWindow`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `symbolWindow` shall exist.]**[constr\_5431] Existence of `syncFrameIdCountMax`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `syncFrameIdCountMax` shall exist.]**[constr\_5432] Existence of `transmissionStartSequenceDuration`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `transmissionStartSequenceDuration` shall exist.]**[constr\_5433] Existence of `wakeupRxIdle`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `wakeupRxIdle` shall exist.]**[constr\_5434] Existence of `wakeupRxLow`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `wakeupRxLow` shall exist.]**[constr\_5435] Existence of `wakeupRxWindow`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `wakeupRxWindow` shall exist.]

**[constr\_5436] Existence of `wakeupTxActive`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `wakeupTxActive` shall exist.]**[constr\_5437] Existence of `wakeupTxIdle`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `wakeupTxIdle` shall exist.]**[constr\_5438] Existence of `sampleClockPeriod`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayCluster`, the attribute `sampleClockPeriod` shall exist.]**[constr\_5439] Existence of `admitWithoutMessageId`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoConfiguration`, the attribute `admitWithoutMessageId` shall exist.]**[constr\_5440] Existence of `baseCycle`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoConfiguration`, the attribute `baseCycle` shall exist.]**[constr\_5441] Existence of `cycleRepetition`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoConfiguration`, the attribute `cycleRepetition` shall exist.]**[constr\_5442] Existence of `fifoDepth`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoConfiguration`, the attribute `fifoDepth` shall exist.]**[constr\_5443] Existence of `msgIdMask`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoConfiguration`, the attribute `msgIdMask` shall exist.]**[constr\_5444] Existence of `msgIdMatch`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoConfiguration`, the attribute `msgIdMatch` shall exist.]**[constr\_5445] Existence of `fifoRange`***Imposition time:* CP: IT\_SysDesc[Each `FlexrayFifoConfiguration` shall aggregate at least two `FlexrayFifoRanges` in the role `fifoRange`.]

**[constr\_5446] Existence of `rangeMax`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoRange`, the attribute `rangeMax` shall exist.]**[constr\_5447] Existence of `rangeMin`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayFifoRange`, the attribute `rangeMin` shall exist.]**[constr\_5448] Existence of `channelName`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayPhysicalChannel`, the attribute `channelName` shall exist.]**[constr\_5449] `LinCommunicationController.protocolVersion` shall exist***Imposition time:* CP: IT\_SysDesc[The attribute `LinCommunicationController.protocolVersion` shall exist.]**[constr\_5450] Existence of `index`***Imposition time:* CP: IT\_SysDesc[For each `LinOrderedConfigurableFrame`, the attribute shall `index` shall exist.]**[constr\_5451] Existence of `LinOrderedConfigurableFrame.frame` reference***Imposition time:* CP: IT\_SysDesc[For each `LinOrderedConfigurableFrame`, the reference to `LinFrame` in the role `frame` shall exist.]**[constr\_5452] Existence of `LinConfigurableFrame.frame` reference***Imposition time:* CP: IT\_SysDesc[For each `LinConfigurableFrame`, the reference to `LinFrame` in the role `frame` shall exist.]**[constr\_5453] Existence of `macMulticastAddress`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `MacMulticastGroup`, the attribute `macMulticastAddress` shall exist.]**[constr\_5454] Existence of `vlanIdentifier`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `VlanConfig`, the attribute `vlanIdentifier` shall exist.]**[constr\_5455] Existence of `couplingType`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `CouplingElement`, the attribute `couplingType` shall exist.]

**[constr\_5456] Existence of `communicationCluster`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `CouplingElement`, the reference `communicationCluster` shall exist.]**[constr\_5457] Existence of `defaultPriority`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `VlanMembership`, the attribute `defaultPriority` shall exist.]**[constr\_5458] Existence of `vlan`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `VlanMembership`, the reference `vlan` shall exist.]**[constr\_5462] Existence of `ingressPriority`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `EthernetPriorityRegeneration`, the attribute `ingressPriority` shall exist.]**[constr\_5463] Existence of `regeneratedPriority`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `EthernetPriorityRegeneration`, the attribute `regeneratedPriority` shall exist.]**[constr\_5464] Existence of `trafficClass`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `CouplingPortTrafficClassAssignment`, the attribute `trafficClass` shall exist.]**[constr\_5465] Existence of `softwareComposition`***Imposition time:* CP: IT\_SysDesc[For each `RootSwCompositionPrototype`, the reference to `CompositionSwComponentType` in the role `softwareComposition` shall exist.]**[constr\_5466] Existence of `SenderReceiverToSignalMapping.dataElement`***Imposition time:* CP: IT\_EcuExt[For each `SenderReceiverToSignalMapping`, the reference to `VariableDataPrototype` in the role `dataElement` shall exist.]**[constr\_5467] Existence of `SenderReceiverToSignalMapping.systemSignal`***Imposition time:* CP: IT\_EcuExt[For each `SenderReceiverToSignalMapping`, the reference to `SystemSignal` in the role `systemSignal` shall exist.]



**[constr\_5468] Existence of `SenderReceiverToSignalGroupMapping.dataElement`***Imposition time:* CP: IT\_EcuExt

[For each `SenderReceiverToSignalGroupMapping`, the reference to `VariableDataPrototype` in the role `dataElement` shall exist.]

**[constr\_5469] Existence of `SenderReceiverToSignalGroupMapping.signalGroup`***Imposition time:* CP: IT\_EcuExt

[For each `SenderReceiverToSignalGroupMapping`, the reference to `SystemSignalGroup` in the role `signalGroup` shall exist.]

**[constr\_5470] Existence of `SenderReceiverToSignalGroupMapping.typeMapping`***Imposition time:* CP: IT\_EcuExt

[For each `SenderReceiverToSignalGroupMapping`, the aggregation of `SenderRecCompositeTypeMapping` in the role `typeMapping` shall exist.]

**[constr\_5471] Existence of `SenderRecArrayElementMapping.indexedArrayElement`***Imposition time:* CP: IT\_EcuExt

[For each `SenderRecArrayElementMapping`, the aggregation in the role `indexedArrayElement` shall exist.]

**[constr\_5472] Existence of `IndexedArrayElement.index`***Imposition time:* CP: IT\_EcuExt

[For each `IndexedArrayElement`, the attribute `index` shall exist.]

**[constr\_5473] Existence of `ClientServerToSignalMapping.callSignal`***Imposition time:* CP: IT\_EcuExt

[For each `ClientServerToSignalMapping`, the reference to `SystemSignal` in the role `callSignal` shall exist.]

**[constr\_5474] Existence of `ClientServerToSignalMapping.clientServerOperation`***Imposition time:* CP: IT\_EcuExt

[For each `ClientServerToSignalMapping`, the reference to `ClientServerOperation` in the role `clientServerOperation` shall exist.]

**[constr\_5475] Existence of `SenderReceiverCompositeElementToSignalMapping.systemSignal`***Imposition time:* CP: IT\_EcuExt

[For each `SenderReceiverCompositeElementToSignalMapping`, the reference to `SystemSignal` in the role `systemSignal` shall exist.]

**[constr\_5476] Existence of `SenderReceiverCompositeElementToSignalMapping.typeMapping`***Imposition time:* CP: IT\_EcuExt

[For each `SenderReceiverCompositeElementToSignalMapping`, the aggregation of `SenderRecCompositeTypeMapping` in the role `typeMapping` shall exist.]

**[constr\_5477] Existence of `TriggerToSignalMapping.systemSignal`***Imposition time:* CP: IT\_EcuExt

[For each `TriggerToSignalMapping`, the reference to `SystemSignal` in the role `systemSignal` shall exist.]

**[constr\_5478] Existence of `TriggerToSignalMapping.trigger`***Imposition time:* CP: IT\_EcuExt

[For each `TriggerToSignalMapping`, the reference to `Trigger` in the role `trigger` shall exist.]

**[constr\_5479] Existence of `PncMapping.pncIdentifier`***Imposition time:* CP: IT\_SysDesc

[For each `PncMapping`, the attribute `pncIdentifier` shall exist.]

**[constr\_5480] Existence of `EcuResourceEstimation.ecuInstance`***Imposition time:* CP: IT\_SysDesc

[For each `EcuResourceEstimation`, the reference to `EcuInstance` in the role `ecuInstance` shall exist.]

**[constr\_5481] Existence of `SwcToSwcSignal.dataElement`***Imposition time:* CP: IT\_SysDesc

[Each `SwcToSwcSignal` shall reference exactly two `VariableDataPrototypes` in the role `dataElement`.]

**[constr\_5482] Existence of `SwcToSwcOperationArguments.direction`***Imposition time:* CP: IT\_SysDesc

[For each `SwcToSwcOperationArguments`, the attribute `direction` shall exist.]

**[constr\_5483] Existence of `SwcToSwcOperationArguments.operation`***Imposition time:* CP: IT\_SysDesc

[Each `SwcToSwcOperationArguments` element shall reference exactly two `ClientServerOperations` in the role `operation`.]

**[constr\_5484] Existence of `ForbiddenSignalPath.physicalChannel`***Imposition time:* CP: IT\_SysDesc

[For each `ForbiddenSignalPath`, at least one reference to `PhysicalChannel` in the role `physicalChannel` shall exist.]

**[constr\_5485] Existence of `PermissibleSignalPath.physicalChannel`***Imposition time:* CP: IT\_SysDesc

[For each `PermissibleSignalPath`, at least one reference to `PhysicalChannel` in the role `physicalChannel` shall exist.]

**[constr\_5486] Existence of `SwcToEcuMapping.component`***Imposition time:* CP: IT\_SysDesc

[For each `SwcToEcuMapping`, the reference to `SwComponentPrototype` in the role `component` shall exist.]

**[constr\_5487] Existence of `SwcToEcuMapping.ecuInstance`***Imposition time:* CP: IT\_SysDesc

[For each `SwcToEcuMapping` the reference to `EcuInstance` in the role `ecuInstance` shall exist.]

**[constr\_5488] Existence of `SwcToImplMapping.component`***Imposition time:* CP: IT\_EcuExt

[For each `SwcToImplMapping`, the reference to `SwComponentPrototype` in the role `component` shall exist at least once.]

**[constr\_5489] Existence of `SwcToImplMapping.componentImplementation`***Imposition time:* CP: IT\_EcuExt

[For each `SwcToImplMapping`, the reference to `SwImplementation` in the role `componentImplementation` shall exist.]

**[constr\_5491] Existence of `ComponentClustering.clusteredComponent`***Imposition time:* CP: IT\_SysDesc

[For each `ComponentClustering`, at least one reference to `SwComponentPrototype` in the role `clusteredComponent` shall exist.]

**[constr\_5492] Existence of `ComponentSeparation.separatedComponent`***Imposition time:* CP: IT\_SysDesc

[For each `ComponentSeparation` always two references to `SwComponentPrototypes` in the role `separatedComponent` shall exist.]

**[constr\_5493] Existence of `J1939ControllerApplication.functionId`***Imposition time:* CP: IT\_SysDesc

[For each `J1939ControllerApplication`, the attribute `functionId` shall exist.]

**[constr\_5494] Existence of `BusMirrorChannel.busMirrorNetworkId`***Imposition time:* CP: IT\_SysDesc

[For each `BusMirrorChannel`, the attribute `busMirrorNetworkId` shall exist.]

**[constr\_5495] Existence of `BusMirrorCanIdRangeMapping.destinationBaseId`***Imposition time:* CP: IT\_SysDesc

[For each `BusMirrorCanIdRangeMapping`, the attribute `destinationBaseId` shall exist.]

**[constr\_5496] Existence of `BusMirrorCanIdRangeMapping.sourceCanIdCode`***Imposition time:* CP: IT\_SysDesc

[For each `BusMirrorCanIdRangeMapping`, the attribute `sourceCanIdCode` shall exist.]

**[constr\_5497] Existence of `BusMirrorCanIdRangeMapping.sourceCanIdMask`***Imposition time:* CP: IT\_SysDesc

[For each `BusMirrorCanIdRangeMapping`, the attribute `sourceCanIdMask` shall exist.]

**[constr\_5498] Existence of `BusMirrorCanIdToCanIdMapping.remappedCanId`***Imposition time:* CP: IT\_SysDesc

[For each `BusMirrorCanIdToCanIdMapping`, the attribute `remappedCanId` shall exist.]

**[constr\_5499] Existence of `BusMirrorLinPidToCanIdMapping.remappedCanId`***Imposition time:* CP: IT\_SysDesc

[For each `BusMirrorLinPidToCanIdMapping`, the attribute `remappedCanId` shall exist.]

**[constr\_9100] Existence of `CanFrameTriggering.canAddressingMode`***Imposition time:* CP: IT\_SysDesc

[For each `CanFrameTriggering`, the attribute `canAddressingMode` shall exist.]

**[constr\_9101] Existence of `RxIdentifierRange.lowerCanId`***Imposition time:* CP: IT\_SysDesc[For each `RxIdentifierRange`, the attribute `lowerCanId` shall exist.]**[constr\_9102] Existence of `RxIdentifierRange.upperCanId`***Imposition time:* CP: IT\_SysDesc[For each `RxIdentifierRange`, the attribute `upperCanId` shall exist.]**[constr\_9103] Existence of `communicationDirection`***Imposition time:* CP: IT\_SysDesc[For each `CommConnectorPort`, the attribute `communicationDirection` shall exist.]**[constr\_9105] Existence of `DoIpTpConfig.tpConnection`***Imposition time:* CP: IT\_SysDesc[For each `DoIpTpConfig`, the aggregation of at least one `DoIpTpConnection` in the role `tpConnection` shall exist.]**[constr\_9106] Existence of `DoIpTpConnection.doIpSourceAddress`***Imposition time:* CP: IT\_SysDesc[For each `DoIpTpConnection`, the reference to `DoIpLogicAddress` in the role `doIpSourceAddress` shall exist.]**[constr\_9107] Existence of `DoIpTpConnection.doIpTargetAddress`***Imposition time:* CP: IT\_SysDesc[For each `DoIpTpConnection`, the reference to `DoIpLogicAddress` in the role `doIpTargetAddress` shall exist.]**[constr\_9108] Existence of `DoIpTpConnection.tpSdu`***Imposition time:* CP: IT\_SysDesc[For each `DoIpTpConnection`, the reference to `DoIpLogicAddress` in the role `tpSdu` shall exist.]**[constr\_9109] Existence of `IPv6ExtHeaderFilterList.allowedIPv6ExtHeader`***Imposition time:* CP: IT\_SysDesc[For each `IPv6ExtHeaderFilterList`, the attribute `allowedIPv6ExtHeader` shall exist.]**[constr\_9110] Existence of `TcpOptionFilterList.allowedTcpOption`***Imposition time:* CP: IT\_SysDesc[For each `TcpOptionFilterList`, the attribute `allowedTcpOption` shall exist.]

**[constr\_9111] Existence of `ApplicationEndpoint.networkEndpoint`***Imposition time:* CP: IT\_SysDesc

[For each `ApplicationEndpoint`, the reference to `NetworkEndpoint` in the role `networkEndpoint` shall exist.]

**[constr\_9113] Existence of `UdpTp.udpTpPort`***Imposition time:* CP: IT\_SysDesc

[For each `UdpTp`, the aggregation of `TpPort` in the role `udpTpPort` shall exist.]

**[constr\_9114] Existence of `TcpTp.tcpTpPort`***Imposition time:* CP: IT\_SysDesc

[For each `TcpTp`, the aggregation of `TpPort` in the role `tcpTpPort` shall exist.]

**[constr\_9122] Existence of `NetworkEndpoint.networkEndpointAddress`***Imposition time:* CP: IT\_SysDesc

[For each `NetworkEndpoint`, the aggregation of `NetworkEndpointAddress` in the role `networkEndpointAddress` shall exist.]

**[constr\_9123] Existence of `MacMulticastConfiguration.macMulticastGroup`***Imposition time:* CP: IT\_SysDesc

[For each `MacMulticastConfiguration`, the reference to `MacMulticastGroup` in the role `macMulticastGroup` shall exist.]

**[constr\_9124] Existence of `FlexrayFrameTriggering.allowDynamicLSduLength`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayFrameTriggering`, the attribute `allowDynamicLSduLength` shall exist.]

**[constr\_9125] Existence of `FlexrayFrameTriggering.payloadPreambleIndicator`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayFrameTriggering`, the attribute `payloadPreambleIndicator` shall exist.]

**[constr\_9126] Existence of `FlexrayAbsolutelyScheduledTiming.slotID`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayAbsolutelyScheduledTiming`, the attribute `slotID` shall exist.]

**[constr\_9127] Existence of `FlexrayAbsolutelyScheduledTiming.communicationCycle`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayAbsolutelyScheduledTiming`, the aggregation of `CommunicationCycle` in the role `communicationCycle` shall exist.]

**[constr\_9128] Existence of `CycleCounter.CycleCounter`***Imposition time:* CP: IT\_SysDesc

[For each `CycleCounter`, the attribute `CycleCounter` shall exist.]

**[constr\_9129] Existence of `CycleRepetition.BaseCycle`***Imposition time:* CP: IT\_SysDesc

[For each `CycleRepetition`, the attribute `BaseCycle` shall exist.]

**[constr\_9130] Existence of `CycleRepetition.CycleRepetition`***Imposition time:* CP: IT\_SysDesc

[For each `CycleRepetition` the attribute `CycleRepetition` shall exist.]

**[constr\_9131] Existence of `FrameTriggering.frame`***Imposition time:* CP: IT\_SysDesc

[For each `FrameTriggering`, the reference to `Frame` in the role `frame` shall exist.]

**[constr\_9132] Existence of `LinSporadicFrame.substitutedFrame`***Imposition time:* CP: IT\_SysDesc

[For each `LinSporadicFrame`, at least one reference to `LinUnconditionalFrame` in the role `substitutedFrame` shall exist.]

**[constr\_9133] Existence of `LinEventTriggeredFrame.linUnconditionalFrame`***Imposition time:* CP: IT\_SysDesc

[For each `LinEventTriggeredFrame`, at least one reference to `LinUnconditionalFrame` in the role `linUnconditionalFrame` shall exist.]

**[constr\_9134] Existence of `ScheduleTableEntry.delay`***Imposition time:* CP: IT\_SysDesc

[For each `ScheduleTableEntry` the attribute `delay` shall exist.]

**[constr\_9135] Existence of `ScheduleTableEntry.positionInTable`***Imposition time:* CP: IT\_SysDesc

[For each `ScheduleTableEntry`, the attribute `positionInTable` shall exist.]

**[constr\_9136] Existence of `ApplicationEntry.frameTriggering`***Imposition time:* CP: IT\_SysDesc

[For each `ApplicationEntry`, the reference to `FrameTriggering` in the role `frameTriggering` shall exist.]

**[constr\_9137] Existence of `AssignFrameId.assignedFrameTriggering`***Imposition time:* CP: IT\_SysDesc

[For each `AssignFrameId`, the reference to `LinFrameTriggering` in the role `assignedFrameTriggering` shall exist.]

**[constr\_9138] Existence of `UnassignFrameId.unassignedFrameTriggering`***Imposition time:* CP: IT\_SysDesc

[For each `UnassignFrameId`, the reference to `LinFrameTriggering` in the role `unassignedFrameTriggering` shall exist.]

**[constr\_9139] Existence of `AssignFrameIdRange.startIndex`***Imposition time:* CP: IT\_SysDesc

[For each `AssignFrameIdRange`, the attribute `startIndex` shall exist.]

**[constr\_9140] Existence of `FramePid.index`***Imposition time:* CP: IT\_SysDesc

[For each `FramePid`, the attribute `index` shall exist.]

**[constr\_9141] Existence of `FramePid.pid`***Imposition time:* CP: IT\_SysDesc

[For each `FramePid`, the attribute `pid` shall exist.]

**[constr\_9142] Existence of `AssignNad.newNad`***Imposition time:* CP: IT\_SysDesc

[For each `AssignNad`, the attribute `newNad` shall exist.]

**[constr\_9143] Existence of `ConditionalChangeNad.byte`***Imposition time:* CP: IT\_SysDesc

[For each `ConditionalChangeNad`, the attribute `byte` shall exist.]

**[constr\_9144] Existence of `ConditionalChangeNad.id`***Imposition time:* CP: IT\_SysDesc

[For each `ConditionalChangeNad`, the attribute `id` shall exist.]

**[constr\_9145] Existence of `ConditionalChangeNad.invert`***Imposition time:* CP: IT\_SysDesc

[For each `ConditionalChangeNad`, the attribute `invert` shall exist.]



**[constr\_9146] Existence of `ConditionalChangeNad.mask`***Imposition time:* CP: IT\_SysDesc[For each `ConditionalChangeNad`, the attribute `mask` shall exist.]**[constr\_9147] Existence of `ConditionalChangeNad.newNad`***Imposition time:* CP: IT\_SysDesc[For each `ConditionalChangeNad`, the attribute `newNad` shall exist.]**[constr\_9148] Existence of `DataDumpEntry.byteValue`***Imposition time:* CP: IT\_SysDesc[For each `DataDumpEntry`, 5 `byteValues` shall be defined.]**[constr\_9149] Existence of `FreeFormat.byteValue`***Imposition time:* CP: IT\_SysDesc[For each `FreeFormat`, 8 `byteValues` shall be defined.]**[constr\_9150] Existence of `NmEcu.ecuInstance`***Imposition time:* CP: IT\_SysDesc[For each `NmEcu`, the reference to `EcuInstance` in the role `ecuInstance` shall exist.]**[constr\_9151] Existence of `nmDataCycle`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayNmCluster`, the attribute `nmDataCycle` shall exist.]**[constr\_9152] Existence of `nmRemoteSleepIndicationTime`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayNmCluster`, the attribute `nmRemoteSleepIndicationTime` shall exist.]**[constr\_9153] Existence of `nmRepeatMessageTime`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayNmCluster`, the attribute `nmRepeatMessageTime` shall exist.]**[constr\_9154] Existence of `nmRepetitionCycle`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayNmCluster`, the attribute `nmRepetitionCycle` shall exist.]**[constr\_9155] Existence of `nmVotingCycle`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayNmCluster`, the attribute `nmVotingCycle` shall exist.]

**[constr\_9156] Existence of `nmScheduleVariant`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayNmClusterCoupling`, the attribute `nmScheduleVariant` shall exist.]

**[constr\_9157] Existence of `nmBusloadReductionActive`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster`, the attribute `nmBusloadReductionActive` shall exist.]

**[constr\_9158] Existence of `nmImmediateNmTransmissions`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster`, the attribute `nmImmediateNmTransmissions` shall exist.]

**[constr\_9159] Existence of `nmMessageTimeoutTime`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster`, the attribute `nmMessageTimeoutTime` shall exist.]

**[constr\_9160] Existence of `nmMsgCycleTime`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster` the attribute `nmMsgCycleTime` shall exist.]

**[constr\_9161] Existence of `nmNetworkTimeout`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster`, the attribute `nmNetworkTimeout` shall exist.]

**[constr\_9162] Existence of `nmRemoteSleepIndicationTime`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster`, the attribute `nmRemoteSleepIndicationTime` shall exist.]

**[constr\_9163] Existence of `nmRepeatMessageTime`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster`, the attribute `nmRepeatMessageTime` shall exist.]

**[constr\_9164] Existence of `nmWaitBusSleepTime`***Imposition time:* CP: IT\_SysDesc

[For each `CanNmCluster`, the attribute `nmWaitBusSleepTime` shall exist.]

**[constr\_9165] Existence of nmBusloadReductionEnabled***Imposition time:* CP: IT\_SysDesc

[For each `CanNmClusterCoupling`, the attribute `nmBusloadReductionEnabled` shall exist.]

**[constr\_9166] Existence of nmImmediateRestartEnabled***Imposition time:* CP: IT\_SysDesc

[For each `CanNmClusterCoupling`, the attribute `nmImmediateRestartEnabled` shall exist.]

**[constr\_9167] Existence of J1939NodeName.arbitraryAddressCapable***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `arbitraryAddressCapable` shall exist.]

**[constr\_9168] Existence of J1939NodeName.ecuInstance***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `ecuInstance` shall exist.]

**[constr\_9169] Existence of J1939NodeName.function***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `function` shall exist.]

**[constr\_9170] Existence of J1939NodeName.functionInstance***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `functionInstance` shall exist.]

**[constr\_9171] Existence of J1939NodeName.identityNumber***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `identityNumber` shall exist.]

**[constr\_9172] Existence of J1939NodeName.industryGroup***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `industryGroup` shall exist.]

**[constr\_9173] Existence of J1939NodeName.manufacturerCode***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `manufacturerCode` shall exist.]

**[constr\_9174] Existence of J1939NodeName.vehicleSystem***Imposition time:* CP: IT\_SysDesc

[For each `J1939NodeName`, the attribute `vehicleSystem` shall exist.]

**[constr\_9175] Existence of `J1939NodeName.vehicleSystemInstance`***Imposition time:* CP: IT\_SysDesc[For each `J1939NodeName`, the attribute `vehicleSystemInstance` shall exist.]**[constr\_9176] Existence of `StaticPart.iPdu`***Imposition time:* CP: IT\_SysDesc[For each `StaticPart`, the reference to `ISignalIPdu` in role `iPdu` shall exist.]**[constr\_9177] Existence of `DynamicPartAlternative.initialDynamicPart`***Imposition time:* CP: IT\_SysDesc[For each `DynamicPartAlternative`, the attribute `initialDynamicPart` shall exist.]**[constr\_9178] Existence of `DynamicPartAlternative.initialDynamicPart`***Imposition time:* CP: IT\_SysDesc[For each `DynamicPartAlternative` the attribute `initialDynamicPart` shall exist.]**[constr\_9179] Existence of `DynamicPartAlternative.iPdu`***Imposition time:* CP: IT\_SysDesc[For each `DynamicPartAlternative`, the reference to `ISignalIPdu` in role `iPdu` shall exist.]**[constr\_9180] Existence of `DynamicPartAlternative.selectorFieldCode`***Imposition time:* CP: IT\_SysDesc[For each `DynamicPartAlternative`, the attribute `selectorFieldCode` shall exist.]**[constr\_9181] Existence of `MultiplexedPart.segmentPosition`***Imposition time:* CP: IT\_SysDesc[For each `MultiplexedPart` the aggregation of `SegmentPosition` in role `segmentPosition` shall exist.]**[constr\_9182] Existence of `SegmentPosition.segmentByteOrder`***Imposition time:* CP: IT\_SysDesc[For each `SegmentPosition`, the attribute `segmentByteOrder` shall exist.]**[constr\_9183] Existence of `SegmentPosition.segmentLength`***Imposition time:* CP: IT\_SysDesc[For each `SegmentPosition`, the attribute `segmentLength` shall exist.]

**[constr\_9184] Existence of `SegmentPosition.segmentPosition`***Imposition time:* CP: IT\_SysDesc[For each `SegmentPosition`, the attribute `segmentPosition` shall exist.]**[constr\_9185] Existence of `TransmissionModeCondition.dataFilter`***Imposition time:* CP: IT\_SysDesc[For each `TransmissionModeCondition`, the aggregation of `DataFilter` in the role `dataFilter` shall exist.]**[constr\_9186] Existence of `TransmissionModeCondition.iSignalInIPdu`***Imposition time:* CP: IT\_SysDesc[For each `TransmissionModeCondition`, the reference to `ISignalToIPduMapping` in the role `iSignalInIPdu` shall exist.]**[constr\_9187] Existence of `ModeDrivenTransmissionModeCondition.modeDeclaration`***Imposition time:* CP: IT\_SysDesc[For each `ModeDrivenTransmissionModeCondition`, the reference to `ModeDeclaration` in the role `modeDeclaration` shall exist.]**[constr\_9188] Existence of `ModeDrivenTransmissionModeCondition.timePeriod`***Imposition time:* CP: IT\_SysDesc[For each `CyclicTiming`, the aggregation of `TimeRangeType` in the role `timePeriod` shall exist.]**[constr\_9189] Existence of `EventControlledTiming.numberOfRepetitions`***Imposition time:* CP: IT\_SysDesc[For each `EventControlledTiming`, the attribute `numberOfRepetitions` shall exist.]**[constr\_9190] Existence of `TimeRangeType.value`***Imposition time:* CP: IT\_SysDesc[For each `TimeRangeType`, the attribute `value` shall exist.]**[constr\_9191] Existence of `RelativeTolerance.relative`***Imposition time:* CP: IT\_SysDesc[For each `RelativeTolerance`, the attribute `relative` shall exist.]**[constr\_9192] Existence of `AbsoluteTolerance.absolute`***Imposition time:* CP: IT\_SysDesc[For each `AbsoluteTolerance`, the attribute `absolute` shall exist.]

**[constr\_9193] Existence of `TriggerIPduSendCondition.modeDeclaration`***Imposition time:* CP: IT\_SysDesc

[For each `TriggerIPduSendCondition`, the reference to `ModeDeclaration` in role `modeDeclaration` shall exist.]

**[constr\_9194] Existence of `DcmIPdu.diagPduType`***Imposition time:* CP: IT\_SysDesc

[For each `DcmIPdu`, the attribute `diagPduType` shall exist.]

**[constr\_9195] Existence of `PduToFrameMapping.packingByteOrder`***Imposition time:* CP: IT\_SysDesc

[For each `PduToFrameMapping`, the attribute `packingByteOrder` shall exist.]

**[constr\_9196] Existence of `PduToFrameMapping.startPosition`***Imposition time:* CP: IT\_SysDesc

[For each `PduToFrameMapping`, the attribute `startPosition` shall exist.]

**[constr\_9197] Existence of `PduToFrameMapping.pdu`***Imposition time:* CP: IT\_SysDesc

[For each `PduToFrameMapping`, the reference to `Pdu` in the role `pdu` shall exist.]

**[constr\_9198] Existence of `PduTriggering.iPdu`***Imposition time:* CP: IT\_SysDesc

[For each `PduTriggering`, the reference to `Pdu` in the role `iPdu` shall exist.]

**[constr\_9199] Existence of `ISignalIPduGroup.communicationDirection`***Imposition time:* CP: IT\_SysDesc

[For each `ISignalIPduGroup`, the attribute `communicationDirection` shall exist.]

**[constr\_9200] Existence of `ContainerIPdu.headerType`***Imposition time:* CP: IT\_SysDesc

[For each `ContainerIPdu` the attribute `headerType` shall exist.]

**[constr\_9201] Existence of `ContainerIPdu.rxAcceptContainedIPdu`***Imposition time:* CP: IT\_SysDesc

[For each `ContainerIPdu` the attribute `rxAcceptContainedIPdu` shall exist.]

**[constr\_9202] Existence of `ContainedIPduProps.collectionSemantics`***Imposition time:* CP: IT\_SysDesc

[For each `ContainedIPduProps` the attribute `collectionSemantics` shall exist.]

**[constr\_9203] Existence of SecuredIPdu.payload***Imposition time:* CP: IT\_SysDesc

[For each SecuredIPdu, the reference to PduTriggering in the role payload shall exist.]

**[constr\_9204] Existence of SecuredIPdu.secureCommunicationProps***Imposition time:* CP: IT\_SysDesc

[For each SecuredIPdu the aggregation of SecureCommunicationProps in the role secureCommunicationProps, shall exist.]

**[constr\_9205] Existence of SecureCommunicationProps.dataId***Imposition time:* CP: IT\_SysDesc

[For each SecureCommunicationProps, the attribute dataId shall exist.]

**[constr\_9206] Existence of CryptoServiceKey.length***Imposition time:* CP: IT\_SysDesc

[For each CryptoServiceKey, the attribute length shall exist.]

**[constr\_9210] Existence of InitialSdDelayConfig.initialDelayMaxValue aggregated by SomeipSdClientServiceInstanceConfig***Imposition time:* CP: IT\_SysDesc

[For each InitialSdDelayConfig that is aggregated by a SomeipSdClientServiceInstanceConfig in the role initialFindBehavior, the attribute initialDelayMaxValue shall exist.]

**[constr\_9211] Existence of InitialSdDelayConfig.initialDelayMinValue aggregated by SomeipSdClientServiceInstanceConfig***Imposition time:* CP: IT\_SysDesc

[For each InitialSdDelayConfig that is aggregated by a SomeipSdClientServiceInstanceConfig in the role initialFindBehavior, the attribute initialDelayMinValue shall exist.]

**[constr\_9212] Existence of SomeipSdClientEventGroupTimingConfig.timeToLive***Imposition time:* CP: IT\_SysDesc

[For each SomeipSdClientEventGroupTimingConfig, the attribute timeToLive shall exist.]

**[constr\_9213] Existence of `RequestResponseDelay.minValue` aggregated by `SomeipSdClientEventGroupTimingConfig`***Imposition time:* CP: IT\_SysDesc

[For each `RequestResponseDelay` that is aggregated by a `SomeipSdClientEventGroupTimingConfig` in the role `requestResponseDelay`, the attribute `minValue` shall exist.]

**[constr\_9214] Existence of `RequestResponseDelay.maxValue` aggregated by `SomeipSdClientEventGroupTimingConfig`***Imposition time:* CP: IT\_SysDesc

[For each `RequestResponseDelay` that is aggregated by a `SomeipSdClientEventGroupTimingConfig` in the role `requestResponseDelay`, the attribute `maxValue` shall exist.]

**[constr\_9215] Existence of `InitialSdDelayConfig.initialDelayMaxValue` aggregated by `SomeipSdServerServiceInstanceConfig`***Imposition time:* CP: IT\_SysDesc

[For each `InitialSdDelayConfig` that is aggregated by a `SomeipSdServerServiceInstanceConfig` in the role `initialOfferBehavior`, the attribute `initialDelayMaxValue` shall exist.]

**[constr\_9216] Existence of `InitialSdDelayConfig.initialDelayMinValue` aggregated by `SomeipSdServerServiceInstanceConfig`***Imposition time:* CP: IT\_SysDesc

[For each `InitialSdDelayConfig` that is aggregated by a `SomeipSdServerServiceInstanceConfig` in the role `initialOfferBehavior`, the attribute `initialDelayMinValue` shall exist.]

**[constr\_9217] Existence of `SomeipSdServerServiceInstanceConfig.serviceOfferTimeToLive`***Imposition time:* CP: IT\_SysDesc

[For each `SomeipSdServerServiceInstanceConfig`, the attribute `serviceOfferTimeToLive` shall exist.]

**[constr\_9218] Existence of `RequestResponseDelay.minValue` aggregated by `SomeipSdServerServiceInstanceConfig`***Imposition time:* CP: IT\_SysDesc

[For each `RequestResponseDelay` that is aggregated by a `SomeipSdServerServiceInstanceConfig` in the role `requestResponseDelay`, the attribute `minValue` shall exist.]



**[constr\_9219] Existence of `RequestResponseDelay.maxValue` aggregated by `SomeipSdServerServiceInstanceConfig`***Imposition time:* CP: IT\_SysDesc

[For each `RequestResponseDelay` that is aggregated by a `SomeipSdServerServiceInstanceConfig` in the role `requestResponseDelay`, the attribute `maxValue` shall exist.]

**[constr\_9220] Existence of `RequestResponseDelay.minValue` aggregated by `SomeipSdServerEventGroupTimingConfig`***Imposition time:* CP: IT\_SysDesc

[For each `RequestResponseDelay` that is aggregated by a `SomeipSdServerEventGroupTimingConfig` in the role `requestResponseDelay`, the attribute `minValue` shall exist.]

**[constr\_9221] Existence of `RequestResponseDelay.maxValue` aggregated by `SomeipSdServerEventGroupTimingConfig`***Imposition time:* CP: IT\_SysDesc

[For each `RequestResponseDelay` that is aggregated by a `SomeipSdServerEventGroupTimingConfig` in the role `requestResponseDelay`, the attribute `maxValue` shall exist.]

**[constr\_9222] Existence of `ISignal.dataTypePolicy`***Imposition time:* CP: IT\_SysDesc

[For each `ISignal`, the attribute `dataTypePolicy` shall exist.]

**[constr\_9223] Existence of `ISignal.length`***Imposition time:* CP: IT\_SysDesc

[For each `ISignal`, the attribute `length` shall exist.]

**[constr\_9224] Existence of `ISignal.systemSignal`***Imposition time:* CP: IT\_SysDesc

[For each `ISignal`, the reference to `SystemSignal` in the role `systemSignal` shall exist.]

**[constr\_9225] Existence of `ISignalGroup.systemSignalGroup`***Imposition time:* CP: IT\_SysDesc

[For each `ISignalGroup`, the reference to `SystemSignalGroup` in the role `systemSignalGroup` shall exist.]

**[constr\_9226] Existence of `TpConfig.communicationCluster`***Imposition time:* CP: IT\_SysDesc

[For each `TpConfig`, the reference to `CommunicationCluster` in the role `communicationCluster` shall exist.]

**[constr\_9227] Existence of `TpAddress.tpAddress`***Imposition time:* CP: IT\_SysDesc[For each `TpAddress`, the attribute `tpAddress` shall exist.]**[constr\_9228] Existence of `FlexrayTpConfig.pduPool`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpConfig`, the aggregation of `FlexrayTpPduPool` in the role `pduPool` shall exist at least once.]**[constr\_9229] Existence of `FlexrayTpConfig.tpAddress`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpConfig`, the aggregation of `TpAddress` in the role `tpAddress` shall exist at least once.]**[constr\_9230] Existence of `FlexrayTpConfig.tpEcu`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpConfig`, the aggregation of `FlexrayTpEcu` in the role `tpEcu` shall exist at least once.]**[constr\_9231] Existence of `FlexrayTpConnection.directTpSdu`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpConnection`, the reference to `IPdu` in the role `directTpSdu` shall exist.]**[constr\_9233] Existence of `FlexrayTpConnection.receiver`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpConnection`, the reference to `FlexrayTpNode` in the role `receiver` shall exist at least once.]**[constr\_9234] Existence of `FlexrayTpConnection.tpConnectionControl`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpConnection`, the reference to `FlexrayTpConnectionControl` in the role `tpConnectionControl` shall exist.]**[constr\_9235] Existence of `FlexrayTpConnection.transmitter`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpConnection`, the reference to `FlexrayTpNode` in the role `transmitter` shall exist.]**[constr\_9236] Existence of `FlexrayTpEcu.ecuInstance`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpEcu`, the reference to `EcuInstance` in the role `ecuInstance` shall exist.]

**[constr\_9237] Existence of `FlexrayTpEcu.fullDuplexEnabled`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayTpEcu`, the attribute `fullDuplexEnabled` shall exist.]**[constr\_9238] Existence of `FlexrayArTpChannel.ackType`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpChannel`, the attribute `ackType` shall exist.]**[constr\_9239] Existence of `FlexrayArTpChannel.extendedAddressing`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpChannel`, the attribute `extendedAddressing` shall exist.]**[constr\_9240] Existence of `FlexrayArTpChannel.maximumMessageLength`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpChannel`, the attribute `maximumMessageLength` shall exist.]**[constr\_9241] Existence of `FlexrayArTpChannel.minimumSeparationTime`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpChannel`, the attribute `minimumSeparationTime` shall exist.]**[constr\_9242] Existence of `FlexrayArTpChannel.multicastSegmentation`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpChannel`, the attribute `multicastSegmentation` shall exist.]**[constr\_9243] Existence of `FlexrayArTpChannel.tpConnection`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpChannel`, the aggregation of `FlexrayArTpConnection` in the role `tpConnection` shall exist at least once.]**[constr\_9244] Existence of `FlexrayArTpConnection.directTpSdu`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpConnection`, the reference to `IPdu` in the role `directTpSdu` shall exist.]**[constr\_9245] Existence of `FlexrayArTpConnection.source`***Imposition time:* CP: IT\_SysDesc[For each `FlexrayArTpConnection`, the reference to `FlexrayArTpNode` in the role `source` shall exist.]

**[constr\_9246] Existence of `FlexrayArTpConnection.target`***Imposition time:* CP: IT\_SysDesc

[For each `FlexrayArTpConnection`, at least one reference to `FlexrayArTpNode` in the role `target` shall exist.]

**[constr\_9247] Existence of `CanTpConfig.tpAddress`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConfig`, the aggregation of `CanTpAddress` in the role `tpAddress` shall exist at least once.]

**[constr\_9248] Existence of `CanTpConfig.tpChannel`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConfig`, the aggregation of `CanTpChannel` in the role `tpChannel` shall exist at least once.]

**[constr\_9249] Existence of `CanTpConfig.tpConnection`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConfig`, the aggregation of `CanTpConnection` in the role `tpConnection` shall exist at least once.]

**[constr\_9250] Existence of `CanTpConfig.tpEcu`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConfig`, the aggregation of `CanTpEcu` in the role `tpEcu` shall exist at least once.]

**[constr\_9251] Existence of `CanTpConfig.tpNode`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConfig`, the aggregation of `CanTpNode` in the role `tpNode` shall exist at least once.]

**[constr\_9252] Existence of `CanTpConnection.addressingFormat`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConnection`, the attribute `addressingFormat` shall exist.]

**[constr\_9253] Existence of `CanTpConnection.canTpChannel`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConnection`, the reference to `CanTpChannel` in the role `canTpChannel` shall exist.]

**[constr\_9254] Existence of `CanTpConnection.dataPdu`***Imposition time:* CP: IT\_SysDesc

[For each `CanTpConnection`, the reference to `NPdu` in the role `dataPdu` shall exist.]

**[constr\_9255] Existence of [CanTpConnection.paddingActivation](#)***Imposition time:* CP: IT\_SysDesc[For each [CanTpConnection](#), the attribute [paddingActivation](#) shall exist.]**[constr\_9256] Existence of [CanTpConnection.tpSdu](#)***Imposition time:* CP: IT\_SysDesc[For each [CanTpConnection](#), the reference to [IPdu](#) in the role [tpSdu](#) shall exist.]**[constr\_9257] Existence of [CanTpAddress.tpAddress](#)***Imposition time:* CP: IT\_SysDesc[For each [CanTpAddress](#), the attribute [tpAddress](#) shall exist.]**[constr\_9258] Existence of [CanTpEcu.ecuInstance](#)***Imposition time:* CP: IT\_SysDesc[For each [CanTpEcu](#), the attribute [ecuInstance](#) shall exist.]**[constr\_9259] Existence of [LinTpConfig.tpAddress](#)***Imposition time:* CP: IT\_SysDesc[For each [LinTpConfig](#), at least one [TpAddress](#) shall be aggregated by [LinTpConfig](#) in the role [tpAddress](#).]**[constr\_9260] Existence of [LinTpConnection.dataPdu](#)***Imposition time:* CP: IT\_SysDesc[For each [LinTpConnection](#), the reference to [NPdu](#) in the role [dataPdu](#) shall exist.]**[constr\_9261] Existence of [LinTpConnection.linTpNSdu](#)***Imposition time:* CP: IT\_SysDesc[For each [LinTpConnection](#), the reference to [IPdu](#) in the role [linTpNSdu](#) shall exist.]**[constr\_9262] Existence of [LinTpConnection.receiver](#)***Imposition time:* CP: IT\_SysDesc[For each [LinTpConnection](#), at least one reference to [LinTpNode](#) in the role [receiver](#) shall exist.]**[constr\_9263] Existence of [LinTpConnection.transmitter](#)***Imposition time:* CP: IT\_SysDesc[For each [LinTpConnection](#), the reference to [LinTpNode](#) in the role [transmitter](#) shall exist.]

**[constr\_9264] Existence of J1939TpConfig.tpAddress***Imposition time:* CP: IT\_SysDesc

[For each J1939TpConfig, at least one TpAddress shall be aggregated in the role tpAddress.]

**[constr\_9265] Existence of J1939TpConfig.tpConnection***Imposition time:* CP: IT\_SysDesc

[For each J1939TpConfig, at least one J1939TpConnection shall be aggregated in the role tpConnection.]

**[constr\_9266] Existence of J1939TpConfig.tpNode***Imposition time:* CP: IT\_SysDesc

[For each J1939TpConfig, at least one J1939TpNode shall be aggregated in the role tpNode.]

**[constr\_9268] Existence of J1939TpConnection.dataPdu***Imposition time:* CP: IT\_SysDesc

[For each J1939TpConnection, the reference to NPdu in the role dataPdu shall exist.]

**[constr\_9269] Existence of J1939TpConnection.flowControlPdu***Imposition time:* CP: IT\_SysDesc

[For each J1939TpConnection, at least one reference to NPdu in the role flowControlPdu.]

**[constr\_9270] Existence of TlsCryptoCipherSuite.version***Imposition time:* CP: IT\_SysDesc

[For each TlsCryptoCipherSuite, the attribute version shall exist.]

**[constr\_9271] Existence of TlsPskIdentity.pskIdentity***Imposition time:* CP: IT\_SysDesc

[For each TlsPskIdentity, the attribute pskIdentity shall exist.]

**[constr\_9273] Existence of DataTransformation.executeDespiteDataUnavailability***Imposition time:* CP: IT\_SysDesc

[For each DataTransformation, the attribute executeDespiteDataUnavailability shall exist.]

**[constr\_9274] Existence of DataTransformation.transformerChain***Imposition time:* CP: IT\_SysDesc

[For each DataTransformation, at least one reference to TransformationTechnology in the role transformerChain shall exist.]

**[constr\_9275] Existence of `TransformationTechnology.bufferProperties`***Imposition time:* CP: IT\_SysDesc

[For each `TransformationTechnology`, a `BufferProperties` element shall be aggregated by `TransformationTechnology` in the role `bufferProperties`.]

**[constr\_9276] Existence of `TransformationTechnology.protocol`***Imposition time:* CP: IT\_SysDesc

[For each `TransformationTechnology`, the attribute `protocol` shall exist.]

**[constr\_9277] Existence of `TransformationTechnology.transformerClass`***Imposition time:* CP: IT\_SysDesc

[For each `TransformationTechnology`, the attribute `transformerClass` shall exist.]

**[constr\_9278] Existence of `TransformationTechnology.version`***Imposition time:* CP: IT\_SysDesc

[For each `TransformationTechnology`, the attribute `version` shall exist.]

**[constr\_9279] Existence of `BufferProperties.headerLength`***Imposition time:* CP: IT\_SysDesc

[For each `BufferProperties`, the attribute `headerLength` shall exist.]

**[constr\_9280] Existence of `BufferProperties.inPlace`***Imposition time:* CP: IT\_SysDesc

[For each `BufferProperties`, the attribute `inPlace` shall exist.]

**[constr\_9281] Existence of `TransformationISignalProps.dataPdu`***Imposition time:* CP: IT\_SysDesc

[For each `TransformationISignalProps`, the reference to `TransformationTechnology` in the role `transformer` shall exist.]

**[constr\_9282] Existence of `SOMEIPTransformationDescription.alignment`***Imposition time:* CP: IT\_SysDesc

[For each `SOMEIPTransformationDescription`, the attribute `alignment` shall exist.]

**[constr\_9283] Existence of `SOMEIPTransformationDescription.byteOrder`***Imposition time:* CP: IT\_SysDesc

[For each `SOMEIPTransformationDescription`, the attribute `byteOrder` shall exist.]

**[constr\_9284] Existence of `SOMEIPTransformationDescription.interfaceVersion`***Imposition time:* CP: IT\_SysDesc

[For each `SOMEIPTransformationDescription`, the attribute `interfaceVersion` shall exist.]

**[constr\_9285] Existence of `DataPrototypeInSenderReceiverInterfaceInstanceRef.targetDataPrototypeInSr`***Imposition time:* CP: IT\_SysDesc

[For each `DataPrototypeInSenderReceiverInterfaceInstanceRef`, the reference to `DataPrototype` in the role `targetDataPrototypeInSr` shall exist.]

**[constr\_9286] Existence of `DataPrototypeInClientServerInterfaceInstanceRef.targetDataPrototypeInCs`***Imposition time:* CP: IT\_SysDesc

[For each `DataPrototypeInClientServerInterfaceInstanceRef`, the reference to `DataPrototype` in the role `targetDataPrototypeInCs` shall exist.]

**[constr\_9287] Existence of `EndToEndTransformationDescription.profileName`***Imposition time:* CP: IT\_SysDesc

[For each `EndToEndTransformationDescription`, the attribute `fileName` shall exist.]

**[constr\_9288] Existence of `TlvDataIdDefinition.id`***Imposition time:* CP: IT\_SysDesc

[For each `TlvDataIdDefinition`, the attribute `id` shall exist.]

**[constr\_9289] Existence of `FrameMapping.sourceFrame`***Imposition time:* CP: IT\_SysDesc

[For each `FrameMapping`, the reference to `FrameTriggering` in the role `sourceFrame` shall exist.]

**[constr\_9290] Existence of `FrameMapping.targetFrame`***Imposition time:* CP: IT\_SysDesc

[For each `FrameMapping`, the reference to `FrameTriggering` in the role `targetFrame` shall exist.]

**[constr\_9291] Existence of `Gateway.ecu`***Imposition time:* CP: IT\_SysDesc

[For each `Gateway`, the reference to `EcuInstance` in the role `ecu` shall exist.]



**[constr\_9292] Existence of `IPduMapping.sourceIPdu`***Imposition time:* CP: IT\_SysDesc

[For each `IPduMapping`, the reference to `PduTriggering` in the role `sourceIPdu` shall exist.]

**[constr\_9293] Existence of `IPduMapping.targetIPdu`***Imposition time:* CP: IT\_SysDesc

[Each `IPduMapping` shall aggregate a `TargetIPduRef` in the role `targetIPdu`.]

**[constr\_9294] Existence of `TargetIPduRef.targetIPdu`***Imposition time:* CP: IT\_SysDesc

[For each `TargetIPduRef`, the reference to `PduTriggering` in the role `targetIPdu` shall exist.]

**[constr\_9295] Existence of `PduMappingDefaultValue.defaultValueElement`***Imposition time:* CP: IT\_SysDesc

[For each `PduMappingDefaultValue`, at least one `DefaultValueElement` shall be aggregated by `PduMappingDefaultValue` in the role `defaultValueElement`.]

**[constr\_9296] Existence of `DefaultValueElement.elementPosition`***Imposition time:* CP: IT\_SysDesc

[For each `DefaultValueElement`, the attribute `elementPosition` shall exist.]

**[constr\_9297] Existence of `DefaultValueElement.elementByteValue`***Imposition time:* CP: IT\_SysDesc

[For each `DefaultValueElement`, the attribute `elementByteValue` shall exist.]

**[constr\_9298] Existence of `ISignalMapping.sourceSignal`***Imposition time:* CP: IT\_SysDesc

[For each `ISignalMapping`, the reference to `ISignalTriggering` in the role `sourceSignal` shall exist.]

**[constr\_9299] Existence of `ISignalMapping.targetSignal`***Imposition time:* CP: IT\_SysDesc

[For each `ISignalMapping`, the reference to `ISignalTriggering` in the role `targetSignal` shall exist.]

**[constr\_9300] Existence of `FlatMap.instance`***Imposition time:* CP: IT\_EcuExt

[For each `FlatMap`, at least one `FlatInstanceDescriptor` shall be aggregated by `FlatMap` in the role `instance`.]

**[constr\_9301] Existence of `AliasNameAssignment.shortLabel`***Imposition time:* CP: IT\_EcuExt[For each `AliasNameAssignment`, the attribute `shortLabel` shall exist.]**[constr\_9302] Existence of `GlobalTimeDomain.domainId`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[If a `GlobalTimeDomain` defines a `GlobalTimeDomain.globalTimeMaster` or `GlobalTimeDomain.slave`, then the attribute `GlobalTimeDomain.domainId` shall exist.]**[constr\_9303] Existence of `GlobalTimeMaster.communicationConnector`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `GlobalTimeMaster`, the reference to `CommunicationConnector` in the role `communicationConnector` shall exist.]**[constr\_9304] Existence of `GlobalTimeMaster.isSystemWideGlobalTimeMaster`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `GlobalTimeMaster`, the attribute `isSystemWideGlobalTimeMaster` shall exist.]**[constr\_9305] Existence of `GlobalTimeMaster.syncPeriod`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `GlobalTimeMaster`, the attribute `syncPeriod` shall exist.]**[constr\_9306] Existence of `GlobalTimeSlave.communicationConnector`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `GlobalTimeSlave`, the reference to `CommunicationConnector` in the role `communicationConnector` shall exist.]**[constr\_9307] Existence of `GlobalTimeGateway.master`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `GlobalTimeGateway`, the reference to `GlobalTimeMaster` in the role `master` shall exist.]**[constr\_9308] Existence of `GlobalTimeGateway.slave`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes[For each `GlobalTimeGateway`, the reference to `GlobalTimeSlave` in the role `slave` shall exist.]**[constr\_9310] Existence of `GlobalTimeCanSlave.crcValidated`***Imposition time:* CP: IT\_SysDesc[For each `GlobalTimeCanSlave`, the attribute `crcValidated` shall exist.]

**[constr\_9311] Existence of `EthGlobalTimeDomainProps.messageCompliance`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[For each `EthGlobalTimeDomainProps`, the attribute `messageCompliance` shall exist.]

**[constr\_9312] Existence of `EthGlobalTimeManagedCouplingPort.pdelayResponseEnabled`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[For each `EthGlobalTimeManagedCouplingPort`, the attribute `pdelayResponseEnabled` shall exist.]

**[constr\_9313] Existence of `GlobalTimeCouplingPortProps.propagationDelay`***Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[For each `GlobalTimeCouplingPortProps`, the attribute `propagationDelay` shall exist.]

**[constr\_9314] Existence of `GlobalTimeFrMaster.crcSecured`***Imposition time:* CP: IT\_SysDesc

[For each `GlobalTimeFrMaster`, the attribute `crcSecured` shall exist.]

**[constr\_9315] Existence of `GlobalTimeFrSlave.crcValidated`***Imposition time:* CP: IT\_SysDesc

[For each `GlobalTimeFrSlave`, the attribute `crcValidated` shall exist.]

**[constr\_9317] `StateDependentFirewall.firewallStateModeDeclaration` reference restriction***Imposition time:* CP: IT\_SysDesc

[Each `StateDependentFirewall` shall only reference `ModeDeclarations` in the role `firewallStateModeDeclaration` that are aggregated by the same `ModeDeclarationGroup`.]

**[constr\_9318] Reception of `CanFrameTriggerings` with the same `identifier` by an `EcuInstance`***Imposition time:* CP: IT\_SysDesc

[For all `CanFrameTriggerings` on the same `PhysicalChannel` that refer to a `FramePort` with the `communicationDirection` = `in` of the same `EcuInstance` the condition applies that no two of these `CanFrameTriggerings` shall have the same `identifier` and the same `canAddressingMode` assigned.]

**[constr\_9319] Value of `BusMirrorChannelMappingCan.mirroringProtocol`**

*Imposition time:* CP: IT\_SysDesc

[Within the scope of a `BusMirrorChannelMappingCan`, if the (see [constr\_3468]) `PduTriggering` referenced in the role `BusMirrorChannelMappingCan.target-PduTriggering` is in turn referenced in the role `pduTriggering` by a `Can-FrameTriggering` where the aggregation in the role `canXlFrameTriggering-Props` exists, then the value of attribute `mirroringProtocol` shall only be set to `MirroringProtocolEnum.version1`.]

**[constr\_9320] Value of `BusMirrorChannelMappingFlexray.mirroringProtocol`**

*Imposition time:* CP: IT\_SysDesc

[The value of attribute `BusMirrorChannelMappingFlexray.mirroringProtocol` shall only be set to `MirroringProtocolEnum.version1`.]

**[constr\_9321] Same time base for all `BusMirrorChannelMappings` of one `EcuInstance`**

*Imposition time:* CP: IT\_SysDesc

[All `BusMirrorChannelMappings` that are referencing the same `EcuInstance` in the role `ecuInstance` shall reference the same `GlobalTimeDomain` in the role `globalTimeDomain`.]

**[constr\_9326] Exclusive existence of `ISignalTriggering.iSignal` and `ISignalTriggering.iSignalGroup`**

*Imposition time:* CP: IT\_SysDesc

[Each `ISignalTriggering` shall either define an `ISignalTriggering.iSignal` or an `ISignalTriggering.iSignalGroup` reference.]

**[constr\_9330] Derivation of network representation in case that several `DataMappings` are defined that map the same `SystemSignal` to different `VariableDataPrototypes`**

*Imposition time:* CP: IT\_SysDesc

[If several `DataMappings` are defined that map the same `SystemSignal` to different `VariableDataPrototypes` then

- all `ISignals` that reference this `SystemSignal` shall define `networkRepresentationProps` or
- if `networkRepresentationProps` are not specified on the `ISignal` level (and are therefore derived from the `ImplementationDataType`) then the different `DataMappings` shall reference `VariableDataPrototypes` that in turn reference the identical `ImplementationDataType`.

]

### [constr\_9331] E2E protection of a **ClientServerOperation**

*Imposition time:* CP: IT\_SysDesc

[If an **ISignal** aggregates **EndToEndTransformationISignalProps** and references a **SystemSignal** that in turn is referenced by a **ClientServerToSignalMapping** in the role **callSignal**, then the **EndToEndTransformationISignalProps** settings and the **EndToEndTransformationDescription** settings defined in the **TransformationTechnology** that is referenced by the **EndToEndTransformationISignalProps** shall have the same values for the following attributes:

- **EndToEndTransformationDescription.profileName**
- **EndToEndTransformationDescription.offset**
- **EndToEndTransformationISignalProps.sourceId**

as for the **ISignal** that is referenced by the **SystemSignal** that in turn is referenced by the same **ClientServerToSignalMapping** in the role **returnSignal**.]

### [constr\_9332] Existence of **J1939TpConnection.tpProtocolType**

*Imposition time:* CP: IT\_SysDesc

[For each **J1939TpConnection**, the attribute **tpProtocolType** shall exist.]

### [constr\_9333] **FibexElements** in ECU\_EXTRACT

*Imposition time:* CP: IT\_EcuExt

[Each **FibexElement** that is used in the ECU\_EXTRACT shall be referenced by the **System** element in the role **fibexElement**.]

### [constr\_9343] Allowed **J1939ProtectedIPdu.payload** reference target

*Status:* DRAFT

*Imposition time:* CP: IT\_SysDesc

[A **J1939ProtectedIPdu** is only allowed to reference a **PduTriggering** with the **payload** reference that in turn references an **ISignalIPdu** in the role **iPdu** to which an **ISignalGroup** is mapped that aggregates **EndToEndTransformationISignalProps** in the role **transformationISignalProps** which references an **EndToEndTransformationDescription** with **fileName** PROFILE\_76.]

### [constr\_9346] Existence of **EthernetVlanTranslationTable.translatedVlanId**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[For each **EthernetVlanTranslationTable**, the attribute **translatedVlanId** shall exist.]

**[constr\_9347] Range of `EthernetVlanTranslationTable.ingressVlanId` and `EthernetVlanTranslationTable.translatedVlanId`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If defined, the value of `ingressVlanId` and `translatedVlanId` shall be in the range 0..4095.]

**[constr\_9348] `EthernetVlanTranslationTable.translatedVlanId` and `vlanMembership`**

*Imposition time:* CP: IT\_SysDesc, AP: IT\_SysDes

[If a `CouplingPort` defines an `EthernetVlanTranslationTable` via the `CouplingPortDetails` then the `CouplingPort` shall have a `vlanMembership` defined that references an `EthernetPhysicalChannel` that has the same `vlanIdentifier` value defined as the `translatedVlanId` value in the `EthernetVlanTranslationTable`.]

**[constr\_9349] An `ISignal` shall not be used for SOME/IP and DDS transport at the same time**

*Imposition time:* CP: IT\_SysDesc

[An `ISignal`

- shall not be referenced by `DdsCpISignalToDdsTopicMapping` in the role `iSignal` and
- shall not aggregate `SOMEIPTransformationISignalProps` in the role `transformationISignalProps`

at the same time.]

**[constr\_9354] Definition of unconditional IPdu Timing**

*Imposition time:* CP: IT\_SysDesc

[If a `TransmissionModeDeclaration` has

- no `TransmissionModeDeclaration.transmissionModeCondition` or all of the aggregated `TransmissionModeConditions` have the `TransmissionModeCondition.dataFilter` set to `DataFilter.dataFilterType = DataFilterTypeEnum.always`, and
- no `TransmissionModeDeclaration.modeDrivenTrueCondition` defined, and
- no `TransmissionModeDeclaration.modeDrivenFalseCondition` defined,

then only one `TransmissionModeTiming` in the role `TransmissionModeDeclaration.transmissionModeTrueTiming` shall be defined.]

**[constr\_9355] Category of `HwElement` for `EcuPartitionToCoreMapping`**

*Imposition time:* CP: IT\_EcuExt

[The `HwElement`, which is referenced by `EcuPartitionToCoreMapping` in the role `processingUnit`, shall be of `category` "ProcessingUnit".]

**[constr\_9358] `ISignal` that references a `DataTransformation` shall have the `dataTypePolicy` set to `transformingISignal`**

*Imposition time:* CP: IT\_SysDesc

[In a complete model every `ISignal` that references the `DataTransformation` in the role `dataTransformation` shall have the `dataTypePolicy` set to `transformingISignal`, `ddsSignal`, or `ddsService`.]

**[constr\_9359] Different `EcuPartitionToCoreMapping`.`coreId` attribute values shall not be assigned to the same `processingUnit`**

*Imposition time:* CP: IT\_EcuExt

[`EcuPartitionToCoreMappings` that reference the same `HwElement` in the role `processingUnit` shall not define different values for the `EcuPartitionToCoreMapping`.`coreId` attribute.]

**[constr\_9360] `DataMapping` not available for elements of `PortInterfaces` with `isService` = true**

*Imposition time:* CP: IT\_EcuExt

[`VariableDataPrototypes`, `ClientServerOperations` and `Triggers` within `PortPrototypes` typed by `PortInterfaces` in which the `isService` attribute is set to true shall not be referenced by a `DataMapping`.]

**[constr\_9361] `FlatInstanceDescriptor`.`dataPrototype` reference restriction**

*Imposition time:* CP: IT\_EcuExt

[The `FlatInstanceDescriptor`.`dataPrototype` reference shall not be used to reference an `ArgumentDataPrototype`.]

**[constr\_9362] Mutually exclusive existence of `FlatInstanceDescriptor`.`dataPrototype` and `FlatInstanceDescriptor`.`bswImplementation` vs. `FlatInstanceDescriptor`.`ecuExtractReference`**

*Imposition time:* CP: IT\_EcuExt

[If a `FlatInstanceDescriptor` references an `AutosarDataPrototype` with role `dataPrototype` and a `BswImplementation` in the role `bswImplementation` then the same `FlatInstanceDescriptor` shall not reference an `AtpFeature` in the role `ecuExtractReference`.]



**[constr\_9363] FlatInstanceDescriptor.dataPrototype and FlatInstanceDescriptor.bswImplementation***Imposition time:* CP: IT\_EcuExt

[If a FlatInstanceDescriptor references an AutosarDataPrototype with role dataPrototype then the FlatInstanceDescriptor shall also reference a BswImplementation in the role FlatInstanceDescriptor.bswImplementation.]

**[constr\_9366] GlobalTimeSlave.followUpTimeoutValue not applicable to GlobalTimeFrSlave***Imposition time:* CP: IT\_SysDesc

[The attribute GlobalTimeSlave.followUpTimeoutValue shall not be defined for a GlobalTimeFrSlave.]

**[constr\_9367] Definition of several local ApplicationEndpoints with identical properties (IP, Port, Protocol) is forbidden***Imposition time:* CP: IT\_SysDesc

[It is not allowed to define several local ApplicationEndpoints (referenced by ProvidedServiceInstances in the role localUnicastAddress or by ConsumedServiceInstances in the role localUnicastAddress) that use the same port number and protocol via tpConfiguration and reference the same NetworkEndpoint in the role networkEndpoint in the context of an EthernetPhysicalChannel.]

**[constr\_9368] Applicable attributes for an Ethernet switch***Imposition time:* CP: IT\_SysDesc

[If a CouplingPort is aggregated by a CouplingElement and that CouplingElement has the attribute couplingType set to the value CouplingElementEnum.switch, then the attributes defined in the column "Switch Port" of [TPS\_SYST\_02422] are applicable.]

**[constr\_9369] Applicable attributes for an Ethernet node on the classic platform***Imposition time:* CP: IT\_SysDesc

[If a CouplingPort is aggregated by an EthernetCommunicationController and that EthernetCommunicationController is in turn aggregated by an EcuInstance, then the attributes defined in the column "Endpoint" of [TPS\_SYST\_02422] are applicable.]

**[constr\_9371] Compatibility of CompuMethod defined in the context of a SystemSignal and CompuMethod defined in the context of the DataPrototype in a RPortPrototype mapped to the SystemSignal***Imposition time:* CP: IT\_SysDesc

[The compuMethods of AutosarDataType.swDataDefProps defined on ApplicationDataType of the DataPrototype in a RPortPrototype that is mapped to



a `SystemSignal` is compatible to the `compuMethods` of `physicalProps` of the `SystemSignal` if the following conditions apply:

- `[constr_1163]` (see `[2]`) that defines the compatibility of `CompuMethods` is fulfilled,
- `[constr_1153]` (see `[2]`) that defines the compatibility of `CompuScales` of the enclosing `CompuMethod` is fulfilled,
- `[constr_1156]` (see `[2]`) that defines the compatibility of `CompuScales` which contribute to tabular conversion by having a `compuConst`,
- `[constr_1176]` (see `[2]`) that defines the compatibility of `CompuScaleless` of category `LINEAR` and `RAT_FUNC` is fulfilled,
- `[constr_1192]` (see `[2]`) that defines the compatibility of `CompuScaleless` of category `IDENTICAL` to `RAT_FUNC` or `LINEAR` is fulfilled,
- `[constr_9376]` is fulfilled.

]

**`[constr_9372]` Compatibility of `CompuMethod` defined in the context of a `SystemSignal` and `CompuMethod` defined in the context of the `DataPrototype` in a `PPortPrototype` mapped to the `SystemSignal`**

*Imposition time:* CP: `IT_SysDesc`

[The `compuMethods` of `AutosarDataType.swDataDefProps` defined on `ApplicationDataType` of the `DataPrototype` in a `PPortPrototype` that is mapped to a `SystemSignal` is compatible to the `compuMethods` of `physicalProps` of the `SystemSignal` if the following conditions apply:

- `[constr_1163]` (see `[2]`) that defines the compatibility of `CompuMethods` is fulfilled,
- `[constr_1153]` (see `[2]`) that defines the compatibility of `CompuScales` of the enclosing `CompuMethod` is fulfilled,
- `[constr_1156]` (see `[2]`) that defines the compatibility of `CompuScales` which contribute to tabular conversion by having a `compuConst`,
- `[constr_1176]` (see `[2]`) that defines the compatibility of `CompuScaleless` of category `LINEAR` and `RAT_FUNC` is fulfilled,
- `[constr_1192]` (see `[2]`) that defines the compatibility of `CompuScaleless` of category `IDENTICAL` to `RAT_FUNC` or `LINEAR` is fulfilled,
- `[constr_9375]` is fulfilled.

]

**[constr\_9373] Compatibility of `DataConstr` between `SystemSignal` and `DataPrototype` in a `PPortPrototype`***Imposition time:* CP: IT\_SysDesc

[The `DataConstrs` (e.g. the limits) defined in the `ApplicationDataType` of the `DataPrototype` in a `PPortPrototype` shall be within the `DataConstrs` defined in the `SystemSignal.physicalProps` of the `SystemSignal` to which the `DataPrototype` is mapped.]

**[constr\_9374] Compatibility of `DataConstr` between `SystemSignal` and `DataPrototype` in a `RPortPrototype`***Imposition time:* CP: IT\_SysDesc

[The `DataConstrs` (e.g. the limits) defined in the `SystemSignal.physicalProps` of the `SystemSignal` to which the `DataPrototype` in a `RPortPrototype` is mapped shall be within the `DataConstrs` defined in the `ApplicationDataType` of the `DataPrototype`.]

**[constr\_9375] Compatibility of `CompuScales` defined in the context of a `SystemSignal` and `CompuScales` defined in the context of a `DataPrototype` of a `PPortPrototype` mapped to the `SystemSignal`***Imposition time:* CP: IT\_SysDesc

[The set of `CompuScales` in the `CompuMethod` defined in the `ApplicationDataType` of the `DataPrototype` in a `PPortPrototype` that is mapped to the `SystemSignal` shall be a subset of the set of `CompuScales` defined in the `CompuMethod` of the `SystemSignal`.]

**[constr\_9376] Compatibility of `CompuScales` defined in the context of a `SystemSignal` and `CompuScales` defined in the context of a `DataPrototype` of a `RPortPrototype` mapped to the `SystemSignal`***Imposition time:* CP: IT\_SysDesc

[The set of `CompuScales` in the `CompuMethod` of the `SystemSignal` shall be a subset of the set of `CompuScales` defined in the `ApplicationDataType` of the `DataPrototype` in a `RPortPrototype`.]

**[constr\_9377] `J1939Node.pduTriggering` reference restriction***Imposition time:* CP: IT\_SysDesc

[A `J1939Node` shall not reference a `PduTriggering` in the role `pduTriggering` that in turn references an `ISignalIPdu` in the role `iPdu`.]

**[constr\_9378] `J1939Nodes` on the same `EcuInstance` shall not share `PduTriggerings`***Imposition time:* CP: IT\_SysDesc

[A `PduTriggering` shall not be referenced by several `J1939Nodes` that are aggregated by the same `EcuInstance` in the role `pduTriggering`.]

**[constr\_9379] Consistent mapping of software-component to J1939Node***Imposition time:* CP: IT\_SysDesc

[The value of attribute `J1939Node.nodeName.function` of a `J1939Node` referenced by `J1939ControllerApplicationToJ1939NodeMapping` in the role `j1939Node` shall be identical to the value of `J1939ControllerApplication.functionId`.]

**[constr\_9380] Consistent mapping of J1939ControllerApplication to EcuInstance***Imposition time:* CP: IT\_SysDesc

[A `SwComponentPrototype` that is referenced by a `J1939ControllerApplication` mapped to a specific `J1939Node` shall only be mapped to an `EcuInstance` that in turn owns the same `J1939Node`.]

**[constr\_9381] J1939Node shall be referenced by a single J1939ControllerApplicationToJ1939NodeMapping***Imposition time:* CP: IT\_SysDesc

[At most one `J1939ControllerApplicationToJ1939NodeMapping` shall reference a `J1939Node` in the role `J1939ControllerApplicationToJ1939NodeMapping.j1939Node`.]

**[constr\_9382] AppOsTaskProxyToEcuTaskProxyMapping.appTaskProxy shall only target AppTaskProxy***Imposition time:* CP: IT\_SysDesc

[The reference `AppOsTaskProxyToEcuTaskProxyMapping.appTaskProxy` shall only refer to an `OsTaskProxy` that fulfills the definition of an `AppTaskProxy` according to [TPS\_SYST\_02438]. It shall not target an `EcuTaskProxy` or an `AppAndEcuTaskProxy`.]

**[constr\_9383] AppOsTaskProxyToEcuTaskProxyMapping.ecuTaskProxy shall only target EcuTaskProxy***Imposition time:* CP: IT\_SysDesc

[The reference `AppOsTaskProxyToEcuTaskProxyMapping.ecuTaskProxy` shall only refer to an `OsTaskProxy` that fulfills the definition of an `EcuTaskProxy` according to [TPS\_SYST\_02438]. It shall not target an `AppTaskProxy` or an `AppAndEcuTaskProxy`.]

**[constr\_9384] Relation between both `CyclicHandlingComDataToOsTaskProxyMapping.rxCycleProcessTime` and `CyclicHandlingComDataToOsTaskProxyMapping.offset` and `OsTaskProxy.period`***Imposition time:* CP: IT\_SysDesc

[The `CyclicHandlingComDataToOsTaskProxyMapping.rxCycleProcessTime` and `CyclicHandlingComDataToOsTaskProxyMapping.offset` (if defined) shall be a positive integer multitude of `period` defined in the `OsTaskProxy` that is referenced by the `CyclicHandlingComDataToOsTaskProxyMapping`.]

**[constr\_9385] Existence of `CyclicHandlingComDataToOsTaskProxyMapping.osTaskProxy`***Imposition time:* CP: IT\_SysDesc

[For each `CyclicHandlingComDataToOsTaskProxyMapping` the reference `CyclicHandlingComDataToOsTaskProxyMapping.osTaskProxy` shall exist.]

**[constr\_9386] Existence of `CyclicHandlingComDataToOsTaskProxyMapping.variableDataPrototype`***Imposition time:* CP: IT\_SysDesc

[For each `CyclicHandlingComDataToOsTaskProxyMapping` the reference `CyclicHandlingComDataToOsTaskProxyMapping.variableDataPrototype` shall exist at least once.]

**[constr\_9387] One `CyclicHandlingComDataToOsTaskProxyMapping` for every `VariableDataPrototype` with `ReceptionComSpecProps.comHandlerTaskMappingEnabled = TRUE`***Imposition time:* CP: IT\_SysDesc

[Every `VariableDataPrototype` that

- is referenced by a `ReceiverComSpec` with `ReceptionComSpecProps.comHandlerTaskMappingEnabled = TRUE` and
- is mapped to a `SystemSignal` or `SystemSignalGroup` and
- that `SystemSignal` or `SystemSignalGroup` has an `ISignal` or `ISignalGroup` that is received in the context of the `System`,

, then there shall be exactly one `CyclicHandlingComDataToOsTaskProxyMapping` in the context of that `System` referencing that `VariableDataPrototype`.]

**[constr\_9388] `CanNmNode.txNmPdu` reference restriction***Imposition time:* CP: IT\_SysDesc

[Each `CanNmNode` shall reference at most one `NmPdu` in the role `txNmPdu` at the time when the System Description is complete.]

**[constr\_9389] `UdpNmNode.txNmPdu` reference restriction***Imposition time:* CP: IT\_SysDesc

[Each `UdpNmNode` shall reference at most one `NmPdu` in the role `txNmPdu` at the time when the System Description is complete.]

**[constr\_9390] `J1939NmNode.txNmPdu` reference restriction***Imposition time:* CP: IT\_SysDesc

[Each `J1939NmNode` shall reference at most one `NmPdu` in the role `txNmPdu` at the time when the System Description is complete.]

**[constr\_9391] FlexrayNmNode.txNmPdu reference restriction**

*Imposition time:* CP: IT\_SysDesc

[Each FlexrayNmNode shall reference at most four NmPdus in the role txNmPdu at the time when the System Description is complete.]

**[constr\_9395] Each call ISignal shall have exactly one corresponding return ISignal that is associated with the same ClientServerOperation and PhysicalChannel**

*Imposition time:* IT\_SysDesc

[For each ClientServerToSignalMapping the number of call ISignals

- ISignals referring to a SystemSignal in the role systemSignal and
- that SystemSignal is referenced from the ClientServerToSignalMapping in role callSignal and
- the ISignal is referenced from an ISignalTriggering in role iSignal and
- that ISignalTriggering is aggregated by a PhysicalChannel in role iSignalTriggering

shall be exactly the same as the number of return ISignals

- ISignals referring to a SystemSignal in the role systemSignal and
- that SystemSignal is referenced from the ClientServerToSignalMapping in role returnSignal and
- the ISignal is referenced from an ISignalTriggering in role iSignal and
- that ISignalTriggering is aggregated by the same PhysicalChannel in role iSignalTriggering

on that PhysicalChannel.]

**[constr\_9396] SomeipTpConnection.tpConcurrentProcessingSdu reference restriction**

*Imposition time:* IT\_SysDesc

[A PduTriggering that is referenced by a SomeipTpConnection in the role tp-ConcurrentProcessingSdu shall reference an IPdu in the role iPdu.]

**[constr\_9397] Exclusive usage of tpSdu or tpConcurrentProcessingSdu**

*Imposition time:* IT\_SysDesc

[A SomeipTpConnection shall either define one tpSdu reference or a set of tp-ConcurrentProcessingSdu references, but not both.]

## 2.7 CP\_TPS\_TimingExtensions

### [constr\_4500] Restricted usage of Occurrence Expression functions

*Imposition time:* IT\_SubClasTdevAss

[The functions:

- *TIMEX\_occurs*,
- *TIMEX\_hasOccurred*,
- *TIMEX\_timeSinceLastOccurrence*,
- *TIMEX\_angleSinceLastOccurrence*,
- *TIMEX\_modeActive*

shall only be used for an `TDEventOccurrenceExpressionFormula` applied to a `TDEventComplex`.]

### [constr\_4502] Use references only as function operands

*Imposition time:* IT\_SubClasTdevAss

[The references to model elements (e.g. the *timing event* reference targeting `TimingDescriptionEvent`) do have specific semantics. The usage of these references within the expression is *only* allowed as operand of the functions mentioned above.]

### [constr\_4503] Restricted usage of `AutosarOperationArgumentInstance` for Content Filter

*Imposition time:* IT\_SubClasTdevAss

[If a content filter is defined for an atomic event then references to `AutosarOperationArgumentInstances` are only allowed if the atomic event is of type `TDEventOperation`. Only if such an atomic event occurs, the value of the operation arguments can be evaluated. Thus, also the scope of the atomic event shall be the same as the `AutosarOperationArgumentInstance`, meaning that they shall point to the same `ClientServerOperation`. Finally, references to an `AutosarOperationArgumentInstance` with argument direction "out" are only allowed, if the atomic event of type `TDEventOperation` refers either to the point in time when the operation call response has been sent (`TDEventOperationTypeEnum=operationCallResponseSent` or to the point in time when the operation call response has been received (`TDEventOperationTypeEnum=operationCallResponseReceived`).]

### [constr\_4504] Restriction of the `scope` of an `AgeConstraint`

*Imposition time:* IT\_SubClasTdevAss

[An `AgeConstraint` may only reference either a:

- `TDEventVariableDataPrototype.tdEventVariableDataPrototypeType==variableDataPrototypeReceived`
- `TDEventTrigger.tdEventTriggerType==triggerActivated`

in the role `scope`]

#### [constr\_4505] Specifying minimum and maximum number of occurrences

*Imposition time:* IT\_SubClasTdEvAss

[The minimum and maximum number of occurrences shall be specified such that the following holds:  $0 \leq \text{minNumberOfOccurrences} \leq \text{maxNumberOfOccurrences}$ .]

#### [constr\_4506] Specifying minimum inter-arrival time and pattern length

*Imposition time:* IT\_SubClasTdEvAss

[The `minimumInterArrivalTime` and `patternLength` shall be specified such that the following holds:  $0 < \text{minimumInterArrivalTime} \leq \text{patternLength}$ .]

#### [constr\_4507] Specifying pattern length, pattern jitter and pattern period

*Imposition time:* IT\_SubClasTdEvAss

[The `patternLength`, `patternJitter` and `patternPeriod` shall be specified such that the following holds:  $\text{patternLength} + \text{patternJitter} < \text{patternPeriod}$ .]

#### [constr\_4508] Existence of `TDEventVfbPort.portPrototypeBlueprint`

*Imposition time:* IT\_VfbTd

[The reference `TDEventVfbPort.portPrototypeBlueprint` shall exist only if the immediate parent is `ARPackage.category==BLUEPRINT`]

#### [constr\_4510] Specifying references to `RunnableEntity` and `VariableAccess`

*Imposition time:* IT\_SwcTd

[A `RunnableEntity` and `VariableAccess` shall be referenced at the same time if and only if the value of `tdEventSwcInternalBehaviorType==runnableEntityVariableAccess`. These two references are **not** mutual exclusive.]

#### [constr\_4511] Validity of referencing `RunnableEntity`

*Imposition time:* IT\_SwcTd

[A `RunnableEntity` shall be referenced if and only if the value of `tdEventSwcInternalBehaviorType` is either:

- `runnableEntityActivated`
- `runnableEntityStarted`
- `runnableEntityTerminated`
- `runnableEntityVariableAccess`

]



**[constr\_4512] Validity of referencing `VariableAccess`**

*Imposition time:* IT\_SwcTd

[A `VariableAccess` shall be referenced if and only if the value of `tdEventSwcInternalBehaviorType==runnableEntityVariableAccess`.]

**[constr\_4513] `SynchronizationTimingConstraint` shall reference at least two events**

*Imposition time:* IT\_SubClasTdEvAss

[In the case, that the `SynchronizationTimingConstraint` is imposed on events then at least two (2) timing description events shall be referenced.]

**[constr\_4514] `SynchronizationTimingConstraint` shall reference at least two event chains**

*Imposition time:* IT\_SubClasTdEvAss

[In the case, that the `SynchronizationTimingConstraint` is imposed on `TimingDescriptionEventChains` then at least two (2) `TimingDescriptionEventChains` shall be referenced.]

**[constr\_4515] Orthogonality of `stimulus` and `response` in a `TimingDescriptionEventChain`**

*Imposition time:* IT\_SubClasTeAss

[The reference `TimingDescriptionEventChain.stimulus` and the reference `TimingDescriptionEventChain.response` shall not reference the same `TimingDescriptionEvent.shortName`.]

**[constr\_4516] Completeness of a composed `TimingDescriptionEventChain`**

*Imposition time:* IT\_SubClasTeAss

[If a `TimingDescriptionEventChain` has > 0 `segments`: after [constr\_4518] is applied, there shall be at least one end-to-end path from the parental `TimingDescriptionEventChain.stimulus`, through the `segments`, to the parental `TimingDescriptionEventChain.response`.]

**[constr\_4518] Specifying end-points of a composed `TimingDescriptionEventChain`**

*Imposition time:* IT\_SubClasTeAss

[If a `TimingDescriptionEventChain` has > 0 `segments`: in *that* list of `segments`:

- at least one `segment.stimulus` shall reference the (parent) `TimingDescriptionEventChain.stimulus` in which it is referenced in the role `segment`
- at least one `segment.response` shall reference the (parent) `TimingDescriptionEventChain.response` in which it is referenced in the role `segment`

]



#### [constr\_4519] Specifying **patternLength**

*Imposition time:* IT\_SubClasTdEvAss

[The **patternLength** shall be specified such that the following holds:  $0 \leq \max(\text{offset}) \leq \text{patternLength}$ .]

#### [constr\_4520] Specifying attribute **synchronizationConstraintType**

*Imposition time:* IT\_SubClasTdEvAss

[The attribute **synchronizationConstraintType** shall be specified if the **SynchronizationTimingConstraint** is imposed on events.]

#### [constr\_4521] Specifying attribute **synchronizationConstraintType**

*Imposition time:* IT\_SubClasTdEvAss

[The attribute **synchronizationConstraintType** shall be specified if the **SynchronizationTimingConstraint** is imposed on **TimingDescriptionEventChains**.]

#### [constr\_4522] **SynchronizationTimingConstraint** shall either reference events or event chains

*Imposition time:* IT\_SubClasTdEvAss

[The **SynchronizationTimingConstraint** shall either reference **TimingDescriptionEvents** or **TimingDescriptionEventChains**, but not both at the same time.]

#### [constr\_4523] Restriction of **maxCycleRepetitions** and **maxSlotsPerCycle** to Repetitive Execution Order Constraint

*Imposition time:* IT\_SwcTd

[The attributes

- **EOCExecutableEntityRefGroup.maxCycleRepetitions**
- **EOCExecutableEntityRefGroup.maxSlotsPerCycle**

shall exist only if *that* **EOCExecutableEntityRefGroup** is aggregated by an **ExecutionOrderConstraint.executionOrderConstraintType==repetitiveEOC** in the role **orderedElement**]

#### [constr\_4525] Precedence of successor relationships **successor** and **directSuccessor**

*Imposition time:* IT\_SwcTd

[The successor relationships **successor** and **directSuccessor** take always precedence over the **ordered** multiplicity of the association **nestedElement**.]

**[constr\_4526] Specifying `maxCycleRepetitions` and `maxSlotsPerCycle` in a Repetitive Execution Order Constraint***Imposition time:* IT\_SwcTd

[The attributes `maxCycleRepetitions` and `maxSlotsPerCycle` shall be specified only by the *root* group of executable entity references `EOCExecutableEntityRefGroup`.]

**[constr\_4527] Referencing `TimingDescriptionEvent` in a Repetitive Execution Order Constraint***Imposition time:* IT\_SwcTd

[The `TimingDescriptionEvent` shall be specified only by the *root* group of executable entity references `EOCExecutableEntityRefGroup`.]

**[constr\_4528] The *root* `EOCExecutableEntityRefGroup` shall reference only `EOCExecutableEntityRefGroups`***Imposition time:* IT\_SwcTd

[The *root* `EOCExecutableEntityRefGroup` shall reference only groups of executable entity references respectively event references grouped by the element `EOCExecutableEntityRefGroups`.]

**[constr\_4529] Number of nested elements referenced by the *root* `EOCExecutableEntityRefGroup`***Imposition time:* IT\_SwcTd

[The number of nested elements referenced by the *root* `EOCExecutableEntityRefGroup` shall be exactly the number given by the attribute `maxCycleRepetitions`.]

**[constr\_4530] An `EOCExecutableEntityRefGroup` representing a cycle shall reference only `EOCExecutableEntityRefs` respectively `EOCEventRefs`***Imposition time:* IT\_SwcTd

[The `EOCExecutableEntityRefGroup` representing a cycle shall reference only `EOCExecutableEntityRefs`, respectively `EOCEventRefs`.]

**[constr\_4531] Number of nested elements referenced by `EOCExecutableEntityRefGroup` representing a cycle***Imposition time:* IT\_SwcTd

[The number of nested elements referenced by a `EOCExecutableEntityRefGroup` representing a cycle shall be exactly the number given by the attribute `maxSlotsPerCycle`.]

**[constr\_4532] Successor relationship is not self-referencing***Imposition time:* IT\_SwcTd

[The target and source of the successor relationships `successor` and `directSuccessor` shall not be the same. In other words an `EOCExecutableEntityRef` and

`EOCExecutableEntityRefGroup` shall not reference itself as its logical or direct successor.]

#### [constr\_4533] Maximum number of successor relationships

*Imposition time:* IT\_SwcTd

[The maximum number of successor relationships, namely `successor` or `directSuccessor`:

- between two `EOCExecutableEntityRefs`
- between two `EOCEventRefs`
- between two `EOCExecutableEntityRefGroups`
- between an `EOCExecutableEntityRef` and an `EOCExecutableEntityRefGroup`
- between an `EOCEventRef` and an `EOCExecutableEntityRefGroup`

is one (1).]

#### [constr\_4534] Maximum number of `directSuccessor` relationships

*Imposition time:* IT\_SwcTd

[The number of `directSuccessor` relationships of a:

- `EOCExecutableEntityRef`
- `EOCEventRef`
- `EOCExecutableEntityRefGroup`

shall not exceed the number of independent execution units available in a system.]

#### [constr\_4536] Compatible recurrence of any `ExecutableEntity`

*Imposition time:* IT\_SwcTd

[In an `ExecutionOrderConstraint` the `ExecutableEntity`s, referenced by all `EOCExecutableEntityRefs` respectively all `EOCEventRefs`, shall be compatible with regard to their recurrence.]

#### [constr\_4537] References among elements in an `ExecutionOrderConstraint`

*Imposition time:* IT\_SwcTd

[An `EOCExecutableEntityRef` respectively `EOCEventRef` or an `EOCExecutableEntityRefGroup` shall reference only `EOCExecutableEntityRefs`, respectively all `EOCEventRefs`, or `EOCExecutableEntityRefGroups` which are part of the same `ExecutionOrderConstraint`.]

**[constr\_4538] Hierarchical Execution Order Constraint:** `EOCExecutableEntityRef`, `EOCEventRef`, and `EOCExecutableEntityRefGroup` shall be target or source of a successor relationship

*Imposition time:* IT\_SwcTd

[In a `ExecutionOrderConstraint.executionOrderConstraintType==hierarchicalEOC`, each:

- `EOCExecutableEntityRefGroup`
- `EOCExecutableEntityRef`
- `EOCEventRef`

which is not part of an `EOCExecutableEntityRefGroup` shall be target or source of at least one successor relationship.]

**[constr\_4539] The successor relationships `successor` and `directSuccessor` shall not be used**

*Imposition time:* IT\_SwcTd

[The successor relationships `successor` and `directSuccessor` shall not be used in a `executionOrderConstraintType==repetitiveEOC`.]

**[constr\_4540] `maxCycleRepetitions` and `maxSlotsPerCycle` shall not be zero**

*Imposition time:* IT\_SwcTd

[If the attributes `maxCycleRepetitions` and `maxSlotsPerCycle` are used, then the values of the attributes `maxCycleRepetitions` and `maxSlotsPerCycle` shall be greater than zero (0).]

**[constr\_4541] Existence of `EOCExecutableEntityRef.executable` in an Ordinary Execution Order Constraint**

*Imposition time:* IT\_SwcTd

[In an `ExecutionOrderConstraint.executionOrderConstraintType==ordinaryEOC`, in the tree of `orderedElements`, if the `orderedElement` is a `EOCExecutableEntityRef`, it shall reference an `ExecutableEntity` in the role `executable`.]

**[constr\_4542] Existence of `EOCExecutableEntityRef.executable` in a Hierarchical Execution Order Constraint**

*Imposition time:* IT\_SwcTd

[In an `ExecutionOrderConstraint.executionOrderConstraintType==hierarchicalEOC`, in the tree of `orderedElements`, if the `orderedElement` is a `EOCExecutableEntityRef`, it shall reference an `ExecutableEntity` in the role `executable`.]

**[constr\_4543] Maximum value of `minimumInterArrivalTime`**

*Imposition time:* IT\_SubClasTdEvAss

[The `minimumInterArrivalTime` shall be  $\leq$  the `period`.]

**[constr\_4544] Specifying `patternLength`, `patternJitter` and `patternPeriod`**

*Imposition time:* IT\_SubClasTdEvAss

[The `patternLength`, `patternJitter` and `patternPeriod` shall be specified such that the following holds: `patternLength` + `patternJitter` < `patternPeriod`.]

**[constr\_4545] Referring either `ExecutableEntitys` or `AbstractEvents`**

*Imposition time:* IT\_SwcTd

[An `ExecutionOrderConstraint` shall contain either only `EOCExecutableEntityRef` or only `EOCEventRef`, but not both. In the former case `ExecutableEntitys` are referenced and in the latter case `AbstractEvents` are referenced.]

**[constr\_4546] Setting the attribute `isEvent`**

*Imposition time:* IT\_SwcTd

[The value of the attribute `isEvent` shall be set to:

- TRUE: when the `ExecutionOrderConstraint` refers only to `AbstractEvents`
- FALSE: when the `ExecutionOrderConstraint` refers only to `ExecutableEntitys`

as per [constr\_4545]]

**[constr\_4547] Restriction of `ExecutionOrderConstraint.permitMultipleReferencesToEE`**

*Imposition time:* IT\_SwcTd

[The attribute `permitMultipleReferencesToEE` shall exist only if `ExecutionOrderConstraint.isEvent==FALSE` as per [constr\_4546]]

**[constr\_4548] Existence of `EOCEventRef.event` in an Ordinary Execution Order Constraint**

*Imposition time:* IT\_SwcTd

[In an `ExecutionOrderConstraint.executionOrderConstraintType==ordinaryEOC`, in the tree of `orderedElements`, if the `orderedElement` is a `EOCEventRef`, it shall reference an `AbstractEvent` in the role `event`.]

**[constr\_4549] Existence of `EOCEventRef.event` in a Hierarchical Execution Order Constraint***Imposition time:* IT\_SwcTd

[In an `ExecutionOrderConstraint.executionOrderConstraintType==hierarchicalEOC`, in the tree of `orderedElements`, if the `orderedElement` is a `EOCEventRef`, it shall reference an `AbstractEvent` in the role `event`.]

**[constr\_4551] Use only Numericals in `TDEventOccurrenceExpression`***Imposition time:* IT\_SubClasTdEvAss

[The target data prototype of the instance references of `variable` and `argument` shall be `Numerical`.]

**[constr\_4552] Restricted usage of `AutosarVariableInstance` for Content Filter***Imposition time:* IT\_SubClasTdEvAss

[If a content filter is defined for an atomic event then references to `AutosarVariableInstances` are only allowed if the atomic event is of type `TDEventVariableDataPrototype`. Only if such an atomic event occurs, the value of the variables can be evaluated. Thus, also the scope of the atomic event shall be the same as the `AutosarVariableInstance`, meaning that they shall point to the same `VariableDataPrototype`.]

**[constr\_4554] Restriction of the referenced `TimingDescriptionEventChain` for a `letInterval`***Imposition time:* IT\_SwcTd

[The element `EOCExecutableEntityRefGroup.letInterval` shall be present only in a `ROOT_GROUP` (according to [constr\_6909])]

**[constr\_4559] Restriction of `TimingDescriptionEvent.category`***Imposition time:* IT\_SubClasTdEvAss

[Any `TimingDescriptionEvent.category` not in the list in [TPS\_TIMEX\_00056] shall be ignored.]

**[constr\_4561] Usage of the category value `DISPATCH_ENTRY_POINT` in `TimingDescriptionEvent`***Imposition time:* IT\_SysTd

[The value `DISPATCH_ENTRY_POINT` of the attribute `category` of a `TimingDescriptionEvent` shall be set if and only if the timing description event plays the role of a stimulus event and the corresponding timing description event chain, referencing this timing description event, represents a dispatcher in the context of describing timing of a software cluster.]

**[constr\_4562] Usage of the category value DISPATCH\_EXIT\_POINT in `TimingDescriptionEvent`**

*Imposition time:* IT\_SysTd

[The value DISPATCH\_EXIT\_POINT of the attribute `category` of a `TimingDescriptionEvent` shall be set if and only if the timing description event plays the role of a response event and the corresponding timing description event chain, referencing this timing description event, represents a dispatcher in the context of describing timing of a software cluster.]

**[constr\_4565] Consistency of `TDCpSoftwareClusterMapping.timingDescription` and `TDCpSoftwareClusterResourceMapping.timingDescription`**

*Imposition time:* IT\_SysTd

[The references:

- `TDCpSoftwareClusterMapping.timingDescription`
- `TDCpSoftwareClusterResourceMapping.timingDescription`

shall (after [constr\_6918] has been applied) refer to the same sub-class and `category` of `TimingDescription`]

**[constr\_6816] Restricted usage of `TimingDescriptionEventChain.isPipeliningPermitted` in `TimingDescriptionEventChain`**

*Status:* DRAFT

*Imposition time:* IT\_SwcTd

[The attribute `isPipeliningPermitted` shall only exist if the `TimingDescriptionEventChain.category==SL_LET_INTERVAL`.]

**[constr\_6817] Restricted usage of `TimingDescriptionEvent.clockReference`**

*Status:* DRAFT

*Imposition time:* IT\_SwcTd

[The reference `TimingDescriptionEvent.clockReference` shall exist if (and only if), the `TimingDescriptionEvent` is itself referenced:

- in the role `stimulus` or
- in the role `response`

by a `TimingDescriptionEventChain.category==SL_LET_INTERVAL`]

**[constr\_6818] Existence of `EventTriggeringConstraint.event`**

*Imposition time:* IT\_SubClasTdEvAss

[For each `EventTriggeringConstraint`, the reference in the role `event` shall exist]

**[constr\_6819] Existence of `PeriodicEventTriggering.jitter`***Imposition time:* IT\_SubClasTdEvAss[For each `PeriodicEventTriggering`, the attribute `jitter` shall exist]**[constr\_6820] Existence of `PeriodicEventTriggering.minimumInterArrivalTime`***Imposition time:* IT\_SubClasTdEvAss[For each `PeriodicEventTriggering`, the attribute `minimumInterArrivalTime` shall exist]**[constr\_6821] Existence of `PeriodicEventTriggering.period`***Imposition time:* IT\_SubClasTdEvAss[For each `PeriodicEventTriggering`, the attribute `period` shall exist]**[constr\_6822] Existence of `SporadicEventTriggering.maximumInterArrivalTime`***Imposition time:* IT\_SubClasTdEvAss[For each `SporadicEventTriggering`, the attribute `maximumInterArrivalTime` shall exist]**[constr\_6823] Existence of `SporadicEventTriggering.minimumInterArrivalTime`***Imposition time:* IT\_SubClasTdEvAss[For each `SporadicEventTriggering`, the attribute `minimumInterArrivalTime` shall exist]**[constr\_6824] Existence of `ConcretePatternEventTriggering.patternLength`***Imposition time:* IT\_SubClasTdEvAss[For each `ConcretePatternEventTriggering`, the attribute `patternLength` shall exist]**[constr\_6825] Existence of `BurstPatternEventTriggering.maxNumberOfOccurrences`***Imposition time:* IT\_SubClasTdEvAss[For each `BurstPatternEventTriggering`, the attribute `maxNumberOfOccurrences` shall exist]**[constr\_6826] Existence of `BurstPatternEventTriggering.minimumInterArrivalTime`***Imposition time:* IT\_SubClasTdEvAss[For each `BurstPatternEventTriggering`, the attribute `minimumInterArrivalTime` shall exist]



**[constr\_6827] Existence of `BurstPatternEventTriggering.patternLength`***Imposition time:* IT\_SubClasTdEvAss

[For each `BurstPatternEventTriggering`, the attribute `patternLength` shall exist]

**[constr\_6828] Existence of `ArbitraryEventTriggering.minimumDistance`***Imposition time:* IT\_SubClasTdEvAss

[For each `ArbitraryEventTriggering`, the reference in the role `minimumDistance` shall exist at least once]

**[constr\_6829] Existence of `ArbitraryEventTriggering.maximumDistance`***Imposition time:* IT\_SubClasTdEvAss

[For each `ArbitraryEventTriggering`, the reference in the role `maximumDistance` shall exist at least once]

**[constr\_6830] Existence of `ConfidenceInterval.lowerBound`***Imposition time:* IT\_SubClasTdEvAss

[For each `ConfidenceInterval`, the attribute `lowerBound` shall exist]

**[constr\_6831] Existence of `ConfidenceInterval.propability`***Imposition time:* IT\_SubClasTdEvAss

[For each `ConfidenceInterval`, the attribute `propability` shall exist]

**[constr\_6832] Existence of `ConfidenceInterval.upperBound`***Imposition time:* IT\_SubClasTdEvAss

[For each `ConfidenceInterval`, the attribute `upperBound` shall exist]

**[constr\_6833] Existence of `ExecutionOrderConstraint.orderedElement`***Imposition time:* IT\_SubClasTdEvAss

[For each `ExecutionOrderConstraint`, the attribute `orderedElement` shall exist at least once]

**[constr\_6834] Existence of `EOCExecutableEntityRefGroup.nestedElement`***Imposition time:* IT\_SubClasTdEvAss

[For each `EOCExecutableEntityRefGroup`, the reference in the role `nestedElement` shall exist at least once]

**[constr\_6835] Existence of `ExecutionTimeConstraint.executionTimeType`***Imposition time:* IT\_SwcTd

[For each `ExecutionTimeConstraint`, the attribute `executionTimeType` shall exist]

**[constr\_6836] Existence of `ExecutionTimeConstraint.executable`***Imposition time:* IT\_SwcTd

[For each `ExecutionTimeConstraint`, the reference to `ExecutableEntity` in the role `executable` shall exist]

**[constr\_6837] Existence of `LatencyTimingConstraint.latencyConstraintType`***Imposition time:* IT\_SubClasTdEvAss

[For each `LatencyTimingConstraint`, the attribute `latencyConstraintType` shall exist]

**[constr\_6838] Existence of `LatencyTimingConstraint.maximum`***Imposition time:* IT\_SubClasTdEvAss

[For each `LatencyTimingConstraint`, the attribute `maximum` shall exist]

**[constr\_6839] Existence of `LatencyTimingConstraint.minimum`***Imposition time:* IT\_SubClasTdEvAss

[For each `LatencyTimingConstraint`, the attribute `minimum` shall exist]

**[constr\_6841] Existence of `LatencyTimingConstraint.scope`***Imposition time:* IT\_SubClasTdEvAss

[For each `LatencyTimingConstraint`, the reference in the role `scope` shall exist at least once]

**[constr\_6842] Existence of `OffsetTimingConstraint.maximum`***Imposition time:* IT\_SubClasTdEv

[For each `OffsetTimingConstraint`, the attribute `maximum` shall exist]

**[constr\_6843] Existence of `OffsetTimingConstraint.minimum`***Imposition time:* IT\_SubClasTdEv

[For each `OffsetTimingConstraint`, the attribute `minimum` shall exist]

**[constr\_6844] Existence of `OffsetTimingConstraint.source`***Imposition time:* IT\_SubClasTdEv

[For each `OffsetTimingConstraint`, the reference in the role `source` shall exist at least once]

**[constr\_6845] Existence of `OffsetTimingConstraint.target`***Imposition time:* IT\_SubClasTdEv

[For each `OffsetTimingConstraint`, the reference in the role `target` shall exist at least once]

**[constr\_6846] Existence of `SynchronizationTimingConstraint.synchronizationConstraintType`***Imposition time:* IT\_SubClasTdEv

[For each `SynchronizationTimingConstraint`, the attribute `synchronizationConstraintType` shall exist]

**[constr\_6847] Existence of `SynchronizationTimingConstraint.tolerance`***Imposition time:* IT\_SubClasTdEv

[For each `SynchronizationTimingConstraint`, the attribute `tolerance` shall exist]

**[constr\_6849] Existence of `SystemTiming.system`***Imposition time:* IT\_SysTd

[For each `SystemTiming`, the reference to `System` in the role `system` shall exist]

**[constr\_6850] Existence of `BswModuleTiming.behavior`***Imposition time:* IT\_BswTd

[For each `BswModuleTiming`, the reference to `BswInternalBehavior` in the role `behavior` shall exist]

**[constr\_6851] Existence of `BswCompositionTiming.implementation`***Imposition time:* IT\_BswTd

[For each `BswCompositionTiming`, the reference to `BswImplementation` in the role `implementation` shall exist at least once]

**[constr\_6852] Existence of `EcuTiming.ecuConfiguration`***Imposition time:* IT\_EcuTd

[For each `EcuTiming`, the reference to `EcucValueCollection` in the role `ecuConfiguration` shall exist at least once]

**[constr\_6853] Existence of `ModeInBswInstanceRef.contextModeDeclarationGroupPrototype`***Imposition time:* IT\_BswTd

[For each `ModeInBswInstanceRef`, the reference to `ModeDeclarationGroupPrototype` in the role `contextModeDeclarationGroupPrototype` shall exist at least once.]

**[constr\_6854] Existence of `ModeInBswInstanceRef.targetModeDeclaration`***Imposition time:* IT\_BswTd

[For each `ModeInBswInstanceRef`, the reference to `ModeDeclaration` in the role `targetModeDeclaration` shall exist at least once.]

**[constr\_6855] Existence of `ModeInSwcInstanceRef.contextModeDeclarationGroupPrototype`***Imposition time:* IT\_SwcTd

[For each `ModeInSwcInstanceRef`, the reference to `ModeDeclarationGroupPrototype` in the role `contextModeDeclarationGroupPrototype` shall exist at least once.]

**[constr\_6856] Existence of `ModeInSwcInstanceRef.contextPort`***Imposition time:* IT\_SwcTd

[For each `ModeInSwcInstanceRef`, the reference to `PortPrototype` in the role `contextPort` shall exist at least once.]

**[constr\_6857] Existence of `ModeInSwcInstanceRef.targetModeDeclaration`***Imposition time:* IT\_SwcTd

[For each `ModeInSwcInstanceRef`, the reference to `ModeDeclaration` in the role `targetModeDeclaration` shall exist at least once.]

**[constr\_6858] Existence of `TDEventBswInternalBehavior.tdEventBswInternalBehaviorType`***Imposition time:* IT\_BswTd

[For each `TDEventBswInternalBehavior`, the attribute `tdEventBswInternalBehaviorType` shall exist]

**[constr\_6859] Existence of `TDEventBswInternalBehavior.bswModuleEntity`***Imposition time:* IT\_BswTd

[For each `TDEventBswInternalBehavior`, the reference to `BswModuleEntity` in the role `bswModuleEntity` shall exist]

**[constr\_6860] Existence of `TDEventBswModule.tdEventBswModuleType`***Imposition time:* IT\_BswTd

[For each `TDEventBswModule`, the attribute `tdEventBswModuleType` shall exist]

**[constr\_6861] Existence of `TDEventBswModule.bswModuleEntry`***Imposition time:* IT\_BswTd

[For each `TDEventBswModule`, the reference to `BswModuleEntry` in the role `bswModuleEntry` shall exist]

**[constr\_6862] Existence of `TDEventBswModeDeclaration.tdEventBswModeDeclarationType`***Imposition time:* IT\_BswTd

[For each `TDEventBswModeDeclaration`, the attribute `tdEventBswModeDeclarationType` shall exist]

**[constr\_6863] Existence of `TDEventBswModeDeclaration.modeDeclaration`***Imposition time:* IT\_BswTd

[For each `TDEventBswModeDeclaration`, the reference to `ModeDeclarationGroupPrototype` in the role `modeDeclaration` shall exist]

**[constr\_6864] Existence of `TDEventISignal.tdEventType`***Imposition time:* IT\_EcuTd

[For each `TDEventISignal`, the attribute `tdEventType` shall exist]

**[constr\_6865] Existence of `TDEventISignal.iSignal`***Imposition time:* IT\_EcuTd

[For each `TDEventISignal`, the reference to `ISignal` in the role `iSignal` shall exist]

**[constr\_6866] Existence of `TDEventISignal.physicalChannel`***Imposition time:* IT\_EcuTd

[For each `TDEventISignal`, the reference to `PhysicalChannel` in the role `physicalChannel` shall exist]

**[constr\_6867] Existence of `TDEventIPdu.tdEventType`***Imposition time:* IT\_EcuTd

[For each `TDEventIPdu`, the attribute `tdEventType` shall exist]

**[constr\_6868] Existence of `TDEventIPdu.iPdu`***Imposition time:* IT\_EcuTd

[For each `TDEventIPdu`, the reference to `IPdu` in the role `iPdu` shall exist]

**[constr\_6869] Existence of `TDEventIPdu.physicalChannel`***Imposition time:* IT\_EcuTd

[For each `TDEventIPdu`, the reference to `PhysicalChannel` in the role `physicalChannel` shall exist]

**[constr\_6870] Existence of `TDEventFrame.tdEventType`***Imposition time:* IT\_EcuTd

[For each `TDEventFrame`, the attribute `tdEventType` shall exist]

**[constr\_6871] Existence of `TDEventFrame.frame`***Imposition time:* IT\_EcuTd

[For each `TDEventFrame`, the reference to `Frame` in the role `frame` shall exist]

**[constr\_6872] Existence of `TDEventFrame.physicalChannel`***Imposition time:* IT\_EcuTd

[For each `TDEventFrame`, the reference to `PhysicalChannel` in the role `physicalChannel` shall exist]

**[constr\_6873] Existence of `TDEventFrameEthernet.tdEventType`***Imposition time:* IT\_EcuTd

[For each `TDEventFrameEthernet`, the attribute `tdEventType` shall exist]

**[constr\_6874] Existence of `TDHeaderIdRange.maxHeaderId`***Imposition time:* IT\_EcuTd

[For each `TDHeaderIdRange`, the attribute `maxHeaderId` shall exist]

**[constr\_6875] Existence of `TDHeaderIdRange.minHeaderId`***Imposition time:* IT\_EcuTd

[For each `TDHeaderIdRange`, the attribute `minHeaderId` shall exist]

**[constr\_6876] Existence of `TDEventCycleStart.cycleRepetition`***Imposition time:* IT\_EcuTd

[For each `TDEventCycleStart`, the attribute `cycleRepetition` shall exist]

**[constr\_6877] Existence of `TDEventFrClusterCycleStart.frCluster`***Imposition time:* IT\_EcuTd

[For each `TDEventFrClusterCycleStart`, the attribute `frCluster` shall exist]

**[constr\_6879] Existence of `TDEventOccurrenceExpression.formula`***Imposition time:* IT\_SubClasTdeEvAss

[For each `TDEventOccurrenceExpression`, the attribute `formula` shall exist]

**[constr\_6880] Existence of `AutosarVariableInstance.variableInstance`***Imposition time:* IT\_SubClasTdeEvAss

[For each `AutosarVariableInstance`, the reference in the role `variableInstance` shall exist]

**[constr\_6881] Existence of `AutosarOperationArgumentInstance.operationArgumentInstance`***Imposition time:* IT\_SubClasTdeEvAss

[For each `AutosarOperationArgumentInstance`, the reference in the role `operationArgumentInstance` shall exist]

**[constr\_6882] Existence of `TDEventSwcInternalBehavior.tdEventSwcInternalBehaviorType`***Imposition time:* IT\_SwcTd

[For each `TDEventSwcInternalBehavior`, the attribute `tdEventSwcInternalBehaviorType` shall exist]

**[constr\_6883] Existence of `TDEventSwcInternalBehavior.runnable`***Imposition time:* IT\_SwcTd

[For each `TDEventSwcInternalBehavior`, the reference to `RunnableEntity` in the role `runnable` shall exist]

**[constr\_6884] Existence of `TDEventSwcInternalBehaviorReference.referencedTDEventSwc`***Imposition time:* IT\_SwcTd

[For each `TDEventSwcInternalBehaviorReference`, the reference to `TDEventSwc` in the role `referencedTDEventSwc` shall exist]

**[constr\_6885] Existence of `TDEventVfbPort.isExternal`***Imposition time:* IT\_VfbTd

[For each `TDEventVfbPort`, the attribute `isExternal` shall exist]

**[constr\_6886] Existence of `TDEventVfbReference.referencedTDEventVfb`***Imposition time:* IT\_VfbTd

[For each `TDEventVfbReference`, the reference to `TDEventVfb` in the role `referencedTDEventVfb` shall exist]

**[constr\_6887] Existence of `TDEventVariableDataPrototype.tdEventVariableDataPrototypeType`***Imposition time:* IT\_VfbTd

[For each `TDEventVariableDataPrototype`, the attribute `tdEventVariableDataPrototypeType` shall exist]

**[constr\_6888] Existence of `TDEventVariableDataPrototype.dataElement`***Imposition time:* IT\_VfbTd

[For each `TDEventVariableDataPrototype`, the reference to `VariableDataPrototype` in the role `dataElement`]

**[constr\_6889] Existence of `TDEventOperation.tdEventOperationType`***Imposition time:* IT\_VfbTd

[For each `TDEventOperation`, the attribute `tdEventOperationType` shall exist]

**[constr\_6890] Existence of `TDEventOperation.operation`***Imposition time:* IT\_VfbTd

[For each `TDEventOperation`, the reference to `ClientServerOperation` in the role `operation` shall exist]

**[constr\_6891] Existence of `TDEventModeDeclaration.tdEventModeDeclarationType`***Imposition time:* IT\_VfbTd

[For each `TDEventModeDeclaration`, the attribute `tdEventModeDeclarationType` shall exist]

**[constr\_6892] Existence of `TDEventModeDeclaration.modeDeclaration`***Imposition time:* IT\_VfbTd

[For each `TDEventModeDeclaration`, the reference to `ModeDeclarationGroupPrototype` in the role `modeDeclaration` shall exist]

**[constr\_6893] Existence of `TDEventTrigger.tdEventTriggerType`***Imposition time:* IT\_VfbTd

[For each `TDEventTrigger`, the attribute `tdEventTriggerType` shall exist]

**[constr\_6894] Existence of `TDEventTrigger.trigger`***Imposition time:* IT\_VfbTd

[For each `TDEventTrigger`, the reference to `Trigger` in the role `trigger` shall exist]

**[constr\_6895] Existence of `TimingDescriptionEventChain.response`***Imposition time:* IT\_SubClasTdEvAss

[For each `TimingDescriptionEventChain`, the reference in the role `response` shall exist]

**[constr\_6896] Existence of `TimingDescriptionEventChain.stimulus`***Imposition time:* IT\_SubClasTdEvAss

[For each `TimingDescriptionEventChain`, the reference in the role `stimulus` shall exist]

**[constr\_6897] Existence of `TimingDescriptionEventChain.segment`***Imposition time:* IT\_SubClasTdEvAss

[For each `TimingDescriptionEventChain`, the reference in the role `segment` shall exist at least once]

**[constr\_6898] Existence of `ConcretePatternEventTriggering.offset`***Imposition time:* IT\_SubClasTdEvAss

[For each `ConcretePatternEventTriggering`, the attribute `offset` shall exist]



**[constr\_6899] Existence of `ModeInSwcInstanceRef.base`***Imposition time:* IT\_SwcTd

[For each `ModeInSwcInstanceRef`, the reference to `SwComponentType` in the role `base` shall exist at least once.]

**[constr\_6900] Dual existence of `TDEventVfb.portPrototype` and `TDEventVfb.portPrototypeBlueprint`***Status:* DRAFT*Imposition time:* IT\_VfbTd

[The reference `TDEventVfbPort.portPrototype` and `TDEventVfbPort.portPrototypeBlueprint` shall not co-exist in a model]

**[constr\_6901] Existence of `TDEventBsw.bswModuleDescription`***Status:* DRAFT*Imposition time:* IT\_BswTd

[For each `BswModuleTiming`, the reference to a `BswModuleDescription` in the role `bswModuleDescription` shall exist]

**[constr\_6906] Conformity of `stimulus` and `response` in a `TimingDescriptionEventChain`***Status:* DRAFT*Imposition time:* IT\_SubClasTdEvAss

[The `TimingDescriptionEvents` referenced in the roles `stimulus` and `response` shall be of the same sub-class (of `TimingDescriptionEvent`)]

**[constr\_6907] Restriction of `EOCExecutableEntityRefGroup.triggeringEvent`***Status:* DRAFT*Imposition time:* IT\_SwcTd

[The `TimingDescriptionEvent` referenced in the role `EOCExecutableEntityRefGroup.triggeringEvent` shall exist only if the `EOCExecutableEntityRefGroup` is transitively aggregated by an `ExecutionOrderConstraint.executionOrderConstraintType==repetitiveEOC` in the role `orderedElement`]

**[constr\_6908] Restriction of `EOCExecutableEntityRefGroup.letDataExchangeParadigm`***Status:* DRAFT*Imposition time:* IT\_SwcTd

[The attribute `letDataExchangeParadigm` shall exist only if the `letInterval` in the same same `EOCExecutableEntityRefGroup` references a `TimingDescriptionEventChain.category==LET_INTERVAL`]

### [constr\_6909] Singleton ROOT\_GROUP in a Hierarchical Execution Order Constraint

*Status:* DRAFT

*Imposition time:* IT\_SwcTd

[In a `ExecutionOrderConstraint.executionOrderConstraintType==hierarchicalEOC`, in the tree of `orderedElements`, there shall be only **one** `EOCExecutableEntityRefGroup.category==ROOT_GROUP`]

### [constr\_6910] Referencing from a ROOT\_GROUP in a Hierarchical Execution Order Constraint

*Status:* DRAFT

*Imposition time:* IT\_SwcTd

[In a `ExecutionOrderConstraint.executionOrderConstraintType==hierarchicalEOC`, in the tree of `orderedElements`, in the singularly identifiable `ROOT_GROUP` (according to [constr\_6909]):

- the `successor` shall not exist
- the `directSuccessor` shall not exist

]

### [constr\_6911] Referencing to a ROOT\_GROUP in a Hierarchical Execution Order Constraint

*Status:* DRAFT

*Imposition time:* IT\_SwcTd

[In a `ExecutionOrderConstraint.executionOrderConstraintType==hierarchicalEOC`, in the tree of `orderedElements`, the singularly identifiable `ROOT_GROUP` (according to [constr\_6909]) shall not be referenced in the role:

- `successor` by another `EOCExecutableEntityRefGroup`
- `directSuccessor` by another `EOCExecutableEntityRefGroup`
- `nestedElement` by another `EOCExecutableEntityRefGroup`

]

### [constr\_6912] Mandatory specification of LET interval recurrence

*Status:* DRAFT

*Imposition time:* IT\_SwcTd

[For a `TDEventComplex.category==LET_RELEASE`, there shall exist a `PeriodicEventTriggering` referencing that `TDEventComplex.category==LET_RELEASE` in the role `event`]

**[constr\_6913] Restriction on RTEEvents used in an LET interval***Status:* DRAFT*Imposition time:* IT\_SwcTd

[An `EOCExecutableEntityRefGroup` which references a `TimingDescription-EventChain.category==LET_INTERVAL` in the role `letInterval` **and** transitively references an `EOCEventRef` in the role `successor` **or** references an `EOCEventRef` in the role `nestedElement`, those `EOCEventRefs` shall reference either:

- `TimingEvent` in the role `event` or
- `BswTimingEvent` in the role `event`

]

**[constr\_6914] Restriction of the portPrototype context of an AgeConstraint***Status:* DRAFT*Imposition time:* IT\_SubClasTdeEvAss

[An `AgeConstraint.scope.portPrototype` shall reference only sub-classes of `AbstractRequiredPortPrototype`]

**[constr\_6915] Affinity of ISignal in TDEventISignal***Status:* DRAFT*Imposition time:* IT\_EcuTd

[The referenced `ISignal` in the role `TDEventISignal.iSignal` shall exist also in the list of `iSignals` aggregated by `TDEventISignal.physicalChannel.iSignalTriggering`]

**[constr\_6916] Affinity of Frame in TDEventFrame***Status:* DRAFT*Imposition time:* IT\_EcuTd

[The referenced `Frame` in the role `TDEventFrame.frame` shall exist also in the list of `frames` aggregated by `TDEventFrame.physicalChannel.frameTriggering`]

**[constr\_6917] Affinity of IPdu in TDEventIPdu***Status:* DRAFT*Imposition time:* IT\_EcuTd

[The referenced `IPdu` in the role `TDEventIPdu.iPdu` shall exist also in the list of `iPdus` aggregated by `TDEventIPdu.physicalChannel.pduTriggering`]

**[constr\_6918] Referenced TimingDescriptions in TDCpSoftwareClusterMapping and TDCpSoftwareClusterResourceMapping***Status:* DRAFT*Imposition time:* IT\_SysTd

[The references:

- `TDCpSoftwareClusterMapping.timingDescription`

- `TDCpSoftwareClusterResourceMapping.timingDescription`

shall refer to either:

- `TDEventComplex.category==DISPATCH_ENTRY_POINT`, or
- `TimingDescriptionEventChain.category==LET_INTERVAL`

]

#### [constr\_6919] Referenced `CpSoftwareCluster` of `TDCpSoftwareClusterMapping`

*Status:* DRAFT

*Imposition time:* IT\_SysTd

[The references:

- `TDCpSoftwareClusterMapping.provider`
- `TDCpSoftwareClusterMapping.requestor`

shall refer to a `CpSoftwareCluster.category==HOST_SOFTWARE_CLUSTER`]

#### [constr\_6920] Existence of `LatencyTimingConstraint.minimum` used in an LET interval

*Status:* DRAFT

*Imposition time:* IT\_SwcTd

[For a `LatencyTimingConstraint` with:

- `latencyConstraintType==reaction`
- `scope.category==LET_INTERVAL`

the attribute `minimum` shall not exist.]

#### [constr\_6921] Disallow `TimingDescriptionEventChain` segmental circular-referencing

*Status:* DRAFT

*Imposition time:* IT\_SubClasTeAss

[A `TimingDescriptionEventChain.segment` shall never reference the (parent) `TimingDescriptionEventChain` in which it is referenced in the role `segment`.]

## 2.8 FO\_TPS\_GenericStructureTemplate

**[constr\_2501] Blueprint of blueprints are not supported** [Note that objects modeled particularly as a "blueprint" (e.g. `PortPrototypeBlueprint`) also live in a package of category `BLUEPRINT`. Strictly speaking this means that they can be "blueprints" of "blueprints". This indirection is not intended and not supported.]

**[constr\_2502] Merged model shall be compliant to the meta-model** [A model merged from `<<atpSplittable>>` elements shall adhere to the constraints of the *meta-model*. This concerns, for example, the lower and upper multiplicities of model elements. Note that the applied constraints depend on the imposition times.]

**[constr\_2504] Constraint to `bindingTime`** [The tag `vh.latestBindingTime` *constraints* the value of the attribute `bindingTime` from [TPS\_GST\_00190]. Hence, it defines the latest point in methodology which is allowed as value for `bindingTime` of this particular application of `<<atpVariation>>`.]

**[constr\_2505] Multiplicity after binding** [if  $\text{Phase} \geq \{\text{partRole}\}.\text{BindingTime}$  then number of `\{\text{partRole}\}`'s =  $n$ ]

**[constr\_2507] `EvaluatedVariantSet` shall not refer to itself** [An `EvaluatedVariantSet` shall not refer to itself directly or via other `EvaluatedVariantSet`.]

**[constr\_2508] The `shortName` shall be unique in its name space** [The content of `shortName` needs to be unique (case insensitive) within a the parent given name space.

Note that the check for uniqueness of `shortName` shall be performed case insensitively. This supports the good practice that names should not differ in upper / lower case only which would cause a lot of confusion.

The term "case insensitive" indicates that the characters in the sets

```
{a b c d e f g h i j k l m n o p q r s t u v w x y z}
{A B C D E F G H I J K L M N O P Q R S T U V W X Y Z}
```

are respectively considered to be the same. In other words case-insensitive check for uniqueness of `shortNames` results in the fact that e.g. elements with `shortName` "X" and "x" are considered the same and shall not exist in the same name space.]

**[constr\_2509] Uniqueness of `ReferenceBase.shortLabel` in the scope of an `ARPackage`** [The `shortLabel` of any given `ReferenceBase` defined in the scope of an `ARPackage` shall be unique within the scope of the enclosing `ARPackage`.]

**[constr\_2511] Named reference bases shall be available** [If there is a relative references, then one of the containing packages shall have a `referenceBase` with a `shortLabel` equal to the `base` of the reference.]

**[constr\_2512] `shortName` uniqueness constraint for variants** [`shortName` + `shortLabel` of a variant element shall be unique within the name space established by the surrounding `Identifiable`.]

**[constr\_2514] `shortLabel` in `VariationPoint` shall be unique** [The combination of `shortName` and `shortLabel` shall be unique within the next enclosing `Identifiable` {WholeClass}.]

# [constr\_2515] Categories of packages shall not conflict [

	child + category (also indirect children)				
parent category	empty	BLUEPRINT	STANDARD	custom1	custom2
empty	ok	ok	ok	ok	ok
BLUEPRINT	ok	ok	conflict	conflict	conflict
STANDARD	ok	conflict	ok	conflict	conflict
custom1	ok	conflict	conflict	ok	conflict
custom2	ok	conflict	conflict	conflict	ok
	target package category (if category is empty, then the parent category applies)				
category of package that contains reference source element (if category is empty, then the parent category applies)	empty	BLUEPRINT	STANDARD	custom1	custom2
empty	ok	ok	ok	ok	ok
BLUEPRINT	ok	ok	ok	conflict	conflict
STANDARD	ok	conflict	ok	conflict	conflict
custom1	ok	ok	ok	ok	ok
custom2	ok	ok	ok	ok	ok

Upper part of the table: If a non empty category is defined for a package, then all sub packages shall have empty category or the same category.

Lower part of the table: Additionally, the "Rules for references between elements in packages with specific categories" shall apply.

]

**[constr\_2516] Return type of an [AttributeValueVariationPoint](#)** [When such a formula is evaluated by a software tool, and the return value of the formula is shall be compatible to the type of the attribute in the pure meta-model.]

**[constr\_2517] [postBuildVariantCondition](#) only for PostBuild** [Aggregation of [PostBuildVariantCondition](#) in [VariationPoint](#) is only allowed if the annotated model states `vh.latestBindingTime` to PostBuild.]

**[constr\_2518] Binding time is constrained** [Note that this binding time is again constrained by the value of the tag `vh.latestBindingTime`.]

**[constr\_2519] [PredefinedVariants](#) need to be consistent** [If a [PredefinedVariant](#) plus its [includedVariants](#) references more than one [SwSystemconstantValueSet](#) all [value](#) attributes in [SwSystemconstValues](#) for a particular [SwSystemconst](#) shall be identical.]

**[constr\_2520] Nesting of lists shall be limited** [The nesting of lists shall be limited to a reasonable depth such that it can safely be rendered on A4 pages. A reasonable approach is not to nest more than three levels.]

**[constr\_2521] The `shortLabel` in `AttributeValueVariationPoint` shall be unique** [The `shortLabel` shall be unique (case insensitive) within the next enclosing `Identifiable` and is used to individually address variation points in the *variant-rich M1 model*.

Note that the check for uniqueness of `shortLabel` shall be performed case insensitively. This supports the good practice that `shortLabels` should not differ in upper / lower case only which would cause a lot of confusion.

The term 'case insensitive' indicates that the characters in the sets

```
{a b c d e f g h i j k l m n o p q r s t u v w x y z}
{A B C D E F G H I J K L M N O P Q R S T U V W X Y Z}
```

are respectively considered to be the same. In other words case-insensitive check for uniqueness of `shortLabel` results in the fact that e.g. elements with `shortLabel` 'X' and 'x' are considered the same and shall not exist in the same context.]

**[constr\_2522] Notes should not be nested** [Note even if it is possible to nest notes it is not recommended to do so, since it might lead to problems with the rendering of the note icon.]

**[constr\_2523] Used languages need to be consistent** [The used languages of an AUTOSAR file are specified in the top level `adminData`. All other elements shall be provided in the languages specified for the document.]

**[constr\_2524] Non splittable elements in one file** [If the *aggregation/attribute* is not `<<atpSplittable>>`, then all aggregated element(s) shall be described in the same physical file as the aggregating element.]

**[constr\_2533] Documentation context is either a feature or an identifiable** [One particular `DocumentationContext` shall be either a feature or an identifiable but not both at the same time. If this is desired, one should create multiple `DocumentationContext`.]

**[constr\_2534] Practically `UnlimitedInteger` shall be limited such that it fits into 64 bit.** [If a signed value is represented the min value can be down to -9223372036854775808 (0x800000000000000014) and the max value can be up to 9223372036854775807 (0x7fffffffffffffffffff).]

**[constr\_2538] Global reference is limited to certain elements** [The ability to perform a global reference is limited to

- `Chapter`,
- `Topic1`,
- `Caption`,
- `Traceable`,
- `XrefTarget`,



- Std,
- Xdoc,
- Xfile

]

**[constr\_2547] Ordered collections cannot be split into different partial models**

[Ordered collections cannot be split. In other words: Contrary to the semantics of unordered collections - which can be distributed between partial models - ordered collections can only be placed as a whole in one of the partial models. Otherwise the merge approach would influence the semantics of the collections.]

**[constr\_2557] No `VariationPoints` where `vh.latestBindingTime` set to `BlueprintDerivationTime` in system configurations**

[Blueprints are **not** part of a system configuration. In consequence of this, in a system configuration there shall be no `VariationPoint` where `vh.latestBindingTime` is restricted to `BlueprintDerivationTime` by the meta-model.]

**[constr\_2558] If `vh.latestBindingTime` is `BlueprintDerivationTime` then there shall only be `blueprintCondition` or `formalBlueprintGenerator` respectively `blueprintValue`**

[`VariationPoints` with `vh.latestBindingTime` restricted to `BlueprintDerivation` shall not have `swSyscond` nor `postBuildVariantCondition`.]

**[constr\_2559] No nested `VariationPoint`** [As `blueprintCondition` is a `DocumentationBlock` it could again contain `VariationPoints` and therefore would allow nesting of `VariationPoints`. This is not intended and shall not be used.]

**[constr\_2567] Undefined Value in Attribute Value Blueprints**

[If a `blueprintValue` is specified, then the `value` defined by the `AttributeValueVariationPoint` is not used and should therefore at least contain one term `undefined` which is to be refined when deriving objects from this blueprint.]

**[constr\_2572] Unique Control of Document Languages** [The settings for multiple languages are specified in the top-Level `AdminData` only]

**[constr\_2575] `blueprintValue` in blueprints only** [`blueprintValue` is only allowed in blueprints and may not be present in a system description.]

**[constr\_2577] Binding Time in Aggregation Pattern** [Within `VariationPoint`, the class `ConditionByFormula` has an attribute `bindingTime` which defines the *latest* binding time for this variation point. This binding time is further constrained by the UML tag `vh.latestBindingTime` that is attached to the aggregation see [TPS\_GST\_00190], [TPS\_GST\_00220], [TPS\_GST\_00221]]:

`ConditionByFormula.bindingTime` ≤ `aggregation.vh.latestBindingTime`]



**[constr\_2578] Binding Time in Association Pattern** [Within `VariationPoint`, the class `ConditionByFormula` has an attribute `bindingTime` which defines the *latest* binding time for this variation point. This binding time is further constrained by the UML tag `vh.latestBindingTime` that is attached to the association (see [TPS\_GST\_00190], [TPS\_GST\_00220], [TPS\_GST\_00221]):

$$\text{ConditionByFormula.bindingTime} \leq \text{association.vh.latestBindingTime}]$$

**[constr\_2579] Binding Time in Attribute Value Pattern** [The meta-class `AttributeValueVariationPoint` has an attribute `bindingTime` which defines the *latest* binding time for this variation point. This binding time is further constrained by the UML tag `vh.latestBindingTime` that is attached to the attribute (see [TPS\_GST\_00190], [TPS\_GST\_00220], [TPS\_GST\_00221]):

$$\text{AttributeValueVariationPoint.bindingTime} \leq \text{attribute.vh.latestBindingTime}]$$

**[constr\_2580] Binding Time in Property Set Pattern** [The meta-class `VariationPoint` has an attribute `bindingTime` which defines the *latest* binding time for this variation point. This binding time is further constrained by the UML tag `vh.latestBindingTime` that is attached to the meta-class which is marked as `<<atpVariation>>` (see [TPS\_GST\_00190], [TPS\_GST\_00220], [TPS\_GST\_00221]):

$$\text{VariationPoint.bindingTime} \leq \text{meta class.vh.latestBindingTime}]$$

**[constr\_2581] Default life cycle state shall be defined properly** [`defaultLcState` in `LifeCycleInfoSet` shall reference to a `lcState` defined in the `LifeCycleStateDefinitionGroup` referenced by `usedLifeCycleStateDefinitionGroup`.]

**[constr\_2583] Used life cycle state shall be defined properly** [`defaultLcState` in `LifeCycleInfo` shall reference to a `lcState` defined in the `LifeCycleStateDefinitionGroup` referenced by `usedLifeCycleStateDefinitionGroup` of the containing `LifeCycleInfoSet`.]

**[constr\_2585] LifeCycleInfo shall be unambiguous** [Within one particular `LifeCycleInfoSet` `lifeCycleInfo.lcObject` shall be unique. This ensures that the association of a `LifeCycleState` to a `Referrable` is unambiguous.

This constraint applies for a particular point in time under consideration of the period of viability according to [TPS\_GST\_00244].]

**[constr\_2586] Constraints on LifeCyclePeriod** [The attributes `date`, `arReleaseVersion`, `productRelease` in `LifeCyclePeriod` are mutually exclusive.]

**[constr\_2587] No System in AnyInstanceRef** [In consequence of [TPS\_GST\_00387] `System` shall not be `contextElement` nor `target` of an `AnyInstanceRef`. Otherwise `atpBase` would not be determined.]

**[constr\_2594] Cyclic value assignments to `SwSystemconst` is not allowed** [It is explicitly forbidden to assign values to `SwSystemconst` which in turn depend directly or indirectly on this value assignment.]

**[constr\_2595] Footnotes should not be nested** [Note that even if supported by the meta-model, footnotes shall not be nested. Nested footnotes might lead to problems with the processing of the footnote link. In other words `LParagraph` shall not be aggregated with role `ft` within a `LParagraph` which already has the role `ft`.]

**[constr\_2596] Used colors of attributes `color` and `bgcolor`** [The used colors of the attributes `color` and `bgcolor` shall base on the 6 digits RGB hex-code following

```
|#([a-fA-F0-9]{6})|
```

.]

**[constr\_2599] Maximum one `VariationPoints` in `«atpMixed»`** [In case an `«atpMixed»` meta-class is aggregated as `«atpVariation»` there shall not be more than one `VariationPoint` and the `VariationPoint` shall be the last aggregated element.]

**[constr\_2601] Value of `AbstractEnumerationValueVariationPoint`** [The formula of an `AbstractEnumerationValueVariationPoint` shall evaluate to a value for which a mapping is defined in the `EnumerationMappingTable` which is referenced by the attributes `base` and `enumTable`.]

**[constr\_2602] Completeness of `AnyInstanceRef` referencing `ImplementationDataTypeElement`** [If the `target` references an `ImplementationDataTypeElement` the `AnyInstanceRef` shall define a `contextElement` reference for

1. each leaf `ImplementationDataTypeElement` in a chain of referencing `ImplementationDataTypes` which is not the `target`
2. and each `ImplementationDataTypeElement` of category `ARRAY` in a chain of referencing `ImplementationDataTypes`

Thereby the contexts are created according [TPS\_GST\_00162] from the root to the leaf `ImplementationDataTypeElement` which is either typed (directly or indirectly via `ImplementationDataType` of category `TYPE_REFERENCE`) or owns the `target`.]

**[constr\_2606] Existence of `upperMultiplicityInfinite` and `upperMultiplicity` of `AbstractMultiplicityRestriction` is mutually exclusive** [The existence of the elements `upperMultiplicityInfinite` and `upperMultiplicity` of `AbstractMultiplicityRestriction` shall be mutually exclusive.]

**[constr\_2607] `lowerMultiplicity` of `AbstractMultiplicityRestriction` shall be smaller or equal to `upperMultiplicity`** [`lowerMultiplicity` of `Ab-`

`structMultiplicityRestriction` shall be smaller or equal to `upperMultiplicity`.]

**[constr\_2626] `atpTarget` of `InstanceRefs` shall be consistent** [The `atpTarget` of an instance ref shall either

- be an `atpFeature` owned by the `atpType` of the last `atpContextElement` or
- be an `atpFeature` owned by an `AtpStructureElement` owned by the `atpType` of the last `atpContextElement`.

]

**[constr\_2627] No reassigning of the same name within one LET Block** [Within one `LET` block one name shall be assigned to a value at most once.]

**[constr\_2628] Representation of `xml.xsd.type=double` data types** [All data types with `xml.xsd.type=double` shall comply with IEEE 754 and are limited to what can be expressed by a 64 bit binary representation.]

**[constr\_2629] Defined identity up to the root** [If an element in the M1 model aggregates splittable elements on deeper levels, it shall have a defined identity, i.e. the identifying attributes (e.g. `shortName` or `shortLabel`); see [TPS\_GST\_00047]; shall be set in the M1 model.]

**[constr\_2630] M1 elements with same identity but different type are not allowed** [Splittable M1 elements with the same identity but different type shall not exist, i.e. a merge conflict shall be reported.]

**[constr\_2631] Usage of value ANY for `AnyServiceInstanceId`** [The value of a given `AnyServiceInstanceId` shall not be set to ANY.]

**[constr\_2633] Existence of reference decorated with stereotype `<<isOfType>>`** [If a subclass of `AtpPrototype` defines a reference decorated with stereotype `<<isOfType>>` to a subclass of `AtpType`, then this reference shall always exist.]

**[constr\_2634] Conditionals with ordered collections** [Ordered collections shall not be split over different conditionals.]

**[constr\_2635] No custom values for `Collection.category`** [It is not allowed to define any custom or project-specific value of the attribute `Collection.category`.]

**[constr\_2636] No custom values for `Collection.elementRole`** [It is not allowed to define any custom or project-specific value of the attribute `Collection.elementRole`.]

**[constr\_2637] Limits of `PositiveUnlimitedInteger`** [For `PositiveUnlimitedInteger`, the min value can be down to 0 and the max value can be up to 18446744073709551615 (0xffffffffffffffff).]

**[constr\_2638] Variation points shall not exist in non-variant roles** [Variation Points shall not exist if the aggregation is not stereotyped `<<atpVariation>>` in the AUTOSAR meta model at any time in the workflow.]

**[constr\_2639] Restriction for the value of the first character in an `AnyVersionString`** [The first character of the value of any attribute typed by `AnyVersionString` shall only be in the range 1..9.]

**[constr\_2640] Restriction for the length of the value of an `AnyVersionString`** [The value of any attribute typed by `AnyVersionString` shall contain at least one character.]

**[constr\_2641] Mixed content elements cannot be split into different partial models** [The content of elements stereotyped with `<<atpMixed>>` or `<<atpMixedString>>` cannot be split, i.e. the mixed content element must be placed as a whole in one of the partial models.]

**[constr\_10656] Value of a `SwSystemconst` used in the context of the *formula language for post-build configuration*** [If the combination of `SwSystemconst` and `SwSystemconstValue` is used in the context of the *formula language for post-build configuration*, then the effective value the involved `SwSystemconst` shall represent a **constant positive integer value** in the value range that can be represented by a 32-bit integer data type, i.e. 0 .. 4294967295.]

## 2.9 FO\_TPS\_StandardizationTemplate

**[constr\_2500] `PortInterfaces` shall be of same kind** [Both objects (`PortInterfaces`) referenced by a blueprint mapping for port interfaces (represented by `BlueprintMapping`) shall be of the same kind (e.g. both shall be `SenderReceiverInterfaces`). In other words both interfaces shall be instances of the same meta class.]

**[constr\_2526] `PortInterface` need to be compatible to the blueprints** [`PortInterface` shall be compatible to their respective blueprints according to the compatibility rules.]

**[constr\_2527] Blueprints shall live in package of a proper category** [As explained in detail in the [11], model artifacts (in this case `PortPrototypeBlueprint` and incompletely specified `PortInterfaces`) created for the purpose of becoming blueprints shall reside in an `ARPackage` of category `BLUEPRINT`.]

**[constr\_2528] `PortPrototypes` shall not refer to blueprints of a `PortInterface`** [A port `PortPrototype` shall not reference a `PortInterface` which lives in a package of category `BLUEPRINT`.]

**[constr\_2529] PortPrototypeBlueprints and derived PortPrototypes shall reference proper PortInterfaces** [A PortPrototypeBlueprint may reference a blueprint of PortInterface. According to [constr\_2570], a system description shall not contain blueprints. Therefore the reference to the PortInterface may need to be rewritten when a PortPrototype is derived from the blueprint.]

In this case the PortInterface referenced by the derived PortPrototype shall be compatible to the PortInterface (which is a blueprint) referenced by the PortPrototypeBlueprint.

According to [constr\_2526] this can be ensured if the PortInterface referenced by the PortPrototypeBlueprint is the blueprint of the PortInterface referenced by the respective PortPrototype.]

**[constr\_2546] References in derived model elements** [Model elements derived from blueprints shall never refer to model elements that are blueprints.]

**[constr\_2553] shortName shall follow the pattern defined in the Blueprint** [The shortName respectively symbol of the derived objects shall follow the pattern defined in namePattern or blueprintValue of the blueprint according to [TPS\_STDT\_00086]]

**[constr\_2554] Derived objects shall match the blueprints** [Unless specified explicitly otherwise, the attributes of the blueprint shall appear in the derived objects. As an exception namePattern and blueprintValue may not be copied.]

**[constr\_2556] No Blueprint Motivated VariationPoints in AUTOSAR Descriptions** [AUTOSAR descriptions which are not blueprints shall not have blueprintCondition, formalBlueprintGenerator nor blueprintValue.]

**[constr\_2563] BswModuleDescription blueprints should not have a BswInternalBehavior** [A BswModuleDescription blueprint should not have a BswInternalBehavior since this is a matter of implementation and not subject to standardization. Exceptions might exist in vendor internal applications.]

**[constr\_2565] Traceable shall not be nested** [Due to the intended atomicity of requirements respectively specification items, Traceable shall not be nested.]

**[constr\_2566] Blueprintmapping shall map appropriate elements** [BlueprintMapping shall map elements which represent a valid pair of blueprint / derived object. In most of the cases this means that blueprint and derivedObject shall refer to objects of the same meta-class.]

**[constr\_2568] SwComponentTypes shall be of same kind** [Both objects (SwComponentTypes) referenced by a blueprint mapping for port interfaces (represented by BlueprintMapping) shall be of the same kind (e.g. both shall be AtomicSwComponentTypes). In other words both components shall be instances of the same meta class.]

**[constr\_2569] Purely Blueprint Motivated `VariationPoints`** [`VariationPoints` with `vh.latestBindingTime` set to `blueprintDerivationTime` shall have only `blueprintCondition` or `formalBlueprintGenerator` respectively `blueprintValue`.]

**[constr\_2570] No Blueprints in system descriptions** [There shall be no blueprints in system descriptions. In consequence of this blueprint elements shall be referenced only from blueprints and `AtpBlueprintMappings`. Due to `«atpUriDef»`, the references from `AtpBlueprintMapping` do not need to be resolved in system descriptions.]

**[constr\_2571] Outgoing references from Blueprints** [Note that outgoing references from Blueprints are basically not limited. Practically, references to objects living in a package of category EXAMPLE should not occur.]

**[constr\_2589] In VFB Timing Blueprint `TDEventVfbPort` shall reference `Port-PrototypeBlueprint`** [In a VFB Timing Blueprint `TDEventVfbPort` shall reference `PortPrototypeBlueprint`. In other words, a VFB Timing Description Event specified in a VFB Timing Blueprint shall always reference a Port Prototype Blueprint.]

**[constr\_2590] One `BlueprintPolicy` is allowed** [For each attribute of a blueprint, at most one `BlueprintPolicy` is allowed.]

**[constr\_2591] `BlueprintPolicyNotModifiable`** [If `BlueprintPolicyNotModifiable` is assigned to an attribute, then during blueprinting it is not allowed to modify the value of the attribute and all its contained content.]

**[constr\_2592] No `BlueprintPolicy`** [If no `BlueprintPolicy` is assigned to an attribute, then arbitrary modifications are allowed while deriving from the blueprint.]

**[constr\_2593] Expression for identifying the attribute a `BlueprintPolicy` relates to** [The expression language for identifying the related attribute of a `BlueprintPolicy` is a subset version of xpath, see [12]. For navigation over the model we use the names as they are used in XML.]

**[constr\_2597] `ClientServerOperationBlueprintMapping` constrains number of arguments** [The number of arguments of the `BswModuleEntry` referenced by a `bswModuleEntry` shall be identical to the number of `portDefinedArgumentBlueprints` of the owning `ClientServerInterfaceToBswModuleEntry-BlueprintMapping` plus the number of `ArgumentDataPrototypes` aggregated in the role argument of the `clientServerOperation`.]

**[constr\_2598] `ClientServerOperationBlueprintMapping` constrains the types of arguments** [The arguments in the ordered lists `bswModuleEntry` and the matching arguments in the set union of the ordered lists `portDefinedArgument-Blueprint` plus `clientServerOperation` shall result in the identical C data type definitions.]



**[constr\_2603] Use of [appliesTo](#) in context of the specification level** [On specification level 1 and 2 only the requirements table including the [appliesTo](#) attribute shall be used. On the specification levels 3 and 4 only the requirements table without the [appliesTo](#) shall be used. Exception: Documents of the foundation which are handled on specification level 3.]

**[constr\_2604] Allowed up-traces in context of [appliesTo](#) values** [Traces to documents of upper specification levels shall be conform to the values assigned to [appliesTo](#).]

**[constr\_2625] Permitted [LifeCycleState](#) combinations in a requirement up-trace** [

	Trace to: <a href="#">TraceableText.category</a> =REQUIREMENT_ITEM			
Trace from:	DRAFT	VALID	OBSOLETE	REMOVED
DRAFT	1	1		
VALID	x	1		
OBSOLETE	1	1	1	
REMOVED	1	1	1	1
Legend:				
x) A "not applicable" requirement - as per [TPS_STDT_00056] with <a href="#">LifeCycleState</a> ==VALID may uptrace to <a href="#">LifeCycleState</a> ==DRAFT				
1) Permitted				

]

## A Mentioned Class Tables

Class	ARPackage			
Note	AUTOSAR package, allowing to create top level packages to structure the contained ARElements. ARPackages are open sets. This means that in a file based description system multiple files can be used to partially describe the contents of a package. This is an extended version of MSR's SW-SYSTEM.			
Base	ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.arPackage</a> , <a href="#">AUTOSAR.arPackage</a>			
Attribute	Type	Mult.	Kind	Note
arPackage	<a href="#">ARPackage</a>	*	aggr	This represents a sub package within an ARPackage, thus allowing for an unlimited package hierarchy. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=arPackage.shortName, arPackage.variation Point.shortLabel vh.latestBindingTime=blueprintDerivationTime xml.sequenceOffset=30
element	PackageableElement	*	aggr	Elements that are part of this package <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=element.shortName, element.variation Point.shortLabel vh.latestBindingTime=systemDesignTime xml.sequenceOffset=20
referenceBase	<a href="#">ReferenceBase</a>	*	aggr	This denotes the reference bases for the package. This is the basis for all relative references within the package. The base needs to be selected according to the base attribute within the references. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=referenceBase.shortLabel xml.sequenceOffset=10

Table A.1: ARPackage

Class	AUTOSAR			
Note	Root element of an AUTOSAR description, also the root element in corresponding XML documents. <b>Tags:</b> xml.globalElement=true			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
adminData	<a href="#">AdminData</a>	0..1	aggr	This represents the administrative data of an Autosar file. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=adminData xml.sequenceOffset=10
arPackage	<a href="#">ARPackage</a>	*	aggr	This is the top level package in an AUTOSAR model. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=arPackage.shortName, arPackage.variation Point.shortLabel vh.latestBindingTime=blueprintDerivationTime xml.sequenceOffset=30







Class	AUTOSAR			
fileInfo Comment	FileInfoComment	0..1	aggr	This represents a possibility to provide a structured comment in an AUTOSAR file. <b>Stereotypes:</b> atpStructuredComment <b>Tags:</b> xml.roleElement=true xml.sequenceOffset=-10 xml.typeElement=false
introduction	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents an introduction on the Autosar file. It is intended for example to represent disclaimers and legal notes. <b>Tags:</b> xml.sequenceOffset=20

Table A.2: AUTOSAR

Class	AbsoluteTolerance			
Note	Maximum allowable deviation			
Base	ARObject, TimeRangeTypeTolerance			
Aggregated by	<a href="#">TimeRangeType.tolerance</a>			
Attribute	Type	Mult.	Kind	Note
absolute	TimeValue	0..1	attr	Maximum allowable deviation in duration (in seconds)

Table A.3: AbsoluteTolerance

Class	AbstractAccessPoint (abstract)			
Note	Abstract class indicating an access point from an <a href="#">ExecutableEntity</a> .			
Base	ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">AsynchronousServerCallResultPoint</a> , <a href="#">ExternalTriggeringPointIdent</a> , <a href="#">InternalTriggeringPoint</a> , <a href="#">ModeAccessPointIdent</a> , <a href="#">ModeSwitchPoint</a> , <a href="#">ParameterAccess</a> , <a href="#">ServerCallPoint</a> , <a href="#">VariableAccess</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a>			
Attribute	Type	Mult.	Kind	Note
returnValue Provision	<a href="#">RteApiReturnValue</a> <a href="#">ProvisionEnum</a>	0..1	attr	This attribute controls the provision of return values for RTE APIs that correspond to the enclosing access point. This Attribute is only used by the AUTOSAR Classic Platform.

Table A.4: AbstractAccessPoint

Class	AbstractCanCommunicationControllerAttributes (abstract)			
Note	For the configuration of the CanController parameters two different approaches can be used: 1. Providing exact values which are taken by the ECU developer (CanControllerConfiguration). 2. Providing ranges of values which are taken as requirements and have to be respected by the ECU developer (CanControllerConfigurationRequirements).			
Base	ARObject			
Subclasses	<a href="#">CanControllerConfiguration</a> , <a href="#">CanControllerConfigurationRequirements</a>			
Aggregated by	<a href="#">AbstractCanCommunicationController.canControllerAttributes</a>			
Attribute	Type	Mult.	Kind	Note





Class	<b>AbstractCanCommunicationControllerAttributes</b> (abstract)			
canControllerFdAttributes	<a href="#">CanControllerFdConfiguration</a>	0..1	aggr	Bit timing related configuration of a CAN controller for payload and CRC of a CanFD frame. If this element exists the controller supports CanFD frames and the ECU developer shall take these values for the configuration of the CanFD controller.
canControllerFdRequirements	<a href="#">CanControllerFdConfigurationRequirements</a>	0..1	aggr	Additional CanFD ranges of the bit timing related configuration of a CanFD controller. If this element exists the controller supports CanFD frames and the ECU developer shall take these ranges as requirements for the configuration of the CanFD controller.
canControllerXlAttributes	<a href="#">CanControllerXlConfiguration</a>	0..1	aggr	Bit timing related configuration of a CAN controller for payload and CRC of a CanXL frame. If this element exists the controller supports CanXL frames and the ECU developer shall take these values for the configuration of the CanXL controller.
canControllerXlRequirements	<a href="#">CanControllerXlConfigurationRequirements</a>	0..1	aggr	Additional CanXL ranges of the bit timing related configuration of a CanXL controller. If this element exists the controller supports CanXL frames and the ECU developer shall take these ranges as requirements for the configuration of the CanXL controller.

**Table A.5: AbstractCanCommunicationControllerAttributes**

Class	«atpMixedString» <b>AbstractEnumerationValueVariationPoint</b> (abstract)			
Note	This is an abstract EnumerationValueVariationPoint. It is introduced to support the case that additional attributes are required for particular purposes.			
Base	ARObject, <a href="#">AttributeValueVariationPoint</a> , <a href="#">FormulaExpression</a> , <a href="#">SwSystemconstDependentFormula</a>			
Subclasses				
Aggregated by	<a href="#">VariationPointProxy.valueAccess</a>			
Attribute	Type	Mult.	Kind	Note
base	<a href="#">Identifier</a>	0..1	attr	This attribute reflects the base to be used in context of EnumerationMappingTable for this reference. <b>Tags:</b> xml.attribute=true
enumTable	<a href="#">Ref</a>	0..1	attr	This represents the assigned enumeration table. <b>Tags:</b> xml.attribute=true

**Table A.6: AbstractEnumerationValueVariationPoint**

Class	<b>AbstractEthernetFrame</b> (abstract)			
Note	Ethernet specific attributes to the Frame.			
Base	ARObject, <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Frame</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	GenericEthernetFrame, UserDefinedEthernetFrame			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.7: AbstractEthernetFrame**

<b>Class</b>	<b>AbstractEvent</b> (abstract)			
<b>Note</b>	This meta-class represents the abstract ability to model an event that can be taken to implement application software or basic software in AUTOSAR.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">BswEvent</a> , <a href="#">RTEEvent</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
activationReasonRepresentation	<a href="#">ExecutableEntity</a> <a href="#">ActivationReason</a>	0..1	ref	If the activationReasonRepresentation is referenced from the enclosing AbstractEvent this shall be taken as an indication that the latter contributes to the activating vector of this ExecutableEntity that owns the referenced ExecutableEntityActivationReason.

**Table A.8: AbstractEvent**

<b>Class</b>	<b>AbstractImplementationDataType</b> (abstract)			
<b>Note</b>	This meta-class represents an abstract base class for different flavors of ImplementationDataType.			
<b>Base</b>	ARElement, ARObject, <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">AutosarDataType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">ImplementationDataType</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.9: AbstractImplementationDataType**

<b>Class</b>	<b>AbstractImplementationDataTypeElement</b> (abstract)			
<b>Note</b>	This meta-class represents the ability to act as an abstract base class for specific derived meta-classes that support the modeling of <a href="#">ImplementationDataTypes</a> for a particular language binding.			
<b>Base</b>	ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">ImplementationDataTypeElement</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.10: AbstractImplementationDataTypeElement**

<b>Class</b>	<b>AbstractMultiplicityRestriction</b> (abstract)			
<b>Note</b>	Restriction that specifies the valid number of occurrences of an element in the current context.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">SdgAttribute</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
lowerMultiplicity	PositiveInteger	0..1	attr	Specifies the minimal number of times an object shall occur. If this primitive attribute is not set, then the object is optional.
upperMultiplicity	PositiveInteger	0..1	attr	Specifies the maximum number of times an object may occur. If this primitive attribute is not set, then there is no limit with respect to the maximum occurrence.
upperMultiplicityInfinite	Boolean	0..1	attr	This explicitly specifies, that the upper multiplicity is NOT restricted. Note: The use of 'upperMultiplicityInfinite' and 'upperMultiplicity' is mutual exclusive.

**Table A.11: AbstractMultiplicityRestriction**

<b>Class</b>	<b>AbstractProvidedPortPrototype</b> (abstract)			
<b>Note</b>	This abstract class provides the ability to become a provided PortPrototype.			
<b>Base</b>	ARObject, AtpBlueprintable, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, PortPrototype, Referrable			
<b>Subclasses</b>	PPortPrototype, PRPortPrototype			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwComponentType.port			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
providedComSpec	PPortComSpec	*	aggr	Provided communication attributes per interface element (data element or operation). <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=providedComSpec.dataElement, providedComSpec.getter, providedComSpec.modeGroup, providedComSpec.operation, providedComSpec.parameter, providedComSpec.setter, providedComSpec.variable

**Table A.12: AbstractProvidedPortPrototype**

<b>Class</b>	<b>AbstractRequiredPortPrototype</b> (abstract)			
<b>Note</b>	This abstract class provides the ability to become a required PortPrototype.			
<b>Base</b>	ARObject, AtpBlueprintable, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, PortPrototype, Referrable			
<b>Subclasses</b>	PRPortPrototype, RPortPrototype			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwComponentType.port			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
requiredComSpec	RPortComSpec	*	aggr	Required communication attributes, one for each interface element. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=requiredComSpec.dataElement, requiredComSpec.getter, requiredComSpec.modeGroup, requiredComSpec.operation, requiredComSpec.parameter, requiredComSpec.setter, requiredComSpec.variable

**Table A.13: AbstractRequiredPortPrototype**

<b>Class</b>	<b>AbstractRuleBasedValueSpecification</b> (abstract)			
<b>Note</b>	This represents an abstract base class for all rule-based value specifications.			
<b>Base</b>	ARObject, ValueSpecification			
<b>Subclasses</b>	ApplicationRuleBasedValueSpecification, CompositeRuleBasedValueSpecification, NumericalRuleBasedValueSpecification			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, ArrayValueSpecification.element, CalibrationParameterValue.applInitValue, CalibrationParameterValue.implInitValue, ConstantSpecification.valueSpec, CryptoServiceKey.developmentValue, DiagnosticEnvDataCondition.compareValue, DiagnosticEnvDataElementCondition.compareValue, DiagnosticEnvSovdDataCondition.compareValue, FieldSenderComSpec.initValue, ISignal.initValue, ISignal.receptionDefaultValue, ISignal.timeoutSubstitutionValue, NonqueuedReceiverComSpec.initValue, NonqueuedReceiverComSpec.timeoutSubstitutionValue, NonqueuedSenderComSpec.initValue, NvProvideComSpec.ramBlockInitValue, NvProvideComSpec.romBlockInitValue, NvRequireComSpec.initValue, ParameterDataPrototype.initValue, ParameterProvideComSpec.initValue, ParameterRequireComSpec.initValue, PersistencyDataRequiredComSpec.initValue, PersistencyKeyValuePair.initValue, PortDefinedArgumentValue.value, PortPrototypeBlueprintInitValue.value, RecordValueSpecification.field, SomeipEventDeployment.eventReceptionDefaultValue, StateManagementCompareCondition.compareValue, SwDataDefProps.invalidValue, UserDefinedEventDeployment.eventReceptionDefaultValue, VariableDataPrototype.initValue			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.14: AbstractRuleBasedValueSpecification**

<b>Class</b>	<b>AbstractServiceInstance</b> (abstract)			
<b>Note</b>	Provided and Consumed Ethernet Service Instances that are available at the ApplicationEndpoint.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">ConsumedServiceInstance</a> , <a href="#">DdsCpServiceInstance</a> , <a href="#">ProvidedServiceInstance</a>			
<b>Aggregated by</b>	ServiceInstanceCollectionSet.serviceInstance			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
capabilityRecord	TagWithOptionalValue	*	aggr	A sequence of records to store arbitrary name/value pairs conveying additional information about the named service. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=capabilityRecord, capabilityRecord.variationPoint.shortLabel vh.latestBindingTime=postBuild
majorVersion	PositiveInteger	0..1	attr	Major Version of the ServiceInterface. Value can be set to a number that represents the Major Version of the service.
methodActivationRoutingGroup	<a href="#">PduActivationRoutingGroup</a>	0..1	aggr	The ServiceDiscovery module is able to activate and deactivate the PDU routing for ClientServerOperations (SOME/IP methods). <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=methodActivationRoutingGroup.shortName, methodActivationRoutingGroup.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.15: AbstractServiceInstance**

<b>Class</b>	<b>AccessCount</b>			
<b>Note</b>	This meta-class provides one count value for a <a href="#">AbstractAccessPoint</a> .			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">AccessCountSet.accessCount</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessPoint	<a href="#">AbstractAccessPoint</a>	0..1	ref	AbstractAccessPoint for which the count value is applicable.
value	PositiveInteger	0..1	attr	This attribute represents the number of determined accesses <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.16: AccessCount**

<b>Class</b>	<b>AccessCountSet</b>			
<b>Note</b>	This meta-class provides a set of count values evaluated according to the rules of a specific countProfile.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	ResourceConsumption.accessCountSet			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessCount	<a href="#">AccessCount</a>	*	aggr	Count value for a AbstractAccessPoint. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=accessCount, accessCount.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
countProfile	NameToken	0..1	attr	This attribute defines the name of the count profile used to determine the AccessCount.value numbers.

**Table A.17: AccessCountSet**

<b>Class</b>	<b>AdminData</b>			
<b>Note</b>	AdminData represents the ability to express administrative information and custom extensions for an element. This administration information is to be treated as meta-data such as revision id or state of the file. There are basically the following kinds of meta-data <ul style="list-style-type: none"> <li>• The language and/or used languages.</li> <li>• Revision information covering e.g. revision number, state, release date, changes. Note that this information can be given in general as well as related to a particular company.</li> <li>• Document meta-data specific for a company</li> </ul> Beside that a custom extension of model-data is possible by <ul style="list-style-type: none"> <li>• Special data</li> </ul>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	AUTOSAR.adminData, Describable.adminData, Identifiable.adminData			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
docRevision (ordered)	DocRevision	*	aggr	This allows to denote information about the current revision of the object. Note that information about previous revisions can also be logged here. The entries shall be sorted descendant by date in order to reflect the history. Therefore the most recent entry representing the current version is denoted first. <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=50 xml.typeElement=false xml.typeWrapperElement=false
language	LEnum	0..1	attr	This attribute specifies the master language of the document or the document fragment. The master language is the one in which the document is maintained and from which the other languages are derived from. In particular in case of inconsistencies, the information in the master language is priority. <b>Tags:</b> xml.sequenceOffset=20
sdg	Sdg	*	aggr	This property allows to keep special data which is not represented by the standard model. It can be utilized to keep e.g. tool specific data. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=sdg.sdgCaption.shortName xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=60 xml.typeElement=false xml.typeWrapperElement=false
usedLanguages	MultiLanguagePlainText	0..1	aggr	This property specifies the languages which are provided in the document. Therefore it should only be specified in the top level admin data. For each language provided in the document there is one entry in MultiLanguagePlainText. The content of each entry can be used for illustration of the language. The used language itself depends on the language attribute in the entry. <b>Tags:</b> xml.sequenceOffset=30

Table A.18: AdminData

<b>Class</b>	<b>AgeConstraint</b>
<b>Note</b>	Constrains the <i>scope</i> by a <i>minimum</i> and <i>maximum</i> time boundary.
<b>Base</b>	ARObject, Identifiable, MultilanguageReferrable, Referrable, TimingConstraint, Traceable
<b>Aggregated by</b>	TimingExtension.timingGuarantee, TimingExtension.timingRequirement





Class	AgeConstraint			
Attribute	Type	Mult.	Kind	Note
maximum	<a href="#">MultidimensionalTime</a>	0..1	aggr	The received event referenced by <a href="#">scope</a> should not exceed this upper bound.
minimum	<a href="#">MultidimensionalTime</a>	0..1	aggr	The received event referenced by <a href="#">scope</a> should not precede this lower bound.
scope	<a href="#">TimingDescriptionEvent</a>	0..1	ref	<a href="#">TimingDescriptionEvent</a> to be constrained.

**Table A.19: AgeConstraint**

Class	AliasNameAssignment			
<b>Note</b>	This meta-class represents the ability to associate an alternative name to a flat representations or an Identifiable. The usage of this name is defined outside of AUTOSAR. For example this name can be used by MCD tools or as a name for component instances in the ECU extract. Note that flatInstance and identifiable are mutually exclusive.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">AliasNameSet.aliasName</a>			
Attribute	Type	Mult.	Kind	Note
flatInstance	<a href="#">FlatInstanceDescriptor</a>	0..1	ref	Assignment of a unique name to a flat representation. <b>Tags:</b> xml.sequenceOffset=60 This Attribute is only used by the AUTOSAR Classic Platform.
identifiable	<a href="#">Identifiable</a>	0..1	ref	Assignment of a unique name to an Identifiable. <b>Tags:</b> xml.sequenceOffset=50
label	MultilanguageLong Name	0..1	aggr	This represents an "Alias LongName". <b>Tags:</b> xml.sequenceOffset=20
shortLabel	String	0..1	attr	This attribute represents the alias name. It is modeled as string because the alias name is used outside of AUTOSAR and therefore no naming conventions can be applied within AUTOSAR. <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> xml.sequenceOffset=10

**Table A.20: AliasNameAssignment**

Class	AliasNameSet			
<b>Note</b>	This meta-class represents a set of AliasNames. The AliasNameSet can for example be an input to the A2L-Generator. <b>Tags:</b> atp.recommendedPackage=AliasNameSets			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
aliasName	<a href="#">AliasNameAssignment</a>	*	aggr	AliasNames contained in the AliasNameSet. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=aliasName.shortLabel, aliasName.variation Point.shortLabel vh.latestBindingTime=preCompileTime

**Table A.21: AliasNameSet**

<b>Class</b>	<b>AnalyzedExecutionTime</b>			
<b>Note</b>	AnalyzedExecutionTime provides an analytic method for specifying the best and worst case execution time.			
<b>Base</b>	ARObject, <a href="#">ExecutionTime</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ResourceConsumption.executionTime			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bestCase ExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The best case execution time (BCET) defines the minimum amount of time the related executable entity requires for its execution.
worstCase ExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The worst case execution time (WCET) defines the maximum amount of time the related executable entity requires for its execution.

**Table A.22: AnalyzedExecutionTime**

<b>Class</b>	<b>AnyInstanceRef</b>			
<b>Note</b>	Describes a reference to any instance in an AUTOSAR model. This is the most generic form of an instance ref. Refer to the superclass notes for more details.			
<b>Base</b>	ARObject, <a href="#">AtpInstanceRef</a>			
<b>Aggregated by</b>	ApmcInstanceReferenceValue.value, ApmcUpstreamDocInstanceReferenceValue.value, ApmcUriInstanceReferenceValue.value, <a href="#">Collection.collectedInstance</a> , <a href="#">Collection.sourceInstance</a> , <a href="#">DocumentationContext.feature</a> , <a href="#">EcucInstanceReferenceValue.value</a> , <a href="#">FlatInstanceDescriptor.ecuExtractReference</a> , <a href="#">FlatInstanceDescriptor.upstreamReference</a> , <a href="#">RptContainer.byPassPoint</a> , <a href="#">RptHook.rptArHook</a> , <a href="#">SecurityEventReportInstanceValue.object</a> , <a href="#">ViewMap.firstElementInstance</a> , <a href="#">ViewMap.secondElementInstance</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
base	<a href="#">AtpClassifier</a>	1	ref	This is the base from which navigation path begins. <b>Stereotypes:</b> atpDerived
contextElement (ordered)	<a href="#">AtpFeature</a>	*	ref	This is one step in the navigation path specified by the instance ref.
target	<a href="#">AtpFeature</a>	1	ref	This is the target of the instance ref.

**Table A.23: AnyInstanceRef**

<b>Primitive</b>	<b>AnyServiceInstanceId</b>
<b>Note</b>	This is a positive integer or the literal ALL (the value ANY is technically supported but deprecated) which can be denoted in decimal, octal and hexadecimal. The value is between 0 and 65535. <b>Tags:</b> xml.xsd.customType=ANY-SERVICE-INSTANCE-ID xml.xsd.pattern=[1-9][0-9]* 0[xX][0-9a-fA-F]+ 0[0-7]* 0[bB][0-1]+ ANY ALL xml.xsd.type=string

**Table A.24: AnyServiceInstanceId**

<b>Primitive</b>	<b>AnyVersionString</b>
<b>Note</b>	<b>Tags:</b> xml.xsd.customType=ANY-VERSION-STRING xml.xsd.pattern=[0-9]+ ANY xml.xsd.type=string

**Table A.25: AnyVersionString**



Class	AppOsTaskProxyToEcuTaskProxyMapping			
Note	This meta-class is used to map an OsTaskProxy that was created in the context of a SwComponent to an OsTaskProxy that was created in the context of an Ecu. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">SystemMapping.appOsTaskProxyToEcuTaskProxyMapping</a>			
Attribute	Type	Mult.	Kind	Note
appTaskProxy	<a href="#">OsTaskProxy</a>	0..1	ref	Reference to an OsTaskProxy that is created in the context of a SwComponent.
ecuTaskProxy	<a href="#">OsTaskProxy</a>	0..1	ref	Reference to an OsTaskProxy that is created in the context of an EcuInstance.
offset	Integer	0..1	attr	This attribute is used to describe the position of the app TaskProxy in an ecuTaskProxy as a relative value, i.e. the values show only the relative position of the appTask Proxy in the ecuTaskProxy.

**Table A.26: AppOsTaskProxyToEcuTaskProxyMapping**

Class	ApplicationArrayType			
Note	An application data type which is an array, each element is of the same application data type. <b>Tags:</b> atp.recommendedPackage=ApplicationDataTypes			
Base	ARElement, ARObject, <a href="#">ApplicationCompositeDataType</a> , <a href="#">ApplicationDataType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">AutosarDataType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dynamicArraySizeProfile	String	0..1	attr	Specifies the profile which the array will follow if it is a variable size array.
element	<a href="#">ApplicationArrayElement</a>	0..1	aggr	This association implements the concept of an array element. That is, in some cases it is necessary to be able to identify single array elements, e.g. as input values for an interpolation routine.

**Table A.27: ApplicationArrayType**

Class	ApplicationArrayElement			
Note	Describes the properties of the elements of an application array data type.			
Base	ARObject, <a href="#">ApplicationCompositeElementDataPrototype</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ApplicationArrayType.element</a> , <a href="#">AtpClassifier.atpFeature</a>			
Attribute	Type	Mult.	Kind	Note
arraySizeHandling	<a href="#">ArraySizeHandlingEnum</a>	0..1	attr	The way how the size of the array is handled.
arraySizeSemantics	<a href="#">ArraySizeSemanticsEnum</a>	0..1	attr	This attribute controls how the information about the array size shall be interpreted.
indexDataType	<a href="#">ApplicationPrimitiveDataType</a>	0..1	ref	This reference can be taken to assign a <a href="#">CompuMethod</a> of category TEXTTABLE to the array. The texttable entries associate a textual value to an index number such that the element with that index number is represented by a symbolic name.





Class	ApplicationArrayElement			
maxNumberOfElements	PositiveInteger	0..1	attr	The maximum number of elements that the array can contain. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.28: ApplicationArrayElement**

Class	ApplicationCompositeDataType (abstract)			
Note	Abstract base class for all application data types composed of other data types.			
Base	ARElement, ARObject, <a href="#">ApplicationDataType</a> , AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">AutosarDataType</a> , CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">ApplicationArrayDataType</a> , <a href="#">ApplicationRecordDataType</a>			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.29: ApplicationCompositeDataType**

Class	ApplicationCompositeDataTypeSubElementRef			
Note	This meta-class represents the specialization of <a href="#">SubElementMapping</a> with respect to <a href="#">ApplicationCompositeDataTypes</a> .			
Base	ARObject, SubElementRef			
Aggregated by	<a href="#">SubElementMapping.firstElement</a> , <a href="#">SubElementMapping.secondElement</a>			
Attribute	Type	Mult.	Kind	Note
application Composite Element	<a href="#">ApplicationCompositeElementDataPrototype</a>	0..1	iref	This represents the referenced ApplicationCompositeDataPrototype. <b>InstanceRef implemented by:</b> <a href="#">ApplicationCompositeElementInPortInterfaceInstanceRef</a>

**Table A.30: ApplicationCompositeDataTypeSubElementRef**

Class	ApplicationCompositeElementDataPrototype (abstract)			
Note	This class represents a data prototype which is aggregated within a composite application data type (record or array). It is introduced to provide a better distinction between target and context in instance Refs.			
Base	ARObject, <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">ApplicationArrayElement</a> , <a href="#">ApplicationRecordElement</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a>			
Attribute	Type	Mult.	Kind	Note
type	<a href="#">ApplicationDataType</a>	0..1	tref	This represents the corresponding data type. <b>Stereotypes:</b> isOfType

**Table A.31: ApplicationCompositeElementDataPrototype**

Class	ApplicationCompositeElementInPortInterfaceInstanceRef			
Note				
Base	ARObject, <a href="#">AtpInstanceRef</a>			
Aggregated by	<a href="#">ApplicationCompositeDataTypeSubElementRef.applicationCompositeElement</a> , <a href="#">CompositeNetworkRepresentation.leafElement</a>			
Attribute	Type	Mult.	Kind	Note
base	<a href="#">DataInterface</a>	0..1	ref	This represents the SenderReceiverInterface that acts as the base in this InstanceRef definition <b>Stereotypes:</b> atpDerived <b>Tags:</b> xml.sequenceOffset=10
contextData Prototype (ordered)	<a href="#">ApplicationCompositeElementDataPrototype</a>	*	ref	This represents a context ApplicationCompositeData Prototype <b>Tags:</b> xml.sequenceOffset=20
rootData Prototype	<a href="#">AutosarDataPrototype</a>	0..1	ref	This refers to the dataPrototype which is typed by the ApplicationDatatype in which which the target can be found. <b>Tags:</b> xml.sequenceOffset=15
targetData Prototype	<a href="#">ApplicationCompositeElementDataPrototype</a>	0..1	ref	This represents the referenced ApplicationComposite DataPrototype. <b>Tags:</b> xml.sequenceOffset=30

**Table A.32: ApplicationCompositeElementInPortInterfaceInstanceRef**

Class	ApplicationDataType (abstract)			
Note	ApplicationDataType defines a data type from the application point of view. Especially it should be used whenever something "physical" is at stake. An ApplicationDataType represents a set of values as seen in the application model, such as measurement units. It does not consider implementation details such as bit-size, endianness, etc. It should be possible to model the application level aspects of a VFB system by using ApplicationDataTypes only.			
Base	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">AutosarDataType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">ApplicationCompositeDataType</a> , <a href="#">ApplicationPrimitiveDataType</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.33: ApplicationDataType**

Class	ApplicationEndpoint			
Note	An application endpoint is the endpoint on an Ecu in terms of application addressing (e.g. socket). The application endpoint represents e.g. the listen socket in client-server-based communication.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">SocketAddress.applicationEndpoint</a>			
Attribute	Type	Mult.	Kind	Note
maxNumberOfConnections	PositiveInteger	0..1	attr	This attribute defines the maximal number of clients the Server is able to deal with in case of Service Discovery.
network Endpoint	<a href="#">NetworkEndpoint</a>	0..1	ref	Reference to the network address.
priority	PositiveInteger	0..1	attr	Defines the frame priority where values from 0 (best effort) to 7 (highest) are allowed.





Class	ApplicationEndpoint			
tlsCryptoMapping	<a href="#">TlsCryptoServiceMapping</a>	0..1	ref	This reference identifies the applicable TlsCryptoServiceMapping that adds the ability for TLS-based encryption on the enclosing ApplicationEndpoint.
tpConfiguration	TransportProtocolConfiguration	0..1	aggr	Configuration of the used transport protocol.

**Table A.34: ApplicationEndpoint**

Class	ApplicationEntry			
Note	Schedule table entry for application messages. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">ScheduleTableEntry</a>			
Aggregated by	<a href="#">LinScheduleTable.tableEntry</a>			
Attribute	Type	Mult.	Kind	Note
frameTriggering	<a href="#">LinFrameTriggering</a>	0..1	ref	Specifies the LinFrame that will be transmitted in this frame slot.

**Table A.35: ApplicationEntry**

Class	ApplicationError			
Note	This is a user-defined error that is associated with an element of an AUTOSAR interface. It is specific for the particular functionality or service provided by the AUTOSAR software component.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ClientServerInterface.possibleError</a>			
Attribute	Type	Mult.	Kind	Note
errorCode	Integer	0..1	attr	The RTE generator is forced to assign this value to the corresponding error symbol. Note that for error codes certain ranges are predefined (see RTE specification).

**Table A.36: ApplicationError**

Class	ApplicationPartition			
Note	ApplicationPartition to which SwComponentPrototypes are mapped at a point in time when the corresponding EcuInstance is not yet known or defined. In a later methodology step the ApplicationPartition can be assigned to an EcuPartition. <b>Tags:</b> atp.recommendedPackage=ApplicationPartitions This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.37: ApplicationPartition**

Class	ApplicationPartitionToEcuPartitionMapping			
Note	Maps ApplicationPartitions to EcuPartitions. With this mapping an OEM has the option to predefine an allocation of Software Components to EcuPartitions in the System Design phase. The final and complete assignment is described in the OS Configuration. This Class is only used by the AUTOSAR Classic Platform.			





<b>Class</b>	<b>ApplicationPartitionToEcuPartitionMapping</b>			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.applicationPartitionToEcuPartitionMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
application Partition	<a href="#">ApplicationPartition</a>	*	ref	Reference to ApplicationPartitions that are mapped to an EcuPartition.
ecuPartition	<a href="#">EcuPartition</a>	0..1	ref	Reference to EcuPartition to which the Application Partitions are assigned.

**Table A.38: ApplicationPartitionToEcuPartitionMapping**

<b>Class</b>	<b>ApplicationPrimitiveDataType</b>			
<b>Note</b>	A primitive data type defines a set of allowed values. <b>Tags:</b> atp.recommendedPackage=ApplicationDataTypes			
<b>Base</b>	ARElement, ARObject, <a href="#">ApplicationDataType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">AutosarDataType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.39: ApplicationPrimitiveDataType**

<b>Class</b>	<b>ApplicationRecordDataType</b>			
<b>Note</b>	An application data type which can be decomposed into prototypes of other application data types. <b>Tags:</b> atp.recommendedPackage=ApplicationDataTypes			
<b>Base</b>	ARElement, ARObject, <a href="#">ApplicationCompositeDataType</a> , <a href="#">ApplicationDataType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">AutosarDataType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
element (ordered)	<a href="#">ApplicationRecordElement</a>	*	aggr	Specifies an element of a record. The aggregation of <a href="#">ApplicationRecordElement</a> is subject to variability with the purpose to support the conditional existence of elements inside a <a href="#">ApplicationRecordDataType</a> . <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=element.shortName, element.variation Point.shortLabel vh.latestBindingTime=preCompileTime

**Table A.40: ApplicationRecordDataType**

<b>Class</b>	<b>ApplicationRecordElement</b>			
<b>Note</b>	Describes the properties of one particular element of an application record data type.			
<b>Base</b>	ARObject, <a href="#">ApplicationCompositeElementDataPrototype</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ApplicationRecordDataType.element</a> , <a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	ApplicationRecordElement			
isOptional	Boolean	0..1	attr	This attribute represents the ability to declare the enclosing <code>ApplicationRecordElement</code> as optional. This means that, at runtime, the <code>ApplicationRecordElement</code> may or may not have a valid value and shall therefore be ignored. The underlying runtime software provides means to set the <code>ApplicationRecordElement</code> as not valid at the sending end of a communication and determine its validity at the receiving end.

**Table A.41: ApplicationRecordElement**

Class	ApplicationRuleBasedValueSpecification			
Note	This meta-class represents rule based values for DataPrototypes typed by ApplicationDataTypes (ApplicationArrayType or a compound ApplicationPrimitiveDataType which also boils down to an array-nature).			
Base	ARObject, <a href="#">AbstractRuleBasedValueSpecification</a> , <a href="#">CompositeRuleBasedValueArgument</a> , <a href="#">ValueSpecification</a>			
Aggregated by	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">CompositeRuleBasedValueSpecification.compoundPrimitiveArgument</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistenceDataRequiredComSpec.initValue</a> , <a href="#">PersistenceKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
Attribute	Type	Mult.	Kind	Note
category	<a href="#">Identifier</a>	0..1	attr	This represents the category of the RuleBasedValue Specification <b>Tags:</b> xml.sequenceOffset=-20
swAxisCont (ordered)	<a href="#">RuleBasedAxisCont</a>	*	aggr	This represents the axis values of a Compound Primitive Data Type (curve or map). The first swAxisCont describes the x-axis, the second swAxisCont describes the y-axis, the third swAxisCont describes the z-axis. In addition to this, the axis can be denoted in swAxisIndex.
swValueCont	<a href="#">RuleBasedValueCont</a>	0..1	aggr	This represents the values of an array or Compound Primitive Data Type. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=swValueCont

**Table A.42: ApplicationRuleBasedValueSpecification**

Class	ApplicationSwComponentType
Note	The <code>ApplicationSwComponentType</code> is used to represent the application software. <b>Tags:</b> atp.recommendedPackage=SwComponentTypes
Base	ARElement, ARObject, <a href="#">AtomicSwComponentType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">SwComponentType</a>
Aggregated by	<a href="#">ARPackageElement</a>





Class	ApplicationSwComponentType			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.43: ApplicationSwComponentType**

Class	ApplicationValueSpecification			
<b>Note</b>	This meta-class represents values for DataPrototypes typed by ApplicationDataTypes (this includes in particular compound primitives). For further details refer to ASAM CDF 2.0. This meta-class corresponds to some extent with SW-INSTANCE in ASAM CDF 2.0.			
<b>Base</b>	ARObject, CompositeRuleBasedValueArgument, <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">CompositeRuleBasedValueSpecification.compoundPrimitiveArgument</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
Attribute	Type	Mult.	Kind	Note
category	<a href="#">Identifier</a>	0..1	attr	Specifies to which category of ApplicationDataType this ApplicationValueSpecification can be applied (e.g. as an initial value), thus imposing constraints on the structure and semantics of the contained values, see [ <a href="#">constr_1006</a> ] and [ <a href="#">constr_1519</a> ].
swAxisCont (ordered)	<a href="#">SwAxisCont</a>	*	aggr	This represents the axis values of a Compound Primitive Data Type (curve or map). The first swAxisCont describes the x-axis, the second swAxisCont describes the y-axis, the third swAxisCont describes the z-axis. In addition to this, the axis can be denoted in swAxisIndex.
swValueCont	<a href="#">SwValueCont</a>	0..1	aggr	This represents the values of a Compound Primitive Data Type.

**Table A.44: ApplicationValueSpecification**

Class	ArParameterInImplementationDataInstanceRef			
<b>Note</b>	This class represents the ability to navigate into an element inside of an ParameterDataPrototype typed by an ImplementationDatatype. Note that it shall not be used if the target is the ParameterDataPrototype itself (e.g. if the target is a primitive data type). Note that this class follows the pattern of an InstanceRef but is not implemented based on the abstract classes because the ImplementationDataType isn't either, especially because ImplementationDataTypeElement (intentionally) isn't derived from AtpPrototype.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">ImplementationDataTypeSubElementRef.parameterImplementationDataTypeElement</a>			
Attribute	Type	Mult.	Kind	Note







Class	ArParameterInImplementationDataInstanceRef			
contextData Prototype (ordered)	<a href="#">AbstractImplementation DataTypeElement</a>	*	ref	This is a context in case there are subelements with explicit types. The reference has to be ordered to properly reflect the nested structure.
portPrototype	<a href="#">PortPrototype</a>	0..1	ref	This reference points to the PortPrototype providing/ receiving the root of the parameter.
rootParameter DataPrototype	<a href="#">ParameterData Prototype</a>	0..1	ref	This refers to the ParameterDataPrototype typed by the implementationDataType in which the target can be found.
targetData Prototype	<a href="#">AbstractImplementation DataTypeElement</a>	0..1	ref	This reference points to the target ImplementationData TypeElement.

**Table A.45: ArParameterInImplementationDataInstanceRef**

Class	ArVariableInImplementationDataInstanceRef			
<b>Note</b>	This class represents the ability to navigate into a data element inside of an VariableDataPrototype which is typed by an ImplementationDatatype. Note that it shall not be used if the target is the VariableDataPrototype itself (e.g. if its a primitive). Note that this class follows the pattern of an InstanceRef but is not implemented based on the abstract classes because the ImplementationDataType isn't either, especially because ImplementationDataTypeElement isn't derived from AtpPrototype.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">AutosarVariableRef.autosarVariableInImplDatatype</a> , <a href="#">ImplementationDataTypeSubElementRef.implementationDataTypeElement</a>			
Attribute	Type	Mult.	Kind	Note
contextData Prototype (ordered)	<a href="#">AbstractImplementation DataTypeElement</a>	*	ref	This is a context in case there are subelements with explicit types. The reference has to be ordered to properly reflect the nested structure. <b>Tags:</b> xml.sequenceOffset=30
portPrototype	<a href="#">PortPrototype</a>	0..1	ref	This is the port providing/receiving the root of the variable <b>Tags:</b> xml.sequenceOffset=10
rootVariable DataPrototype	<a href="#">VariableDataPrototype</a>	0..1	ref	This refers to the VariableDataPrototype typed by the ImplementationDatatype in which the target can be found. <b>Tags:</b> xml.sequenceOffset=20
targetData Prototype	<a href="#">AbstractImplementation DataTypeElement</a>	0..1	ref	This reference points to the target ImplementationData TypeElement. <b>Tags:</b> xml.sequenceOffset=40

**Table A.46: ArVariableInImplementationDataInstanceRef**

Class	ArbitraryEventTriggering			
<b>Note</b>	Describes that an event occurs occasionally, singly, irregularly or randomly. The primary purpose of this event triggering is to abstract event occurrences captured by data acquisition tools (background debugger, trace analyzer, etc.) during system runtime.			
<b>Base</b>	ARObject, <a href="#">EventTriggeringConstraint</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">Timing Constraint</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<a href="#">TimingExtension.timingGuarantee</a> , <a href="#">TimingExtension.timingRequirement</a>			
Attribute	Type	Mult.	Kind	Note
confidence Interval	<a href="#">ConfidenceInterval</a>	*	aggr	List of confidence intervals. <b>Tags:</b> xml.sequenceOffset=30







Class	ArbitraryEventTriggering			
maximum Distance	<a href="#">MultidimensionalTime</a>	*	aggr	<p>The nth array element describes the maximum distance that can be observed for a sample of n+1 event occurrences.</p> <p>This is an array with an identical number of elements as for the minimumDistance.</p> <p><b>Tags:</b>  xml.name=TIME-VALUE  xml.roleElement=true  xml.sequenceOffset=20  xml.typeElement=false</p>
minimum Distance	<a href="#">MultidimensionalTime</a>	*	aggr	<p>The nth array element describes the minimum distance that can be observed for a sample of n+1 event occurrences.</p> <p>This is an array with an identical number of elements as for the maximumDistance.</p> <p><b>Tags:</b>  xml.name=TIME-VALUE  xml.roleElement=true  xml.sequenceOffset=10  xml.typeElement=false</p>

Table A.47: ArbitraryEventTriggering

Class	ArgumentDataPrototype			
<b>Note</b>	An argument of an operation, carries direction and implementation information.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">AutosarDataPrototype</a> , <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">ClientServerOperation.argument</a>			
Attribute	Type	Mult.	Kind	Note
direction	<a href="#">ArgumentDirectionEnum</a>	0..1	attr	This attribute specifies the direction of the argument.
serverArgument ImplPolicy	<a href="#">ServerArgumentImplPolicyEnum</a>	0..1	attr	<p>This defines how the argument type of the servers <a href="#">RunnableEntity</a> is implemented.</p> <p>If the attribute is not defined this has the same semantics as if the attribute is set to the value <a href="#">useArgumentType</a> for primitive arguments and structures.</p>

Table A.48: ArgumentDataPrototype

Enumeration	ArgumentDirectionEnum
<b>Note</b>	<p>Use cases:</p> <ul style="list-style-type: none"> <li>Arguments in ClientServerOperation can have different directions that need to be formally indicated because they have an impact on how the function signature looks like eventually.</li> <li>Arguments in BswModuleEntry already determine a function signature, but the direction is used to specify the semantics, especially of pointer arguments.</li> </ul>
<b>Aggregated by</b>	<a href="#">ArgumentDataPrototype.direction</a> , <a href="#">DiagnosticSovdAccessArgument.direction</a> , <a href="#">RunnableEntityArgument.direction</a> , <a href="#">SwServiceArg.direction</a>
Literal	Description
in	<p>The argument value is passed to the callee.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=0</p>
inout	<p>The argument value is passed to the callee but also passed back from the callee to the caller.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=1</p>
out	<p>The argument value is passed from the callee to the caller.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=2</p>

Table A.49: ArgumentDirectionEnum

<b>Enumeration</b>	<b>ArraySizeHandlingEnum</b>
<b>Note</b>	This enumeration defines different ways to handle the sizes of variable size arrays.
<b>Aggregated by</b>	<a href="#">ApplicationArrayElement.arraySizeHandling</a> , <a href="#">ImplementationDataTypeElement.arraySizeHandling</a>
<b>Literal</b>	<b>Description</b>
allIndicesDifferent ArraySize	All elements of the variable size array may have different sizes. <b>Tags:</b> atp.EnumerationLiteralIndex=0
allIndicesSame ArraySize	All elements of the variable size array have the same size. <b>Tags:</b> atp.EnumerationLiteralIndex=1
inheritedFromArray ElementTypeSize	The size of all dimensions of the variable size array is determined by the size of the contained array element. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.50: ArraySizeHandlingEnum**

<b>Enumeration</b>	<b>ArraySizeSemanticsEnum</b>
<b>Note</b>	This type controls how the information about the number of elements in an <a href="#">ApplicationArrayDataType</a> is to be interpreted.
<b>Aggregated by</b>	<a href="#">ApplicationArrayElement.arraySizeSemantics</a> , <a href="#">DiagnosticDataElement.arraySizeSemantics</a> , <a href="#">ImplementationDataTypeElement.arraySizeSemantics</a> , <a href="#">SwTextProps.arraySizeSemantics</a>
<b>Literal</b>	<b>Description</b>
fixedSize	This means that the <a href="#">ApplicationArrayDataType</a> will always have a fixed number of elements. <b>Tags:</b> atp.EnumerationLiteralIndex=0
variableSize	This implies that the actual number of elements in the <a href="#">ApplicationArrayDataType</a> might vary at run-time. The value of <a href="#">arraySize</a> represents the maximum number of elements in the array. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.51: ArraySizeSemanticsEnum**

<b>Class</b>	<b>ArrayValueSpecification</b>			
<b>Note</b>	Specifies the values for an array.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">CompositeValueSpecification</a> , <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	<a href="#">ApplicationAssocMapElementValueSpecification.key</a> , <a href="#">ApplicationAssocMapElementValueSpecification.value</a> , <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">CompositeRuleBasedValueSpecification.argument</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
element (ordered)	<a href="#">ValueSpecification</a>	*	aggr	The value for a single array element. All Value Specifications aggregated by <a href="#">ArrayValueSpecification</a> shall have the same structure. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=element, element.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	ArrayValueSpecification			
intendedPartialInitializationCount	PositiveInteger	0..1	attr	This attribute shall only have a meaning for dynamic arrays and shall be taken as a sanity check: the number filled in the attribute shall be identical to the number of ArrayValueSpecification.element. If the attribute does not exist it means that no partial initialization is intended.

**Table A.52: ArrayValueSpecification**

Class	AssemblySwConnector			
Note	AssemblySwConnectors are exclusively used to connect SwComponentPrototypes in the context of a CompositionSwComponentType.			
Base	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable, SwConnector			
Aggregated by	AtpClassifier.atpFeature, CompositionSwComponentType.connector			
Attribute	Type	Mult.	Kind	Note
provider	AbstractProvidedPortPrototype	0..1	iref	Instance of providing port. <b>InstanceRef implemented by:</b> PPortInComposition InstanceRef
requester	AbstractRequiredPortPrototype	0..1	iref	Instance of requiring port. <b>InstanceRef implemented by:</b> RPortInComposition InstanceRef

**Table A.53: AssemblySwConnector**

Class	AssignFrameId			
Note	Schedule entry for an Assign Frame Id master request. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, LinConfigurationEntry, ScheduleTableEntry			
Aggregated by	LinScheduleTable.tableEntry			
Attribute	Type	Mult.	Kind	Note
assignedFrameTriggering	LinFrameTriggering	0..1	ref	The frame whose identifier is set by this assignment.

**Table A.54: AssignFrameId**

Class	AssignFrameIdRange			
Note	AssignFrameIdRange generates an assign frame PID range request. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, LinConfigurationEntry, ScheduleTableEntry			
Aggregated by	LinScheduleTable.tableEntry			
Attribute	Type	Mult.	Kind	Note
framePid	FramePid	0..4	aggr	Optional assignment of frame_PID values that are included in the request. The frame_PIDs are ordered.
startIndex	Integer	0..1	attr	The startIndex sets the index to the first frame to assign a PID.

**Table A.55: AssignFrameIdRange**

<b>Class</b>	<b>AssignNad</b>			
<b>Note</b>	Schedule entry for an Assign NAD master request. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, LinConfigurationEntry, <a href="#">ScheduleTableEntry</a>			
<b>Aggregated by</b>	<a href="#">LinScheduleTable.tableEntry</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
newNad	Integer	0..1	attr	The newly assigned NAD value.

**Table A.56: AssignNad**

<b>Class</b>	<b>AsynchronousServerCallPoint</b>			
<b>Note</b>	An AsynchronousServerCallPoint is used for asynchronous invocation of a ClientServerOperation. IMPORTANT: a ServerCallPoint cannot be used concurrently. Once the client RunnableEntity has made the invocation, the ServerCallPoint cannot be used until the call returns (or an error occurs!) at which point the ServerCallPoint becomes available again. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">AbstractAccessPoint</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServerCallPoint</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">RunnableEntity.serverCallPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.57: AsynchronousServerCallPoint**

<b>Class</b>	<b>AsynchronousServerCallResultPoint</b>			
<b>Note</b>	If a <a href="#">RunnableEntity</a> owns an AsynchronousServerCallResultPoint it is entitled to get the result of the referenced <a href="#">AsynchronousServerCallPoint</a> . If it is associated with an <a href="#">AsynchronousServerCallReturnsEvent</a> , this RTEEvent notifies the completion of the required <a href="#">ClientServerOperation</a> or a timeout. The occurrence of this event can either unblock a <a href="#">WaitPoint</a> or can lead to the invocation of a <a href="#">RunnableEntity</a> . This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">AbstractAccessPoint</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">RunnableEntity.asynchronousServerCallResultPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
asynchronousServerCallPoint	<a href="#">AsynchronousServerCallPoint</a>	0..1	ref	The referenced Asynchronous Server Call Point defines the asynchronous server call from which the results are returned.

**Table A.58: AsynchronousServerCallResultPoint**

<b>Class</b>	<b>AsynchronousServerCallReturnsEvent</b>			
<b>Note</b>	This event is raised when an asynchronous server call is finished.			
<b>Base</b>	ARObject, <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
eventSource	<a href="#">AsynchronousServerCallResultPoint</a>	0..1	ref	The referenced AsynchronousServerCallResultPoint raises this AsynchronousServerCallReturnsEvent when the asynchronous server call returns. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.59: AsynchronousServerCallReturnsEvent**

<b>Class</b>	<b>AtomicSwComponentType</b> (abstract)			
<b>Note</b>	An atomic software component is atomic in the sense that it cannot be further decomposed and distributed across multiple ECUs.			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
<b>Subclasses</b>	ApplicationSwComponentType, ComplexDeviceDriverSwComponentType, EcuAbstractionSwComponentType, NvBlockSwComponentType, SensorActuatorSwComponentType, ServiceProxySwComponentType, ServiceSwComponentType			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
internalBehavior	<a href="#">SwcInternalBehavior</a>	0..1	aggr	The <a href="#">SwcInternalBehavior</a> s owned by an <a href="#">AtomicSwComponentType</a> can be located in a different physical file. Therefore the aggregation is <<atp Splitable>>. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=internalBehavior.shortName, internalBehavior.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
symbolProps	<a href="#">SymbolProps</a>	0..1	aggr	This represents the <a href="#">SymbolProps</a> for the <a href="#">AtomicSwComponentType</a> . <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=symbolProps.shortName

**Table A.60: AtomicSwComponentType**

<b>Class</b>	<b>AtpBlueprintMapping</b> (abstract)			
<b>Note</b>	This meta-class represents the ability to express a particular mapping between a blueprint and an element derived from this blueprint. Particular mappings are defined by specializations of this meta-class.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">BlueprintMapping</a>			
<b>Aggregated by</b>	BlueprintMappingSet.blueprintMap			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
atpBlueprint	AtpBlueprint	1	ref	This represents the blueprint. <b>Stereotypes:</b> atpAbstract; atpUriDef <b>Tags:</b> xml.sequenceOffset=50
atpBlueprinted Element	AtpBlueprintable	1	ref	This represents the blueprinted elements which shall be mapped to the blueprint. <b>Stereotypes:</b> atpAbstract <b>Tags:</b> xml.sequenceOffset=60

**Table A.61: AtpBlueprintMapping**

<b>Class</b>	<b>AtpClassifier</b> (abstract)			
<b>Note</b>	A classifier classifies M0 instances according to their features. Or: a classifier is something that has instances - an M1 classifier has M0 instances.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AtpStructureElement</a> , <a href="#">AtpType</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
atpFeature	<a href="#">AtpFeature</a>	*	aggr	This is a feature of the classifier. <b>Stereotypes:</b> atpDerived

**Table A.62: AtpClassifier**

<b>Class</b>	<b>AtpFeature</b> (abstract)			
<b>Note</b>	Features are properties via which a classifier classifies instances. Or: a classifier has features and every M0 instance of it will have those features.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AtpPrototype</a> , <a href="#">AtpStructureElement</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

Table A.63: AtpFeature

<b>Class</b>	<b>AtpInstanceRef</b> (abstract)			
<b>Note</b>	An M0 instance of a classifier may be represented as a tree rooted at that instance, where under each node come the sub-trees representing the instances which act as features under that node. An instance ref specifies a navigation path from any M0 tree-instance of the base (which is a classifier) to a leaf (which is an instance of the target).			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">AnyInstanceRef</a> , <a href="#">ApplicationCompositeElementInPortInterfaceInstanceRef</a> , <a href="#">ComponentInCompositionInstanceRef</a> , <a href="#">ComponentInSystemInstanceRef</a> , <a href="#">DataPrototypeInPortInterfaceInstanceRef</a> , <a href="#">DataPrototypeInSystemInstanceRef</a> , <a href="#">InnerDataPrototypeGroupInCompositionInstanceRef</a> , <a href="#">InnerPortGroupInCompositionInstanceRef</a> , <a href="#">InnerRunnableEntityGroupInCompositionInstanceRef</a> , <a href="#">InstanceEventInCompositionInstanceRef</a> , <a href="#">ModeDeclarationGroupPrototypeInSystemInstanceRef</a> , <a href="#">ModeGroupInAtomicSwcInstanceRef</a> , <a href="#">ModelInBswModuleDescriptionInstanceRef</a> , <a href="#">ModelInSwcInstanceRef</a> , <a href="#">OperationArgumentInComponentInstanceRef</a> , <a href="#">OperationInAtomicSwcInstanceRef</a> , <a href="#">OperationInSystemInstanceRef</a> , <a href="#">PModelInSystemInstanceRef</a> , <a href="#">ParameterDataPrototypeInSystemInstanceRef</a> , <a href="#">ParameterInAtomicSWCTypeInstanceRef</a> , <a href="#">PortGroupInSystemInstanceRef</a> , <a href="#">PortInCompositionTypeInstanceRef</a> , <a href="#">RModelInAtomicSwcInstanceRef</a> , <a href="#">RteEventInCompositionInstanceRef</a> , <a href="#">RteEventInEcuInstanceRef</a> , <a href="#">RteEventInSystemInstanceRef</a> , <a href="#">RunnableEntityInCompositionInstanceRef</a> , <a href="#">SwcServiceDependencyInSystemInstanceRef</a> , <a href="#">TriggerInAtomicSwcInstanceRef</a> , <a href="#">TriggerInSystemInstanceRef</a> , <a href="#">VariableAccessInEcuInstanceRef</a> , <a href="#">VariableDataPrototypeInCompositionInstanceRef</a> , <a href="#">VariableDataPrototypeInSystemInstanceRef</a> , <a href="#">VariableInAtomicSWCTypeInstanceRef</a> , <a href="#">VariableInAtomicSwcInstanceRef</a> , <a href="#">VariableInComponentInstanceRef</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
atpBase	<a href="#">AtpClassifier</a>	1	ref	This is the base from which the navigation path starts. <b>Stereotypes:</b> atpAbstract; atpDerived
atpContext Element (ordered)	<a href="#">AtpPrototype</a>	*	ref	This is one particular step in the navigation path. <b>Stereotypes:</b> atpAbstract
atpTarget	<a href="#">AtpFeature</a>	1	ref	This is the target of the instance ref. In other words it is the terminal of the navigation path. <b>Stereotypes:</b> atpAbstract

Table A.64: AtpInstanceRef

<b>Class</b>	<b>AtpPrototype</b> (abstract)			
<b>Note</b>	A prototype is a typed feature. A prototype in a classifier indicates that instances of that classifier will have a feature, and the structure of that feature is given by the its type. An instance of that type will play the role indicated by the feature in the owning classifier. A feature is not an instance but an indication of an instance-to-be.			
<b>Base</b>	ARObject, <a href="#">AtpFeature</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">DataPrototype</a> , <a href="#">ModeDeclarationGroupPrototype</a> , <a href="#">PortPrototype</a> , <a href="#">RootSwCompositionPrototype</a> , <a href="#">SwComponentPrototype</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
atpType	<a href="#">AtpType</a>	1	ref	This is the type of the feature. <b>Stereotypes:</b> atpAbstract

Table A.65: AtpPrototype

<b>Class</b>	<b>AtpStructureElement</b> (abstract)			
<b>Note</b>	A structure element is both a classifier and a feature. As a feature, its structure is given by the feature it owns as a classifier.			
<b>Base</b>	ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AbstractAccessPoint</a> , <a href="#">AbstractImplementationDataTypeElement</a> , <a href="#">AsynchronousServerCallResultPoint</a> , <a href="#">BswModuleDescription</a> , <a href="#">BulkNvDataDescriptor</a> , <a href="#">ClientServerOperation</a> , <a href="#">DataPrototypeGroup</a> , <a href="#">IdentCaption</a> , <a href="#">InternalBehavior</a> , <a href="#">InternalTriggeringPoint</a> , <a href="#">ModeDeclaration</a> , <a href="#">ModeDeclarationMapping</a> , <a href="#">ModeSwitchPoint</a> , <a href="#">ModeTransition</a> , <a href="#">NvBlockDescriptor</a> , <a href="#">ParameterAccess</a> , <a href="#">PerInstanceMemory</a> , <a href="#">PortGroup</a> , <a href="#">PortPrototypeBlueprint</a> , <a href="#">RTEEvent</a> , <a href="#">RunnableEntity</a> , <a href="#">RunnableEntityGroup</a> , <a href="#">ServerCallPoint</a> , <a href="#">SwConnector</a> , <a href="#">SwcBswMapping</a> , <a href="#">SwcServiceDependency</a> , <a href="#">System</a> , <a href="#">Trigger</a> , <a href="#">VariableAccess</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.66: AtpStructureElement**

<b>Class</b>	<b>AtpType</b> (abstract)			
<b>Note</b>	A type is a classifier that may serve to type prototypes. It is a reusable classifier.			
<b>Base</b>	ARObject, <a href="#">AtpClassifier</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AutosarDataType</a> , <a href="#">ModeDeclarationGroup</a> , <a href="#">ModeDeclarationMappingSet</a> , <a href="#">PortInterface</a> , <a href="#">SwComponentType</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.67: AtpType**

<b>Class</b>	«atpMixedString» <b>AttributeValueVariationPoint</b> (abstract)			
<b>Note</b>	This class represents the ability to derive the value of the Attribute from a system constant (by Sw SystemconstDependentFormula). It also provides a bindingTime.			
<b>Base</b>	ARObject, <a href="#">FormulaExpression</a> , <a href="#">SwSystemconstDependentFormula</a>			
<b>Subclasses</b>	<a href="#">AbstractEnumerationValueVariationPoint</a> , <a href="#">AbstractNumericalVariationPoint</a> , <a href="#">BooleanValueVariationPoint</a> , <a href="#">FloatValueVariationPoint</a> , <a href="#">IntegerValueVariationPoint</a> , <a href="#">PositiveIntegerValueVariationPoint</a> , <a href="#">TimeValueVariationPoint</a> , <a href="#">UnlimitedIntegerValueVariationPoint</a>			
<b>Aggregated by</b>	<a href="#">VariationPointProxy.valueAccess</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bindingTime	FullBindingTimeEnum	0..1	attr	This is the binding time in which the attribute value needs to be bound. If this attribute is missing, the attribute is not a variation point. In particular this means that It needs to be a single value according to the type specified in the pure model. It is an error if it is still a formula. <b>Tags:</b> xml.attribute=true
blueprintValue	String	0..1	attr	This represents a description that documents how the value shall be defined when deriving objects from the blueprint. <b>Tags:</b> xml.attribute=true
sd	String	0..1	attr	This special data is provided to allow synchronization of Attribute value variation points with variant management systems. The usage is subject of agreement between the involved parties. <b>Tags:</b> xml.attribute=true
shortLabel	PrimitiveIdentifier	0..1	attr	This allows to identify the variation point. It is also intended to allow RTE support for CompileTime Variation points. <b>Tags:</b> xml.attribute=true

**Table A.68: AttributeValueVariationPoint**



<b>Class</b>	<b>AutosarDataPrototype</b> (abstract)			
<b>Note</b>	Base class for prototypical roles of an <a href="#">AutosarDataType</a> .			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">ArgumentDataPrototype</a> , <a href="#">ParameterDataPrototype</a> , <a href="#">VariableDataPrototype</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
type	<a href="#">AutosarDataType</a>	0..1	tref	This represents the corresponding data type. <b>Stereotypes:</b> isOfType

**Table A.69: AutosarDataPrototype**

<b>Class</b>	<b>AutosarDataType</b> (abstract)			
<b>Note</b>	Abstract base class for user defined AUTOSAR data types for software.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AbstractImplementationDataType</a> , <a href="#">ApplicationDataType</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	The properties of this AutosarDataType. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=swDataDefProps

**Table A.70: AutosarDataType**

<b>Class</b>	<b>AutosarOperationArgumentInstance</b>			
<b>Note</b>	This class represents a reference to an argument instance. This way it is possible to reference an argument instance in the occurrence expression formula. The argument instance can target to one of the following arguments: <ul style="list-style-type: none"> <li>a whole argument used in an operation of a PortPrototype with ClientServerInterface</li> <li>an element inside of a composite argument used in an operation of a PortPrototype with ClientServerInterface</li> </ul>			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">TDEventOccurrenceExpression.argument</a> , <a href="#">TimingExtensionResource.timingArgument</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operation Argument Instance	<a href="#">DataPrototype</a>	0..1	iref	This is the reference to the instanceRef definition. <b>InstanceRef implemented by:</b> OperationArgumentIn ComponentInstanceRef

**Table A.71: AutosarOperationArgumentInstance**



Class	AutosarParameterRef			
Note	<p>This class represents a reference to a parameter within AUTOSAR which can be one of the following use cases:</p> <p>localParameter:</p> <ul style="list-style-type: none"> <li>localParameter which is used as whole (e.g. sharedAxis for curve)</li> </ul> <p>autosarVariable:</p> <ul style="list-style-type: none"> <li>a parameter provided via <a href="#">PortPrototype</a> which is used as whole (e.g. parameterAccess)</li> <li>an element inside of a composite local parameter typed by <a href="#">ApplicationDataType</a> (e.g. sharedAxis for a curve)</li> <li>an element inside of a composite parameter provided via Port and typed by <a href="#">ApplicationDataType</a> (e.g. sharedAxis for a curve)</li> </ul> <p>autosarParameterInImplDatatype:</p> <ul style="list-style-type: none"> <li>an element inside of a composite local parameter typed by ImplementationDatatype</li> <li>an element inside of a composite parameter provided via PortPrototype and typed by Implementation Datatype</li> </ul>			
Base	ARObject			
Aggregated by	<a href="#">InstantiationDataDefProps.parameterInstance</a> , <a href="#">ParameterAccess.accessedParameter</a> , <a href="#">RoleBasedDataAssignment.usedParameterElement</a> , <a href="#">SwCalprmRefProxy.arParameter</a>			
Attribute	Type	Mult.	Kind	Note
autosarParameter	<a href="#">DataPrototype</a>	0..1	iref	<p>This instance reference is used if the calibration parameter is either imported via a port or is part of a composite data structure.</p> <p><b>InstanceRef implemented by:</b> <a href="#">ParameterInAtomicSWCTypeInstanceRef</a></p>
localParameter	<a href="#">DataPrototype</a>	0..1	ref	<p>In the majority of cases this reference goes to Parameter DataPrototypes rather than VariableDataPrototypes. Pointing the reference to a VariableDataPrototype is limited to special use cases, e.g. if the AutosarParameterRef is used in the context of an SwAxisGrouped. This reference is used if the arParameter is local to the current component.</p> <p>Of course, it would technically also be feasible to use an InstanceRef for this case. However, the InstanceRef would not have a contextElement (because the current instance is the context).</p> <p>Hence, the local instance is a special case which may provide further optimization. Therefore an explicit reference is provided for this case.</p>

Table A.72: AutosarParameterRef

Class	AutosarVariableInstance			
Note	<p>This class represents a reference to a variable instance within AUTOSAR. This way it is possible to reference a variable instance in the occurrence expression formula. The variable instance can target to one of the following variables:</p> <ul style="list-style-type: none"> <li>a variable provided via a PortPrototype as whole</li> <li>an element inside of a composite variable provided via a PortPrototype</li> </ul>			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">TDEventOccurrenceExpression.variable</a> , <a href="#">TimingExtensionResource.timingVariable</a>			
Attribute	Type	Mult.	Kind	Note
variableInstance	<a href="#">DataPrototype</a>	0..1	iref	<p>This is the reference to the instanceRef definition.</p> <p><b>InstanceRef implemented by:</b> <a href="#">VariableInComponentInstanceRef</a></p>

Table A.73: AutosarVariableInstance

<b>Class</b>	<b>AutosarVariableRef</b>			
<b>Note</b>	<p>This class represents a reference to a variable within AUTOSAR which can be one of the following use cases:</p> <p>localVariable:</p> <ul style="list-style-type: none"> <li>localVariable which is used as whole (e.g. InterRunnableVariable, inputValue for curve)</li> </ul> <p>autosarVariable:</p> <ul style="list-style-type: none"> <li>a variable provided via Port which is used as whole (e.g. dataAccessPoints)</li> <li>an element inside of a composite local variable typed by <a href="#">ApplicationDataType</a> (e.g. inputValue for a curve)</li> <li>an element inside of a composite variable provided via <a href="#">PortPrototype</a> and typed by <a href="#">ApplicationDataType</a> (e.g. inputValue for a curve)</li> </ul> <p>autosarVariableInImplDatatype:</p> <ul style="list-style-type: none"> <li>an element inside of a composite local variable typed by <a href="#">ImplementationDataType</a> (e.g. nvram Data mapping)</li> <li>an element inside of a composite variable provided via Port and typed by <a href="#">ImplementationDataType</a> (e.g. inputValue for a curve)</li> </ul>			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">InstantiationDataDefProps.variableInstance</a> , <a href="#">NvBlockDataMapping.nvRamBlockElement</a> , <a href="#">NvBlockDataMapping.readNvData</a> , <a href="#">NvBlockDataMapping.writtenNvData</a> , <a href="#">NvBlockDataMapping.writtenReadNvData</a> , <a href="#">RoleBasedDataAssignment.usedDataElement</a> , <a href="#">SwVariableRefProxy.autosarVariable</a> , <a href="#">VariableAccess.accessedVariable</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
autosarVariable	<a href="#">DataPrototype</a>	0..1	iref	<p>This references a variable which is provided by a port and/or which is part of a CompositeDataType.</p> <p><b>InstanceRef implemented by:</b> <a href="#">VariableInAtomicSWCTypeInstanceRef</a></p>
autosarVariableInImplDatatype	<a href="#">ArVariableInImplementationDataInstanceRef</a>	0..1	aggr	<p>This is used if the target variable is inside of variableData Prototype typed by an ImplementationDataType.</p>
localVariable	<a href="#">VariableDataPrototype</a>	0..1	ref	<p>This reference is used if the variable is local to the current component. It would also be possible to use the instance ref here. Such an instance ref would not have a contextElement, since the current instance is the context. But the local instance is a special case which may provide further optimization. Therefore an explicit reference is provided for this case.</p>

**Table A.74: AutosarVariableRef**

<b>Class</b>	<b>BaseType</b> (abstract)			
<b>Note</b>	This abstract meta-class represents the ability to specify a platform dependent base type.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">SwBaseType</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
baseTypeDefinition	BaseTypeDefinition	1	aggr	<p>This is the actual definition of the base type.</p> <p><b>Tags:</b></p> <ul style="list-style-type: none"> <li>xml.roleElement=false</li> <li>xml.roleWrapperElement=false</li> <li>xml.sequenceOffset=20</li> <li>xml.typeElement=false</li> <li>xml.typeWrapperElement=false</li> </ul>

**Table A.75: BaseType**

<b>Class</b>	<b>BaseTypeDirectDefinition</b>			
<b>Note</b>	This BaseType is defined directly (as opposite to a derived BaseType)			
<b>Base</b>	ARObject, BaseTypeDefinition			
<b>Aggregated by</b>	BaseType.baseTypeDefinition			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
baseTypeEncoding	BaseTypeEncodingString	0..1	attr	This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence. <b>Tags:</b> xml.sequenceOffset=90
baseTypeSize	PositiveInteger	0..1	attr	Describes the length of the data type specified in the container in bits. <b>Tags:</b> xml.sequenceOffset=70
byteOrder	ByteOrderEnum	0..1	attr	This attribute specifies the byte order of the base type. <b>Tags:</b> xml.sequenceOffset=110
memAlignment	PositiveInteger	0..1	attr	This attribute describes the alignment of the memory object in bits. E.g. "8" specifies, that the object in question is aligned to a byte while "32" specifies that it is aligned four byte. If the value is set to "0" the meaning shall be interpreted as "unspecified". <b>Tags:</b> xml.sequenceOffset=100
nativeDeclaration	NativeDeclarationString	0..1	attr	This attribute describes the declaration of such a base type in the native programming language, primarily in the Programming language C. This can then be used by a code generator to include the necessary declarations into a header file. For example BaseType with shortName: "MyUnsignedInt" native Declaration: "unsigned short" Results in typedef unsigned short MyUnsignedInt; If the attribute is not defined the referring Implementation DataTypes will not be generated as a typedef by RTE. If a nativeDeclaration type is given it shall fulfill the characteristic given by BaseTypeEncoding and BaseTypeSize. This is required to ensure the consistent handling and interpretation by software components, RTE, COM and MCM systems. <b>Tags:</b> xml.sequenceOffset=120

**Table A.76: BaseTypeDirectDefinition**

<b>Class</b>	<b>BinaryManifestAddressableObject</b> (abstract)			
<b>Note</b>	This meta-class acts as an abstract base class for addressable objects in the context of the binary manifest of a CP software cluster. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, Identifiable, MultilanguageReferrable, Referrable			
<b>Subclasses</b>	BinaryManifestItem, BinaryManifestMetaDataField			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
address	Address	0..1	attr	This attribute specifies the address of the enclosing addressable object.
symbol	SymbolString	0..1	attr	This attribute specifies the symbol of the addressable object.

**Table A.77: BinaryManifestAddressableObject**

Class	BinaryManifestItem			
Note	This meta-class represents the ability to describe a specific handle or auxiliary field in the context of binary manifest resource. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">BinaryManifestAddressableObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">BinaryManifestItem.auxiliaryField</a> , <a href="#">BinaryManifestResource.item</a>			
Attribute	Type	Mult.	Kind	Note
auxiliaryField	<a href="#">BinaryManifestItem</a>	*	aggr	This aggregation is used to define structured Binary ManifestItems. <b>Tags:</b> xml.sequenceOffset=20
defaultValue	BinaryManifestItem Value	0..1	aggr	This aggregation represents the definition of a default value for a binary manifest handle or an auxiliaryField. This value shall be taken if no connection for this resource is possible. <b>Tags:</b> xml.sequenceOffset=10
isUnused	Boolean	0..1	attr	If true, the handle or auxiliary field in the context of binary manifest resource relates to an optional BinaryManifestItemDefinition and is not used.
value	BinaryManifestItem Value	0..1	aggr	This aggregation represents the definition of a value for a binary manifest handle or an auxiliaryField. This value shall be taken to establish a connection.

**Table A.78: BinaryManifestItem**

Class	BinaryManifestItemDefinition			
Note	This meta-class provides the ability to define the handle definition or an auxiliary field of a binary manifest resource. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">BinaryManifestItemDefinition.auxiliaryFieldDefinition</a> , <a href="#">BinaryManifestResourceDefinition.itemDefinition</a>			
Attribute	Type	Mult.	Kind	Note
auxiliaryField Definition	<a href="#">BinaryManifestItem Definition</a>	*	aggr	This aggregation is used to define structured Binary ManifestItemDefinitions.
isOptional	Boolean	0..1	attr	If true, the handle definition or auxiliary field of a binary manifest resource is optional and may not be used in all BinaryManifestResources referring to this BinaryManifestResourceDefinition.
size	PositiveInteger	0..1	attr	This attribute provides the ability to specify the size of the enclosing BinaryManifestResourceDefinition.

**Table A.79: BinaryManifestItemDefinition**

Class	BinaryManifestItemNumericalValue			
Note	This meta-class has the ability to provide a numerical value for a binary manifest item. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">BinaryManifestItemValue</a>			
Aggregated by	<a href="#">BinaryManifestItem.defaultValue</a> , <a href="#">BinaryManifestItem.value</a>			
Attribute	Type	Mult.	Kind	Note
value	<a href="#">Numerical</a>	0..1	attr	This attribute specifies the actual numerical value to be used in the binary manifest handle.

**Table A.80: BinaryManifestItemNumericalValue**

<b>Class</b>	<b>BinaryManifestItemPointerValue</b>			
<b>Note</b>	This meta-class has the ability to provide a value for a pointer in the context of a binary manifest item. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>BinaryManifestItemValue</i>			
<b>Aggregated by</b>	<a href="#">BinaryManifestItem.defaultValue</a> , <a href="#">BinaryManifestItem.value</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
address	Address	0..1	attr	This attribute represents the address value of the enclosing pointer value.
symbol	SymbolString	0..1	attr	This attribute represents the symbol associated with the binary manifest handle.

**Table A.81: BinaryManifestItemPointerValue**

<b>Class</b>	<b>BinaryManifestMetaDataField</b>			
<b>Note</b>	This meta-class provides the ability to define a meta-data field for the binary manifest descriptor. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <a href="#">BinaryManifestAddressableObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CpSoftwareClusterBinaryManifestDescriptor metaDataField</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
size	PositiveInteger	0..1	attr	The value of this attribute represents the size of the meta-data field in bytes.
value	VerbatimString	0..1	attr	This attribute specifies the value of the meta-data field.

**Table A.82: BinaryManifestMetaDataField**

<b>Class</b>	<b>BinaryManifestProvideResource</b>			
<b>Note</b>	This meta-class represents a provided resource in the binary manifest. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <a href="#">BinaryManifestResource</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CpSoftwareClusterBinaryManifestDescriptor.provideResource</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
numberOfNotifierSets	PositiveInteger	0..1	attr	This attribute provides an upper limit for the number of notifiers for this resource.
supportsMultipleNotifierSets	Boolean	0..1	attr	This attribute indicates whether the enclosing BinaryManifestResource supports multiple notifiers sets.

**Table A.83: BinaryManifestProvideResource**

<b>Class</b>	<b>BinaryManifestRequireResource</b>			
<b>Note</b>	This meta-class represents a required resource in the binary manifest. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <a href="#">BinaryManifestResource</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CpSoftwareClusterBinaryManifestDescriptor.requireResource</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
connectionIsMandatory	Boolean	0..1	attr	This attribute indicates whether the connection of the enclosing BinaryManifestResource is mandatory.

**Table A.84: BinaryManifestRequireResource**

<b>Class</b>	<b>BinaryManifestResource</b> (abstract)			
<b>Note</b>	This meta-class acts as an abstract base class for specializations. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">BinaryManifestProvideResource</a> , <a href="#">BinaryManifestRequireResource</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
globalResource Id	PositiveInteger	0..1	attr	A unique identifiers per resource used for the connection process. The identifier is required to be unique in the scope of a single machine. If software clusters are designed to be reused on multiple machines the uniqueness requirements applies for all the intended machines.
item (ordered)	<a href="#">BinaryManifestItem</a>	*	aggr	This aggregation represents the collection of binary manifest handles owned by the enclosing binary manifest resource.
resource	<a href="#">CpSoftwareClusterResource</a>	0..1	ref	This reference identifies the CpSoftwareClusterResource (on design level) that corresponds to the BinaryManifest Resource (on integration level).
resource Definition	<a href="#">BinaryManifestResourceDefinition</a>	0..1	ref	this reference identifies the definition of the Binary ManifestResource. The definition provides configuration information that is shared among all BinaryManifest Resources that refer to the BinaryManifestResource Definition.
resourceGuard Value	String	0..1	attr	This attribute specifies the guard value of the enclosing binary manifest resource.

**Table A.85: BinaryManifestResource**

<b>Class</b>	<b>BinaryManifestResourceDefinition</b>			
<b>Note</b>	This meta-class represents the ability to specify a resource definition that provides information that can be shared by all resources that refer to the respective resource definition. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CpSoftwareClusterBinaryManifestDescriptor.resourceDefinition</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
itemDefinition (ordered)	<a href="#">BinaryManifestItemDefinition</a>	*	aggr	This aggregation specifies the collection of handle definitions in the context of the enclosing binary manifest resource definitions.

**Table A.86: BinaryManifestResourceDefinition**

<b>Class</b>	<b>BlueprintMapping</b>			
<b>Note</b>	This meta-class represents the ability to map two an object and its blueprint.			
<b>Base</b>	ARObject, <a href="#">AtpBlueprintMapping</a>			
<b>Aggregated by</b>	BlueprintMappingSet.blueprintMap			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
blueprint	AtpBlueprint	1	ref	This represents the mapped blueprint. <b>Stereotypes:</b> atpIdentityContributor
derivedObject	AtpBlueprintable	1	ref	This represents the object which was derived from the blueprint. <b>Stereotypes:</b> atpIdentityContributor

**Table A.87: BlueprintMapping**

<b>Class</b>	<b>BlueprintPolicy</b> (abstract)			
<b>Note</b>	This meta-class represents the ability to indicate whether blueprintable elements will be modifiable or not modifiable.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	BlueprintPolicyModifiable, <a href="#">BlueprintPolicyNotModifiable</a>			
<b>Aggregated by</b>	AtpBlueprint.blueprintPolicy			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
attributeName	String	1	attr	This identifies the related attribute of a BlueprintPolicy. For navigation over the model a subset of xpath expressions is used. <b>Stereotypes:</b> atpIdentityContributor

**Table A.88: BlueprintPolicy**

<b>Class</b>	<b>BlueprintPolicyNotModifiable</b>			
<b>Note</b>	The class represents that the related attribute is not modifiable during the blueprinting.			
<b>Base</b>	ARObject, <a href="#">BlueprintPolicy</a>			
<b>Aggregated by</b>	AtpBlueprint.blueprintPolicy			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.89: BlueprintPolicyNotModifiable**

<b>Class</b>	<b>BswAsynchronousServerCallPoint</b>			
<b>Note</b>	Represents an asynchronous procedure call point via the BSW Scheduler.			
<b>Base</b>	ARObject, <a href="#">BswModuleCallPoint</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswModuleEntity.callPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
calledEntry	<a href="#">BswModuleClientServerEntry</a>	0..1	ref	The entry to be called.

**Table A.90: BswAsynchronousServerCallPoint**

<b>Class</b>	<b>BswAsynchronousServerCallResultPoint</b>			
<b>Note</b>	The callback point for an BswAsynchronousServerCallPoint i.e. the point at which the result can be retrieved from the BSW Scheduler. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">BswModuleCallPoint</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswModuleEntity.callPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
asynchronous ServerCallPoint	<a href="#">BswAsynchronousServerCallPoint</a>	0..1	ref	The call point invoking the call to which the result belongs.

**Table A.91: BswAsynchronousServerCallResultPoint**

<b>Class</b>	<b>BswAsynchronousServerCallReturnsEvent</b>			
<b>Note</b>	This is the "callback" event for asynchronous Client-Server-Communication via the BSW Scheduler which is thrown after completion of the asynchronous Client-Server call. Its eventSource specifies the call point to be used for retrieving the result.			
<b>Base</b>	ARObject, <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">BswScheduleEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			





Class	BswAsynchronousServerCallReturnsEvent			
Aggregated by	<a href="#">BswInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
eventSource	<a href="#">BswAsynchronousServerCallResultPoint</a>	0..1	ref	The call point to be used for retrieving the result. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.92: BswAsynchronousServerCallReturnsEvent**

Enumeration	BswCallType
Note	Denotes the mechanism by which the entry into the Bsw module shall be called.
Aggregated by	<a href="#">BswModuleEntry.callType</a>
Literal	Description
callback	Callback (i.e. the caller specifies the signature) <b>Tags:</b> atp.EnumerationLiteralIndex=0
callout	Callout - provide defined means to extend the functionality of an existing module. In this case caller specifies the signature. <b>Tags:</b> atp.EnumerationLiteralIndex=4
interrupt	Interrupt routine <b>Tags:</b> atp.EnumerationLiteralIndex=1
regular	Regular API call <b>Tags:</b> atp.EnumerationLiteralIndex=2
scheduled	Called by the scheduler <b>Tags:</b> atp.EnumerationLiteralIndex=3

**Table A.93: BswCallType**

Class	BswCalledEntity			
Note	BSW module entity which is designed to be called from another BSW module or cluster.			
Base	<a href="#">ARObject</a> , <a href="#">BswModuleEntity</a> , <a href="#">ExecutableEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">BswInternalBehavior.entity</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.94: BswCalledEntity**

Class	BswCompositionTiming			
Note	A model element used to define timing descriptions and constraints for a set of BswImplementations representing a BSW composition. A constraint defined at this level holds true for all referenced Bsw Implementations. Note, that multiple implementations of the same basic software module could be involved. TimingDescriptions aggregated by BswCompositionTiming are restricted to event chains referring to events which are derived from the class TDEventBswInternalBehavior and TDEventBsw. <b>Tags:</b> atp.recommendedPackage=TimingExtensions This Class is only used by the AUTOSAR Classic Platform.			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TimingExtension</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note







Class	BswCompositionTiming			
implementation	<a href="#">BswImplementation</a>	*	ref	This defines the scope of a BswCompositionTiming. All corresponding timing descriptions and constraints shall be defined within this scope.

**Table A.95: BswCompositionTiming**

Class	BswDataReceivedEvent			
Note	This event is thrown on reception of the referenced data via Sender-Receiver-Communication over the BSW Scheduler.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">BswScheduleEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">BswInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
data	<a href="#">VariableDataPrototype</a>	0..1	ref	The received data.

**Table A.96: BswDataReceivedEvent**

Class	BswDataReceptionPolicy (abstract)			
Note	Specifies the reception policy for the referred data in sender-receiver communication over the BSW Scheduler. To be used for inter-partition and/or inter-core communication.			
Base	<a href="#">ARObject</a> , <a href="#">BswApiOptions</a>			
Subclasses	<a href="#">BswQueuedDataReceptionPolicy</a>			
Aggregated by	<a href="#">BswInternalBehavior.receptionPolicy</a>			
Attribute	Type	Mult.	Kind	Note
receivedData	<a href="#">VariableDataPrototype</a>	0..1	ref	The data received over the BSW Scheduler using this policy.

**Table A.97: BswDataReceptionPolicy**

Class	BswDirectCallPoint			
Note	Represents a concrete point in the code from where a BswModuleEntry is called directly, i.e. not via the BSW Scheduler. This information can be used to analyze call tree and resource locking scenarios. It is not needed to configure the BSW Scheduler.			
Base	<a href="#">ARObject</a> , <a href="#">BswModuleCallPoint</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">BswModuleEntity.callPoint</a>			
Attribute	Type	Mult.	Kind	Note
calledEntry	<a href="#">BswModuleEntry</a>	0..1	ref	The BswModuleEntry called at this point. This Attribute is only used by the AUTOSAR Classic Platform.
calledFrom WithinExclusive Area	ExclusiveAreaNesting Order	0..1	ref	This indicates that the call point is located at the deepest level inside one or more ExclusiveAreas that are nested in the given order.

**Table A.98: BswDirectCallPoint**

<b>Class</b>	<b>BswDistinguishedPartition</b>			
<b>Note</b>	Each instance of this meta-class represents an abstract partition in which context the code of the enclosing BswModuleBehavior can be executed. The intended use case is to distinguish between several partitions in order to implement different behavior per partition, for example to behave either as a master or satellite in a multicore ECU with shared BSW code.			
<b>Base</b>	ARObject, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.distinguishedPartition</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.99: BswDistinguishedPartition**

<b>Class</b>	<b>BswEntryRelationship</b>			
<b>Note</b>	Describes a relationship between two BswModuleEntrys and the type of relationship.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">BswEntryRelationshipSet.bswEntryRelationship</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswEntry Relationship Type	BswEntryRelationship Enum	0..1	attr	Denotes the type of the relationship. <b>Tags:</b> xml.sequenceOffset=5
from	<a href="#">BswModuleEntry</a>	0..1	ref	Type of relationship that refers to the abstract BswModule Entry. Please notice that in this case the bswEntry RelationshipType shall be set to drivenFrom. This Attribute is only used by the AUTOSAR Classic Platform.
to	<a href="#">BswModuleEntry</a>	0..1	ref	Type of relationship that refers to the concrete Bsw ModuleEntry. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.100: BswEntryRelationship**

<b>Class</b>	<b>BswEntryRelationshipSet</b>			
<b>Note</b>	Describes a set of relationships between two BswModuleEntrys. <b>Tags:</b> atp.recommendedPackage=BswEntryRelationshipSets This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswEntry Relationship	<a href="#">BswEntryRelationship</a>	*	aggr	Relationship between two BswModuleEntrys.

**Table A.101: BswEntryRelationshipSet**

<b>Class</b>	<b>BswEvent</b> (abstract)			
<b>Note</b>	Base class of various kinds of events which are used to trigger a BswModuleEntity of this BSW module or cluster. The event is local to the BSW module or cluster. The short name of the meta-class instance is intended as an input to configure the required API of the BSW Scheduler.			
<b>Base</b>	ARObject, <a href="#">AbstractEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">BswInterruptEvent</a> , <a href="#">BswOperationInvokedEvent</a> , <a href="#">BswScheduleEvent</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.event</a>			





Class	<b>BswEvent</b> (abstract)			
Attribute	Type	Mult.	Kind	Note
context Limitation	<a href="#">BswDistinguishedPartition</a>	*	ref	The existence of this reference indicates that the usage of the event is limited to the context of the referred Bsw DistinguishedPartitions.
disabledInMode	<a href="#">ModeDeclaration</a>	*	iref	The modes, in which this event is disabled. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=disabledInMode.contextModeDeclarationGroup, disabledInMode.targetMode <b>InstanceRef implemented by:</b> ModelInBswModuleDescriptionInstanceRef
startsOnEvent	<a href="#">BswModuleEntity</a>	0..1	ref	The entity which is started by the event.

**Table A.102: BswEvent**

Class	<b>BswExclusiveAreaPolicy</b>			
Note	The ExclusiveArea for which the BSW Scheduler using this policy.			
Base	<a href="#">ARObject</a> , <a href="#">BswApiOptions</a>			
Aggregated by	<a href="#">BswInternalBehavior.exclusiveAreaPolicy</a>			
Attribute	Type	Mult.	Kind	Note
apiPrinciple	ApiPrincipleEnum	0..1	attr	Specifies for this ExclusiveArea if either one common set of Enter and Exit APIs for the whole BSW module is requested from the SchM or if the set of Enter and Exit APIs is expected per BswModuleEntity. The default value is "common".
exclusiveArea	<a href="#">ExclusiveArea</a>	0..1	ref	The ExclusiveArea for which the BSW Scheduler using this policy.

**Table A.103: BswExclusiveAreaPolicy**

Enumeration	<b>BswExecutionContext</b>
Note	Specifies the execution context required or guaranteed for the call associated with this service.
Aggregated by	<a href="#">BswModuleEntry.executionContext</a>
Literal	Description
hook	Context of an OS "hook" routine always <b>Tags:</b> atp.EnumerationLiteralIndex=0
interruptCat1	CAT1 interrupt context always <b>Tags:</b> atp.EnumerationLiteralIndex=1
interruptCat2	CAT2 interrupt context always <b>Tags:</b> atp.EnumerationLiteralIndex=2
task	Task context always <b>Tags:</b> atp.EnumerationLiteralIndex=3
unspecified	The execution context is not specified by the API <b>Tags:</b> atp.EnumerationLiteralIndex=4

**Table A.104: BswExecutionContext**

Class	<b>BswExternalTriggerOccurredEvent</b>
Note	A BswEvent resulting from a trigger released by another module or cluster.
Base	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">BswScheduleEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>





Class	BswExternalTriggerOccurredEvent			
Aggregated by	BswInternalBehavior.event			
Attribute	Type	Mult.	Kind	Note
trigger	Trigger	0..1	ref	The trigger associated with this event. The trigger is external to this module.

**Table A.105: BswExternalTriggerOccurredEvent**

Class	BswImplementation			
Note	Contains the implementation specific information in addition to the generic specification (BswModule Description and BswBehavior). It is possible to have several different BswImplementations referring to the same BswBehavior. <b>Tags:</b> atp.recommendedPackage=BswImplementations This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, Identifiable, Implementation, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
arReleaseVersion	RevisionLabelString	0..1	attr	Version of the AUTOSAR Release on which this implementation is based. The numbering contains three levels (major, minor, revision) which are defined by AUTOSAR.
behavior	BswInternalBehavior	0..1	ref	The behavior of this implementation. This relation is made as an association because <ul style="list-style-type: none"> <li>it follows the pattern of the SWCT</li> <li>since ARElement cannot be split, but we want supply the implementation later, the BswImplementation is not aggregated in BswBehavior</li> </ul>
preconfiguredConfiguration	EcucModuleConfigurationValues	*	ref	Reference to the set of preconfigured (i.e. fixed) configuration values for this BswImplementation. If the BswImplementation represents a cluster of several modules, more than one EcucModuleConfigurationValues element can be referred (at most one per module), otherwise at most one such element can be referred. <b>Tags:</b> xml.roleWrapperElement=true
recommendedConfiguration	EcucModuleConfigurationValues	*	ref	Reference to one or more sets of recommended configuration values for this module or module cluster.
vendorApiInfix	Identifier	0..1	attr	In driver modules which can be instantiated several times on a single ECU, SRS_BSW_00347 requires that the names of files, APIs, published parameters and memory allocation keywords are extended by the vendorId and a vendor specific name. This parameter is used to specify the vendor specific name. In total, the implementation specific API name is generated as follows: <Module Name>_<vendorId>_<vendorApiInfix>_<API name from SWS>. E.g. assuming that the vendorId of the implementer is 123 and the implementer chose a vendorApiInfix of "v11r456" an API name Can_Write defined in the SWS will translate to Can_123_v11r456_Write. This attribute is mandatory for all modules with upper multiplicity > 1. It shall not be used for modules with upper multiplicity =1. See also SWS_BSW_00102.





Class	BswImplementation			
vendorSpecificModuleDef	<a href="#">EcucModuleDef</a>	*	ref	<p>Reference to</p> <ul style="list-style-type: none"> <li>the vendor specific EcucModuleDef used in this Bsw Implementation if it represents a single module</li> <li>several EcucModuleDefs used in this Bsw Implementation if it represents a cluster of modules</li> <li>one or no EcucModuleDefs used in this Bsw Implementation if it represents a library</li> </ul> <p><b>Tags:</b> xml.roleWrapperElement=true</p>

**Table A.106: BswImplementation**

Class	BswInternalBehavior			
<b>Note</b>	Specifies the behavior of a BSW module or a BSW cluster w.r.t. the code entities visible by the BSW Scheduler. It is possible to have several different BswInternalBehaviors referring to the same BswModuleDescription.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">InternalBehavior</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">BswModuleDescription.internalBehavior</a>			
Attribute	Type	Mult.	Kind	Note
arTypedPerInstanceMemory	<a href="#">VariableDataPrototype</a>	*	aggr	<p>Defines an AUTOSAR typed memory-block that needs to be available for each instance of the Basic Software Module. The aggregation of arTypedPerInstanceMemory is subject to variability with the purpose to support variability in the Basic Software Module's implementations. Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=arTypedPerInstanceMemory.shortName, arTypedPerInstanceMemory.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
bswPerInstanceMemoryPolicy	BswPerInstanceMemoryPolicy	*	aggr	<p>Policy for a arTypedPerInstanceMemory The policy selects the options of the Schedule Manager API generation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=bswPerInstanceMemoryPolicy, bswPerInstanceMemoryPolicy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
clientPolicy	BswClientPolicy	*	aggr	<p>Policy for a requiredClientServerEntry. The policy selects the options of the Schedule Manager API generation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=clientPolicy, clientPolicy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
distinguishedPartition	<a href="#">BswDistinguishedPartition</a>	*	aggr	<p>Indicates an abstract partition context in which the enclosing BswModuleEntity can be executed.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=distinguishedPartition.shortName, distinguishedPartition.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=60</p>





Class	BswInternalBehavior			
entity	<a href="#">BswModuleEntity</a>	*	aggr	A code entity for which the behavior is described <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=entity.shortName, entity.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=5
event	<a href="#">BswEvent</a>	*	aggr	An event required by this module behavior. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=event.shortName, event.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=10
exclusiveArea Policy	<a href="#">BswExclusiveArea Policy</a>	*	aggr	Policy for an ExclusiveArea in this BswInternalBehavior. The policy selects the options of the Schedule Manager API generation. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=exclusiveAreaPolicy, exclusiveArea Policy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
includedData TypeSet	IncludedDataTypeSet	*	aggr	The includedDataTypeSet is used by a basic software module for its implementation. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=includedDataTypeSet
includedMode Declaration GroupSet	IncludedMode DeclarationGroupSet	*	aggr	This aggregation represents the included Mode DeclarationGroups <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=includedModeDeclarationGroupSet
internal TriggeringPoint	<a href="#">BswInternalTriggering Point</a>	*	aggr	An internal triggering point. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=internalTriggeringPoint.shortName, internal TriggeringPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=2 This Attribute is only used by the AUTOSAR Classic Platform.
internal TriggeringPoint Policy	<a href="#">BswInternalTriggering PointPolicy</a>	*	aggr	Policy for an internalTriggeringPoint in this BswInternal Behavior.. The policy selects the options of the Schedule Manager API generation. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=internalTriggeringPointPolicy, internal TriggeringPointPolicy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
modeReceiver Policy	<a href="#">BswModeReceiver Policy</a>	*	aggr	Implementation policy for the reception of mode switches. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=modeReceiverPolicy, modeReceiver Policy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=25





Class	BswInternalBehavior			
modeSender Policy	<a href="#">BswModeSenderPolicy</a>	*	aggr	Implementation policy for providing a mode group. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=modeSenderPolicy, modeSender Policy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=20
parameterPolicy	BswParameterPolicy	*	aggr	Policy for a perInstanceParameter in this BswInternal Behavior. The policy selects the options of the Schedule Manager API generation. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=parameterPolicy, parameterPolicy.variation Point.shortLabel vh.latestBindingTime=preCompileTime
perInstance Parameter	<a href="#">ParameterData Prototype</a>	*	aggr	Describes a read only memory object containing characteristic value(s) needed by this BswInternal Behavior. The role name perInstanceParameter is chosen in analogy to the similar role in the context of SwcInternal Behavior. In contrast to constantMemory, this object is not allocated locally by the module's code, but by the BSW Scheduler and it is accessed from the BSW module via the BSW Scheduler API. The main use case is the support of software emulation of calibration data. The aggregation is subject to variability with the purpose to support implementation variants. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=perInstanceParameter.shortName, per InstanceParameter.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=45
receptionPolicy	<a href="#">BswDataReception Policy</a>	*	aggr	Data reception policy for inter-partition and/or inter-core communication. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=receptionPolicy, receptionPolicy.variation Point.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=55
releasedTrigger Policy	BswReleasedTrigger Policy	*	aggr	Policy for a releasedTrigger. The policy selects the options of the Schedule Manager API generation. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=releasedTriggerPolicy, releasedTrigger Policy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
schedulerName Prefix	BswSchedulerName Prefix	*	aggr	Optional definition of one or more prefixes to be used for the BswScheduler. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=schedulerNamePrefix.shortName, scheduler NamePrefix.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=50





Class	BswInternalBehavior			
sendPolicy	BswDataSendPolicy	*	aggr	Policy for a providedData. The policy selects the options of the Schedule Manager API generation. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=sendPolicy, sendPolicy.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
service Dependency	<a href="#">BswService Dependency</a>	*	aggr	Defines the requirements on AUTOSAR Services for a particular item. The aggregation is subject to variability with the purpose to support the conditional existence of ServiceNeeds. The aggregation is splitable in order to support that ServiceNeeds might be provided in later development steps. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=serviceDependency.ident.shortName, serviceDependency.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=40
triggerDirect Implementation	<a href="#">BswTriggerDirect Implementation</a>	*	aggr	Specifies a trigger to be directly implemented via OS calls. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=triggerDirectImplementation, triggerDirectImplementation.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=15
variationPoint Proxy	<a href="#">VariationPointProxy</a>	*	aggr	Proxy of a variation points in the C/C++ implementation. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=variationPointProxy.shortName

**Table A.107: BswInternalBehavior**

Class	BswInternalTriggerOccurredEvent			
<b>Note</b>	A BswEvent, which can happen sporadically. The event is activated by explicit calls from the module to the BSW Scheduler. The main purpose for such an event is to cause a context switch, e.g. from an ISR context into a task context. Activation and switching are handled within the same module or cluster only.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">BswScheduleEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
eventSource	<a href="#">BswInternalTriggeringPoint</a>	0..1	ref	The activation point is the source of this event. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.108: BswInternalTriggerOccurredEvent**

Class	BswInternalTriggeringPoint			
<b>Note</b>	Represents the activation point for one or more BswInternalTriggerOccurredEvents. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.internalTriggeringPoint</a>			
Attribute	Type	Mult.	Kind	Note
swImplPolicy	<a href="#">SwImplPolicyEnum</a>	0..1	attr	This attribute, when set to value queued, specifies a queued processing of the internal trigger event.

**Table A.109: BswInternalTriggeringPoint**



<b>Enumeration</b>	<b>BswInterruptCategory</b>
<b>Note</b>	Category of the interrupt service
<b>Aggregated by</b>	<a href="#">BswInterruptEntity.interruptCategory</a>
<b>Literal</b>	<b>Description</b>
cat1	Cat1 interrupt routines are not controlled by the OS and are only allowed to make a very limited selection of OS calls to enable and disable all interrupts. The BswInterruptEntity is implemented by the interrupt service routine, which is directly called from the interrupt vector (not via the OS). <b>Tags:</b> atp.EnumerationLiteralIndex=0
cat2	Cat2 interrupt routines are controlled by the OS and they are allowed to make OS calls. The BswInterruptEntity is implemented by the interrupt handler, which is called from the OS. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.110: BswInterruptCategory**

<b>Class</b>	<b>BswInterruptEntity</b>			
<b>Note</b>	BSW module entity, which is designed to be triggered by an interrupt.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">BswModuleEntity</a> , <a href="#">ExecutableEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.entity</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
interruptCategory	<a href="#">BswInterruptCategory</a>	0..1	attr	Category of the interrupt
interruptSource	String	0..1	attr	Allows a textual documentation of the intended interrupt source.

**Table A.111: BswInterruptEntity**

<b>Class</b>	<b>BswInterruptEvent</b>			
<b>Note</b>	This meta-class represents an event triggered by an interrupt.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.event</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.112: BswInterruptEvent**

<b>Class</b>	<b>BswMgrNeeds</b>			
<b>Note</b>	Specifies the abstract needs on the configuration of the Basic Software Manager for one "user".			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.113: BswMgrNeeds**

<b>Class</b>	<b>BswModeManagerErrorEvent</b>			
<b>Note</b>	This represents the ability to react on errors occurring during mode handling.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">BswScheduleEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.event</a>			





Class	BswModeManagerErrorEvent			
Attribute	Type	Mult.	Kind	Note
modeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	This represents the ModeDeclarationGroupPrototype for which the error behavior of the mode manager applies.

**Table A.114: BswModeManagerErrorEvent**

Class	BswModeReceiverPolicy			
Note	Specifies the details for the reception of a mode switch for the referred mode group.			
Base	ARObject			
Aggregated by	<a href="#">BswInternalBehavior.modeReceiverPolicy</a>			
Attribute	Type	Mult.	Kind	Note
enhancedMode Api	Boolean	0..1	attr	This controls the creation of the enhanced mode API that returns information about the previous mode and the next mode. If set to TRUE the enhanced mode API is supposed to be generated. For more details please refer to the SWS_RTE.
requiredMode Group	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	The required mode group for which the policy is specified.
supports Asynchronous ModeSwitch	Boolean	0..1	attr	Specifies whether the module can handle the reception of an asynchronous mode switch (true) or not (false).

**Table A.115: BswModeReceiverPolicy**

Class	BswModeSenderPolicy			
Note	Specifies the details for the sending of a mode switch for the referred mode group.			
Base	ARObject			
Aggregated by	<a href="#">BswInternalBehavior.modeSenderPolicy</a>			
Attribute	Type	Mult.	Kind	Note
ackRequest	<a href="#">BswModeSwitchAck Request</a>	0..1	aggr	Request for acknowledgement
enhancedMode Api	Boolean	0..1	attr	This controls the creation of the enhanced mode API that returns information about the previous mode and the next mode. If set to TRUE the enhanced mode API is supposed to be generated. For more details please refer to the SWS_RTE.
providedMode Group	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	The provided mode group for which the policy is specified.
queueLength	PositiveInteger	0..1	attr	Length of call queue on the sender side. The queue is implemented by the RTE resp.BswScheduler. The value shall be greater or equal to 0. Setting the value of queue Length to 0 implies non-queued communication.

**Table A.116: BswModeSenderPolicy**

Class	BswModeSwitchAckRequest			
Note	Requests acknowledgements that a mode switch has been processed successfully			
Base	ARObject			
Aggregated by	<a href="#">BswModeSenderPolicy.ackRequest</a>			
Attribute	Type	Mult.	Kind	Note
timeout	TimeValue	0..1	attr	Number of seconds before an error is reported.

**Table A.117: BswModeSwitchAckRequest**

<b>Class</b>	<b>BswModeSwitchEvent</b>			
<b>Note</b>	A BswEvent resulting from a mode switch.			
<b>Base</b>	ARObject, AbstractEvent, BswEvent, BswScheduleEvent, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	BswInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
activation	ModeActivationKind	0..1	attr	Kind of activation w.r.t. to the referred mode.
mode (ordered)	ModeDeclaration	0..2	iref	Reference to one or two Modes that initiate the Mode Switch Event. <b>InstanceRef implemented by:</b> ModeInBswModule DescriptionInstanceRef

**Table A.118: BswModeSwitchEvent**

<b>Class</b>	<b>BswModeSwitchedAckEvent</b>			
<b>Note</b>	The event is raised after a switch of the referenced mode group has been acknowledged or an error occurs. The referenced mode group shall be provided by this module.			
<b>Base</b>	ARObject, AbstractEvent, BswEvent, BswScheduleEvent, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	BswInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeGroup	ModeDeclarationGroup Prototype	0..1	ref	A mode group provided by this module. The acknowledgement of a switch of this group raises this event.

**Table A.119: BswModeSwitchedAckEvent**

<b>Class</b>	<b>BswModuleCallPoint</b> (abstract)			
<b>Note</b>	Represents a point at which a BswModuleEntity handles a procedure call into a BswModuleEntry, either directly or via the BSW Scheduler.			
<b>Base</b>	ARObject, Referrable			
<b>Subclasses</b>	BswAsynchronousServerCallPoint, BswAsynchronousServerCallResultPoint, BswDirectCallPoint, BswSynchronousServerCallPoint			
<b>Aggregated by</b>	BswModuleEntity.callPoint			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
context Limitation	BswDistinguished Partition	*	ref	The existence of this reference indicates that the call point is used only in the context of the referred Bsw DistinguishedPartitions.

**Table A.120: BswModuleCallPoint**

<b>Class</b>	<b>BswModuleClientServerEntry</b>			
<b>Note</b>	This meta-class represents a single API entry into the BSW module or cluster that has the ability to be called in client-server fashion via the BSW Scheduler. In this regard it is more special than BswModuleEntry and can be seen as a wrapper around the Bsw ModuleEntry to which it refers (property encapsulatedEntry). <b>Tags:</b> atp.recommendedPackage=BswModuleEntrys			
<b>Base</b>	ARObject, Referrable			
<b>Aggregated by</b>	BswModuleDescription.providedClientServerEntry, BswModuleDescription.requiredClientServerEntry			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	BswModuleClientServerEntry			
encapsulated Entry	<a href="#">BswModuleEntry</a>	0..1	ref	The underlying BswModuleEntry. <b>Tags:</b> xml.sequenceOffset=5 This Attribute is only used by the AUTOSAR Classic Platform.
isReentrant	Boolean	0..1	attr	Reentrancy from the viewpoint of clients invoking the service via the BSW Scheduler: <ul style="list-style-type: none"> <li>• true: Enables the service to be invoked again, before the service has finished.</li> <li>• false: It is prohibited to invoke the service again before is has finished.</li> </ul> <b>Tags:</b> xml.sequenceOffset=10
isSynchronous	Boolean	0..1	attr	Synchronicity from the viewpoint of clients invoking the service via the BSW Scheduler: <ul style="list-style-type: none"> <li>• true: This calls a synchronous service, i.e. the service is completed when the call returns.</li> <li>• false: The service (on semantical level) may not be complete when the call returns.</li> </ul> <b>Tags:</b> xml.sequenceOffset=15

**Table A.121: BswModuleClientServerEntry**

Class	BswModuleDependency			
<b>Note</b>	This class collects the dependencies of a BSW module or cluster on a certain other BSW module. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswModuleDescription.bswModuleDependency</a>			
Attribute	Type	Mult.	Kind	Note
targetModuleId	PositiveInteger	0..1	attr	AUTOSAR identifier of the target module of which the dependencies are defined. This information is optional, because the target module may also be identified by targetModuleRef. <b>Tags:</b> xml.sequenceOffset=5
targetModule Ref	<a href="#">BswModuleDescription</a>	0..1	ref	Reference to the target module. It is an <<atpUriDef>> because the reference shall be used to identify the target module without actually needing the description of that target module. <b>Stereotypes:</b> atpSplittable; atpUriDef; atpVariation <b>Tags:</b> atp.Splitkey=targetModuleRef.bswModuleDescription, targetModuleRef.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=7

**Table A.122: BswModuleDependency**

Class	BswModuleDescription			
<b>Note</b>	Root element for the description of a single BSW module or BSW cluster. In case it describes a BSW module, the short name of this element equals the name of the BSW module. <b>Tags:</b> atp.recommendedPackage=BswModuleDescriptions This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a> , <a href="#">AtpClassifier.atpFeature</a>			





Class	BswModuleDescription			
Attribute	Type	Mult.	Kind	Note
bswModule Dependency	<a href="#">BswModuleDependency</a>	*	aggr	Describes the dependency to another BSW module. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=bswModuleDependency.shortName, bsw ModuleDependency.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=20
bswModule Documentation	SwComponent Documentation	0..1	aggr	This adds a documentation to the BSW module. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=bswModuleDocumentation, bswModule Documentation.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=6
expectedEntry	<a href="#">BswModuleEntry</a>	*	ref	Indicates an entry which is required by this module. Replacement of outgoingCallback / requiredEntry. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=expectedEntry.bswModuleEntry, expected Entry.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
implemented Entry	<a href="#">BswModuleEntry</a>	*	ref	Specifies an entry provided by this module which can be called by other modules. This includes "main" functions, interrupt routines, and callbacks. Replacement of providedEntry / expectedCallback. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=implementedEntry.bswModuleEntry, implementedEntry.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
internalBehavior	<a href="#">BswInternalBehavior</a>	*	aggr	The various BswInternalBehaviors associated with a Bsw ModuleDescription can be distributed over several physical files. Therefore the aggregation is <<atp Splitable>>. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=internalBehavior.shortName xml.sequenceOffset=65
moduleId	PositiveInteger	0..1	attr	Refers to the BSW Module Identifier defined by the AUTOSAR standard. For non-standardized modules, a proprietary identifier can be optionally chosen. <b>Tags:</b> xml.sequenceOffset=5
providedClient ServerEntry	<a href="#">BswModuleClientServer Entry</a>	*	aggr	Specifies that this module provides a client server entry which can be called from another partition or core. This entry is declared locally to this context and will be connected to the requiredClientServerEntry of another or the same module via the configuration of the BSW Scheduler. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=providedClientServerEntry.shortName, providedClientServerEntry.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=45





Class	BswModuleDescription			
providedData	<a href="#">VariableDataPrototype</a>	*	aggr	<p>Specifies a data prototype provided by this module in order to be read from another partition or core. The providedData is declared locally to this context and will be connected to the requiredData of another or the same module via the configuration of the BSW Scheduler.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=providedData.shortName, providedData.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime  xml.sequenceOffset=55</p>
providedModeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	*	aggr	<p>A set of modes which is owned and provided by this module or cluster. It can be connected to the requiredModeGroups of other modules or clusters via the configuration of the BswScheduler. It can also be synchronized with modes provided via ports by an associated ServiceSwComponentType, EcuAbstractionSwComponentType or ComplexDeviceDriverSwComponentType.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=providedModeGroup.shortName, providedModeGroup.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime  xml.sequenceOffset=25</p>
releasedTrigger	<a href="#">Trigger</a>	*	aggr	<p>A Trigger released by this module or cluster. It can be connected to the requiredTriggers of other modules or clusters via the configuration of the BswScheduler. It can also be synchronized with Triggers provided via ports by an associated ServiceSwComponentType, EcuAbstractionSwComponentType or ComplexDeviceDriverSwComponentType.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=releasedTrigger.shortName, releasedTrigger.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime  xml.sequenceOffset=35</p>
requiredClientServerEntry	<a href="#">BswModuleClientServerEntry</a>	*	aggr	<p>Specifies that this module requires a client server entry which can be implemented on another partition or core. This entry is declared locally to this context and will be connected to the providedClientServerEntry of another or the same module via the configuration of the BSW Scheduler.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=requiredClientServerEntry.shortName, requiredClientServerEntry.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime  xml.sequenceOffset=50</p>
requiredData	<a href="#">VariableDataPrototype</a>	*	aggr	<p>Specifies a data prototype required by this module in order to be provided from another partition or core. The requiredData is declared locally to this context and will be connected to the providedData of another or the same module via the configuration of the BswScheduler.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=requiredData.shortName, requiredData.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime  xml.sequenceOffset=60</p>





Class	BswModuleDescription			
requiredModeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	*	aggr	Specifies that this module or cluster depends on a certain mode group. The requiredModeGroup is local to this context and will be connected to the providedModeGroup of another module or cluster via the configuration of the BswScheduler. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=requiredModeGroup.shortName, requiredModeGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=30
requiredTrigger	<a href="#">Trigger</a>	*	aggr	Specifies that this module or cluster reacts upon an external trigger. This requiredTrigger is declared locally to this context and will be connected to the providedTrigger of another module or cluster via the configuration of the BswScheduler. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=requiredTrigger.shortName, requiredTrigger.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=40

**Table A.123: BswModuleDescription**

Class	BswModuleEntity (abstract)			
Note	Specifies the smallest code fragment which can be described for a BSW module or cluster within AUTOSAR.			
Base	<a href="#">ARObject</a> , <a href="#">ExecutableEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">BswCalledEntity</a> , <a href="#">BswInterruptEntity</a> , <a href="#">BswSchedulableEntity</a>			
Aggregated by	<a href="#">BswInternalBehavior.entity</a>			
Attribute	Type	Mult.	Kind	Note
accessedModeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	*	ref	A mode group which is accessed via API call by this entity. It shall be a ModeDeclarationGroupPrototype required by this module or cluster. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=accessedModeGroup.modeDeclarationGroupPrototype, accessedModeGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
activationPoint	<a href="#">BswInternalTriggeringPoint</a>	*	ref	Activation point used by the module entity to activate one or more internal triggers. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=activationPoint.bswInternalTriggeringPoint, activationPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.





Class	BswModuleEntity (abstract)			
callPoint	BswModuleCallPoint	*	aggr	<p>A call point used in the code of this entity.</p> <p>The variability of this association is especially targeted at debug scenarios: It is possible to have one variant calling into the AUTOSAR debug module and another one which doesn't.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=callPoint.shortName, callPoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
dataReceivePoint	BswVariableAccess	*	aggr	<p>The data is received via the BSW Scheduler.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataReceivePoint.shortName, dataReceivePoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
dataSendPoint	BswVariableAccess	*	aggr	<p>The data is sent via the BSW Scheduler.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataSendPoint.shortName, dataSendPoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
implementedEntry	BswModuleEntry	0..1	ref	<p>The entry which is implemented by this module entity.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
issuedTrigger	Trigger	*	ref	<p>A trigger issued by this entity via BSW Scheduler API call. It shall be a BswTrigger released (i.e. owned) by this module or cluster.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=issuedTrigger.trigger, issuedTrigger.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
managedModeGroup	ModeDeclarationGroupPrototype	*	ref	<p>A mode group which is managed by this entity. It shall be a ModeDeclarationGroupPrototype provided by this module or cluster.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=managedModeGroup.modeDeclarationGroupPrototype, managedModeGroup.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
schedulerNamePrefix	BswSchedulerNamePrefix	0..1	ref	<p>A prefix to be used in generated names for the BswModuleScheduler in the context of this BswModuleEntity, for example entry point prototypes, macros for dealing with exclusive areas, header file names.</p> <p>Details are defined in the SWS RTE.</p> <p>The prefix supersedes default rules for the prefix of those names.</p>

**Table A.124: BswModuleEntity**

Class	BswModuleEntry
Note	<p>This class represents a single API entry (C-function prototype) into the BSW module or cluster.</p> <p>The name of the C-function is equal to the short name of this element with one exception: In case of multiple instances of a module on the same CPU, special rules for "infixes" apply, see description of class BswImplementation.</p> <p><b>Tags:</b> atp.recommendedPackage=BswModuleEntrys</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>







Class	BswModuleEntry			
Base	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> <a href="#">Referrable</a> , PackageableElement, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
argument (ordered)	<a href="#">SwServiceArg</a>	*	aggr	An argument belonging to this BswModuleEntry. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=argument.shortName, argument.variation Point.shortLabel vh.latestBindingTime=blueprintDerivationTime xml.sequenceOffset=45
bswEntryKind	BswEntryKindEnum	0..1	attr	This describes whether the entry is concrete or abstract. If the attribute is missing the entry is considered as concrete. <b>Tags:</b> xml.sequenceOffset=40
callType	<a href="#">BswCallType</a>	0..1	attr	The type of call associated with this service. <b>Tags:</b> xml.sequenceOffset=25
execution Context	<a href="#">BswExecutionContext</a>	0..1	attr	Specifies the execution context which is required (in case of entries into this module) or guaranteed (in case of entries called from this module) for this service. <b>Tags:</b> xml.sequenceOffset=30
function Prototype Emitter	NameToken	0..1	attr	This attribute is used to control the generation of function prototypes. If set to "RTE", the RTE generates the function prototypes in the Module Interlink Header File.
isReentrant	Boolean	0..1	attr	Reentrancy from the viewpoint of function callers: • true: Enables the service to be invoked again, before the service has finished. • false: It is prohibited to invoke the service again before is has finished. <b>Tags:</b> xml.sequenceOffset=15
isSynchronous	Boolean	0..1	attr	Synchronicity from the viewpoint of function callers: • true: This calls a synchronous service, i.e. the service is completed when the call returns. • false: The service (on semantical level) may not be complete when the call returns. <b>Tags:</b> xml.sequenceOffset=20
returnType	<a href="#">SwServiceArg</a>	0..1	aggr	The return type belonging to this bswModuleEntry. <b>Tags:</b> xml.sequenceOffset=40
role	<a href="#">Identifier</a>	0..1	attr	Specifies the role of the entry in the given context. It shall be equal to the standardized name of the service call, especially in cases where no ServiceIdentifier is specified, e.g. for callbacks. Note that the ShortName is not always sufficient because it maybe vendor specific (e.g. for callbacks which can have more than one instance). <b>Tags:</b> xml.sequenceOffset=10
serviceId	PositiveInteger	0..1	attr	Refers to the service identifier of the Standardized Interfaces of AUTOSAR basic software. For non-standardized interfaces, it can optionally be used for proprietary identification. <b>Tags:</b> xml.sequenceOffset=5
swServiceImpl Policy	SwServiceImplPolicy Enum	0..1	attr	Denotes the implementation policy as a standard function call, inline function or macro. This has to be specified on interface level because it determines the signature of the call. <b>Tags:</b> xml.sequenceOffset=35

**Table A.125: BswModuleEntry**

<b>Class</b>	<b>BswModuleTiming</b>			
<b>Note</b>	<p>A model element used to define timing descriptions and constraints for the BswInternalBehavior of one BSW Module. Thereby, for each BswInternalBehavior a separate timing can be specified.</p> <p>A constraint defined at this level holds true for all Implementations of that BswInternalBehavior.</p> <p>TimingDescriptions aggregated by BswModuleTiming are restricted to event chains referring to events which are derived from the class TDEventBswInternalBehavior.</p> <p><b>Tags:</b> atp.recommendedPackage=TimingExtensions</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TimingExtension</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
behavior	<a href="#">BswInternalBehavior</a>	0..1	ref	This defines the scope of a BswModuleTiming. All corresponding timing descriptions and constraints shall be defined within this scope.

**Table A.126: BswModuleTiming**

<b>Class</b>	<b>BswOperationInvokedEvent</b>			
<b>Note</b>	<p>This event is thrown on operation invocation in Client-Server-Communication via the BSW Scheduler. Its "entry" reference provides the BswClientServerEntry that is called subsequently.</p> <p>Note this event is not needed in case of direct function calls.</p>			
<b>Base</b>	ARObject, <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.event</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
entry	<a href="#">BswModuleClientServerEntry</a>	0..1	ref	The providedClientServerEntry invoked by this event.

**Table A.127: BswOperationInvokedEvent**

<b>Class</b>	<b>BswQueuedDataReceptionPolicy</b>			
<b>Note</b>	Reception policy attributes specific for queued receiving.			
<b>Base</b>	ARObject, <a href="#">BswApiOptions</a> , <a href="#">BswDataReceptionPolicy</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.receptionPolicy</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
queueLength	PositiveInteger	0..1	attr	Length of queue for received events.

**Table A.128: BswQueuedDataReceptionPolicy**

<b>Class</b>	<b>BswSchedulableEntity</b>			
<b>Note</b>	BSW module entity, which is designed for control by the BSW Scheduler. It may for example implement a so-called "main" function.			
<b>Base</b>	ARObject, <a href="#">BswModuleEntity</a> , <a href="#">ExecutableEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.entity</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.129: BswSchedulableEntity**

<b>Class</b>	<b>BswScheduleEvent</b> (abstract)			
<b>Note</b>	BswEvent that is able to start a BswScheduleEntity.			
<b>Base</b>	ARObject, <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">BswAsynchronousServerCallReturnsEvent</a> , <a href="#">BswBackgroundEvent</a> , <a href="#">BswDataReceivedEvent</a> , <a href="#">BswExternalTriggerOccurredEvent</a> , <a href="#">BswInternalTriggerOccurredEvent</a> , <a href="#">BswModeManagerErrorEvent</a> , <a href="#">BswModeSwitchEvent</a> , <a href="#">BswModeSwitchedAckEvent</a> , <a href="#">BswOsTaskExecutionEvent</a> , <a href="#">BswTimingEvent</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.event</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

Table A.130: BswScheduleEvent

<b>Class</b>	<b>BswServiceDependency</b>			
<b>Note</b>	Specialization of ServiceDependency in the context of an BswInternalBehavior. It allows to associate BswModuleEntries and data defined for a BSW module or cluster to a given ServiceNeeds element.			
<b>Base</b>	ARObject, <a href="#">ServiceDependency</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.serviceDependency</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
assignedData	<a href="#">RoleBasedDataAssignment</a>	*	aggr	Defines the role of an associated data object (owned by this module or cluster) in the context of the ServiceNeeds element. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=assignedData, assignedData.variation Point.shortLabel vh.latestBindingTime=preCompileTime
assignedEntryRole	<a href="#">RoleBasedBswModuleEntryAssignment</a>	*	aggr	Defines the role of an associated BswModuleEntry in the context of the ServiceNeeds element. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=assignedEntryRole, assignedEntryRole.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
ident	<a href="#">BswServiceDependencyIdent</a>	0..1	aggr	This adds the ability to become referrable to BswServiceDependency. <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> xml.sequenceOffset=-100
serviceNeeds	<a href="#">ServiceNeeds</a>	0..1	aggr	The associated ServiceNeeds.

Table A.131: BswServiceDependency

<b>Class</b>	<b>BswServiceDependencyIdent</b>			
<b>Note</b>	This meta-class is created to add the ability to become the target of a reference to the non-Referrable BswServiceDependency.			
<b>Base</b>	ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">IdentCaption</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">BswServiceDependency.ident</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

Table A.132: BswServiceDependencyIdent

<b>Class</b>	<b>BswSynchronousServerCallPoint</b>			
<b>Note</b>	Represents a synchronous procedure call point via the BSW Scheduler.			
<b>Base</b>	ARObject, <a href="#">BswModuleCallPoint</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswModuleEntity.callPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
calledEntry	<a href="#">BswModuleClientServerEntry</a>	0..1	ref	The entry to be called.
calledFrom WithinExclusive Area	ExclusiveAreaNesting Order	0..1	ref	This indicates that the call point is located at the deepest level inside one or more ExclusiveAreas that are nested in the given order.

**Table A.133: BswSynchronousServerCallPoint**

<b>Class</b>	<b>BswTimingEvent</b>			
<b>Note</b>	A recurring BswEvent driven by a time period.			
<b>Base</b>	ARObject, <a href="#">AbstractEvent</a> , <a href="#">BswEvent</a> , <a href="#">BswScheduleEvent</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.event</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
period	TimeValue	0..1	attr	Requirement for the time period (in seconds) by which this event is triggered.

**Table A.134: BswTimingEvent**

<b>Class</b>	<b>BswTriggerDirectImplementation</b>			
<b>Note</b>	Specifies a released trigger to be directly implemented via OS calls, for example in a Complex Driver module.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.triggerDirectImplementation</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
cat2lsr	<a href="#">Identifier</a>	0..1	attr	The name of the OS category 2 ISR, which is controlled by the referred trigger. This means, that the module manages the category 2 ISR (e.g. according hardware initialization and enabling of ISR). Instead of calling an RTE / SchM API to raise the appropriate events in components or modules receiving the trigger, this ISR directly schedules the triggered ExecutableEntities. The ISR name is required by the integrator to map the Bsw Events and RTEEvents to this ISR.
masteredTrigger	<a href="#">Trigger</a>	0..1	ref	The trigger which is directly mastered by this module. There may be several different BswTriggerDirect Implementations mastering the same Trigger. This may be required e.g. due to memory partitioning.
task	<a href="#">Identifier</a>	0..1	attr	The name of the OS task, which is controlled by the referred trigger. This means, that the module uses the trigger condition to directly activate an OS task instead of calling an API of the BswScheduler. The task name is required by the RTE generator resp. BswScheduler to raise the appropriate events in components or modules receiving the trigger.

**Table A.135: BswTriggerDirectImplementation**

<b>Class</b>	<b>BswVariableAccess</b>			
<b>Note</b>	The presence of a BswVariableAccess implies that a BswModuleEntity needs access to a VariableData Prototype via the BSW Scheduler. The kind of access is specified by the role in which the class is used.			
<b>Base</b>	ARObject, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswModuleEntity.dataReceivePoint</a> , <a href="#">BswModuleEntity.dataSendPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessed Variable	<a href="#">VariableDataPrototype</a>	0..1	ref	The data accessed via the BSW Scheduler.
context Limitation	<a href="#">BswDistinguishedPartition</a>	*	ref	The existence of this reference indicates that the variable is received resp. sent only in the context of the referred BswDistinguishedPartitions.

**Table A.136: BswVariableAccess**

<b>Class</b>	<b>BufferProperties</b>			
<b>Note</b>	Configuration of the buffer properties the transformer needs to work.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">TransformationTechnology.bufferProperties</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
headerLength	Integer	0..1	attr	Defines the length of the header (in bits) this transformer will add in front of the data.
inPlace	Boolean	0..1	attr	If set, the transformer uses the input buffer as output buffer.

**Table A.137: BufferProperties**

<b>Class</b>	<b>BulkNvDataDescriptor</b>			
<b>Note</b>	This meta-class represents one bulk NV Data Block that is read-only for the application software. The purpose of a bulk NV Data Block is to provide access to information uploaded to the vehicle at e.g. the end of the production line.			
<b>Base</b>	ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">NvBlockSwComponentType.bulkNvDataDescriptor</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bulkNvBlock	<a href="#">VariableDataPrototype</a>	0..1	aggr	This aggregation represents the actual bulk NVBlock.
nvBlockData Mapping	<a href="#">NvBlockDataMapping</a>	*	aggr	Defines the mapping between the VariableData Prototypes in the NvBlockComponents ports and the VariableDataPrototypes of the non-volatile memory. The aggregation of NvBlockDataMapping is subject to variability with the purpose to support the conditional existence of nv data ports. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=nvBlockDataMapping, nvBlockData Mapping.variationPoint.shortLabel vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.138: BulkNvDataDescriptor**

Class	BurstPatternEventTriggering			
Note	Describes the maximum number of occurrences of the same event in a given time interval. Typically used to model a worst case activation scenario.			
Base	ARObject, <a href="#">EventTriggeringConstraint</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
Aggregated by	TimingExtension.timingGuarantee, TimingExtension.timingRequirement			
Attribute	Type	Mult.	Kind	Note
maxNumberOfOccurrences	PositiveInteger	0..1	attr	The maximum number of event occurrences within the given time interval. The event may never occur, or may occur N times between 1 and <a href="#">maxNumberOfOccurrences</a> . If the parameter <a href="#">minNumberOfOccurrences</a> is specified then the event occurs at least the number of times specified by <a href="#">minNumberOfOccurrences</a> and at maximum by <a href="#">maxNumberOfOccurrences</a> .
minimumInterArrivalTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	Specifies the minimum distance between subsequent occurrences of the event within the given time interval.
minNumberOfOccurrences	PositiveInteger	0..1	attr	The minimum number of event occurrences within the given time interval. <b>Tags:</b> xml.sequenceOffset=10
patternJitter	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum deviation of the time interval's starting point from the beginning of the given period. This parameter is only applicable in conjunction with the parameter <a href="#">patternPeriod</a>
patternLength	<a href="#">MultidimensionalTime</a>	0..1	aggr	The duration of the time interval within which the event repeatedly occurs. The event occurs at arbitrary points in time within the given time interval.
patternPeriod	<a href="#">MultidimensionalTime</a>	0..1	aggr	The time distance between the beginnings of subsequent repetitions of the given burst pattern.

**Table A.139: BurstPatternEventTriggering**

Class	BusMirrorCanIdRangeMapping			
Note	This element defines a rule for remapping a set of CAN IDs.			
Base	ARObject			
Aggregated by	<a href="#">BusMirrorChannelMappingCan.canIdRangeMapping</a>			
Attribute	Type	Mult.	Kind	Note
destinationBaseId	PositiveInteger	0..1	attr	Base ID merged with the masked parts of the original CAN ID to form the mapped CAN ID.
sourceCanIdCode	PositiveInteger	0..1	attr	Value to match masked original CAN IDs.
sourceCanIdMask	PositiveInteger	0..1	attr	Mask applied to original CAN IDs before comparison.

**Table A.140: BusMirrorCanIdRangeMapping**

Class	BusMirrorCanIdToCanIdMapping			
Note	This element defines a rule for remapping a single CAN ID.			
Base	ARObject			
Aggregated by	<a href="#">BusMirrorChannelMappingCan.canIdToCanIdMapping</a>			
Attribute	Type	Mult.	Kind	Note
remappedCanId	PositiveInteger	0..1	attr	This attribute defines the CanId on the targetChannel.
sourceCanId	<a href="#">CanFrameTriggering</a>	0..1	ref	This reference points to the sourceFrame with sourceCanId on the sourceChannel.

**Table A.141: BusMirrorCanIdToCanIdMapping**

<b>Class</b>	<b>BusMirrorChannel</b>			
<b>Note</b>	This element assigns a busMirrorNetworkId to the referenced channel.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	BusMirrorChannelMapping.sourceChannel, BusMirrorChannelMapping.targetChannel			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
busMirrorNetworkId	PositiveInteger	0..1	attr	This attribute defines the networkId of the communication channel.
channel	PhysicalChannel	0..1	ref	Reference to PhysicalChannel that is used in the bus mirroring as sourceChannel or targetChannel. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=channel.physicalChannel, channel.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime

Table A.142: BusMirrorChannel

<b>Class</b>	<b>BusMirrorChannelMapping</b> (abstract)			
<b>Note</b>	This element defines a bus mirroring in which the traffic from one communication bus (sourceChannel) is forwarded to another one (targetChannel). This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Subclasses</b>	BusMirrorChannelMappingCan, BusMirrorChannelMappingFlexray, BusMirrorChannelMappingIp, BusMirrorChannelMappingUserDefined			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ecuInstance	EcuInstance	0..1	ref	Ecu on which the BusMirroring is performed <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=ecuInstance.ecuInstance, ecuInstance.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime
globalTimeDomain	GlobalTimeDomain	0..1	ref	Reference to the GlobalTimeDomain this BusMirrorChannelMapping shall be synchronized with. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=globalTimeDomain.globalTimeDomain, globalTimeDomain.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime
mirroringProtocol	MirroringProtocolEnum	0..1	attr	This attribute defines the bus mirroring protocol that is used in the BusMirrorChannelMapping
sourceChannel	BusMirrorChannel	0..1	aggr	Defines the sourceChannel from which frames are received. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=sourceChannel
targetChannel	BusMirrorChannel	0..1	aggr	Defines the targetChannel to which frames are forwarded. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=targetChannel





Class	<b>BusMirrorChannelMapping</b> (abstract)			
targetPduTriggering	<a href="#">PduTriggering</a>	*	ref	Reference to the PduTriggering that is used for transmission of the mirrored frames on the targetChannel. Please note that on FlexRay several targetPduTriggerings may be used. For all other communication channels only a single targetPduTriggering is supported. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=targetPduTriggering.pduTriggering, targetPduTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild
transmissionDeadline	TimeValue	0..1	attr	Time in seconds after which the collection of source frames into the destination frame is stopped and the frame is sent at the latest. If omitted, destination frames are only sent when full or when the time stamp overflows.

**Table A.143: BusMirrorChannelMapping**

Class	<b>BusMirrorChannelMappingCan</b>			
<b>Note</b>	This element defines the bus mirroring between a CAN or LIN sourceChannel and a CAN targetChannel. <b>Tags:</b> atp.recommendedPackage=BusMirrorChannelMappings This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">BusMirrorChannelMapping</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
canIdRangeMapping	<a href="#">BusMirrorCanIdRangeMapping</a>	*	aggr	Rules for remapping of a set of CAN IDs.
canIdToCanIdMapping	<a href="#">BusMirrorCanIdToCanIdMapping</a>	*	aggr	Rules for remapping of single CanIds.
linPidToCanIdMapping	<a href="#">BusMirrorLinPidToCanIdMapping</a>	*	aggr	Rules for remapping of single LIN Frames.
mirrorSourceLinToCanRangeBaseId	PositiveInteger	0..1	attr	Base ID merged with the LIN frame ID to form the CAN ID. Only required when a BusMirrorChannel that refers to a LinPhysicalChannel in the role channel is referenced in the role sourceChannel.
mirrorStatusCanId	PositiveInteger	0..1	attr	CAN ID of the CAN status frame. If configured, a status frame will be sent on the CAN destination bus that contains the state of all active source buses.

**Table A.144: BusMirrorChannelMappingCan**

Class	<b>BusMirrorChannelMappingFlexray</b>			
<b>Note</b>	This element defines the bus mirroring between a CAN, LIN or FlexRay sourceChannel and a FlexRay targetChannel. <b>Tags:</b> atp.recommendedPackage=BusMirrorChannelMappings This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">BusMirrorChannelMapping</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.145: BusMirrorChannelMappingFlexray**



<b>Class</b>	<b>BusMirrorChannelMappingIp</b>			
<b>Note</b>	This element defines the bus mirroring between a CAN, LIN or FlexRay sourceChannel and an Ethernet IP targetChannel. <b>Tags:</b> atp.recommendedPackage=BusMirrorChannelMappings This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">BusMirrorChannelMapping</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.146: BusMirrorChannelMappingIp**

<b>Class</b>	<b>BusMirrorChannelMappingUserDefined</b>			
<b>Note</b>	This element defines the bus mirroring between a CAN, LIN or FlexRay sourceChannel and a User Defined targetChannel. <b>Tags:</b> atp.recommendedPackage=BusMirrorChannelMappings This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">BusMirrorChannelMapping</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.147: BusMirrorChannelMappingUserDefined**

<b>Class</b>	<b>BusMirrorLinPidToCanIdMapping</b>			
<b>Note</b>	This element defines a rule for remapping a single LIN Frame. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">BusMirrorChannelMappingCan.linPidToCanIdMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
remappedCanId	PositiveInteger	0..1	attr	This attribute defines the CanId on the targetChannel.
sourceLinPid	<a href="#">LinFrameTriggering</a>	0..1	ref	This reference points to the sourceFrame with LIN identifier on the sourceChannel.

**Table A.148: BusMirrorLinPidToCanIdMapping**

<b>Class</b>	<b>BusspecificNmEcu</b> (abstract)			
<b>Note</b>	Busspecific NmEcu attributes. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	CanNmEcu, FlexrayNmEcu, J1939NmEcu, UdpNmEcu			
<b>Aggregated by</b>	<a href="#">NmEcu.busDependentNmEcu</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.149: BusspecificNmEcu**

Enumeration	ByteOrderEnum
<b>Note</b>	When more than one byte is stored in the memory the order of those bytes may differ depending on the architecture of the processing unit. If the least significant byte is stored at the lowest address, this architecture is called little endian and otherwise it is called big endian. ByteOrder is very important in case of communication between different PUs or ECUs.
<b>Aggregated by</b>	ApSomeipTransformationProps.byteOrder, <a href="#">BaseTypeDirectDefinition.byteOrder</a> , <a href="#">DiagnosticCommonProps.defaultEndianness</a> , <a href="#">ISignalToIPduMapping.packingByteOrder</a> , <a href="#">MultiplexedIPdu.selectorFieldByteOrder</a> , <a href="#">PduToFrameMapping.packingByteOrder</a> , <a href="#">SegmentPosition.segmentByteOrder</a> , <a href="#">SOMEIPTTransformationDescription.byteOrder</a> , <a href="#">System.containerIPduHeaderByteOrder</a>
Literal	Description
mostSignificantByteFirst	Most significant byte shall come at the lowest address (also known as BigEndian or as Motorola-Format) <b>Tags:</b> atp.EnumerationLiteralIndex=0
mostSignificantByteLast	Most significant byte shall come highest address (also known as LittleEndian or as Intel-Format) <b>Tags:</b> atp.EnumerationLiteralIndex=1
opaque	For opaque data endianness conversion has to be configured to Opaque. See AUTOSAR COM Specification for more details. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.150: ByteOrderEnum**

Class	CalibrationParameterValue			
Note	<p>Specifies instance specific calibration parameter values used to initialize the memory objects implementing calibration parameters in the generated RTE code.</p> <p>RTE generator will use the implInitValue to override the initial values specified for the DataPrototypes of a component type.</p> <p>The applInitValue is used to exchange init values with the component vendor not publishing the transformation algorithm between ApplicationDataTypes and ImplementationDataTypes or defining an instance specific initialization of components which are only defined with ApplicationDataTypes.</p> <p>Note: If both representations of init values are available these need to represent the same content.</p> <p>Note further that in this case an explicit mapping of ValueSpecification is not implemented because calibration parameters are delivered back after the calibration phase.</p>			
Base	ARObject			
Aggregated by	CalibrationParameterValueSet.calibrationParameterValue			
Attribute	Type	Mult.	Kind	Note
applInitValue	ValueSpecification	0..1	aggr	This is the initial value specification structured according to the ApplicationDataType
implInitValue	ValueSpecification	0..1	aggr	This is the initial value specification structured according to the ImplementationDataType
initialized Parameter	FlatInstanceDescriptor	0..1	ref	This represents the parameter that is initialized by the CalibrationParameterValue. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.151: CalibrationParameterValue**

Enumeration	CalprmAxisCategoryEnum
<b>Note</b>	This enum specifies the possible values of the category property within SwCalprmAxis.
<b>Aggregated by</b>	<a href="#">RuleBasedAxisCont.category</a> , <a href="#">SwAxisCont.category</a> , <a href="#">SwCalprmAxis.category</a>
Literal	Description
comAxis	COM_AXIS is equal to an STD_AXIS, the difference is, that a COM_AXIS is an shared axis, that means this axis can be used multiple times by different CURVES, MAPs, CUBOIDs, CUBE_4s, and CUBE_5s. <b>Tags:</b> atp.EnumerationLiteralIndex=0 xml.name=COM_AXIS





Enumeration	CalprmAxisCategoryEnum
fixAxis	FIX_AXIS means that the input axis is not stored. The axis is calculated using parameters and so on it is also not possible to modify the axis points. <b>Tags:</b> atp.EnumerationLiteralIndex=4 xml.name=FIX_AXIS
resAxis	RES_AXIS is also an shared axis like COM_AXIS, the difference is that this kind of axis can be used for rescaling. <b>Tags:</b> atp.EnumerationLiteralIndex=6 xml.name=RES_AXIS
stdAxis	STD_AXIS means that input and output axis definition are stored within this CURVE, MAP, CUBOID, CUBE_4, and CUBE_5. There is no shared or calculated axis. <b>Tags:</b> atp.EnumerationLiteralIndex=8 xml.name=STD_AXIS

**Table A.152: CalprmAxisCategoryEnum**

<b>Class</b>	«atpVariation» <b>CanCluster</b>			
<b>Note</b>	CAN bus specific cluster attributes. <b>Tags:</b> atp.recommendedPackage=CommunicationClusters			
<b>Base</b>	ARElement, ARObject, AbstractCanCluster, CollectableElement, <a href="#">CommunicationCluster</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.153: CanCluster**

<b>Class</b>	<b>CanCommunicationConnector</b>			
<b>Note</b>	CAN bus specific communication connector attributes.			
<b>Base</b>	ARObject, AbstractCanCommunicationConnector, <a href="#">CommunicationConnector</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcuInstance.connector</a> , MachineDesign.communicationConnector			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
pncWakeupCanId	PositiveInteger	0..1	attr	CAN Identifier used to configure the CAN Transceiver for partial network wakeup.
pncWakeupCanIdExtended	Boolean	0..1	attr	Defines whether pncWakeupCanId and pncWakeupCanIdMask shall be interpreted as extended or standard CAN ID.
pncWakeupCanIdMask	PositiveInteger	0..1	attr	Bit mask for CAN Identifier used to configure the CAN Transceiver for partial network wakeup.
pncWakeupDataMask	<a href="#">PositiveUnlimitedInteger</a>	0..1	attr	Bit mask for CAN Payload used to configure the CAN Transceiver for partial network wakeup.
pncWakeupDlc	PositiveInteger	0..1	attr	Data Length of the remote data frame used to configure the CAN Transceiver for partial network wakeup in Bytes.

**Table A.154: CanCommunicationConnector**

<b>Class</b>	«atpVariation» <b>CanCommunicationController</b>			
<b>Note</b>	CAN bus specific communication port attributes.			
<b>Base</b>	ARObject, AbstractCanCommunicationController, <a href="#">CommunicationController</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcuInstance.commController</a> , MachineDesign.communicationController			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.155: CanCommunicationController**

<b>Class</b>	<b>CanControllerConfiguration</b>			
<b>Note</b>	This element is used for the specification of the exact CAN Bit Timing configuration parameter values.			
<b>Base</b>	ARObject, <a href="#">AbstractCanCommunicationControllerAttributes</a>			
<b>Aggregated by</b>	<a href="#">AbstractCanCommunicationController.canControllerAttributes</a> , CanXIProps.canConfig			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
propSeg	Integer	0..1	attr	Specifies propagation delay in time quantas.
syncJumpWidth	Integer	0..1	attr	The number of quanta in the Synchronization Jump Width, SJW. The (Re-)Synchronization Jump Width (SJW) defines how far a resynchronization may move the Sample Point inside the limits defined by the Phase Buffer Segments to compensate for edge phase errors.
timeSeg1	Integer	0..1	attr	Specifies phase segment 1 in time quantas. timeSeg1 = Phase_Seg1
timeSeg2	Integer	0..1	attr	Specifies phase segment 2 in time quantas. timeSeg2 = Phase_Seg2

**Table A.156: CanControllerConfiguration**

<b>Class</b>	<b>CanControllerConfigurationRequirements</b>			
<b>Note</b>	This element allows the specification of ranges for the CAN Bit Timing configuration parameters. These ranges are taken as requirements and have to be respected by the ECU developer.			
<b>Base</b>	ARObject, <a href="#">AbstractCanCommunicationControllerAttributes</a>			
<b>Aggregated by</b>	<a href="#">AbstractCanCommunicationController.canControllerAttributes</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
maxNumberOfTimeQuantaPerBit	Integer	0..1	attr	Maximum number of time quanta in the bit time.
maxSamplePoint	Float	0..1	attr	The max. value of the sample point as a percentage of the total bit time.
maxSyncJumpWidth	Float	0..1	attr	The max. Synchronization Jump Width value as a percentage of the total bit time. The (Re-)Synchronization Jump Width (SJW) defines how far a resynchronization may move the Sample Point inside the limits defined by the Phase Buffer Segments to compensate for edge phase errors.
minNumberOfTimeQuantaPerBit	Integer	0..1	attr	Minimum number of time quanta in the bit time.
minSamplePoint	Float	0..1	attr	The min. value of the sample point as a percentage of the total bit time.





Class	CanControllerConfigurationRequirements			
minSyncJumpWidth	Float	0..1	attr	The min. Synchronization Jump Width value as a percentage of the total bit time. The (Re-)Synchronization Jump Width (SJW) defines how far a resynchronization may move the Sample Point inside the limits defined by the Phase Buffer Segments to compensate for edge phase errors.

**Table A.157: CanControllerConfigurationRequirements**

Class	CanControllerFdConfiguration			
Note	Bit timing related configuration of a CAN controller for payload and CRC of a CAN FD frame.			
Base	ARObject			
Aggregated by	<a href="#">AbstractCanCommunicationControllerAttributes.canControllerFdAttributes</a> , CanXIProps.canFdConfig			
Attribute	Type	Mult.	Kind	Note
paddingValue	PositiveInteger	0..1	attr	Specifies the value which is used to pad unused data in CAN FD frames which are bigger than 8 byte if the length of a Pdu which was requested to be sent does not match the allowed DLC values of CAN FD.
propSeg	PositiveInteger	0..1	attr	Specifies propagation delay in time quantas.
sspOffset	PositiveInteger	0..1	attr	Specifies the Transmitter Delay Compensation Offset in minimum time quanta. Transmitter Delay Compensation Offset is used to adjust the position of the Secondary Sample Point (SSP), relative to the beginning of the received bit. If this parameter is configured, the Transmitter Delay Compensation is done by measurement of the CAN controller. If not specified Transmitter Delay Compensation is disabled.
syncJumpWidth	PositiveInteger	0..1	attr	Specifies the synchronization jump width for the controller in time quantas.
timeSeg1	PositiveInteger	0..1	attr	Specifies phase segment 1 in time quantas.
timeSeg2	PositiveInteger	0..1	attr	Specifies phase segment 2 in time quantas.
txBitRateSwitch	Boolean	0..1	attr	Specifies if the bit rate switching shall be used for transmissions. TRUE: CAN FD frames shall be sent with bit rate switching. FALSE: CAN FD frames shall be sent without bit rate switching.

**Table A.158: CanControllerFdConfiguration**

Class	CanControllerFdConfigurationRequirements			
Note	This element allows the specification of ranges for the CanFD bit timing configuration parameters. These ranges are taken as requirements and shall be respected by the ECU developer.			
Base	ARObject			
Aggregated by	<a href="#">AbstractCanCommunicationControllerAttributes.canControllerFdRequirements</a>			
Attribute	Type	Mult.	Kind	Note
maxNumberOfTimeQuantaPerBit	Integer	0..1	attr	Maximum number of time quanta in the bit time.
maxSamplePoint	Float	0..1	attr	The max. value of the sample point as a percentage of the total bit time.





Class	CanControllerFdConfigurationRequirements			
maxSyncJumpWidth	Float	0..1	attr	The max. Synchronization Jump Width value as a percentage of the total bit time. The (Re-)Synchronization Jump Width (SJW) defines how far a resynchronization may move the Sample Point inside the limits defined by the Phase Buffer Segments to compensate for edge phase errors.
maxTrcvDelayCompensationOffset	TimeValue	0..1	attr	Specifies the maximum Transceiver Delay Compensation Offset in seconds. If not specified Transceiver Delay Compensation is disabled.
minNumberOfTimeQuantaPerBit	Integer	0..1	attr	Minimum number of time quanta in the bit time.
minSamplePoint	Float	0..1	attr	The min. value of the sample point as a percentage of the total bit time.
minSyncJumpWidth	Float	0..1	attr	The min. Synchronization Jump Width value as a percentage of the total bit time. The (Re-)Synchronization Jump Width (SJW) defines how far a resynchronization may move the Sample Point inside the limits defined by the Phase Buffer Segments to compensate for edge phase errors.
minTrcvDelayCompensationOffset	TimeValue	0..1	attr	Specifies the minimum Transceiver Delay Compensation Offset in seconds. If not specified Transceiver Delay Compensation is disabled.
paddingValue	PositiveInteger	0..1	attr	Specifies the value which is used to pad unused data in CAN FD frames which are bigger than 8 byte if the length of a Pdu which was requested to be sent does not match the allowed DLC values of CAN FD.
txBitRateSwitch	Boolean	0..1	attr	Specifies if the bit rate switching shall be used for transmissions. TRUE: CAN FD frames shall be sent with bit rate switching. FALSE: CAN FD frames shall be sent without bit rate switching.

**Table A.159: CanControllerFdConfigurationRequirements**

Class	CanControllerXIConfiguration			
Note	This meta-class represents the CAN XL-specific controller attributes.			
Base	ARObject			
Aggregated by	<a href="#">AbstractCanCommunicationControllerAttributes.canControllerXIAttributes</a> , CanXIProps.canXIConfig			
Attribute	Type	Mult.	Kind	Note
errorSignalingEnabled	Boolean	0..1	attr	Specifies if error signaling shall be enabled. This is not possible when the transceiver is switched to PWM mode (trcvPwmModeEnabled set to TRUE). TRUE: Error signaling shall be enabled. FALSE: Error signaling shall be disabled.
propSeg	PositiveInteger	0..1	attr	Specifies propagation delay in time quantas.
pwmL	PositiveInteger	0..1	attr	Specifies the PWM long phase length.
pwmO	PositiveInteger	0..1	attr	Specifies the PWM time offset.
pwmS	PositiveInteger	0..1	attr	Specifies the PWM short phase length.





Class	CanControllerXConfiguration			
sspOffset	PositiveInteger	0..1	attr	Specifies the Transmitter Delay Compensation Offset in minimum time quanta. Transmitter Delay Compensation Offset is used to adjust the position of the Secondary Sample Point (SSP), relative to the beginning of the received bit. If this parameter is configured, the Transmitter Delay Compensation is done by measurement of the CAN controller. If not specified Transmitter Delay Compensation is disabled.
syncJumpWidth	PositiveInteger	0..1	attr	Specifies the synchronization jump width for the controller in time quantas.
timeSeg1	PositiveInteger	0..1	attr	Specifies phase segment 1 in time quantas.
timeSeg2	PositiveInteger	0..1	attr	Specifies phase segment 2 in time quantas.
trcvPwmMode Enabled	Boolean	0..1	attr	Specifies if the transceiver shall be set to the PWM mode. TRUE: The transceiver shall be switched to PWM mode. FALSE: The transceiver shall work in classic CAN mode.

**Table A.160: CanControllerXConfiguration**

Class	CanControllerXConfigurationRequirements			
<b>Note</b>	This element allows the specification of ranges for the CAN XL configuration parameters. These ranges are taken as requirements and have to be respected by the ECU developer.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">AbstractCanCommunicationControllerAttributes.canControllerXRequirements</a> , CanXIProps.canXIConfig Reqs			
Attribute	Type	Mult.	Kind	Note
errorSignaling Enabled	Boolean	0..1	attr	Specifies if error signaling shall be enabled. This is not possible when the transceiver is switched to PWM mode (trcvPwmModeEnabled set to TRUE). TRUE: Error signaling shall be enabled. FALSE: Error signaling shall be disabled.
maxNumberOf TimeQuantaPer Bit	Integer	0..1	attr	Maximum number of time quanta in the bit time.
maxPwmL	PositiveInteger	0..1	attr	Specifies the maximum PWM long phase length.
maxPwmO	PositiveInteger	0..1	attr	Specifies the minimum PWM time offset.
maxPwmS	PositiveInteger	0..1	attr	Specifies the maximum PWM short phase length.
maxSample Point	Float	0..1	attr	The max. value of the sample point as a percentage of the total bit time.
maxSyncJump Width	Float	0..1	attr	The max. Synchronization Jump Width value as a percentage of the total bit time. The (Re-)Synchronization Jump Width (SJW) defines how far a resynchronization may move the Sample Point inside the limits defined by the Phase Buffer Segments to compensate for edge phase errors.
maxTrcvDelay Compensation Offset	TimeValue	0..1	attr	Specifies the maximum Transceiver Delay Compensation Offset in seconds. If not specified Transceiver Delay Compensation is disabled.
minNumberOf TimeQuantaPer Bit	Integer	0..1	attr	Minimum number of time quanta in the bit time.
minPwmL	PositiveInteger	0..1	attr	Specifies the minimum PWM long phase length.
minPwmO	PositiveInteger	0..1	attr	Specifies the maximum PWM time offset.
minPwmS	PositiveInteger	0..1	attr	Specifies the minimum PWM short phase length.





Class	CanControllerXConfigurationRequirements			
minSamplePoint	Float	0..1	attr	The min. value of the sample point as a percentage of the total bit time.
minSyncJumpWidth	Float	0..1	attr	The min. Synchronization Jump Width value as a percentage of the total bit time. The (Re-)Synchronization Jump Width (SJW) defines how far a resynchronization may move the Sample Point inside the limits defined by the Phase Buffer Segments to compensate for edge phase errors.
minTrcvDelayCompensationOffset	TimeValue	0..1	attr	Specifies the minimum Transceiver Delay Compensation Offset in seconds. If not specified Transceiver Delay Compensation is disabled.
trcvPwmModeEnabled	Boolean	0..1	attr	Specifies if the transceiver shall be set to the PWM mode. TRUE: The transceiver shall be switched to PWM mode. FALSE: The transceiver shall work in classic CAN mode.

**Table A.161: CanControllerXConfigurationRequirements**

Class	CanFrameTriggering			
Note	CAN specific attributes to the FrameTriggering			
Base	<a href="#">ARObject</a> , <a href="#">FrameTriggering</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">PhysicalChannel.frameTriggering</a>			
Attribute	Type	Mult.	Kind	Note
canAddressingMode	CanAddressingModeType	0..1	attr	The CAN protocol supports two types of frame formats. The standard frame format uses 11-bit identifiers and is defined in the CAN specification 2.0 A. Additionally the extended frame format allows 29-bit identifiers and is defined in the CAN specification 2.0 B.
canFrameRxBehavior	CanFrameRxBehaviorEnum	0..1	attr	Defines which CAN protocol shall be expected for frame reception.
canFrameTxBehavior	<a href="#">CanFrameTxBehaviorEnum</a>	0..1	attr	Defines which CAN protocol shall be used for frame transmission.
canXIframeTriggeringProps	<a href="#">CanXIframeTriggeringProps</a>	0..1	aggr	Definition of CAN XL specific attributes in case the frame is a CAN XL frame.
identifier	Integer	0..1	attr	This attribute is used to define the identifier this frame shall use on the CAN network.
j1939requestable	Boolean	0..1	attr	Frame can be triggered by the J1939 request message.
rxIdentifierRange	<a href="#">RxIdentifierRange</a>	0..1	aggr	Optional definition of a CanId range.
rxMask	PositiveInteger	0..1	attr	Identifier mask which denotes the relevant bits in the CAN Identifier. Together with the identifier, this parameter defines a CAN identifier range.
txMask	PositiveInteger	0..1	attr	Identifier mask which denotes static bits in the CAN identifier. The other bits can be set dynamically.

**Table A.162: CanFrameTriggering**

Enumeration	CanFrameTxBehaviorEnum
Note	Defines different CAN protocols for frame transmission behavior.
Aggregated by	<a href="#">CanFrameTriggering.canFrameTxBehavior</a> , <a href="#">IEEE1722TpAcFCanPart.canFrameTxBehavior</a>
Literal	Description







Enumeration	CanFrameTxBehaviorEnum
can20	This CAN frame shall be sent as CAN 2.0 only. <b>Tags:</b> atp.EnumerationLiteralIndex=0
canFd	This CAN frame shall be sent as CAN FD. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.163: CanFrameTxBehaviorEnum**

Class	CanNmCluster			
Note	Can specific NmCluster attributes			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">NmCluster</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">NmConfig.nmCluster</a>			
Attribute	Type	Mult.	Kind	Note
nmBusloadReductionActive	Boolean	0..1	attr	It determines if bus load reduction for the respective Can Nm channel is active or not.
nmCarWakeUpBitPosition	PositiveInteger	0..1	attr	Specifies the bit position of the CarWakeUp within the Nm Pdu.
nmCarWakeUpFilterNodeId	PositiveInteger	0..1	attr	Source node identifier for CarWakeUp filtering.
nmCbvPosition	Integer	0..1	attr	Defines the position of the control bit vector within the Nm Pdu (Byte position). If this attribute is not configured, the Control Bit Vector is not used.
nmImmediateNmCycleTime	TimeValue	0..1	attr	Defines the immediate NmPdu cycle time in seconds which is used for nmImmediateNmTransmissions NmPdu transmissions. This parameter is only valid if CanNmImmediateNmTransmissions is greater one.
nmImmediateNmTransmissions	PositiveInteger	0..1	attr	Defines the number of immediate NmPdus which shall be transmitted. If the value is zero no immediate NmPdus are transmitted. The cycle time of immediate NmPdus is defined by nmImmediateNmCycleTime.
nmMessageTimeoutTime	TimeValue	0..1	attr	Timeout of an NmPdu in seconds. It determines how long the NM shall wait with notification of transmission failure while communication errors occur on the bus.
nmMsgCycleTime	TimeValue	0..1	attr	Period of a NmPdu in seconds. It determines the periodic rate in the periodic transmission mode with bus load reduction and is the basis for transmit scheduling in the periodic transmission mode without bus load reduction.
nmNetworkTimeout	TimeValue	0..1	attr	Network Timeout for NmPdus in seconds It denotes the time how long the CanNm shall stay in the Network Mode before transition into Prepare Bus-Sleep Mode shall take place.
nmNidPosition	Integer	0..1	attr	Defines the byte position of the source node identifier within the NmPdu. If this attribute is not configured, the Node Identification is not used.
nmPnHandleMultipleNetworkRequests	Boolean	0..1	attr	Defines if Nm performs an additional transition from Network Mode to Repeat Message State (true) or not (false).
nmRemoteSleepIndicationTime	TimeValue	0..1	attr	Timeout for Remote Sleep Indication in seconds. It defines the time how long it shall take to recognize that all other nodes are ready to sleep.
nmRepeatMessageTime	TimeValue	0..1	attr	Timeout for Repeat Message State in seconds. Defines the time how long the NM shall stay in the Repeat Message State.





Class	CanNmCluster			
nmWaitBusSleepTime	TimeValue	0..1	attr	Timeout for bus calm down phase in seconds. It denotes the time how long the CanNm shall stay in the Prepare Bus-Sleep Mode before transition into Bus-Sleep Mode shall take place.

Table A.164: CanNmCluster

Class	CanNmClusterCoupling			
Note	CAN attributes that are valid for each of the referenced (coupled) CAN clusters. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, NmClusterCoupling			
Aggregated by	NmConfig.nmClusterCoupling			
Attribute	Type	Mult.	Kind	Note
coupledCluster	CanNmCluster	*	ref	Reference to coupled CAN Clusters.
nmBusloadReductionEnabled	Boolean	0..1	attr	Enables busload reduction support
nmImmediateRestartEnabled	Boolean	0..1	attr	Enables the asynchronous transmission of a CanNm PDU upon bus-communication request in Prepare-Bus-Sleep mode.

Table A.165: CanNmClusterCoupling

Class	CanNmNode			
Note	CAN specific NM Node attributes.			
Base	ARObject, Identifiable, MultilanguageReferrable, NmNode, Referrable			
Aggregated by	NmCluster.nmNode			
Attribute	Type	Mult.	Kind	Note
allNmMessagesKeepAwake	Boolean	0..1	attr	Specifies if Nm drops irrelevant NM PDUs. false: Only NM PDUs with a Partial Network Information Bit (PNI) = true and containing a Partial Network request for this ECU trigger the standard RX indication handling and thus keep the ECU awake true: Every NM PDU triggers the standard RX indication handling and keeps the ECU awake
nmCarWakeUpFilterEnabled	Boolean	0..1	attr	If this attribute is set to true the CareWakeUp filtering is supported.
nmCarWakeUpRxEnabled	Boolean	0..1	attr	If set to true this attribute enables the support of CarWake Up bit evaluation in received NmPdus.
nmMsgCycleOffset	TimeValue	0..1	attr	Node specific time offset in the periodic transmission node. It determines the start delay of the transmission. Specified in seconds.
nmMsgReducedTime	TimeValue	0..1	attr	Node specific bus cycle time in the periodic transmission mode with bus load reduction. Specified in seconds.

Table A.166: CanNmNode

Class	CanPhysicalChannel			
Note	CAN bus specific physical channel attributes.			
Base	ARObject, AbstractCanPhysicalChannel, Identifiable, MultilanguageReferrable, PhysicalChannel, Referrable			





<b>Class</b>	<b>CanPhysicalChannel</b>			
<b>Aggregated by</b>	<a href="#">CommunicationCluster.physicalChannel</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.167: CanPhysicalChannel**

<b>Class</b>	<b>CanTpAddress</b>			
<b>Note</b>	An ECUs TP address on the referenced channel. This represents the diagnostic Address. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CanTpConfig.tpAddress</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
tpAddress	Integer	0..1	attr	An ECUs TP address on the referenced channel. This represents the diagnostic Address.
tpAddress ExtensionValue	Integer	0..1	attr	If the mixed addressing format is used, this parameter contains the transport protocol address extension value.

**Table A.168: CanTpAddress**

<b>Class</b>	<b>CanTpChannel</b>			
<b>Note</b>	Configuration parameters of the CanTp channel. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CanTpConfig.tpChannel</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
channelId	PositiveInteger	0..1	attr	The id of the channel. The value shall be unique for each channel.

**Table A.169: CanTpChannel**

<b>Class</b>	<b>CanTpConfig</b>			
<b>Note</b>	This element defines exactly one CAN TP Configuration. One CanTpConfig element shall be created for each CAN Network in the System. <b>Tags:</b> atp.recommendedPackage=TpConfigs This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>CollectableElement</i> , <i>FibexElement</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <i>PackageableElement</i> , <a href="#">Referrable</a> , <a href="#">TpConfig</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
tpAddress	<a href="#">CanTpAddress</a>	*	aggr	Collection of TP Addresses. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpAddress.shortName, tpAddress.variation Point.shortLabel vh.latestBindingTime=postBuild





Class	CanTpConfig			
tpChannel	<a href="#">CanTpChannel</a>	*	aggr	Configuration of CAN TP channels. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpChannel.shortName, tpChannel.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpConnection	<a href="#">CanTpConnection</a>	*	aggr	Senders and receivers of CAN TP messages. atpVariation: Derived, because TpNode can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpConnection, tpConnection.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpEcu	<a href="#">CanTpEcu</a>	*	aggr	Collection of TP Ecus atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpEcu, tpEcu.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpNode	<a href="#">CanTpNode</a>	*	aggr	Senders and receivers of Can TP messages. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpNode.shortName, tpNode.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.170: CanTpConfig**

Class	CanTpConnection			
<b>Note</b>	A connection identifies the sender and the receiver of this particular communication. The CanTp module routes a Pdu through this connection. atpVariation: Derived, because TpNode can vary. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <a href="#">TpConnection</a>			
<b>Aggregated by</b>	<a href="#">CanTpConfig.tpConnection</a>			
Attribute	Type	Mult.	Kind	Note
addressingFormat	CanTpAddressingFormatType	0..1	attr	Declares which communication addressing mode is supported.
cancellation	Boolean	0..1	attr	With this switch Tx Cancellation can be turned on or off. Please note that the Rx Cancellation is always enabled.
canTpChannel	<a href="#">CanTpChannel</a>	0..1	ref	Reference to the CanTpChannel on which this CanTp Connection is realized.
dataPdu	<a href="#">NPdu</a>	0..1	ref	Reference to an Data NPdu.
flowControlPdu	<a href="#">NPdu</a>	0..1	ref	Reference to the Flow Control NPdu.
maxBlockSize	Integer	0..1	attr	The maximum number of N-PDUs the CanTp receiver allows the sender to send, before waiting for an authorization to continue transmission of the following N-PDUs. For further details on this parameter value see ISO 15765-2 specification. Note: For reasons of buffer length, the CAN Transport Layer can adapt the BS value within the limit of this maximum BS
multicast	<a href="#">CanTpAddress</a>	0..1	ref	TP address for 1:n connections.





Class	CanTpConnection			
padding Activation	Boolean	0..1	attr	This specifies whether or not Sfs, FCs and the last CF shall be padded to 8 bytes length in case it contains less payload. true: The N-PDU received uses padding for SF, FC and the last CF. (N-PDU length is always 8 bytes) false: The N-PDU received does not use padding for SF, CF and the last CF. (N-PDU length is dynamic)
receiver	<a href="#">CanTpNode</a>	*	ref	The target of the TP connection.
taType	NetworkTargetAddress Type	0..1	attr	Network Target Address type.
timeoutBr	TimeValue	0..1	attr	Value in seconds of the performance requirement for (N_Br + N_Ar). N_Br is the elapsed time between the receiving indication of a FF or CF or the transmit confirmation of a FC, until the transmit request of the next FC.
timeoutBs	TimeValue	0..1	attr	This parameter defines the timeout for waiting for an FC or AF on the sender side in an 1:1 connection. Specified in seconds.
timeoutCr	TimeValue	0..1	attr	This parameter defines the timeout value for waiting for a CF or FF-x (in case of retry) after receiving the last CF or after sending an FC or AF on the receiver side. Specified in seconds.
timeoutCs	TimeValue	0..1	attr	The attribute timeoutCs represents the time (in seconds) which elapses between the transmit request of a CF N-PDU until the transmit request of the next CF N-PDU.
tpSdu	<a href="#">IPdu</a>	0..1	ref	Reference to an IPdu that is segmented by the Transport Protocol.
transmitter	<a href="#">CanTpNode</a>	0..1	ref	The source of the TP connection.

**Table A.171: CanTpConnection**

Class	CanTpEcu			
<b>Note</b>	ECU specific TP configuration parameters. Each TpEcu element has a reference to exactly one ECUInstance in the topology. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">CanTpConfig.tpEcu</a>			
Attribute	Type	Mult.	Kind	Note
cycleTimeMain Function	TimeValue	0..1	attr	The period between successive calls to the Main Function of the AUTOSAR TP. Specified in seconds.
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	Connection to the ECUInstance in the Topology

**Table A.172: CanTpEcu**

Class	CanTpNode			
<b>Note</b>	TP Node (Sender or Receiver) provides the TP Address and the connection to the Topology description. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<a href="#">CanTpConfig.tpNode</a>			
Attribute	Type	Mult.	Kind	Note





Class	CanTpNode			
connector	<a href="#">CommunicationConnector</a>	0..1	ref	Association to a CommunicationConnector in the topology description. In a System Description this reference is mandatory. In an ECU Extract this reference is optional (references to ECUs that are not part of the ECU Extract shall be avoided).
maxFcWait	Integer	0..1	attr	This attribute defines the maximum number of flow control PDUs that can be consecutively be transmitted by a receiver.
stMin	TimeValue	0..1	attr	Sets the duration of the minimum time the CanTp sender shall wait between the transmissions of two CF N-PDUs.
timeoutAr	TimeValue	0..1	attr	This attribute states the timeout between the PDU transmit request of the Transport Layer to the Can Interface and the corresponding confirmation of the Can Interface on the receiver side (for FC or AF). Specified in seconds.
timeoutAs	TimeValue	0..1	attr	This attribute states the timeout between the PDU transmit request for the first PDU of the group used in the current connection of the Transport Layer to the Can Interface and the corresponding confirmation of the Can Interface (when having sent the last PDU of the group used in this connection) on the sender side (SF-x, FF-x, CF or FC (in case of Transmit Cancellation)). Specified in seconds.
tpAddress	<a href="#">CanTpAddress</a>	0..1	ref	Reference to the TP Address that is used by the TpNode. This reference is optional in case that the multicast TP Address is used (reference from TpConnection).

**Table A.173: CanTpNode**

Class	CanXIframeTriggeringProps			
Note	This element indicates the frame being CAN XL and contains further CAN XL specific attributes.			
Base	ARObject			
Aggregated by	<a href="#">CanFrameTriggering.canXIframeTriggeringProps</a>			
Attribute	Type	Mult.	Kind	Note
acceptanceField	PositiveInteger	0..1	attr	Acceptance field of a CAN XL message.
priorityId	PositiveInteger	0..1	attr	Priority ID of a CAN XL message.
sduType	PositiveInteger	0..1	attr	SDU type of a CAN XL message.
vcid	PositiveInteger	0..1	attr	Virtual CAN network ID of a CAN XL message.

**Table A.174: CanXIframeTriggeringProps**

Class	Caption			
Note	This meta-class represents the ability to express a caption which is a title, and a shortName.			
Base	ARObject, <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	MIFigure.figureCaption, MIFormula.formulaCaption, Table.tableCaption			
Attribute	Type	Mult.	Kind	Note
desc	MultiLanguageOverviewParagraph	0..1	aggr	This represents a general but brief (one paragraph) description what the object in question is about. It is only one paragraph! This property helps a human reader to identify the object in question. <b>Tags:</b> xml.sequenceOffset=10

**Table A.175: Caption**

Class	Chapter			
Note	This meta-class represents a chapter of a document. Chapters are the primary structuring element in documentation.			
Base	ARObject, DocumentViewSelectable, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Paginateable</a> , <a href="#">Referrable</a>			
Aggregated by	ChapterOrMsrQuery.chapter, MsrQueryResultChapter.chapter, SwComponentDocumentation.chapter, SwComponentDocumentation.swCalibrationNotes, SwComponentDocumentation.swCarbDoc, SwComponentDocumentation.swDiagnosticsNotes, SwComponentDocumentation.swFeatureDef, SwComponentDocumentation.swFeatureDesc, SwComponentDocumentation.swMaintenanceNotes, SwComponentDocumentation.swTestDesc, <a href="#">System.systemDocumentation</a>			
Attribute	Type	Mult.	Kind	Note
chapterModel	ChapterModel	1	aggr	This represents the overall contents of the chapter. <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.typeElement=false xml.typeWrapperElement=false
helpEntry	String	0..1	attr	This specifies an entry point in an online help system to be linked with the parent class. The syntax shall be defined by the applied help system respectively help system generator. Maybe it is a concatenated Identifier, but as of now we leave it as an arbitrary string. <b>Tags:</b> xml.attribute=true

Table A.176: Chapter

Class	ClientComSpec			
Note	Client-specific communication attributes ( <a href="#">RPortPrototype</a> typed by <a href="#">ClientServerInterface</a> )			
Base	ARObject, <a href="#">RPortComSpec</a>			
Aggregated by	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
Attribute	Type	Mult.	Kind	Note
endToEndCallResponseTimeout	TimeValue	0..1	attr	This attribute defines the maximum time interval in which the application shall expect the servers's response (time between the sending of the call invocation until the arrival of the server's response).
operation	<a href="#">ClientServerOperation</a>	0..1	ref	This represents the corresponding ClientServerOperation. <b>Stereotypes:</b> atpIdentityContributor
transformationComSpecProps	TransformationComSpecProps	*	aggr	This references the TransformationComSpecProps which define port-specific configuration for data transformation. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=transformationComSpecProps

Table A.177: ClientComSpec

Class	ClientIdDefinition			
Note	Several clients in one client-ECU can communicate via inter-ECU client-server communication with a server on a different ECU, if a client identifier is used to distinguish the different clients. The Client Identifier of the transaction handle that is used by the RTE can be defined by this element.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	ClientIdDefinitionSet.clientIdDefinition			
Attribute	Type	Mult.	Kind	Note
clientId	<a href="#">Numerical</a>	0..1	attr	The Client Identifier of the transaction handle used for an inter-ECU client server communication is defined by this attribute. If defined the RTE generator shall use this client Id.





Class	ClientIdDefinition			
clientServerOperation	<a href="#">ClientServerOperation</a>	0..1	iref	Reference to the ClientServerOperation that is called by the client. <b>InstanceRef implemented by:</b> <a href="#">OperationInSystemInstanceRef</a>

**Table A.178: ClientIdDefinition**

Class	ClientIdRange			
<b>Note</b>	With this element it is possible to restrict the Client Identifier of the transaction handle that is generated by the client RTE for inter-Ecu Client/Server communication to an allowed range of numerical values.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">EcuInstance.clientIdRange</a>			
Attribute	Type	Mult.	Kind	Note
lowerLimit	<a href="#">Limit</a>	0..1	attr	This specifies the lower limit of the ClientIdRange. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
upperLimit	<a href="#">Limit</a>	0..1	attr	This specifies the upper limit of the ClientIdRange. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.179: ClientIdRange**

Class	ClientServerAnnotation			
<b>Note</b>	Annotation to a port regarding a certain Operation.			
<b>Base</b>	<i>ARObject</i> , <i>GeneralAnnotation</i>			
<b>Aggregated by</b>	<a href="#">PortPrototype.clientServerAnnotation</a>			
Attribute	Type	Mult.	Kind	Note
operation	<a href="#">ClientServerOperation</a>	0..1	ref	This represents the ClientServerOperation that the Client ServerAnnotation corresponds to.

**Table A.180: ClientServerAnnotation**

Class	ClientServerApplicationErrorMapping			
<b>Note</b>	This meta-class represents the ability to map <a href="#">ApplicationErrors</a> onto each other.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">ClientServerInterfaceMapping.errorMapping</a>			
Attribute	Type	Mult.	Kind	Note
firstApplicationError	<a href="#">ApplicationError</a>	0..1	ref	This represents the first ApplicationError in the context of the ClientServerApplicationErrorMapping.
secondApplicationError	<a href="#">ApplicationError</a>	0..1	ref	This represents the second ApplicationError in the context of the ClientServerApplicationErrorMapping.

**Table A.181: ClientServerApplicationErrorMapping**



<b>Class</b>	<b>ClientServerInterface</b>			
<b>Note</b>	A client/server interface declares a number of operations that can be invoked on a server by a client. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">PortInterface</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operation	<a href="#">ClientServerOperation</a>	*	aggr	ClientServerOperation(s) of this ClientServerInterface. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=operation.shortName, operation.variation Point.shortLabel vh.latestBindingTime=blueprintDerivationTime This Attribute is only used by the AUTOSAR Classic Platform.
possibleError	<a href="#">ApplicationError</a>	*	aggr	Application errors that are defined as part of this interface.

**Table A.182: ClientServerInterface**

<b>Class</b>	<b>ClientServerInterfaceMapping</b>			
<b>Note</b>	Defines the mapping of <a href="#">ClientServerOperations</a> in context of two different <a href="#">ClientServerInterfaces</a> .			
<b>Base</b>	ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PortInterfaceMapping</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	PortInterfaceMappingSet.portInterfaceMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
errorMapping	<a href="#">ClientServerApplicationErrorMapping</a>	*	aggr	Map two different ApplicationErrors defined in the context of two different ClientServerInterfaces.
operation Mapping	<a href="#">ClientServerOperationMapping</a>	*	aggr	Mapping of two ClientServerOperations in two different ClientServerInterfaces <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=operationMapping

**Table A.183: ClientServerInterfaceMapping**

<b>Class</b>	<b>ClientServerInterfaceToBswModuleEntryBlueprintMapping</b>			
<b>Note</b>	This represents a mapping between one ClientServerInterface blueprint and BswModuleEntry blueprint in order to express the intended implementation of ClientServerOperations by specific BswModuleEntries under consideration of PortDefinedArguments. Such a mapping enables the formal check whether the number of arguments and the data types of arguments of the operation + additional PortDefined Arguments matches the signature of the BswModuleEntry. <b>Tags:</b> atp.recommendedPackage=BlueprintMappingSets This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
clientServer Interface	<a href="#">ClientServerInterface</a>	1	ref	The referenced ClientServerInterface represents the client server interface the mapping is dedicated to.





Class	ClientServerInterfaceToBswModuleEntryBlueprintMapping			
operation Mapping	<a href="#">ClientServerOperationBlueprintMapping</a>	1..*	aggr	This specifies the operations used in the mapping between the ClientServerInterface and the BswModuleEntry. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=operationMapping, operationMapping.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
portDefined Argument Blueprint (ordered)	PortDefinedArgumentBlueprint	*	aggr	This specifies the PortDefinedArguments used in the mapping between the ClientServerInterface and the BswModuleEntry. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=portDefinedArgumentBlueprint, portDefinedArgumentBlueprint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.184: ClientServerInterfaceToBswModuleEntryBlueprintMapping**

Class	ClientServerOperation			
Note	An operation declared within the scope of a client/server interface.			
Base	<a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	ApplicationInterface.command, <a href="#">AtpClassifier.atpFeature</a> , <a href="#">ClientServerInterface.operation</a> , DiagnosticDataElementInterface.read, DiagnosticDataIdentifierInterface.read, DiagnosticDataIdentifierInterface.write, DiagnosticExtendedDataRecordInterface.provide, DiagnosticRoutineInterface.requestResult, DiagnosticRoutineInterface.start, DiagnosticRoutineInterface.stop, PhmRecoveryActionInterface.recovery, ServiceInterface.method			
Attribute	Type	Mult.	Kind	Note
argument (ordered)	<a href="#">ArgumentDataPrototype</a>	*	aggr	An argument of this <a href="#">ClientServerOperation</a> . <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=argument.shortName, argument.variationPoint.shortLabel vh.latestBindingTime=blueprintDerivationTime
diagArgIntegrity	Boolean	0..1	attr	This attribute shall only be used in the implementation of diagnostic routines to support the case where input and output arguments are allocated in a shared buffer and might unintentionally overwrite input arguments by tentative write operations to output arguments. This situation can happen during sliced execution or while output parameters are arrays (call by reference). The value true means that the <a href="#">ClientServerOperation</a> is aware of the usage of a shared buffer and takes precautions to avoid unintentional overwrite of input arguments. If the attribute does not exist or is set to false the <a href="#">ClientServerOperation</a> does not have to consider the usage of a shared buffer. This Attribute is only used by the AUTOSAR Classic Platform.
possibleError	<a href="#">ApplicationError</a>	*	ref	Possible errors that may be raised by the referring operation. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.185: ClientServerOperation**

<b>Class</b>	<b>ClientServerOperationBlueprintMapping</b>			
<b>Note</b>	This class describes a specific mapping between a ClientServerOperation in a ClientServerInterface blueprint and a BswModuleEntry blueprint.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	ClientServerInterfaceToBswModuleEntryBlueprintMapping.operationMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
blueprint MappingGuide	DocumentationBlock	0..1	aggr	This attribute offers the possibility to provide additional information with respect to the mapping.
bswModule Entry	BswModuleEntry	1	ref	The referenced BswModuleEntry represents the Bsw ModuleEntry the mapping is dedicated to. This Attribute is only used by the AUTOSAR Classic Platform.
clientServer Operation	ClientServerOperation	1	ref	The referenced ClientServerOperation represents the client server operation the mapping is dedicated to.

**Table A.186: ClientServerOperationBlueprintMapping**

<b>Class</b>	<b>ClientServerOperationMapping</b>			
<b>Note</b>	Defines the mapping of two particular ClientServerOperations in context of two different ClientServerInterfaces.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	ClientServerInterfaceMapping.operationMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
argument Mapping	DataPrototypeMapping	*	aggr	Defines the mapping of two particular ArgumentData Prototypes with unequal names or unequal semantic (resolution or range) in context of Operations. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=argumentMapping
firstOperation	ClientServerOperation	0..1	ref	First to-be-mapped ClientServerOperation of a Client ServerInterface.
firstToSecond Data Transformation	DataTransformation	0..1	ref	This reference indicates that a DataTransformation is intended in the context of the ClientServerOperation Mapping.
second Operation	ClientServerOperation	0..1	ref	Second to-be-mapped ClientServerOperation of a Client ServerInterface.

**Table A.187: ClientServerOperationMapping**

<b>Class</b>	<b>ClientServerToSignalMapping</b>			
<b>Note</b>	This element maps the ClientServerOperation to call- and return-SystemSignals.			
<b>Base</b>	ARObject, DataMapping			
<b>Aggregated by</b>	SystemMapping.dataMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
callSignal	SystemSignal	0..1	ref	Reference to the callSignal to which the IN and INOUT ArgumentDataPrototypes are mapped.
clientServer Operation	ClientServerOperation	0..1	iref	Reference to a ClientServerOperation, which is mapped to a call SystemSignal and a return SystemSignal. <b>InstanceRef implemented by:</b> OperationInSystem InstanceRef
returnSignal	SystemSignal	0..1	ref	Reference to the returnSignal to which the OUT and INOUT ArgumentDataPrototypes are mapped.

**Table A.188: ClientServerToSignalMapping**

Class	Code			
Note	A generic code descriptor. The type of the code (source or object) is defined via the category attribute of the associated engineering object.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">Implementation.codeDescriptor</a>			
Attribute	Type	Mult.	Kind	Note
artifactDescriptor	AutosarEngineeringObject	*	aggr	Refers to the artifact belonging to this code descriptor.
callbackHeader	<a href="#">ServiceNeeds</a>	*	ref	The association callbackHeader describes in which header files the function declarations of callback functions are provided to a service module. With this information the service module can include the appropriate header files in its configuration files.

Table A.189: Code

Class	Collection			
Note	<p>This meta-class specifies a collection of elements. A collection can be utilized to express additional aspects for a set of elements.</p> <p>Note that Collection is an ARElement. Therefore it is applicable e.g. for EvaluatedVariant, even if this is not obvious.</p> <p>Usually the category of a Collection is "SET". On the other hand, a Collection can also express an arbitrary relationship between elements. This is denoted by the category "RELATION" (see also [TPS_GST_00347]).</p> <p>In this case the collection represents an association from "sourceElement" to "targetElement" in the role "role".</p> <p><b>Tags:</b> atp.recommendedPackage=Collections</p>			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
autoCollect	AutoCollectEnum	0..1	attr	<p>This attribute reflects how far the referenced objects are part of the collection.</p> <p><b>Tags:</b> xml.sequenceOffset=20</p>
collectedInstance	<a href="#">AtpFeature</a>	*	iref	<p>This instance ref supports the use case that a particular instance is part of the collection.</p> <p><b>Tags:</b> xml.sequenceOffset=60</p> <p><b>InstanceRef implemented by:</b> <a href="#">AnyInstanceRef</a></p>
collectionSemantics	NameToken	0..1	attr	<p>Provides the ability to express the semantics of a Collection depending on the intended use case. The collectionSemantics is specified as a NameToken which must be agreed by all stakeholders.</p> <p><b>Tags:</b> xml.sequenceOffset=25</p>
element	<a href="#">Identifiable</a>	*	ref	<p>This is an element in the collection. Note that Collection itself is collectable. Therefore collections can be nested.</p> <p>In case of category="RELATION" this represents the target end of the relation.</p> <p><b>Tags:</b> xml.sequenceOffset=40</p>
elementRole	<a href="#">Identifier</a>	0..1	attr	<p>This attribute allows to denote a particular role of the collection. Note that the applicable semantics shall be mutually agreed between the two parties.</p> <p>In particular it denotes the role of element in the context of sourceElement.</p> <p><b>Tags:</b> xml.sequenceOffset=30</p>
sourceElement	<a href="#">Identifiable</a>	*	ref	<p>Only if Category = "RELATION". This represents the source of a relation.</p> <p><b>Tags:</b> xml.sequenceOffset=50</p>





Class	Collection			
sourceInstance	<a href="#">AtpFeature</a>	*	iref	Only if Category = "RELATION". This represents the source instance of a relation. <b>Tags:</b> xml.sequenceOffset=70 <b>InstanceRef implemented by:</b> <a href="#">AnyInstanceRef</a>

Table A.190: Collection

Class	<b>CommConnectorPort</b> (abstract)			
<b>Note</b>	The Ecu communication relationship defines which signals, Pdus and frames are actually received and transmitted by this ECU. For each signal, Pdu or Frame that is transmitted or received and used by the Ecu an association between an ISignalPort, IPduPort or FramePort with the corresponding Triggering shall be created. An ISignalPort shall be created only if the corresponding signal is handled by COM (RTE or Signal Gateway). If a Pdu Gateway ECU only routes the Pdu without being interested in the content only a FramePort and an IPduPort needs to be created.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">FramePort</a> , <a href="#">IPduPort</a> , <a href="#">ISignalPort</a>			
<b>Aggregated by</b>	<a href="#">CommunicationConnector.ecuCommPortInstance</a>			
Attribute	Type	Mult.	Kind	Note
communication Direction	<a href="#">CommunicationDirectionType</a>	0..1	attr	Communication Direction of the Connector Port (input or output Port).

Table A.191: CommConnectorPort

Class	<b>CommunicationBufferLocking</b>			
<b>Note</b>	The aggregation of this meta-class specifies that a RunnableEntity supports locked communication buffers supplied by the RTE. It is able to cope with the error RTE_E_COM_BUSY.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">SwcSupportedFeature</a>			
<b>Aggregated by</b>	<a href="#">PortAPIOption.supportedFeature</a>			
Attribute	Type	Mult.	Kind	Note
supportBuffer Locking	<a href="#">SupportBufferLockingEnum</a>	0..1	attr	This attribute is used to indicate the intended buffer locking behavior.

Table A.192: CommunicationBufferLocking

Class	«atpVariation» <b>CommunicationCluster</b> (abstract)			
<b>Note</b>	The CommunicationCluster is the main element to describe the topological connection of communicating ECUs. A cluster describes the ensemble of ECUs, which are linked by a communication medium of arbitrary topology (bus, star, ring, ...). The nodes within the cluster share the same communication protocol, which may be event-triggered, time-triggered or a combination of both. A CommunicationCluster aggregates one or more physical channels. <b>Tags:</b> vh.latestBindingTime=postBuild			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Subclasses</b>	<a href="#">AbstractCanCluster</a> , <a href="#">EthernetCluster</a> , <a href="#">FlexrayCluster</a> , <a href="#">LinCluster</a> , <a href="#">UserDefinedCluster</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
baudrate	<a href="#">PositiveUnlimitedInteger</a>	0..1	attr	Channels speed in bits/s.





Class	«atpVariation» <b>CommunicationCluster</b> (abstract)			
physical Channel	<a href="#">PhysicalChannel</a>	*	aggr	This relationship defines which channel element belongs to which cluster. A channel shall be assigned to exactly one cluster, whereas a cluster may have one or more channels. Note: This atpSplitable property has no atp.Splitkey due to atpVariation (PropertySetPattern). <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> vh.latestBindingTime=systemDesignTime
protocolName	String	0..1	attr	The name of the protocol used.
protocolVersion	String	0..1	attr	The version of the protocol used.

**Table A.193: CommunicationCluster**

Class	<b>CommunicationConnector</b> (abstract)			
<b>Note</b>	The connection between the referencing ECU and the referenced channel via the referenced controller. Connectors are used to describe the bus interfaces of the ECUs and to specify the sending/receiving behavior. Each CommunicationConnector has a reference to exactly one communicationController. Note: Several CommunicationConnectors can be assigned to one PhysicalChannel in the scope of one ECU Instance.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AbstractCanCommunicationConnector</a> , <a href="#">EthernetCommunicationConnector</a> , <a href="#">FlexrayCommunicationConnector</a> , <a href="#">LinCommunicationConnector</a> , <a href="#">UserDefinedCommunicationConnector</a>			
<b>Aggregated by</b>	<a href="#">EcuInstance.connector</a> , <a href="#">MachineDesign.communicationConnector</a>			
Attribute	Type	Mult.	Kind	Note
commController	<a href="#">CommunicationController</a>	0..1	ref	Reference to the communication controller. The CommunicationConnector and referenced CommunicationController shall be aggregated by the same ECUInstance. The communicationController can be referenced by several CommunicationConnector elements. This is important for the FlexRay Bus. FlexRay communicates via two physical channels. But only one controller in an ECU is responsible for both channels. Thus, two connectors (for channel A and for channel B) shall reference to the same controller.
createEcu WakeupSource	Boolean	0..1	attr	If this parameter is available and set to true then a channel wakeup source shall be created for the Physical Channel referencing this CommunicationConnector.
dynamicPncTo Channel Mapping Enabled	Boolean	0..1	attr	Defines if this EcuInstance shall implement the dynamic PNC-to-channel-mapping functionality on this CommunicationConnector and its respective Physical Channel. <b>Tags:</b> atp.Status=draft This Attribute is only used by the AUTOSAR Classic Platform.
ecuCommPort Instance	<a href="#">CommConnectorPort</a>	*	aggr	An ECUs reception or send ports. atpVariation: If signals/PDUs/frames are variable, the corresponding ports shall be variable, too. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=ecuCommPortInstance.shortName, ecu CommPortInstance.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.





Class	CommunicationConnector (abstract)			
explicitWakeupChannel	<a href="#">PhysicalChannel</a>	*	ref	Defines a restriction which PhysicalChannels shall be woken up if this CommunicationConnector is the wakeup source. If not defined, then no restriction applies. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=explicitWakeupChannel.physicalChannel, explicitWakeupChannel.variationPoint.shortLabel vh.latestBindingTime=postBuild
explicitWakeupPnc	<a href="#">PncMappingIdent</a>	*	ref	Defines a restriction which PNCs shall be woken up if this CommunicationConnector is the wakeup source. If not defined, then no restriction applies. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=explicitWakeupPnc.pncMappingIdent, explicitWakeupPnc.variationPoint.shortLabel vh.latestBindingTime=postBuild
pncFilterArrayMask (ordered)	PositiveInteger	*	attr	Bit mask for NM-Pdu Payload used to configure the NM filter mask for the Network Management.
pncGatewayType	<a href="#">PncGatewayTypeEnum</a>	0..1	attr	Defines if this EcuInstance shall implement the Pnc Gateway functionality on this CommunicationConnector and its respective PhysicalChannel. Several Ecu Instances on the same PhysicalChannel can have the PncGateway functionality enabled, but only one of them shall have the pncGatewayType "active". This Attribute is only used by the AUTOSAR Classic Platform.

Table A.194: CommunicationConnector

Class	«atpVariation» CommunicationController (abstract)			
Note	The communication controller is a dedicated hardware device by means of which hosts are sending frames to and receiving frames from the communication medium. <b>Tags:</b> vh.latestBindingTime=postBuild			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	AbstractCanCommunicationController, <a href="#">EthernetCommunicationController</a> , FlexrayCommunicationController, <a href="#">LinCommunicationController</a> , UserDefinedCommunicationController			
Aggregated by	<a href="#">EcuInstance.commController</a> , MachineDesign.communicationController			
Attribute	Type	Mult.	Kind	Note
wakeUpByControllerSupported	Boolean	0..1	attr	Defines whether the ECU shall be woken up by this CommunicationController. TRUE: wake up is possible FALSE: wake up is not supported Note: If wakeUpByControllerSupported is set to TRUE the feature shall be supported by both hardware and basic software.

Table A.195: CommunicationController

Class	CommunicationControllerMapping			
Note	CommunicationControllerMapping specifies the CommunicationPeripheral hardware (defined in the ECU Resource Template) to realize the specified CommunicationController in a physical topology.			
Base	ARObject			
Aggregated by	<a href="#">ECUMapping.commControllerMapping</a>			
Attribute	Type	Mult.	Kind	Note







Class	CommunicationControllerMapping			
communication Controller	<a href="#">CommunicationController</a>	0..1	ref	Reference to the CommunicationController in the System Template
hw Communication Controller	<a href="#">HwElement</a>	0..1	ref	Reference to a HwElement of category Communication Controller in the ECU Resource Template.

**Table A.196: CommunicationControllerMapping**

Class	CommunicationCycle (abstract)			
Note	The communication cycle where the frame is sent.			
Base	<a href="#">ARObject</a>			
Subclasses	<a href="#">CycleCounter</a> , <a href="#">CycleRepetition</a>			
Aggregated by	<a href="#">FlexrayAbsolutelyScheduledTiming.communicationCycle</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.197: CommunicationCycle**

Enumeration	CommunicationDirectionType
Note	Describes the communication direction.
Aggregated by	<a href="#">CommConnectorPort.communicationDirection</a> , <a href="#">IEEE1722TpConnection.communicationDirection</a> , <a href="#">IPSecRule.direction</a> , <a href="#">ISignalIPduGroup.communicationDirection</a>
Literal	Description
in	Reception (Input) <b>Tags:</b> atp.EnumerationLiteralIndex=0
out	Transmission (Output) <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.198: CommunicationDirectionType**

Class	ComplexDeviceDriverSwComponentType			
Note	The ComplexDeviceDriverSwComponentType is a special AtomicSwComponentType that has direct access to hardware on an ECU and which is therefore linked to a specific ECU or specific hardware. The ComplexDeviceDriverSwComponentType introduces the possibility to link from the software representation to its hardware description provided by the ECU Resource Template. <b>Tags:</b> atp.recommendedPackage=SwComponentTypes			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtomicSwComponentType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
hardware Element	<a href="#">HwDescriptionEntity</a>	*	ref	Reference from the ComplexDeviceDriverSwComponent Type to the description of the used HwElements.

**Table A.199: ComplexDeviceDriverSwComponentType**

Class	ComponentClustering
Note	Constraint that forces the mapping of all referenced SW component instances to the same ECU, Core, Partition depending on the defined mappingScope attribute. If mappingScope is not specified then mappingScopeEcu shall be assumed.







Class	ComponentClustering			
Base	ARObject, MappingConstraint			
Aggregated by	SystemMapping.mappingConstraint			
Attribute	Type	Mult.	Kind	Note
clustered Component	SwComponent Prototype	*	iref	Reference to the components that have to be mapped together. <b>InstanceRef implemented by:</b> ComponentInSystem InstanceRef
mappingScope	MappingScopeEnum	0..1	attr	This attribute indicates whether the ComponentClustering mapping constraint applies to different ECUs, partitions or cores. If this attribute is not specified then mappingScope Ecu shall be assumed.

**Table A.200: ComponentClustering**

Class	ComponentSeparation			
Note	Constraint that forces the two referenced SW components (called A and B in the following) not to be mapped to the same ECU, Core, Partition depending on the defined mappingScope attribute. If mapping Scope is not specified then mappingScopeEcu shall be assumed. If a SW component (e.g. A) is a composition, none of the atomic SW components making up the A composition shall be mapped together with any of the atomic SW components making up the B composition. Furthermore, A and B shall be disjoint.			
Base	ARObject, MappingConstraint			
Aggregated by	SystemMapping.mappingConstraint			
Attribute	Type	Mult.	Kind	Note
mappingScope	MappingScopeEnum	0..1	attr	This attribute indicates whether the Component Separation mapping constraint applies to different ECUs, partitions or cores. If this attribute is not specified then mappingScopeEcu shall be assumed.
separated Component	SwComponent Prototype	0..2	iref	The two components that have to be mapped to different ECUs <b>InstanceRef implemented by:</b> ComponentInSystem InstanceRef

**Table A.201: ComponentSeparation**

Class	CompositeNetworkRepresentation			
Note	This meta-class is used to define the network representation of leaf elements of composite application data types.			
Base	ARObject			
Aggregated by	ReceiverComSpec.compositeNetworkRepresentation, SenderComSpec.compositeNetwork Representation			
Attribute	Type	Mult.	Kind	Note
leafElement	ApplicationComposite ElementDataPrototype	0..1	iref	This represents that leaf element of an application composite data type. <b>InstanceRef implemented by:</b> ApplicationComposite ElementInPortInterfaceInstanceRef
network Representation	SwDataDefProps	0..1	aggr	The SwDataDefProps owned by the CompositeNetwork Representation are used to define the network representation of the leaf element of an Application CompositeDataType. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=networkRepresentation

**Table A.202: CompositeNetworkRepresentation**

<b>Class</b>	<b>CompositeRuleBasedValueSpecification</b>			
<b>Note</b>	This meta-class represents rule-based values for DataPrototypes typed by composite AutosarDataTypes.			
<b>Base</b>	ARObject, <a href="#">AbstractRuleBasedValueSpecification</a> , <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
argument (ordered)	<a href="#">CompositeValueSpecification</a>	*	aggr	This represents the collection of aggregated Value Specifications. The last ValueSpecification in the collection shall be taken to execute the filling rule. <b>Tags:</b> xml.sequenceOffset=30
compound Primitive Argument (ordered)	CompositeRuleBasedValueArgument	*	aggr	This represents the collection of aggregated Value Specifications for compound primitive data type. The last ValueSpecification in the collection shall be taken to execute the filling rule. <b>Tags:</b> xml.sequenceOffset=35
maxSizeToFill	PositiveInteger	0..1	attr	If a rule is chosen which does not fill until the end, this determines until which size the rule shall fill the values. <b>Tags:</b> xml.sequenceOffset=40
rule	<a href="#">Identifier</a>	0..1	attr	This denotes the name of the rule of the RuleBasedValue Specification. The rule determines the calculation specification according which the arguments are used to calculated the values. <b>Tags:</b> xml.sequenceOffset=20

**Table A.203: CompositeRuleBasedValueSpecification**

<b>Class</b>	<b>CompositeValueSpecification</b> (abstract)			
<b>Note</b>	This abstract meta-class acts a base class for ValueSpecifications that have a composite form.			
<b>Base</b>	ARObject, <a href="#">ValueSpecification</a>			
<b>Subclasses</b>	<a href="#">ArrayValueSpecification</a> , <a href="#">RecordValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">CompositeRuleBasedValueSpecification.argument</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.204: CompositeValueSpecification**

Class	CompositionSwComponentType			
Note	A CompositionSwComponentType aggregates SwComponentPrototypes (that in turn are typed by SwComponentType)s as well as SwConnectors for primarily connecting SwComponentPrototypes among each others and towards the surface of the CompositionSwComponentType. By this means, a hierarchical structures of software-components can be created. <b>Tags:</b> atp.recommendedPackage=SwComponentTypes			
Base	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable, SwComponentType			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
component	SwComponentPrototype	*	aggr	<p>The instantiated components that are part of this composition. The aggregation of SwComponentPrototype is subject to variability with the purpose to support the conditional existence of a SwComponentPrototype. Please be aware: if the conditional existence of SwComponentPrototypes is resolved post-build, the deselected SwComponentPrototypes are still contained in the ECUs build but the instances are inactive in that they are not scheduled by the RTE.</p> <p>The aggregation is marked as atpSplitable in order to allow the addition of service components to the ECU extract during the ECU integration.</p> <p>The use case for having 0 components owned by the CompositionSwComponentType could be to deliver an empty CompositionSwComponentType to e.g. a supplier for filling the internal structure.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=component.shortName, component.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>
connector	SwConnector	*	aggr	<p>SwConnectors have the principal ability to establish a connection among PortPrototypes. They can have many roles in the context of a CompositionSwComponentType. Details are refined by subclasses.</p> <p>The aggregation of SwConnectors is subject to variability with the purpose to support variant data flow.</p> <p>The aggregation is marked as atpSplitable in order to allow the extension of the ECU extract with AssemblySwConnectors between ApplicationSwComponentTypes and ServiceSwComponentTypes during the ECU integration.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=connector.shortName, connector.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>
constantValue Mapping	ConstantSpecification MappingSet	*	ref	<p>Reference to the ConstantSpecificationMapping to be applied for initValues of PPortComSpecs and RPortComSpec.</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=constantValueMapping</p>





Class	CompositionSwComponentType			
dataType Mapping	<a href="#">DataTypeMappingSet</a>	*	ref	<p>Reference to the <a href="#">DataTypeMappingSet</a> to be applied for the used <a href="#">ApplicationDataTypes</a> in <a href="#">PortInterfaces</a>.</p> <p>Background: when developing subsystems it may happen that <a href="#">ApplicationDataTypes</a> are used on the surface of <a href="#">CompositionSwComponentTypes</a>. In this case it would be reasonable to be able to also provide the intended mapping to the <a href="#">ImplementationDataTypes</a>. However, this mapping shall be informal and not technically binding for the implementors mainly because the RTE generator is not concerned about the <a href="#">CompositionSwComponentTypes</a>.</p> <p>Rationale: if the mapping of <a href="#">ApplicationDataTypes</a> on the delegated and inner <a href="#">PortPrototype</a> matches then the mapping to <a href="#">ImplementationDataTypes</a> is not impacting compatibility.</p> <p><b>Stereotypes:</b> atpSplittable</p> <p><b>Tags:</b> atp.Splitkey=dataTypeMapping</p>
instantiation RTEEventProps	<a href="#">InstantiationRTEEventProps</a>	*	aggr	<p>This allows to define instantiation specific properties for RTE Events, in particular for instance specific scheduling.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation</p> <p><b>Tags:</b></p> <p>atp.Splitkey=instantiationRTEEventProps.shortLabel, instantiationRTEEventProps.variationPoint.shortLabel</p> <p>vh.latestBindingTime=codeGenerationTime</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
physical Dimension Mapping	PhysicalDimension MappingSet	0..1	ref	<p>This reference identifies the <a href="#">PhysicalDimensionMappingSet</a> that is applicable in the context of the enclosing <a href="#">CompositionSwComponentType</a>. The <a href="#">PhysicalDimensionMappings</a> contained in the <a href="#">PhysicalDimensionMappingSet</a> shall be taken into account for the assessment of the compatibility of <a href="#">PhysicalDimensions</a> in the context of creation of a <a href="#">PortInterfaceMapping</a> in the scope of the <a href="#">CompositionSwComponentType</a>.</p>

**Table A.205: CompositionSwComponentType**

Class	Compu			
<b>Note</b>	This meta-class represents the ability to express one particular computation.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">CompuMethod.compuInternalToPhys</a> , <a href="#">CompuMethod.compuPhysToInternal</a>			
Attribute	Type	Mult.	Kind	Note
compuContent	CompuContent	0..1	aggr	<p>This specifies the details of the computation.</p> <p><b>Stereotypes:</b> atpSplittable</p> <p><b>Tags:</b></p> <p>atp.Splitkey=compuContent</p> <p>xml.roleElement=false</p> <p>xml.roleWrapperElement=false</p> <p>xml.sequenceOffset=20</p> <p>xml.typeElement=false</p> <p>xml.typeWrapperElement=false</p>





Class	Compu			
compuDefault Value	<a href="#">CompuConst</a>	0..1	aggr	This property can be used to specify an output value for a conversion formula, if the value to be converted lies outside the plausibility limit. Although this is possible for all conversion formulae, it is especially valid for variables with tabular conversion formulae. <b>Tags:</b> xml.sequenceOffset=70

**Table A.206: Compu**

Class	CompuConst			
<b>Note</b>	This meta-class represents the fact that the value of a computation method scale is constant.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">Compu.compuDefaultValue</a> , <a href="#">CompuScale.compuInverseValue</a> , <a href="#">CompuScaleConstantContents.compuConst</a>			
Attribute	Type	Mult.	Kind	Note
compuConst ContentType	CompuConstContent	0..1	aggr	This is the actual content of the constant compu method scale. <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=10 xml.typeElement=false xml.typeWrapperElement=false

**Table A.207: CompuConst**

Class	CompuConstFormulaContent			
<b>Note</b>	This meta-class represents the fact that the constant value of the computation method is represented by a variation point. This difference is due to compatibility with ASAM HDO.			
<b>Base</b>	<i>ARObject</i> , <i>CompuConstContent</i>			
<b>Aggregated by</b>	<a href="#">CompuConst.compuConstContentType</a>			
Attribute	Type	Mult.	Kind	Note
vf	<a href="#">Numerical</a>	1	attr	Value calculated via a system constant. This element is included in every case where parameters should be generated from numerical values during compile time (not runtime!). Thus for example, the influence of the cylinder number on conversion formulae can be introduced in a repeatable manner. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=codeGenerationTime xml.sequenceOffset=30

**Table A.208: CompuConstFormulaContent**

Class	CompuConstTextContent			
<b>Note</b>	This meta-class represents the textual content of a scale.			
<b>Base</b>	<i>ARObject</i> , <i>CompuConstContent</i>			
<b>Aggregated by</b>	<a href="#">CompuConst.compuConstContentType</a>			
Attribute	Type	Mult.	Kind	Note
vt	VerbatimString	0..1	attr	This represents a textual constant in the computation method.

**Table A.209: CompuConstTextContent**

Class	CompuMethod			
Note	This meta-class represents the ability to express the relationship between a physical value and the mathematical representation. Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant. <b>Tags:</b> atp.recommendedPackage=CompuMethods			
Base	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> <a href="#">Referrable</a> , PackageableElement, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
compuInternalToPhys	<a href="#">Compu</a>	0..1	aggr	This specifies the computation from internal values to physical values. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=compuInternalToPhys xml.sequenceOffset=80
compuPhysToInternal	<a href="#">Compu</a>	0..1	aggr	This represents the computation from physical values to the internal values. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=compuPhysToInternal xml.sequenceOffset=90
displayFormat	DisplayFormatString	0..1	attr	This property specifies, how the physical value shall be displayed e.g. in documents or measurement and calibration tools. <b>Tags:</b> xml.sequenceOffset=20
unit	<a href="#">Unit</a>	0..1	ref	This is the physical unit of the Physical values for which the CompuMethod applies. <b>Tags:</b> xml.sequenceOffset=30

Table A.210: CompuMethod

Class	CompuNominatorDenominator			
Note	This class represents the ability to express a polynomial either as Nominator or as Denominator.			
Base	ARObject			
Aggregated by	<a href="#">CompuRationalCoeffs.compuDenominator</a> , <a href="#">CompuRationalCoeffs.compuNumerator</a>			
Attribute	Type	Mult.	Kind	Note
v (ordered)	<a href="#">Numerical</a>	*	attr	this is the list of polynomial factors. Note that the first vf represents the power=0. The polynomial is $v[0] * x^0 + v[1] * x^1 \dots$ <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.roleElement=true xml.roleWrapperElement=false xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false

Table A.211: CompuNominatorDenominator

Class	CompuRationalCoeffs			
Note	This meta-class represents the ability to express a rational function by specifying the coefficients of nominator and denominator.			
Base	ARObject			
Aggregated by	<a href="#">CompuScaleRationalFormula.compuRationalCoeffs</a>			





Class	CompuRationalCoeffs			
Attribute	Type	Mult.	Kind	Note
compu Denominator	<a href="#">CompuNominator Denominator</a>	0..1	aggr	This is the denominator of the expression. <b>Tags:</b> xml.sequenceOffset=30
compu Numerator	<a href="#">CompuNominator Denominator</a>	0..1	aggr	This is the numerator of the rational expression. <b>Tags:</b> xml.sequenceOffset=20

**Table A.212: CompuRationalCoeffs**

Class	CompuScale			
Note	This meta-class represents the ability to specify one segment of a segmented computation method.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">CompuScales.compuScale</a>			
Attribute	Type	Mult.	Kind	Note
a2IDisplayText	String	0..1	attr	The value of this attribute shall be taken for generating one display text (specifically the OutVal) within the equivalent of the enclosing <a href="#">CompuMethod</a> in A2L.
compuInverse Value	<a href="#">CompuConst</a>	0..1	aggr	This is the inverse value of the constraint. This supports the case that the scale is not reversible per se. <b>Tags:</b> xml.sequenceOffset=60
compuScale Contents	CompuScaleContents	0..1	aggr	This represents the computation details of the scale. <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=70 xml.typeElement=false xml.typeWrapperElement=false
desc	MultiLanguageOverview Paragraph	0..1	aggr	<desc> represents a general but brief description of the object in question. <b>Tags:</b> xml.sequenceOffset=30
lowerLimit	<a href="#">Limit</a>	0..1	attr	This specifies the lower limit of the scale. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=40
mask	<a href="#">PositiveUnlimitedInteger</a>	0..1	attr	In difference to all the other computational methods every COMPU-SCALE will be applied including the bit MASK. Therefore it is allowed for this type of COMPU-METHOD, that COMPU-SCALES overlap. To calculate the string reverse to a value, the string has to be split and the according value for each substring has to be summed up. The sum is finally transmitted. The processing has to be done in order of the COMPU-SCALE elements. <b>Tags:</b> xml.sequenceOffset=35
shortLabel	<a href="#">Identifier</a>	0..1	attr	This element specifies a short name for the particular scale. The name can for example be used to derive a programming language identifier. <b>Tags:</b> xml.sequenceOffset=20
symbol	CIdentifier	0..1	attr	The symbol, if provided, is used by code generators to get a C identifier for the CompuScale. The name will be used as is for the code generation, therefore it needs to be unique within the generation context. <b>Tags:</b> xml.sequenceOffset=25







Class	CompuScale			
upperLimit	<a href="#">Limit</a>	0..1	attr	This specifies the upper limit of a of the scale. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=50

Table A.213: CompuScale

Class	CompuScaleConstantContents			
<b>Note</b>	This meta-class represents the fact that a particular scale of the computation method is constant.			
<b>Base</b>	ARObject, CompuScaleContents			
<b>Aggregated by</b>	<a href="#">CompuScale.compuScaleContents</a>			
Attribute	Type	Mult.	Kind	Note
compuConst	<a href="#">CompuConst</a>	0..1	aggr	This represents the fact that the scale is a constant. The use case is mainly a non interpolated scale. It is a simplification of the fact that a constant scale can also be expressed as rational function of order 0. <b>Tags:</b> xml.sequenceOffset=90

Table A.214: CompuScaleConstantContents

Class	CompuScales			
<b>Note</b>	This meta-class represents the ability to stepwise express a computation method.			
<b>Base</b>	ARObject, CompuContent			
<b>Aggregated by</b>	<a href="#">Compu.compuContent</a>			
Attribute	Type	Mult.	Kind	Note
compuScale (ordered)	<a href="#">CompuScale</a>	*	aggr	This represents one scale within the compu method. Note that it contains a Variationpoint in order to support blueprints of enumerations. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=compuScale, compuScale.variationPoint.shortLabel vh.latestBindingTime=blueprintDerivationTime xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=40 xml.typeElement=false xml.typeWrapperElement=false

Table A.215: CompuScales

Class	ConcretePatternEventTriggering			
<b>Note</b>	Describes the behavior of an event that occurs according to a precisely known pattern.			
<b>Base</b>	ARObject, <a href="#">EventTriggeringConstraint</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	TimingExtension.timingGuarantee, TimingExtension.timingRequirement			
Attribute	Type	Mult.	Kind	Note







Class	ConcretePatternEventTriggering			
offset	<a href="#">MultidimensionalTime</a>	*	aggr	The offset for each occurrence of the event in the specified time interval. A list of point-in-times in the time interval given by the parameter patternLength at which the event occurs. <b>Tags:</b> xml.name=TIME-VALUE xml.roleElement=true xml.sequenceOffset=10 xml.typeElement=false
patternJitter	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum deviation of the time interval's starting point from the beginning of the given period. This parameter is only applicable in conjunction with the parameter <a href="#">patternPeriod</a> .
patternLength	<a href="#">MultidimensionalTime</a>	0..1	aggr	The duration of the time interval within which the event repeatedly occurs. The event occurs at concrete points in time within the given time interval. <b>Tags:</b> xml.sequenceOffset=20
patternPeriod	<a href="#">MultidimensionalTime</a>	0..1	aggr	The time distance between the beginnings of subsequent repetitions of the given concrete pattern.

**Table A.216: ConcretePatternEventTriggering**

Class	«atpMixedString» ConditionByFormula			
<b>Note</b>	This class represents a condition which is computed based on system constants according to the specified expression. The expected result is considered as boolean value. The result of the expression is interpreted as a condition. • "0" represents "false"; • a value other than zero is considered "true"			
<b>Base</b>	ARObject, FormulaExpression, SwSystemconstDependentFormula			
<b>Aggregated by</b>	<a href="#">VariationPoint.swSyscond</a> , <a href="#">VariationPointProxy.conditionAccess</a>			
Attribute	Type	Mult.	Kind	Note
bindingTime	BindingTimeEnum	1	attr	This attribute specifies the point in time when condition may be evaluated at earliest. At this point in time all referenced system constants shall have a value. <b>Tags:</b> xml.attribute=true

**Table A.217: ConditionByFormula**

Class	ConditionalChangeNad			
<b>Note</b>	Generates an conditional change NAD request. See ISO 17987 protocol specification for more information. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, LinConfigurationEntry, <a href="#">ScheduleTableEntry</a>			
<b>Aggregated by</b>	<a href="#">LinScheduleTable.tableEntry</a>			
Attribute	Type	Mult.	Kind	Note
byte	Integer	0..1	attr	Byte Position of Data Byte that should be used for the bitwise XOR with Invert and the bitwise AND with Mask.
id	PositiveInteger	0..1	attr	Byte Position of Id.
invert	Integer	0..1	attr	Byte Position of Invert.
mask	Integer	0..1	attr	Byte Position of Mask.
newNad	Integer	0..1	attr	The newly assigned NAD value (Byte Position).

**Table A.218: ConditionalChangeNad**

<b>Class</b>	<b>ConfidenceInterval</b>			
<b>Note</b>	Additionally to the list of measured distances of event occurrences, a confidence interval can be specified for the expected distance of two consecutive event occurrences with a given probability.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">ArbitraryEventTriggering.confidenceInterval</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
lowerBound	<a href="#">MultidimensionalTime</a>	0..1	aggr	The lower bound of the expected distance of two consecutive event occurrences.
propability	Float	0..1	attr	The probability for the measured lower and upper bound of the confidence interval.
upperBound	<a href="#">MultidimensionalTime</a>	0..1	aggr	The upper bound of the expected distance of two consecutive event occurrences.

**Table A.219: ConfidenceInterval**

<b>Class</b>	<b>ConsistencyNeeds</b>			
<b>Note</b>	This meta-class represents the ability to define requirements on the implicit communication behavior.			
<b>Base</b>	<i>ARObject</i> , <i>AtpBlueprint</i> , <i>AtpBlueprintable</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	ConsistencyNeedsBlueprintSet.consistencyNeeds, <a href="#">SwComponentType.consistencyNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dpgDoesNotRequireCoherency	DataPrototypeGroup	*	aggr	This group of VariableDataPrototypes does not require coherency with respect to the implicit communication behavior. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=dpgDoesNotRequireCoherency.shortName, dpgDoesNotRequireCoherency.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
dpgRequiresCoherency	DataPrototypeGroup	*	aggr	This group of VariableDataPrototypes requires coherency with respect to the implicit communication behavior, i.e. all read and write access to VariableDataPrototypes in the DataPrototypeGroup by the RunnableEntitys of the RunnableEntityGroup need to be handled in a coherent manner. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=dpgRequiresCoherency.shortName, dpgRequiresCoherency.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
regDoesNotRequireStability	RunnableEntityGroup	*	aggr	This group of RunnableEntities does not require stability with respect to the implicit communication behavior. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=regDoesNotRequireStability.shortName, regDoesNotRequireStability.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
regRequiresStability	RunnableEntityGroup	*	aggr	This group of RunnableEntities requires stability with respect to the implicit communication behavior, i.e. all read and write access to VariableDataPrototypes in the DataPrototypeGroup by the RunnableEntitys of the RunnableEntityGroup need to be handled in a stable manner. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=regRequiresStability.shortName, regRequiresStability.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.220: ConsistencyNeeds**

Class	ConstantReference			
Note	Instead of defining this value inline, a constant is referenced.			
Base	ARObject, <a href="#">ValueSpecification</a>			
Aggregated by	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
Attribute	Type	Mult.	Kind	Note
constant	<a href="#">ConstantSpecification</a>	0..1	ref	The referenced constant.

Table A.221: ConstantReference

Class	ConstantSpecification			
Note	Specification of a constant that can be part of a package, i.e. it can be defined stand-alone. <b>Tags:</b> atp.recommendedPackage=ConstantSpecifications			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
valueSpec	<a href="#">ValueSpecification</a>	0..1	aggr	Specification of an expression leading to a value for this constant. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=valueSpec

Table A.222: ConstantSpecification

Class	ConstantSpecificationMapping			
Note	This meta-class is used to create an association of two ConstantSpecifications. One Constant Specification is supposed to be defined in the application domain while the other should be defined in the implementation domain. Hence the ConstantSpecificationMapping needs to be used where a ConstantSpecification defined in one domain needs to be associated to a ConstantSpecification in the other domain. This information is crucial for the RTE generator.			
Base	ARObject			
Aggregated by	<a href="#">ConstantSpecificationMappingSet.mapping</a>			
Attribute	Type	Mult.	Kind	Note
applConstant	<a href="#">ConstantSpecification</a>	0..1	ref	A ConstantSpecification defined in the application domain.
implConstant	<a href="#">ConstantSpecification</a>	0..1	ref	A ConstantSpecification defined in the implementation domain.

Table A.223: ConstantSpecificationMapping

<b>Class</b>	<b>ConstantSpecificationMappingSet</b>			
<b>Note</b>	This meta-class represents the ability to map two ConstantSpecifications to each others. One Constant Specification is supposed to be described in the application domain and the other should be described in the implementation domain. <b>Tags:</b> atp.recommendedPackage=ConstantSpecificationMappingSets			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
mapping	<a href="#">ConstantSpecificationMapping</a>	*	aggr	ConstantSpecificationMappings owned by the Constant SpecificationMappingSet.

**Table A.224: ConstantSpecificationMappingSet**

<b>Class</b>	<b>ConsumedEventGroup</b>			
<b>Note</b>	This element represents an event-group to which the service consumer wants to subscribe.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ConsumedServiceInstance.consumedEventGroup</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
autoRequire	Boolean	0..1	attr	Defines that this ConsumedEventGroup shall be requested (subscribed) as soon as the corresponding ConsumedServiceInstance is requested. This could be at ECU start, if ConsumedServiceInstance.autoRequire is set to TRUE or as soon as the ConsumedServiceInstance is requested by the application, if ConsumedServiceInstance.autoRequire is set to FALSE.
eventGroup Identifier	PositiveInteger	0..1	attr	EventGroup ID. Shall be unique within one system to allow service discovery.
eventMulticast Address	<a href="#">ApplicationEndpoint</a>	*	ref	This reference defines the multicast address or a multicast address resource where the events of the event group are received. If the multicast address is determined via configuration and not at runtime via service discovery this reference points to the multicast address over which the events will be received. If the multicast address is determined at runtime via service discovery this reference shall be used to define the necessary local multicast address resources, i.e. RAM space in the TcpIp module in which the multicast address is stored at runtime. Please note that in this case the referenced address may be defined as ANY UDP port and ANY IP address since the multicast address will be received at runtime. If several multicast addresses are considered to be used the ConsumedEventGroup shall point to different ApplicationEndpoint objects to reserve the necessary resources in the configuration. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=eventMulticastAddress.applicationEndpoint, eventMulticastAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild
pduActivation RoutingGroup	<a href="#">PduActivationRoutingGroup</a>	*	aggr	The ServiceDiscovery module is able to activate and deactivate the PDU routing for receiving events.
priority	PositiveInteger	0..1	attr	Defines the frame priority where values from 0 (best effort) to 7 (highest) are allowed.





Class	ConsumedEventGroup			
sdClientTimer Config	<a href="#">SomeipSdClientEventGroupTimingConfig</a>	0..1	ref	Client Timing configuration settings that are EventGroup specific. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=sdClientTimerConfig.someipSdClientEventGroupTimingConfig, sdClientTimerConfig.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.225: ConsumedEventGroup**

Class	ConsumedServiceInstance			
<b>Note</b>	Service instances that are consumed by the ECU that is connected via the ApplicationEndpoint to a CommunicationConnector.			
<b>Base</b>	ARObject, <a href="#">AbstractServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ServiceInstanceCollectionSet.serviceInstance			
Attribute	Type	Mult.	Kind	Note
allowedServiceProvider	<a href="#">NetworkEndpoint</a>	*	ref	NetworkEndpoint on which the ProvidedServiceInstance that is communicating with this ConsumedServiceInstance is allowed to be located so that the ACL check in the ServiceDiscovery is successful and the connection is allowed to be established. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=allowedServiceProvider.networkEndpoint, allowedServiceProvider.variationPoint.shortLabel atp.Status=draft vh.latestBindingTime=postBuild
autoRequire	Boolean	0..1	attr	Defines that this ConsumedServiceInstance shall be required (searched for) by the service discovery at ECU start.
blocklistedVersion	<a href="#">SomeipServiceVersion</a>	*	aggr	Collection of blocklisted versions <b>Tags:</b> atp.Status=draft
consumedEventGroup	<a href="#">ConsumedEventGroup</a>	*	aggr	Selection of event-groups the consumer wants to subscribe for. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=consumedEventGroup.shortName, consumedEventGroup.variationPoint.shortLabel vh.latestBindingTime=postBuild
eventMulticastSubscriptionAddress	<a href="#">ApplicationEndpoint</a>	0..1	ref	Multicast Address that is used by the client to subscribe to the server: This enables the multicast subscription feature. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=eventMulticastSubscriptionAddress.applicationEndpoint, eventMulticastSubscriptionAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild
instanceIdentifier	<a href="#">AnyServiceInstanceId</a>	0..1	attr	This attribute represents the ability to describe the required service instance ID.





Class	ConsumedServiceInstance			
localUnicastAddress	<a href="#">ApplicationEndpoint</a>	0..2	ref	The local address over which the CSI is consumed (udp, tcp or both). <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=localUnicastAddress.applicationEndpoint, localUnicastAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild
minorVersion	<a href="#">AnyVersionString</a>	0..1	attr	Minor Version of the ServiceInterface. Value can be set to a number that represents the Minor Version of the searched service or to ANY.
remoteUnicastAddress	<a href="#">ApplicationEndpoint</a>	0..2	ref	This reference defines the remote address where the service provider is located. This reference shall ONLY be used if the remote address is determined from the configuration and not at runtime from the Service Discovery. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=remoteUnicastAddress.applicationEndpoint, remoteUnicastAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild
sdClientTimerConfig	<a href="#">SomeIpSdClientServiceInstanceConfig</a>	0..1	ref	Client specific configuration settings relevant for the SOME/IP service discovery. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=sdClientTimerConfig.someIpSdClientServiceInstanceConfig, sdClientTimerConfig.variationPoint.shortLabel vh.latestBindingTime=postBuild
serviceIdentifier	PositiveInteger	0..1	attr	This attribute represents the ability to describe the SOME/IP service ID that is searched.
versionDrivenFindBehavior	<a href="#">ServiceVersionAcceptanceKindEnum</a>	0..1	attr	Defines the service discovery find behavior. <b>Tags:</b> atp.Status=draft

**Table A.226: ConsumedServiceInstance**

Enumeration	ContainedIPduCollectionSemanticsEnum
<b>Note</b>	Defines the collection semantics for ContainedIPdus.
<b>Aggregated by</b>	<a href="#">ContainedIPduProps.collectionSemantics</a>
<b>Literal</b>	<b>Description</b>
lastIsBest	The ContainedIPdu data will be fetched via TriggerTransmit just before the transmission executes. <b>Tags:</b> atp.EnumerationLiteralIndex=0
queued	The ContainedIPdu data will instantly be stored to the ContainerIPdu in the context of the Transmit API. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.227: ContainedIPduCollectionSemanticsEnum**

Class	ContainedIPduProps			
<b>Note</b>	Defines the aspects of an IPdu which can be collected inside a ContainerIPdu.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">ContainerIPdu.containedIPduTriggeringProps</a> , <a href="#">IPdu.containedIPduProps</a>			
Attribute	Type	Mult.	Kind	Note





Class	ContainedIPduProps			
collection Semantics	<a href="#">ContainedIPduCollectionSemanticsEnum</a>	0..1	attr	Defines whether this ContainedIPdu shall be collected using a last-is-best or queued semantics.
containedPdu Triggering	<a href="#">PduTriggering</a>	0..1	ref	Reference to Pdu for which the ContainedIPduProps are valid.
headerIdLong Header	PositiveInteger	0..1	attr	Defines the header id this IPdu shall have in case this IPdu is put inside a ContainerIPdu with headerType = longHeader.
headerIdShort Header	PositiveInteger	0..1	attr	Defines the header id this IPdu shall have in case this IPdu is put inside a ContainerIPdu with headerType = shortHeader.
j1939requestable	Boolean	0..1	attr	Contained I-PDU can be triggered by the J1939 request message.
offset	PositiveInteger	0..1	attr	Byte offset that describes the location of the Contained Pdu in the ContainerPdu if no header is used.
priority	PositiveInteger	0..1	attr	Defines a priority of a ContainedTxPdu. 255 represents the lowest priority and 0 represent the highest priority.
timeout	TimeValue	0..1	attr	Defines a IPdu specific sender timeout which can reduce the ContainerIPdu timer when this containedIPdu is put inside the ContainerIPdu. This attribute is ignored on receiver side.
trigger	PduCollectionTriggerEnum	0..1	attr	Defines whether this IPdu does trigger the sending of the ContainerIPdu. This attribute is ignored on receiver side.
update IndicationBit Position	PositiveInteger	0..1	attr	The updateIndicationBit specifies the bit location of ContainedIPdu Update-Bit in the Container PDU. It indicates to the receivers that the ContainedIPdu in the ContainerIPdu was updated.

**Table A.228: ContainedIPduProps**

Class	ContainerIPdu			
<b>Note</b>	Allows to collect several IPdus in one ContainerIPdu based on the headerType. <b>Tags:</b> atp.recommendedPackage=Pdus			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
containedIPdu TriggeringProps	<a href="#">ContainedIPduProps</a>	*	aggr	Defines properties for an IPdu that is part of the ContainerIPdu.
containedPdu Triggering	<a href="#">PduTriggering</a>	*	ref	This PduTriggering shall be collected inside the Container IPdu. <b>Tags:</b> atp.Status=obsolete
container Timeout	TimeValue	0..1	attr	When this timeout expires the ContainerIPdu is sent out. The respective timer is started when the first Ipdu is put into the ContainerIPdu. This attribute is ignored on receiver side.
containerTrigger	ContainerIPduTriggerEnum	0..1	attr	Defines if the transmission of the ContainerIPdu shall be requested right after the first ContainedIPdu was put into it. This attribute shall be ignored on receiver side.
headerType	<a href="#">ContainerIPduHeaderTypeEnum</a>	0..1	attr	Defines whether and which header type is used (header id and length).
minimumRx Container QueueSize	PositiveInteger	0..1	attr	This attribute defines the minimum queue size for received containers.





Class	ContainerIPdu			
minimumTxContainerQueueSize	PositiveInteger	0..1	attr	This attribute defines the minimum queue size for transmitted containers.
rxAcceptContainedIPdu	<a href="#">RxAcceptContainedIPduEnum</a>	0..1	attr	Defines whether this ContainerIPdu has a fixed set of containedIPdus assigned for reception.
thresholdSize	PositiveInteger	0..1	attr	Defines the size threshold which, when exceeded, triggers the sending of the ContainerIPdu although the maximum Pdu size has not been reached yet. Unit: byte.
unusedBitPattern	PositiveInteger	0..1	attr	IPduM fills not updated areas of the ContainerPdu with this byte-pattern.

**Table A.229: ContainerIPdu**

Enumeration	ContainerIPduHeaderTypeEnum
Note	Is used to define the header type and size of ContainerIPdus. The header size includes the header id and the length information.
Aggregated by	<a href="#">ContainerIPdu.headerType</a>
Literal	Description
longHeader	Header size is 64 bit: <ul style="list-style-type: none"> <li>Header Id 32 bit</li> <li>Dlc 32 bit</li> </ul> <b>Tags:</b> atp.EnumerationLiteralIndex=0
noHeader	No Header is used and the location of each containedPdu in the ContainerPdu is statically configured. <b>Tags:</b> atp.EnumerationLiteralIndex=2
shortHeader	Header size is 32 bit: <ul style="list-style-type: none"> <li>Header Id 24 bit</li> <li>Dlc 8 bit.</li> </ul> <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.230: ContainerIPduHeaderTypeEnum**

Class	CouplingElement			
Note	A CouplingElement is used to connect EcuInstances to the VLAN of an EthernetCluster. Coupling Elements can reach from a simple hub to a complex managed switch or even devices with functionalities in higher layers. A CouplingElement that is not related to an EcuInstance occurs as a dedicated single device. <b>Tags:</b> atp.recommendedPackage=CouplingElements			
Base	<a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
communicationCluster	<a href="#">EthernetCluster</a>	0..1	ref	This relationship defines to which cluster the Coupling Element belongs.







Class	CouplingElement			
couplingElementDetails	CouplingElementAbstractDetails	0..1	aggr	Definition of details for this specific CouplingElement. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=couplingElementDetails.shortName, couplingElementDetails.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild xml.namePlural=COUPLING-ELEMENT-DETAILS This Attribute is only used by the AUTOSAR Classic Platform.
couplingPort	CouplingPort	*	aggr	Hardware Port of the CouplingElement that is used to connect this CouplingPort to EcuInstances or other CouplingElements. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=couplingPort.shortName, couplingPort.variationPoint.shortLabel vh.latestBindingTime=postBuild
couplingType	CouplingElementEnum	0..1	attr	Describes the coupling type of this CouplingElement.
ecuInstance	EcuInstance	0..1	ref	Optional reference to the ECU where the Coupling Element is located.
firewallRule	StateDependentFirewall	*	ref	Firewall rules defined in the context of a Coupling Element. <b>Tags:</b> atp.Status=candidate
switchMacAddressLearningMode	SwitchMacAddressLearningEnum	0..1	attr	Defines the MAC address learning mode of the Ethernet switch.

Table A.231: CouplingElement

Enumeration	CouplingElementEnum
Note	Identifies the Coupling type.
Aggregated by	CouplingElement.couplingType
Literal	Description
hub	A device that is used to connect segments of a LAN. In Hubs frames are "broadcasted" to every one of its ports. <b>Tags:</b> atp.EnumerationLiteralIndex=0
router	A device that routes frames between different networks. <b>Tags:</b> atp.EnumerationLiteralIndex=1
switch	A device that filters and forwards frames between different LAN segments. <b>Tags:</b> atp.EnumerationLiteralIndex=2

Table A.232: CouplingElementEnum

Class	CouplingElementSwitchDetails			
Note	Collection of specific details for the CouplingElement of couplingType switch. <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=SwitchStreamIdentificationTables This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, CouplingElementAbstractDetails, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	CouplingElement.couplingElementDetails			
Attribute	Type	Mult.	Kind	Note





Class	CouplingElementSwitchDetails			
atsInstanceEntry	SwitchAtsInstanceEntry	*	aggr	Collection of ATS Instance Entries. <b>Tags:</b> atp.Status=candidate
flowMetering	SwitchFlowMeteringEntry	*	aggr	Collection of Flow Metering Entries. <b>Tags:</b> atp.Status=candidate
streamFilter (ordered)	SwitchStreamFilterEntry	*	aggr	Collection of Stream Filter Entries. <b>Tags:</b> atp.Status=candidate
streamGate	SwitchStreamGateEntry	*	aggr	Collection of Stream Gate Entries. <b>Tags:</b> atp.Status=candidate
switchStreamIdentification (ordered)	SwitchStreamIdentification	*	aggr	Collection of switch stream identification entries. <b>Tags:</b> atp.Status=candidate
trafficShaperGroup	SwitchAsynchronousTrafficShaperGroupEntry	*	aggr	Collection of Traffic Shaper Groups. <b>Tags:</b> atp.Status=candidate

**Table A.233: CouplingElementSwitchDetails**

Class	CouplingPort			
<b>Note</b>	A CouplingPort is used to connect a CouplingElement with an EcuInstance or two CouplingElements with each other via a CouplingPortConnection. Optionally, the CouplingPort may also have a reference to a macMulticastGroup and a defaultVLAN.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CouplingElement.couplingPort</a> , <a href="#">EthernetCommunicationController.couplingPort</a>			
Attribute	Type	Mult.	Kind	Note
connectionNegotiationBehavior	<a href="#">EthernetConnectionNegotiationEnum</a>	0..1	attr	Specifies the connection negotiation of the CouplingPort.
couplingPortDetails	<a href="#">CouplingPortDetails</a>	0..1	aggr	Defines more details of a CouplingPort in case a more specific configuration is required.
couplingPortRole	<a href="#">CouplingPortRoleEnum</a>	0..1	attr	Defines the role this CouplingPort takes in the context of the CouplingElement.
defaultVlan	<a href="#">EthernetPhysicalChannel</a>	0..1	ref	The vLanIdentifier of the referenced VLAN is the Default-PVID (port VLAN ID). A Port VLAN ID is a default VLAN ID that is assigned to an access CouplingPort to designate the VLAN segment to which this port is connected. Also, if a CouplingPort has not been configured with any VLAN memberships, the virtual switch's Port VLAN ID (pvid) becomes the default VLAN ID for the ports connection. This identifier/tag is added for incoming untagged messages at the port (ingress tagging). For outgoing messages with this identifier, the tag is removed at the port (egress untagging, depending on the Vlan Membership.sendActivity).
macAddressVlanAssignment	<a href="#">MacAddressVlanMembership</a>	*	aggr	Statically defines the assignment of MAC-Multicast-Addresses, optionally together with VLANs, to this CouplingPort. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=macAddressVlanAssignment.shortName, macAddressVlanAssignment.variationPoint.shortLabel vh.latestBindingTime=postBuild
macLayerType	<a href="#">EthernetMacLayerTypeEnum</a>	0..1	attr	Specifies the mac layer type of the CouplingPort.





Class	CouplingPort			
macSecProps	<a href="#">MacSecProps</a>	*	aggr	Properties to configure MACsec (Media access control security) and the MKA (MACsec Key Agreement) for the CouplingPort (PHY). <b>Tags:</b> atp.Status=candidate
physicalLayerType	<a href="#">EthernetPhysicalLayerTypeEnum</a>	0..1	attr	Specifies the physical layer type of the CouplingPort.
plcaProps	<a href="#">PlcaProps</a>	0..1	aggr	Optional properties for configuration of PLCA (Physical Layer Collision Avoidance) in case 10-BASE-T1S Ethernet is used and PLCA is enabled on the Coupling Port (PHY).
pncMapping	<a href="#">PncMappingIdent</a>	*	ref	Reference to the partial networks this CouplingPort participates in. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=pncMapping
receiveActivity	EthernetSwitchVlanIngressTagEnum	0..1	attr	Defines the handling of frames at the ingress port.
vlanMembership	<a href="#">VlanMembership</a>	*	aggr	Messages of VLANs that are defined here can be communicated via the CouplingPort.
wakeupSleepOnDatalineConfig	<a href="#">EthernetWakeupSleepOnDatalineConfig</a>	0..1	ref	Optional reference to EthernetWakeupSleepOnDataline Config.

**Table A.234: CouplingPort**

Class	CouplingPortConnection			
<b>Note</b>	Connection between two CouplingPorts (firstPort and secondPort) or between a collection of Ports that are all referenced by the portCollection reference.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">EthernetCluster.couplingPortConnection</a>			
Attribute	Type	Mult.	Kind	Note
firstPort	<a href="#">CouplingPort</a>	0..1	ref	Reference to the first CouplingPort that is connected via the CouplingPortConnection.
nodePort	<a href="#">CouplingPort</a>	*	ref	Reference to a number of CouplingPorts that are connected via the CouplingPortConnection. This reference shall be used to describe a 10BASE-T1S topology architecture where several CouplingPorts of EthernetCommunicationControllers are connected via one CouplingPortConnection. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=nodePort.couplingPort, nodePort.variationPoint.shortLabel vh.latestBindingTime=postBuild
plcaLocalNodeCount	PositiveInteger	0..1	attr	Defines the number of communication participants in case 10BASE-T1S and the nodePort reference is used.
plcaTransmitOpportunityTimer	PositiveInteger	0..1	attr	Timer for the transmission in bit time to evaluate if a Transmission Opportunity is yield or not.
secondPort	<a href="#">CouplingPort</a>	0..1	ref	Reference to the second CouplingPort that is connected via the CouplingPortConnection.

**Table A.235: CouplingPortConnection**

Class	CouplingPortDetails			
Note	Defines details of a CouplingPort. May be used to configure the structures of a switch.			
Base	ARObject			
Aggregated by	CouplingPort.couplingPortDetails			
Attribute	Type	Mult.	Kind	Note
couplingPort Structural Element	CouplingPortStructuralElement	*	aggr	Collects all the structural parts at which a CouplingPort may be configurable.
defaultTraffic Class	PositiveInteger	0..1	attr	Defines the default traffic class for this CouplingPort.
ethernetPriority Regeneration	EthernetPriorityRegeneration	0..8	aggr	Defines a priority regeneration where the ingress priority is replaced by regenerated priority.
ethernetTraffic Class Assignment	CouplingPortTrafficClassAssignment	*	aggr	Defines the priority to traffic class assignment.
frame Preemption Support	Boolean	0..1	attr	Defines whether frames handled by this CouplingPort may be preempted.
globalTime Props	GlobalTimeCouplingPortProps	0..1	aggr	Specifies properties for the usage of the CouplingPort in the scope of Global Time Sync.
lastEgress Scheduler	CouplingPortScheduler	0..1	ref	Defines which CouplingPortScheduler is the last in the egress port structure.
ratePolicy	CouplingPortRatePolicy	*	aggr	Rate policies to be applied for this CouplingPort. <b>Tags:</b> atp.Status=obsolete
vlanTranslation Table	EthernetVlanTranslationTable	*	aggr	Definition of entries that define the ingress Vlan translation between IngressVlanID and TranslatedVlanID.

**Table A.236: CouplingPortDetails**

Class	CouplingPortEnhancedTrafficShaper			
Note	Defines a scheduler used for enhanced traffic shaping (e.g. weighted round robin). <b>Tags:</b> atp.Status=candidate			
Base	ARObject, CouplingPortAbstractShaper, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	CouplingPortFifo.shaper			
Attribute	Type	Mult.	Kind	Note
etsAvailable BandwidthIn Percent	PositiveInteger	0..1	attr	Defines the available bandwidth in percent of an enhanced transmission selection algorithm (ETS). <b>Tags:</b> atp.Status=candidate
etsAvailable BandwidthIn WeightValue	PositiveInteger	0..1	attr	Defines the available bandwidth as weight value of an enhanced transmission selection algorithm (ETS). <b>Tags:</b> atp.Status=candidate

**Table A.237: CouplingPortEnhancedTrafficShaper**

Class	CouplingPortFifo			
Note	Defines a FIFO for the CouplingPort egress structure.			
Base	ARObject, CouplingPortStructuralElement, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	CouplingPortDetails.couplingPortStructuralElement			
Attribute	Type	Mult.	Kind	Note
assignedTraffic Class	PositiveInteger	*	attr	Defines a set of Traffic Classes which shall be handled by this FIFO.





Class	CouplingPortFifo			
minimumFifoLength	PositiveInteger	0..1	attr	FIFO minimum length in Byte. An actual configuration/hardware may use a bigger value.
shaper	CouplingPortAbstractShaper	0..1	aggr	Definition of the shaper to be used for the processing of this FIFO. <b>Tags:</b> atp.Status=candidate
trafficClassPreemptionSupport	EthernetCouplingPortPreemptionEnum	0..1	attr	Defines whether frames assigned to the traffic class associated with this CouplingPortFifo may be preempted or not.

**Table A.238: CouplingPortFifo**

Class	CouplingPortRatePolicy			
<b>Note</b>	Defines a rate policy on a CouplingPort. <b>Tags:</b> atp.Status=obsolete			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	CouplingPortDetails.ratePolicy			
Attribute	Type	Mult.	Kind	Note
dataLength	PositiveInteger	0..1	attr	Amount of data in bytes (excluding header information) that can be received to define the rate policy. <b>Tags:</b> atp.Status=obsolete
policyAction	CouplingPortRatePolicyActionEnum	0..1	attr	Defines the action to be performed when this rate policy is violated. <b>Tags:</b> atp.Status=obsolete
priority	PositiveInteger	0..1	attr	Defines the priority which this rate policy shall be limited on. If no priority is given this rate policy is not considering priority. <b>Tags:</b> atp.Status=obsolete
timeInterval	TimeValue	0..1	attr	Time interval used to define the base of the rate policy. <b>Tags:</b> atp.Status=obsolete
vLan	EthernetPhysicalChannel	*	ref	Defines the VLANs this rate policy shall be limited on. If no VLAN is given this rate policy is not considering VLAN tags. <b>Tags:</b> atp.Status=obsolete

**Table A.239: CouplingPortRatePolicy**

Enumeration	CouplingPortRoleEnum
<b>Note</b>	Defines the role a CouplingPort takes in the context of a CouplingElement.
<b>Aggregated by</b>	CouplingPort.couplingPortRole
<b>Literal</b>	<b>Description</b>
hostPort	The hostPort is connected to an ECU (host ecu). The host ECU controls the connected Coupling Element (e.g. Ethernet switch). <b>Tags:</b> atp.EnumerationLiteralIndex=0
standardPort	A CouplingPort can be a standardPort that is used to connect the CouplingElement with Coupling Ports outside the ECU. <b>Tags:</b> atp.EnumerationLiteralIndex=2
upLinkPort	A CouplingPort can be connected to another CouplingPort of a CouplingElement located on the same ECU (CouplingElement.ecuInstance) using the CouplingPortConnection. This is used to model a cascaded switch. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.240: CouplingPortRoleEnum**

<b>Class</b>	<b>CouplingPortScheduler</b>			
<b>Note</b>	Defines a scheduler for the CouplingPort egress structure.			
<b>Base</b>	ARObject, CouplingPortStructuralElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CouplingPortDetails.couplingPortStructuralElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
portScheduler	<a href="#">EthernetCouplingPortSchedulerEnum</a>	0..1	attr	Defines the schedule algorithm to be used.
predecessor (ordered)	CouplingPortStructuralElement	*	ref	Ordered List of predecessor inputs. The first element has the highest priority. The following elements have decreasing priorities.

**Table A.241: CouplingPortScheduler**

<b>Class</b>	<b>CouplingPortTrafficClassAssignment</b>			
<b>Note</b>	Defines the assignment of Traffic Class to a frame.			
<b>Base</b>	ARObject, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CouplingPortDetails.ethernetTrafficClassAssignment</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
priority	PositiveInteger	*	attr	Defines a priority which is mapped onto a Traffic Class.
trafficClass	PositiveInteger	0..1	attr	Defines the Traffic Class which is assigned.

**Table A.242: CouplingPortTrafficClassAssignment**

<b>Class</b>	<b>CpSoftwareCluster</b>			
<b>Note</b>	This meta class provides the ability to define a CP Software Cluster. Each CP Software Cluster can be integrated and build individually. It defines the sub-set of hierarchical tree(s) of Software Components belonging to this CP Software Cluster. Resources required or provided by this CP Software Cluster are given in the according mappings. <b>Tags:</b> atp.recommendedPackage=CpSoftwareClusters This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
softwareClusterId	PositiveInteger	0..1	attr	This attribute represents the value of the id of the corresponding CP software cluster.
swComponentAssignment	<a href="#">SwComponentPrototypeAssignment</a>	*	aggr	This is the collection of SwComponentPrototype Assignments <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=swComponentAssignment, swComponentAssignment.variationPoint.shortLabel vh.latestBindingTime=postBuild
swComposition	<a href="#">CompositionSwComponentType</a>	*	ref	Software Components in the context of a CompositionSwComponentType belonging to this CP Software Cluster. This reference can be used to describe the belonging SWCs when the CP Software Cluster is described out of the context of a System, e.g. reusable CP Software Cluster. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=swComposition.compositionSwComponentType, swComposition.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime

**Table A.243: CpSoftwareCluster**

Class	CpSoftwareClusterBinaryManifestDescriptor			
Note	<p>This meta-class has the ability to act as a hub for all information related to the binary manifest of a given CP software cluster. The manifest is subject to integrator work and therefore not a part of the definition of the CP software cluster itself.</p> <p><b>Tags:</b> atp.recommendedPackage=CpSoftwareClusterBinaryManifestDescriptors  This Class is only used by the AUTOSAR Classic Platform.</p>			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
cpSoftwareCluster	<a href="#">CpSoftwareCluster</a>	0..1	ref	This reference identifies the CpSoftwareCluster to which the enclosing CpSoftwareClusterBinaryManifestDescriptor belongs. The CpSoftwareClusterBinaryManifestDescriptor is defined in an integration phase while the referenced CpSoftwareCluster represents a design element. Therefore, it makes sense to use a reference rather than an aggregation in the relation of the two meta-classes.
metaDataField	<a href="#">BinaryManifestMetaDataField</a>	*	aggr	This aggregation identifies the collection of meta-data contained in the enclosing binary manifest.
provideResource	<a href="#">BinaryManifestProvideResource</a>	*	aggr	This aggregation represents the collection of provided resources in the enclosing binary manifest.
requireResource	<a href="#">BinaryManifestRequireResource</a>	*	aggr	This aggregation represents the collection of required resources in the enclosing binary manifest.
resourceDefinition	<a href="#">BinaryManifestResourceDefinition</a>	*	aggr	This aggregation represents the collection of binary manifest resource definitions that belong to the enclosing CpSoftwareClusterBinaryManifestDescriptor.
softwareClusterId	PositiveInteger	0..1	attr	This attribute represents the value of the id of the corresponding CP software cluster. This id is assigned by an integrator, but may also be copied from CpSoftwareCluster.softwareClusterId if available.

**Table A.244: CpSoftwareClusterBinaryManifestDescriptor**

Class	CpSoftwareClusterCommunicationResource			
Note	<p>Represents a single resource required or provided by a CP Software Cluster which relates to the port based communication on VFB level.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
Base	ARObject, <a href="#">CpSoftwareClusterResource</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	CpSoftwareClusterResourcePool.resource			
Attribute	Type	Mult.	Kind	Note
communicationResourceProps	CpSoftwareClusterCommunicationResourceProps	0..1	aggr	This aggregation supports the further qualification of the enclosing CpSoftwareClusterCommunicationResource by means of additional attributes depending on the nature of the CpSoftwareClusterCommunicationResource.

**Table A.245: CpSoftwareClusterCommunicationResource**

Class	CpSoftwareClusterResource (abstract)			
Note	<p>Represents a single resource required or provided by a CP Software Cluster.</p> <p><b>Tags:</b> atp.recommendedPackage=Resources  This Class is only used by the AUTOSAR Classic Platform.</p>			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">CpSoftwareClusterCommunicationResource</a> , <a href="#">CpSoftwareClusterServiceResource</a>			
Aggregated by	CpSoftwareClusterResourcePool.resource			







Class	CpSoftwareClusterResource (abstract)			
Attribute	Type	Mult.	Kind	Note
dependent Resource	RoleBasedResource Dependency	*	aggr	Link to a resource which depends on this resource to implement them.
globalResource Id	PositiveInteger	0..1	attr	A unique identifiers per resource used for the connection process. The identifier is required to be unique in the scope of a single machine. If software clusters are designed to be reused on multiple machines the uniqueness requirements applies for all the intended machines.
isMandatory	Boolean	0..1	attr	This attribute indicates, that the resource is mandatory to operate the Software Cluster. If the resource is not provided on the machine the connection process of any Software Cluster requiring this resource gets aborted.

**Table A.246: CpSoftwareClusterResource**

Class	CpSoftwareClusterResourceToApplicationPartitionMapping			
Note	This meta class maps a Software Cluster resource to an Application Partition to restrict the usage. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	CpSoftwareClusterMappingSet.resourceToApplicationPartitionMapping, <a href="#">SystemMapping.resourceToApplicationPartitionMapping</a>			
Attribute	Type	Mult.	Kind	Note
application Partition	<a href="#">ApplicationPartition</a>	0..1	ref	ApplicationPartition for which the mapping applies.
resource	<a href="#">CpSoftwareClusterResource</a>	0..1	ref	Software Cluster Resource for which the mapping applies.

**Table A.247: CpSoftwareClusterResourceToApplicationPartitionMapping**

Class	CpSoftwareClusterServiceResource			
Note	Represents a single resource required or provided by a CP Software Cluster which relates to the BSW. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">CpSoftwareClusterResource</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	CpSoftwareClusterResourcePool.resource			
Attribute	Type	Mult.	Kind	Note
resourceNeeds	<a href="#">EcucContainerValue</a>	*	ref	Reference(s) to one or multiple EcucContainerValue(s) qualifying the characteristics of the resource.

**Table A.248: CpSoftwareClusterServiceResource**

Class	CpSoftwareClusterToApplicationPartitionMapping			
Note	This meta class defines ApplicationPartitions that are applicable for the CpSoftwareCluster. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	CpSoftwareClusterMappingSet.softwareClusterToApplicationPartitionMapping, <a href="#">SystemMapping.softwareClusterToApplicationPartitionMapping</a>			
Attribute	Type	Mult.	Kind	Note
application Partition	<a href="#">ApplicationPartition</a>	*	ref	Collection of ApplicationPartitions available in the Cp SoftwareCluster
softwareCluster	<a href="#">CpSoftwareCluster</a>	0..1	ref	Software Cluster Resource for which the mapping applies

**Table A.249: CpSoftwareClusterToApplicationPartitionMapping**



Class	CpSoftwareClusterToEcuInstanceMapping			
Note	This meta class maps a CpSoftwareCluster to a EcuInstance. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">SystemMapping.swClusterMapping</a>			
Attribute	Type	Mult.	Kind	Note
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	Reference to a specific ECU Instance description.
machineId	PositiveInteger	0..1	attr	Unique number of the (virtual or physical) machine to which the Software Cluster is mapped.
swCluster	<a href="#">CpSoftwareCluster</a>	*	ref	The mapped CP Software Cluster <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=swCluster.cpSoftwareCluster, swCluster.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime

**Table A.250: CpSoftwareClusterToEcuInstanceMapping**

Class	CpSoftwareClusterToResourceMapping			
Note	This meta class maps a service resource to CP Software Clusters. By this mapping it's specified whether the Software Cluster has to provide or to require the resource. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	CpSoftwareClusterMappingSet.softwareClusterToResourceMapping, <a href="#">SystemMapping.softwareClusterToResourceMapping</a>			
Attribute	Type	Mult.	Kind	Note
provider	<a href="#">CpSoftwareCluster</a>	0..1	ref	CP Software Cluster providing the resource
requester	<a href="#">CpSoftwareCluster</a>	*	ref	CP Software Cluster requesting the resource
service Resource	<a href="#">CpSoftwareCluster</a> <a href="#">ServiceResource</a>	0..1	ref	Service resource for which the mapping applies.

**Table A.251: CpSoftwareClusterToResourceMapping**

Class	CryptoServiceCertificate			
Note	This meta-class represents the ability to model a cryptographic certificate. <b>Tags:</b> atp.recommendedPackage=CryptoServiceCertificates			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
algorithmFamily	CryptoCertificate AlgorithmFamilyEnum	0..1	attr	This attribute represents a description of the family of crypto algorithm used to generate public key and signature of the cryptographic certificate.
format	CryptoCertificateFormat Enum	0..1	attr	This attribute can be used to provide information about the format used to create the certificate
maximum Length	PositiveInteger	0..1	attr	This attribute represents the ability to define the maximum length of the certificate in bytes.
nextHigher Certificate	<a href="#">CryptoServiceCertificate</a>	0..1	ref	The reference identifies the next higher certificate in the certificate chain.





Class	CryptoServiceCertificate			
serverName Identification	String	0..1	attr	Server Name Indication (SNI) is needed if the IP address hosts multiple servers (on the same port), each of them using a different certificate. If the client sends the SNI to the Server in the client hello, the server looks the SNI up in its certificate list and uses the certificate identified by the SNI.

**Table A.252: CryptoServiceCertificate**

Class	CryptoServiceKey			
<b>Note</b>	This meta-class has the ability to represent a crypto key. <b>Tags:</b> atp.recommendedPackage=CryptoDevelopmentKeys			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
algorithmFamily	String	0..1	attr	This attribute represent the description of the family of the applicable crypto algorithm.
development Value	<a href="#">ValueSpecification</a>	0..1	aggr	This aggregation represents the ability to assign a specific value to the crypto key as part of the system description. This value can then be taken for the development of the respective ECU.
keyGeneration	CryptoServiceKey GenerationEnum	0..1	attr	This attribute describes how a the specific cryptographic key is created.
keyStorageType	String	0..1	attr	This attribute describes where the enclosing cryptographic key shall be stored. AUTOSAR reserves specific values for this attributes but it is possible to insert custom values as well.
length	PositiveInteger	0..1	attr	This attribute describes the length of the cryptographic key in bits.

**Table A.253: CryptoServiceKey**

Class	CryptoServicePrimitive			
<b>Note</b>	This meta-class has the ability to represent a crypto primitive. <b>Tags:</b> atp.recommendedPackage=CryptoPrimitives			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
algorithmFamily	String	0..1	attr	This attribute represents a description of the family (e.g. AES) of crypto algorithm implemented by the crypto primitive.
algorithmMode	String	0..1	attr	This attribute represents a description of the mode of the crypto algorithm implemented by the crypto primitive.
algorithm Secondary Family	String	0..1	attr	This attribute represents a further description of the secondary family of crypto algorithm implemented by the crypto primitive. The secondary family is needed for the specification of the hash algorithm for a signature check, e.g. using RSA.

**Table A.254: CryptoServicePrimitive**

<b>Class</b>	<b>CryptoServiceQueue</b>			
<b>Note</b>	This meta-class has the ability to represent a crypto queue. <b>Tags:</b> atp.recommendedPackage=CryptoServiceQueues			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
queueSize	PositiveInteger	0..1	attr	Defines the queue size of the CryptoServiceQueue.

**Table A.255: CryptoServiceQueue**

<b>Class</b>	<b>CycleCounter</b>			
<b>Note</b>	The communication cycle where the frame is send is described by the attribute "cycleCounter".			
<b>Base</b>	ARObject, <a href="#">CommunicationCycle</a>			
<b>Aggregated by</b>	<a href="#">FlexrayAbsolutelyScheduledTiming.communicationCycle</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
CycleCounter	Integer	0..1	attr	The communication cycle where the frame described by this timing is sent. If a timing is given in this way the referencing FlexrayCluster shall specify the cycleCountMax as upper bound and point of total repetition. This value is incremented at the beginning of each new cycle, ranging from 0 to cycleCountMax, and is reset to 0 after a sequence of cycleCountMax+1 cycles.

**Table A.256: CycleCounter**

<b>Class</b>	<b>CycleRepetition</b>			
<b>Note</b>	The communication cycle where the frame is send is described by the attributes baseCycle and cycleRepetition.			
<b>Base</b>	ARObject, <a href="#">CommunicationCycle</a>			
<b>Aggregated by</b>	<a href="#">FlexrayAbsolutelyScheduledTiming.communicationCycle</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
BaseCycle	Integer	0..1	attr	The first communication cycle where the frame is sent. This value is incremented at the beginning of each new cycle, ranging from 0 to 63, and is reset to 0 after a sequence of 64 cycles.
CycleRepetition	CycleRepetitionType	0..1	attr	The number of communication cycles (after the first cycle) whenever the frame described by this timing is sent again.

**Table A.257: CycleRepetition**

<b>Class</b>	<b>CyclicHandlingComDataToOsTaskProxyMapping</b>			
<b>Note</b>	This meta-class is used to map VariableDataPrototypes to an OsTaskProxy for the Cyclic Handling of Communication Data in the RTE. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.cyclicHandlingComDataToOsTaskProxyMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
e2eNoNewDataExtensionFactor	PositiveInteger	0..1	attr	This attribute defines the jitter factor of E2E no new data reception cycle time.





Class	CyclicHandlingComDataToOsTaskProxyMapping			
e2e Oversampling Period	TimeValue	0..1	attr	This attribute defines an optional E2E oversampling cycle time for the cyclic processing of the mapped VariableData Prototypes.
offset	PositiveInteger	0..1	attr	This attribute is used to describe the position in the Os Task as a relative value.
osTaskProxy	<a href="#">OsTaskProxy</a>	0..1	ref	Reference to the OsTaskProxy.
rxCycleProcess Time	TimeValue	0..1	attr	This attribute defines the cyclic processing time within the OsTask.
variableData Prototype	<a href="#">VariableDataPrototype</a>	*	iref	Reference to the VariableDataPrototypes for which the "Cyclic Handling of Communication Data in the RTE" will be implemented by the RTE. <b>InstanceRef implemented by:</b> <a href="#">VariableDataPrototypeIn SystemInstanceRef</a>

**Table A.258: CyclicHandlingComDataToOsTaskProxyMapping**

Class	CyclicTiming			
Note	Specification of a cyclic sending behavior.			
Base	<i>ARObject</i> , <i>Describable</i>			
Aggregated by	<a href="#">TransmissionModeTiming.cyclicTiming</a>			
Attribute	Type	Mult.	Kind	Note
timeOffset	<a href="#">TimeRangeType</a>	0..1	aggr	This attribute specifies the time until first transmission of this I-PDU. This attribute defines the time between Com_IpduGroupStart and the first transmission of the cyclic part of this transmission request for this I-PDU.
timePeriod	<a href="#">TimeRangeType</a>	0..1	aggr	Period of the repetition of cyclic transmissions.

**Table A.259: CyclicTiming**

Class	DataConstr			
Note	This meta-class represents the ability to specify constraints on data. <b>Tags:</b> atp.recommendedPackage=DataConstrs			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>AtpBlueprint</i> , <i>AtpBlueprintable</i> , <i>CollectableElement</i> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <i>PackageableElement</i> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dataConstrRule	<a href="#">DataConstrRule</a>	*	aggr	This is one particular rule within the data constraints. <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=30 xml.typeElement=false xml.typeWrapperElement=false

**Table A.260: DataConstr**

Class	DataConstrRule			
Note	This meta-class represents the ability to express one specific data constraint rule.			
Base	<i>ARObject</i>			
Aggregated by	<a href="#">DataConstr.dataConstrRule</a>			
Attribute	Type	Mult.	Kind	Note





Class	DataConstrRule			
constrLevel	Integer	0..1	attr	This attribute describes the category of a constraint. One of its functions is in the area of constraint violation, where it can be used from a certain level, to produce error messages. The lower the level, the more stringent the check. Used to distinguish hard or soft limits. <b>Tags:</b> xml.sequenceOffset=20
internalConstrs	InternalConstrs	0..1	aggr	Describes the limitations applicable on the internal domain (as opposed to the physical domain). <b>Tags:</b> xml.sequenceOffset=40
physConstrs	<a href="#">PhysConstrs</a>	0..1	aggr	Describes the limitations applicable on the physical domain (as opposed to the internal domain). <b>Tags:</b> xml.sequenceOffset=30

**Table A.261: DataConstrRule**

Class	DataDumpEntry			
<b>Note</b>	This service is reserved for initial configuration of a slave node by the slave node supplier and the format of this message is supplier specific. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>LinConfigurationEntry</i> , <a href="#">ScheduleTableEntry</a>			
<b>Aggregated by</b>	<a href="#">LinScheduleTable.tableEntry</a>			
Attribute	Type	Mult.	Kind	Note
byteValue (ordered)	Integer	*	attr	Supplier specific format.

**Table A.262: DataDumpEntry**

Class	DataFilter			
<b>Note</b>	Base class for data filters. The type of the filter is specified in attribute dataFilterType. Some of the filter types require additional arguments which are specified as attributes of this class.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">ISignalPort.dataFilter</a> , <a href="#">NonqueuedReceiverComSpec.filter</a> , <a href="#">NonqueuedSenderComSpec.dataFilter</a> , <a href="#">SignalBasedEventElementToSignalTriggeringMapping.filter</a> , <a href="#">SignalBasedFieldToSignalTriggeringMapping.filter</a> , <a href="#">SignalServiceTranslationElementProps.filter</a> , <a href="#">TransmissionModeCondition.dataFilter</a>			
Attribute	Type	Mult.	Kind	Note
dataFilterType	<a href="#">DataFilterTypeEnum</a>	0..1	attr	This attribute specifies the type of the filter.
mask	<a href="#">UnlimitedInteger</a>	0..1	attr	Mask for old and new value.
max	<a href="#">UnlimitedInteger</a>	0..1	attr	Value to specify the upper boundary
min	<a href="#">UnlimitedInteger</a>	0..1	attr	Value to specify the lower boundary
offset	PositiveInteger	0..1	attr	Specifies the initial number of messages to occur before the first message is passed
period	PositiveInteger	0..1	attr	Specifies number of messages to occur before the message is passed again
x	<a href="#">UnlimitedInteger</a>	0..1	attr	Value to compare with

**Table A.263: DataFilter**

Enumeration	DataFilterTypeEnum
Note	This enum specifies the supported DataFilterTypes.
Aggregated by	<a href="#">DataFilter.dataFilterType</a>
Literal	Description
always	No filtering is performed so that the message always passes. <b>Tags:</b> atp.EnumerationLiteralIndex=0
maskedNewDiffers MaskedOld	Pass messages where the masked value has changed. (new_value&mask) !=(old_value&mask) new_value: current value of the message old_value: last value of the message (initialized with the initial value of the message, updated with new_value if the new message value is not filtered out) <b>Tags:</b> atp.EnumerationLiteralIndex=1
maskedNewDiffers X	Pass messages whose masked value is not equal to a specific value x (new_value&mask) != x new_value: current value of the message <b>Tags:</b> atp.EnumerationLiteralIndex=2
maskedNewEquals X	Pass messages whose masked value is equal to a specific value x (new_value&mask) == x new_value: current value of the message <b>Tags:</b> atp.EnumerationLiteralIndex=3
never	The filter removes all messages. <b>Tags:</b> atp.EnumerationLiteralIndex=4
newIsOutside	Pass a message if its value is outside a predefined boundary. (min > new_value) OR (new_value > max) <b>Tags:</b> atp.EnumerationLiteralIndex=5
newIsWithin	Pass a message if its value is within a predefined boundary. min <= new_value <= max <b>Tags:</b> atp.EnumerationLiteralIndex=6
oneEveryN	Pass a message once every N message occurrences. Algorithm: occurrence % period == offset Start: occurrence = 0. Each time the message is received or transmitted, occurrence is incremented by 1 after filtering. Length of occurrence is 8 bit (minimum). <b>Tags:</b> atp.EnumerationLiteralIndex=7

**Table A.264: DataFilterTypeEnum**

Enumeration	DataIdModeEnum
Note	Supported inclusion modes to include the implicit two-byte Data ID in the one-byte CRC.
Aggregated by	<a href="#">E2EProfileConfiguration.dataIdMode</a> , <a href="#">EndToEndTransformationDescription.dataIdMode</a>
Literal	Description
all16Bit	Two bytes are included in the CRC (double ID configuration). <b>Tags:</b> atp.EnumerationLiteralIndex=0
alternating8Bit	One of the two bytes byte is included, alternating high and low byte, depending on parity of the counter (alternating ID configuration). For even counter low byte is included; For odd counters the high byte is included. <b>Tags:</b> atp.EnumerationLiteralIndex=1 This EnumerationLiteral is only used by the AUTOSAR Classic Platform.
lower12Bit	The low byte is included in the implicit CRC calculation, the low nibble of the high byte is transmitted along with the data (i.e. it is explicitly included), the high nibble of the high byte is not used. This is applicable for the IDs up to 12 bits. <b>Tags:</b> atp.EnumerationLiteralIndex=2
lower8Bit	Only low byte is included, high byte is never used. This is applicable if the IDs in a particular system are 8 bits. <b>Tags:</b> atp.EnumerationLiteralIndex=3 This EnumerationLiteral is only used by the AUTOSAR Classic Platform.

**Table A.265: DataIdModeEnum**

<b>Class</b>	<b>DataInterface</b> (abstract)			
<b>Note</b>	The purpose of this meta-class is to act as an abstract base class for subclasses that share the semantics of being concerned about data (as opposed to e.g. operations).			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">PortInterface</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">NvDataInterface</a> , <a href="#">ParameterInterface</a> , <a href="#">SenderReceiverInterface</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.266: DataInterface**

<b>Class</b>	<b>DataMapping</b> (abstract)			
<b>Note</b>	Mapping of port elements (data elements and parameters) to frames and signals.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Subclasses</b>	<a href="#">ClientServerToSignalMapping</a> , <a href="#">SenderReceiverCompositeElementToSignalMapping</a> , <a href="#">SenderReceiverToSignalGroupMapping</a> , <a href="#">SenderReceiverToSignalMapping</a> , <a href="#">TriggerToSignalMapping</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.dataMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
introduction	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents introductory documentation about the data mapping.

**Table A.267: DataMapping**

<b>Class</b>	<b>DataPrototype</b> (abstract)			
<b>Note</b>	Base class for prototypical roles of any data type.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">ApplicationCompositeElementDataPrototype</a> , <a href="#">AutosarDataPrototype</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	This property allows to specify data definition properties which apply on data prototype level. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=swDataDefProps

**Table A.268: DataPrototype**

<b>Class</b>	<b>DataPrototypeInClientServerInterfaceInstanceRef</b>			
<b>Note</b>	This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpInstanceRef</a> , <a href="#">DataPrototypeInPortInterfaceInstanceRef</a>			
<b>Aggregated by</b>	<a href="#">DataPrototypeInPortInterfaceRef.dataPrototypeInClientServerInterface</a> , <a href="#">DiagnosticServiceSwMapping.accessedDataPrototype</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
base	<a href="#">ClientServerInterface</a>	0..1	ref	<b>Stereotypes:</b> atpDerived
contextData PrototypeInCs (ordered)	<a href="#">ApplicationCompositeElementDataPrototype</a>	*	ref	<b>Tags:</b> xml.sequenceOffset=20
rootData PrototypeInCs	<a href="#">AutosarDataPrototype</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=10
targetData PrototypeInCs	<a href="#">DataPrototype</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=30

**Table A.269: DataPrototypeInClientServerInterfaceInstanceRef**



Class	DataPrototypeInPortInterfaceRef			
Note	This class represents a RootDataPrototype that is typed by an ApplicationDataType or Implementation DataType or a DataTypeElement that is aggregated within a composite application data type (record or array).			
Base	ARObject, <a href="#">DataPrototypeReference</a>			
Aggregated by	<a href="#">DataPrototypeTransformationProps.dataPrototypeInPortInterfaceRef</a> , <a href="#">SignalServiceTranslationElementProps.element</a> , <a href="#">TransmissionComSpecProps.onChangeDataPrototype</a>			
Attribute	Type	Mult.	Kind	Note
dataPrototypeInClientServerInterface	<a href="#">DataPrototype</a>	0..1	iref	This element defines a reference to a DataPrototype in the context of a ClientServerInterface. <b>InstanceRef implemented by:</b> <a href="#">DataPrototypeInClientServerInterfaceInstanceRef</a> This Attribute is only used by the AUTOSAR Classic Platform.
dataPrototypeInSenderReceiverInterface	<a href="#">DataPrototype</a>	0..1	iref	This element defines a reference to a DataPrototype in the context of a SenderReceiverInterface. <b>InstanceRef implemented by:</b> <a href="#">DataPrototypeInSenderReceiverInterfaceInstanceRef</a> This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.270: DataPrototypeInPortInterfaceRef**

Class	DataPrototypeInSenderReceiverInterfaceInstanceRef			
Note	This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">AtpInstanceRef</a> , <a href="#">DataPrototypeInPortInterfaceInstanceRef</a>			
Aggregated by	<a href="#">DataPrototypeInPortInterfaceRef.dataPrototypeInSenderReceiverInterface</a>			
Attribute	Type	Mult.	Kind	Note
base	<a href="#">SenderReceiverInterface</a>	0..1	ref	<b>Stereotypes:</b> atpDerived
contextDataPrototypeInSr (ordered)	<a href="#">ApplicationCompositeElementDataPrototype</a>	*	ref	<b>Tags:</b> xml.sequenceOffset=20
rootDataPrototypeInSr	<a href="#">AutosarDataPrototype</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=10
targetDataPrototypeInSr	<a href="#">DataPrototype</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=30

**Table A.271: DataPrototypeInSenderReceiverInterfaceInstanceRef**

Class	DataPrototypeMapping			
Note	Defines the mapping of two particular <a href="#">VariableDataPrototypes</a> , <a href="#">ParameterDataPrototypes</a> or <a href="#">ArgumentDataPrototypes</a> with non-equal <a href="#">shortNames</a> , non-equal structure (specific condition is described by <a href="#">[constr_1187]</a> ), and/or non-equal semantic (resolution or range) in context of two different <a href="#">SenderReceiverInterface</a> , <a href="#">NvDataInterface</a> or <a href="#">ParameterInterface</a> or Operations. If the semantic is unequal, the following rules apply: The <a href="#">textTableMapping</a> is only applicable if the referred <a href="#">DataPrototypes</a> are typed by <a href="#">AutosarDataType</a> referring to <a href="#">CompuMethods</a> of <a href="#">category</a> TEXTTABLE, SCALE_LINEAR_AND_TEXTTABLE or BITFIELD_TEXTTABLE. In the case that the <a href="#">DataPrototypes</a> are typed by <a href="#">AutosarDataType</a> either referring to <a href="#">CompuMethods</a> of <a href="#">category</a> LINEAR, IDENTICAL or referring to no <a href="#">CompuMethod</a> (which is similar as IDENTICAL) the linear conversion factor is calculated out of the <a href="#">factorSiToUnit</a> and <a href="#">offsetSiToUnit</a> attributes of the referred <a href="#">Units</a> and the <a href="#">CompuRationalCoeffs</a> of a <a href="#">compuInternalToPhys</a> of the referred <a href="#">CompuMethods</a> .			
Base	ARObject			
Aggregated by	<a href="#">ClientServerOperationMapping.argumentMapping</a> , <a href="#">VariableAndParameterInterfaceMapping.dataMapping</a>			
Attribute	Type	Mult.	Kind	Note







Class	DataPrototypeMapping			
firstData Prototype	<a href="#">AutosarDataPrototype</a>	0..1	ref	First to be mapped DataPrototype in context of a Sender ReceiverInterface, NvDataInterface, ParameterInterface or Operation.
firstToSecond Data Transformation	<a href="#">DataTransformation</a>	0..1	ref	This reference defines the need to execute the Data Transformation <Mip>.<transformerId> functions of the transformation chain when communicating from the Data PrototypeMapping.firstDataPrototype to the Data PrototypeMapping.secondDataPrototype. This reference also specifies the reverse Data Transformation <Mip>.<Inv>.<transformerId> functions of the transformation chain (i.e. from the DataPrototype Mapping.secondDataPrototype to the DataPrototype Mapping.firstDataPrototype) if the referenced Data Transformation is symmetric, i.e. attribute Data Transformation.dataTransformationKind is set to symmetric.
secondData Prototype	<a href="#">AutosarDataPrototype</a>	0..1	ref	Second to be mapped DataPrototype in context of a SenderReceiverInterface, NvDataInterface, Parameter Interface or Operation.
secondToFirst Data Transformation	<a href="#">DataTransformation</a>	0..1	ref	This defines the need to execute the reverse Data Transformation <Mip>.<Inv>.<transformerId> functions of the transformation chain when communicating from the DataPrototypeMapping.secondDataPrototype to the Data PrototypeMapping.firstDataPrototype.
subElement Mapping	<a href="#">SubElementMapping</a>	*	aggr	This represents the owned SubelementMapping. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=subElementMapping
textTable Mapping	<a href="#">TextTableMapping</a>	0..2	aggr	Applied TextTableMapping(s)

**Table A.272: DataPrototypeMapping**

Class	DataPrototypeReference (abstract)			
Note	This meta-class provides the ability to reference a DataPrototype.			
Base	ARObject			
Subclasses	<a href="#">DataPrototypeInPortInterfaceRef</a> , <a href="#">ImplementationDataTypeElementInPortInterfaceRef</a>			
Aggregated by	<a href="#">DataPrototypeTransformationProps.dataPrototypeInPortInterfaceRef</a> , <a href="#">SignalServiceTranslationElement Props.element</a> , <a href="#">TransmissionComSpecProps.onChangeDataPrototype</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.273: DataPrototypeReference**

Class	DataPrototypeTransformationProps			
Note	DataPrototypeTransformationProps allows to set the attributes for the different Transformation Technologies that are DataPrototype specific.			
Base	ARObject			
Aggregated by	<a href="#">TransformationISignalProps.dataPrototypeTransformationProps</a>			
Attribute	Type	Mult.	Kind	Note
dataPrototypeIn PortInterface Ref	<a href="#">DataPrototype Reference</a>	0..1	aggr	Reference to a DataPrototype that is transported in the serialized ISignal.





Class	DataPrototypeTransformationProps			
ident	DataPrototypeTransformationProps Ident	0..1	aggr	This adds the ability to add a shortName to DataPrototypeTransformationProps. Please note that the short-name needs to be provided if the splitable mechanism is used.
network Representation Props	SwDataDefProps	0..1	aggr	Specification of the actual network representation for the referenced primitive DataPrototype. If a network representation is provided then the baseType shall be used by the Transformer as input for the serialization/deserialization. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=networkRepresentationProps
transformation Props	TransformationProps	0..1	ref	Collection of AutosarDataPrototype related configuration settings for a transformer.

**Table A.274: DataPrototypeTransformationProps**

Class	DataReceiveErrorEvent			
Note	This event is raised when the Com layer detects and notifies an error concerning the reception of the referenced <a href="#">VariableDataPrototype</a> .			
Base	ARObject, <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
data	<a href="#">VariableDataPrototype</a>	0..1	iref	The referenced VariableDataPrototype raises this DataReceiveErrorEvent when there was an error during the reception. <b>InstanceRef implemented by:</b> RVariableInAtomicSwc InstanceRef

**Table A.275: DataReceiveErrorEvent**

Class	DataReceivedEvent			
Note	This event is raised when the referenced data element is received.			
Base	ARObject, <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
data	<a href="#">VariableDataPrototype</a>	0..1	iref	The referenced VariableDataPrototype raises this DataReceivedEvent when the data has been received. <b>InstanceRef implemented by:</b> RVariableInAtomicSwc InstanceRef

**Table A.276: DataReceivedEvent**

Class	DataSendCompletedEvent			
Note	This event is raised when the referenced explicit data element has been sent or an error occurred.			
Base	ARObject, <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note





Class	DataSendCompletedEvent			
eventSource	<a href="#">VariableAccess</a>	0..1	ref	The referenced <a href="#">VariableAccess</a> raises this <a href="#">DataSendCompletedEvent</a> when the explicit write access was successful or an error occurred.

**Table A.277: DataSendCompletedEvent**

Class	DataTransformation			
Note	A DataTransformation represents a transformer chain. It is an ordered list of transformers.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">DataTransformationSet.dataTransformation</a>			
Attribute	Type	Mult.	Kind	Note
data Transformation Kind	<a href="#">DataTransformationKindEnum</a>	0..1	attr	This attribute controls the kind of DataTransformation to be applied.
executeDespite Data Unavailability	Boolean	0..1	attr	Specifies whether the transformer chain is executed even if no input data are available.
transformer Chain (ordered)	<a href="#">TransformationTechnology</a>	*	ref	This attribute represents the definition of a chain of transformers that are supposed to be executed according to the order of being referenced from DataTransformation.

**Table A.278: DataTransformation**

Enumeration	DataTransformationKindEnum
Note	This enumeration contributes to the definition of the scope of the DataTransformation.
Aggregated by	<a href="#">DataTransformation.dataTransformationKind</a>
Literal	Description
asymmetricFrom ByteArray	The DataTransformation shall only be applied to the receiving end only, i.e. transform from byte array to data type. <b>Tags:</b> atp.EnumerationLiteralIndex=0
asymmetricToByte Array	The DataTransformation shall be applied to the sending end only, i.e. from data type to byte array. <b>Tags:</b> atp.EnumerationLiteralIndex=1
symmetric	The DataTransformation shall be applied at both the sending and the receiving end of the communication. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.279: DataTransformationKindEnum**

Class	DataTypeMap			
Note	This class represents the relationship between <a href="#">ApplicationDataType</a> and its implementing <a href="#">AbstractImplementationDataType</a> .			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">DataTypeMappingSet.dataTypeMap</a>			
Attribute	Type	Mult.	Kind	Note
applicationData Type	<a href="#">ApplicationDataType</a>	0..1	ref	This is the corresponding <a href="#">ApplicationDataType</a>
implementation DataType	<a href="#">AbstractImplementationDataType</a>	0..1	ref	This is the corresponding <a href="#">AbstractImplementationDataType</a> .

**Table A.280: DataTypeMap**

<b>Class</b>	<b>DataTypeMappingSet</b>			
<b>Note</b>	This class represents a list of mappings between <a href="#">ApplicationDataTypes</a> and <a href="#">ImplementationDataTypes</a> . In addition, it can contain mappings between <a href="#">ImplementationDataTypes</a> and <a href="#">ModeDeclarationGroups</a> . <b>Tags:</b> atp.recommendedPackage=DataTypeMappingSets			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataTypeMap	<a href="#">DataTypeMap</a>	*	aggr	This is one particular association between an <a href="#">ApplicationDataType</a> and its <a href="#">AbstractImplementationDataType</a> .
modeRequestTypeMap	<a href="#">ModeRequestTypeMap</a>	*	aggr	This is one particular association between an <a href="#">ModeDeclarationGroup</a> and its <a href="#">AbstractImplementationDataType</a> .

**Table A.281: DataTypeMappingSet**

<b>Enumeration</b>	<b>DataTypePolicyEnum</b>
<b>Note</b>	This class lists the supported DataTypesPolicies.
<b>Aggregated by</b>	<a href="#">ISignal.dataTypePolicy</a>
<b>Literal</b>	<b>Description</b>
ddsService	This literal indicates that this ISignal is used to transport a message as part of a service for Dds. <b>Tags:</b> atp.EnumerationLiteralIndex=6 atp.Status=candidate
ddsSignal	This literal indicates that this ISignal is used to transport a signal based signal for Dds. <b>Tags:</b> atp.EnumerationLiteralIndex=5 atp.Status=candidate
legacy	In case the System Description doesn't use a complete Software Component Description (VFB View) this value can be chosen. This supports the inclusion of legacy signals. The aggregation of SwDataDefProps shall be used to configure the "ComSignalDataInvalidValue" and the Data Semantics. <b>Tags:</b> atp.EnumerationLiteralIndex=0
networkRepresentationFromComSpec	Ignore any networkRepresentationProps of this ISignal and use the networkRepresentation from the ComSpec. Please note that the usage does not imply the existence of the SwDataDefProps in the role networkRepresentation aggregated by the SenderComSpec or ReceiverComSpec if an ImplementationDataType is defined. <b>Tags:</b> atp.EnumerationLiteralIndex=1
override	If this value is chosen the requirements specified in the ComSpec (networkRepresentationFromComSpec) are not fulfilled by the aggregated SwDataDefProps. In this case the networkRepresentation is specified by the aggregated swDataDefProps. <b>Tags:</b> atp.EnumerationLiteralIndex=2
transformingISignal	This literal indicates that a transformer chain shall be used to communicate the ISignal as UINT8_N over the bus. <b>Tags:</b> atp.EnumerationLiteralIndex=4

**Table A.282: DataTypePolicyEnum**

<b>Class</b>	<b>DataWriteCompletedEvent</b>
<b>Note</b>	This event is raised when an implicit write access was successful or an error occurred.
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>





Class	DataWriteCompletedEvent			
Attribute	Type	Mult.	Kind	Note
eventSource	<a href="#">VariableAccess</a>	0..1	ref	The referenced <a href="#">VariableAccess</a> raises this <a href="#">DataWriteCompletedEvent</a> when the implicit write access was successful or an error occurred.

**Table A.283: DataWriteCompletedEvent**

Class	DcmIPdu			
Note	Represents the IPdus handled by Dcm. <b>Tags:</b> atp.recommendedPackage=Pdus			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagPduType	DiagPduType	0..1	attr	Attribute is used to distinguish a request from a response.

**Table A.284: DcmIPdu**

Class	DdsCpConsumedServiceInstance			
Note	This meta-class represents the ability to describe the existence and configuration of a consumed (required) service instance in a concrete implementation on top of DDS. <b>Tags:</b> atp.Status=candidate			
Base	<a href="#">ARObject</a> , <a href="#">AbstractServiceInstance</a> , <a href="#">DdsCpServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	ServiceInstanceCollectionSet.serviceInstance			
Attribute	Type	Mult.	Kind	Note
consumedEvent	<a href="#">DdsServiceInstanceEventCp</a>	*	aggr	Collection of consumed events. <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=consumedEvent.shortName, consumedEvent.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild
consumedField	<a href="#">DdsServiceInstanceFieldCp</a>	*	aggr	Collection of consumed fields. <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=consumedField.shortName, consumedField.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild
consumedOperation	<a href="#">DdsServiceInstanceOperationCp</a>	*	aggr	Collection of consumed operations. <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=consumedOperation.shortName, consumedOperation.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild





Class	DdsCpConsumedServiceInstance			
localUnicastAddress	<a href="#">ApplicationEndpoint</a>	0..1	ref	The local address over which the Service is consumed. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=localUnicastAddress.applicationEndpoint, localUnicastAddress.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=systemDesignTime xml.namePlural=LOCAL-UNICAST-ADDRESSES
requiredServiceInstanceID	PositiveInteger	0..1	attr	This attribute describes the required service instance ID. <b>Tags:</b> atp.Status=candidate
staticRemoteMulticastAddress	<a href="#">ApplicationEndpoint</a>	0..1	ref	This reference defines the remote multicast address of the Service provider. This reference shall ONLY be used if the remote multicast address of the server is determined from the configuration and not at runtime. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=staticRemoteMulticastAddress.applicationEndpoint, staticRemoteMulticastAddress.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=systemDesignTime xml.namePlural=STATIC-REMOTE-MULTICAST-ADDRESSES
staticRemoteUnicastAddress	<a href="#">ApplicationEndpoint</a>	0..1	ref	This reference defines the remote unicast address of the Service provider. This reference shall ONLY be used if the remote unicast address of the server is determined from the configuration and not at runtime. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=staticRemoteUnicastAddress.applicationEndpoint, staticRemoteUnicastAddress.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=systemDesignTime xml.namePlural=STATIC-REMOTE-UNICAST-ADDRESSES

**Table A.285: DdsCpConsumedServiceInstance**

Class	DdsCpISignalToDdsTopicMapping			
<b>Note</b>	Mapping of an ISignal to a DdsTopic. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">SystemMapping.ddsISignalToTopicMapping</a>			
Attribute	Type	Mult.	Kind	Note
ddsTopic	DdsCpTopic	0..1	ref	Reference to the DdsTopic. <b>Tags:</b> atp.Status=candidate
iSignal	<a href="#">ISignal</a>	0..1	ref	Reference to the ISignal. <b>Tags:</b> atp.Status=candidate

**Table A.286: DdsCpISignalToDdsTopicMapping**

<b>Class</b>	<b>DdsCpProvidedServiceInstance</b>			
<b>Note</b>	This meta-class represents the ability to describe the existence and configuration of a provided service instance in a concrete implementation on top of DDS. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, <a href="#">AbstractServiceInstance</a> , <a href="#">DdsCpServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ServiceInstanceCollectionSet.serviceInstance			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
localUnicastAddress	<a href="#">ApplicationEndpoint</a>	0..1	ref	The local address over which the Service is provided. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=localUnicastAddress.applicationEndpoint, localUnicastAddress.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=systemDesignTime xml.namePlural=LOCAL-UNICAST-ADDRESSES
providedEvent	<a href="#">DdsServiceInstanceEventCp</a>	*	aggr	Collection of provided events. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=providedEvent.shortName, providedEvent.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild
providedField	<a href="#">DdsServiceInstanceFieldCp</a>	*	aggr	Collection of provided fields. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=providedField.shortName, providedField.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild
providedOperation	<a href="#">DdsServiceInstanceOperationCp</a>	*	aggr	Collection of provided operations. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=providedOperation.shortName, providedOperation.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild
providedServiceInstanceId	PositiveInteger	0..1	attr	This attribute describes the provided service instance ID. <b>Tags:</b> atp.Status=candidate
staticRemoteMulticastAddress	<a href="#">ApplicationEndpoint</a>	0..1	ref	This reference defines the remote multicast address of Service consumers. This reference shall ONLY be used if the remote multicast address of the clients is determined from the configuration and not at runtime. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=staticRemoteMulticastAddress.applicationEndpoint, staticRemoteMulticastAddress.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=systemDesignTime xml.name Plural=STATIC-REMOTE-MULTICAST-ADDRESSES





Class	DdsCpProvidedServiceInstance			
staticRemoteUnicastAddress	<a href="#">ApplicationEndpoint</a>	*	ref	<p>This reference defines the remote unicast addresses of Service consumers.</p> <p>This reference shall ONLY be used if the remote unicast address of the clients is determined from the configuration and not at runtime.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b></p> <p>atp.Splitkey=staticRemoteUnicastAddress.applicationEndpoint, staticRemoteUnicastAddress.variationPoint.shortLabel</p> <p>atp.Status=candidate</p> <p>vh.latestBindingTime=systemDesignTime</p> <p>xml.name</p> <p>Plural=STATIC-REMOTE-UNICAST-ADDRESSES</p>

**Table A.287: DdsCpProvidedServiceInstance**

Class	DdsCpServiceInstance (abstract)			
<b>Note</b>	Provided and Consumed Dds Service Instances that are available at the ApplicationEndpoint. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">DdsCpConsumedServiceInstance</a> , <a href="#">DdsCpProvidedServiceInstance</a>			
<b>Aggregated by</b>	ServiceInstanceCollectionSet.serviceInstance			
Attribute	Type	Mult.	Kind	Note
ddsFieldReplyTopic	DdsCpTopic	0..1	ref	Reference to the DdsTopic used as fragment for the topic name of field setters. <b>Tags:</b> atp.Status=candidate
ddsFieldRequestTopic	DdsCpTopic	0..1	ref	Reference to the DdsTopic used as fragment for the topic name of field getters. <b>Tags:</b> atp.Status=candidate
ddsMethodReplyTopic	DdsCpTopic	0..1	ref	Reference to the DdsTopic used as fragment for the topic name of method replies. <b>Tags:</b> atp.Status=candidate
ddsMethodRequestTopic	DdsCpTopic	0..1	ref	Reference to the DdsTopic used as fragment for the topic name of method requests. <b>Tags:</b> atp.Status=candidate
ddsServiceQosProfile	DdsCpQosProfile	0..1	ref	Reference to the QOS Profile used for the service. <b>Tags:</b> atp.Status=candidate
discoveryType	DdsDiscoveryTypeEnum	0..1	attr	Defines the discovery scheme for this DDS Service Instance.
resourceIdentifierType	DdsResourceIdentifierTypeEnum	0..1	attr	Defines the in-band instance identification fields used to discriminate samples related to specific Service Instances sharing the same DDS Topics. <b>Tags:</b> atp.Status=candidate
serviceInterfaceId	String	0..1	attr	Unique Identifier that identifies the ServiceInterface in DDS. This Identifier is encoded in the USER_DATA QoS of the DomainParticipant associated with the Service Instance and its value is propagated by DDS Discovery messages. <b>Tags:</b> atp.Status=candidate
serviceMinorVersion	PositiveInteger	0..1	attr	Minor Version of the Service defined by this DdsCp ServiceInstance. <b>Tags:</b> atp.Status=candidate







<b>Class</b>	<b>DdsCpServiceInstance</b> (abstract)			
transport Protocol	String	0..1	attr	This attribute defines which Transport Layer Protocol(s) this Instance is intended to use. <b>Tags:</b> atp.Status=candidate

**Table A.288: DdsCpServiceInstance**

<b>Class</b>	<b>DdsServiceInstanceEventCp</b>			
<b>Note</b>	This element represents an event as part of the DDS Service Instance. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, DdsAbstractServiceInstanceElementCp, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DdsCpConsumedServiceInstance.consumedEvent</a> , <a href="#">DdsCpProvidedServiceInstance.providedEvent</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ddsEventQos Profile	DdsCpQosProfile	0..1	ref	Reference to the QOS Profile used for this Event. <b>Tags:</b> atp.Status=candidate
ddsEventTopic	DdsCpTopic	0..1	ref	Reference to the DDS Topic used for this Event. <b>Tags:</b> atp.Status=candidate
eventTriggering	<a href="#">PduTriggering</a>	0..1	ref	Reference to the PduTriggering used for the upper layer transport of this DdsEvent message. <b>Tags:</b> atp.Status=candidate

**Table A.289: DdsServiceInstanceEventCp**

<b>Class</b>	<b>DdsServiceInstanceFieldCp</b>			
<b>Note</b>	This element represents a field as part of the DDS Service Instance. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, DdsAbstractServiceInstanceElementCp, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DdsCpConsumedServiceInstance.consumedField</a> , <a href="#">DdsCpProvidedServiceInstance.providedField</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
getter	<a href="#">DdsServiceInstanceOperationCp</a>	0..1	ref	Reference to the field getter operation. <b>Tags:</b> atp.Status=candidate
notifier	<a href="#">DdsServiceInstanceEventCp</a>	0..1	ref	Reference to the field notifier event. <b>Tags:</b> atp.Status=candidate
setter	<a href="#">DdsServiceInstanceOperationCp</a>	0..1	ref	Reference to the field setter operation. <b>Tags:</b> atp.Status=candidate

**Table A.290: DdsServiceInstanceFieldCp**

<b>Class</b>	<b>DdsServiceInstanceOperationCp</b>			
<b>Note</b>	This element represents an operation as part of the DDS Service Instance. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, DdsAbstractServiceInstanceElementCp, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DdsCpConsumedServiceInstance.consumedOperation</a> , <a href="#">DdsCpProvidedServiceInstance.providedOperation</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operation Request Triggering	<a href="#">PduTriggering</a>	0..1	ref	Reference to the PduTriggering used for the upper layer transport of this DdsOperation request message. <b>Tags:</b> atp.Status=candidate





Class	DdsServiceInstanceOperationCp			
operation Response Triggering	<a href="#">PduTriggering</a>	0..1	ref	Reference to the PduTriggering used for the upper layer transport of this DdsOperation response message. <b>Tags:</b> atp.Status=candidate

**Table A.291: DdsServiceInstanceOperationCp**

Class	DdsTransformationDescription			
<b>Note</b>	The DdsTransformationDescription is used to specify the DDS transformer specific attributes. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	<i>ARObject</i> , <i>Describable</i> , <a href="#">TransformationDescription</a>			
<b>Aggregated by</b>	<a href="#">TransformationTechnology.transformationDescription</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.292: DdsTransformationDescription**

Class	DefaultValueElement			
<b>Note</b>	The default value consists of a number of elements. Each element is one byte long and the number of elements is specified by SduLength.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">PduMappingDefaultValue.defaultValueElement</a>			
Attribute	Type	Mult.	Kind	Note
elementByte Value	Integer	0..1	attr	The integer value of a freely defined data byte.
elementPosition	Integer	0..1	attr	This attribute specifies the byte position of the element within the default value

**Table A.293: DefaultValueElement**

Class	DelegatedPortAnnotation			
<b>Note</b>	Annotation to a "delegated port" to specify the Signal Fan In or Signal Fan Out inside the CompositionSw ComponentType.			
<b>Base</b>	<i>ARObject</i> , <i>GeneralAnnotation</i>			
<b>Aggregated by</b>	<a href="#">PortPrototype.delegatedPortAnnotation</a>			
Attribute	Type	Mult.	Kind	Note
signalFan	SignalFanEnum	0..1	attr	Specifies the Signal Fan In or Signal Fan Out inside the Composition Type.

**Table A.294: DelegatedPortAnnotation**

Class	DelegationSwConnector			
<b>Note</b>	A delegation connector delegates one inner <a href="#">PortPrototype</a> (a port of a component that is used inside the composition) to a outer <a href="#">PortPrototype</a> of compatible type that belongs directly to the composition (a port that is owned by the composition).			
<b>Base</b>	<i>ARObject</i> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">SwConnector</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">CompositionSwComponentType.connector</a>			
Attribute	Type	Mult.	Kind	Note





Class	DelegationSwConnector			
innerPort	<a href="#">PortPrototype</a>	0..1	iref	The port that belongs to the ComponentPrototype in the composition <b>InstanceRef implemented by:</b> PortInCompositionType InstanceRef
outerPort	<a href="#">PortPrototype</a>	0..1	ref	The port that is located on the outside of the Composition Type

**Table A.295: DelegationSwConnector**

Class	DependencyOnArtifact			
Note	Dependency on the existence of another artifact, e.g. a library.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">Implementation.generatedArtifact</a> , <a href="#">Implementation.requiredArtifact</a> , <a href="#">Implementation.requiredGenerator Tool</a>			
Attribute	Type	Mult.	Kind	Note
artifact Descriptor	AutosarEngineering Object	0..1	aggr	The specified artifact needs to exist.
usage	DependencyUsage Enum	*	attr	Specification for which process step(s) this dependency is required.

**Table A.296: DependencyOnArtifact**

Class	Dhcpv6Props			
Note	This meta-class specifies the configuration options for DHCPv6.			
Base	<i>ARObject</i>			
Aggregated by	Ipv6Props.dhcpProps			
Attribute	Type	Mult.	Kind	Note
tcplpDhcpV6 CnfDelayMax	TimeValue	0..1	attr	Maximum delay in seconds before sending the first Confirm message. If this value is bigger than the previous minimum delay value a random delay will be chosen from the interval.
tcplpDhcpV6 CnfDelayMin	TimeValue	0..1	attr	Minimum delay in seconds before the first Confirm message will be sent.
tcplpDhcpV6Inf DelayMax	TimeValue	0..1	attr	Maximum delay in seconds before sending the first Information Request message. If this value is bigger than the previous minimum delay value a random delay will be chosen from the interval.
tcplpDhcpV6Inf DelayMin	TimeValue	0..1	attr	Minimum delay (s) before the first Information Request message will be sent.
tcplpDhcpV6Sol DelayMax	TimeValue	0..1	attr	Maximum delay in seconds before sending the first Solicit message. If this value is bigger than the previous minimum delay value a random delay will be chosen from the interval.
tcplpDhcpV6Sol DelayMin	TimeValue	0..1	attr	Minimum delay (s) before the first Solicit message will be sent.

**Table A.297: Dhcpv6Props**

<b>Class</b>	<b>DiagEventDebounceCounterBased</b>			
<b>Note</b>	This meta-class represents the ability to indicate that the counter-based debounce algorithm shall be used by the DEM for this diagnostic monitor. This is related to set the ECUC choice container DemDebounceAlgorithmClass to DemDebounceCounterBased.			
<b>Base</b>	ARObject, DiagEventDebounceAlgorithm, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticDebounceAlgorithmProps.debounceAlgorithm</a> , <a href="#">DiagnosticEventNeeds.diagEventDebounceAlgorithm</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
counterBasedFdcThresholdStorageValue	Integer	0..1	attr	Threshold to allocate an event memory entry and to capture the Freeze Frame.
counterDecrementStepSize	Integer	0..1	attr	This value shall be taken to decrement the internal debounce counter. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
counterFailedThreshold	Integer	0..1	attr	This value defines the event-specific limit that indicates the "failed" counter status. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
counterIncrementStepSize	Integer	0..1	attr	This value shall be taken to increment the internal debounce counter. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
counterJumpDown	Boolean	0..1	attr	This value activates or deactivates the counter jump-down behavior. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
counterJumpDownValue	Integer	0..1	attr	This value represents the initial value of the internal debounce counter if the counting direction changes from incrementing to decrementing. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
counterJumpUp	Boolean	0..1	attr	This value activates or deactivates the counter jump-up behavior. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
counterJumpUpValue	Integer	0..1	attr	This value represents the initial value of the internal debounce counter if the counting direction changes from decrementing to incrementing. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
counterPassedThreshold	Integer	0..1	attr	This value defines the event-specific limit that indicates the "passed" counter status. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.298: DiagEventDebounceCounterBased**

<b>Class</b>	<b>DiagEventDebounceMonitorInternal</b>			
<b>Note</b>	This meta-class represents the ability to indicate that no Dem pre-debounce algorithm shall be used for this diagnostic monitor. The SWC might implement an internal debouncing algorithm and report qualified (debounced) results to the Dem/DM.			
<b>Base</b>	ARObject, DiagEventDebounceAlgorithm, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticDebounceAlgorithmProps.debounceAlgorithm</a> , <a href="#">DiagnosticEventNeeds.diagEventDebounceAlgorithm</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.299: DiagEventDebounceMonitorInternal**

<b>Class</b>	<b>DiagEventDebounceTimeBased</b>			
<b>Note</b>	This meta-class represents the ability to indicate that the time-based pre-debounce algorithm shall be used by the Dem for this diagnostic monitor. This is related to set the EcuC choice container DemDebounceAlgorithmClass to DemDebounceTimeBase.			
<b>Base</b>	ARObject, DiagEventDebounceAlgorithm, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticDebounceAlgorithmProps.debounceAlgorithm</a> , <a href="#">DiagnosticEventNeeds.diagEventDebounceAlgorithm</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
timeBasedFdcThresholdStorageValue	TimeValue	0..1	attr	Threshold to allocate an event memory entry and to capture the Freeze Frame. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
timeFailedThreshold	TimeValue	0..1	attr	This value represents the event-specific delay indicating the "failed" status. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
timePassedThreshold	TimeValue	0..1	attr	This value represents the event-specific delay indicating the "passed" status. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.300: DiagEventDebounceTimeBased**

<b>Class</b>	<b>DiagnosticAbstractDataIdentifier</b> (abstract)			
<b>Note</b>	This meta-class represents an abstract base class for the modeling of a diagnostic data identifier (DID).			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">DiagnosticDataIdentifier</a> , <a href="#">DiagnosticDynamicDataIdentifier</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
id	PositiveInteger	0..1	attr	This is the numerical identifier used to identify the DiagnosticAbstractDataIdentifier in the scope of diagnostic workflow <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.301: DiagnosticAbstractDataIdentifier**

<b>Class</b>	<b>DiagnosticAbstractParameter</b> (abstract)			
<b>Note</b>	This meta-class represents an abstract base class for modeling a diagnostic parameter.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">DiagnosticParameter</a> , <a href="#">DiagnosticParameterElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bitOffset	PositiveInteger	0..1	attr	This represents the bitOffset of the DiagnosticParameter. The value of the bitOffset shall always be interpreted as relative to the start of the enclosing DiagnosticDataIdentifier, DiagnosticParameterIdentifier, or DiagnosticRoutineSubfunction. <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> atp.Status=candidate





Class	<b>DiagnosticAbstractParameter</b> (abstract)			
dataElement	<a href="#">DiagnosticDataElement</a>	0..1	aggr	This represents the related dataElement of the Diagnostic Parameter <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=dataElement.shortName, dataElement.variationPoint.shortLabel vh.latestBindingTime=postBuild
parameterSize	PositiveInteger	0..1	attr	This attribute allows for the specification of the parameter size. This information is relevant if there is a gap between one diagnostic parameter and the following diagnostic parameter (or the tail of the telegram). The unit is bit and the values shall be multiples of 8. <b>Tags:</b> atp.Status=candidate

**Table A.302: DiagnosticAbstractParameter**

Class	<b>DiagnosticAccessPermission</b>			
<b>Note</b>	This represents the specification of whether a given service can be accessed according to the existence of meta-classes referenced by a particular DiagnosticAccessPermission. In other words, this meta-class acts as a mapping element between several (otherwise unrelated) pieces of information that are put into context for the purpose of checking for access rights. <b>Tags:</b> atp.recommendedPackage=DiagnosticAccessPermissions			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
authentication Enabled	DiagnosticAuthRole Proxy	0..1	aggr	The existence of this aggregation indicates that an authentication is foreseen. The details are clarified by the aggregated class. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=authenticationEnabled
diagnostic Session	<a href="#">DiagnosticSession</a>	*	ref	This represents the associated DiagnosticSessions <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=diagnosticSession
environmental Condition	<a href="#">DiagnosticEnvironmentalCondition</a>	0..1	ref	This represents the environmental conditions associated with the access permission. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=environmentalCondition
securityLevel	<a href="#">DiagnosticSecurityLevel</a>	*	ref	This represents the associated DiagnosticSecurityLevels <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=securityLevel

**Table A.303: DiagnosticAccessPermission**

Class	<b>DiagnosticAging</b>			
<b>Note</b>	Defines the aging algorithm. <b>Tags:</b> atp.recommendedPackage=DiagnosticAgings			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticAging			
agingCycle	<a href="#">DiagnosticOperation Cycle</a>	0..1	ref	This represents the applicable aging cycle. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=agingCycle.diagnosticOperationCycle, agingCycle.variationPoint.shortLabel vh.latestBindingTime=postBuild
threshold	PositiveInteger	0..1	attr	Number of aging cycles needed to unlearn/delete the event. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild

**Table A.304: DiagnosticAging**

Class	<i>DiagnosticAuthentication</i> (abstract)			
Note	This meta-class represents the ability to configure the usage of the UDS service Authentication in the Diagnostic extract.			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">DiagnosticAuthTransmitCertificate</a> , <a href="#">DiagnosticAuthenticationConfiguration</a> , <a href="#">DiagnosticDeAuthentication</a> , <a href="#">DiagnosticProofOfOwnership</a> , <a href="#">DiagnosticVerifyCertificateBidirectional</a> , <a href="#">DiagnosticVerifyCertificate Unidirectional</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
authentication Class	Diagnostic AuthenticationClass	0..1	ref	This represents the corresponding "class", i.e. this meta-class provides properties that are shared among all instances of applicable sub-classes of DiagnosticService Instance. The subclasses that affected by this pattern implement references to the applicable "class"-role that substantiate this abstract reference.

**Table A.305: DiagnosticAuthentication**

Class	DiagnosticAuthenticationConfiguration			
Note	This meta-class represents the subfunction to configure the authentication. <b>Tags:</b> atp.recommendedPackage=DiagnosticAuthentications			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticAuthentication</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.306: DiagnosticAuthenticationConfiguration**

Class	DiagnosticClearResetEmissionRelatedInfo			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x04 service. <b>Tags:</b> atp.recommendedPackage=DiagnosticClearResetEmissionRelatedInfos			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticClearResetEmissionRelatedInfo			
clearResetEmissionRelatedDiagnosticInfoClass	DiagnosticClearResetEmissionRelatedInfoClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticClearResetEmissionRelatedInfo in the given context.

**Table A.307: DiagnosticClearResetEmissionRelatedInfo**

Class	DiagnosticComControl			
Note	This represents an instance of the "Communication Control" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticCommunicationControls			
Base	ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
comControlClass	DiagnosticComControlClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticComControl in the given context.
customSubFunctionNumber	PositiveInteger	0..1	attr	This attribute shall be used to define a custom sub-function number if none of the standardized values of category shall be used.

**Table A.308: DiagnosticComControl**

Class	DiagnosticComControlSpecificChannel			
Note	This represents the ability to add further attributes to the definition of a specific channel that is subject to the diagnostic service "communication control".			
Base	ARObject			
Aggregated by	DiagnosticComControlClass.specificChannel			
Attribute	Type	Mult.	Kind	Note
specificChannel	<a href="#">CommunicationCluster</a>	0..1	ref	This represents the affected CommunicationCluster in the role specificChannel
specificPhysicalChannel	<a href="#">EthernetPhysicalChannel</a>	0..1	ref	This represents the affected specific EthernetPhysicalChannel.
subnetNumber	PositiveInteger	0..1	attr	This represents the applicable subnet number (which is an arbitrary number ranging from 1..14)

**Table A.309: DiagnosticComControlSpecificChannel**

Class	DiagnosticComControlSubNodeChannel			
Note	This represents the ability to add further attributes to the definition of a specific sub-node channel that is subject to the diagnostic service "communication control".			
Base	ARObject			
Aggregated by	DiagnosticComControlClass.subNodeChannel			
Attribute	Type	Mult.	Kind	Note
subNodeChannel	<a href="#">CommunicationCluster</a>	0..1	ref	This represents the affected CommunicationCluster in the role subNodeChannel







Class	DiagnosticComControlSubNodeChannel			
subNode Number	PositiveInteger	0..1	attr	This represents the applicable subNode number. The value corresponds to the request message parameter nodeIdentificationNumber of diagnostic service CommunicationControl (0x28).
subNode Physical Channel	<a href="#">EthernetPhysicalChannel</a>	0..1	ref	This represents the affected sub-node EthernetPhysicalChannel.

**Table A.310: DiagnosticComControlSubNodeChannel**

Class	DiagnosticCommonElement (abstract)			
Note	This meta-class represents a common base class for all diagnostic elements. It does not contribute any specific functionality other than the ability to become the target of a reference.			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">DiagnosticAbstractAliasEvent</a> , <a href="#">DiagnosticAbstractDataIdentifier</a> , <a href="#">DiagnosticAccessPermission</a> , <a href="#">DiagnosticAging</a> , <a href="#">DiagnosticAuthRole</a> , <a href="#">DiagnosticCondition</a> , <a href="#">DiagnosticConditionGroup</a> , <a href="#">DiagnosticCustomServiceClass</a> , <a href="#">DiagnosticDataIdentifierSet</a> , <a href="#">DiagnosticEcuInstanceProps</a> , <a href="#">DiagnosticEnvironmentalCondition</a> , <a href="#">DiagnosticEvent</a> , <a href="#">DiagnosticExtendedDataRecord</a> , <a href="#">DiagnosticFimEventGroup</a> , <a href="#">DiagnosticFreezeFrame</a> , <a href="#">DiagnosticFunctionIdentifier</a> , <a href="#">DiagnosticFunctionIdentifierInhibit</a> , <a href="#">DiagnosticIndicator</a> , <a href="#">DiagnosticInfoType</a> , <a href="#">DiagnosticLumpr</a> , <a href="#">DiagnosticLumprDenominatorGroup</a> , <a href="#">DiagnosticLumprGroup</a> , <a href="#">DiagnosticJ1939ExpandedFreezeFrame</a> , <a href="#">DiagnosticJ1939FreezeFrame</a> , <a href="#">DiagnosticJ1939Node</a> , <a href="#">DiagnosticJ1939Spn</a> , <a href="#">DiagnosticMapping</a> , <a href="#">DiagnosticMeasurementIdentifier</a> , <a href="#">DiagnosticMemoryDestination</a> , <a href="#">DiagnosticMemoryIdentifier</a> , <a href="#">DiagnosticOperationCycle</a> , <a href="#">DiagnosticParameterIdentifier</a> , <a href="#">DiagnosticPowertrainFreezeFrame</a> , <a href="#">DiagnosticProtocol</a> , <a href="#">DiagnosticRoutine</a> , <a href="#">DiagnosticSecurityLevel</a> , <a href="#">DiagnosticServiceClass</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">DiagnosticServiceTable</a> , <a href="#">DiagnosticSession</a> , <a href="#">DiagnosticTestResult</a> , <a href="#">DiagnosticTestRoutineIdentifier</a> , <a href="#">DiagnosticTroubleCode</a> , <a href="#">DiagnosticTroubleCodeGroup</a> , <a href="#">DiagnosticTroubleCodeProps</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.311: DiagnosticCommonElement**

Class	«atpVariation» DiagnosticCommonProps			
Note	This meta-class aggregates a number of common properties that are shared among a diagnostic extract. <b>Tags:</b> vh.latestBindingTime=codeGenerationTime			
Base	ARObject			
Aggregated by	<a href="#">DiagnosticContributionSet.commonProperties</a>			
Attribute	Type	Mult.	Kind	Note
authentication Timeout	TimeValue	0..1	attr	This attribute defines the time (in seconds) that the authentication state is maintained in default-session if there is no communication from the authenticated client.
debounce AlgorithmProps	<a href="#">DiagnosticDebounceAlgorithmProps</a>	*	aggr	Defines the used debounce algorithms relevant in the context of the enclosing DiagnosticCommonProps. Usually, there is a variety of debouncing algorithms to take into account and therefore the multiplicity of this aggregation is set to 0..*. Note: This atpSplittable property has no atp.Splitkey due to atpVariation (PropertySetPattern). <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild





Class	«atpVariation» DiagnosticCommonProps			
default Endianness	ByteOrderEnum	0..1	attr	Defines the default endianness of the data belonging to a DID or RID which is applicable if the DiagnosticData Element does not define the endianness via the swData DefProps.baseType attribute.
event Combination Reporting Behavior	DiagnosticEventCombinationReportingBehaviorEnum	0..1	attr	In case of EventCombination on Retrieval, this attribute specifies if a specific order of reporting is to be maintained.
maxNumberOfRequestCorrectlyReceivedResponsePending	PositiveInteger	0..1	attr	Maximum number of negative responses with response code 0x78 (requestCorrectlyReceived-ResponsePending) allowed per request. DCM will send a negative response with response code 0x10 (generalReject), in case the limit value gets reached. Value 0xFF means that no limit number of NRC 0x78 response apply.
occurrence Counter Processing	DiagnosticOccurrenceCounterProcessingEnum	0..1	attr	This attribute defines the consideration of the fault confirmation process for the occurrence counter.
resetConfirmedBitOnOverflow	Boolean	0..1	attr	This attribute defines, whether the confirmed bit is reset or not while an event memory entry will be displaced.
resetPendingBitOnOverflow	Boolean	0..1	attr	This attribute defines, whether the pending bit is reset or not while an event memory entry will be displaced. In order to be compliant to ISO 14229-1 [1], this parameter needs to be set to "false".
responseOnAllRequestSids	Boolean	0..1	attr	If set to FALSE the DCM will not respond to diagnostic request that contains a service ID which is in the range from 0x40 to 0x7F or in the range from 0xC0 to 0xFF (Response IDs).
responseOnSecondDeclinedRequest	Boolean	0..1	attr	Defines the reaction upon a second request (ClientB) that can not be processed (e.g. due to priority assessment). TRUE: when the second request (Client B) can not be processed, it shall be answered with NRC21 BusyRepeat Request. FALSE: when the second request (Client B) can not be processed, it shall not be responded.
typeOfEventCombinationSupported	DiagnosticEventCombinationBehaviorEnum	0..1	attr	Select type of Event Combination support.

**Table A.312: DiagnosticCommonProps**

Enumeration	DiagnosticCompareTypeEnum
Note	Enumeration for the type of a comparison of values usually expressed by the following operators: ==, !=, <, <=, >, >=
Aggregated by	DiagnosticEnvCompareCondition.compareType
Literal	Description
isEqual	equal Tags: atp.EnumerationLiteralIndex=0
isGreaterOrEqual	greater than or equal Tags: atp.EnumerationLiteralIndex=5
isGreaterThan	greater than Tags: atp.EnumerationLiteralIndex=4
isLessOrEqual	less than or equal Tags: atp.EnumerationLiteralIndex=3
isLessThan	less than Tags: atp.EnumerationLiteralIndex=2
isNotEqual	not equal Tags: atp.EnumerationLiteralIndex=1

**Table A.313: DiagnosticCompareTypeEnum**

<b>Class</b>	<b>DiagnosticCondition</b> (abstract)			
<b>Note</b>	Abstract element for StorageConditions and EnableConditions.			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">DiagnosticEnableCondition</a> , <a href="#">DiagnosticStorageCondition</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initValue	Boolean	0..1	attr	Defines the initial status for enable or disable of acceptance/storage of event reports of a diagnostic event. The value is the initialization after power up (before this condition is reported the first time). true: acceptance/storage of a diagnostic event enabled false: acceptance/storage of a diagnostic event disabled

**Table A.314: DiagnosticCondition**

<b>Class</b>	<b>DiagnosticConnectedIndicator</b>			
<b>Note</b>	Description of indicators that are defined per DiagnosticEvent.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticEvent.connectedIndicator</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
behavior	DiagnosticConnectedIndicatorBehaviorEnum	0..1	attr	Behavior of the linked indicator.
healingCycleCounterThreshold	PositiveInteger	0..1	attr	This attribute defines the number of healing cycles for the WarningIndicatorOffCriteria <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
indicator	<a href="#">DiagnosticIndicator</a>	0..1	ref	Reference to the used indicator.
indicatorFailureCycleCounterThreshold	PositiveInteger	0..1	attr	This attribute defines the number of failure cycles for the WarningIndicatorOnCriteria. Please note that this attribute is not relevant for the Adaptive Platform.

**Table A.315: DiagnosticConnectedIndicator**

<b>Class</b>	<b>DiagnosticConnection</b>			
<b>Note</b>	DiagnosticConnction that is used to describe the relationship between several TP connections. <b>Tags:</b> atp.recommendedPackage=DiagnosticConnections			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
functionalRequest	<a href="#">TpConnectionIdent</a>	*	ref	Reference to functional request messages.
periodicResponseUdt	<a href="#">PduTriggering</a>	*	ref	Reference to UUDT responses.
physicalRequest	<a href="#">TpConnectionIdent</a>	0..1	ref	Reference to a physical request message.
response	<a href="#">TpConnectionIdent</a>	0..1	ref	In the vast majority of cases a response is required. However, there are also cases where providing the response is not possible and/or not allowed.

**Table A.316: DiagnosticConnection**

<b>Class</b>	<b>DiagnosticContributionSet</b>			
<b>Note</b>	This meta-class represents a root node of a diagnostic extract. It bundles a given set of diagnostic model elements. The granularity of the DiagnosticContributionSet is arbitrary in order to support the aspect of decentralized configuration, i.e. different contributors can come up with an own DiagnosticContributionSet. <b>Tags:</b> atp.recommendedPackage=DiagnosticContributionSets			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
common Properties	<a href="#">DiagnosticCommonProps</a>	0..1	aggr	This attribute represents a collection of diagnostic properties that are shared among the entire DiagnosticContributionSet. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=commonProperties
element	<a href="#">DiagnosticCommonElement</a>	*	ref	This represents a DiagnosticCommonElement considered in the context of the DiagnosticContributionSet <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=element.diagnosticCommonElement, element.variationPoint.shortLabel vh.latestBindingTime=postBuild
serviceTable	<a href="#">DiagnosticServiceTable</a>	*	ref	This represents the collection of DiagnosticServiceTables to be considered in the scope of this DiagnosticContributionSet. <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=serviceTable.diagnosticServiceTable, serviceTable.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.317: DiagnosticContributionSet**

<b>Class</b>	<b>DiagnosticControlEnableMaskBit</b>			
<b>Note</b>	This meta-class has the ability to represent one bit in the control enable mask record.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">DiagnosticIOControl.controlEnableMaskBit</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bitNumber	PositiveInteger	0..1	attr	This attribute represents the bit number of the bit in the control mask record. Bit number 0 is the most significant bit (MSB) in the first byte of the CEMR in the network presentation.
controlledData Element	<a href="#">DiagnosticDataElement</a>	*	ref	This reference represents the collection of DiagnosticDataElements that are controlled by this bit of the control mask record.

**Table A.318: DiagnosticControlEnableMaskBit**

<b>Class</b>	<b>DiagnosticCustomServiceClass</b>			
<b>Note</b>	This represents the ability to define a custom diagnostic service class and assign an ID to it. Further configuration is not foreseen from the point of view of the diagnostic extract and consequently needs to be done on the level of ECUC. <b>Tags:</b> atp.recommendedPackage=DiagnosticCustomServiceClasses			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceClass</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			





Class	DiagnosticCustomServiceClass			
Attribute	Type	Mult.	Kind	Note
customServiceId	PositiveInteger	0..1	attr	This attribute may only be used for the definition of custom services. The values shall not overlap with existing standardized service IDs.

**Table A.319: DiagnosticCustomServiceClass**

Class	DiagnosticDataByIdentifier (abstract)			
Note	This represents an abstract base class for all diagnostic services that access data by identifier.			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">DiagnosticReadDataByIdentifier</a> , <a href="#">DiagnosticReadScalingDataByIdentifier</a> , <a href="#">DiagnosticWriteDataByIdentifier</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dataIdentifier	<a href="#">DiagnosticAbstractDataIdentifier</a>	0..1	ref	This represents the linked DiagnosticDataIdentifier.

**Table A.320: DiagnosticDataByIdentifier**

Class	DiagnosticDataElement			
Note	This meta-class represents the ability to describe a concrete piece of data to be taken into account for diagnostic purposes.			
Base	ARObject, <a href="#">DiagnosticServiceMappingDiagTarget</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">DiagnosticAbstractParameter.dataElement</a>			
Attribute	Type	Mult.	Kind	Note
arraySizeSemantics	<a href="#">ArraySizeSemanticsEnum</a>	0..1	attr	This attribute controls the meaning of the value of the array size.
maxNumberOfElements	PositiveInteger	0..1	attr	The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.
scalingInfoSize	PositiveInteger	0..1	attr	Size in bytes of scaling information for the DiagnosticDataElement if used with <a href="#">DiagnosticReadScalingDataByIdentifier</a>
swDataDefProps	<a href="#">SwDataDefProps</a>	0..1	aggr	This property allows to specify data definition properties in order to support the definition of e.g. computation formulae and data constraints. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=swDataDefProps

**Table A.321: DiagnosticDataElement**

Class	DiagnosticDataIdentifier			
Note	This meta-class represents the ability to model a diagnostic data identifier (DID) that is fully specified regarding the payload at configuration-time. <b>Tags:</b> atp.recommendedPackage=DiagnosticDataIdentifiers			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticAbstractDataIdentifier</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticDataIdentifier			
dataElement	<a href="#">DiagnosticParameter</a>	*	aggr	This is the dataElement associated with the Diagnostic DataIdentifier. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=dataElement.bitOffset, dataElement.ident.shortName, dataElement.variationPoint.shortLabel vh.latestBindingTime=postBuild
didSize	PositiveInteger	0..1	attr	This attribute indicates the size in bytes of the Diagnostic DataIdentifier.
representsVin	Boolean	0..1	attr	This attributes indicates whether the specific Diagnostic DataIdentifier represents the vehicle identification.
supportInfoByte	DiagnosticSupportInfo Byte	0..1	aggr	This attribute represents the supported information associated with the DiagnosticDataIdentifier.

**Table A.322: DiagnosticDataIdentifier**

Class	DiagnosticDataIdentifierSet			
Note	This represents the ability to define a list of DiagnosticDataIdentifiers that can be reused in different contexts. <b>Tags:</b> atp.recommendedPackage=DiagnosticDataIdentifierSets			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagnosticData Identifier (ordered)	<a href="#">DiagnosticDataIdentifier</a>	*	ref	Reference to an ordered list of Data Identifiers. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=diagnosticDataIdentifier.diagnosticData Identifier, diagnosticDataIdentifier.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.323: DiagnosticDataIdentifierSet**

Class	DiagnosticDeAuthentication			
Note	This meta-class represents the subfunction to remove the authentication <b>Tags:</b> atp.recommendedPackage=DiagnosticAuthentications			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticAuthentication</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.324: DiagnosticDeAuthentication**

Class	DiagnosticDebounceAlgorithmProps			
Note	Defines properties for the debounce algorithm class.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">DiagnosticCommonProps.debounceAlgorithmProps</a>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticDebounceAlgorithmProps			
debounce Algorithm	DiagEventDebounce Algorithm	0..1	aggr	This represents the actual debounce algorithm.
debounce Behavior	DiagnosticDebounce BehaviorEnum	0..1	attr	This attribute defines how the event debounce algorithm will behave, if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.
debounce CounterStorage	Boolean	0..1	attr	Switch to store the debounce counter value non-volatile or not. true: debounce counter value shall be stored non-volatile false: debounce counter value is volatile Please note that this attribute is not relevant for the adaptive platform. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.325: DiagnosticDebounceAlgorithmProps**

Class	DiagnosticDynamicDataIdentifier			
<b>Note</b>	This meta-class represents the ability to define a diagnostic data identifier (DID) at run-time. <b>Tags:</b> atp.recommendedPackage=DiagnosticDataIdentifiers			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticAbstractDataIdentifier</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.326: DiagnosticDynamicDataIdentifier**

Class	DiagnosticDynamicallyDefineDataIdentifier			
<b>Note</b>	This represents an instance of the "Dynamically Define Data Identifier" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticDynamicallyDefineDataIdentifiers			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dataIdentifier	<a href="#">DiagnosticDynamicData Identifier</a>	0..1	ref	This represents the applicable DiagnosticDynamicData Identifier.
dynamically DefineData IdentifierClass	<a href="#">DiagnosticDynamically DefineDataIdentifier Class</a>	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticDynamicallyDefine DataIdentifier in the given context.
maxSource Element	PositiveInteger	0..1	attr	This represents the maximum number of source elements of the dynamically created DID.

**Table A.327: DiagnosticDynamicallyDefineDataIdentifier**



<b>Class</b>	<b>DiagnosticDynamicallyDefineDataIdentifierClass</b>			
<b>Note</b>	This meta-class contains attributes shared by all instances of the "Dynamically Define Data Identifier" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticDynamicallyDefineDataIdentifiers			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceClass</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
checkPerSourceId	Boolean	0..1	attr	If set to TRUE, the Dcm module shall check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF. If set to FALSE, the Dcm module shall not check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF.
configurationHandling	DiagnosticHandleDDIDConfigurationEnum	0..1	attr	This configuration switch defines whether DDID definition is handled as non-volatile information or not.
subfunction	<a href="#">DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum</a>	*	attr	This attribute contains a list of applicable subfunctions for all DiagnosticDynamicallyDefineDataIdentifier that reference the DiagnosticDynamicallyDefineDataIdentifier Class.

**Table A.328: DiagnosticDynamicallyDefineDataIdentifierClass**

<b>Enumeration</b>	<b>DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum</b>
<b>Note</b>	This meta-class contains a list of possible subfunctions for the UDS service 0x2C.
<b>Aggregated by</b>	<a href="#">DiagnosticDynamicallyDefineDataIdentifierClass.subfunction</a>
<b>Literal</b>	<b>Description</b>
clearDynamicallyDefineDataIdentifier	Clear the specified dynamic data identifier. <b>Tags:</b> atp.EnumerationLiteralIndex=0
defineByIdentifier	The definition of dynamic data identifier shall be done via a reference to a diagnostic data identifier. <b>Tags:</b> atp.EnumerationLiteralIndex=1
defineByMemoryAddress	The definition of dynamic data identifier shall be done via a reference to a memory address. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.329: DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum**

<b>Class</b>	<b>DiagnosticEcuInstanceProps</b>			
<b>Note</b>	This meta-class represents the ability to model properties that are specific for a given EcuInstance but on the other hand represent purely diagnostic-related information. In the spirit of decentralized configuration it is therefore possible to specify the diagnostic-related information related to a given EcuInstance even if the EcuInstance does not yet exist. <b>Tags:</b> atp.recommendedPackage=DiagnosticEcuInstancePropss			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ecuInstance	<a href="#">EcuInstance</a>	*	ref	This represents the actual EcuInstance to which the information contained in the DiagnosticEcuInstance contribute. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=ecuInstance
obdSupport	DiagnosticObdSupportEnum	0..1	attr	This attribute is used to specify the role (if applicable) in which the DiagnosticEcuInstance supports OBD.

**Table A.330: DiagnosticEcuInstanceProps**



<b>Class</b>	<b>DiagnosticEcuReset</b>			
<b>Note</b>	This represents an instance of the "ECU Reset" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticEcuResets			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceInstance</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
customSubFunctionNumber	PositiveInteger	0..1	attr	This attribute shall be used to define a custom sub-function number if none of the standardized values of category shall be used.
ecuResetClass	DiagnosticEcuResetClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticEcuReset in the given context.

**Table A.331: DiagnosticEcuReset**

<b>Class</b>	<b>DiagnosticEdrDataProviderMapping</b>			
<b>Note</b>	This meta-class represents the definition of a data provider for the content of an extended data record. <b>Tags:</b> atp.recommendedPackage=DiagnosticDataProviders			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticMapping</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataProvider	NameToken	0..1	attr	This attribute defines the kind of data that is associated with the referenced DiagnosticExtendedDataRecordElement.
extendedDataRecordElement	<a href="#">DiagnosticExtendedDataRecordElement</a>	0..1	ref	This reference identifies the DiagnosticExtendedDataRecordElement to which the data provider is associated with.

**Table A.332: DiagnosticEdrDataProviderMapping**

<b>Class</b>	<b>DiagnosticEdrSenderPortMapping</b>			
<b>Note</b>	This class is used to map a primitive DataPrototype owned by a PortPrototype that is typed by a Data Interface to an element of an extended data record. <b>Tags:</b> atp.recommendedPackage=DiagnosticPortMappings			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticMapping</i> , <i>DiagnosticSwMapping</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataPrototype	<a href="#">DataPrototype</a>	0..1	iref	This reference identifies the DataPrototype that shall be accessed for filling the extend data record in the context of a System. <b>InstanceRef implemented by:</b> DataPrototypeInSystemInstanceRef
recordElement	<a href="#">DiagnosticExtendedDataRecordElement</a>	0..1	ref	This reference identifies the applicable extended data record element.

**Table A.333: DiagnosticEdrSenderPortMapping**

<b>Class</b>	<b>DiagnosticEdrServerPortMapping</b>			
<b>Note</b>	This mapping class defines to which SWC service ports the element of the affected extended data record is mapped. <b>Tags:</b> atp.recommendedPackage=DiagnosticPortMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, DiagnosticSwMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswServiceDependency	<a href="#">BswServiceDependencyIdent</a>	0..1	ref	Reference to a BswServiceDependency that links Service Needs to BswModuleEntries.
recordElement	<a href="#">DiagnosticExtendedDataRecordElement</a>	0..1	ref	This reference identifies the element of the extended data record to which the value obtained from either application software or basic software shall be assigned.
swcServiceDependencyInSystem	<a href="#">SwcServiceDependency</a>	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. <b>InstanceRef implemented by:</b> SwcServiceDependencyInSystemInstanceRef

**Table A.334: DiagnosticEdrServerPortMapping**

<b>Class</b>	<b>DiagnosticEnableCondition</b>			
<b>Note</b>	Specification of an enable condition. <b>Tags:</b> atp.recommendedPackage=DiagnosticConditions			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticCondition</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.335: DiagnosticEnableCondition**

<b>Class</b>	<b>DiagnosticEnableConditionGroup</b>			
<b>Note</b>	Enable condition group which includes one or several enable conditions. <b>Tags:</b> atp.recommendedPackage=DiagnosticConditions			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticConditionGroup</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
enableCondition	<a href="#">DiagnosticEnableCondition</a>	*	ref	Reference to enableConditions that are part of the Enable ConditionGroup. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=enableCondition.diagnosticEnableCondition, enableCondition.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.336: DiagnosticEnableConditionGroup**

<b>Class</b>	<b>DiagnosticEnableConditionPortMapping</b>			
<b>Note</b>	Defines to which SWC service ports the DiagnosticEnableCondition is mapped. <b>Tags:</b> atp.recommendedPackage=DiagnosticPortMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, DiagnosticSwMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			





Class	DiagnosticEnableConditionPortMapping			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
enableCondition	DiagnosticEnableCondition	0..1	ref	Reference to the EnableCondition which is mapped to a SWC service port.
swcFlatServiceDependency	SwcServiceDependency	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports. This reference can be used in early stages of the development in order to identify the SwcServiceDependency without a full System Context. This Attribute is only used by the AUTOSAR Classic Platform.
swcServiceDependencyInSystem	SwcServiceDependency	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. <b>InstanceRef implemented by:</b> SwcServiceDependencyInSystemInstanceRef This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.337: DiagnosticEnableConditionPortMapping**

Class	DiagnosticEnvBswModeElement			
Note	This meta-class represents the ability to refer to a specific ModeDeclaration in the scope of a BswModule Description.			
Base	ARObject, DiagnosticEnvModeElement, Referrable			
Aggregated by	DiagnosticEnvironmentalCondition.modeElement			
Attribute	Type	Mult.	Kind	Note
mode	ModeDeclaration	0..1	iref	This reference identifies both the ModeDeclarationGroup Prototype and the ModeDeclaration for the specific mode comparison. <b>InstanceRef implemented by:</b> ModeInBswModuleDescriptionInstanceRef

**Table A.338: DiagnosticEnvBswModeElement**

Class	DiagnosticEnvCompareCondition (abstract)			
Note	DiagnosticCompareConditions are atomic conditions. They are based on the idea of a comparison at runtime of some variable data with something constant. The type of the comparison (==, !=, <, <=, ...) is specified in DiagnosticCompareCondition.compareType.			
Base	ARObject, DiagnosticEnvConditionFormulaPart			
Subclasses	DiagnosticEnvDataCondition, DiagnosticEnvDataElementCondition, DiagnosticEnvModeCondition			
Aggregated by	DiagnosticEnvConditionFormulaPart			
Attribute	Type	Mult.	Kind	Note
compareType	DiagnosticCompareTypeEnum	0..1	attr	This attributes represents the concrete type of the comparison.

**Table A.339: DiagnosticEnvCompareCondition**

Class	DiagnosticEnvConditionFormula			
Note	A DiagnosticEnvConditionFormula embodies the computation instruction that is to be evaluated at runtime to determine if the DiagnosticEnvironmentalCondition is currently present (i.e. the formula is evaluated to true) or not (otherwise). The formula itself consists of parts which are combined by the logical operations specified by DiagnosticEnvConditionFormula.op. If a diagnostic functionality cannot be executed because an environmental condition fails then the diagnostic stack shall send a negative response code (NRC) back to the client. The value of the NRC is directly related to the specific formula and is therefore formalized in the attribute DiagnosticEnvConditionFormula.nrcValue.			
Base	ARObject, DiagnosticEnvConditionFormulaPart			
Aggregated by	DiagnosticEnvConditionFormula.part, DiagnosticEnvironmentalCondition.formula			
Attribute	Type	Mult.	Kind	Note
nrcValue	PositiveInteger	0..1	attr	This attribute represents the concrete NRC value that shall be returned if the condition fails.
op	DiagnosticLogicalOperatorEnum	0..1	attr	This attribute represents the concrete operator (supported operators: and, or) of the condition formula.
part (ordered)	DiagnosticEnvConditionFormulaPart	*	aggr	This aggregation represents the collection of formula parts that can be combined by logical operators.

**Table A.340: DiagnosticEnvConditionFormula**

Class	DiagnosticEnvDataCondition			
Note	A DiagnosticEnvDataCondition is an atomic condition that compares the current value of the referenced DiagnosticDataElement with a constant value defined by the ValueSpecification. All compareTypes are supported.			
Base	ARObject, DiagnosticEnvCompareCondition, DiagnosticEnvConditionFormulaPart			
Aggregated by	DiagnosticEnvConditionFormula.part			
Attribute	Type	Mult.	Kind	Note
compareValue	ValueSpecification	0..1	aggr	This attribute represents a fixed compare value taken to evaluate the compare condition.
dataElement	DiagnosticDataElement	0..1	ref	This reference represents the related diagnostic data element.

**Table A.341: DiagnosticEnvDataCondition**

Class	DiagnosticEnvDataElementCondition			
Note	This meta-class represents the ability to formulate a diagnostic environment condition based on the value of a data element owned by the application software.			
Base	ARObject, DiagnosticEnvCompareCondition, DiagnosticEnvConditionFormulaPart			
Aggregated by	DiagnosticEnvConditionFormula.part			
Attribute	Type	Mult.	Kind	Note
compareValue	ValueSpecification	0..1	aggr	This aggregation represents the definition of the compare value against which the value taken from the application software shall be compared.
dataPrototype	DataPrototype	0..1	iref	This instanceRef represent the ability to access a data element owned by the application software on the AUTOSAR classic platform. <b>InstanceRef implemented by:</b> DataPrototypeInSystem InstanceRef
swDataDef Props	SwDataDefProps	0..1	aggr	Via this aggregation it is possible to describe the properties of the data that is obtained from the application for the environmental condition. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=swDataDefProps

**Table A.342: DiagnosticEnvDataElementCondition**

<b>Class</b>	<b>DiagnosticEnvModeCondition</b>			
<b>Note</b>	DiagnosticEnvModeCondition are atomic condition based on the comparison of the active Mode Declaration in a ModeDeclarationGroupPrototype with the constant value of a ModeDeclaration. The formulation of this condition uses only one DiagnosticEnvElement, which contains enough information to deduce the variable part (i.e. the part that changes at runtime) as well as the constant part of the comparison. Only DiagnosticCompareTypeEnum.isEqual or DiagnosticCompareTypeEnum.isNotEqual are eligible values for DiagnosticAtomicCondition.compareType.			
<b>Base</b>	ARObject, <a href="#">DiagnosticEnvCompareCondition</a> , <a href="#">DiagnosticEnvConditionFormulaPart</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticEnvConditionFormulaPart</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeElement	<a href="#">DiagnosticEnvModeElement</a>	0..1	ref	This reference represents both the ModeDeclaration GroupPrototype and the ModeDeclaration relevant for the mode comparison.

**Table A.343: DiagnosticEnvModeCondition**

<b>Class</b>	<b>DiagnosticEnvModeElement</b> (abstract)			
<b>Note</b>	All ModeDeclarations that are referenced in a DiagnosticEnvModeCondition shall be defined as a DiagnosticEnvModeElement of this DiagnosticEnvironmentalCondition. This concept keeps the ARXML clean: It avoids that the DiagnosticEnvConditionFormula is cluttered by lengthy InstanceRef definitions. Furthermore, it allows that an InstanceRef only needs to be defined once and can be used multiple times in the different DiagnosticEnvModeConditions.			
<b>Base</b>	ARObject, <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">DiagnosticEnvBswModeElement</a> , <a href="#">DiagnosticEnvSwcModeElement</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticEnvironmentalCondition.modeElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.344: DiagnosticEnvModeElement**

<b>Class</b>	<b>DiagnosticEnvSwcModeElement</b>			
<b>Note</b>	This meta-class represents the ability to refer to a ModeDeclaration in a concrete System context.			
<b>Base</b>	ARObject, <a href="#">DiagnosticEnvModeElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticEnvironmentalCondition.modeElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
mode	<a href="#">ModeDeclaration</a>	0..1	iref	This reference identifies both the ModeDeclarationGroup Prototype and the ModeDeclaration for the specific mode comparison. <b>InstanceRef implemented by:</b> PModelInSystemInstance Ref

**Table A.345: DiagnosticEnvSwcModeElement**

<b>Class</b>	<b>DiagnosticEnvironmentalCondition</b>			
<b>Note</b>	The meta-class DiagnosticEnvironmentalCondition formalizes the idea of a condition which is evaluated during runtime of the ECU by looking at "environmental" states (e.g. one such condition is that the vehicle is not driving, i.e. vehicle speed == 0). <b>Tags:</b> atp.recommendedPackage=DiagnosticEnvironmentalConditions			
<b>Base</b>	ARElement, ARObject, <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			





Class	DiagnosticEnvironmentalCondition			
Attribute	Type	Mult.	Kind	Note
formula	<a href="#">DiagnosticEnvCondition Formula</a>	0..1	aggr	This attribute represents the formula part of the DiagnosticEnvironmentalCondition.
modeElement	<a href="#">DiagnosticEnvMode Element</a>	*	aggr	This aggregation contains a representation of Mode Declarations in the context of a DiagnosticEnvironmentalCondition.

**Table A.346: DiagnosticEnvironmentalCondition**

Class	DiagnosticEvent			
Note	This element is used to configure DiagnosticEvents. <b>Tags:</b> atp.recommendedPackage=DiagnosticEvents			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
associated Event Identification	PositiveInteger	0..1	attr	This attribute represents the identification number that is associated with the enclosing DiagnosticEvent and allows to identify it when placed into a snapshot record or extended data record storage. This value can be reported as internal data element in snapshot records or extended data records.
clearEvent Allowed Behavior	<a href="#">DiagnosticClearEvent AllowedBehaviorEnum</a>	0..1	attr	This attribute defines the resulting UDS status byte for the related event, which shall not be cleared according to the ClearEventAllowed callback
confirmation Threshold	PositiveInteger	0..1	attr	This attribute defines the number of operation cycles with a failed result before a confirmed DTC is set to 1. The semantic of this attribute is a by "1" increased value compared to the confirmation threshold of the "trip counter" mentioned in ISO 14229-1 in figure D.4. A value of "1" defines the immediate confirmation of the DTC along with the first reported failed. This is also sometimes called "zero trip DTC". A value of "2" defines a DTC confirmation in the operation cycle after the first occurred failed. A value of "2" is typically used in the US for OBD DTC confirmation. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
connected Indicator	<a href="#">DiagnosticConnected Indicator</a>	*	aggr	Event specific description of Indicators. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=connectedIndicator.shortName, connectedIndicator.variationPoint.shortLabel vh.latestBindingTime=postBuild
eventClear Allowed	<a href="#">DiagnosticEventClear AllowedEnum</a>	0..1	attr	This attribute defines whether the Dem has access to a "ClearEventAllowed" callback. This Attribute is only used by the AUTOSAR Classic Platform.
eventKind	<a href="#">DiagnosticEventKind Enum</a>	0..1	attr	This attribute is used to distinguish between SWC and BSW events. This Attribute is only used by the AUTOSAR Classic Platform.
prestorage FreezeFrame	Boolean	0..1	attr	This attribute describes whether the Prestorage of Freeze Frames is supported by the assigned event or not. true: Prestorage of FreezeFrames is supported false: Prestorage of FreezeFrames is not supported





Class	DiagnosticEvent			
prestoredFreezeFrameStoredInNvm	Boolean	0..1	attr	If the Event uses a prestored freeze-frame (using the operations PrestoreFreezeFrame and ClearPrestoredFreezeFrame of the service interface DiagnosticMonitor) this attribute indicates if the Event requires the data to be stored in non-volatile memory. TRUE = Dem shall store the prestored data in non-volatile memory, FALSE = Data can be lost at shutdown (not stored in Nvm)
recoverableInSameOperationCycle	Boolean	0..1	attr	If the attribute is set to true then reporting PASSED will reset the indication of a failed test in the current operation cycle. If the attribute is set to false then reporting PASSED will be ignored and not lead to a reset of the indication of a failed test.

**Table A.347: DiagnosticEvent**

Enumeration	DiagnosticEventCombinationBehaviorEnum
Note	Select type of Event Combination support
Aggregated by	<a href="#">DiagnosticCommonProps.typeOfEventCombinationSupported</a>
Literal	Description
eventCombinationOnRetrieval	Event combination on retrieval is used to combine events. For each event an individual event memory entry is created, while reporting the data via UDS, the data is combined. <b>Tags:</b> atp.EnumerationLiteralIndex=1
eventCombinationOnStorage	Event combination on storage is used to combine events. Only one memory entry exists for each DTC which is also reported via UDS. <b>Tags:</b> atp.EnumerationLiteralIndex=0

**Table A.348: DiagnosticEventCombinationBehaviorEnum**

Enumeration	DiagnosticEventCombinationReportingBehaviorEnum
Note	Select reporting format of events. Applicable only for Event Combination on Retrieval.
Aggregated by	<a href="#">DiagnosticCommonProps.eventCombinationReportingBehavior</a>
Literal	Description
reportingInChronologicalOrderOldestFirst	The reporting order for event combination on retrieval is the chronological storage order of the events <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.349: DiagnosticEventCombinationReportingBehaviorEnum**

Class	DiagnosticEventNeeds			
Note	Specifies the abstract needs on the configuration of the Diagnostic Event Manager for one diagnostic event. Its shortName can be regarded as a symbol identifying the diagnostic event from the viewpoint of the component or module which owns this element. In case the diagnostic event specifies a production error, the shortName shall be the name of the production error.			
Base	ARObject, DiagnosticCapabilityElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
Aggregated by	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
Attribute	Type	Mult.	Kind	Note
deferringFid	<a href="#">FunctionInhibitionNeeds</a>	*	ref	This reference contains the link to a function identifier within the FiM which is used by the monitor before delivering a result.







Class	DiagnosticEventNeeds			
diagEventDebounceAlgorithm	DiagEventDebounceAlgorithm	0..1	aggr	Specifies the abstract need on the Debounce Algorithm applied by the Diagnostic Event Manager.
inhibitingFid	<a href="#">FunctionInhibitionNeeds</a>	0..1	ref	This represents the primary Function Inhibition Identifier used for inhibition of the diagnostic monitor. The FID might either inhibit the monitoring of a symptom or the reporting of detected faults.
inhibitingSecondaryFid	<a href="#">FunctionInhibitionNeeds</a>	*	ref	This represents the secondary Function Inhibition Identifier used for inhibition of the diagnostic monitor. Any of the FID inhibitions leads to an inhibition of the monitoring of a symptom or the reporting of detected faults.
prestoredFreezeFrameStoredInNvm	Boolean	0..1	attr	If the Event uses a prestored freeze-frame (using the operations PrestoreFreezeFrame and ClearPrestoredFreezeFrame of the service interface DiagnosticMonitor) this attribute indicates if the Event requires the data to be stored in non-volatile memory. TRUE = Dem shall store the prestored data in non-volatile memory, FALSE = Data can be lost at shutdown (not stored in Nvm).
usesMonitorData	Boolean	0..1	attr	This attribute defines whether additional monitor data shall be added to the reporting of events.

**Table A.350: DiagnosticEventNeeds**

Class	DiagnosticEventPortMapping			
Note	Defines to which SWC service ports the DiagnosticEvent is mapped. Tags: atp.recommendedPackage=DiagnosticPortMappings			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, DiagnosticSwMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
bswServiceDependency	<a href="#">BswServiceDependencyIdent</a>	0..1	ref	Reference to a BswServiceDependency that links ServiceNeeds to BswModuleEntries. This Attribute is only used by the AUTOSAR Classic Platform.
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to the DiagnosticEvent that is assigned to SWC service ports.
swcFlatServiceDependency	<a href="#">SwcServiceDependency</a>	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports. This Attribute is only used by the AUTOSAR Classic Platform.
swcServiceDependencyInSystem	<a href="#">SwcServiceDependency</a>	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. <b>InstanceRef implemented by:</b> SwcServiceDependencyInSystemInstanceRef This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.351: DiagnosticEventPortMapping**



<b>Class</b>	<b>DiagnosticEventToDebounceAlgorithmMapping</b>			
<b>Note</b>	Defines which Debounce Algorithm is applicable for a DiagnosticEvent. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
debounce Algorithm	<a href="#">DiagnosticDebounceAlgorithmProps</a>	0..1	ref	Reference to a DebounceAlgorithm assigned to a DiagnosticEvent.
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a DiagnosticEvent to which a Debounce Algorithm is assigned.

**Table A.352: DiagnosticEventToDebounceAlgorithmMapping**

<b>Class</b>	<b>DiagnosticEventToEnableConditionGroupMapping</b>			
<b>Note</b>	Defines which EnableConditionGroup is applicable for a DiagnosticEvent. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a DiagnosticEvent to which an Enable ConditionGroup is assigned.
enableCondition Group	<a href="#">DiagnosticEnableConditionGroup</a>	0..1	ref	Reference to an EnableConditionGroup assigned to a DiagnosticEvent.

**Table A.353: DiagnosticEventToEnableConditionGroupMapping**

<b>Class</b>	<b>DiagnosticEventToOperationCycleMapping</b>			
<b>Note</b>	Defines which OperationCycle is applicable for a DiagnosticEvent. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a DiagnosticEvent to which an Operation Cycle is assigned.
diagnostic OperationCycle	<a href="#">DiagnosticOperationCycle</a>	0..1	ref	Reference to an OperationCycle assigned to a Diagnostic Event. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=diagnosticOperationCycle.diagnosticOperationCycle.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.354: DiagnosticEventToOperationCycleMapping**

Class	DiagnosticEventToSecurityEventMapping			
Note	This meta-class represents the ability to map a security event that is defined in the context of the Security Extract to a diagnostic event defined on the context of the DiagnosticExtract. <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=DiagnosticMappings			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	This reference identifies the applicable diagnostic event. <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.
securityEvent Props	<a href="#">SecurityEventContext Props</a>	0..1	ref	This reference identifies the qualification of the applicable security event <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.355: DiagnosticEventToSecurityEventMapping**

Class	DiagnosticEventToStorageConditionGroupMapping			
Note	Defines which StorageConditionGroup is applicable for a DiagnosticEvent. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a DiagnosticEvent to which a Storage ConditionGroup is assigned.
storage ConditionGroup	<a href="#">DiagnosticStorage ConditionGroup</a>	0..1	ref	Reference to a StorageConditionGroup assigned to a DiagnosticEvent.

**Table A.356: DiagnosticEventToStorageConditionGroupMapping**

Class	DiagnosticEventToTroubleCodeJ1939Mapping			
Note	By means of this meta-class it is possible to associate a DiagnosticEvent to a DiagnosticTroubleCode J1939. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a DiagnosticEvent to which a J1939 Diagnostic Trouble Code is assigned.
troubleCode J1939	<a href="#">DiagnosticTroubleCode J1939</a>	0..1	ref	Reference to a J1939 Diagnostic Trouble Code to which a DiagnosticEvent is assigned.

**Table A.357: DiagnosticEventToTroubleCodeJ1939Mapping**

<b>Class</b>	<b>DiagnosticEventToTroubleCodeUdsMapping</b>			
<b>Note</b>	Defines which UDS Diagnostic Trouble Code is applicable for a DiagnosticEvent. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a DiagnosticEvent to which a UDS Diagnostic Trouble Code is assigned.
troubleCodeUds	<a href="#">DiagnosticTroubleCodeUds</a>	0..1	ref	Reference to an UDS Diagnostic Trouble Code assigned to a DiagnosticEvent.

**Table A.358: DiagnosticEventToTroubleCodeUdsMapping**

<b>Class</b>	<b>DiagnosticExtendedDataRecord</b>			
<b>Note</b>	Description of an extended data record. <b>Tags:</b> atp.recommendedPackage=DiagnosticExtendedDataRecords			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
customTrigger	String	0..1	attr	This attribute shall be taken to verbally describe the nature of the custom trigger.
element (ordered)	<a href="#">DiagnosticExtendedDataRecordElement</a>	*	aggr	This aggregation represents the collection of elements of the enclosing Extended Data Record.
recordNumber	PositiveInteger	0..1	attr	This attribute specifies an unique identifier for an extended data record.
trigger	<a href="#">DiagnosticRecordTriggerEnum</a>	0..1	attr	This attribute specifies the primary trigger to allocate an event memory entry.
update	Boolean	0..1	attr	This attribute defines when an extended data record is captured. true: This extended data record is captured every time. false: This extended data record is only captured for new event memory entries.

**Table A.359: DiagnosticExtendedDataRecord**

<b>Class</b>	<b>DiagnosticExtendedDataRecordElement</b>			
<b>Note</b>	This meta-class represents an element of an extended data record. Such an element represents a primitive data object or a fixed-size array of primitive data objects without further internal structure (no structure allowed).			
<b>Base</b>	ARObject, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	<a href="#">DiagnosticExtendedDataRecord.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
numberOfElements	PositiveInteger	0..1	attr	The existence of this attribute turns the data instance into a fixed-size array of data. The attribute determines the size of the array in terms of how many elements the array shall take. The aggregation of SwDataDefProps (especially with respect to SwBaseType) applies specifically to an element of the array (as a representation of all array elements) instead of the entire array itself!
swDataDefProps	<a href="#">SwDataDefProps</a>	0..1	aggr	This aggregation allows for the specification of various properties for the enclosing element.

**Table A.360: DiagnosticExtendedDataRecordElement**

<b>Class</b>	<b>DiagnosticFimAliasEventGroupMapping</b>			
<b>Note</b>	This meta-class represents the ability to map a DiagnosticFimEventGroup to a DiagnosticFimAliasEvent Group. By this means the "preliminary" modeling by way of a DiagnosticFimAliasEventGroup is further substantiated. <b>Tags:</b> atp.recommendedPackage=DiagnosticFimAliasEventGroupMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
actualEvent	DiagnosticFimEvent Group	0..1	ref	This represents the reference to the actual summary event.
aliasEvent	DiagnosticFimAlias EventGroup	0..1	ref	This represents the reference to the alias summary event.

**Table A.361: DiagnosticFimAliasEventGroupMapping**

<b>Class</b>	<b>DiagnosticFimAliasEventMapping</b>			
<b>Note</b>	This meta-class represents the ability to model the mapping of a DiagnosticEvent to a DiagnosticAlias Event. By this means the "preliminary" modeling by way of a DiagnosticAliasEvent is further substantiated. <b>Tags:</b> atp.recommendedPackage=DiagnosticFimEventMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
actualEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	This represents the reference to the actual diagnostic event.
aliasEvent	DiagnosticFimAlias Event	0..1	ref	This represents the reference to the alias event.

**Table A.362: DiagnosticFimAliasEventMapping**

<b>Class</b>	<b>DiagnosticFimFunctionMapping</b>			
<b>Note</b>	This meta-class represents the ability to define a mapping between a function identifier (FID) and the corresponding SwcServiceDependency in the application software resp. basic software. <b>Tags:</b> atp.recommendedPackage=DiagnosticFimFunctionMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, <a href="#">DiagnosticSwMapping</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
mappedBsw Service Dependency	<a href="#">BswService DependencyIdent</a>	0..1	ref	This is supposed to represent a reference to a Bsw ServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.
mappedFlatSwc Service Dependency	<a href="#">SwcService Dependency</a>	0..1	ref	This represents the ability to refer to an AtomicSw ComponentType that is available without the definition of how it will be embedded into the component hierarchy.
mapped Function	DiagnosticFunction Identifier	0..1	ref	This represents the mapped FID.





Class	DiagnosticFimFunctionMapping			
mappedSwc Service Dependency	<a href="#">SwcService Dependency</a>	0..1	iref	This represents the ability to point into the component hierarchy (under possible consideration of the root SoftwareComposition). <b>InstanceRef implemented by:</b> SwcServiceDependency InSystemInstanceRef

**Table A.363: DiagnosticFimFunctionMapping**

Class	DiagnosticFreezeFrame			
<b>Note</b>	This element describes combinations of DIDs for a non OBD relevant freeze frame. <b>Tags:</b> atp.recommendedPackage=DiagnosticFreezeFrames			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
customTrigger	String	0..1	attr	This attribute shall be taken to verbally describe the nature of the custom trigger.
recordNumber	PositiveInteger	0..1	attr	This attribute defines a record number for a freeze frame record. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
trigger	<a href="#">DiagnosticRecord TriggerEnum</a>	0..1	attr	This attribute defines the primary trigger to allocate an event memory entry.
update	Boolean	0..1	attr	This attribute defines the approach when the freeze frame record is stored/updated. true: FreezeFrame record is captured every time. false: FreezeFrame record is only captured for new event memory entries.

**Table A.364: DiagnosticFreezeFrame**

Class	DiagnosticFunctionIdentifierInhibit			
<b>Note</b>	This meta-class represents the ability to define the inhibition of a specific function identifier within the Fim configuration. <b>Tags:</b> atp.recommendedPackage=DiagnosticFunctionIdentifierInhibits			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
function Identifier	DiagnosticFunction Identifier	0..1	ref	This represents the corresponding function identifier.
inhibitionMask	DiagnosticInhibition MaskEnum	0..1	attr	This represents the value of the inhibition mask behavior.
inhibitSource	<a href="#">DiagnosticFunction InhibitSource</a>	*	aggr	This represents a collection of DiagnosticFunctionInhibit Source that contribute to the configuration of the enclosing DiagnosticFunctionIdentifierInhibit.

**Table A.365: DiagnosticFunctionIdentifierInhibit**

<b>Class</b>	<b>DiagnosticFunctionInhibitSource</b>			
<b>Note</b>	This meta-class represents the ability to define an inhibition source in the context of the Fim configuration.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticFunctionIdentifierInhibit.inhibitSource</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
event	DiagnosticFimAlias Event	0..1	ref	This represents the alias event applicable for the referencing inhibition source.
eventGroup	DiagnosticFimAlias EventGroup	0..1	ref	This represents the event group applicable for the referencing inhibition source.

**Table A.366: DiagnosticFunctionInhibitSource**

<b>Class</b>	<b>DiagnosticIOControl</b>			
<b>Note</b>	This represents an instance of the "I/O Control" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticIOControls			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
controlEnable MaskBit	<a href="#">DiagnosticControl EnableMaskBit</a>	*	aggr	This aggregation represents the control mask record consisting of single bits.
dataIdentifier	<a href="#">DiagnosticDataIdentifier</a>	0..1	ref	This represents the corresponding DiagnosticData Identifier
freezeCurrent State	Boolean	0..1	attr	Setting this attribute to true represents the ability of the Dcm to execute a freezeCurrentState.
ioControlClass	DiagnosticIOControl Class	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticIOControl in the given context.
resetToDefault	Boolean	0..1	attr	Setting this attribute to true represents the ability of the Dcm to execute a resetToDefault.
shortTerm Adjustment	Boolean	0..1	attr	Setting this attribute to true represents the ability of the Dcm to execute a shortTermAdjustment.

**Table A.367: DiagnosticIOControl**

<b>Class</b>	<b>DiagnosticIndicator</b>			
<b>Note</b>	Definition of an indicator. <b>Tags:</b> atp.recommendedPackage=DiagnosticIndicators			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
type	DiagnosticIndicatorType Enum	0..1	attr	Defines the type of the indicator. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.368: DiagnosticIndicator**

Class	DiagnosticInfoType			
Note	This meta-class represents the ability to model an OBD info type. <b>Tags:</b> atp.recommendedPackage=DiagnosticInfoTypes			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dataElement	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the data associated with the enclosing DiagnosticInfoType. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=dataElement.bitOffset, dataElement.ident.shortName
id	PositiveInteger	0..1	attr	This attribute represents the value of InfoType (see SAE J1979-DA).

Table A.369: DiagnosticInfoType

Class	DiagnosticIoControlNeeds			
Note	Specifies the general needs on the configuration of the Diagnostic Communication Manager (DCM) which are not related to a particular item (e.g. a PID). The main use case is the mapping of service ports to the Dcm which are not related to a particular item.			
Base	ARObject, <a href="#">DiagnosticCapabilityElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
Aggregated by	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
Attribute	Type	Mult.	Kind	Note
currentValue	<a href="#">DiagnosticValueNeeds</a>	0..1	ref	Reference to the DiagnosticValueNeeds indicating the access to the current value via signalBasedDiagnostics.
freezeCurrentStateSupported	Boolean	0..1	attr	This attribute determines, if the referenced port supports temporary freezing of I/O value.
resetToDefaultSupported	Boolean	0..1	attr	This represents a flag for the existence of the ResetToDefault operation in the service interface.
shortTermAdjustmentSupported	Boolean	0..1	attr	This attribute determines, if the referenced port supports temporarily setting of I/O value to a specific value provided by the diagnostic tester.

Table A.370: DiagnosticIoControlNeeds

Class	DiagnosticIumprGroup			
Note	This meta-class represents the ability to model a IUMPR groups. <b>Tags:</b> atp.recommendedPackage=DiagnosticIumprGroups			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
iumpr	<a href="#">DiagnosticIumpr</a>	*	ref	This reference collects DiagnosticIumpr to a DiagnosticIumprGroup. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=iumpr







Class	DiagnosticIumprGroup			
iumprGroupIdentifier	<a href="#">DiagnosticIumprGroupIdentifier</a>	0..1	aggr	This aggregation allows for the variant modeling of the groupIdentifier. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=iumprGroupIdentifier.groupId, iumprGroupIdentifier.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.371: DiagnosticIumprGroup**

Class	DiagnosticIumprGroupIdentifier			
Note	This meta-class provides the ability to the define the group identifier for an IumprGroup.			
Base	ARObject			
Aggregated by	<a href="#">DiagnosticIumprGroup.iumprGroupIdentifier</a>			
Attribute	Type	Mult.	Kind	Note
groupId	NameToken	0..1	attr	This attribute shall be taken to define an identifier for the IUMPR group. Please note that the value of this identifier is driven by regulations outside the scope of AUTOSAR and can therefore not be limited to the set of characters suitable for a shortName. <b>Stereotypes:</b> atpIdentityContributor

**Table A.372: DiagnosticIumprGroupIdentifier**

Class	DiagnosticIumprToFunctionIdentifierMapping			
Note	This meta-class represents the ability to associate a DiagnosticFunctionIdentifier with a DiagnosticIumpr. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMapping</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
functionIdentifier	DiagnosticFunctionIdentifier	0..1	ref	This reference identifies the applicable DiagnosticFunctionIdentifier.
iumpr	DiagnosticIumpr	0..1	ref	This reference identifies the applicable DiagnosticIumpr.

**Table A.373: DiagnosticIumprToFunctionIdentifierMapping**

Class	DiagnosticJ1939Node			
Note	This meta-class represents the diagnostic configuration of a J1939 Nm node, which in turn represents a "virtual Ecu" on the J1939 communication bus. <b>Tags:</b> atp.recommendedPackage=DiagnosticJ1939Nodes This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
nmNode	<a href="#">J1939NmNode</a>	0..1	ref	This represents the reference to the "virtual Ecu" to which the enclosing DiagnosticJ1939Node is associated.

**Table A.374: DiagnosticJ1939Node**



<b>Class</b>	<b>DiagnosticJ1939Spn</b>			
<b>Note</b>	This meta-class represents the ability to model a J1939 Suspect Parameter Number (SPN). <b>Tags:</b> atp.recommendedPackage=DiagnosticJ1939Spns This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
spn	PositiveInteger	0..1	attr	This attribute represents the concrete numerical identification for the enclosing SPN.

**Table A.375: DiagnosticJ1939Spn**

<b>Class</b>	<b>DiagnosticMasterToSlaveEventMapping</b>			
<b>Note</b>	This meta-class provides the ability to map a master diagnostic event with a slave diagnostic event such that reporting of the master event with a given value also reports the slave event with the same value <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMapping</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
masterEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	This represents the master diagnostic event.
slaveEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	This represents the slave diagnostic event.

**Table A.376: DiagnosticMasterToSlaveEventMapping**

<b>Class</b>	<b>DiagnosticMeasurementIdentifier</b>			
<b>Note</b>	This meta-class represents the ability to describe a measurement identifier. <b>Tags:</b> atp.recommendedPackage=DiagnosticMeasurementIdentifiers			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
obdMid	PositiveInteger	0..1	attr	This represents the numerical measurement Id <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.377: DiagnosticMeasurementIdentifier**

<b>Class</b>	<b>DiagnosticMemoryAddressableRangeAccess</b> (abstract)			
<b>Note</b>	This abstract base class			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMemoryByAddress</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">DiagnosticReadMemoryByAddress</a> , <a href="#">DiagnosticRequestDownload</a> , <a href="#">DiagnosticRequestUpload</a> , <a href="#">DiagnosticWriteMemoryByAddress</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
memoryRange	<a href="#">DiagnosticMemoryIdentifier</a>	*	ref	This represents the formal description of the memory segment to which the <a href="#">DiagnosticMemoryByAddress</a> applies.

**Table A.378: DiagnosticMemoryAddressableRangeAccess**

<b>Class</b>	<b>DiagnosticMemoryDestination</b> (abstract)			
<b>Note</b>	This abstract meta-class represents a possible memory destination for a diagnostic event.			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">DiagnosticMemoryDestinationPrimary</a> , <a href="#">DiagnosticMemoryDestinationUserDefined</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
agingRequiresTestedCycle	Boolean	0..1	attr	Defines whether the aging cycle counter is processed every aging cycles or else only tested aging cycle are considered. If the attribute is set to TRUE: only tested aging cycle are considered for aging cycle counter. If the attribute is set to FALSE: aging cycle counter is processed every aging cycle. On the classic platform, the value of this attribute has to be identical for each DiagnosticMemoryDestination.
clearDtcLimitation	DiagnosticClearDtcLimitationEnum	0..1	attr	Defines the scope of the DEM_ClearDTC Api. On the classic platform, the value of this attribute has to be identical for each DiagnosticMemoryDestination.
dtcStatusAvailabilityMask	PositiveInteger	0..1	attr	Mask for the supported DTC status bits by the Dem.
eventDisplacementStrategy	DiagnosticEventDisplacementStrategyEnum	0..1	attr	This attribute defines, whether support for event displacement is enabled or not, and which displacement strategy is followed.
maxNumberOfEventEntries	PositiveInteger	0..1	attr	This attribute fixes the maximum number of event entries in the fault memory.
memoryEntryStorageTrigger	DiagnosticMemoryEntryStorageTriggerEnum	0..1	attr	Describes the trigger to allocate an event memory entry.
statusBitHandlingTestFailedSinceLastClear	DiagnosticStatusBitHandlingTestFailedSinceLastClearEnum	0..1	attr	This attribute defines, whether the aging and displacement mechanism shall be applied to the "TestFailedSinceLastClear" status bits. On the classic platform, the value of this attribute has to be identical for each DiagnosticMemoryDestination.
statusBitStorageTestFailed	Boolean	0..1	attr	This parameter is used to activate/deactivate the permanent storage of the "TestFailed" status bits. true: storage activated false: storage deactivated This Attribute is only used by the AUTOSAR Classic Platform.
typeOfFreezeFrameRecordNumeration	DiagnosticTypeOfFreezeFrameRecordNumerationEnum	0..1	attr	This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.

**Table A.379: DiagnosticMemoryDestination**

<b>Class</b>	<b>DiagnosticMemoryDestinationPrimary</b>			
<b>Note</b>	This represents a primary memory for a diagnostic event. <b>Tags:</b> atp.recommendedPackage=DiagnosticMemoryDestinations			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMemoryDestination</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
typeOfDtcSupported	DiagnosticTypeOfDtcSupportedEnum	0..1	attr	This attribute defines the format returned by Dem_DcmGetTranslationType and does not relate to/influence the supported Dem functionality.

**Table A.380: DiagnosticMemoryDestinationPrimary**

<b>Class</b>	<b>DiagnosticMemoryDestinationUserDefined</b>			
<b>Note</b>	This represents a user-defined memory for a diagnostic event. <b>Tags:</b> atp.recommendedPackage=DiagnosticMemoryDestinations			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMemoryDestination</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
affectedByControlDTCSetting	Boolean	0..1	attr	This attribute configures how the content of the memory is affected by an active ControlDTCSetting or not: <ul style="list-style-type: none"> <li>If the attribute is set to <b>true</b>, the user-defined fault memory is <b>not</b> updated if ControlDTCSetting is off.</li> <li>If the attribute is set to <b>false</b>, the user defined fault memory is updated even if ControlDTCSetting is off.</li> </ul>
authenticationEnabled	DiagnosticAuthRoleProxy	0..1	aggr	The existence of this aggregation indicates that an authentication is foreseen. The details are clarified by the aggregated class. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=authenticationEnabled
memoryId	PositiveInteger	0..1	attr	This represents the identifier of the user-defined memory.

**Table A.381: DiagnosticMemoryDestinationUserDefined**

<b>Class</b>	<b>DiagnosticMemoryIdentifier</b>			
<b>Note</b>	This meta-class represents the ability to define memory properties from the diagnostics point of view. <b>Tags:</b> atp.recommendedPackage=DiagnosticMemoryByAdresss			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessPermission	<a href="#">DiagnosticAccessPermission</a>	0..1	ref	This represents that access permission defined for the specific DiagnosticMemoryIdentifier. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=accessPermission
id	PositiveInteger	0..1	attr	This represents the identification of the memory segment.
memoryHighAddress	PositiveInteger	0..1	attr	This represents the upper bound for addresses of the memory segment.
memoryHighAddressLabel	String	0..1	attr	This represents a symbolic label for the upper bound for addresses of the memory segment.
memoryLowAddress	PositiveInteger	0..1	attr	This represents the lower bound for addresses of the memory segment.
memoryLowAddressLabel	String	0..1	attr	This represents a symbolic label for the lower bound for addresses of the memory segment.

**Table A.382: DiagnosticMemoryIdentifier**

<b>Class</b>	<b>DiagnosticOperationCycle</b>			
<b>Note</b>	Definition of an operation cycle that is the base of the event qualifying and for Dem scheduling. <b>Tags:</b> atp.recommendedPackage=DiagnosticOperationCycles			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
type	DiagnosticOperationCycleTypeEnum	0..1	attr	Operation cycles types for the Dem.

**Table A.383: DiagnosticOperationCycle**

<b>Class</b>	<b>DiagnosticOperationCyclePortMapping</b>			
<b>Note</b>	Defines to which SWC service ports the DiagnosticOperationCycle is mapped. <b>Tags:</b> atp.recommendedPackage=DiagnosticPortMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, DiagnosticSwMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operationCycle	<a href="#">DiagnosticOperation Cycle</a>	0..1	ref	Reference to the DiagnosticOperationCycle that is assigned to SWC service ports.
swcFlatService Dependency	<a href="#">SwcService Dependency</a>	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports. This Attribute is only used by the AUTOSAR Classic Platform.
swcService DependencyIn System	<a href="#">SwcService Dependency</a>	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. <b>InstanceRef implemented by:</b> SwcServiceDependency InSystemInstanceRef This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.384: DiagnosticOperationCyclePortMapping**

<b>Class</b>	<b>DiagnosticParameter</b>			
<b>Note</b>	This meta-class represents the ability to describe information relevant for the execution of a specific diagnostic service, i.e. it can be taken to parameterize the service.			
<b>Base</b>	ARObject, <a href="#">DiagnosticAbstractParameter</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticDataIdentifier.dataElement</a> , <a href="#">DiagnosticInfoType.dataElement</a> , <a href="#">DiagnosticParameterIdentifier.dataElement</a> , <a href="#">DiagnosticRequestRoutineResults.request</a> , <a href="#">DiagnosticRequestRoutineResults.response</a> , <a href="#">DiagnosticStartRoutine.request</a> , <a href="#">DiagnosticStartRoutine.response</a> , <a href="#">DiagnosticStopRoutine.request</a> , <a href="#">DiagnosticStopRoutine.response</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ident	<a href="#">DiagnosticParameter Ident</a>	0..1	aggr	The aggregation in the role ident provides the ability to make the DiagnosticAbstractParameter identifiable. From the semantical point of view, the AbstractDiagnosticParameter is considered a first-class Identifiable and therefore the aggregation in the role ident shall always exist (until it may be possible to let AbstractDiagnosticParameter directly inherit from Identifiable). <b>Stereotypes:</b> atpIdentityContributor
supportInfo	DiagnosticParameter SupportInfo	0..1	aggr	This attribute represents the ability to define which bit of the support info byte is representing this part of the PID.

**Table A.385: DiagnosticParameter**

<b>Class</b>	<b>DiagnosticParameterElement</b>			
<b>Note</b>	This meta-class represents an element of a DiagnosticParameter if the DiagnosticParameter represents a structure.			
<b>Base</b>	ARObject, <a href="#">DiagnosticAbstractParameter</a> , <a href="#">DiagnosticServiceMappingDiagTarget</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticParameterElement.subElement</a> , <a href="#">DiagnosticParameterIdent.subElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
arraySize	PositiveInteger	0..1	attr	This attribute indicates that the enclosing DiagnosticParameterElement represents an array and configures the array size in terms of the number of elements of the array.
subElement	<a href="#">DiagnosticParameter Element</a>	*	aggr	This collection represents the sub-elements on the next lower level.

**Table A.386: DiagnosticParameterElement**

<b>Class</b>	<b>DiagnosticParameterElementAccess</b>			
<b>Note</b>	This meta-class acts as a single point for defining structured references to a specific DiagnosticParameterElement.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">DiagnosticServiceDataMapping.parameterElementAccess</a> , <a href="#">DiagnosticServiceSwMapping.parameterElementAccess</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
contextElement (ordered)	<a href="#">DiagnosticParameterElement</a>	*	ref	This represents the context of an applicable payload that corresponds to the referenced DataPrototype in the role mappedDataElement. <b>Tags:</b> xml.sequenceOffset=10
targetElement	<a href="#">DiagnosticParameterElement</a>	0..1	ref	This represents the target reference of an applicable payload that corresponds to the referenced DataPrototype in the role mappedDataElement. <b>Tags:</b> xml.sequenceOffset=20

**Table A.387: DiagnosticParameterElementAccess**

<b>Class</b>	<b>DiagnosticParameterIdent</b>			
<b>Note</b>	This meta-class has been created to introduce the ability to become referenced into the meta-class AbstractDiagnosticParameter without breaking backwards compatibility.			
<b>Base</b>	<i>ARObject</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <i>DiagnosticServiceMappingDiagTarget</i> , <i>IdentCaption</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">DiagnosticParameter.ident</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
subElement	<a href="#">DiagnosticParameterElement</a>	*	aggr	This collection represents the subElements on the top level.

**Table A.388: DiagnosticParameterIdent**

<b>Class</b>	<b>DiagnosticParameterIdentifier</b>			
<b>Note</b>	This meta-class represents the ability to model a diagnostic parameter identifier (PID) for the purpose of executing on-board diagnostics (OBD). <b>Tags:</b> atp.recommendedPackage=DiagnosticParameterIdentifiers			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <a href="#">DiagnosticCommonElement</a> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataElement	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the data carried by the DiagnosticParameterIdentifier. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=dataElement.bitOffset, dataElement.ident.shortName, dataElement.variationPoint.shortLabel vh.latestBindingTime=postBuild
id	PositiveInteger	0..1	attr	This is the numerical identifier used to identify the DiagnosticParameterIdentifier in the scope of diagnostic workflow (see SAE J1979-DA).
pidSize	PositiveInteger	0..1	attr	The size of the entire PID can be greater than the sum of the data elements because padding might be applied. Unit: byte.
supportInfoByte	DiagnosticSupportInfoByte	0..1	aggr	This represents the supported information associated with the DiagnosticParameterIdentifier.

**Table A.389: DiagnosticParameterIdentifier**

<b>Class</b>	<b>DiagnosticPeriodicRate</b>			
<b>Note</b>	This represents the ability to define a periodic rate for the specification of the "read data by periodic ID" diagnostic service.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">DiagnosticReadDataByPeriodicIDClass.periodicRate</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
period	TimeValue	0..1	attr	This represents the period of the DiagnosticPeriodicRate in seconds.
periodicRate Category	DiagnosticPeriodicRate CategoryEnum	0..1	attr	This attribute represents the category of the periodic rate.

**Table A.390: DiagnosticPeriodicRate**

<b>Class</b>	<b>DiagnosticProofOfOwnership</b>			
<b>Note</b>	This meta-class represents the subfunction to provide proof of ownership. <b>Tags:</b> atp.recommendedPackage=DiagnosticAuthentications			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <a href="#">DiagnosticAuthentication</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.391: DiagnosticProofOfOwnership**

<b>Class</b>	<b>DiagnosticProtocol</b>			
<b>Note</b>	This meta-class represents the ability to define a diagnostic protocol. <b>Tags:</b> atp.recommendedPackage=DiagnosticProtocols			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
diagnostic Connection	<a href="#">DiagnosticConnection</a>	*	ref	This represents the collection of applicable Diagnostic Connections for this DiagnosticProtocol. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=diagnosticConnection.diagnosticConnection, diagnosticConnection.variationPoint.shortLabel vh.latestBindingTime=postBuild
priority	PositiveInteger	0..1	attr	This represents the priority of the diagnostic protocol in comparison to other diagnostic protocols. Lower numeric values represent higher protocol priority: • 0 - Highest protocol priority • 255 - Lowest protocol priority <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
protocolKind	NameToken	0..1	attr	This identifies the applicable protocol.
sendRespPend OnTransToBoot	Boolean	0..1	attr	The purpose of this attribute is to define whether or not the ECU should send a NRC 0x78 (response pending) before transitioning to the bootloader (in this case the attribute shall be set to "true") or if the transition shall be initiated without sending NRC 0x78 (in this case the attribute shall be set to "false"). <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime





Class	DiagnosticProtocol			
serviceTable	<a href="#">DiagnosticServiceTable</a>	0..1	ref	<p>This represents the service table applicable for the given diagnostic protocol.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=serviceTable.diagnosticServiceTable, serviceTable.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>

**Table A.392: DiagnosticProtocol**

Class	DiagnosticReadDataByIdentifier			
<b>Note</b>	<p>This represents an instance of the "Read Data by Identifier" diagnostic service.</p> <p><b>Tags:</b> atp.recommendedPackage=DiagnosticDataByIdentifiers</p>			
<b>Base</b>	<i>ARElement, ARObjct, CollectableElement, <a href="#">DiagnosticCommonElement</a>, <a href="#">DiagnosticDataByIdentifier</a>, <a href="#">DiagnosticServiceInstance</a>, <a href="#">Identifiable</a>, <a href="#">MultilanguageReferrable</a>, <a href="#">PackageableElement</a>, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
readClass	DiagnosticReadDataByIdentifierClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticReadDataByIdentifier in the given context.</p>

**Table A.393: DiagnosticReadDataByIdentifier**

Class	DiagnosticReadDataByPeriodicIDClass			
<b>Note</b>	<p>This meta-class contains attributes shared by all instances of the "Read Data by periodic Identifier" diagnostic service.</p> <p><b>Tags:</b> atp.recommendedPackage=DiagnosticReadDataByPeriodicIds</p>			
<b>Base</b>	<i>ARElement, ARObjct, CollectableElement, <a href="#">DiagnosticCommonElement</a>, <a href="#">DiagnosticServiceClass</a>, <a href="#">Identifiable</a>, <a href="#">MultilanguageReferrable</a>, <a href="#">PackageableElement</a>, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
maxPeriodicDidToRead	PositiveInteger	0..1	attr	This represents the maximum number of data identifiers that can be included in one request.
periodicRate	<a href="#">DiagnosticPeriodicRate</a>	*	aggr	This represents the description of a collection of periodic rates in which the service can be executed.
schedulerMaxNumber	PositiveInteger	0..1	attr	This represents the maximum number of periodic data identifiers that can be scheduled in parallel.

**Table A.394: DiagnosticReadDataByPeriodicIDClass**

Class	DiagnosticReadScalingDataByIdentifier			
<b>Note</b>	<p>This represents an instance of the "Read Scaling Data by Identifier" diagnostic service.</p> <p><b>Tags:</b> atp.recommendedPackage=DiagnosticDataByIdentifiers</p>			
<b>Base</b>	<i>ARElement, ARObjct, CollectableElement, <a href="#">DiagnosticCommonElement</a>, <a href="#">DiagnosticDataByIdentifier</a>, <a href="#">DiagnosticServiceInstance</a>, <a href="#">Identifiable</a>, <a href="#">MultilanguageReferrable</a>, <a href="#">PackageableElement</a>, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note







Class	DiagnosticReadScalingDataByIdentifier			
readScalingDataClass	DiagnosticReadScalingDataByIdentifierClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticReadScalingDataByIdentifier in the given context.

**Table A.395: DiagnosticReadScalingDataByIdentifier**

Enumeration	DiagnosticRecordTriggerEnum
Note	Triggers to allocate an event memory entry.
Aggregated by	<a href="#">DiagnosticExtendedDataRecord.trigger</a> , <a href="#">DiagnosticFreezeFrame.trigger</a>
Literal	Description
confirmed	capture on "Confirmed" <b>Tags:</b> atp.EnumerationLiteralIndex=0
custom	implement custom capture <b>Tags:</b> atp.EnumerationLiteralIndex=4
fdcThreshold	capture on "FDC Threshold" <b>Tags:</b> atp.EnumerationLiteralIndex=1
pending	capture on "Pending" <b>Tags:</b> atp.EnumerationLiteralIndex=2
testFailed	capture on "Test Failed" <b>Tags:</b> atp.EnumerationLiteralIndex=3
testFailedThisOperationCycle	Test Failed This Operation Cycle. <b>Tags:</b> atp.EnumerationLiteralIndex=5 This EnumerationLiteral is only used by the AUTOSAR Classic Platform.
testPassed	Capture on testFailed bit transition 1 --> 0. <b>Tags:</b> atp.EnumerationLiteralIndex=6 This EnumerationLiteral is only used by the AUTOSAR Classic Platform.

**Table A.396: DiagnosticRecordTriggerEnum**

Class	DiagnosticRequestControlOfOnBoardDevice			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x08 service. <b>Tags:</b> atp.recommendedPackage=DiagnosticRequestControlOfOnBoardDevices			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
requestControlOfOnBoardDeviceClass	DiagnosticRequestControlOfOnBoardDeviceClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestControlOfOnBoardDevice in the given context.
testId	<a href="#">DiagnosticTestRoutineIdentifier</a>	0..1	ref	This represents the test Id for the mode 0x08.

**Table A.397: DiagnosticRequestControlOfOnBoardDevice**



<b>Class</b>	<b>DiagnosticRequestCurrentPowertrainData</b>			
<b>Note</b>	This meta-class represents the ability to model an instance of the OBD mode 0x01 service. <b>Tags:</b> atp.recommendedPackage=DiagnosticRequestCurrentPowertrainData			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
pid	<a href="#">DiagnosticParameterIdentifier</a>	0..1	ref	This represents the PID associated with this instance of the OBD mode 0x01 service.
requestCurrentPowertrainDiagnosticDataClass	DiagnosticRequestCurrentPowertrainDataClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestCurrentPowertrainData in the given context.

**Table A.398: DiagnosticRequestCurrentPowertrainData**

<b>Class</b>	<b>DiagnosticRequestDownload</b>			
<b>Note</b>	This represents an instance of the "Request Download" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticMemoryByAddress			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMemoryAddressableRangeAccess</a> , <a href="#">DiagnosticMemoryByAddress</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
requestDownloadClass	DiagnosticRequestDownloadClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestDownload in the given context.

**Table A.399: DiagnosticRequestDownload**

<b>Class</b>	<b>DiagnosticRequestEmissionRelatedDTC</b>			
<b>Note</b>	This meta-class represents the ability to model an instance of the OBD mode 0x03/0x07 service. <b>Tags:</b> atp.recommendedPackage=DiagnosticRequestEmissionRelatedDTCs			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
requestEmissionRelatedDtcClass	DiagnosticRequestEmissionRelatedDTCClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestEmissionRelatedDTC in the given context.

**Table A.400: DiagnosticRequestEmissionRelatedDTC**

<b>Class</b>	<b>DiagnosticRequestEmissionRelatedDTCPermanentStatus</b>			
<b>Note</b>	This meta-class represents the ability to model an instance of the OBD mode 0x0A service. <b>Tags:</b> atp.recommendedPackage=DiagnosticRequestEmissionRelatedDTCPermanentStatus			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			





Class	DiagnosticRequestEmissionRelatedDTCPermanentStatus			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
requestEmissionRelatedDtcPermanentStatus	DiagnosticRequestEmissionRelatedDTCPermanentStatusClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestEmissionRelatedDTCPermanentStatus in the given context.

**Table A.401: DiagnosticRequestEmissionRelatedDTCPermanentStatus**

Class	DiagnosticRequestOnBoardMonitoringTestResults			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x06 service. <b>Tags:</b> atp.recommendedPackage=DiagnosticRequestOnBoardMonitoringTestResultss			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagnosticTestResult	<a href="#">DiagnosticTestResult</a>	*	ref	This reference identifies the applicable collection of test identifiers for setting up a request message for mode 0x06.
requestOnBoardMonitoringTestResultsClass	DiagnosticRequestOnBoardMonitoringTestResultsClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestOnBoardMonitoringTestResults in the given context.

**Table A.402: DiagnosticRequestOnBoardMonitoringTestResults**

Class	DiagnosticRequestPowertrainFreezeFrameData			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x02 service. <b>Tags:</b> atp.recommendedPackage=DiagnosticPowertrainFreezeFrames			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
freezeFrame	DiagnosticPowertrainFreezeFrame	0..1	ref	This represents the associated freeze-frame.
requestPowertrainFreezeFrameData	DiagnosticRequestPowertrainFreezeFrameDataClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestPowertrainFreezeFrameData in the given context.

**Table A.403: DiagnosticRequestPowertrainFreezeFrameData**

Class	DiagnosticRequestRoutineResults			
Note	This meta-class represents the ability to define the result of a diagnostic routine execution.			
Base	<a href="#">ARObject</a> , <a href="#">DiagnosticRoutineSubfunction</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">DiagnosticRoutine.requestResult</a>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticRequestRoutineResults			
request	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the request parameters.
response	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the response parameters.

**Table A.404: DiagnosticRequestRoutineResults**

Class	DiagnosticRequestUpload			
<b>Note</b>	This represents an instance of the "Request Upload" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticMemoryByAddresss			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMemoryAddressableRangeAccess</a> , <a href="#">DiagnosticMemoryByAddress</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
requestUpload Class	DiagnosticRequest UploadClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestUpload in the given context.

**Table A.405: DiagnosticRequestUpload**

Class	DiagnosticRequestVehicleInfo			
<b>Note</b>	This meta-class represents the ability to model an instance of the OBD mode 0x09 service. <b>Tags:</b> atp.recommendedPackage=DiagnosticRequestVehicleInfos			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
infoType	<a href="#">DiagnosticInfoType</a>	0..1	ref	This represents the info type associated with the mode 0x09 service.
requestVehicle Information Class	DiagnosticRequest VehicleInfoClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequesVehicleInfo in the given context.

**Table A.406: DiagnosticRequestVehicleInfo**

Class	DiagnosticResponseOnEventClass			
<b>Note</b>	This represents the ability to define common properties for all instances of the "Response on Event" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticResponseOnEvents			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceClass</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
maxNumberOf Stored DTCStatus ChangedEvents	PositiveInteger	0..1	attr	The maximum number of DTCs that can be stored as DTCs with change status within one ResponseOnEvent SchedulerRate interval.





Class	DiagnosticResponseOnEventClass			
maxNumChangeOfDataIdentifierEvents	PositiveInteger	0..1	attr	The maximum number of events that can be simultaneously configured with sub function onChangeOfDataIdentifier.
maxNumComparisonOfValueEvents	PositiveInteger	0..1	attr	The maximum number of events that can be simultaneously configured with sub function onComparisonOfValues.
maxSupportedDIDLength	PositiveInteger	0..1	attr	The maximum number of measurable data bytes allowed for each DID that is used for comparison or data change.
responseOnEventSchedulerRate	TimeValue	0..1	attr	The call rate of the periodic scheduler to compare the values of the DataIdentifier (DID) or to detect DTC status changes.
storeEventEnabled	Boolean	0..1	attr	Specifies if the storeEvent functionality of the ResponseOnEvent diagnostic service shall be supported or not. If set to true, the storeEvent functionality is available. If set to false the storeEvent functionality is not available.

**Table A.407: DiagnosticResponseOnEventClass**

Class	DiagnosticRoutine			
Note	This meta-class represents the ability to define a diagnostic routine. Tags: atp.recommendedPackage=DiagnosticRoutines			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	0..1	attr	This is the numerical identifier used to identify the DiagnosticRoutine in the scope of diagnostic workflow Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
requestResult	<a href="#">DiagnosticRequestRoutineResults</a>	0..1	aggr	This represents the ability to request the result of a running routine.
routineInfo	PositiveInteger	0..1	attr	This represents the routine info byte. The info byte contains a manufacturer-specific value (for the identification of record identifiers) that is reported to the tester. Other use cases for this attribute are mentioned in ISO 27145 and ISO 26021.
start	<a href="#">DiagnosticStartRoutine</a>	0..1	aggr	This represents the ability to start a routine
stop	<a href="#">DiagnosticStopRoutine</a>	0..1	aggr	This represents the ability to stop a running routine.

**Table A.408: DiagnosticRoutine**

Class	DiagnosticRoutineControl			
Note	This represents an instance of the "Routine Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticRoutineControls			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
routine	<a href="#">DiagnosticRoutine</a>	0..1	ref	This refers to the applicable DiagnosticRoutine.





Class	DiagnosticRoutineControl			
routineControl Class	DiagnosticRoutineControlClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRoutineControl in the given context.

**Table A.409: DiagnosticRoutineControl**

Class	DiagnosticRoutineNeeds			
<b>Note</b>	Specifies the general needs on the configuration of the Diagnostic Communication Manager (Dcm) which are not related to a particular item (e.g. a PID). The main use case is the mapping of service ports to the Dcm which are not related to a particular item.			
<b>Base</b>	ARObject, DiagnosticCapabilityElement, Identifiable, MultilanguageReferrable, Referrable, ServiceNeeds			
<b>Aggregated by</b>	BswServiceDependency.serviceNeeds, SwcServiceDependency.serviceNeeds			
Attribute	Type	Mult.	Kind	Note
diagRoutine Type	DiagnosticRoutineType Enum	0..1	attr	This denotes the type of diagnostic routine which is implemented by the referenced server port.

**Table A.410: DiagnosticRoutineNeeds**

Enumeration	DiagnosticRoutineTypeEnum
<b>Note</b>	This enumerator specifies the different types of diagnostic routines.
<b>Aggregated by</b>	DiagnosticRoutineNeeds.diagRoutineType
Literal	Description
asynchronous	This indicates that the diagnostic server is not blocked while the diagnostic routine is running. <b>Tags:</b> atp.EnumerationLiteralIndex=0
synchronous	This indicates that the diagnostic routine blocks the diagnostic server in the ECU while the routine is running. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.411: DiagnosticRoutineTypeEnum**

Class	DiagnosticSecurityAccess			
<b>Note</b>	This represents an instance of the "Security Access" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticSecurityAccess			
<b>Base</b>	ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
requestSeedId	PositiveInteger	0..1	attr	This would be 0x01, 0x03, 0x05, ... The sendKey id can be computed by adding 1 to the requestSeedId
securityAccess Class	DiagnosticSecurityAccessClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticSecurityAccess in the given context.
securityDelay TimeOnBoot	TimeValue	0..1	attr	Start delay timer on power on in seconds. This delay indicates the time after ECU boot power-on where no security access request is accepted.





Class	DiagnosticSecurityAccess			
securityLevel	<a href="#">DiagnosticSecurityLevel</a>	0..1	ref	This reference identifies the applicable security level for the security access. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=securityLevel

**Table A.412: DiagnosticSecurityAccess**

Class	DiagnosticSecurityAccessClass			
<b>Note</b>	This meta-class contains attributes shared by all instances of the "Security Access" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticSecurityAccesss			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceClass</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.413: DiagnosticSecurityAccessClass**

Class	DiagnosticSecurityEventReportingModeMapping			
<b>Note</b>	This meta-class represents the ability to associate a location in a DID with a security event. The purpose of this mapping is that the location in the DID contains the setting of the reporting mode for the specific security event. This means that the reporting mode of the security event can be set via the diagnostic service WriteDataByIdentifier. <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=DiagnosticMappings This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMapping</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dataElement	<a href="#">DiagnosticDataElement</a>	0..1	ref	This reference identifies the data element that carries the information about the reporting mode. <b>Tags:</b> atp.Status=candidate
securityEvent	<a href="#">SecurityEventContext Props</a>	0..1	ref	This reference identifies the mapped security event. <b>Tags:</b> atp.Status=candidate

**Table A.414: DiagnosticSecurityEventReportingModeMapping**

Class	DiagnosticSecurityLevel			
<b>Note</b>	This meta-class represents the ability to define a security level considered for diagnostic purposes. <b>Tags:</b> atp.recommendedPackage=DiagnosticSecurityLevels			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
accessDataRecordSize	PositiveInteger	0..1	attr	This represents the size of the AccessDataRecord used in GetSeed. Unit:byte.
keySize	PositiveInteger	0..1	attr	This represents the size of the security key. Unit: byte.





Class	DiagnosticSecurityLevel			
numFailedSecurityAccess	PositiveInteger	0..1	attr	This represents the number of failed security accesses after which the delay time is activated.
securityDelayTime	TimeValue	0..1	attr	This represents the delay time after a failed security access. Unit: second.
seedSize	PositiveInteger	0..1	attr	This represents the size of the security seed. Unit: byte.

**Table A.415: DiagnosticSecurityLevel**

Class	DiagnosticServiceClass (abstract)			
Note	This meta-class provides the ability to define common properties that are shared among all instances of sub-classes of DiagnosticServiceInstance.			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	DiagnosticAuthenticationClass, DiagnosticClearDiagnosticInformationClass, DiagnosticClearResetEmissionRelatedInfoClass, DiagnosticComControlClass, DiagnosticControlDTCSettingClass, <a href="#">DiagnosticCustomServiceClass</a> , DiagnosticDataTransferClass, <a href="#">DiagnosticDynamicallyDefineDataIdentifierClass</a> , DiagnosticEcuResetClass, DiagnosticIoControlClass, DiagnosticReadDTCInformationClass, DiagnosticReadDataByIdentifierClass, <a href="#">DiagnosticReadDataByPeriodicIDClass</a> , DiagnosticReadMemoryByAddressClass, DiagnosticReadScalingDataByIdentifierClass, DiagnosticRequestControlOfOnBoardDeviceClass, DiagnosticRequestCurrentPowertrainDataClass, DiagnosticRequestDownloadClass, DiagnosticRequestEmissionRelatedDTCClass, DiagnosticRequestEmissionRelatedDTCPermanentStatusClass, DiagnosticRequestFileTransferClass, DiagnosticRequestOnBoardMonitoringTestResultsClass, DiagnosticRequestPowertrainFreezeFrameDataClass, DiagnosticRequestUploadClass, DiagnosticRequestVehicleInfoClass, <a href="#">DiagnosticResponseOnEventClass</a> , DiagnosticRoutineControlClass, <a href="#">DiagnosticSecurityAccessClass</a> , <a href="#">DiagnosticSessionControlClass</a> , DiagnosticTransferExitClass, DiagnosticWriteDataByIdentifierClass, DiagnosticWriteMemoryByAddressClass			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.416: DiagnosticServiceClass**

Class	DiagnosticServiceDataMapping			
Note	This represents the ability to define a mapping of a diagnostic service to a software-component. This kind of service mapping is applicable for the usage of SenderReceiverInterfaces or event/notifier semantics in ServiceInterfaces on the adaptive platform. <b>Tags:</b> atp.recommendedPackage=DiagnosticServiceMappings			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMapping</a> , <a href="#">DiagnosticSwMapping</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagnosticDataElement	<a href="#">DiagnosticDataElement</a>	0..1	ref	This represents the applicable payload that corresponds to the referenced DataPrototype in the role mappedDataElement or (in case of a usage on the adaptive platform) mappedApDataElement.
diagnosticParameter	<a href="#">DiagnosticParameterIdent</a>	0..1	ref	This represents the applicable payload that corresponds to the referenced DataPrototype in the role mappedDataElement. <b>Tags:</b> xml.sequenceOffset=20







Class	DiagnosticServiceDataMapping			
mappedDataElement	<a href="#">DataPrototype</a>	0..1	iref	This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform. <b>InstanceRef implemented by:</b> DataPrototypeInSystemInstanceRef This Attribute is only used by the AUTOSAR Classic Platform.
parameterElementAccess	<a href="#">DiagnosticParameterElementAccess</a>	0..1	aggr	This aggregation represents the single point of access to the reference to one specific DiagnosticParameterElement.

**Table A.417: DiagnosticServiceDataMapping**

Class	DiagnosticServiceInstance (abstract)			
Note	This represents a concrete instance of a diagnostic service.			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">DiagnosticAuthentication</a> , <a href="#">DiagnosticClearDiagnosticInformation</a> , <a href="#">DiagnosticClearResetEmissionRelatedInfo</a> , <a href="#">DiagnosticComControl</a> , <a href="#">DiagnosticControlDTCSetting</a> , <a href="#">DiagnosticCustomServiceInstance</a> , <a href="#">DiagnosticDataByIdentifier</a> , <a href="#">DiagnosticDynamicallyDefineDataIdentifier</a> , <a href="#">DiagnosticEcuReset</a> , <a href="#">DiagnosticIOControl</a> , <a href="#">DiagnosticMemoryByAddress</a> , <a href="#">DiagnosticReadDTCInformation</a> , <a href="#">DiagnosticReadDataByPeriodicID</a> , <a href="#">DiagnosticRequestControlOfOnBoardDevice</a> , <a href="#">DiagnosticRequestCurrentPowertrainData</a> , <a href="#">DiagnosticRequestEmissionRelatedDTC</a> , <a href="#">DiagnosticRequestEmissionRelatedDTCPermanentStatus</a> , <a href="#">DiagnosticRequestFileTransfer</a> , <a href="#">DiagnosticRequestOnBoardMonitoringTestResults</a> , <a href="#">DiagnosticRequestPowertrainFreezeFrameData</a> , <a href="#">DiagnosticRequestVehicleInfo</a> , <a href="#">DiagnosticResponseOnEvent</a> , <a href="#">DiagnosticRoutineControl</a> , <a href="#">DiagnosticSecurityAccess</a> , <a href="#">DiagnosticSessionControl</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
accessPermission	<a href="#">DiagnosticAccessPermission</a>	0..1	ref	This represents the collection of DiagnosticAccessPermissions that allow for the execution of the referencing DiagnosticServiceInstance.. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=accessPermission
serviceClass	<a href="#">DiagnosticServiceClass</a>	0..1	ref	This represents the corresponding "class", i.e. this meta-class provides properties that are shared among all instances of applicable sub-classes of DiagnosticServiceInstance. The subclasses that affected by this pattern implement references to the applicable "class"-role that substantiate this abstract reference. <b>Stereotypes:</b> atpAbstract

**Table A.418: DiagnosticServiceInstance**

Class	DiagnosticServiceMappingDiagTarget (abstract)			
Note	This meta-class serves as a base class for diagnostics-related targets of subclasses of DiagnosticSwMapping			
Base	<a href="#">ARObject</a>			
Subclasses	<a href="#">DiagnosticDataElement</a> , <a href="#">DiagnosticParameterElement</a> , <a href="#">DiagnosticParameterIdent</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.419: DiagnosticServiceMappingDiagTarget**



<b>Class</b>	<b>DiagnosticServiceSwMapping</b>			
<b>Note</b>	This represents the ability to define a mapping of a diagnostic service to a software-component or a basic-software module. If the former is used then this kind of service mapping is applicable for the usage of ClientServerInterfaces. <b>Tags:</b> atp.recommendedPackage=DiagnosticServiceMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, DiagnosticSwMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessedData Prototype	<a href="#">DataPrototype</a>	0..1	iref	This instanceRef identifies the DataPrototype that is supposed to be accessed in the context of the operation argument. <b>InstanceRef implemented by:</b> <a href="#">DataPrototypeInClientServerInterfaceInstanceRef</a> This Attribute is only used by the AUTOSAR Classic Platform.
diagnosticData Element	<a href="#">DiagnosticDataElement</a>	0..1	ref	This represents a DiagnosticDataElement required to execute the respective diagnostic service in the context of the diagnostic service mapping,
diagnostic Parameter	<a href="#">DiagnosticParameterIdent</a>	0..1	ref	This represents the applicable payload that corresponds to the referenced DataPrototype in the role mappedData Element.
mappedBsw Service Dependency	<a href="#">BswServiceDependencyIdent</a>	0..1	ref	This is supposed to represent a reference to a Bsw ServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.
mappedFlatSwc Service Dependency	<a href="#">SwcServiceDependency</a>	0..1	ref	This represents the ability to refer to an AtomicSw ComponentType that is available without the definition of how it will be embedded into the component hierarchy.
mappedSwc Service DependencyIn System	<a href="#">SwcServiceDependency</a>	0..1	iref	This represents the ability to point into the component hierarchy (under possible consideration of the root SoftwareComposition) <b>InstanceRef implemented by:</b> <a href="#">SwcServiceDependencyInSystemInstanceRef</a>
parameter ElementAccess	<a href="#">DiagnosticParameterElementAccess</a>	0..1	aggr	This aggregation represents the single point of access to the reference to one specific DiagnosticParameter Element.
serviceInstance	<a href="#">DiagnosticServiceInstance</a>	0..1	ref	This represents the service instance that needs to be considered in this diagnostics service mapping.

**Table A.420: DiagnosticServiceSwMapping**

<b>Class</b>	<b>DiagnosticServiceTable</b>			
<b>Note</b>	This meta-class represents a model of a diagnostic service table, i.e. the UDS services applicable for a given ECU. <b>Tags:</b> atp.recommendedPackage=DiagnosticServiceTables			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	DiagnosticServiceTable			
diagnostic Connection	<a href="#">DiagnosticConnection</a>	*	ref	This represents the DiagnosticConnection that is taken for handling the data transmission for the enclosing DiagnosticServiceTable. It is possible to refer to more than one diagnostic Connections in order to support more than one diagnostic tester. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=diagnosticConnection.diagnosticConnection, diagnosticConnection.variationPoint.shortLabel vh.latestBindingTime=postBuild
diagnostic ServiceInstance	<a href="#">DiagnosticService Instance</a>	*	ref	This represents the collection of DiagnosticService Instances to be considered in the scope of this Diagnostic ServiceTable. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=diagnosticServiceInstance.diagnosticService Instance, diagnosticServiceInstance.variationPoint.short Label vh.latestBindingTime=postBuild
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	This represents the applicable EcuInstance for this DiagnosticServiceTable. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=ecuInstance
protocolKind	NameToken	0..1	attr	This identifies the applicable protocol.

**Table A.421: DiagnosticServiceTable**

Class	DiagnosticSession			
<b>Note</b>	This meta-class represents the ability to define a diagnostic session. <b>Tags:</b> atp.recommendedPackage=DiagnosticSessions			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	0..1	attr	This is the numerical identifier used to identify the DiagnosticSession in the scope of diagnostic workflow
jumpToBoot Loader	DiagnosticJumpToBoot LoaderEnum	0..1	attr	This attribute represents the ability to define whether this diagnostic session allows to jump to Bootloader (OEM Bootloader or System Supplier Bootloader). If this diagnostic session doesn't allow to jump to Bootloader the value JumpToBootLoaderEnum.noBoot shall be chosen. This Attribute is only used by the AUTOSAR Classic Platform.
p2ServerMax	TimeValue	0..1	attr	This is the session value for P2ServerMax in seconds (per Session Control). The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds.
p2StarServer Max	TimeValue	0..1	attr	This is the session value for P2*ServerMax in seconds (per Session Control). The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds.

**Table A.422: DiagnosticSession**

<b>Class</b>	<b>DiagnosticSessionControl</b>			
<b>Note</b>	This represents an instance of the "Session Control" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticSessionControls			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
diagnostic Session	<a href="#">DiagnosticSession</a>	0..1	ref	This represents the applicable DiagnosticSessions
sessionControl Class	<a href="#">DiagnosticSessionControlClass</a>	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticSessionControl in the given context.

**Table A.423: DiagnosticSessionControl**

<b>Class</b>	<b>DiagnosticSessionControlClass</b>			
<b>Note</b>	This meta-class contains attributes shared by all instances of the "Session Control" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticSessionControls			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceClass</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
s3Server Timeout	TimeValue	0..1	attr	Time for the server to keep a diagnostic session other than the default session active while not receiving any diagnostic request message.

**Table A.424: DiagnosticSessionControlClass**

<b>Class</b>	<b>DiagnosticStartRoutine</b>			
<b>Note</b>	This represents the ability to start a diagnostic routine.			
<b>Base</b>	ARObject, DiagnosticRoutineSubfunction, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticRoutine.start</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
request	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the request parameters.
response	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the response parameters.

**Table A.425: DiagnosticStartRoutine**

<b>Class</b>	<b>DiagnosticStopRoutine</b>			
<b>Note</b>	This represents the ability to stop a diagnostic routine.			
<b>Base</b>	ARObject, DiagnosticRoutineSubfunction, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DiagnosticRoutine.stop</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
request	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the request parameters.
response	<a href="#">DiagnosticParameter</a>	*	aggr	This represents the response parameters.

**Table A.426: DiagnosticStopRoutine**

<b>Class</b>	<b>DiagnosticStorageCondition</b>			
<b>Note</b>	Specification of a storage condition. <b>Tags:</b> atp.recommendedPackage=DiagnosticConditions			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticCondition</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.427: DiagnosticStorageCondition**

<b>Class</b>	<b>DiagnosticStorageConditionGroup</b>			
<b>Note</b>	Storage condition group which includes one or several storage conditions. <b>Tags:</b> atp.recommendedPackage=DiagnosticConditions			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticConditionGroup</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
storage Condition	<a href="#">DiagnosticStorageCondition</a>	*	ref	Reference to storageConditions that are part of the StorageConditionGroup. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=storageCondition.diagnosticStorageCondition, storageCondition.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.428: DiagnosticStorageConditionGroup**

<b>Class</b>	<b>DiagnosticStorageConditionPortMapping</b>			
<b>Note</b>	Defines to which SWC service ports with DiagnosticStorageConditionNeeds the DiagnosticStorageCondition is mapped. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticMapping</a> , <a href="#">DiagnosticSwMapping</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
diagnostic Storage Condition	<a href="#">DiagnosticStorageCondition</a>	0..1	ref	Reference to the StorageCondition which is mapped to a SWC service port with DiagnosticStorageConditionNeeds.
swcFlatService Dependency	<a href="#">SwcServiceDependency</a>	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports.
swcService DependencyIn System	<a href="#">SwcServiceDependency</a>	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. <b>InstanceRef implemented by:</b> SwcServiceDependencyInSystemInstanceRef

**Table A.429: DiagnosticStorageConditionPortMapping**

<b>Class</b>	<b>DiagnosticTestIdentifier</b>			
<b>Note</b>	This meta-class represents the ability to create a diagnostic test identifier.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">DiagnosticTestResult.testIdentifier</a>			





Class	DiagnosticTestIdentifier			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	0..1	attr	This represents the numerical id associated with the diagnostic test identifier. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
uasId	PositiveInteger	0..1	attr	This represents the unit and scaling Id of the diagnostic test result. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.430: DiagnosticTestIdentifier**

Class	DiagnosticTestResult			
Note	This meta-class represents the ability to define diagnostic test results. <b>Tags:</b> atp.recommendedPackage=DiagnosticTestResults			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	<a href="#">DiagnosticEvent</a>	0..1	ref	This attribute represents the diagnostic event that is related to the diagnostic test result. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=diagnosticEvent.diagnosticEvent, diagnosticEvent.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
monitoredIdentifier	<a href="#">DiagnosticMeasurementIdentifier</a>	0..1	ref	This attribute represents the related diagnostic monitored identifier.
testIdentifier	<a href="#">DiagnosticTestIdentifier</a>	0..1	aggr	This attribute represents the applicable test identifier.
updateKind	DiagnosticTestResultUpdateEnum	0..1	attr	This attribute controls the update behavior of the enclosing DiagnosticTestResult. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.431: DiagnosticTestResult**

Class	DiagnosticTestRoutineIdentifier			
Note	This represents the test id of the DiagnosticTestIdentifier. <b>Tags:</b> atp.recommendedPackage=DiagnosticTestRoutineIdentifiers			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	0..1	attr	This represents the numerical id of the DiagnosticTest Identifier (see SAE J1979-DA).
requestDataSize	PositiveInteger	0..1	attr	This represents the specified data size for the request message. Unit: byte.
responseDataSize	PositiveInteger	0..1	attr	This represents the specified data size for the response message. Unit: byte.

**Table A.432: DiagnosticTestRoutineIdentifier**

<b>Class</b>	<b>DiagnosticTroubleCodeGroup</b>			
<b>Note</b>	The diagnostic trouble code group defines the DTCs belonging together and thereby forming a group. <b>Tags:</b> atp.recommendedPackage=DiagnosticTroubleCodes			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dtc	DiagnosticTroubleCode	*	ref	This represents the collection of DiagnosticTroubleCodes defined by this DiagnosticTroubleCodeGroup. <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=dtc.diagnosticTroubleCode, dtc.variation Point.shortLabel vh.latestBindingTime=postBuild
groupNumber	PositiveInteger	0..1	attr	This represents the base number of the DTC group. <b>Stereotypes:</b> atp.Variation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.433: DiagnosticTroubleCodeGroup**

<b>Class</b>	<b>DiagnosticTroubleCodeJ1939</b>			
<b>Note</b>	This meta-class represents the ability to model specific trouble-code related properties for J1939. <b>Tags:</b> atp.recommendedPackage=DiagnosticTroubleCodes This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticTroubleCode</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dtcProps	<a href="#">DiagnosticTroubleCodeProps</a>	0..1	ref	Defined properties associated with the J1939 DTC.
fmi	PositiveInteger	0..1	attr	This attribute represents the behavior of the Failure Mode Indicator.
kind	<a href="#">DiagnosticTroubleCodeJ1939DtcKindEnum</a>	0..1	attr	This attribute further specifies the DTC in terms of its semantics.
node	<a href="#">DiagnosticJ1939Node</a>	0..1	ref	This represents the related DiagnosticJ1939Node.
spn	<a href="#">DiagnosticJ1939Spn</a>	0..1	ref	This represents the related SPN.

**Table A.434: DiagnosticTroubleCodeJ1939**

<b>Enumeration</b>	<b>DiagnosticTroubleCodeJ1939DtcKindEnum</b>			
<b>Note</b>	This meta-class represents the ability to further specify a J1939 DTC in terms of its semantics. This Enumeration is only used by the AUTOSAR Classic Platform.			
<b>Aggregated by</b>	<a href="#">DiagnosticTroubleCodeJ1939.kind</a>			
<b>Literal</b>	<b>Description</b>			
serviceOnly	this represents a DTC that is only relevant for service in a garage, reported by e.g. DM53. <b>Tags:</b> atp.EnumerationLiteralIndex=0			
standard	This represents a non-specific DTC reported by e.g. DM1. <b>Tags:</b> atp.EnumerationLiteralIndex=1			

**Table A.435: DiagnosticTroubleCodeJ1939DtcKindEnum**

<b>Class</b>	<b>DiagnosticTroubleCodeObd</b>			
<b>Note</b>	This element is used to define OBD-relevant DTCs. <b>Tags:</b> atp.recommendedPackage=DiagnosticTroubleCodes			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticTroubleCode</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
considerPtoStatus	Boolean	0..1	attr	This attribute describes the affection of the event by the Dem PTO handling. true: the event is affected by the Dem PTO handling. false: the event is not affected by the Dem PTO handling. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
eventReadinessGroup	EventObdReadinessGroup	0..1	aggr	This aggregation allows for the variant definition of the attribute eventObdReadinessGroup. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=eventReadinessGroup.eventObdReadinessGroup, eventReadinessGroup.variationPoint.shortLabel vh.latestBindingTime=postBuild
obdDTCValue	PositiveInteger	0..1	attr	Unique Diagnostic Trouble Code value for OBD. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

Table A.436: DiagnosticTroubleCodeObd

<b>Class</b>	<b>DiagnosticTroubleCodeProps</b>			
<b>Note</b>	This element defines common Dtc properties that can be reused by different DTCs. <b>Tags:</b> atp.recommendedPackage=DiagnosticTroubleCodePropss			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
aging	<a href="#">DiagnosticAging</a>	0..1	ref	Reference to an aging algorithm in case that an aging/unlearning of the event is allowed. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=aging
diagnosticMemory	<a href="#">DiagnosticMemoryDestination</a>	0..1	ref	Reference to the applicable DiagnosticMemory Destination. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=diagnosticMemory
extendedDataRecord	<a href="#">DiagnosticExtendedDataRecord</a>	*	ref	Defines the links to an extended data class sampler. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=extendedDataRecord.diagnosticExtendedDataRecord, extendedDataRecord.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
freezeFrame	<a href="#">DiagnosticFreezeFrame</a>	*	ref	Define the links to a freeze frame class sampler. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=freezeFrame.diagnosticFreezeFrame, freezeFrame.variationPoint.shortLabel vh.latestBindingTime=preCompileTime







Class	DiagnosticTroubleCodeProps			
immediateNvDataStorage	Boolean	0..1	attr	Change description for Class immediateNvDataStorage in table "Table A.111: DiagnosticTroubleCodeProps": Switch to enable immediate storage triggering of an according event memory entry persistently to NVRAM. true: immediate non-volatile storage triggering on first occurrence and shutdown. false: immediate non-volatile storage triggering on shutdown.
legislatedFreezeFrameContentUdsObd	<a href="#">DiagnosticDataIdentifierSet</a>	0..1	ref	This reference identifies the layout of legislated freeze frames used for emission related diagnostics over the UDS protocol such as OBDOnUDS or WWH-OBD. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=legislatedFreezeFrameContentUdsObd.diagnosticDataIdentifierSet, legislatedFreezeFrameContentUdsObd.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
maxNumberFreezeFrameRecords	PositiveInteger	0..1	attr	This attribute defines the number of according freeze frame records, which can maximal be stored for this event. Therefore all these freeze frame records have the same freeze frame class.
obdRelevance	Boolean	0..1	attr	The attribute controls whether the enclosing DTC is relevant for OBD. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
priority	PositiveInteger	0..1	attr	Priority of the event, in view of full event buffer. A lower value means higher priority. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
significance	DiagnosticSignificanceEnum	0..1	attr	Significance of the event, which indicates additional information concerning fault classification and resolution.
snapshotRecordContent	<a href="#">DiagnosticDataIdentifierSet</a>	0..1	ref	This represents the freeze frame layout as a set of DIDs. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=snapshotRecordContent.diagnosticDataIdentifierSet, snapshotRecordContent.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.437: DiagnosticTroubleCodeProps**

Class	DiagnosticTroubleCodeUds			
Note	This element is used to describe diagnostic trouble codes (DTCs). <b>Tags:</b> atp.recommendedPackage=DiagnosticTroubleCodes			
Base	ARElement, ARObjekt, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticTroubleCode, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
considerPtoStatus	Boolean	0..1	attr	This attribute describes the affection of the event by the Dem PTO handling. true: the event is affected by the Dem PTO handling. false: the event is not affected by the Dem PTO handling. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild







Class	DiagnosticTroubleCodeUds			
eventReadinessGroup	EventObdReadinessGroup	0..1	aggr	This attribute specifies the Event OBD Readiness group for PID \$01 and PID \$41 computation. This attribute is only applicable for emission-related ECUs. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=eventReadinessGroup.eventObdReadinessGroup, eventReadinessGroup.variationPoint.shortLabel vh.latestBindingTime=postBuild
functionalUnit	PositiveInteger	0..1	attr	This attribute specifies a 1-byte value which identifies the corresponding basic vehicle / system function which reports the DTC. This parameter is necessary for the report of severity information. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
obdDtcValue3Byte	PositiveInteger	0..1	attr	3 Byte OBD DTC value based on the definition from SAE J2012. The existence of this attribute is only required if separated UDS and OBD DTC values are used for SAE J1979-2. If this attribute does not exist, then UDS DTC values are used with J1979-2. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
severity	DiagnosticUdsSeverityEnum	0..1	attr	DTC severity according to ISO 14229-1. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
troubleCodeProps	<a href="#">DiagnosticTroubleCodeProps</a>	0..1	ref	Defined properties associated with the DemDTC. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=troubleCodeProps.diagnosticTroubleCodeProps, troubleCodeProps.variationPoint.shortLabel vh.latestBindingTime=postBuild
udsDtcValue	PositiveInteger	0..1	attr	Unique Diagnostic Trouble Code value for UDS. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
wwhObdDtcClass	DiagnosticWwhObdDtcClassEnum	0..1	attr	This attribute is used to identify (if applicable) the corresponding severity class of an WWH-OB DTC. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild

Table A.438: DiagnosticTroubleCodeUds

Class	DiagnosticTroubleCodeUdsToTroubleCodeObdMapping			
Note	This meta-class represents the ability to associate a UDS trouble code to an OBD trouble code. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings			
Base	ARElement, ARObjct, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
troubleCodeObd	<a href="#">DiagnosticTroubleCodeObd</a>	0..1	ref	This represents the OBD DTC referenced in the mapping between UDS and OBD DTCs.
troubleCodeUds	<a href="#">DiagnosticTroubleCodeUds</a>	0..1	ref	This represents the UDS DTC referenced in the mapping between UDS and OBD DTCs.

Table A.439: DiagnosticTroubleCodeUdsToTroubleCodeObdMapping

Class	DiagnosticValueNeeds			
Note	<p>Specifies the general needs on the configuration of the Diagnostic Communication Manager (DCM) which are not related to a particular item (e.g. a PID). The main use case is the mapping of service ports to the DCM which are not related to a particular item.</p> <p>In the case of using a sender receiver communicated value, the related value shall be taken via assigned Data in the role "signalBasedDiagnostics".</p> <p>In case of using a client/server communicated value, the related value shall be communicated via the port referenced by assignedPort. The details of this communication (e.g. appropriate naming conventions) are specified in the related software specifications (SWS).</p>			
Base	ARObject, DiagnosticCapabilityElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
Aggregated by	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
Attribute	Type	Mult.	Kind	Note
dataLength	PositiveInteger	0..1	attr	This attribute is applicable only if the DiagnosticValueNeeds is aggregated within a BswModuleDependency. This attribute represents the length of data (in bytes) provided for this particular PID signal. This Attribute is only used by the AUTOSAR Classic Platform.
diagnosticValueAccess	DiagnosticValueAccessEnum	0..1	attr	This attribute is applicable only if the DiagnosticValueNeeds is aggregated within a BswModuleDependency. This attribute controls whether the data can be read and written or whether it is to be handled read-only.
fixedLength	Boolean	0..1	attr	This attribute is applicable only if the DiagnosticValueNeeds is aggregated within a BswModuleDependency. This attribute controls whether the data length of the data is fixed.
processingStyle	DiagnosticProcessingStyleEnum	0..1	attr	This attribute controls whether interaction requires the software-component to react synchronously on a request or whether it processes the request in background but still the DCM has to issue the call again to eventually obtain the result of the request.

Table A.440: DiagnosticValueNeeds

Class	DiagnosticVerifyCertificateBidirectional			
Note	<p>This meta-class represents the subfunction to do a bidirectional verification of the certificate.</p> <p><b>Tags:</b> atp.recommendedPackage=DiagnosticAuthentications</p>			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticAuthentication</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

Table A.441: DiagnosticVerifyCertificateBidirectional

Class	DiagnosticVerifyCertificateUnidirectional			
Note	<p>This meta-class represents the subfunction to do a unidirectional verification of the certificate.</p> <p><b>Tags:</b> atp.recommendedPackage=DiagnosticAuthentications</p>			
Base	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticAuthentication</a> , <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

Table A.442: DiagnosticVerifyCertificateUnidirectional

<b>Class</b>	<b>DiagnosticWriteDataByIdentifier</b>			
<b>Note</b>	This represents an instance of the "Write Data by Identifier" diagnostic service. <b>Tags:</b> atp.recommendedPackage=DiagnosticDataByIdentifiers			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , <a href="#">DiagnosticDataByIdentifier</a> , <a href="#">DiagnosticServiceInstance</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
writeClass	DiagnosticWriteDataByIdentifierClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticWriteDataByIdentifier in the given context.

**Table A.443: DiagnosticWriteDataByIdentifier**

<b>Class</b>	<b>DltConfig</b>			
<b>Note</b>	This element defines a Dlt configuration for a specific Ecu. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">EcuInstance.dltConfig</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dltEcu	DltEcu	0..1	ref	Reference to the Ecu representation in the Log And Trace Extract.
dltLogChannel	<a href="#">DltLogChannel</a>	*	aggr	Describes the DltLogChannels that are configured for the log/trace message output
globalTimeDomain	<a href="#">GlobalTimeDomain</a>	0..1	ref	Reference to the GlobalTimeDomain this DltConfig shall be synchronized with <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=globalTimeDomain.globalTimeDomain, globalTimeDomain.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime
sessionIdSupport	Boolean	0..1	attr	This attribute defines whether the sessionId is used or not.
timestampSupport	Boolean	0..1	attr	This attribute defines whether a timestamp shall be added to the Dlt messages or not.

**Table A.444: DltConfig**

<b>Class</b>	<b>DltLogChannel</b>			
<b>Note</b>	This element contains the settings for the log/trace message output for a tuple of ApplicationId and ContextId (verbose mode) or a SessionId (non-verbose mode). This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">DltConfig.dltLogChannel</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
applicationContext	DltContext	*	ref	Reference to the Swc that produces the log or trace message. Please note that this reference shall not be set in case that the Bsw module produces the associated log or trace messages.
defaultTraceState	DltDefaultTraceStateEnum	0..1	attr	This attributes defines the default trace status.
dltMessage	DltMessage	*	ref	Reference to DltMessages that can be transported over the DltLogChannel in the DltPdu.





Class	DltLogChannel			
logChannelId	String	0..1	attr	This attribute identifies the Channel for usage within the Log And Trace protocol.
logTraceDefaultLogThreshold	LogTraceDefaultLogLevelEnum	0..1	attr	This attribute allows to set a log level Threshold for Log Level filtering.
nonVerboseMode	Boolean	0..1	attr	This attribute defines whether this channel supports non-Verbose Dlt messages. If disabled only verbose mode messages shall be used.
rxPduTriggering	<a href="#">PduTriggering</a>	0..1	ref	Reference to DltPdu that is received by the DltLog Channel
segmentationSupported	Boolean	0..1	attr	If enabled, segmentation will be used if a DLT message is larger than Pdu.length referenced via DltLogChannel.txPduTriggering.
txPduTriggering	<a href="#">PduTriggering</a>	0..1	ref	Reference to DltPdu that is transmitted by the DltLog Channel.

**Table A.445: DltLogChannel**

Class	DolpActivationLineNeeds			
<b>Note</b>	A DolP entity needs to be informed when an external tester is attached or activated. The DolpActivationServiceNeeds specifies the trigger for such an event. Examples would be a Pdu via a regular communication bus, a PWM signal, or an I/O. For details please refer to the ISO 13400.			
<b>Base</b>	ARObject, <a href="#">DolpServiceNeeds</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.446: DolpActivationLineNeeds**

Class	DolpGidNeeds			
<b>Note</b>	The DolpGidNeeds indicates that the software-component owning this ServiceNeeds is providing the GID number either after a GID Synchronisation or by other means like e.g. flashed EEPROM parameter. This need can be used independent from DolpGidSynchronizationNeeds and is necessary if the GID can not be provided out of the DolP configuration options.			
<b>Base</b>	ARObject, <a href="#">DolpServiceNeeds</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.447: DolpGidNeeds**

Class	DolpGidSynchronizationNeeds			
<b>Note</b>	The DolpGidSynchronizationNeeds indicates that the software-component owning this ServiceNeeds is triggered by the DolP entity to start a synchronization of the GID (Group Identification) on the DolP service 0x0001, 0x0002, 0x0003 or before announcement via service 0x0004 according to ISO 13400-2:2012 if necessary. Note that this need is only relevant for DolP synchronization masters.			
<b>Base</b>	ARObject, <a href="#">DolpServiceNeeds</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.448: DolpGidSynchronizationNeeds**

<b>Class</b>	<b>DolpLogicAddress</b>			
<b>Note</b>	The logical DoIP address.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	DolpConfig.logicAddress, <a href="#">DolpTpConfig.dolpLogicAddress</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
address	Integer	0..1	attr	The logical DoIP address.
dolpLogicAddressProps	AbstractDolpLogicAddressProps	0..1	aggr	Collection of additional LogicAddress properties.

**Table A.449: DolpLogicAddress**

<b>Class</b>	<b>DolpPowerModeStatusNeeds</b>			
<b>Note</b>	The DolpPowerModeStatusNeeds indicates that the software-component owning this ServiceNeeds is providing the PowerModeStatus for the DoIP service 0x4003 according to ISO 13400-2:2012.			
<b>Base</b>	ARObject, <a href="#">DolpServiceNeeds</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.450: DolpPowerModeStatusNeeds**

<b>Class</b>	<b>DolpServiceNeeds</b> (abstract)			
<b>Note</b>	This represents an abstract base class for ServiceNeeds related to DoIP.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Subclasses</b>	<a href="#">DolpActivationLineNeeds</a> , <a href="#">DolpGidNeeds</a> , <a href="#">DolpGidSynchronizationNeeds</a> , <a href="#">DolpPowerModeStatusNeeds</a> , <a href="#">DolpRoutingActivationAuthenticationNeeds</a> , <a href="#">DolpRoutingActivationConfirmationNeeds</a> , <a href="#">FurtherActionByteNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.451: DolpServiceNeeds**

<b>Class</b>	<b>DolpTpConfig</b>			
<b>Note</b>	This element defines exactly one DolpTp Configuration that is used to configure all DoIPChannels available in a DoIPInterface. Each DoIPChannel describes a connection between a dolpSourceAddress and a dolpTargetAddress and the exchange of DcmIPdus between the PduR and DoIP. <b>Tags:</b> atp.recommendedPackage=TpConfigs			
<b>Base</b>	ARObject, <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TpConfig</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dolpLogicAddress	<a href="#">DolpLogicAddress</a>	*	aggr	Collection of logical DoIP Addresses.
tpConnection	<a href="#">DolpTpConnection</a>	*	aggr	Collection of unidirectional connections between a source address and a target address.

**Table A.452: DolpTpConfig**

Class	DolpTpConnection			
Note	A connection identifies the sender and the receiver of this particular communication. The Dolp module routes a tpSdu through this connection.			
Base	ARObject, <a href="#">TpConnection</a>			
Aggregated by	<a href="#">DolpTpConfig.tpConnection</a>			
Attribute	Type	Mult.	Kind	Note
dolpSourceAddress	<a href="#">DolpLogicAddress</a>	0..1	ref	Reference to the address of the sender of the tpSdu.
dolpTargetAddress	<a href="#">DolpLogicAddress</a>	0..1	ref	Reference to the address of the receiver of the tpSdu.
tpSdu	<a href="#">PduTriggering</a>	0..1	ref	This reference is used to describe the data exchange between Dolp and the PduR.

Table A.453: DolpTpConnection

Class	Documentation			
Note	This meta-class represents the ability to handle a so called standalone documentation. Standalone means, that such a documentation is not embedded in another ARElement or identifiable object. The standalone documentation is an entity of its own which denotes its context by reference to other objects and instances. <b>Tags:</b> atp.recommendedPackage=Documentations			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
context	<a href="#">DocumentationContext</a>	*	aggr	This is the context of the particular documentation.
documentationContent	PredefinedChapter	0..1	aggr	This is the content of the documentation related to the specified contexts. <b>Tags:</b> xml.sequenceOffset=200

Table A.454: Documentation

Class	«atpMixed» DocumentationBlock			
Note	This class represents a documentation block. It is made of basic text structure elements which can be displayed in a table cell.			
Base	ARObject			
Aggregated by	ApplicabilityInfo.remark, <a href="#">AUTOSAR.introduction</a> , BlueprintGenerator.introduction, <a href="#">BlueprintPolicyModifiable.blueprintDerivationGuide</a> , <a href="#">ClientServerOperationBlueprintMapping.blueprintMappingGuide</a> , <a href="#">DataMapping.introduction</a> , DefItem.def, <a href="#">Describable.introduction</a> , <a href="#">EcucAddInfoParamValue.value</a> , <a href="#">EcuResourceEstimation.introduction</a> , Entry.entryContents, <a href="#">FrameMapping.introduction</a> , <a href="#">GeneralAnnotation.annotationText</a> , <a href="#">Identifiable.introduction</a> , <a href="#">IPduMapping.introduction</a> , <a href="#">ISignalMapping.introduction</a> , Item.itemContents, LabeledItem.itemContents, <a href="#">LifeCycleInfo.remark</a> , <a href="#">MappingConstraint.introduction</a> , MsrQueryP2.msrQueryResultP2, Note.noteText, PortDefinedArgumentBlueprint.blueprintMappingGuide, PrmChar.cond, PrmChar.remark, <a href="#">ScheduleTableEntry.introduction</a> , <a href="#">SignalPathConstraint.introduction</a> , <a href="#">StructuredReq.conflicts</a> , <a href="#">StructuredReq.dependencies</a> , <a href="#">StructuredReq.description</a> , <a href="#">StructuredReq.rationale</a> , <a href="#">StructuredReq.remark</a> , <a href="#">StructuredReq.supportingMaterial</a> , <a href="#">StructuredReq.useCase</a> , SwAxisType.swGenericAxisDesc, TopicContent.blockLevelContent, <a href="#">TraceableText.text</a> , <a href="#">VariationPoint.blueprintCondition</a>			
Attribute	Type	Mult.	Kind	Note
defList	DefList	0..1	aggr	This represents a definition list in the documentation block. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=40





Class	«atpMixed» DocumentationBlock			
figure	MIFigure	0..1	aggr	This represents a figure in the documentation block. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=70
formula	MIFormula	0..1	aggr	This is a formula in the definition block. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=60
labeledList	LabeledList	0..1	aggr	This represents a labeled list. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=50
list	List	0..1	aggr	This represents numbered or unnumbered list. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=30
msrQueryP2	MsrQueryP2	0..1	aggr	This represents automatically contributed contents provided by an msrquery in the context of Documentation Block.
note	Note	0..1	aggr	This represents a note in the text flow. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=80
p	MultiLanguage Paragraph	0..1	aggr	This is one particular paragraph. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=10
structuredReq	<a href="#">StructuredReq</a>	0..1	aggr	This aggregation supports structured requirements embedded in a documentation block. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=100
trace	<a href="#">TraceableText</a>	0..1	aggr	This represents traceable text in the documentation block. This allows to specify requirements/constraints in any documentation block. The kind of the trace is specified in the category. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=90
verbatim	MultiLanguageVerbatim	0..1	aggr	This represents one particular verbatim text. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild xml.sequenceOffset=20

**Table A.455: DocumentationBlock**



<b>Class</b>	<b>DocumentationContext</b>			
<b>Note</b>	This class represents the ability to denote a context of a so called standalone documentation. Note that this is an <<atpMixed>>. The contents needs to be considered as ordered.			
<b>Base</b>	ARObject, <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">Documentation.context</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
feature	<a href="#">AtpFeature</a>	0..1	iref	This refers to a particular feature (instance in the M0 model) to which is the context of the documentation. <b>InstanceRef implemented by:</b> <a href="#">AnyInstanceRef</a>
identifiable	<a href="#">Identifiable</a>	0..1	ref	This is an identifiable object which is part of the context of the documentation.

**Table A.456: DocumentationContext**

<b>Class</b>	<b>DtcStatusChangeNotificationNeeds</b>			
<b>Note</b>	This meta-class represents the needs of a software-component interested to get information regarding any DTC status change.			
<b>Base</b>	ARObject, <a href="#">DiagnosticCapabilityElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
notificationTime	<a href="#">DiagnosticClearDtcNotificationEnum</a>	0..1	attr	This attribute determines the time when the notification about the DTC operation shall be executed. This attribute is only relevant for the configuration of the ClearDtc Notification.

**Table A.457: DtcStatusChangeNotificationNeeds**

<b>Class</b>	<b>DynamicPart</b>			
<b>Note</b>	Dynamic part of a multiplexed I-Pdu. Reserved space which is used to transport varying SignalIPdus at the same position, controlled by the corresponding selectorFieldCode.			
<b>Base</b>	ARObject, <a href="#">MultiplexedPart</a>			
<b>Aggregated by</b>	<a href="#">MultiplexedIPdu.dynamicPart</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dynamicPartAlternative	<a href="#">DynamicPartAlternative</a>	*	aggr	Com IPdu alternatives that are transmitted in the Dynamic Part of the MultiplexedIPdu.

**Table A.458: DynamicPart**

<b>Class</b>	<b>DynamicPartAlternative</b>			
<b>Note</b>	One of the Com IPdu alternatives that are transmitted in the Dynamic Part of the MultiplexedIPdu. The selectorFieldCode specifies which Com IPdu is contained in the DynamicPart within a certain transmission of a multiplexed PDU.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">DynamicPart.dynamicPartAlternative</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initialDynamicPart	Boolean	0..1	attr	Dynamic part that shall be used to initialize this multiplexed IPdu. Constraint: Only one "DynamicPartAlternative" in a "DynamicPart" shall be the initialDynamicPart.
iPdu	<a href="#">ISignalIPdu</a>	0..1	ref	Reference to a Com IPdu which is routed to the IPduM module and is combined to a multiplexedPdu.







Class	DynamicPartAlternative			
selectorField Code	Integer	0..1	attr	The selector field is part of a multiplexed IPdu. It consists of contiguous bits. The value of the selector field selects the layout of the multiplexed part of the IPdu.

**Table A.459: DynamicPartAlternative**

Class	E2EProfileCompatibilityProps			
Note	This meta-class collects settings for configuration of the E2E state machine. Tags: atp.recommendedPackage=E2EProfileCompatibilityPropsCollection			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
combinedNo DataInitCount	Boolean	0..1	attr	E2E State machine behavior concerning counting of detected counter errors and missing messages in states NODATA and INIT <ul style="list-style-type: none"> <li>value = 0 (false) or not defined: counting of detected counter errors and missing messages in states NODATA and INIT are counted per state separated (Autosar R23-11 or former behavior)</li> <li>value = 1 (true): counting of detected counter errors and missing messages in states NODATA and INIT are counted in total</li> </ul>
transitToInvalid Extended	Boolean	0..1	attr	E2E State machine behavior concerning transition from NODATA/INIT to INVALID <ul style="list-style-type: none"> <li>value=0 (false): no direct transition from NODATA to INVALID, no transition from INIT to INVALID due to counter-related faults (Autosar R19-11 or former behavior)</li> <li>value=1 (true): direct transition from NODATA to INVALID covered, transition from INIT to INVALID due to counter-related faults covered (state machine extended)</li> </ul>

**Table A.460: E2EProfileCompatibilityProps**

Class	ECUMapping			
Note	ECUMapping allows to assign an ECU hardware type (defined in the ECU Resource Template) to an ECUInstance used in a physical topology. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">SystemMapping.ecuResourceMapping</a>			
Attribute	Type	Mult.	Kind	Note
commController Mapping	<a href="#">CommunicationControllerMapping</a>	*	aggr	The ECUMapping contains the mapping of all CommunicationControllers of the ECU.
ecu	<a href="#">HwElement</a>	0..1	ref	Reference to a HwElement of category ECU in the ECU Resource Template.
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	Reference to the EcuInstance in the System Template
hwPortMapping	<a href="#">HwPortMapping</a>	1..*	aggr	The ECUMapping contains the mapping of all HW Communication Ports of the ECU.

**Table A.461: ECUMapping**

<b>Class</b>	<b>EOCEventRef</b>			
<b>Note</b>	This is used to define a reference to an RTE or BSW Event. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">EOCExecutableEntityRefAbstract</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ExecutionOrderConstraint.orderedElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswModule Instance	<a href="#">BswImplementation</a>	0..1	ref	Specifies the BSW module instance the BSW event is related to.
component	<a href="#">SwComponent Prototype</a>	0..1	iref	This association references the specific instance of the SW-C prototype. <b>InstanceRef implemented by:</b> ComponentInCompositionInstanceRef
event	<a href="#">AbstractEvent</a>	0..1	ref	The AbstractEvent (event) whose execution order is restricted by the constraint.
successor	<a href="#">EOCExecutableEntityRefAbstract</a>	*	ref	The logical successor of an executable entity or a group of executable entities.

**Table A.462: EOCEventRef**

<b>Class</b>	<b>EOCExecutableEntityRef</b>			
<b>Note</b>	This is used to define a reference to an ExecutableEntity If the ExecutionOrderConstraint is defined on VFB, System or ECU level, a reference to the Sw ComponentPrototype, via the ComponentInCompositionInstanceRef, the referenced ExecutableEntity belongs to, shall be provided as context information. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">EOCExecutableEntityRefAbstract</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ExecutionOrderConstraint.orderedElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswModule Instance	<a href="#">BswImplementation</a>	0..1	ref	Specifies the BSW module instance the BSW module entity belongs to.
component	<a href="#">SwComponent Prototype</a>	0..1	iref	This association references the specific instance of the SW-C prototype. <b>InstanceRef implemented by:</b> ComponentInCompositionInstanceRef
executable	<a href="#">ExecutableEntity</a>	0..1	ref	The ExecutableEntity whose execution order is restricted by the constraint.
successor	<a href="#">EOCExecutableEntityRefAbstract</a>	*	ref	The logical successor of an executable entity or a group of executable entities.

**Table A.463: EOCExecutableEntityRef**

<b>Class</b>	<b>EOCExecutableEntityRefAbstract</b> (abstract)			
<b>Note</b>	This is the abstractions for Execution Order Constraint Executable Entity References (leaves) and Execution Order Constraint Executable Entity Reference Groups (composites). This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">EOCEventRef</a> , <a href="#">EOCExecutableEntityRef</a> , <a href="#">EOCExecutableEntityRefGroup</a>			
<b>Aggregated by</b>	<a href="#">ExecutionOrderConstraint.orderedElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
directSuccessor	<a href="#">EOCExecutableEntityRefAbstract</a>	*	ref	The direct successor of an executable entity or a group of executable entities.

**Table A.464: EOCExecutableEntityRefAbstract**

<b>Class</b>	<b>EOCExecutableEntityRefGroup</b>			
<b>Note</b>	This is used to specify a group (composite) consisting of Execution Order Constraint Executable Entity References (leaves) and/or further Execution Order Constraint Executable Entity Reference Groups (composite). This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">EOCExecutableEntityRefAbstract</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ExecutionOrderConstraint.orderedElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
letDataExchangeParadigm	LetDataExchangeParadigmEnum	0..1	attr	Specifies the data exchange paradigm between <a href="#">ExecutableEntity</a> s within a LET interval. <b>Tags:</b> atp.Status=draft
letInterval	<a href="#">TimingDescriptionEventChain</a>	*	ref	This association references the TimingDescriptionEventChain that plays the role of a LET interval the executable entities in the group are assigned to. <a href="#">[constr_4554]</a> applies.
maxCycleRepetitions	PositiveInteger	0..1	attr	<b>Repetitive Execution Order Constraint only:</b> The number of repetitions (cycles) of the event in the Repetitive Execution Order Constraint. <b>Tags:</b> atp.Status=draft
maxSlotsPerCycle	PositiveInteger	0..1	attr	<b>Repetitive Execution Order Constraint only:</b> The number of <a href="#">ExecutableEntity</a> s (slots) that are executed in a given order within a cycle, for the Repetitive Execution Order Constraint. <b>Tags:</b> atp.Status=draft
nestedElement (ordered)	<a href="#">EOCExecutableEntityRefAbstract</a>	*	ref	This association is used to establish hierarchies of EOCEER Groups and References.
successor	<a href="#">EOCExecutableEntityRefAbstract</a>	*	ref	The logical successor of an executable entity or a group of executable entities.
triggeringEvent	<a href="#">TimingDescriptionEvent</a>	0..1	ref	In case of a Repetitive Execution Order Constraint this association references the timing description event triggering every cycle.

**Table A.465: EOCExecutableEntityRefGroup**

<b>Class</b>	<b>EcuAbstractionSwComponentType</b>			
<b>Note</b>	The EcuAbstraction is a special AtomicSwComponentType that resides between a software-component that wants to access ECU periphery and the Microcontroller Abstraction. The EcuAbstractionSwComponentType introduces the possibility to link from the software representation to its hardware description provided by the ECU Resource Template. <b>Tags:</b> atp.recommendedPackage=SwComponentTypes			
<b>Base</b>	ARElement, ARObject, <a href="#">AtomicSwComponentType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
hardwareElement	<a href="#">HwDescriptionEntity</a>	*	ref	Reference from the EcuAbstractionComponentType to the description of the used HwElements.

**Table A.466: EcuAbstractionSwComponentType**

<b>Class</b>	<b>EcuInstance</b>			
<b>Note</b>	ECUInstances are used to define the ECUs used in the topology. The type of the ECU is defined by a reference to an ECU specified with the ECU resource description. <b>Tags:</b> atp.recommendedPackage=EcuInstances			





Class	EcuInstance			
Base	ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
associatedComIPduGroup	ISignalIPduGroup	*	ref	With this reference it is possible to identify which ISignalIPduGroups are applicable for which Communication Connector/ ECU. Only top level ISignalIPduGroups shall be referenced by an EcuInstance. If an ISignalIPduGroup contains other ISignalIPduGroups than these contained ISignalIPduGroups shall not be referenced by the EcuInstance. Contained ISignalIPduGroups are associated to an Ecu Instance via the top level ISignalIPduGroup. This Attribute is only used by the AUTOSAR Classic Platform.
associatedConsumedProvidedServiceInstanceGroup	ConsumedProvidedServiceInstanceGroup	*	ref	With this reference it is possible to identify which ConsumedProvidedServiceInstanceGroups are applicable for which ECUInstance. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=associatedConsumedProvidedServiceInstanceGroup.consumedProvidedServiceInstanceGroup, associatedConsumedProvidedServiceInstanceGroup.variationPoint.shortLabel vh.latestBindingTime=postBuild
associatedPdurIPduGroup	PdurIPduGroup	*	ref	With this reference it is possible to identify which PdurIPdu Groups are applicable for which Communication Connector/ ECU.
channelSynchronousWakeup	Boolean	0..1	attr	If this parameter is available and set to true, then all available channels will be woken up as soon as at least one channel wakeup occurs. If PNCs are configured, then all PNCs will be requested upon a channel wakeup.
clientIdRange	ClientIdRange	0..1	aggr	Restriction of the Client Identifier for this Ecu to an allowed range of numerical values. The Client Identifier of the transaction handle is generated by the client RTE for inter-Ecu Client/Server communication.
comConfigurationGwTimeBase	TimeValue	0..1	attr	The period between successive calls to Com_MainFunctionRouteSignals of the AUTOSAR COM module in seconds. This Attribute is only used by the AUTOSAR Classic Platform.
comConfigurationRxTimeBase	TimeValue	0..1	attr	The period between successive calls to Com_MainFunctionRx of the AUTOSAR COM module in seconds. This Attribute is only used by the AUTOSAR Classic Platform.
comConfigurationTxTimeBase	TimeValue	0..1	attr	The period between successive calls to Com_MainFunctionTx of the AUTOSAR COM module in seconds. This Attribute is only used by the AUTOSAR Classic Platform.
comEnableMDTForCyclicTransmission	Boolean	0..1	attr	Enables for the Com module of this EcuInstance the minimum delay time monitoring for cyclic and repeated transmissions (TransmissionModeTiming has cyclic Timing assigned or eventControlledTiming with numberOfRepetitions > 0). This Attribute is only used by the AUTOSAR Classic Platform.





Class	EcuInstance			
commController	<a href="#">Communication Controller</a>	*	aggr	CommunicationControllers of the ECU. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=commController.shortName, comm Controller.variationPoint.shortLabel vh.latestBindingTime=postBuild
connector	<a href="#">Communication Connector</a>	*	aggr	All channels controlled by a single controller. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=connector.shortName, connector.variation Point.shortLabel vh.latestBindingTime=postBuild
dltConfig	<a href="#">DltConfig</a>	0..1	aggr	Describes the Dlt configuration on this EcuInstance. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=dltConfig This Attribute is only used by the AUTOSAR Classic Platform.
dolpConfig	DolpConfig	0..1	aggr	Dolp configuration on this EcuInstance. <b>Tags:</b> atp.Status=draft This Attribute is only used by the AUTOSAR Classic Platform.
ecuTaskProxy	<a href="#">OsTaskProxy</a>	*	ref	Reference to OsTaskProxies assigned to the Ecu Instance. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=ecuTaskProxy This Attribute is only used by the AUTOSAR Classic Platform.
ethSwitchPort Group Derivation	Boolean	0..1	attr	Defines whether the derivation of SwitchPortGroups based on VLAN and/or CouplingPort.pncMapping shall be performed for this EcuInstance. If not defined the derivation shall not be done. This Attribute is only used by the AUTOSAR Classic Platform.
firewallRule	<a href="#">StateDependentFirewall</a>	*	ref	Firewall rules defined in the context of an EcuInstance. <b>Tags:</b> atp.Status=candidate
j1939Node	<a href="#">J1939Node</a>	*	aggr	Optional collection of J1939Nodes defined on this Ecu Instance. This Attribute is only used by the AUTOSAR Classic Platform.
partition	<a href="#">EcuPartition</a>	*	aggr	Optional definition of Partitions within an Ecu. This Attribute is only used by the AUTOSAR Classic Platform.
pncNmRequest	Boolean	0..1	attr	Defines if this EcuInstance shall request Nm on all its PhysicalChannels which have Nm variant set to FULL each time a PNC is requested.
pncPrepare SleepTimer	TimeValue	0..1	attr	Time in seconds the PNC state machine shall wait in PNC_PREPARE_SLEEP.
pnc Synchronous Wakeup	Boolean	0..1	attr	If this parameter is available and set to true then all available PNCs will be woken up as soon as a channel wakeup occurs. This is ensured by adding all PNCs to all channel wakeup sources during upstream mapping.
pnResetTime	TimeValue	0..1	attr	Specifies the runtime of the reset timer in seconds. This reset time is valid for the reset of PN requests in the EIRA and in the ERA.





Class	EcuInstance			
sleepModeSupported	Boolean	0..1	attr	Specifies whether the ECU instance may be put to a "low power mode" <ul style="list-style-type: none"> <li>• true: sleep mode is supported</li> <li>• false: sleep mode is not supported</li> </ul> Note: This flag may only be set to "true" if the feature is supported by both hardware and basic software. This Attribute is only used by the AUTOSAR Classic Platform.
tcpIpCmpProps	EthTcpIpCmpProps	0..1	ref	EcuInstance specific ICMP (Internet Control Message Protocol) attributes This Attribute is only used by the AUTOSAR Classic Platform.
tcpIpProps	EthTcpIpProps	0..1	ref	EcuInstance specific TcpIp Stack attributes. This Attribute is only used by the AUTOSAR Classic Platform.
v2xSupported	V2xSupportEnum	0..1	attr	This attribute is used to control the existence of the V2X stack on the given EcuInstance. This Attribute is only used by the AUTOSAR Classic Platform.
wakeUpOverBusSupported	Boolean	0..1	attr	Driver support for wakeup over Bus. This Attribute is only used by the AUTOSAR Classic Platform.

Table A.467: EcuInstance

Class	EcuPartition			
Note	Partitions are used as error containment regions. They permit the grouping of SWCs and resources and allow to describe recovery policies individually for each partition. Partitions can be terminated or restarted during run-time as a result of a detected error. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">EcuInstance.partition</a>			
Attribute	Type	Mult.	Kind	Note
execInUserMode	Boolean	0..1	attr	A partition can execute either in CPU user mode (execInUserMode = TRUE) or supervisor mode (execInUserMode = FALSE). In user mode, the partition has a limited access to memory, to memory mapped hardware and to CPU. In user mode, the partition is mapped to a non-trusted OS-Application.

Table A.468: EcuPartition

Class	EcuPartitionToCoreMapping			
Note	This element maps an EcuPartition to a Core that is represented by a HwElement with category ProcessingUnit. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">SystemMapping.ecuPartitionToCoreMapping</a>			
Attribute	Type	Mult.	Kind	Note
coreId	PositiveInteger	0..1	attr	Optional definition of Core Id.
ecuPartition	<a href="#">EcuPartition</a>	0..1	ref	EcuPartition that is mapped to a ProcessingUnit
processingUnit	<a href="#">HwElement</a>	0..1	ref	HwElement with category ProcessingUnit to which the EcuPartition is mapped.

Table A.469: EcuPartitionToCoreMapping

<b>Class</b>	<b>EcuResourceEstimation</b>			
<b>Note</b>	Resource estimations for RTE and BSW of a single ECU instance.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SystemMapping.resourceEstimation			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswResourceEstimation	ResourceConsumption	0..1	aggr	Estimation for the resource consumption of the basic software.
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	Reference to the ECU this estimation is done for.
introduction	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents introductory documentation about the ecu resource estimation <b>Tags:</b> xml.sequenceOffset=-10
rteResourceEstimation	ResourceConsumption	0..1	aggr	Estimation for the resource consumption of the run time environment.
swCompToEcuMapping	<a href="#">SwcToEcuMapping</a>	*	ref	References to SwcToEcuMappings that have been taken into account for the resource estimations. This way it is possible to define different EcuResourceEstimations with different mappings, e.g. before and after mapping an additional SW component. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.470: EcuResourceEstimation**

<b>Class</b>	<b>EcuTiming</b>			
<b>Note</b>	A model element used to define timing descriptions and constraints within the scope of one ECU configuration. TimingDescriptions aggregated by EcuTiming are allowed to use all events derived from the class TimingDescriptionEvent. <b>Tags:</b> atp.recommendedPackage=TimingExtensions This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TimingExtension</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ecuConfiguration	<a href="#">EcucValueCollection</a>	0..1	ref	This defines the scope of an EcuTiming. All corresponding timing descriptions and constraints shall be defined within this scope.

**Table A.471: EcuTiming**

<b>Class</b>	<b>EcucAbstractConfigurationClass</b> (abstract)			
<b>Note</b>	Specifies the ValueConfigurationClass of a parameter/reference or the MultiplicityConfigurationClass of a parameter/reference or a container for each ConfigurationVariant of the EcucModuleDef. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">EcucMultiplicityConfigurationClass</a> , <a href="#">EcucValueConfigurationClass</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
configClass	<a href="#">EcucConfigurationClassEnum</a>	0..1	attr	Specifies the ConfigurationClass for the given ConfigurationVariant.
configVariant	<a href="#">EcucConfigurationVariantEnum</a>	0..1	attr	Specifies the ConfigurationVariant the ConfigurationClass is specified for.

**Table A.472: EcucAbstractConfigurationClass**



<b>Class</b>	<b><i>EcucAbstractInternalReferenceDef</i></b> (abstract)			
<b>Note</b>	Common abstract class to gather attributes for internal references (where the destination is located in the Ecu Configuration Description). This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>AtpDefinition</i> , <a href="#">EcucAbstractReferenceDef</a> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">EcucChoiceReferenceDef</a> , <a href="#">EcucReferenceDef</a> , <a href="#">EcucUriReferenceDef</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.reference</a> , <a href="#">EcucParamConfContainerDef.reference</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
requires SymbolicName Value	Boolean	0..1	attr	If this attribute is set to true the implementation of the reference is done using a Symbolic Name defined by the referenced container according to TPS_ECUC_02108.

**Table A.473: EcucAbstractInternalReferenceDef**

<b>Class</b>	<b><i>EcucAbstractReferenceDef</i></b> (abstract)			
<b>Note</b>	Common class to gather the attributes for the definition of references. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>AtpDefinition</i> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<i>EcucAbstractExternalReferenceDef</i> , <a href="#">EcucAbstractInternalReferenceDef</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.reference</a> , <a href="#">EcucParamConfContainerDef.reference</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
withAuto	Boolean	0..1	attr	Specifies whether it shall be allowed on the value side to specify this reference value as "AUTO". If withAuto is "true" it shall be possible to set the "isAuto Value" attribute of the respective reference to "true". This means that the actual value will not be considered during ECU Configuration but will be (re-)calculated by the code generator and stored in the value attribute afterwards. These implicit updated values might require a re-generation of other modules which reference these values. If withAuto is "false" it shall not be possible to set the "isAuto Value" attribute of the respective reference to "true". If withAuto is not present the default is "false".

**Table A.474: EcucAbstractReferenceDef**

<b>Class</b>	<b><i>EcucAbstractReferenceValue</i></b> (abstract)			
<b>Note</b>	Abstract class to be used as common parent for all reference values in the ECU Configuration Description. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>EcucIndexableValue</i>			
<b>Subclasses</b>	<a href="#">EcucInstanceReferenceValue</a> , <a href="#">EcucReferenceValue</a>			
<b>Aggregated by</b>	<a href="#">EcucContainerValue.referenceValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
annotation	Annotation	*	aggr	Possibility to provide additional notes while defining a model element (e.g. the ECU Configuration Parameter Values). These are not intended as documentation but are mere design notes.
definition	<a href="#">EcucAbstractReferenceDef</a>	0..1	ref	Reference to the definition of this EcucAbstractReference Value subclasses in the ECU Configuration Parameter Definition. <b>Tags:</b> xml.sequenceOffset=-10







Class	<b>EcucAbstractReferenceValue</b> (abstract)			
isAutoValue	Boolean	0..1	attr	<p>If withAuto is set to "true" for this parameter definition the isAutoValue can be set to "true".</p> <p>If isAutoValue is set to "true" the actual value will not be considered during ECU Configuration but will be (re-)calculated by the code generator and stored in the value attribute afterwards. These implicit updated values might require a re-generation of other modules which reference these values.</p> <p>If isAutoValue is not present the default is "false".</p>

**Table A.475: EcucAbstractReferenceValue**

Class	<b>EcucAddInfoParamValue</b>			
Note	<p>This parameter corresponds to EcucAddInfoParamDef.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
Base	ARObject, EcucIndexableValue, <a href="#">EcucParameterValue</a>			
Aggregated by	<a href="#">EcucContainerValue.parameterValue</a>			
Attribute	Type	Mult.	Kind	Note
value	<a href="#">DocumentationBlock</a>	0..1	aggr	Holds the content of the formatted text.

**Table A.476: EcucAddInfoParamValue**

Class	<b>EcucChoiceReferenceDef</b>			
Note	<p>Specify alternative references where in the ECU Configuration description only one of the specified references will actually be used.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
Base	ARObject, AtpDefinition, <a href="#">EcucAbstractInternalReferenceDef</a> , <a href="#">EcucAbstractReferenceDef</a> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">EcucDestinationUriPolicy.reference</a> , <a href="#">EcucParamConfContainerDef.reference</a>			
Attribute	Type	Mult.	Kind	Note
destination	<a href="#">EcucContainerDef</a>	*	ref	<p>All the possible parameter containers for the reference are specified.</p> <p><b>Stereotypes:</b> atpUriDef</p>

**Table A.477: EcucChoiceReferenceDef**

Class	<b>EcucCommonAttributes</b> (abstract)			
Note	<p>Attributes used by Configuration Parameters as well as References.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
Base	ARObject, AtpDefinition, <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">EcucAbstractReferenceDef</a> , <a href="#">EcucParameterDef</a>			
Attribute	Type	Mult.	Kind	Note
multiplicity ConfigClass	<a href="#">EcucMultiplicityConfigurationClass</a>	*	aggr	<p>Specifies in which MultiplicityConfigurationClass this parameter or reference is available in a particular ConfigurationVariant. This aggregation is optional if the surrounding EcucModuleDef has the Category STANDARDIZED_MODULE_DEFINITION. If the category attribute of the EcucModuleDef is set to VENDOR_SPECIFIC_MODULE_DEFINITION, then this aggregation is mandatory.</p> <p><b>Tags:</b> xml.name Plural=MULTIPLICITY-CONFIG-CLASSES</p>





Class	<b>EcucCommonAttributes</b> (abstract)			
origin	String	0..1	attr	String specifying if this configuration parameter is an AUTOSAR standardized configuration parameter or if the parameter is hardware- or vendor-specific.
postBuildVariant Multiplicity	Boolean	0..1	attr	Indicates if a parameter or a reference may have different number of instances in different post-build variants (previously known as post-build selectable configuration sets). TRUE means yes, FALSE means no.
postBuildVariant Value	Boolean	0..1	attr	Indicates if a parameter or a reference may have different value in different post-build variants (previously known as post-build selectable configuration sets). TRUE means yes, FALSE means no.
requiresIndex	Boolean	0..1	attr	Used to define whether the value element for this definition shall be provided with an index.
valueConfig Class	<a href="#">EcucValueConfiguration Class</a>	*	aggr	Specifies in which ValueConfigurationClass this parameter or reference is available in a particular ConfigurationVariant. This aggregation is optional if the surrounding EcucModuleDef has the Category STANDARDIZED_MODULE_DEFINITION. If the category attribute of the EcucModuleDef is set to VENDOR_SPECIFIC_MODULE_DEFINITION, then this aggregation is mandatory. <b>Tags:</b> xml.namePlural=VALUE-CONFIG-CLASSES

**Table A.478: EcucCommonAttributes**

Class	«atpMixedString» <b>EcucConditionFormula</b>			
<b>Note</b>	This formula shall yield a boolean expression depending on ecuc queries. Note that the EcucCondition Formula is a mixed string. Therefore, the properties have the upper multiplicity 1. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, FormulaExpression			
<b>Aggregated by</b>	EcucConditionSpecification.conditionFormula, <a href="#">EcucValidationCondition.validationFormula</a>			
Attribute	Type	Mult.	Kind	Note
ecucQuery	<a href="#">EcucQuery</a>	0..1	ref	The EcucQuery serves as a argument for the formula.
ecucQuery String	<a href="#">EcucQuery</a>	0..1	ref	This indicates that the referenced query shall return a string.

**Table A.479: EcucConditionFormula**

Enumeration	<b>EcucConfigurationClassEnum</b>
<b>Note</b>	Possible configuration classes for the AUTOSAR configuration parameters. This Enumeration is only used by the AUTOSAR Classic Platform.
<b>Aggregated by</b>	<a href="#">EcucAbstractConfigurationClass.configClass</a>
Literal	Description
Link	Link Time: parts of configuration are delivered from another object code file <b>Tags:</b> atp.EnumerationLiteralIndex=0
PostBuild	PostBuildTime: after compilation a configuration parameter can be changed. <b>Tags:</b> atp.EnumerationLiteralIndex=1
PreCompile	PreCompile Time: after compilation a configuration parameter can not be changed any more. <b>Tags:</b> atp.EnumerationLiteralIndex=2
Published Information	PublishedInformation is used to specify the fact that certain information is fixed even before the pre-compile stage. <b>Tags:</b> atp.EnumerationLiteralIndex=3

**Table A.480: EcucConfigurationClassEnum**

Enumeration	EcucConfigurationVariantEnum
Note	Specifies the possible Configuration Variants used for AUTOSAR BSW Modules. This Enumeration is only used by the AUTOSAR Classic Platform.
Aggregated by	<a href="#">EcucAbstractConfigurationClass.configVariant</a> , <a href="#">EcucModuleConfigurationValues.implementationConfigVariant</a> , <a href="#">EcucModuleDef.supportedConfigVariant</a>
Literal	Description
Preconfigured Configuration	Preconfigured (i.e. fixed) configuration which cannot be changed. <b>Tags:</b> atp.EnumerationLiteralIndex=0
Recommended Configuration	Recommended configuration for a module. <b>Tags:</b> atp.EnumerationLiteralIndex=1
VariantLinkTime	Specifies that the BSW Module implementation may use PreCompileTime and LinkTime configuration parameters. <b>Tags:</b> atp.EnumerationLiteralIndex=2
VariantPostBuild	Specifies that the BSW Module implementation may use PreCompileTime, LinkTime and PostBuild configuration parameters. <b>Tags:</b> atp.EnumerationLiteralIndex=3
VariantPreCompile	Specifies that the BSW Module implementation uses only PreCompileTime configuration parameters. <b>Tags:</b> atp.EnumerationLiteralIndex=6

**Table A.481: EcucConfigurationVariantEnum**

Class	EcucContainerDef (abstract)			
Note	Base class used to gather common attributes of configuration container definitions. This Class is only used by the AUTOSAR Classic Platform.			
Base	<a href="#">ARObject</a> , <a href="#">AtpDefinition</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">EcucChoiceContainerDef</a> , <a href="#">EcucParamConfContainerDef</a>			
Aggregated by	<a href="#">EcucDestinationUriPolicy.container</a> , <a href="#">EcucModuleDef.container</a> , <a href="#">EcucParamConfContainerDef.subContainer</a>			
Attribute	Type	Mult.	Kind	Note
destinationUri	<a href="#">EcucDestinationUriDef</a>	*	ref	Several destinationUris can be defined for an Ecuc ContainerDef. With such destinationUris an Ecuc ContainerDef is applicable for several EcucUriReference Defs. <b>Stereotypes:</b> atpUriDef
multiplicityConfigClass	<a href="#">EcucMultiplicityConfigurationClass</a>	*	aggr	Specifies which MultiplicityConfigurationClass this container is available for which ConfigurationVariant. This aggregation is optional if the surrounding EcucModuleDef has the Category STANDARDIZED_MODULE_DEFINITION. If the category attribute of the EcucModuleDef is set to VENDOR_SPECIFIC_MODULE_DEFINITION and if the upperMultiplicity is greater than the lowerMultiplicity then this aggregation is mandatory. <b>Tags:</b> xml.name Plural=MULTIPLICITY-CONFIG-CLASSES
origin	String	0..1	attr	This attribute specifies whether this configuration container is an AUTOSAR standardized container or whether it is vendor-specific.
postBuildVariantMultiplicity	Boolean	0..1	attr	Indicates if a container may have different number of instances in different post-build variants (previously known as post-build selectable configuration sets). TRUE means yes, FALSE means no.
requiresIndex	Boolean	0..1	attr	Used to define whether the value element for this definition shall be provided with an index.

**Table A.482: EcucContainerDef**

<b>Class</b>	<b>EcucContainerValue</b>			
<b>Note</b>	Represents a Container definition in the ECU Configuration Description. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, EcucIndexableValue, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucContainerValue.subContainer</a> , <a href="#">EcucModuleConfigurationValues.container</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
definition	<a href="#">EcucContainerDef</a>	0..1	ref	Reference to the definition of this Container in the ECU Configuration Parameter Definition. <b>Tags:</b> xml.sequenceOffset=-10
parameterValue	<a href="#">EcucParameterValue</a>	*	aggr	Aggregates all ECU Configuration Values within this Container. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=parameterValue, parameterValue.variationPoint.shortLabel vh.latestBindingTime=postBuild
referenceValue	<a href="#">EcucAbstractReferenceValue</a>	*	aggr	Aggregates all References with this container. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=referenceValue, referenceValue.variationPoint.shortLabel vh.latestBindingTime=postBuild
subContainer	<a href="#">EcucContainerValue</a>	*	aggr	Aggregates all sub-containers within this container. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=subContainer.shortName, subContainer.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.483: EcucContainerValue**

<b>Class</b>	<b>EcucDefinitionElement</b> (abstract)			
<b>Note</b>	Common class used to express the commonalities of configuration parameters, references and containers. If not stated otherwise the default multiplicity is exactly one mandatory occurrence of the specified element. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, AtpDefinition, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">EcucCommonAttributes</a> , <a href="#">EcucContainerDef</a> , <a href="#">EcucModuleDef</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ecucCond	EcucCondition Specification	0..1	aggr	If it evaluates to true the Ecu Parameter definition shall be processed as specified. Otherwise the parameter definition shall be ignored. <b>Tags:</b> xml.sequenceOffset=100
ecucValidation Cond	<a href="#">EcucValidationCondition</a>	*	aggr	Collection of validation conditions which all need to evaluate to true in order to indicate a valid validation condition of the EcucDefinitionElement.
lowerMultiplicity	PositiveInteger	0..1	attr	The lower multiplicity of the specified element. 0: optional 1: at least one occurrence n: at least n occurrences <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=codeGenerationTime xml.sequenceOffset=110
relatedTrace Item	<a href="#">Traceable</a>	0..1	ref	This contains a sloppy reference to the Autosar compatible identifier of the element (EcucId). <b>Stereotypes:</b> atpUriDef <b>Tags:</b> xml.sequenceOffset=-10





Class	<i>EcucDefinitionElement</i> (abstract)			
scope	EcucScopeEnum	0..1	attr	Specifies the scope of this configuration element. <b>Tags:</b> xml.sequenceOffset=150
upperMultiplicity	PositiveInteger	0..1	attr	The upper multiplicity of the specified element. 0: no occurrence (used for VSMD) 1: at most one occurrence m: at most m occurrences If upperMultiplicity is set than upperMultiplicityInfinite shall not be used. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=codeGenerationTime xml.sequenceOffset=120
upperMultiplicityInfinite	Boolean	0..1	attr	To express an infinite number of occurrences of this element this attribute has to be set to true. If upperMultiplicityInfinite is set than upperMultiplicity shall not be used. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=codeGenerationTime xml.sequenceOffset=130

**Table A.484: EcucDefinitionElement**

Class	<i>EcucDestinationUriDef</i>			
<b>Note</b>	Description of an EcucDestinationUriDef that is used as target of EcucUriReferenceDefs. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriDefSet.destinationUriDef</a>			
Attribute	Type	Mult.	Kind	Note
destinationUriPolicy	<a href="#">EcucDestinationUriPolicy</a>	0..1	aggr	Description of the targeted EcucContainerDef.

**Table A.485: EcucDestinationUriDef**

Class	<i>EcucDestinationUriDefSet</i>			
<b>Note</b>	This class represents a list of EcucDestinationUriDefs. <b>Tags:</b> atp.recommendedPackage=EcucDestinationUriDefSets This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
destinationUriDef	<a href="#">EcucDestinationUriDef</a>	*	aggr	This is one particular EcucDestinationUriDef.

**Table A.486: EcucDestinationUriDefSet**

Enumeration	<i>EcucDestinationUriNestingContractEnum</i>			
<b>Note</b>	EcucDestinationUriNestingContractEnum is used to determine what is qualified by the EcucDestinationUriPolicy. This Enumeration is only used by the AUTOSAR Classic Platform.			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.destinationUriNestingContract</a>			





Enumeration	EcucDestinationUriNestingContractEnum
Literal	Description
leafOfTargetContainer	EcucDestinationUriPolicy describes elements (subContainers, Parameters, References) that are directly owned by the target container. <b>Tags:</b> atp.EnumerationLiteralIndex=0
targetContainer	EcucDestinationUriPolicy describes the target container of EcucUriReferenceDef. <b>Tags:</b> atp.EnumerationLiteralIndex=1
vertexOfTargetContainer	EcucDestinationUriPolicy describes elements (subContainers, Parameters, References) of the target container which can be defined in arbitrary nested subContainer structure. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.487: EcucDestinationUriNestingContractEnum**

Class	EcucDestinationUriPolicy			
Note	The EcucDestinationUriPolicy describes the EcucContainerDef that will be targeted by EcucUriReference Defs. The type of the description is dependent of the destinationUriNestingContract attribute. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject			
Aggregated by	EcucDestinationUriDef.destinationUriPolicy			
Attribute	Type	Mult.	Kind	Note
container	EcucContainerDef	*	aggr	Description of the targetContainer in case that the destinationUriNestingPolicy is set to targetContainer. In all other cases the subContainers of the target container are defined here.
destinationUriNestingContract	EcucDestinationUriNestingContractEnum	0..1	attr	This attribute defines how the referenced target Ecuc ContainerDef is described.
parameter	EcucParameterDef	*	aggr	Description of parameters that are contained in the target container.
reference	EcucAbstractReferenceDef	*	aggr	Description of references that are contained in the target container.

**Table A.488: EcucDestinationUriPolicy**

Class	EcucEnumerationLiteralDef			
Note	Configuration parameter type for enumeration literals definition. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Aggregated by	EcucEnumerationParamDef.literal			
Attribute	Type	Mult.	Kind	Note
ecucCond	EcucConditionSpecification	0..1	aggr	If it evaluates to true the literal definition shall be processed as specified. Otherwise the literal definition shall be ignored.
origin	String	0..1	attr	String specifying if this literal is an AUTOSAR standardized literal or if the literal is vendor-specific.

**Table A.489: EcucEnumerationLiteralDef**

<b>Class</b>	<b>EcucForeignReferenceDef</b>			
<b>Note</b>	Specify a reference to an XML description of an entity described in another AUTOSAR template. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpDefinition</a> , <a href="#">EcucAbstractExternalReferenceDef</a> , <a href="#">EcucAbstractReferenceDef</a> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.reference</a> , <a href="#">EcucParamConfContainerDef.reference</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
destinationType	String	0..1	attr	The type in the AUTOSAR Metamodel to which instance this reference is allowed to point to.

**Table A.490: EcucForeignReferenceDef**

<b>Class</b>	«atpVariation» <b>EcucFunctionNameDef</b>			
<b>Note</b>	Configuration parameter type for Function Names like those used to specify callback functions. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpDefinition</a> , <a href="#">EcucAbstractStringParamDef</a> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">EcucParameterDef</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.parameter</a> , <a href="#">EcucParamConfContainerDef.parameter</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.491: EcucFunctionNameDef**

<b>Class</b>	<b>EcucInstanceReferenceDef</b>			
<b>Note</b>	Specify a reference to an XML description of an entity described in another AUTOSAR template using the INSTANCE REFERENCE semantics. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpDefinition</a> , <a href="#">EcucAbstractExternalReferenceDef</a> , <a href="#">EcucAbstractReferenceDef</a> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.reference</a> , <a href="#">EcucParamConfContainerDef.reference</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
destinationContext	String	0..1	attr	The context in the AUTOSAR Metamodel to which' this reference is allowed to point to.
destinationType	String	0..1	attr	The type in the AUTOSAR Metamodel to which' instance this reference is allowed to point to.

**Table A.492: EcucInstanceReferenceDef**

<b>Class</b>	<b>EcucInstanceReferenceValue</b>			
<b>Note</b>	InstanceReference representation in the ECU Configuration. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">EcucAbstractReferenceValue</a> , <a href="#">EcucIndexableValue</a>			
<b>Aggregated by</b>	<a href="#">EcucContainerValue.referenceValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
value	<a href="#">AtpFeature</a>	0..1	iref	InstanceReference representation in the ECU Configuration. <b>InstanceRef implemented by:</b> <a href="#">AnyInstanceRef</a>

**Table A.493: EcucInstanceReferenceValue**



<b>Class</b>	<b>EcucModuleConfigurationValues</b>			
<b>Note</b>	<p>Head of the configuration of one Module. A Module can be a BSW module as well as the RTE and ECU Infrastructure.</p> <p>As part of the BSW module description, the EcucModuleConfigurationValues element has two different roles:</p> <p>The recommendedConfiguration contains parameter values recommended by the BSW module vendor. The preconfiguredConfiguration contains values for those parameters which are fixed by the implementation and cannot be changed.</p> <p>These two EcucModuleConfigurationValues are used when the base EcucModuleConfigurationValues (as part of the base ECU configuration) is created to fill parameters with initial values.</p> <p><b>Tags:</b> atp.recommendedPackage=EcucModuleConfigurationValues</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
container	<a href="#">EcucContainerValue</a>	*	aggr	Aggregates all containers that belong to this module configuration. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=container.shortName, container.variation Point.shortLabel vh.latestBindingTime=postBuild xml.sequenceOffset=10
definition	<a href="#">EcucModuleDef</a>	0..1	ref	Reference to the definition of this EcucModule ConfigurationValues element. Typically, this is a vendor specific module configuration. <b>Tags:</b> xml.sequenceOffset=-10
ecucDefEdition	RevisionLabelString	0..1	attr	This is the version info of the ModuleDef ECUC Parameter definition to which this values conform to / are based on. For the Definition of ModuleDef ECUC Parameters the AdminData shall be used to express the semantic changes. The compatibility rules between the definition and value revision labels is up to the module's vendor.
implementation ConfigVariant	<a href="#">EcucConfigurationVariantEnum</a>	0..1	attr	Specifies the kind of deliverable this EcucModule ConfigurationValues element provides. If this element is not used in a particular role (e.g. preconfigured Configuration or recommendedConfiguration) then the value shall be one of VariantPreCompile, VariantLink Time, VariantPostBuild.
module Description	<a href="#">BswImplementation</a>	0..1	ref	Referencing the BSW module description, which this EcucModuleConfigurationValues element is configuring. This is optional because the EcucModuleConfigurationValues element is also used to configure the ECU infrastructure (memory map) or Application SW-Cs. However in case the EcucModuleConfigurationValues are used to configure the module, the reference is mandatory in order to fetch module specific "common" published information.
postBuildVariant Used	Boolean	0..1	attr	Indicates whether a module implementation has or plans to have (i.e., introduced at link or post-build time) new post-build variation points. TRUE means yes, FALSE means no. If the attribute is not defined, FALSE semantics shall be assumed.

**Table A.494: EcucModuleConfigurationValues**



<b>Class</b>	<b>EcucModuleDef</b>			
<b>Note</b>	Used as the top-level element for configuration definition for Software Modules, including BSW and RTE as well as ECU Infrastructure. <b>Tags:</b> atp.recommendedPackage=EcucDefs This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpDefinition</a> , <a href="#">CollectableElement</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
apiServicePrefix	CIdentifier	0..1	attr	For modules where several instances of the VSMD can be defined the apiServicePrefix defines the API namespace of the derived instances, e.g. Cdd, Xfrm (ComXf, SomelpXf, E2EXf).
container	<a href="#">EcucContainerDef</a>	*	aggr	Aggregates the top-level container definitions of this specific module definition. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=container.shortName xml.sequenceOffset=11
postBuildVariantSupport	Boolean	0..1	attr	Indicates if a module supports different post-build variants (previously known as post-build selectable configuration sets). TRUE means yes, FALSE means no.
refinedModuleDef	<a href="#">EcucModuleDef</a>	0..1	ref	Optional reference from the Vendor Specific Module Definition to the Standardized Module Definition it refines. In case this EcucModuleDef has the category STANDARDIZED_MODULE_DEFINITION this reference shall not be provided. In case this EcucModuleDef has the category VENDOR_SPECIFIC_MODULE_DEFINITION this reference is mandatory. <b>Stereotypes:</b> atpUriDef
supportedConfigVariant	<a href="#">EcucConfigurationVariantEnum</a>	*	attr	Specifies which ConfigurationVariants are supported by this software module. This attribute is optional if the EcucModuleDef has the category STANDARDIZED_MODULE_DEFINITION. If the category attribute of the EcucModuleDef is set to VENDOR_SPECIFIC_MODULE_DEFINITION then this attribute is mandatory.

**Table A.495: EcucModuleDef**

<b>Class</b>	<b>EcucMultiplicityConfigurationClass</b>			
<b>Note</b>	Specifies the MultiplicityConfigurationClass of a parameter/reference or a container for each ConfigurationVariant of the EcucModuleDef. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">EcucAbstractConfigurationClass</a>			
<b>Aggregated by</b>	<a href="#">EcucCommonAttributes.multiplicityConfigClass</a> , <a href="#">EcucContainerDef.multiplicityConfigClass</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.496: EcucMultiplicityConfigurationClass**

<b>Class</b>	<b>EcucNumericalParamValue</b>			
<b>Note</b>	Holding the value which is subject to variant handling. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">EcucIndexableValue</a> , <a href="#">EcucParameterValue</a>			
<b>Aggregated by</b>	<a href="#">EcucContainerValue.parameterValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	EcucNumericalParamValue			
value	Numerical	0..1	attr	Value which is subject to variant handling. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.497: EcucNumericalParamValue**

Class	EcucParamConfContainerDef			
<b>Note</b>	Used to define configuration containers that can hierarchically contain other containers and/or parameter definitions. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, AtpDefinition, EcucContainerDef, EcucDefinitionElement, Identifiable, Multilanguage Referrable, Referrable			
<b>Aggregated by</b>	EcucChoiceContainerDef.choice, EcucDestinationUriPolicy.container, EcucModuleDef.container, EcucParamConfContainerDef.subContainer			
Attribute	Type	Mult.	Kind	Note
parameter	EcucParameterDef	*	aggr	The parameters defined within the EcucParamConf ContainerDef. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=parameter.shortName
reference	EcucAbstractReferenceDef	*	aggr	The references defined within the EcucParamConf ContainerDef. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=reference.shortName
subContainer	EcucContainerDef	*	aggr	The containers defined within the EcucParamConf ContainerDef. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=subContainer.shortName

**Table A.498: EcucParamConfContainerDef**

Class	EcucParameterDef (abstract)			
<b>Note</b>	Abstract class used to define the similarities of all ECU Configuration Parameter types defined as subclasses. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, AtpDefinition, EcucCommonAttributes, EcucDefinitionElement, Identifiable, Multilanguage Referrable, Referrable			
<b>Subclasses</b>	EcucAbstractStringParamDef, EcucAddInfoParamDef, EcucBooleanParamDef, EcucEnumerationParamDef, EcucFloatParamDef, EcucIntegerParamDef			
<b>Aggregated by</b>	EcucDestinationUriPolicy.parameter, EcucParamConfContainerDef.parameter			
Attribute	Type	Mult.	Kind	Note
derivation	EcucDerivationSpecification	0..1	aggr	A derivation of a Configuration Parameter value can be specified by an informal Calculation Formula or by a formal language that can be used to specify the computational rules.
symbolicName Value	Boolean	0..1	attr	Specifies that this parameter's value is used, together with the aggregating container, to derive a symbolic name definition. See chapter "Representation of Symbolic Names" in Ecuc specification for more details.





Class	<i>EcucParameterDef</i> (abstract)			
withAuto	Boolean	0..1	attr	Specifies whether it shall be allowed on the value side to specify this parameter value as "AUTO". If withAuto is "true" it shall be possible to set the "isAutoValue" attribute of the respective parameter to "true". This means that the actual value will not be considered during ECU Configuration but will be (re-)calculated by the code generator and stored in the value attribute afterwards. These implicit updated values might require a re-generation of other modules which reference these values. If withAuto is "false" it shall not be possible to set the "isAutoValue" attribute of the respective parameter to "true". If withAuto is not present the default is "false".

**Table A.499: EcucParameterDef**

Class	<i>EcucParameterValue</i> (abstract)			
Note	Common class to all types of configuration values. This Class is only used by the AUTOSAR Classic Platform.			
Base	<i>ARObject</i> , <i>EcucIndexableValue</i>			
Subclasses	<a href="#">EcucAddInfoParamValue</a> , <a href="#">EcucNumericalParamValue</a> , <a href="#">EcucTextualParamValue</a>			
Aggregated by	<a href="#">EcucContainerValue.parameterValue</a>			
Attribute	Type	Mult.	Kind	Note
annotation	Annotation	*	aggr	Possibility to provide additional notes while defining the ECU Configuration Parameter Values. These are not intended as documentation but are mere design notes. <b>Tags:</b> xml.sequenceOffset=10
definition	<a href="#">EcucParameterDef</a>	0..1	ref	Reference to the definition of this EcucParameterValue subclasses in the ECU Configuration Parameter Definition. <b>Tags:</b> xml.sequenceOffset=-10
isAutoValue	Boolean	0..1	attr	If withAuto is set to "true" for this parameter definition the isAutoValue can be set to "true". If isAutoValue is set to "true" the actual value will not be considered during ECU Configuration but will be (re-)calculated by the code generator and stored in the value attribute afterwards. These implicit updated values might require a re-generation of other modules which reference these values. If isAutoValue is not present the default is "false". <b>Tags:</b> xml.sequenceOffset=20

**Table A.500: EcucParameterValue**

Class	<i>EcucQuery</i>			
Note	Defines a query to the ECUC Description. This Class is only used by the AUTOSAR Classic Platform.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<i>EcucConditionSpecification.ecucQuery</i> , <i>EcucDerivationSpecification.ecucQuery</i> , <a href="#">EcucValidationCondition.ecucQuery</a>			
Attribute	Type	Mult.	Kind	Note
ecucQuery Expression	<a href="#">EcucQueryExpression</a>	0..1	aggr	This is the EcucQuery used in the calculation formula or the condition formula.

**Table A.501: EcucQuery**

<b>Class</b>	«atpMixedString» <b>EcucQueryExpression</b>			
<b>Note</b>	Defines a query expression to the ECUC Description and output the result as an numerical value. Due to the "mixedString" nature of the formula there can be several EcucQueryExpressions used. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">EcucQuery.ecucQueryExpression</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
configElement DefGlobal	<a href="#">EcucDefinitionElement</a>	0..1	ref	The EcucQueryExpression points to an EcucDefinition Element that is used to find an element in the Ecuc Description. In order to find the right element in the Ecuc Description a search is necessary. If the complete Ecuc Description needs to be searched this global reference shall be used. Due to the "mixedString" nature of the EcucQueryExpression several references to Ecuc DefinitionElements can be used in one EcucQuery Expression. <b>Stereotypes:</b> atpUriDef
configElement DefLocal	<a href="#">EcucDefinitionElement</a>	0..1	ref	The EcucQueryExpression points to an EcucDefinition Element that is used to find an element in the Ecuc Description. In order to find the right element in the Ecuc Description a search is necessary. If the search is executed inside of the same module that contains the EcucQuery this local reference shall be used. Due to the "mixedString" nature of the EcucQueryExpression several references to EcucDefinitionElements can be used in one EcucQueryExpression. <b>Stereotypes:</b> atpUriDef

**Table A.502: EcucQueryExpression**

<b>Class</b>	<b>EcucReferenceDef</b>			
<b>Note</b>	Specify references within the ECU Configuration Description between parameter containers. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">AtpDefinition</a> , <a href="#">EcucAbstractInternalReferenceDef</a> , <a href="#">EcucAbstractReferenceDef</a> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.reference</a> , <a href="#">EcucParamConfContainerDef.reference</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
destination	<a href="#">EcucContainerDef</a>	0..1	ref	Exactly one reference to a parameter container is allowed as destination. <b>Stereotypes:</b> atpUriDef

**Table A.503: EcucReferenceDef**

<b>Class</b>	<b>EcucReferenceValue</b>			
<b>Note</b>	Used to represent a configuration value that has a parameter definition of type EcucAbstractReference Def (used for all of its specializations excluding EcucInstanceReferenceDef). This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">EcucAbstractReferenceValue</a> , <a href="#">EcucIndexableValue</a>			
<b>Aggregated by</b>	<a href="#">EcucContainerValue.referenceValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
value	<a href="#">Referrable</a>	0..1	ref	Specifies the destination of the reference.

**Table A.504: EcucReferenceValue**

<b>Class</b>	<b>EcucTextualParamValue</b>			
<b>Note</b>	Holding a value which is not subject to variation. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, EcucIndexableValue, <a href="#">EcucParameterValue</a>			
<b>Aggregated by</b>	<a href="#">EcucContainerValue.parameterValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
value	VerbatimString	0..1	attr	Value of the parameter, not subject to variant handling.

**Table A.505: EcucTextualParamValue**

<b>Class</b>	<b>EcucUriReferenceDef</b>			
<b>Note</b>	Definition of reference with a destination that is specified via a destinationUri. With such a reference it is possible to define a reference to a EcucContainerDef in a different module independent from the concrete definition of the target container. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, AtpDefinition, <a href="#">EcucAbstractInternalReferenceDef</a> , <a href="#">EcucAbstractReferenceDef</a> , <a href="#">EcucCommonAttributes</a> , <a href="#">EcucDefinitionElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucDestinationUriPolicy.reference</a> , <a href="#">EcucParamConfContainerDef.reference</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
destinationUri	<a href="#">EcucDestinationUriDef</a>	0..1	ref	Any EcucContainerDef with a destinationUri that is identical to the destinationUri that is referenced here defines a valid target. <b>Stereotypes:</b> atpUriDef

**Table A.506: EcucUriReferenceDef**

<b>Class</b>	<b>EcucValidationCondition</b>			
<b>Note</b>	Validation condition to perform a formula calculation based on EcucQueries. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcucDefinitionElement.ecucValidationCond</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ecucQuery	<a href="#">EcucQuery</a>	*	aggr	Query to the ECU Configuration Description.
validation Formula	<a href="#">EcucConditionFormula</a>	0..1	aggr	Definition of the formula used to define validation condition.

**Table A.507: EcucValidationCondition**

<b>Class</b>	<b>EcucValueCollection</b>			
<b>Note</b>	This represents the anchor point of the ECU configuration description. <b>Tags:</b> atp.recommendedPackage=EcucValueCollections This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ecucValue	<a href="#">EcucModuleConfigurationValues</a>	*	ref	References to the configuration of individual software modules that are present on this ECU. <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=ecucValue.ecucModuleConfigurationValues, ecucValue.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	EcucValueCollection			
ecuExtract	<a href="#">System</a>	0..1	ref	Represents the extract of the System Configuration that is relevant for the ECU configured with that ECU Configuration Description.

**Table A.508: EcucValueCollection**

Class	EcucValueConfigurationClass			
<b>Note</b>	Specifies the ValueConfigurationClass of a parameter/reference for each ConfigurationVariant of the EcucModuleDef. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">EcucAbstractConfigurationClass</a>			
<b>Aggregated by</b>	<a href="#">EcucCommonAttributes.valueConfigClass</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.509: EcucValueConfigurationClass**

Enumeration	EndToEndProfileBehaviorEnum
<b>Note</b>	Behavior of the check functionality
<b>Aggregated by</b>	<a href="#">EndToEndTransformationDescription.profileBehavior</a>
Literal	Description
PRE_R4_2	Check has the legacy behavior, before AUTOSAR Release 4.2. <b>Tags:</b> atp.EnumerationLiteralIndex=0 xml.name=PRE--R-4--2
R4_2	Check behaves like new P4/P5/P6 profiles introduced in AUTOSAR Release 4.2. <b>Tags:</b> atp.EnumerationLiteralIndex=1 xml.name=R-4--2

**Table A.510: EndToEndProfileBehaviorEnum**

Class	EndToEndTransformationComSpecProps			
<b>Note</b>	The class EndToEndTransformationComSpecProps specifies port specific configuration properties for EndToEnd transformer attributes.			
<b>Base</b>	ARObject, Describable, TransformationComSpecProps			
<b>Aggregated by</b>	<a href="#">ClientComSpec.transformationComSpecProps</a> , <a href="#">ReceiverComSpec.transformationComSpecProps</a> , <a href="#">ServerComSpec.transformationComSpecProps</a>			
Attribute	Type	Mult.	Kind	Note
clearFromValidToInvalid	Boolean	0..1	attr	Clear monitoring window on transition from state Valid to state Invalid.
disableEndToEndCheck	Boolean	0..1	attr	Disables/Enables the E2E check. The E2Eheader is removed from the payload independent from the setting of this attribute.
disableEndToEndStateMachine	Boolean	0..1	attr	Disables the E2EStateMachine (only E2E check functionality is performed)
e2eProfileCompatibilityProps	<a href="#">E2EProfileCompatibilityProps</a>	0..1	ref	Reference to additional settings for the E2E state machine.





Class	EndToEndTransformationComSpecProps			
maxDeltaCounter	PositiveInteger	0..1	attr	Maximum allowed difference between two counter values of two consecutively received valid messages. For example, if the receiver gets data with counter 1 and MaxDeltaCounter is 3, then at the next reception the receiver can accept Counters with values 2, 3 or 4.
maxErrorStateInit	PositiveInteger	0..1	attr	Maximal number of checks in which ProfileStatus equal to E2E_P_ERROR was determined, within the last WindowSize checks, for the state E2E_SM_INIT. The minimum value is 0.
maxErrorStateInvalid	PositiveInteger	0..1	attr	Maximal number of checks in which ProfileStatus equal to E2E_P_ERROR was determined, within the last WindowSize checks, for the state E2E_SM_INVALID. The minimum value is 0.
maxErrorStateValid	PositiveInteger	0..1	attr	Maximal number of checks in which ProfileStatus equal to E2E_P_ERROR was determined, within the last WindowSize checks, for the state E2E_SM_VALID. The minimum value is 0.
maxNoNewOrRepeatedData	PositiveInteger	0..1	attr	EndToEndTransformationDescription holds these attributes which are profile specific and have the same value for all E2E transformers. This Attribute is only used by the AUTOSAR Classic Platform.
minOkStateInit	PositiveInteger	0..1	attr	Minimal number of checks in which ProfileStatus equal to E2E_P_OK was determined, within the last WindowSize checks, for the state E2E_SM_INIT. The minimum value is 1.
minOkStateInvalid	PositiveInteger	0..1	attr	Minimal number of checks in which ProfileStatus equal to E2E_P_OK was determined, within the last WindowSize checks, for the state E2E_SM_INVALID. The minimum value is 1.
minOkStateValid	PositiveInteger	0..1	attr	Minimal number of checks in which ProfileStatus equal to E2E_P_OK was determined, within the last WindowSize checks, for the state E2E_SM_VALID. The minimum value is 1.
syncCounterInit	PositiveInteger	0..1	attr	EndToEndTransformationDescription holds these attributes which are profile specific and have the same value for all E2E transformers. This Attribute is only used by the AUTOSAR Classic Platform.
windowSizeInit	PositiveInteger	0..1	attr	Size of the monitoring window of state Init for the E2E state machine.
windowSizeInvalid	PositiveInteger	0..1	attr	Size of the monitoring window of state Invalid for the E2E state machine.
windowSizeValid	PositiveInteger	0..1	attr	Size of the monitoring window of state Valid for the E2E state machine.

**Table A.511: EndToEndTransformationComSpecProps**

Class	EndToEndTransformationDescription			
Note	EndToEndTransformationDescription holds these attributes which are profile specific and have the same value for all E2E transformers.			
Base	ARObject, Describable, <a href="#">TransformationDescription</a>			
Aggregated by	<a href="#">TransformationTechnology.transformationDescription</a>			
Attribute	Type	Mult.	Kind	Note
clearFromValidToInvalid	Boolean	0..1	attr	Clear monitoring window on transition from state Valid to state Invalid.
counterOffset	PositiveInteger	0..1	attr	Offset of the counter in the Data[] array in bits.







Class	EndToEndTransformationDescription			
crcOffset	PositiveInteger	0..1	attr	Offset of the CRC in the Data[] array in bits.
dataIdMode	<a href="#">DataIdModeEnum</a>	0..1	attr	This attribute describes the inclusion mode that is used to include the implicit two-byte Data ID in the one-byte CRC.
dataIdNibbleOffset	PositiveInteger	0..1	attr	Offset of the Data ID nibble in the Data[] array in bits.
e2eProfileCompatibilityProps	<a href="#">E2EProfileCompatibilityProps</a>	0..1	ref	Reference to additional settings for the E2E state machine.
maxDeltaCounter	PositiveInteger	0..1	attr	Maximum allowed difference between two counter values of two consecutively received valid messages. For example, if the receiver gets data with counter 1 and Max DeltaCounter is 3, then at the next reception the receiver can accept Counters with values 2, 3 or 4.
maxErrorStateInit	PositiveInteger	0..1	attr	Maximal number of checks in which ProfileStatus equal to E2E_P_ERROR was determined, within the last Window Size checks, for the state E2E_SM_INIT.
maxErrorStateInvalid	PositiveInteger	0..1	attr	Maximal number of checks in which ProfileStatus equal to E2E_P_ERROR was determined, within the last Window Size checks, for the state E2E_SM_INVALID.
maxErrorStateValid	PositiveInteger	0..1	attr	Maximal number of checks in which ProfileStatus equal to E2E_P_ERROR was determined, within the last Window Size checks, for the state E2E_SM_VALID.
maxNoNewOrRepeatedData	PositiveInteger	0..1	attr	The maximum allowed amount of consecutive failed counter checks.
minOkStateInit	PositiveInteger	0..1	attr	Minimal number of checks in which ProfileStatus equal to E2E_P_OK was determined, within the last WindowSize checks, for the state E2E_SM_INIT.
minOkStateInvalid	PositiveInteger	0..1	attr	Minimal number of checks in which ProfileStatus equal to E2E_P_OK was determined, within the last WindowSize checks, for the state E2E_SM_INVALID.
minOkStateValid	PositiveInteger	0..1	attr	Minimal number of checks in which ProfileStatus equal to E2E_P_OK was determined, within the last WindowSize checks, for the state E2E_SM_VALID.
offset	PositiveInteger	0..1	attr	Offset of the E2E header in the Data[] array in bits.
profileBehavior	<a href="#">EndToEndProfileBehaviorEnum</a>	0..1	attr	Behavior of the check functionality
profileName	NameToken	0..1	attr	Definition of the E2E profile.
syncCounterInit	PositiveInteger	0..1	attr	Number of checks required for validating the consistency of the counter that shall be received with a valid counter (i.e. counter within the allowed lock-in range) after the detection of an unexpected behavior of a received counter.







Class	EndToEndTransformationDescription			
upperHeaderBitsToShift	PositiveInteger	0..1	attr	This attribute describes the number of upper-header bits to be shifted. value = 0 or not present: shift of upper header is NOT performed. value > 0: the E2E Transformer on the protect-side, takes the first upperHeaderBitsToShift bits from the upper buffer (e.g. SOME/IP header part generated by SOME/IP transformer) and shifts them towards the lower bytes and bits within the Data[] for the length of the E2E header (e.g. 12 bytes in case of E2E Profile 4). This means the shift distance is fixed - it depends on the E2E header size - what is configured here is the number of bits that are to be shifted. This option is defined because the Some/IP header generated by SOME/IP transformer shall be, due to compatibility between non-protected and E2E-protected communication, at the same position, which is before E2E header.
windowSizeInit	PositiveInteger	0..1	attr	Size of the monitoring window of state Init for the E2E state machine.
windowSizeInvalid	PositiveInteger	0..1	attr	Size of the monitoring window of state Invalid for the E2E state machine.
windowSizeValid	PositiveInteger	0..1	attr	Size of the monitoring window of state Valid for the E2E state machine.

**Table A.512: EndToEndTransformationDescription**

Class	«atpVariation» EndToEndTransformationISignalProps			
Note	Holds all the ISignal specific attributes for the EndToEndTransformer.			
Base	ARObject, Describable, <a href="#">TransformationISignalProps</a>			
Aggregated by	<a href="#">ISignal.transformationISignalProps</a> , <a href="#">ISignalGroup.transformationISignalProps</a>			
Attribute	Type	Mult.	Kind	Note
dataId (ordered)	PositiveInteger	*	attr	This represents a unique numerical identifier. Note: ID is used for protection against masquerading. The details concerning the maximum number of values (this information is specific for each E2E profile) applicable for this attribute are controlled by a semantic constraint that depends on the category of the EndToEnd Protection.
dataLength	PositiveInteger	0..1	attr	Length of payload and E2E header in bits.
maxDataLength	PositiveInteger	0..1	attr	Maximum length of payload and E2E header in bits.
minDataLength	PositiveInteger	0..1	attr	Minimum length of payload and E2E header in bits.
sourceId	PositiveInteger	0..1	attr	This attribute represents a unique numerical identifier identifying the source of a certain transmission. In case of C/S communication, this ID uniquely identifies the client. Note: ID is used for protection against masquerading. The details concerning the maximum number of values (this information is specific for each E2E profile) applicable for this attribute are controlled by a semantic constraint that depends on the category of the EndToEnd Protection.

**Table A.513: EndToEndTransformationISignalProps**

<b>Class</b>	<b>EngineeringObject</b> (abstract)			
<b>Note</b>	This class specifies an engineering object. Usually such an object is represented by a file artifact. The properties of engineering object are such that the artifact can be found by querying an ASAM catalog file. The engineering object is uniquely identified by domain+category+shortLabel+revisionLabel.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	AutosarEngineeringObject, BuildEngineeringObject, Graphic			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
category	NameToken	1	attr	This denotes the role of the engineering object in the development cycle. Categories are such as <ul style="list-style-type: none"> <li>• SWSRC for source code</li> <li>• SWOBJ for object code</li> <li>• SWHDR for a C-header file</li> </ul> Further roles need to be defined via Methodology. <b>Tags:</b> xml.sequenceOffset=20
domain	NameToken	0..1	attr	This denotes the domain in which the engineering object is stored. This allows to indicate various segments in the repository keeping the engineering objects. The domain may segregate companies, as well as automotive domains. Details need to be defined by the Methodology. Attribute is optional to support a default domain. <b>Tags:</b> xml.sequenceOffset=40
revisionLabel	RevisionLabelString	*	attr	This is a revision label denoting a particular version of the engineering object. <b>Tags:</b> xml.sequenceOffset=30
shortLabel	NameToken	1	attr	This is the short name of the engineering object. Note that it is modeled as NameToken and not as Identifier since in ASAM-CC it is also a NameToken. <b>Tags:</b> xml.sequenceOffset=10

**Table A.514: EngineeringObject**

<b>Class</b>	<b>EnumerationMappingTable</b>			
<b>Note</b>	This class represents an attribute value variation point for Enumeration attributes. Note that this class might be used in the extended meta-model only. <b>Tags:</b> atp.recommendedPackage=EnumerationMappingTables			
<b>Base</b>	ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
entry	EnumerationMappingEntry	*	aggr	Key-value pair mapping enumeration values to unique integers. <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=true xml.typeElement=false xml.typeWrapperElement=false

**Table A.515: EnumerationMappingTable**

<b>Class</b>	<b>ErrorTracerNeeds</b>			
<b>Note</b>	Specifies the need to report failures to the error tracer.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	ErrorTracerNeeds			
tracedFailure	TracedFailure	*	aggr	list of traced failures <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tracedFailure.shortName, traced Failure.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.516: ErrorTracerNeeds**

Class	EthGlobalTimeDomainProps			
<b>Note</b>	Enables the definition of Ethernet Global Time specific properties.			
<b>Base</b>	ARObject, AbstractGlobalTimeDomainProps			
<b>Aggregated by</b>	GlobalTimeDomain.globalTimeDomainProperty			
Attribute	Type	Mult.	Kind	Note
crcFlags	EthTSynCrcFlags	0..1	aggr	Defines the fields of the message which shall be taken into account for CRC calculation and verification.
destination Physical Address	MacAddressString	0..1	attr	Defines the MAC multicast address the Ethernet time sync messages are communicated on.
fupDataIDList (ordered)	PositiveInteger	0..16	attr	The DataIDList for FUP messages to calculate CRC.
managed CouplingPort	<a href="#">EthGlobalTime ManagedCouplingPort</a>	*	aggr	Collection of CouplingPorts which are managed in the scope of this Ethernet GlobalTimeDomain.
message Compliance	EthGlobalTimeMessage FormatEnum	0..1	attr	Defines the compliance of the Ethernet time sync messages to specific standards.
vlanPriority	PositiveInteger	0..1	attr	Defines which VLAN priority shall be assigned to a time sync message in case the message is sent using a VLAN tag.

**Table A.517: EthGlobalTimeDomainProps**

Class	EthGlobalTimeManagedCouplingPort			
<b>Note</b>	Specifies a CouplingPort which is managed by an Ethernet Global Time Domain.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">EthGlobalTimeDomainProps.managedCouplingPort</a>			
Attribute	Type	Mult.	Kind	Note
couplingPort	<a href="#">CouplingPort</a>	0..1	ref	Defines which CouplingPort is managed by this EthGlobalTimeManagedCouplingPort.
globalTimePort Role	<a href="#">GlobalTimePortRole Enum</a>	0..1	attr	This attribute defines the port behavior.
globalTimeTx Period	TimeValue	0..1	attr	This attribute defines the TX period in seconds
pdelayLatency Threshold	TimeValue	0..1	attr	Threshold for calculated Pdelay. If a measured Pdelay exceeds pdelayLatencyThreshold, the measured Pdelay value is discarded.
pdelayRequest Period	TimeValue	0..1	attr	Defines the period for the pdelay request messages.
pdelayRespAnd RespFollowUp Timeout	TimeValue	0..1	attr	Timeout value for Pdelay_Resp and Pdelay_Resp_Follow_Up after a Pdelay_Req has been transmitted resp. a Pdelay_Resp has been received. A value of 0 or not defining this attribute deactivates this timeout observation.





Class	EthGlobalTimeManagedCouplingPort			
pdelay Response Enabled	Boolean	0..1	attr	Defines whether PDELAY RESPONSE and PDELAY RESPONSE FOLLOW UP shall be sent on this Coupling Port.

**Table A.518: EthGlobalTimeManagedCouplingPort**

Class	«atpVariation» EthernetCluster			
Note	Ethernet-specific cluster attributes. <b>Tags:</b> atp.recommendedPackage=CommunicationClusters			
Base	ARElement, ARObject, CollectableElement, <a href="#">CommunicationCluster</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
couplingPort Connection	<a href="#">CouplingPort Connection</a>	*	aggr	Specification of connections between CouplingElements and EcuInstances. Note: This atpSplittable property has no atp.Splitkey due to atpVariation (PropertySetPattern). <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
couplingPort StartupActive Time	TimeValue	0..1	attr	The attribute specifies the time in second a coupling port is switched on to enable the host ECU (ECU that maintains an Ethernet switch) to listen to the network for potential network management requests.
couplingPort SwitchoffDelay	TimeValue	0..1	attr	Switch off delay for CouplingPorts in seconds. It denotes the delay of switching off couplingPorts after the request to switch off a couplingPort was issued. (e.g. switch off of Ethernet switch ports).
macMulticast Group	<a href="#">MacMulticastGroup</a>	*	aggr	MacMulticastGroup that is defined for the Subnet (EthernetCluster).

**Table A.519: EthernetCluster**

Class	EthernetCommunicationConnector			
Note	Ethernet specific attributes to the CommunicationConnector.			
Base	ARObject, <a href="#">CommunicationConnector</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">EcuInstance.connector</a> , MachineDesign.communicationConnector			
Attribute	Type	Mult.	Kind	Note
ethIpProps	EthIpProps	0..1	ref	EcuInstance specific IP attributes. This Attribute is only used by the AUTOSAR Classic Platform.
maximum Transmission Unit	PositiveInteger	0..1	attr	This attribute specifies the maximum transmission unit in bytes.
neighborCache Size	PositiveInteger	0..1	attr	This attribute specifies the size of neighbor cache or ARP table in units of entries.
pathMtu Enabled	Boolean	0..1	attr	If enabled the IPv4/IPv6 processes incoming ICMP "Packet Too Big" messages and stores a MTU value for each destination address. <b>Tags:</b> atp.Status=obsolete
pathMtuTimeout	TimeValue	0..1	attr	If this value is >0 the IPv4/IPv6 will reset the MTU value stored for each destination after n seconds. <b>Tags:</b> atp.Status=obsolete

**Table A.520: EthernetCommunicationConnector**

<b>Class</b>	«atpVariation» <b>EthernetCommunicationController</b>			
<b>Note</b>	Ethernet specific communication port attributes.			
<b>Base</b>	ARObject, <a href="#">CommunicationController</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcuInstance.commController</a> , MachineDesign.communicationController			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
canXIConfig	AbstractCanCommunicationController	0..1	ref	If the Ethernet frames handled by this EthernetCommunicationController are to be tunneled through CAN XL, then this reference shall refer to the AbstractCanCommunicationController that aggregates the CanControllerXIConfiguration of the physical CAN XL channel to be used for tunneling.
couplingPort	<a href="#">CouplingPort</a>	*	aggr	Optional CouplingPort that can be used to connect the ECU to a CouplingElement (e.g. a switch).
macLayerType	<a href="#">EthernetMacLayerTypeEnum</a>	0..1	attr	Specifies the mac layer type of the ethernet controller.
macUnicastAddress	MacAddressString	0..1	attr	Media Access Control address (MAC address) that uniquely identifies each EthernetCommunicationController in the network.
maximumReceiveBufferLength	Integer	0..1	attr	Determines the maximum receive buffer length (frame length) in bytes.
maximumTransmitBufferLength	Integer	0..1	attr	Determines the maximum transmit buffer length (frame length) in bytes.
slaveActAsPassiveCommunicationSlave	Boolean	0..1	attr	This attribute specifies if the EcuInstance is acting as a passive communication slave on the connected Physical Channel. This is used for EthernetCommunicationControllers that use Ethernet hardware which supports wake-up and sleep on the network (e.g. Open Alliance TC10 compliant Ethernet hardware).
slaveQualifiedUnexpectedLinkDownTime	TimeValue	0..1	attr	This attribute specifies time when an unexpected link down is evaluated as link down and indicated to the AUTOSAR communication stack.

**Table A.521: EthernetCommunicationController**

<b>Enumeration</b>	<b>EthernetConnectionNegotiationEnum</b>
<b>Note</b>	Specifies connection negotiation types of Ethernet transceiver links.
<b>Aggregated by</b>	<a href="#">CouplingPort.connectionNegotiationBehavior</a>
<b>Literal</b>	<b>Description</b>
auto	Automatic Negotiation <b>Tags:</b> atp.EnumerationLiteralIndex=0
master	Master <b>Tags:</b> atp.EnumerationLiteralIndex=1
slave	Slave <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.522: EthernetConnectionNegotiationEnum**

<b>Enumeration</b>	<b>EthernetCouplingPortSchedulerEnum</b>
<b>Note</b>	Defines the schedule algorithm to be used.
<b>Aggregated by</b>	<a href="#">CouplingPortScheduler.portScheduler</a>
<b>Literal</b>	<b>Description</b>





Enumeration	EthernetCouplingPortSchedulerEnum
enhancedTrafficShaper	Scheduler used for enhanced traffic shaping (e.g. weighted round robin) <b>Tags:</b> atp.EnumerationLiteralIndex=3
strictPriority	Schedule algorithm "strict priority" <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.523: EthernetCouplingPortSchedulerEnum**

Enumeration	EthernetMacLayerTypeEnum
<b>Note</b>	Specifies MAC (Media Access Control) Layer types.
<b>Aggregated by</b>	<a href="#">CouplingPort.macLayerType</a> , <a href="#">EthernetCommunicationController.macLayerType</a>
<b>Literal</b>	<b>Description</b>
xGMII	Mac layer interface (data) bandwidth class 1Gbit/s (e.g. GMII, RGMII, SGMII, RvGMII, USGMII) <b>Tags:</b> atp.EnumerationLiteralIndex=1 xml.name=XG-MII
xMII	Mac layer interface (data) bandwidth class 100Mbit/s and 10Mbit/s (e.g. RMII, RvMII, SMII, RvMII) <b>Tags:</b> atp.EnumerationLiteralIndex=0 xml.name=X-MII
xXGMII	Mac layer interface (data) bandwidth class 10Gbit/s <b>Tags:</b> atp.EnumerationLiteralIndex=2 xml.name=XXG-MII

**Table A.524: EthernetMacLayerTypeEnum**

Class	EthernetPhysicalChannel			
<b>Note</b>	The EthernetPhysicalChannel represents a VLAN or an untagged channel. An untagged channel is modeled as an EthernetPhysicalChannel without an aggregated VLAN.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PhysicalChannel</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CommunicationCluster.physicalChannel</a>			
Attribute	Type	Mult.	Kind	Note
networkEndpoint	<a href="#">NetworkEndpoint</a>	*	aggr	Collection of NetworkEndpoints that are used in the VLAN. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=networkEndpoint.shortName
soAdConfig	<a href="#">SoAdConfig</a>	0..1	aggr	SoAd Configuration for one specific Physical Channel. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=soAdConfig This Attribute is only used by the AUTOSAR Classic Platform.
vlan	<a href="#">VlanConfig</a>	0..1	aggr	VLAN Configuration.

**Table A.525: EthernetPhysicalChannel**

Enumeration	EthernetPhysicalLayerTypeEnum
<b>Note</b>	Specifies physical layer types of Ethernet transceiver links.
<b>Aggregated by</b>	<a href="#">CouplingPort.physicalLayerType</a>
<b>Literal</b>	<b>Description</b>





Enumeration	EthernetPhysicalLayerTypeEnum
_10000BASE_T1	Ethernet Standard (IEEE 802.3ch) to support 10Gbit/s over a single twisted pair cable. <b>Tags:</b> atp.EnumerationLiteralIndex=13 xml.name=10000BASE-T1
_1000BASE_T	Ethernet Standard (IEEE 802.3ab) to support 1Gbit/s over 4 twisted pairs. <b>Tags:</b> atp.EnumerationLiteralIndex=6 xml.name=1000BASE-T
_1000BASE_T1	Ethernet Standard (IEEE 802.3bp) to support 1Gbit/s over a single twisted pair cable. <b>Tags:</b> atp.EnumerationLiteralIndex=8 xml.name=1000BASE-T1
_100BASE_T1	Ethernet Standard (IEEE 802.3bw) to support 100Mbit/s over a single twisted pair cable. 100 BASE-T1 is the IEEE Standardized version of BroadRReach. <b>Tags:</b> atp.EnumerationLiteralIndex=7 xml.name=100BASE-T1
_100BASE_TX	Ethernet Standard (IEEE 802.3u) to support 100Mbit/s over two twisted pairs. <b>Tags:</b> atp.EnumerationLiteralIndex=5 xml.name=100BASE-TX
_10BASE_T1S	Physical layer interface 10BASE-T1S (10Mbit/s, 2 pairs). Used for automotive. <b>Tags:</b> atp.EnumerationLiteralIndex=10 atp.Status=draft xml.name=10BASE-T1S
_2500BASE_T1	Ethernet Standard (IEEE 802.3ch) to support 2.5Gbit/s over a single twisted pair cable. <b>Tags:</b> atp.EnumerationLiteralIndex=11 xml.name=2500BASE-T1
_5000BASE_T1	Ethernet Standard (IEEE 802.3ch) to support 5Gbit/s over a single twisted pair cable. <b>Tags:</b> atp.EnumerationLiteralIndex=12 xml.name=5000BASE-T1
IEEE802_11P	Ethernet Standard (IEEE 802.11p) to support wireless communication in vehicular environments. <b>Tags:</b> atp.EnumerationLiteralIndex=9 xml.name=IEEE802-11P

**Table A.526: EthernetPhysicalLayerTypeEnum**

Class	EthernetPriorityRegeneration			
Note	Defines a priority regeneration where the ingressPriority is replaced by regeneratedPriority. The ethernetPriorityRegeneration is optional in case no priority regeneration shall be performed. In case a ethernetPriorityRegeneration is defined it shall have 8 mappings, one for each priority.			
Base	ARObject, <a href="#">Referrable</a>			
Aggregated by	<a href="#">CouplingPortDetails.ethernetPriorityRegeneration</a>			
Attribute	Type	Mult.	Kind	Note
ingressPriority	PositiveInteger	0..1	attr	Message priority of the incoming message. range: 0-7
regenerated Priority	PositiveInteger	0..1	attr	Regenerated message priority. range: 0-7

**Table A.527: EthernetPriorityRegeneration**

<b>Class</b>	<b>EthernetVlanTranslationTable</b>			
<b>Note</b>	This element defines one ingress Vlan translation entry in which the IngressVlanID from the incoming frame is replaced by the TranslatedVlanID.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	CouplingPortDetails.vlanTranslationTable			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ingressVlanId	PositiveInteger	0..1	attr	Incoming VlanID from received frame
translatedVlanId	PositiveInteger	0..1	attr	Mapped VlanID after ingress Vlan translation

**Table A.528: EthernetVlanTranslationTable**

<b>Class</b>	<b>EthernetWakeupSleepOnDatalineConfig</b>			
<b>Note</b>	EthernetWakeupSleepOnDatalineConfigSet is the main element that aggregates different config set regarding the wakeup and sleep on data line. An EthernetWakeupSleepOnDatalineConfigSet could aggregate multiple different configurations regarding the wakeup and sleep on dataline (EthernetWakeupSleepOnDatalineConfig).			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	EthernetWakeupSleepOnDatalineConfigSet.ethernetWakeupSleepOnDatalineConfig			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
sleepMode ExecutionDelay	TimeValue	0..1	attr	Delay in seconds to perform a sleep request if the Ethernet hardware (PHY) detect a pending wake-up. This is used to avoid the race condition, if a sleep was requested while a wake-up of a neighboring PHY was received via a local wake-up connection (e.g. I/O pin).
sleepRepetition DelayOfSleep Request	TimeValue	0..1	attr	Delay in seconds for a repetition of a sleep request. This is used to retry a synchronized shutdown of the connected Ethernet hardware (PHY) of the link partner.
sleep RepetitionsOf SleepRequest	PositiveInteger	0..1	attr	Count of repetitions for a sleep on dataline. If a sleep is rejected by the linked communication partner, the sleep is repeated until the count of repetitions exceed. If count of repetitions exceed, the Ethernet hardware (PHY) transit to sleep without acknowledgement of the connected link partner.
wakeupForward LocalEnabled	Boolean	0..1	attr	If enabled, then a remote wake-up received on the physical dataline (e.g. 100BASE-T1) is forwarded as local wake-up (e.g. via an I/O pin). If disabled, then a remote wake-up is not forwarded as local wake-up.
wakeupForward RemoteEnabled	Boolean	0..1	attr	If enabled, then a local wake-up is forwarded to the physical dataline (e.g. 100BASE-T1). If disabled, then a local wake-up is not forwarded to the physical dataline.
wakeupLocal DetectionTime	TimeValue	0..1	attr	Specify the detection time if a local wake-up in seconds is present on the local wake-up connection (e.g. I/O pin). A local wake-up has to be present at least for wakeupLocal DetectionTime to be detected a valid local wake-up.
wakeupLocal DurationTime	TimeValue	0..1	attr	Specify the duration of a local wake-up in seconds to be present on the local wake-up connection (e.g. I/O pin).
wakeupLocal Enabled	Boolean	0..1	attr	If enabled, then a local wake-up received via a local connection (e.g. I/O pin) shall be detected by the Ethernet hardware (PHY). If disabled, Ethernet hardware is not reacting on a local wake-up.
wakeupRemote Enabled	Boolean	0..1	attr	If enabled, then a remote wake-up received via the physical dataline (e.g. 100BASE-T1) shall be detected by the Ethernet hardware (PHY). If disabled, Ethernet hardware is not reaction on a remote wake-up.







Class	EthernetWakeupSleepOnDatalineConfig			
wakeup RepetitionDelay OfWakeup Request	TimeValue	0..1	attr	Delay in seconds for a repetition of a wake-up. This is used to increase the reliability in the network, such that an ECU which initiates the wake-up does repeat the wake-up and increase the probability that affected ECUs receive the wake-up.
wakeup RepetitionsOf Wakeup Request	PositiveInteger	0..1	attr	Count of repetitions for a wake-up. This is used to increase the reliability in the network, such that an ECU which initiates the wake-up does repeat the wake-up and increase the probability that affected ECUs receive the wake-up.

**Table A.529: EthernetWakeupSleepOnDatalineConfig**

Class	EvaluatedVariantSet			
<b>Note</b>	<p>This meta class represents the ability to express if a set of ARElements is able to support one or more particular variants.</p> <p>In other words, for a given set of evaluatedElements this meta class represents a table of evaluated variants, where each PredefinedVariant represents one column. In this column each descendant sw SystemconstantValue resp. postbuildVariantCriterionValue represents one entry.</p> <p>In a graphical representation each swSystemconstantValueSet / postBuildVariantCriterionValueSet could be used as an intermediate headline in the table column.</p> <p>If the approvalStatus is "APPROVED" it expresses that the collection of CollectableElements is known be valid for the given evaluatedVariants.</p> <p>Note that the EvaluatedVariantSet is a CollectableElement. This allows to establish a hierarchy of EvaluatedVariantSets.</p> <p><b>Tags:</b> atp.recommendedPackage=EvaluatedVariantSets</p>			
<b>Base</b>	ARElement, ARObjct, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
approvalStatus	NameToken	1	attr	<p>Defines the approval status of a predefined variant. Two values are predefined: "APPROVED" and "REJECTED":</p> <ul style="list-style-type: none"> <li>• Approved variants are known to work.</li> <li>• Rejected variants are known NOT to work.</li> </ul> <p>Further values can be approved on a per-company basis; within AUTOSAR only "APPROVED" and "REJECTED" should be recognized.</p>
evaluated Element	CollectableElement	*	ref	This represents a particular element which is evaluated in context of the EvaluatedVariants. The approvalStatus applies to this element (and all of its descendants). In other words, the referenced elements are those that were considered when the predefined variant was evaluated.
evaluated Variant	<a href="#">PredefinedVariant</a>	*	ref	This metaclass represents one particular variant which was evaluated. LowerMultiplicity is set to 0 to support a stepwise approach.

**Table A.530: EvaluatedVariantSet**

Class	EventControlledTiming			
<b>Note</b>	Specification of a event driven sending behavior. The PDU is sent n (numberOfRepeat + 1) times separated by the repetitionPeriod. If numberOfRepeats = 0, then the Pdu is sent just once.			
<b>Base</b>	ARObject, Describable			
<b>Aggregated by</b>	<a href="#">TransmissionModeTiming.eventControlledTiming</a>			
Attribute	Type	Mult.	Kind	Note





Class	EventControlledTiming			
numberOfRepetitions	Integer	0..1	attr	Defines the number of repetitions for the Direct/N-Times transmission mode and the event driven part of Mixed transmission mode.
repetitionPeriod	<a href="#">TimeRangeType</a>	0..1	aggr	The repetitionPeriod specifies the time in seconds that elapses before the pdu can be sent the next time (Minimum repeat gap between two pdus). The repetition Period is optional in case that no repetitions are configured.

**Table A.531: EventControlledTiming**

Enumeration	EventGroupControlTypeEnum
Note	Types of a RoutingGroups for the event communication.
Aggregated by	<a href="#">PduActivationRoutingGroup.eventGroupControlType</a>
Literal	Description
activationAndTriggerUnicast	Activate the data path for unicast events and triggered unicast events that are sent out after a client got subscribed. <b>Tags:</b> atp.EnumerationLiteralIndex=0
activationMulticast	Activate the data path for multicast events of an EventGroup. <b>Tags:</b> atp.EnumerationLiteralIndex=1
activationUnicast	Activate the data path for unicast events of an EventGroup. <b>Tags:</b> atp.EnumerationLiteralIndex=2
triggerUnicast	Activate the data path for triggered unicast events that are sent out after a client got subscribed. <b>Tags:</b> atp.EnumerationLiteralIndex=3

**Table A.532: EventGroupControlTypeEnum**

Class	EventHandler			
Note	This element represents an event group as part of the Provided Service Instance.			
Base	<i>ARObject</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Aggregated by	<a href="#">ProvidedServiceInstance.eventHandler</a>			
Attribute	Type	Mult.	Kind	Note
eventGroupIdentifier	PositiveInteger	0..1	attr	Unique Identifier that identifies the EventGroup in SOME/IP. This Identifier is sent as Eventgroup ID in SOME/IP Service Discovery messages.
eventMulticastAddress	<a href="#">ApplicationEndpoint</a>	0..1	ref	Multicast Address that is used for event communication in the IP-Multicast case. It is the destination address to which the server sends the multicast event messages if the multicastThreshold is exceeded. This address is transmitted in the SD-SubscribeEvent GroupAck Message to client (answer to SD-Subscribe EventGroup). <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=eventMulticastAddress.applicationEndpoint, eventMulticastAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild





Class	EventHandler			
multicast Threshold	PositiveInteger	0..1	attr	Specifies the number of subscribed clients that trigger the server to change the transmission of events to multicast. If configured to 0 only unicast will be used. If configured to 1 the first client will be already served by multicast. If configured to 2 the first client will be server with unicast and as soon as the second client arrives both will be served by multicast. This does not influence the handling of initial events, which are served using unicast only.
pduActivation RoutingGroup	<a href="#">PduActivationRoutingGroup</a>	*	aggr	The ServiceDiscovery module is able to activate and deactivate the PDU routing for events.
sdServerEg TimingConfig	<a href="#">SomeipSdServerEventGroupTimingConfig</a>	0..1	ref	Server Timing configuration settings that are EventGroup specific. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=sdServerEgTimingConfig.someipSdServerEventGroupTimingConfig, sdServerEgTimingConfig.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.533: EventHandler**

Class	EventTriggeringConstraint (abstract)			
<b>Note</b>	Describes the occurrence behavior of the referenced timing event. The occurrence behavior can only be determined when a mapping from the timing events to the implementation can be obtained. However, such an occurrence behavior can also be described by the modeler as an assumption or as a requirement about the occurrence of the event.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
<b>Subclasses</b>	<a href="#">ArbitraryEventTriggering</a> , <a href="#">BurstPatternEventTriggering</a> , <a href="#">ConcretePatternEventTriggering</a> , <a href="#">PeriodicEventTriggering</a> , <a href="#">SporadicEventTriggering</a>			
<b>Aggregated by</b>	<a href="#">TimingExtension.timingGuarantee</a> , <a href="#">TimingExtension.timingRequirement</a>			
Attribute	Type	Mult.	Kind	Note
event	<a href="#">TimingDescriptionEvent</a>	0..1	ref	The referenced timing event

**Table A.534: EventTriggeringConstraint**

Class	ExclusiveArea			
<b>Note</b>	Prevents an executable entity running in the area from being preempted.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">InternalBehavior.exclusiveArea</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.535: ExclusiveArea**

Class	ExecutableEntity (abstract)			
<b>Note</b>	Abstraction of executable code.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">BswModuleEntity</a> , <a href="#">RunnableEntity</a>			
Attribute	Type	Mult.	Kind	Note





Class	<i>ExecutableEntity</i> (abstract)			
activationReason	<a href="#">ExecutableEntityActivationReason</a>	*	aggr	If the <a href="#">ExecutableEntity</a> provides at least one <code>activationReason</code> element the RTE resp. BSW Scheduler shall provide means to read the activation vector of this executable entity execution. If no <code>activationReason</code> element is provided the feature of being able to determine the activating RTEEvent is disabled for this <a href="#">ExecutableEntity</a> .
canEnter	<a href="#">ExclusiveArea</a>	*	ref	This means that the executable entity can enter/leave the referenced exclusive area through explicit API calls. <b>Stereotypes:</b> <code>atpSplitable</code> ; <code>atpVariation</code> <b>Tags:</b> <code>atp.Splitkey=canEnter.exclusiveArea</code> , <code>canEnter.variationPoint.shortLabel</code> <code>vh.latestBindingTime=preCompileTime</code>
exclusiveAreaNestingOrder	<a href="#">ExclusiveAreaNestingOrder</a>	*	ref	This represents the set of <code>ExclusiveAreaNestingOrders</code> recognized by this <a href="#">ExecutableEntity</a> .
minimumStartInterval	<a href="#">TimeValue</a>	0..1	attr	Specifies the time in seconds by which two consecutive starts of an <a href="#">ExecutableEntity</a> are guaranteed to be separated.
reentrancyLevel	<a href="#">ReentrancyLevelEnum</a>	0..1	attr	The reentrancy level of this <a href="#">ExecutableEntity</a> . See the documentation of the enumeration type <code>ReentrancyLevelEnum</code> for details. Please note that <code>nonReentrant</code> interfaces can have also reentrant or <code>multicoreReentrant</code> implementations, and reentrant interfaces can also have <code>multicoreReentrant</code> implementations.
runsInside	<a href="#">ExclusiveArea</a>	*	ref	The executable entity runs completely inside the referenced exclusive area. <b>Stereotypes:</b> <code>atpSplitable</code> ; <code>atpVariation</code> <b>Tags:</b> <code>atp.Splitkey=runsInside.exclusiveArea</code> , <code>runsInside.variationPoint.shortLabel</code> <code>vh.latestBindingTime=preCompileTime</code>
swAddrMethod	<a href="#">SwAddrMethod</a>	0..1	ref	Addressing method related to this code entity. Via an association to the same <code>SwAddrMethod</code> , it can be specified that several code entities (even of different modules or components) shall be located in the same memory without already specifying the memory section itself.

**Table A.536: ExecutableEntity**

Class	<i>ExecutableEntityActivationReason</i>			
Note	This meta-class represents the ability to define the reason for the activation of the enclosing <a href="#">ExecutableEntity</a> .			
Base	<a href="#">ARObject</a> , <a href="#">ImplementationProps</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ExecutableEntity.activationReason</a>			
Attribute	Type	Mult.	Kind	Note
bitPosition	<a href="#">PositiveInteger</a>	0..1	attr	This attribute allows for defining the position of the enclosing <a href="#">ExecutableEntityActivationReason</a> in the activation vector.

**Table A.537: ExecutableEntityActivationReason**

<b>Class</b>	<b>ExecutionOrderConstraint</b>			
<b>Note</b>	<p>This constraint is used to restrict the order of execution for a set of <a href="#">ExecutableEntity</a>s. The ExecutionOrderConstraint can be used in any timing view.</p> <p>The various scopes for ExecutionOrderConstraint are described below. Generally, each ExecutionOrderConstraint has a scope of software components and can reference all <a href="#">ExecutableEntity</a>s available in the corresponding internal behavior (RunnableEntity and BswModuleEntity) either directly or by the events activating respectively starting them (RteEvent and BswEvent).</p> <p>On VFB level an ExecutionOrderConstraint can be specified for RunnableEntities part of the composition hierarchy referenced by the VfbTiming.</p> <p>On SW-C level an ExecutionOrderConstraint can be specified for RunnableEntities part of the Internal Behavior referenced by the SwcTiming.</p> <p>On System level an ExecutionOrderConstraint can be specified for RunnableEntities part of the composition hierarchy of the system referenced by the SystemTiming.</p> <p>On BSW Module level, an ExecutionOrderConstraint can be specified for BswModuleEntities part of an BswInternalBehavior referenced by the BswModuleTiming.</p> <p>On ECU level an ExecutionOrderConstraint can be specified for all <a href="#">ExecutableEntity</a>s and Events available via the EcucValueCollection, covering ECU Extract and BSW Module Configuration, referenced by the EcuTiming.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<a href="#">TimingExtension.timingGuarantee</a> , <a href="#">TimingExtension.timingRequirement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
base Composition	<a href="#">CompositionSwComponentType</a>	0..1	ref	Specifies the composition SW-C type playing the role of a SW-C containing further SW-Cs and represents the scope of the Execution Order Constraint.
executionOrderConstraintType	<a href="#">ExecutionOrderConstraintTypeEnum</a>	0..1	attr	Specifies the specific type of ExecutionOrderConstraint.
isEvent	Boolean	0..1	attr	Indicates whether the ExecutionOrderConstraint is only referring to Executable Entities (FALSE) or only to RTE and/or BSW Events (TRUE).
orderedElement	<a href="#">EOCExecutableEntityRefAbstract</a>	*	aggr	This aggregation represents an unordered collection of references to RunnableEntities which shall be considered in the ExecutionOrderConstraint. The role does not imply that the collection of references itself shall be ordered.
permitMultipleReferencesTo EE	Boolean	0..1	attr	Indicates that the ExecutionOrderConstraints permits that an Executable Entity is referenced multiple times (TRUE) or only once (FALSE) in the constraint.

**Table A.538: ExecutionOrderConstraint**

<b>Enumeration</b>	<b>ExecutionOrderConstraintTypeEnum</b>
<b>Note</b>	<p>Specifies the type of the <a href="#">executionOrderConstraintType</a> for a <a href="#">ExecutionOrderConstraint</a>.</p> <p>This Enumeration is only used by the AUTOSAR Classic Platform.</p>
<b>Aggregated by</b>	<a href="#">ExecutionOrderConstraint.executionOrderConstraintType</a>
<b>Literal</b>	<b>Description</b>
hierarchicalEOC	<p>Specifies that the Execution Order Constraint specifies a hierarchical execution order constraint.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=0</p>
ordinaryEOC	<p>Specifies that the Execution Order Constraint specifies an ordinary execution order constraint.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=1</p>
repetitiveEOC	<p>Specifies that the Execution Order Constraint specifies a repetitive execution order constraint.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=2</p>

**Table A.539: ExecutionOrderConstraintTypeEnum**

<b>Class</b>	<b>ExecutionTime</b> (abstract)			
<b>Note</b>	Base class for several means how to describe the ExecutionTime of software. The required context information is provided through this class.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AnalyzedExecutionTime</a> , <a href="#">MeasuredExecutionTime</a> , <a href="#">RoughEstimateOfExecutionTime</a> , <a href="#">SimulatedExecutionTime</a>			
<b>Aggregated by</b>	ResourceConsumption.executionTime			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
exclusiveArea	<a href="#">ExclusiveArea</a>	0..1	ref	Reference to the ExclusiveArea this execution time is provided for.
executableEntity	<a href="#">ExecutableEntity</a>	0..1	ref	The executable entity for which this execution time is described.
hardware Configuration	<a href="#">HardwareConfiguration</a>	0..1	aggr	Provides information on the HardwareConfiguration used to specify this ExecutionTime.
hwElement	<a href="#">HwElement</a>	0..1	ref	The hardware element (e.g. type of ECU) for which the execution time is specified.
includedLibrary	<a href="#">DependencyOnArtifact</a>	*	ref	If this dependency is specified, the execution time of the library code is included in the execution time data for the runnable.
memorySection Location	<a href="#">MemorySectionLocation</a>	*	aggr	Provides information on the MemorySectionLocation which is involved in the ExecutionTime description.
softwareContext	<a href="#">SoftwareContext</a>	0..1	aggr	Provides information on the detailed SoftwareContext used to provide the ExecutionTime description.

**Table A.540: ExecutionTime**

<b>Class</b>	<b>ExecutionTimeConstraint</b>			
<b>Note</b>	<p>Constrains the execution time of the referenced <a href="#">executable</a> in <a href="#">component</a> between a <a href="#">minimum</a> and <a href="#">maximum</a> interval.</p> <p>The time to execute the <a href="#">executable</a> including interruptions by other entities and including external calls is commonly called "response time". The TimingExtensions provide the concept of event chains and latency constraints for that purpose. An event chain from the start of the entity to the termination of the entity with according latency constraint represents a response time constraint for that executable entity. This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<a href="#">TimingExtension.timingGuarantee</a> , <a href="#">TimingExtension.timingRequirement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
component	<a href="#">SwComponentPrototype</a>	0..1	iref	<p>The component that contains the referenced Executable Entity for the ExecutionTimeConstraint. If the entity is in a basic software module no component shall be provided.</p> <p><b>InstanceRef implemented by:</b> ComponentInCompositionInstanceRef</p>
executable	<a href="#">ExecutableEntity</a>	0..1	ref	The referenced ExecutableEntity for the ExecutionTime Constraint.
executionTime Type	ExecutionTimeType Enum	0..1	attr	Specifies the type of the execution time constrained by ExecutionTimeConstraint,
maximum	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum execution time.
minimum	<a href="#">MultidimensionalTime</a>	0..1	aggr	The minimum execution time.

**Table A.541: ExecutionTimeConstraint**

<b>Class</b>	<b>ExternalTriggerOccurredEvent</b>			
<b>Note</b>	This event is raised when the referenced Trigger has occurred.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
trigger	<a href="#">Trigger</a>	0..1	iref	The referenced Trigger raises this ExternalTriggerOccurredEvent. <b>InstanceRef implemented by:</b> RTriggerInAtomicSwc InstanceRef

**Table A.542: ExternalTriggerOccurredEvent**

<b>Class</b>	<b>ExternalTriggeringPoint</b>			
<b>Note</b>	If a RunnableEntity owns an ExternalTriggeringPoint it is entitled to raise an ExternalTriggerOccurredEvent.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">RunnableEntity.externalTriggeringPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ident	ExternalTriggeringPoint Ident	0..1	aggr	The aggregation in the role ident provides the ability to make the ExternalTriggeringPoint identifiable. From the semantical point of view, the ExternalTriggeringPoint is considered a first-class Identifiable and therefore the aggregation in the role ident shall always exist (until it may be possible to let ModeAccessPoint directly inherit from Identifiable). <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> xml.sequenceOffset=-100
trigger	<a href="#">Trigger</a>	0..1	iref	The trigger taken for the ExternalTriggeringPoint. <b>Tags:</b> xml.namePlural=TRIGGER-IREF xml.roleElement=false xml.roleWrapperElement=true xml.typeElement=true xml.typeWrapperElement=false <b>InstanceRef implemented by:</b> PTriggerInAtomicSwc TypeInstanceRef

**Table A.543: ExternalTriggeringPoint**

<b>Class</b>	<b>FibexElement</b> (abstract)			
<b>Note</b>	ASAM FIBEX elements specifying Communication and Topology.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">BusMirrorChannelMapping</a> , <a href="#">CommunicationCluster</a> , <a href="#">ConsumedProvidedServiceInstanceGroup</a> , <a href="#">CouplingElement</a> , <a href="#">EcucInstance</a> , <a href="#">EthernetWakeupSleepOnDataLineConfigSet</a> , <a href="#">Frame</a> , <a href="#">Gateway</a> , <a href="#">GlobalTimeDomain</a> , <a href="#">ISignal</a> , <a href="#">ISignalGroup</a> , <a href="#">ISignalIPduGroup</a> , <a href="#">NmConfig</a> , <a href="#">Pdu</a> , <a href="#">PdurlPduGroup</a> , <a href="#">SecureCommunicationPropsSet</a> , <a href="#">ServiceInstanceCollectionSet</a> , <a href="#">SocketConnectionIpdulIdentifierSet</a> , <a href="#">TpConfig</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.544: FibexElement**



Class	FlatInstanceDescriptor			
<b>Note</b>	<p>Represents exactly one node (e.g. a component instance or data element) of the instance tree of a software system. The purpose of this element is to map the various nested representations of this instance to a flat representation and assign a unique name (shortName) to it.</p> <p>Use cases:</p> <ul style="list-style-type: none"> <li>Specify unique names of measurable data to be used by MCD tools</li> <li>Specify unique names of calibration data to be used by MCD tool</li> <li>Specify a unique name for an instance of a component prototype in the ECU extract of the system description</li> </ul> <p>Note that in addition it is possible to assign alias names via AliasNameAssignment.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">FlatMap.instance</a>			
Attribute	Type	Mult.	Kind	Note
bswImplementation	<a href="#">BswImplementation</a>	0..1	ref	Reference to BswImplementation that defines the context for the AutosarDataPrototype that is referenced by FlatInstanceDescriptor.dataPrototype.
dataPrototype	<a href="#">AutosarDataPrototype</a>	0..1	ref	Reference to a DataPrototype that is defined in the BswInternalBehavior in the context of a BswImplementation that is defined by the FlatInstanceDescriptor.bswImplementation reference.
ecuExtractReference	<a href="#">AtpFeature</a>	0..1	iref	<p>Refers to the instance in the ECU extract. This is valid only, if the FlatMap is used in the context of an ECU extract.</p> <p>The reference shall be such that it uniquely defines the object instance. For example, if a data prototype is declared as a role within an SwcInternalBehavior, it is not enough to state the SwcInternalBehavior as context and the aggregated data prototype as target. In addition, the reference shall also include the complete path identifying instance of the component prototype and the Atomic SoftwareComponentType, which is referred by the particular SwcInternalBehavior.</p> <p><b>Tags:</b> xml.sequenceOffset=40</p> <p><b>InstanceRef implemented by:</b> <a href="#">AnyInstanceRef</a></p>
role	<a href="#">Identifier</a>	0..1	attr	The role denotes the particular role of the downstream memory location described by this FlatInstanceDescriptor. It applies to use case where one upstream object results in multiple downstream objects, e.g. ModeDeclaration GroupPrototypes which are measurable. In this case the RTE will provide locations for current mode, previous mode and next mode.
rtePluginProps	<a href="#">RtePluginProps</a>	0..1	aggr	<p>The properties of a communication graph with respect to the utilization of RTE Implementation Plug-in.</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=rtePluginProps</p>
swDataDefProps	<a href="#">SwDataDefProps</a>	0..1	aggr	<p>The properties of this FlatInstanceDescriptor.</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=swDataDefProps</p>







Class	FlatInstanceDescriptor			
upstream Reference	<a href="#">AtpFeature</a>	0..1	iref	<p>Refers to the instance in the context of an "upstream" description, which could be: the SYSTEM_DESCRIPTION, or SYSTEM_EXTRACT, or ECU_SYSTEM_DESCRIPTION, or SW_CLUSTER_SYSTEM_DESCRIPTION, or the basic software module description (in this case only the target reference of the AnyInstanceRef is needed), or (if a flat map is used in preliminary context) a description of an atomic component or composition.</p> <p>This reference is optional in case the flat map is used in ECU context. The reference shall be such that it uniquely defines the object instance in the given context. For example, if a data prototype is declared as a role within an SwcInternal Behavior, it is not enough to state the SwcInternal Behavior as context and the aggregated data prototype as target. In addition, the reference shall also include the complete path identifying the instance of the component prototype that contains the particular instance of SwcInternalBehavior.</p> <p><b>Tags:</b> xml.sequenceOffset=20  <b>InstanceRef implemented by:</b> <a href="#">AnyInstanceRef</a></p>

**Table A.545: FlatInstanceDescriptor**

Class	FlatMap			
<b>Note</b>	<p>Contains a flat list of references to software objects. This list is used to identify instances and to resolve name conflicts. The scope is given by the RootSwCompositionPrototype for which it is used, i.e. it can be applied to a system, system extract or ECU-extract.</p> <p>An instance of FlatMap may also be used in a preliminary context, e.g. in the scope of a software component before integration into a system. In this case it is not referred by a RootSwCompositionPrototype.</p> <p><b>Tags:</b> atp.recommendedPackage=FlatMaps  This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
instance	<a href="#">FlatInstanceDescriptor</a>	*	aggr	<p>A descriptor instance aggregated in the flat map.</p> <p>The variation point accounts for the fact, that the system in scope can be subject to variability, and thus the existence of some instances is variable.</p> <p>The aggregation has been made splitable because the content might be contributed by different stakeholders at different times in the workflow. Plus, the overall size might be so big that eventually it becomes more manageable if it is distributed over several files.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation  <b>Tags:</b>  atp.Splitkey=instance.shortName, instance.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>

**Table A.546: FlatMap**

Class	FlexrayAbsolutelyScheduledTiming			
Note	Each frame in FlexRay is identified by its slot id and communication cycle. A description is provided by the usage of AbsolutelyScheduledTiming. In the static segment a frame can be sent multiple times within one communication cycle. For describing this case multiple AbsolutelyScheduledTimings have to be used. The main use case would be that a frame is sent twice within one communication cycle.			
Base	ARObject			
Aggregated by	FlexrayFrameTriggering.absolutelyScheduledTiming			
Attribute	Type	Mult.	Kind	Note
communication Cycle	CommunicationCycle	0..1	aggr	The communication cycle where the frame is sent.
slotID	PositiveInteger	0..1	attr	In the static part the SlotID defines the slot in which the frame is transmitted. The SlotID also determines, in combination with FlexrayCluster::numberOfStaticSlots, whether the frame is sent in static or dynamic segment. In the dynamic part, the slot id is equivalent to a priority. Lower dynamic slot ids are all sent until the end of the dynamic segment. Higher numbers, which were ignored that time, have to wait one cycle and then shall try again. minValue: 1 maxValue: 2047

**Table A.547: FlexrayAbsolutelyScheduledTiming**

Class	FlexrayArTpChannel			
Note	A channel is a group of connections sharing several properties. The FlexRay AutosarTransport Layer supports several channels. These channels can work concurrently, thus each of them requires its own state machine and management data structures and its own PDU-IDs.			
Base	ARObject			
Aggregated by	FlexrayArTpConfig.tpChannel			
Attribute	Type	Mult.	Kind	Note
ackType	FrArTpAckType	0..1	attr	Type of Acknowledgement.
cancellation	Boolean	0..1	attr	With this switch Tx and Rx Cancellation can be turned on or off.
extended Addressing	Boolean	0..1	attr	Addressing Type of this connection: true: Two Bytes false: One Byte
maxAr	Integer	0..1	attr	This attribute defines the maximum number of trying to send a frame when a TIMEOUT AR occurs (depending on whether retry is configured).
maxAs	Integer	0..1	attr	This attribute defines the maximum number of trying to send a frame when a TIMEOUT AS occurs (depending on whether retry is configured).
maxBs	Integer	0..1	attr	This attribute defines the number of consecutive CFs between two FCs (block size). Valid values are 1 .. 16 when retry is activated, and 0 .. 255 otherwise.
maxFcWait	PositiveInteger	0..1	attr	This attribute defines the maximal number of wait frames to be sent for a pending connection. Range is 0..255.
maximum MessageLength	MaximumMessageLengthType	0..1	attr	This specifies the maximum message length for the particular channel.
maxRetries	Integer	0..1	attr	This attribute defines the maximum number of retries (if retry is configured for the particular channel).





Class	FlexrayArTpChannel			
minimum Multicast SeparationTime	TimeValue	0..1	attr	This attribute defines the minimum amount of time between two succeeding CFs of a 1:n segmented transmission in seconds. Valid values are 0, 100µs, 200µs ... 900µs, 1ms, 2ms .. 127ms. The value can be changed at runtime using the FrArTp_ChangeParameter interface. minimumMulticastSeparationTime shall be an integer multiple of the cycle length multiplied with the multiplexing factor, i.e. minimumMulticastSeparationTime = n * cycle * m, where n is an integer >= 0, cycle is Flexray Cluster.cycle, and m is the cycle multiplexor of those cycles where PDUs of the PDU pool are scheduled. Please note: Due to the scheduling strategies of FrTp, minimumMulticastSeparationTime can only be kept to a degree defined by the maximum temporal distance of the PDUs of a PDU pool within one FlexRay cycle. Range: 0 .. 0.127
minimum SeparationTime	TimeValue	0..1	attr	This attribute defines the minimum amount of time between two succeeding CFs of a 1:1 segmented transmission in seconds. Valid values are 0, 100µs, 200µs .. 900µs, 1ms, 2ms .. 127ms. The value can be changed at runtime using the FrArTp_ChangeParameter interface. The minimumSeparationTime shall be an integer multiple of the cycle length multiplied with the multiplexing factor, i.e. minimumSeparationTime = n * cycle * m, where n is an integer >=0, cycle is FlexrayCluster.cycle, and m is the cycle multiplexor of those cycles where PDUs of the PDU pool are scheduled. Please note: Due to the scheduling strategies of FrTp, minimumSeparationTime can only be kept to a degree defined by the maximum temporal distance of the PDUs of a PDU pool within one FlexRay cycle. Range: 0 .. 0.127
multicast Segmentation	Boolean	0..1	attr	This attribute defines whether segmentation within a 1:n connection is allowed or not.
nPdu	NPdu	*	ref	A FlexRayTpChannel references a set of NPdus. These NPdus are logically assembled into a pool of Rx NPdus and another pool of Tx NPdus. It shall be ensured that a second channel either references all NPdus of such a pool, or none.
timeBr	TimeValue	0..1	attr	This attribute defines the time in seconds between receiving the last CF of a block or an FF-x (or SF-x) and sending out an FC or AF.
timeCs	TimeValue	0..1	attr	This attribute defines the time in seconds between the sending of two consecutive frames or between a consecutive frame and a flow control (for Transmit Cancellation) or between reception of a flow control or Acknowledgement Frame and sending of the next consecutive frame or a flow control (for Transmit Cancellation).
timeoutAr	TimeValue	0..1	attr	This attribute states the timeout in seconds between the PDU transmit request of the Transport Layer to the Flex Ray Interface and the corresponding confirmation of the FlexRay Interface on the receiver side (for FC or AF).
timeoutAs	TimeValue	0..1	attr	This attribute states the timeout in seconds between the PDU transmit request for the first PDU of the group used in the current connection of the Transport Layer to the FlexRay Interface and the corresponding confirmation of the FlexRay Interface (when having sent the last PDU of the group used in this connection) on the sender side (SF-x, FF-x, CF).





Class	FlexrayArTpChannel			
timeoutBs	TimeValue	0..1	attr	This attribute defines the timeout in seconds for waiting for an FC or AF on the sender side in a 1:1 connection.
timeoutCr	TimeValue	0..1	attr	This attribute defines the timeout value in seconds for waiting for a CF or FF-x (in case of retry) after receiving the last CF or after sending an FC or AF on the receiver side.
tpConnection	<a href="#">FlexrayArTpConnection</a>	*	aggr	Group of connections that can be used in this channel.

**Table A.548: FlexrayArTpChannel**

Class	FlexrayArTpConfig			
<b>Note</b>	This element defines exactly one FlexRay Autosar TP Configuration. One FlexrayArTpConfig element shall be created for each FlexRay Network in the System that uses Flex Ray Autosar TP. <b>Tags:</b> atp.recommendedPackage=TpConfigs			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TpConfig</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
tpAddress	<a href="#">TpAddress</a>	*	aggr	Collection of TpAddresses. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpAddress.shortName, tpAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpChannel	<a href="#">FlexrayArTpChannel</a>	*	aggr	Configuration of FlexRay Autosar Transport Protocol channels. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpChannel, tpChannel.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpNode	<a href="#">FlexrayArTpNode</a>	*	aggr	Senders and receivers of TP messages. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpNode.shortName, tpNode.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.549: FlexrayArTpConfig**

Class	FlexrayArTpConnection			
<b>Note</b>	A connection within a channel identifies the sender and the receiver of this particular communication. The FlexRay Autosar Tp module routes a Pdu through this connection.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">TpConnection</a>			
<b>Aggregated by</b>	<a href="#">FlexrayArTpChannel.tpConnection</a>			
Attribute	Type	Mult.	Kind	Note
connectionPrioPdus	Integer	0..1	attr	This parameter defines the number of PDUs that shall be reserved for this connection when it is active. The range is 1-255.





Class	FlexrayArTpConnection			
directTpSdu	IPdu	0..1	ref	Reference to the IPdu that is segmented by the Transport Protocol. The source address of the transmitted NPdu is determined by the configured source Communication Connector. The target address of the transmitted NPdu is determined by the configured target Communication Connector.
multicast	TpAddress	0..1	ref	TP address for 1:n connections.
reversedTpSdu	IPdu	0..1	ref	Reference to the IPdu that is segmented by the Transport Protocol. If support of both sending and receiving is used, this association references the IPdu used for the additional second direction. The source address of the transmitted NPdu is determined by the configured target Communication Connector. The target address of the transmitted NPdu is determined by the configured source Communication Connector.
source	FlexrayArTpNode	0..1	ref	The source of the TP connection.
target	FlexrayArTpNode	*	ref	The target of the TP connection.

**Table A.550: FlexrayArTpConnection**

Class	FlexrayArTpNode			
Note	TP Node (Sender or Receiver) provides the TP Address and the connection to the Topology description.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">FlexrayArTpConfig.tpNode</a>			
Attribute	Type	Mult.	Kind	Note
connector	<a href="#">FlexrayCommunicationConnector</a>	*	ref	Association to one or more physical connectors (max number of connectors for FlexRay: 2). In a System Description this reference is mandatory. In an ECU Extract this reference is optional (references to ECUs that are not part of the ECU Extract shall be avoided).
tpAddress	<a href="#">TpAddress</a>	0..1	ref	Reference to the TP Address that is used by the TpNode. This reference is optional in case that the multicast TP Address is used (reference from TpConnection).

**Table A.551: FlexrayArTpNode**

Enumeration	FlexrayChannelName
Note	Name of the channel.
Aggregated by	<a href="#">FlexrayPhysicalChannel.channelName</a>
Literal	Description
channelA	Channel A <b>Tags:</b> atp.EnumerationLiteralIndex=0
channelB	Channel B <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.552: FlexrayChannelName**

<b>Class</b>	«atpVariation» <b>FlexrayCluster</b>			
<b>Note</b>	FlexRay specific attributes to the physicalCluster <b>Tags:</b> atp.recommendedPackage=CommunicationClusters			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">CommunicationCluster</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
actionPoint Offset	Integer	0..1	attr	The offset of the action point in networks
bit	TimeValue	0..1	attr	Nominal bit time (= 1 / fx:SPEED). gdBit = cSamplesPer Bit * gdSampleClockPeriod. Unit: seconds (gdBit)
casRxLowMax	Integer	0..1	attr	Upper limit of the Collision Avoidance Symbol (CAS) acceptance window. Unit: bitDuration
coldStart Attempts	Integer	0..1	attr	The maximum number of times that a node in this cluster is permitted to attempt to start the cluster by initiating schedule synchronization
cycle	TimeValue	0..1	attr	Length of the cycle. Unit: seconds
cycleCountMax	Integer	0..1	attr	Maximum cycle counter value in a given cluster. Remark: Set to 63 for FlexRay Protocol 2.1 Rev. A compliance.
detectNitError	Boolean	0..1	attr	Indicates whether NIT error status of each cluster shall be detected or not.
dynamicSlotIdle Phase	Integer	0..1	attr	The duration of the dynamic slot idle phase in minislots.
ignoreAfterTx	Integer	0..1	attr	Duration for which the bitstrobing is paused after transmission [gdBit].
listenNoise	Integer	0..1	attr	Upper limit for the start up and wake up listen timeout in the presence of noise. Expressed as a multiple of the cluster constant pdListenTimeout. Unit: microticks
macroPerCycle	Integer	0..1	attr	The number of macroticks in a communication cycle
macrotick Duration	TimeValue	0..1	attr	Duration of the cluster wide nominal macrotick, expressed in s.
maxWithout ClockCorrection Fatal	Integer	0..1	attr	Threshold concerning vClockCorrectionFailedCounter. Defines the number of consecutive even/odd Cycle pairs with missing clock correction terms that will cause the protocol to transition from the POC:normal active or POC:normal passive state into the POC:halt state.
maxWithout ClockCorrection Passive	Integer	0..1	attr	Threshold concerning vClockCorrectionFailedCounter. Defines the number of consecutive even/odd Cycle pairs with missing clock correction terms that will cause the protocol to transition from the POC:normal active state to the POC:normal passive state.
minislotAction PointOffset	Integer	0..1	attr	The Offset of the action point within a minislot. Unit: macroticks
minislotDuration	Integer	0..1	attr	The duration of a minislot (dynamic segment). Unit: macroticks.
networkIdle Time	Integer	0..1	attr	The duration of the network idle time in macroticks
network Management VectorLength	Integer	0..1	attr	Length of the Network Management vector in a cluster [bytes]
numberOf Minislots	Integer	0..1	attr	Number of Minislots in the dynamic segment.
numberOfStatic Slots	Integer	0..1	attr	The number of static slots in the static segment.





Class	«atpVariation» FlexrayCluster			
offsetCorrectionStart	Integer	0..1	attr	Start of the offset correction phase within the Network Idle Time (NIT), expressed as the number of macroticks from the start of cycle. Unit: macroticks
payloadLengthStatic	Integer	0..1	attr	Globally configured payload length of a static frame. Unit: 16-bit WORDS.
safetyMargin	Integer	0..1	attr	Additional timespan in macroticks which takes jitter into account to be able to set the JobListPointer to the next possible job which can be executed in case the FlexRay Job List Execution Function has been resynchronized.
sampleClockPeriod	TimeValue	0..1	attr	Sample clock period. Unit: seconds
staticSlotDuration	Integer	0..1	attr	The duration of a slot in the static segment. Unit: macroticks
symbolWindow	Integer	0..1	attr	The duration of the symbol window. Unit: macroticks
symbolWindowActionPointOffset	Integer	0..1	attr	Number of macroticks the action point offset is from the beginning of the symbol window [Macroticks].
syncFrameIdCountMax	Integer	0..1	attr	Maximum number of distinct syncframe identifiers present in a given cluster. This parameter maps to FlexRay Protocol 2.1 Rev. A parameter gSyncNodeMax.
tranceiverStandbyDelay	Float	0..1	attr	The duration of timer t_TrcvStdbDelay in seconds. The granularity of this parameter shall be restricted to full FlexRay cycles (cycle). The tranceiver status setting to STANDBY shall be delayed by this value. Not specifying a value or a value of 0 shall imply that the timer is not used.
transmissionStartSequenceDuration	Integer	0..1	attr	Number of bits in the Transmission Start Sequence [gd Bits].
wakeupRxIdle	Integer	0..1	attr	Number of bits used by the node to test the duration of the 'idle' or HIGH phase of a received wakeup. Unit: bitDuration Remarks: This parameter maps to FlexRay Protocol 2.1 Rev. A parameter gdWakeupSymbolRxIdle.
wakeupRxLow	Integer	0..1	attr	Number of bits used by the node to test the duration of the LOW phase of a received wakeup. Unit: bitDuration Remarks: This parameter maps to FlexRay Protocol 2.1 Rev. A parameter gdWakeupSymbolRxLow.
wakeupRxWindow	Integer	0..1	attr	The size of the window used to detect wakeups [gdBit]. Remarks: This parameter maps to FlexRay Protocol 2.1 Rev. A parameter gdWakeupSymbolRxWindow.
wakeupTxActive	Integer	0..1	attr	Number of bits used by the node to transmit the LOW phase of a wakeup symbol and the HIGH and LOW phases of a WUDOP. Unit: bitDuration
wakeupTxIdle	Integer	0..1	attr	Number of bits used by the node to transmit the 'idle' part of a wakeup symbol. Unit: gdBit

**Table A.553: FlexrayCluster**

Class	FlexrayCommunicationConnector			
Note	FlexRay specific attributes to the CommunicationConnector			
Base	ARObject, <a href="#">CommunicationConnector</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">EcuInstance.connector</a> , MachineDesign.communicationConnector			
Attribute	Type	Mult.	Kind	Note





Class	FlexrayCommunicationConnector			
nmReadySleepTime	Float	0..1	attr	The value of this attribute influences the shutdown behavior of the FlexRay NM. FrNm switches to bus sleep mode nmReadySleepTime seconds after the completion of the last repetition cycle containing a NM vote.
wakeUpChannel	Boolean	0..1	attr	Referenced channel used by the node to send a wakeup pattern. (pWakeupChannel)

**Table A.554: FlexrayCommunicationConnector**

Class	FlexrayFifoConfiguration			
Note	One First In First Out (FIFO) queued receive structure, defining the admittance criteria to the FIFO, and mandating the ability to admit messages into the FIFO based on Message Id filtering criteria.			
Base	ARObject			
Aggregated by	FlexrayCommunicationController.flexrayFifo			
Attribute	Type	Mult.	Kind	Note
admitWithoutMessageId	Boolean	0..1	attr	Boolean configuration which determines whether or not frames received in the dynamic segment that don't contain a message ID will be admitted into the FIFO.
baseCycle	Integer	0..1	attr	FIFO cycle counter acceptance criteria.
channel	<a href="#">FlexrayPhysicalChannel</a>	0..1	ref	Fifo channel admittance criteria.
cycleRepetition	Integer	0..1	attr	FIFO cycle counter acceptance criteria.
fifoDepth	Integer	0..1	attr	FrFifoDepth configures the maximum number of rx-frames which can be contained in the FIFO.
fifoRange	<a href="#">FlexrayFifoRange</a>	*	aggr	FIFO Frame Id range acceptance criteria.
msgIdMask	Integer	0..1	attr	FIFO message identifier acceptance criteria (Mask filter).
msgIdMatch	Integer	0..1	attr	FIFO message identifier acceptance criteria (Match filter).

**Table A.555: FlexrayFifoConfiguration**

Class	FlexrayFifoRange			
Note	FIFO Frame Id range acceptance criteria.			
Base	ARObject			
Aggregated by	<a href="#">FlexrayFifoConfiguration.fifoRange</a>			
Attribute	Type	Mult.	Kind	Note
rangeMax	Integer	0..1	attr	Max Range.
rangeMin	Integer	0..1	attr	Min Range.

**Table A.556: FlexrayFifoRange**

Class	FlexrayFrame			
Note	FlexRay specific Frame element. Tags: atp.recommendedPackage=Frames			
Base	ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">Frame</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.557: FlexrayFrame**



<b>Class</b>	<b>FlexrayFrameTriggering</b>			
<b>Note</b>	FlexRay specific attributes to the FrameTriggering			
<b>Base</b>	ARObject, <a href="#">FrameTriggering</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">PhysicalChannel.frameTriggering</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
absolutely Scheduled Timing	<a href="#">FlexrayAbsolutelyScheduledTiming</a>	*	aggr	Specification of a sending behaviour where the exact time for the frames transmission is guaranteed.
allowDynamic LSduLength	Boolean	0..1	attr	Allows L-PDU length reduction and indicates that the related CC buffer has to be reconfigured for the actual length and Header-CRC before transmission of the L-PDU. If this attribute is set to true than the referenced Frame length attribute defines the max. length.
messageId	PositiveInteger	0..1	attr	The first two bytes of the payload segment of the FlexRay frame format for frames transmitted in the dynamic segment can be used as receiver filterable data called the message ID.
payload Preamble Indicator	Boolean	0..1	attr	Switching the Payload Preamble bit.

**Table A.558: FlexrayFrameTriggering**

<b>Class</b>	<b>FlexrayNmCluster</b>			
<b>Note</b>	FlexRay specific NM cluster attributes.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">NmCluster</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">NmConfig.nmCluster</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
nmCarWakeUp BitPosition	PositiveInteger	0..1	attr	Specifies the bit position of the CarWakeUp within the Nm Pdu.
nmCarWakeUp FilterEnabled	Boolean	0..1	attr	If this attribute is set to true the CareWakeUp filtering is supported. In this case only the CarWakeUp bit within the NmPdu with source node identifier nmCarWakeUpFilter NodeId is considered as CarWakeUp request.
nmCarWakeUp FilterNodeId	PositiveInteger	0..1	attr	Source node identifier for CarWakeUp filtering. If Car WakeUp filtering is supported (nmCarWakeUpFilter Enabled), only the CarWakeUp bit within the NmPdu with source node identifier nmCarWakeUpFilterNodeId is considered as CarWakeUp request.
nmCarWakeUp RxEnabled	Boolean	0..1	attr	If set to true this attribute enables the support of CarWake Up bit evaluation in received NmPdus.
nmDataCycle	Integer	0..1	attr	Number of FlexRay Communication Cycles needed to transmit the Nm Data PDUs of all FlexRay Nm Ecus of this FlexRayNmCluster.
nmMain FunctionPeriod	TimeValue	0..1	attr	Defines the processing cycle of the main function of FrNm module.
nmRemote SleepIndication Time	TimeValue	0..1	attr	Timeout for Remote Sleep Indication in seconds. It defines the time how long it shall take to recognize that all other nodes are ready to sleep.
nmRepeat MessageTime	TimeValue	0..1	attr	Timeout for Repeat Message State in seconds. Defines the time how long the NM shall stay in the Repeat Message State.





Class	FlexrayNmCluster			
nmRepetitionCycle	Integer	0..1	attr	Number of FlexRay Communication Cycles used to repeat the transmission of the Nm vote Pdus of all Flex Ray NmEcus of this FlexRayNmCluster. This value shall be an integral multiple of nmVotingCycle.
nmVotingCycle	Integer	0..1	attr	Number of FlexRay CommunicationCycles needed to transmit the Nm vote of Pdus of all FlexRay NmEcus of this FlexRayNmCluster.

**Table A.559: FlexrayNmCluster**

Class	FlexrayNmClusterCoupling			
Note	FlexRay attributes that are valid for each of the referenced (coupled) FlexRay clusters. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, NmClusterCoupling			
Aggregated by	NmConfig.nmClusterCoupling			
Attribute	Type	Mult.	Kind	Note
coupledCluster	FlexrayNmCluster	*	ref	Reference to coupled FlexRay Clusters.
nmScheduleVariant	FlexrayNmScheduleVariant	0..1	attr	FrNm schedule variant according to FrNm SWS.

**Table A.560: FlexrayNmClusterCoupling**

Class	FlexrayNmNode			
Note	FlexRay specific NM Node attributes.			
Base	ARObject, Identifiable, MultilanguageReferrable, NmNode, Referrable			
Aggregated by	NmCluster.nmNode			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.561: FlexrayNmNode**

Class	FlexrayPhysicalChannel			
Note	FlexRay specific attributes to the physicalChannel			
Base	ARObject, Identifiable, MultilanguageReferrable, PhysicalChannel, Referrable			
Aggregated by	CommunicationCluster.physicalChannel			
Attribute	Type	Mult.	Kind	Note
channelName	FlexrayChannelName	0..1	attr	Name of the channel (Channel A or Channel B).

**Table A.562: FlexrayPhysicalChannel**

Class	FlexrayTpConfig			
Note	This element defines exactly one FlexRay ISO TP Configuration. One FlexRayTpConfig element shall be created for each FlexRay Network in the System that uses Flex Ray Iso Tp. Tags: atp.recommendedPackage=TpConfigs This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable, TpConfig			





Class	FlexrayTpConfig			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
pduPool	FlexrayTpPduPool	*	aggr	Configuration of FlexRay TP Pdu Pools. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=pduPool.shortName, pduPool.variation Point.shortLabel vh.latestBindingTime=postBuild
tpAddress	TpAddress	*	aggr	Collection of TpAddresses. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpAddress.shortName, tpAddress.variation Point.shortLabel vh.latestBindingTime=postBuild
tpConnection	FlexrayTpConnection	*	aggr	Configuration of FlexRay TP Connections. atpVariation: Derived, because TpNode can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpConnection, tpConnection.variation Point.shortLabel vh.latestBindingTime=postBuild
tpConnection Control	FlexrayTpConnection Control	*	aggr	Configuration of FlexRay TP Connection Controls. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpConnectionControl.shortName, tp ConnectionControl.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpEcu	FlexrayTpEcu	*	aggr	Collection of TP Ecus atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpEcu, tpEcu.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpNode	FlexrayTpNode	*	aggr	Senders and receivers of FlexRay TP messages. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpNode.shortName, tpNode.variation Point.shortLabel vh.latestBindingTime=postBuild

Table A.563: FlexrayTpConfig

Class	FlexrayTpConnection			
Note	A connection identifies the sender and the receiver of this particular communication. The FlexRayTp module routes a Pdu through this connection. In a System Description the references to the PduPools are mandatory. In an ECU Extract these references can be optional: On unicast connections these references are always mandatory. On multicast the txPduPool is mandatory on the sender side. The rxPduPool is mandatory on the receiver side. On Gateway ECUs both references are mandatory. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, TpConnection			
Aggregated by	FlexrayTpConfig.tpConnection			
Attribute	Type	Mult.	Kind	Note





Class	FlexrayTpConnection			
bandwidthLimitation	Boolean	0..1	attr	Specifies whether the connection requires a bandwidth limitation or not.
directTpSdu	IPdu	0..1	ref	Reference to the IPdu that is segmented by the Transport Protocol.
multicast	TpAddress	0..1	ref	TP address for 1:n connections.
receiver	FlexrayTpNode	*	ref	The target of the TP connection.
reversedTpSdu	IPdu	0..1	ref	Reference to the IPdu that is segmented by the Transport Protocol. If support of both sending and receiving is used, this association references the IPdu used for the additional second direction.
rxPduPool	FlexrayTpPduPool	0..1	ref	A connection has a reference to a set of NPdus (FrTpRx PduPool) which are defined for receiving data via this particular connection. The following constraint is valid only for the System Extract/ECU Extract: In case this connection is applied to the transmitter the rxPduPool holds the actually received NPdus. In case this connection is applied to the receiver the rxPduPool holds the actually sent NPdus.
tpConnectionControl	FlexrayTpConnectionControl	0..1	ref	Reference to the connection control.
transmitter	FlexrayTpNode	0..1	ref	The source of the TP connection.
txPduPool	FlexrayTpPduPool	0..1	ref	A connection has a reference to a set of NPdus (FrTpTx PduPool) which are defined for sending data via this particular connection. The following constraint is valid only for the System Extract/ECU Extract: In case this connection is applied to the transmitter the txPduPool holds the actually sent NPdus. In case this connection is applied to the receiver the txPduPool holds the actually received NPdus.

**Table A.564: FlexrayTpConnection**

Class	FlexrayTpConnectionControl			
Note	Configuration parameters to control a FlexRay TP connection. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Aggregated by	FlexrayTpConfig.tpConnectionControl			
Attribute	Type	Mult.	Kind	Note
ackType	TpAckType	0..1	attr	This parameter defines the type of acknowledgement which is used for the specific channel.
maxFcWait	Integer	0..1	attr	This attribute defines the maximum number of Flow Control N-PDUs with FlowState "WAIT".
maxNumberOfNpduPerCycle	Integer	0..1	attr	This parameter limits the number of N-Pdus the sender is allowed to transmit within a FlexRay cycle.
maxRetries	Integer	0..1	attr	This parameter defines the maximum number of retries (if retry is configured for the particular channel).
separationCycleExponent	Integer	0..1	attr	Exponent to calculate the minimum number of "Separation Cycles" the sender has to wait for the next transmission of an FrTp N-Pdu.
timeBr	TimeValue	0..1	attr	Time (in seconds) until transmission of the next Flow Control N-PDU.





Class	FlexrayTpConnectionControl			
timeBuffer	TimeValue	0..1	attr	This parameter defines the time of waiting for the next try to get a Tx or Rx buffer. This parameter is equivalent to the temporal distance between two FC.WT N-Pdus in case the buffer request returns busy. Specified in seconds.
timeCs	TimeValue	0..1	attr	Time (in seconds) until transmission of the next ConsecutiveFrame NPdu / LastFrame NPdu.
timeoutAr	TimeValue	0..1	attr	This parameter states the timeout between the PDU transmit request of the Transport Layer to the FlexRay Interface and the corresponding confirmation of the Flex Ray Interface on the receiver side (for FC or AF). Specified in seconds.
timeoutAs	TimeValue	0..1	attr	This attribute states the timeout between the PDU transmit request for the first PDU of the group used in the current connection of the Transport Layer to the FlexRay Interface and the corresponding confirmation of the Flex Ray Interface (when having sent the last PDU of the group used in this connection) on the sender side (SF-x, FF-x, CF or FC (in case of Transmit Cancellation)). Specified in seconds.
timeoutBs	TimeValue	0..1	attr	This parameter defines the timeout in seconds for waiting for an FC or AF on the sender side in a 1:1 connection.
timeoutCr	TimeValue	0..1	attr	This parameter defines the timeout value in seconds for waiting for a CF or FF-x (in case of retry) after receiving the last CF or after sending an FC or AF on the receiver side. Specified in seconds.

**Table A.565: FlexrayTpConnectionControl**

Class	FlexrayTpEcu			
Note	ECU specific TP configuration parameters. Each TpEcu element has a reference to exactly one ECUInstance in the topology. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject			
Aggregated by	FlexrayTpConfig.tpEcu			
Attribute	Type	Mult.	Kind	Note
cancellation	Boolean	0..1	attr	With this switch Tx and Rx Cancellation can be turned on or off.
cycleTimeMain Function	TimeValue	0..1	attr	The period between successive calls to the Main Function of the AUTOSAR TP. Specified in seconds.
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	Connection to the ECUInstance in the Topology
fullDuplex Enabled	Boolean	0..1	attr	The full duplex mechanisms is enabled if this attribute is set to true. Otherwise half duplex is enabled.

**Table A.566: FlexrayTpEcu**

Class	FlexrayTpNode			
Note	TP Node (Sender or Receiver) provides the TP Address and the connection to the Topology description. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	FlexrayTpConfig.tpNode			
Attribute	Type	Mult.	Kind	Note





Class	FlexrayTpNode			
connector	<a href="#">Communication Connector</a>	*	ref	Association to one or more physical connectors (max number of connectors for FlexRay: 2). In a System Description this reference is mandatory. In an ECU Extract this reference is optional (references to ECUs that are not part of the ECU Extract shall be avoided).
tpAddress	<a href="#">TpAddress</a>	0..1	ref	Reference to the TP Address that is used by the TpNode. This reference is optional in case that the multicast TP Address is used (reference from TpConnection).

**Table A.567: FlexrayTpNode**

Class	FlexrayTpPduPool			
Note	FlexrayTpPduPool is a set of N-PDUs which are defined for FrTp sending or receiving purpose.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">FlexrayTpConfig.pduPool</a>			
Attribute	Type	Mult.	Kind	Note
nPdu	<a href="#">NPdu</a>	*	ref	Reference to NPdus that are part of the PduPool. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.568: FlexrayTpPduPool**

Class	ForbiddenSignalPath			
Note	The ForbiddenSignalPath describes the physical channels which an element shall not take in the topology. Such a signal path can be a constraint for the communication matrix, because such a path has an effect on the frame generation and the frame path.			
Base	<i>ARObject</i> , <i>SignalPathConstraint</i>			
Aggregated by	<a href="#">SystemMapping.signalPathConstraint</a>			
Attribute	Type	Mult.	Kind	Note
operation	<a href="#">SwcToSwcOperation Arguments</a>	*	aggr	Reference to the operation arguments of one operation which shall not take the predefined way in the topology.
physical Channel	<a href="#">PhysicalChannel</a>	*	ref	The SwcToSwcSignal shall not be transmitted on one of these physical channels.
signal	<a href="#">SwcToSwcSignal</a>	*	aggr	The data element which shall not take the predefined way in the topology.

**Table A.569: ForbiddenSignalPath**

Class	Frame (abstract)			
Note	Data frame which is sent over a communication medium. This element describes the pure Layout of a frame sent on a channel.			
Base	<i>ARObject</i> , <i>CollectableElement</i> , <i>FibexElement</i> , <i>Identifiable</i> , <a href="#">MultilanguageReferrable</a> , <i>Packageable Element</i> , <a href="#">Referrable</a>			
Subclasses	<a href="#">AbstractEthernetFrame</a> , <i>CanFrame</i> , <a href="#">FlexrayFrame</a> , <a href="#">LinFrame</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note





Class	Frame (abstract)			
frameLength	Integer	0..1	attr	The used length (in bytes) of the referencing frame. Should not be confused with a static byte length reserved for each frame by some platforms (e.g. FlexRay). The frameLength of zero bytes is allowed. Please consider also TPS_SYST_02255.
pduToFrame Mapping	<a href="#">PduToFrameMapping</a>	*	aggr	A frames layout as a sequence of Pdus. atpVariation: The content of a frame can be variable. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=pduToFrameMapping.shortName, pduToFrameMapping.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.570: Frame**

Class	FrameMapping			
Note	Maps the source frame to the target frame.			
Base	ARObject			
Aggregated by	<a href="#">Gateway.frameMapping</a>			
Attribute	Type	Mult.	Kind	Note
introduction	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents introductory documentation about the frame mapping.
sourceFrame	<a href="#">FrameTriggering</a>	0..1	ref	Source destination of the referencing mapping.
targetFrame	<a href="#">FrameTriggering</a>	0..1	ref	Target destination of the referencing mapping.

**Table A.571: FrameMapping**

Class	FramePid			
Note	Frame_PIDs that are included in the request. The "pid" attribute describes the value and the "index" attribute the position of the frame_PID in the request. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject			
Aggregated by	<a href="#">AssignFrameIdRange.framePid</a>			
Attribute	Type	Mult.	Kind	Note
index	Integer	0..1	attr	This attribute is used to order the frame_PIDs. The values of index shall be unique within one AssignFrameIdRange.
pid	PositiveInteger	0..1	attr	Frame_PID value.

**Table A.572: FramePid**

Class	FramePort			
Note	Connectors reception or send port on the referenced channel referenced by a FrameTriggering.			
Base	ARObject, <a href="#">CommConnectorPort</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">CommunicationConnector.ecuCommPortInstance</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.573: FramePort**

<b>Class</b>	<b>FrameTriggering</b> (abstract)			
<b>Note</b>	The FrameTriggering describes the instance of a frame sent on a channel and defines the manner of triggering (timing information) and identification of a frame on the channel, on which it is sent. For the same frame, if FrameTriggerings exist on more than one channel of the same cluster the fan-out/in is handled by the Bus interface.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">CanFrameTriggering</a> , <a href="#">EthernetFrameTriggering</a> , <a href="#">FlexrayFrameTriggering</a> , <a href="#">LinFrameTriggering</a>			
<b>Aggregated by</b>	<a href="#">PhysicalChannel.frameTriggering</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
frame	<a href="#">Frame</a>	0..1	ref	One frame can be triggered several times, e.g. on different channels. If a frame has no frame triggering, it won't be sent at all. A frame triggering has assigned exactly one frame, which it triggers.
framePort	<a href="#">FramePort</a>	*	ref	References to the FramePort on every ECU of the system which sends and/or receives the frame. References for both the sender and the receiver side shall be included when the system is completely defined.
pduTriggering	<a href="#">PduTriggering</a>	*	ref	This reference provides the relationship to the Pdu Triggerings that are implemented by the FrameTriggering. The reference is optional since no PduTriggering can be defined for NmPdus and XCP Pdus. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=pduTriggering.pduTriggering, pduTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.574: FrameTriggering**

<b>Class</b>	<b>FreeFormat</b>			
<b>Note</b>	Representing freely defined data. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">FreeFormatEntry</a> , <a href="#">ScheduleTableEntry</a>			
<b>Aggregated by</b>	<a href="#">LinScheduleTable.tableEntry</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
byteValue (ordered)	Integer	*	attr	The integer Value of a freely defined data byte.

**Table A.575: FreeFormat**

<b>Class</b>	<b>FunctionInhibitionNeeds</b>			
<b>Note</b>	Specifies the abstract needs on the configuration of the Function Inhibition Manager for one Function Identifier (FID). This class currently contains no attributes. Its name can be regarded as a symbol identifying the FID from the viewpoint of the component or module which owns this class.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.576: FunctionInhibitionNeeds**



Class	Gateway			
Note	A gateway is an ECU that is connected to two or more clusters (channels, but not redundant), and performs a frame, Pdu or signal mapping between them. <b>Tags:</b> atp.recommendedPackage=Gateways			
Base	ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
ecu	EcuInstance	0..1	ref	Reference to one ECU instance that implements the gateway.
frameMapping	FrameMapping	*	aggr	Frame Gateway: The entire source frame is mapped as it is onto the target frame (what in general is only possible inside of a common platform). In this case source and target frame should be the identical object. atpVariation: If frames are variable in clusters, the gateway frame mapping needs to be variable, too. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=frameMapping, frameMapping.variation Point.shortLabel vh.latestBindingTime=postBuild
iPduMapping	IPduMapping	*	aggr	IPdu Gateway: Arranges those IPdus that are transferred by the gateway from one channel to the other in pairs and defines the mapping between them. atpVariation: If PDUs are variable in clusters, the gateway PDU mapping needs to be variable, too. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=iPduMapping, iPduMapping.variation Point.shortLabel vh.latestBindingTime=postBuild
signalMapping	ISignalMapping	*	aggr	Signal Gateway: Arranges those signals that are transferred by the gateway from one channel to the other in pairs and defines the mapping between them. atpVariation: If signals are variable in clusters, the gateway signal mapping needs to be variable, too. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=signalMapping, signalMapping.variation Point.shortLabel vh.latestBindingTime=postBuild

**Table A.577: Gateway**

Class	GeneralPurposeConnection			
Note	This meta-class allows to describe the relationship between several PduTriggerings that are defined on the same PhysicalChannel, e.g. to create a link between Rx and Tx Pdu that are used for request/response. <b>Tags:</b> atp.recommendedPackage=GeneralPurposeConnections			
Base	ARElement, ARObject, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
pduTriggering	PduTriggering	*	ref	Reference to PduTriggerings that are connected to each other by a GeneralPurposeConnection.

**Table A.578: GeneralPurposeConnection**

<b>Class</b>	<b>GeneralPurposeIPdu</b>			
<b>Note</b>	This element is used for AUTOSAR Pdus without attributes that are routed by the PduR. Please note that the category name of such Pdu is standardized in the AUTOSAR System Template. <b>Tags:</b> atp.recommendedPackage=Pdu			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.579: GeneralPurposeIPdu**

<b>Class</b>	<b>GeneralPurposePdu</b>			
<b>Note</b>	This element is used for AUTOSAR Pdus without additional attributes that are routed by a bus interface. Please note that the category name of such Pdu is standardized in the AUTOSAR System Template. <b>Tags:</b> atp.recommendedPackage=Pdu			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.580: GeneralPurposePdu**

<b>Class</b>	<b>GlobalTimeCanMaster</b>			
<b>Note</b>	This represents the specialization of the GlobalTimeMaster for the CAN communication.			
<b>Base</b>	ARObject, <a href="#">GlobalTimeMaster</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">GlobalTimeDomain.globalTimeMaster</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
crcSecured	GlobalTimeCrcSupport Enum	0..1	attr	Definition of whether or not CRC is supported. This is only relevant for selected bus systems.
sync Confirmation Timeout	TimeValue	0..1	attr	This represents the value for the confirmation timeout. Unit: seconds. <b>Tags:</b> atp.Status=obsolete

**Table A.581: GlobalTimeCanMaster**

<b>Class</b>	<b>GlobalTimeCanSlave</b>			
<b>Note</b>	This represents the specialization of the GlobalTimeSlave for the CAN communication.			
<b>Base</b>	ARObject, <a href="#">GlobalTimeSlave</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">GlobalTimeDomain.slave</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
crcValidated	GlobalTimeCrc ValidationEnum	0..1	attr	Definition of whether or not validation of the CRC is supported.
sequence CounterJump Width	PositiveInteger	0..1	attr	Specifies the maximum allowed gap of the sequence counter between two SYNC messages.

**Table A.582: GlobalTimeCanSlave**

<b>Class</b>	<b>GlobalTimeCouplingPortProps</b>			
<b>Note</b>	Defines properties for the usage of the CouplingPort in the scope of Global Time Sync.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">CouplingPortDetails.globalTimeProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
propagation Delay	TimeValue	0..1	attr	If cyclic propagation delay measurement is enabled, this parameter represents the default value of the propagation delay until the first actually measured propagation delay is available. If cyclic propagation delay measurement is disabled, this parameter defines a fixed value for the propagation delay.

**Table A.583: GlobalTimeCouplingPortProps**

<b>Class</b>	<b>GlobalTimeDomain</b>			
<b>Note</b>	This represents the ability to define a global time domain. <b>Tags:</b> atp.recommendedPackage=GlobalTimeDomains			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
debounceTime	TimeValue	0..1	attr	Defines the minimum amount of time between two time sync messages are transmitted.
domainId	PositiveInteger	0..1	attr	This represents the ID of the GlobalTimeDomain used in the network messages sent on behalf of global time management. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=postBuild
gateway	<a href="#">GlobalTimeGateway</a>	*	aggr	A GlobalTimeGateway may exist in the context of a GlobalTimeDomain to actively update the global time information as it is routed from one GlobalTimeDomain to another. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=gateway.shortName, gateway.variationPoint.shortLabel vh.latestBindingTime=postBuild
globalTime CorrectionProps	GlobalTimeCorrection Props	0..1	aggr	Defintion of attributes for rate and offset correction.
globalTime Domain Property	AbstractGlobalTime DomainProps	0..1	aggr	Additional properties of the GlobalTimeDomain. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=globalTimeDomainProperty, globalTimeDomainProperty.variationPoint.shortLabel vh.latestBindingTime=postBuild
globalTime Master	<a href="#">GlobalTimeMaster</a>	0..1	aggr	This represents the single master of a GlobalTime Domain. A GlobalTimeDomain may have no GlobalTimeDomain.master, e.g. when it gets its time from a GPS receiver. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=globalTimeMaster.shortName, globalTimeMaster.variationPoint.shortLabel vh.latestBindingTime=postBuild





Class	GlobalTimeDomain			
globalTimeSubDomain	<a href="#">GlobalTimeDomain</a>	*	ref	By this means it is possible to create a hierarchy of sub Domains where one global time domain can declare one or more other global time domains as its subDomains. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=globalTimeSubDomain.globalTimeDomain, globalTimeSubDomain.variationPoint.shortLabel vh.latestBindingTime=postBuild
icvFreshnessValueId	PositiveInteger	0..1	attr	This attribute defines the Id of the Freshness Value for the Integrity Check Value (ICV) calculation and verification.
icvSecureComProps	SecOcSecureComProps	0..1	ref	Reference to a SecureComProps definition to be used for the Integrity Check Value (ICV) calculation and verification. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=icvSecureComProps.secOcSecureComProps, icvSecureComProps.variationPoint.shortLabel vh.latestBindingTime=postBuild
maxProgressionMismatchThreshold	TimeValue	0..1	attr	This attribute defines the maximum allowed difference between local time and fallback time of the time base in seconds.
networkSegmentId	<a href="#">NetworkSegmentIdentification</a>	0..1	aggr	Defines the numerical identification of a GlobalTime sub domain.
pduTriggering	<a href="#">PduTriggering</a>	0..1	ref	This PduTriggering will be taken to transmit the global time information from a GlobalTimeMaster to a the associated GlobalTimeSlaves. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=pduTriggering.pduTriggering, pduTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild
slave	<a href="#">GlobalTimeSlave</a>	*	aggr	This represents the collections of slaves of the Global TimeDomain. A GlobalTimeDomain may have no Global TimeDomain.slaves, e.g. when it propagates its time directly to sub domains. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=slave.shortName, slave.variationPoint.shortLabel vh.latestBindingTime=postBuild
syncLossTimeout	TimeValue	0..1	attr	This attribute describes the timeout for the situation that the time synchronization gets lost in the scope of the time domain.

**Table A.584: GlobalTimeDomain**

Class	GlobalTimeEthMaster			
Note	This represents the specialization of the GlobalTimeMaster for Ethernet communication.			
Base	<a href="#">ARObject</a> , <a href="#">GlobalTimeMaster</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">GlobalTimeDomain.globalTimeMaster</a>			
Attribute	Type	Mult.	Kind	Note
crcSecured	GlobalTimeCrcSupportEnum	0..1	attr	Definition of whether or not CRC is supported. This is only relevant for selected bus systems.





Class	GlobalTimeEthMaster			
holdOverTime	TimeValue	0..1	attr	This attribute defines the timeout for transmission of Sync and Follow_Up messages on Master ports in absence of reception of Sync and Follow_Up messages on Slave port.
subTlvConfig	EthTSynSubTlvConfig	0..1	aggr	Defines the subTLV fields which shall be included in the time sync message.

**Table A.585: GlobalTimeEthMaster**

Class	GlobalTimeFrMaster			
Note	This represents the specialization of the GlobalTimeMaster for Flexray communication.			
Base	ARObject, <a href="#">GlobalTimeMaster</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">GlobalTimeDomain.globalTimeMaster</a>			
Attribute	Type	Mult.	Kind	Note
crcSecured	GlobalTimeCrcSupport Enum	0..1	attr	Definition of whether or not CRC is supported. This is only relevant for selected bus systems.

**Table A.586: GlobalTimeFrMaster**

Class	GlobalTimeFrSlave			
Note	This represents the specialization of the GlobalTimeSlave for Flexray communication.			
Base	ARObject, <a href="#">GlobalTimeSlave</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">GlobalTimeDomain.slave</a>			
Attribute	Type	Mult.	Kind	Note
crcValidated	GlobalTimeCrc ValidationEnum	0..1	attr	Definition of whether or not validation of the CRC is supported.
sequence CounterJump Width	PositiveInteger	0..1	attr	Specifies the maximum allowed gap of the sequence counter between two SYNC messages.

**Table A.587: GlobalTimeFrSlave**

Class	GlobalTimeGateway			
Note	This represents the ability to define a time gateway for establishing a global time domain over several communication clusters.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">GlobalTimeDomain.gateway</a>			
Attribute	Type	Mult.	Kind	Note
host	<a href="#">EcuInstance</a>	0..1	ref	The GlobalTimeGateway is hosted by the referenced Ecu Instance. This Attribute is only used by the AUTOSAR Classic Platform.
master	<a href="#">GlobalTimeMaster</a>	0..1	ref	This represents the master of the global time gateway.
slave	<a href="#">GlobalTimeSlave</a>	0..1	ref	This represents the slave of the GlobalTimeGateway.

**Table A.588: GlobalTimeGateway**

<b>Class</b>	<b>GlobalTimeMaster</b> (abstract)			
<b>Note</b>	This represents the generic concept of a global time master.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">GlobalTimeCanMaster</a> , <a href="#">GlobalTimeEthMaster</a> , <a href="#">GlobalTimeFrMaster</a> , UserDefinedGlobalTimeMaster			
<b>Aggregated by</b>	<a href="#">GlobalTimeDomain.globalTimeMaster</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
communicationConnector	<a href="#">CommunicationConnector</a>	0..1	ref	The GlobalTimeMaster is bound to the Communication Connector.
icvSecured	GlobalTimeIcvSupportEnum	0..1	attr	Defines whether an Integrity Check Value (ICV) shall be added to the sent time sync messages. <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.
immediateResumeTime	TimeValue	0..1	attr	Defines the minimum time between an "immediate" message and the next periodic message.
isSystemWideGlobalTimeMaster	Boolean	0..1	attr	If set to TRUE, the GlobalTimeMaster is supposed to act as the root of global time information.
syncPeriod	TimeValue	0..1	attr	This represents the period. Unit: seconds

**Table A.589: GlobalTimeMaster**

<b>Enumeration</b>	<b>GlobalTimePortRoleEnum</b>
<b>Note</b>	Selection of port behavior to Time Slave, Time Master or Dynamic (Time Slave or Time Master at runtime).
<b>Aggregated by</b>	<a href="#">EthGlobalTimeManagedCouplingPort.globalTimePortRole</a>
<b>Literal</b>	<b>Description</b>
dynamic	Time Slave or Time Master port behavior at runtime. <b>Tags:</b> atp.EnumerationLiteralIndex=2
timeMaster	timeMaster port behavior <b>Tags:</b> atp.EnumerationLiteralIndex=1
timeSlave	TimeSlave port behavior <b>Tags:</b> atp.EnumerationLiteralIndex=0

**Table A.590: GlobalTimePortRoleEnum**

<b>Class</b>	<b>GlobalTimeSlave</b> (abstract)			
<b>Note</b>	This represents the generic concept of a global time slave.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">GlobalTimeCanSlave</a> , <a href="#">GlobalTimeEthSlave</a> , <a href="#">GlobalTimeFrSlave</a> , UserDefinedGlobalTimeSlave			
<b>Aggregated by</b>	<a href="#">GlobalTimeDomain.slave</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
communicationConnector	<a href="#">CommunicationConnector</a>	0..1	ref	The GlobalTimeSlave is bound to the Communication Connector.
followUpTimeoutValue	TimeValue	0..1	attr	Rx timeout for the follow-up message.
icvVerification	GlobalTimeIcvVerificationEnum	0..1	attr	Defines how an Integrity Check Value (ICV) shall be handled at the receiver. <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.





Class	GlobalTimeSlave (abstract)			
timeLeapFutureThreshold	TimeValue	0..1	attr	Defines the maximum allowed positive difference between the current Local Time Base value and a newly received Global Time Base value.
timeLeapHealingCounter	PositiveInteger	0..1	attr	Defines the required number of updates to the Time Base where the time difference to the previous received value has to remain within the bounds of timeLeapFutureThreshold and timeLeapPastThreshold until that Time Base is considered healed.
timeLeapPastThreshold	TimeValue	0..1	attr	Defines the maximum allowed negative difference between the current Local Time Base value and a newly received Global Time Base value.

**Table A.591: GlobalTimeSlave**

Enumeration	HandleInvalidEnum
Note	Strategies of handling the reception of invalidValue.
Aggregated by	<a href="#">InvalidationPolicy.handleInvalid</a> , <a href="#">ISignalPort.handleInvalid</a>
Literal	Description
dontInvalidate	Invalidation is switched off. <b>Tags:</b> atp.EnumerationLiteralIndex=0
externalReplacement	Replace a received invalidValue. The replacement value is sourced from the aggregation in the role replaceWith. <b>Tags:</b> atp.EnumerationLiteralIndex=1
keep	The application software is supposed to handle signal invalidation on RTE API level either by Data ReceiveErrorEvent or check of error code on read access. <b>Tags:</b> atp.EnumerationLiteralIndex=2
replace	Replace a received invalidValue. The replacement value is specified by the initValue. <b>Tags:</b> atp.EnumerationLiteralIndex=3

**Table A.592: HandleInvalidEnum**

Enumeration	HandleOutOfRangeEnum
Note	A value of this type is taken for controlling the range checking behavior of the AUTOSAR RTE.
Aggregated by	<a href="#">ISignalProps.handleOutOfRange</a> , <a href="#">ReceiverComSpec.handleOutOfRange</a> , <a href="#">SenderComSpec.handleOutOfRange</a>
Literal	Description
default	The RTE will use the initValue if the actual value is out of the specified bounds. <b>Tags:</b> atp.EnumerationLiteralIndex=0
externalReplacement	This indicates that the value replacement is sourced from the attribute replaceWith. <b>Tags:</b> atp.EnumerationLiteralIndex=1
ignore	The RTE will ignore any attempt to send or receive the corresponding dataElement if the value is out of the specified range. <b>Tags:</b> atp.EnumerationLiteralIndex=2
invalid	The RTE will use the invalidValue if the value is out of the specified bounds. <b>Tags:</b> atp.EnumerationLiteralIndex=3
none	A range check is not required. <b>Tags:</b> atp.EnumerationLiteralIndex=4
saturate	The RTE will saturate the value of the dataElement such that it is limited to the applicable upper bound if it is greater than the upper bound. Consequently, it is limited to the applicable lower bound if the value is less than the lower bound. <b>Tags:</b> atp.EnumerationLiteralIndex=5

**Table A.593: HandleOutOfRangeEnum**

<b>Class</b>	<b>HardwareConfiguration</b>			
<b>Note</b>	Describes in which mode the hardware is operating while needing this resource consumption.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">ExecutionTime.hardwareConfiguration</a> , <a href="#">HeapUsage.hardwareConfiguration</a> , <a href="#">StackUsage.hardwareConfiguration</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
additional Information	String	0..1	attr	Specifies additional information on the Hardware Configuration.
processorMode	String	0..1	attr	Specifies in which mode the processor is operating.
processor Speed	String	0..1	attr	Specifies the speed the processor is operating.

**Table A.594: HardwareConfiguration**

<b>Class</b>	<b>HwAttributeDef</b>			
<b>Note</b>	This metaclass represents the ability to define a particular hardware attribute. The category of this element defines the type of the attributeValue. If the category is Enumeration the hw AttributeEnumerationLiterals specify the available literals.			
<b>Base</b>	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	HwCategory.hwAttributeDef			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
hwAttribute Literal	HwAttributeLiteralDef	*	aggr	The available EnumerationLiterals of the Enumeration definition. Only applicable if the category of the Hw AttributeDef equals Enumeration.
isRequired	Boolean	0..1	attr	This attribute specifies if the defined attribute value is required to be provided.
unit	<a href="#">Unit</a>	0..1	ref	This association specifies the physical unit of the defined hardware attribute. This is optional due to the fact that there are textual attributes.

**Table A.595: HwAttributeDef**

<b>Class</b>	<b>HwAttributeValue</b>			
<b>Note</b>	This metaclass represents the ability to assign a hardware attribute value. Note that v and vt are mutually exclusive.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">HwDescriptionEntity.hwAttributeValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
annotation	Annotation	0..1	aggr	Optional annotation that can be added to each Hw AttributeValue.
hwAttributeDef	<a href="#">HwAttributeDef</a>	0..1	ref	This association represents the definition of the particular hardware attribute value.
v	<a href="#">Numerical</a>	0..1	attr	This represents a numerical hardware attribute value. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=systemDesignTime
vt	VerbatimString	0..1	attr	This represents a textual hardware attribute value.

**Table A.596: HwAttributeValue**



<b>Class</b>	<b>HwDescriptionEntity</b> (abstract)			
<b>Note</b>	This meta-class represents the ability to describe a hardware entity.			
<b>Base</b>	ARObject, <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">HwElement</a> , HwPin, <a href="#">HwPinGroup</a> , <a href="#">HwType</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
hwAttribute Value	<a href="#">HwAttributeValue</a>	*	aggr	This aggregation represents a particular hardware attribute value. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=hwAttributeValue, hwAttributeValue.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime xml.sequenceOffset=50
hwCategory	HwCategory	*	ref	One of the associations representing one particular category of the hardware entity. <b>Tags:</b> xml.sequenceOffset=30
hwType	<a href="#">HwType</a>	0..1	ref	This association is used to assign an optional HwType which contains the common attribute values for all occurrences of this HwDescriptionEntity. Note that HwTypes can not be redefined and therefore shall not have a hwType reference.

**Table A.597: HwDescriptionEntity**

<b>Class</b>	<b>HwElement</b>			
<b>Note</b>	This represents the ability to describe Hardware Elements on an instance level. The particular types of hardware are distinguished by the category. This category determines the applicable attributes. The possible categories and attributes are defined in HwCategory. <b>Tags:</b> atp.recommendedPackage=HwElements			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">HwDescriptionEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
hwElement Connection	<a href="#">HwElementConnector</a>	*	aggr	This represents one particular connection between two hardware elements. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=hwElementConnection, hwElementConnection.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime xml.sequenceOffset=110
hwPinGroup	<a href="#">HwPinGroup</a>	*	aggr	This aggregation is used to describe the connection facilities of a hardware element. Note that hardware element has no pins but only pingroups. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=hwPinGroup.shortName, hwPinGroup.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime xml.sequenceOffset=90





Class	HwElement			
nestedElement	<a href="#">HwElement</a>	*	ref	<p>This association is used to establish hierarchies of hw elements. Note that one particular HwElement can be target of this association only once. I.e. multiple instantiation of the same HwElement is not supported (at any hierarchy level).</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=nestedElement.hwElement, nestedElement.variationPoint.shortLabel  vh.latestBindingTime=systemDesignTime  xml.sequenceOffset=70</p>

Table A.598: HwElement

Class	HwElementConnector			
<b>Note</b>	This meta-class represents the ability to connect two hardware elements. The details of the connection can be refined by hwPinGroupConnection.			
<b>Base</b>	ARObject, Describable			
<b>Aggregated by</b>	<a href="#">HwElement.hwElementConnection</a>			
Attribute	Type	Mult.	Kind	Note
hwElement	<a href="#">HwElement</a>	*	ref	This association connects two hardware elements.
hwPin Connection	<a href="#">HwPinConnector</a>	*	aggr	<p>This represents one particular connection between two hardware pins. This connection shall be used if pin-to-pin-connection is to be described but no description of the connection between the hierarchical composition of HwPinGroups (using HwPinGroupConnector) is required.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=hwPinConnection, hwPinConnection.variationPoint.shortLabel  vh.latestBindingTime=systemDesignTime  xml.sequenceOffset=60</p>
hwPinGroup Connection	<a href="#">HwPinGroupConnector</a>	*	aggr	<p>This represents one particular connection between two hardware pin groups.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=hwPinGroupConnection, hwPinGroupConnection.variationPoint.shortLabel  vh.latestBindingTime=systemDesignTime  xml.sequenceOffset=50</p>

Table A.599: HwElementConnector

Class	HwPinConnector			
<b>Note</b>	This meta-class represents the ability to connect two pins.			
<b>Base</b>	ARObject, Describable			
<b>Aggregated by</b>	<a href="#">HwElementConnector.hwPinConnection</a> , <a href="#">HwPinGroupConnector.hwPinConnection</a>			
Attribute	Type	Mult.	Kind	Note
hwPin	HwPin	*	ref	This association connects two hardware pins.

Table A.600: HwPinConnector

<b>Class</b>	<b>HwPinGroup</b>			
<b>Note</b>	This meta-class represents the ability to describe groups of pins which are used to connect hardware elements. This group acts as a bundle of pins. Thereby they allow to describe high level connections. Pin groups can even be nested.			
<b>Base</b>	ARObject, <a href="#">HwDescriptionEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">HwElement.hwPinGroup</a> , HwPinGroupContent.hwPinGroup			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
hwPinGroup Content	HwPinGroupContent	0..1	aggr	This aggregation describes the contained pins/pin groups.

**Table A.601: HwPinGroup**

<b>Class</b>	<b>HwPinGroupConnector</b>			
<b>Note</b>	This meta-class represents the ability to connect two pin groups.			
<b>Base</b>	ARObject, <a href="#">Describable</a>			
<b>Aggregated by</b>	<a href="#">HwElementConnector.hwPinGroupConnection</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
hwPin Connection	<a href="#">HwPinConnector</a>	*	aggr	This represents one particular connection between two hardware pins. The connected pins shall match the connection provided by the parent hwPinGroup Connection. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=hwPinConnection, hwPin Connection.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime
hwPinGroup	<a href="#">HwPinGroup</a>	*	ref	This association connects two hardware pin groups.

**Table A.602: HwPinGroupConnector**

<b>Class</b>	<b>HwPortMapping</b>			
<b>Note</b>	HwPortMapping specifies the hwCommunicationPort (defined in the ECU Resource Template) to realize the specified CommunicationConnector in a physical topology.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">ECUMapping.hwPortMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
communication Connector	<a href="#">CommunicationConnector</a>	0..1	ref	Reference to the CommunicationConnector in the System Template
hw Communication Port	<a href="#">HwPinGroup</a>	0..1	ref	Reference to the HwPinPortGroup of category CommunicationPort. The connection to the Hw CommunicationController is described in the Ecu Resource Description.

**Table A.603: HwPortMapping**

<b>Class</b>	<b>HwType</b>			
<b>Note</b>	This represents the ability to describe Hardware types on an abstract level. The particular types of hardware are distinguished by the category. This category determines the applicable attributes. The possible categories and attributes are defined in HwCategory. <b>Tags:</b> atp.recommendedPackage=HwTypes			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">HwDescriptionEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			





Class	HwType			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.604: HwType**

<b>Class</b>	<b>IEEE1722TpAcfBus</b> (abstract)			
<b>Note</b>	Abstract class to define various busses to be transported over a IEEE1722TP ACF connection. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">IEEE1722TpAcfCan</a> , <a href="#">IEEE1722TpAcfLin</a>			
<b>Aggregated by</b>	<a href="#">IEEE1722TpAcfConnection.acfTransportedBus</a>			
Attribute	Type	Mult.	Kind	Note
acfPart	IEEE1722TpAcfBusPart	*	aggr	One part transported over IEEE1722Tp channel. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=acfPart.shortName, acfPart.variation Point.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild
busId	PositiveInteger	0..1	attr	Id of the transported bus over the ACF connection.

**Table A.605: IEEE1722TpAcfBus**

<b>Class</b>	<b>IEEE1722TpAcfCan</b>			
<b>Note</b>	ACF IEEE1722Tp bus used for CAN transport. <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=IEEE1722TpConnections			
<b>Base</b>	ARObject, <a href="#">IEEE1722TpAcfBus</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">IEEE1722TpAcfConnection.acfTransportedBus</a>			
Attribute	Type	Mult.	Kind	Note
messageType	IEEE1722TpAcfCan MessageTypeEnum	0..1	attr	Definition of the ACF CAN stream message type.

**Table A.606: IEEE1722TpAcfCan**

<b>Class</b>	<b>IEEE1722TpAcfCanPart</b>			
<b>Note</b>	Definition of one CAN part (frame or frame range) transported over the IEEE1722Tp channel. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, <a href="#">IEEE1722TpAcfBusPart</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">IEEE1722TpAcfBus.acfPart</a>			
Attribute	Type	Mult.	Kind	Note
canAddressing Mode	CanAddressingMode Type	0..1	attr	Defines whether standard or extended address format shall be used.
canBitRate Switch	Boolean	0..1	attr	Defines whether the bit rate switch bit shall be set.
canFrameTx Behavior	<a href="#">CanFrameTxBehavior Enum</a>	0..1	attr	Defines which CAN protocol shall be used for frame transmission.





Class	IEEE1722TpAcfCanPart			
canIdentifier	PositiveInteger	0..1	attr	Optional Can Id defined in case the Can Id can not be determined during runtime.
canIdentifierMask	PositiveInteger	0..1	attr	CAN identifier mask which denotes relevant bits in the CAN Identifier. This attribute defines a CAN Identifier range in an alternative way to canIdentifierRange. It identifies the bits of the configured CAN Identifier that must match the received CAN Identifier.
canIdentifierRange	<a href="#">RxIdentifierRange</a>	0..1	aggr	Definition of the identifier range for IEEE1722Tp ACF Can messages. <b>Tags:</b> atp.Status=candidate
sdu	<a href="#">PduTriggering</a>	0..1	ref	Reference to the Pdu transported in the IEEE1722Tp channel. <b>Tags:</b> atp.Status=candidate

**Table A.607: IEEE1722TpAcfCanPart**

Class	IEEE1722TpAcfConnection			
<b>Note</b>	ACF IEEE1722Tp connection. <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=IEEE1722TpConnections			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">IEEE1722TpConnection</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
acfMaxTransitTime	TimeValue	0..1	attr	Defines the time offset that is added to the current time at the producer in order to get the "presentation time" (in seconds) when content shall be presented at the consumers.
acfTransportedBus	<a href="#">IEEE1722TpAcfBus</a>	*	aggr	Definition of the transported busses over this ACF connection. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=acfTransportedBus.shortName, acfTransportedBus.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=postBuild
collectionThreshold	PositiveInteger	0..1	attr	Defines the size threshold in bytes which, when exceeded, triggers the sending of the IEEE1722Tp ACF message, even when the maximum IEEE1722Tp ACF message size has not been reached yet.
collectionTimeout	TimeValue	0..1	attr	When this timeout expires the IEEE1722Tp ACF message is triggered for sending. The respective timer is started when the first Pdu is put into the IEEE1722Tp ACF message. Defined in seconds.
mixedBusTypeCollection	Boolean	0..1	attr	Defines if this ACF-stream is allowed to collect ACF-messages of different bus kinds (i.e. whether it is allowed to collect CAN and LIN ACF-messages in one ACF-stream message).

**Table A.608: IEEE1722TpAcfConnection**

<b>Class</b>	<b>IEEE1722TpAcfLin</b>			
<b>Note</b>	ACF IEEE1722Tp bus used for LIN transport. <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=IEEE1722TpConnections			
<b>Base</b>	ARObject, <a href="#">IEEE1722TpAcfBus</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">IEEE1722TpAcfConnection.acfTransportedBus</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
baseFrequency	PositiveInteger	0..1	attr	CRF base frequency in Hz.
frameSync Enabled	Boolean	0..1	attr	Defines whether the "fs" (frame sync) shall be enabled.
timestamp Interval	PositiveInteger	0..1	attr	CRF timestamp interval as multiple of the baseFrequency.

**Table A.609: IEEE1722TpAcfLin**

<b>Class</b>	<b>IEEE1722TpAcfLinPart</b>			
<b>Note</b>	Definition of one LIN part transported over the IEEE1722Tp channel. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, <a href="#">IEEE1722TpAcfBusPart</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">IEEE1722TpAcfBus.acfPart</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
linIdentifier	PositiveInteger	0..1	attr	Optional Lin Id defined in case the Lin Id can not be determined during runtime. <b>Tags:</b> atp.Status=candidate
sdu	<a href="#">PduTriggering</a>	0..1	ref	Reference to the Pdu transported in the IEEE1722Tp channel. <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.610: IEEE1722TpAcfLinPart**

<b>Class</b>	<b>IEEE1722TpAvConnection</b> (abstract)			
<b>Note</b>	AV IEEE1722Tp connection. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">IEEE1722TpConnection</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	IEEE1722TpAafConnection, IEEE1722TpCrfConnection, <a href="#">IEEE1722TpIdcConnection</a> , IEEE1722TpRvfConnection			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
maxTransitTime	TimeValue	0..1	attr	Defines the time offset that is added to the current time at the producer in order to get the "presentation time" (in seconds) when content shall be presented at the consumers.
sdu	<a href="#">PduTriggering</a>	*	ref	Reference to the upper layer Sdu used for the transport of the payload of the IEEE1722Tp. <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.611: IEEE1722TpAvConnection**

<b>Class</b>	<b>IEEE1722TpConnection</b> (abstract)			
<b>Note</b>	Definition of the IEEE1722Tp protocol. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">IEEE1722TpActConnection</a> , <a href="#">IEEE1722TpAvConnection</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
destinationMacAddress	MacAddressString	0..1	attr	Optional definition of the destination MAC address for this stream. If no given then macAddressStreamId is used as destination MAC address. <b>Tags:</b> atp.Status=candidate
globalTimeDomain	<a href="#">GlobalTimeDomain</a>	0..1	ref	Reference to the GlobalTimeDomain this IEEE1722Tp Connection shall be synchronized with. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=globalTimeDomain.globalTimeDomain, globalTimeDomain.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime
macAddressStreamId	MacAddressString	0..1	attr	MAC Address part of the Stream Id. <b>Tags:</b> atp.Status=candidate
pdu	<a href="#">PduTriggering</a>	0..1	ref	Reference to the lower layer Pdu used for the IEEE1722Tp protocol transport. <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.
uniqueStreamId	PositiveInteger	0..1	attr	Unique Id part of the Stream Id. <b>Tags:</b> atp.Status=candidate
version	PositiveInteger	0..1	attr	Version of the IEEE1722TP stream. <b>Tags:</b> atp.Status=candidate
vlanPriority	PositiveInteger	0..1	attr	Optional definition of the VLAN priority for this stream.

**Table A.612: IEEE1722TpConnection**

<b>Class</b>	<b>IEEE1722TpIidcConnection</b>			
<b>Note</b>	AV IEEE1722Tp IIDC and IEC61883 connection. <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=IEEE1722TpConnections			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">IEEE1722TpAvConnection</a> , <a href="#">IEEE1722TpConnection</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
iidcChannel	PositiveInteger	0..1	attr	Definition of the IIDC and IEC61883 channel. <b>Tags:</b> atp.Status=candidate
iidcDataBlockSize	PositiveInteger	0..1	attr	Definition of the IEC61883 data block size (DBS). <b>Tags:</b> atp.Status=candidate
iidcFractionNumber	PositiveInteger	0..1	attr	Definition of the IEC61883 fractionNumber (FN). <b>Tags:</b> atp.Status=candidate
iidcSourcePacketHeader	Boolean	0..1	attr	Defines the IEC61883 source packet header (SPH) existence. <b>Tags:</b> atp.Status=candidate
iidcStreamFormat	PositiveInteger	0..1	attr	Definition of the IEC61883 stream format (FMT). <b>Tags:</b> atp.Status=candidate
iidcSy	PositiveInteger	0..1	attr	Definition of the IIDC and IEC61883 sy. <b>Tags:</b> atp.Status=candidate





Class	IEEE1722TplidcConnection			
iidcTag	PositiveInteger	0..1	attr	Definition of the IIDC and IEC61883 tag. <b>Tags:</b> atp.Status=candidate
iidcTCode	PositiveInteger	0..1	attr	Definition of the IIDC and IEC61883 tcode. <b>Tags:</b> atp.Status=candidate

**Table A.613: IEEE1722TplidcConnection**

Class	IPSecRule			
<b>Note</b>	This element defines an IPsec rule that describes communication traffic that is monitored, protected and filtered.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	IPSecConfig.ipSecRule			
Attribute	Type	Mult.	Kind	Note
direction	<a href="#">CommunicationDirectionType</a>	0..1	attr	This attribute defines the direction in which the traffic is monitored. If this attribute is not set a bidirectional traffic monitoring is assumed.
headerType	IPsecHeaderTypeEnum	0..1	attr	Header type specifying the IPsec security mechanism.
ipProtocol	IPsecIpProtocolEnum	0..1	attr	This attribute defines the relevant IP protocol used in the Security Policy Database (SPD) entry.
localCertificate	<a href="#">CryptoServiceCertificate</a>	*	ref	This reference identifies the applicable certificate used for a local authentication.
localId	String	0..1	attr	This attribute defines how the local participant should be identified for authentication.
localPortRangeEnd	PositiveInteger	0..1	attr	This attribute restricts the traffic monitoring and defines an end value for the local port range. If this attribute is not set then this rule shall be effective for all local ports. Please note that port ranges are currently not supported in the AUTOSAR AP's operating system backend. If AP systems are involved, each IPsec rule may only contain a single port.
localPortRangeStart	PositiveInteger	0..1	attr	This attribute restricts the traffic monitoring and defines a start value for the local port range. If this attribute is not set then this rule shall be effective for all local ports. Please note that port ranges are currently not supported in the AUTOSAR AP's operating system backend. If AP systems are involved, each IPsec rule may only contain a single port.
mode	IPsecModeEnum	0..1	attr	This attribute defines the type of the connection.
policy	IPsecPolicyEnum	0..1	attr	An IPsec policy defines the rules that determine which type of IP traffic needs to be secured using IPsec and how that traffic is secured.
preSharedKey	<a href="#">CryptoServiceKey</a>	0..1	ref	This reference identifies the applicable cryptographic key used for authentication.
priority	PositiveInteger	0..1	attr	This attribute defines the priority of the IPSecRule (SPD entry). The processing of entries is based on priority, starting with the highest priority "0".
remoteCertificate	<a href="#">CryptoServiceCertificate</a>	*	ref	This reference identifies the applicable certificate used for a remote authentication.
remoteId	String	0..1	attr	This attribute defines how the remote participant should be identified for authentication.







Class	IPSecRule			
remoteIp Address	<a href="#">NetworkEndpoint</a>	*	ref	Definition of the remote NetworkEndpoint. With this reference the connection between the local Network Endpoint and the remote NetworkEndpoint is described on which the traffic is monitored.
remotePort RangeEnd	PositiveInteger	0..1	attr	This attribute restricts the traffic monitoring and defines an end value for the remote port range. If this attribute is not set then this rule shall be effective for all local ports. Please note that port ranges are currently not supported in the AUTOSAR AP's operating system backend. If AP systems are involved, each IPsec rule may only contain a single port.
remotePort RangeStart	PositiveInteger	0..1	attr	This attribute restricts the traffic monitoring and defines a start value for the remote port range. If this attribute is not set then this rule shall be effective for all local ports. Please note that port ranges are currently not supported in the AUTOSAR AP's operating system backend. If AP systems are involved, each IPsec rule may only contain a single port.

**Table A.614: IPSecRule**

Class	IPdu (abstract)			
Note	The IPdu (Interaction Layer Protocol Data Unit) element is used to sum up all Pdus that are routed by the PduR.			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Subclasses	<a href="#">ContainerIPdu</a> , <a href="#">DcmIPdu</a> , <a href="#">GeneralPurposeIPdu</a> , <a href="#">ISignalIPdu</a> , <a href="#">J1939DcmIPdu</a> , <a href="#">J1939ProtectedIPdu</a> , <a href="#">MultiplexedIPdu</a> , <a href="#">NPdu</a> , <a href="#">SecuredIPdu</a> , <a href="#">UserDefinedIPdu</a>			
Aggregated by	<a href="#">ARPackageElement</a>			
Attribute	Type	Mult.	Kind	Note
containedIPdu Props	<a href="#">ContainedIPduProps</a>	0..1	aggr	Defines whether this IPdu may be collected inside a ContainerIPdu.

**Table A.615: IPdu**

Class	IPduMapping			
Note	Arranges those IPdus that are transferred by the gateway from one channel to the other in pairs and defines the mapping between them.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">GatewayIPduMapping</a>			
Attribute	Type	Mult.	Kind	Note
introduction	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents introductory documentation about the IPdu mapping.
pduMaxLength	PositiveInteger	0..1	attr	Define the maximum length in bytes which limits the length of the Pdu during gateway operation if the runtime length of the received Pdu exceeds this limit.
pduTpChunk Size	PositiveInteger	0..1	attr	Optionally defines the to be configured Pdu Router Tp ChunkSize for this routing relation.
sourceIPdu	<a href="#">PduTriggering</a>	0..1	ref	Source destination of the referencing mapping.
targetIPdu	<a href="#">TargetIPduRef</a>	0..1	aggr	Target destination of the referencing mapping.

**Table A.616: IPduMapping**

<b>Class</b>	<b>IPduPort</b>			
<b>Note</b>	Connectors reception or send port on the referenced channel referenced by a PduTriggering.			
<b>Base</b>	ARObject, <a href="#">CommConnectorPort</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CommunicationConnector.ecuCommPortInstance</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
iPduSignalProcessing	IPduSignalProcessingEnum	0..1	attr	Definition of the two signal processing modes Immediate and Deferred for both Tx and Rx IPdus.
rxSecurityVerification	Boolean	0..1	attr	This attribute defines the bypassing of signature authentication or MAC verification in the receiving ECU. If not defined or set to true the signature authentication or MAC verification shall be performed for the SecuredIPdu. If set to false the signature authentication or MAC verification shall not be performed for the SecuredIPdu.
timestampRxAcceptanceWindow	TimeValue	0..1	attr	This attribute is used to define the maximum allowed deviation in seconds from the expected timestamp for which a SecuredIPdu is still deemed authentic. Please note that this attribute is for documentation only to allow the configuration of required freshness value manager and no upstream mapping is defined for it.
useAuthDataFreshness	Boolean	0..1	attr	This attribute describes whether a part of AuthenticPdu contained in a SecuredIPdu shall be passed on to the SWC that verifies and generates the Freshness. The part of the Authentic-PDU is defined by the authDataFreshnessStartPosition and authDataFreshnessLength.

**Table A.617: IPduPort**

<b>Class</b>	<b>IPv6ExtHeaderFilterList</b>			
<b>Note</b>	Permitted list for the filtering of IPv6 extension headers.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	IPv6ExtHeaderFilterSet.extHeaderFilterList			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
allowedIPv6ExtHeader	PositiveInteger	*	attr	IPv6 Extension Header type allowed by this filter.

**Table A.618: IPv6ExtHeaderFilterList**

<b>Class</b>	<b>ISignal</b>			
<b>Note</b>	Signal of the Interaction Layer. The RTE supports a "signal fan-out" where the same System Signal is sent in different SignalIPdus to multiple receivers. To support the RTE "signal fan-out" each SignalIPdu contains ISignals. If the same System Signal is to be mapped into several SignalIPdus there is one ISignal needed for each ISignalToIPduMapping. ISignals describe the Interface between the Precompile configured RTE and the potentially Postbuild configured Com Stack (see ECUC Parameter Mapping). In case of the SystemSignalGroup an ISignal shall be created for each SystemSignal contained in the SystemSignalGroup. <b>Tags:</b> atp.recommendedPackage=ISignals			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	ISignal			
data Transformation	<a href="#">DataTransformation</a>	0..1	ref	Optional reference to a DataTransformation which represents the transformer chain that is used to transform the data that shall be placed inside this ISignal. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=dataTransformation.dataTransformation, dataTransformation.variationPoint.shortLabel vh.latestBindingTime=codeGenerationTime
dataTypePolicy	<a href="#">DataTypePolicyEnum</a>	0..1	attr	With the aggregation of SwDataDefProps an ISignal specifies how it is represented on the network. This representation follows a particular policy. Note that this causes some redundancy which is intended and can be used to support flexible development methodology as well as subsequent integrity checks. If the policy "networkRepresentationFromComSpec" is chosen the network representation from the ComSpec that is aggregated by the PortPrototype shall be used. If the "override" policy is chosen the requirements specified in the PortInterface and in the ComSpec are not fulfilled by the networkRepresentationProps. In case the System Description doesn't use a complete Software Component Description (VFB View) the "legacy" policy can be chosen.
initValue	<a href="#">ValueSpecification</a>	0..1	aggr	Optional definition of a ISignal's initValue in case the System Description doesn't use a complete Software Component Description (VFB View). This supports the inclusion of legacy system signals. This value can be used to configure the Signal's "Init Value". If a full DataMapping exist for the SystemSignal this information may be available from a configured Sender ComSpec and ReceiverComSpec. In this case the initvalues in SenderComSpec and/or ReceiverComSpec override this optional value specification. Further restrictions apply from the RTE specification.
iSignalProps	ISignalProps	0..1	aggr	Additional optional ISignal properties that may be stored in different files. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=iSignalProps
iSignalType	<a href="#">ISignalTypeEnum</a>	0..1	attr	This attribute defines whether this iSignal is an array that results in a UINT8_N / UINT8_DYN ComSignalType in the COM configuration or a primitive type.
length	<a href="#">UnlimitedInteger</a>	0..1	attr	Size of the signal in bits. The size needs to be derived from the mapped VariableDataPrototype according to the mapping of primitive DataTypes to BaseTypes as used in the RTE. Indicates maximum size for dynamic length signals. The ISignal length of zero bits is allowed.





Class	ISignal			
network Representation Props	<a href="#">SwDataDefProps</a>	0..1	aggr	<p>Specification of the actual network representation. The usage of SwDataDefProps for this purpose is restricted to the attributes compuMethod and baseType. The optional baseType attributes "memAlignment" and "byteOrder" shall not be used.</p> <p>The attribute "dataTypePolicy" in the SystemTemplate element defines whether this network representation shall be ignored and the information shall be taken over from the network representation of the ComSpec.</p> <p>If "override" is chosen by the system integrator the network representation can violate against the requirements defined in the PortInterface and in the network representation of the ComSpec.</p> <p>In case that the System Description doesn't use a complete Software Component Description (VFB View) this element is used to configure "ComSignalDataInvalid Value" and the Data Semantics.</p> <p><b>Stereotypes:</b> atp.Splitable  <b>Tags:</b> atp.Splitkey=networkRepresentationProps</p>
reception DefaultValue (ordered)	<a href="#">ValueSpecification</a>	*	aggr	<p>Value used to fill data on the receiver side, if less then expected data is received.</p> <p>The value is expected to cover the entire expected ISignal network payload.</p> <p><b>Tags:</b> atp.Status=obsolete</p>
systemSignal	<a href="#">SystemSignal</a>	0..1	ref	<p>Reference to the System Signal that is supposed to be transmitted in the ISignal.</p>
timeout Substitution Value	<a href="#">ValueSpecification</a>	0..1	aggr	<p>Defines and enables the ComTimeoutSubstitution for this ISignal.</p>
transformation ISignalProps	<a href="#">TransformationISignal Props</a>	*	aggr	<p>A transformer chain consists of an ordered list of transformers. The ISignal specific configuration properties for each transformer are defined in the TransformationISignalProps class. The transformer configuration properties that are common for all ISignals are described in the TransformationTechnology class.</p> <p><b>Stereotypes:</b> atp.Splitable  <b>Tags:</b> atp.Splitkey=transformationISignalProps</p>

**Table A.619: ISignal**

Class	ISignalGroup			
<b>Note</b>	<p>SignalGroup of the Interaction Layer. The RTE supports a "signal fan-out" where the same System Signal Group is sent in different SignalPdus to multiple receivers.</p> <p>An ISignalGroup refers to a set of ISignals that shall always be kept together. A ISignalGroup represents a COM Signal Group.</p> <p>Therefore it is recommended to put the ISignalGroup in the same Package as ISignals (see atp.recommendedPackage)</p> <p><b>Tags:</b> atp.recommendedPackage=ISignalGroups</p>			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	ISignalGroup			
comBasedSignalGroupTransformation	<a href="#">DataTransformation</a>	0..1	ref	Optional reference to a DataTransformation which represents the transformer chain that is used to transform the data that shall be placed inside this ISignalGroup based on the COMBasedTransformer approach. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=comBasedSignalGroupTransformation.dataTransformation, comBasedSignalGroupTransformation.variationPoint.shortLabel vh.latestBindingTime=codeGenerationTime
iSignal	<a href="#">ISignal</a>	*	ref	Reference to a set of ISignals that shall always be kept together.
systemSignalGroup	<a href="#">SystemSignalGroup</a>	0..1	ref	Reference to the SystemSignalGroup that is defined on VFB level and that is supposed to be transmitted in the ISignalGroup.
transformationISignalProps	<a href="#">TransformationISignalProps</a>	*	aggr	A transformer chain consists of an ordered list of transformers. The ISignalGroup specific configuration properties for each transformer are defined in the TransformationISignalProps class. The transformer configuration properties that are common for all ISignalGroups are described in the TransformationTechnology class. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=transformationISignalProps

**Table A.620: ISignalGroup**

Class	ISignalIPdu			
<b>Note</b>	Represents the IPdus handled by Com. The ISignalIPdu assembled and disassembled in AUTOSAR COM consists of one or more signals. In case no multiplexing is performed this IPdu is routed to/from the Interface Layer. A maximum of one dynamic length signal per IPdu is allowed. <b>Tags:</b> atp.recommendedPackage=Pdus			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
iPduTimingSpecification	IPduTiming	0..1	aggr	Timing specification for Com IPdus (Transmission Modes). This information is mandatory for the sender in a System Extract. This information may be omitted on receivers in a System Extract. atpVariation: The timing of a Pdu can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=iPduTimingSpecification, iPduTimingSpecification.variationPoint.shortLabel vh.latestBindingTime=postBuild
iSignalToPduMapping	<a href="#">ISignalToIPduMapping</a>	*	aggr	Definition of SignalToIPduMappings included in the Signal IPdu. atpVariation: The content of a PDU can be variable. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=iSignalToPduMapping.shortName, iSignalToPduMapping.variationPoint.shortLabel vh.latestBindingTime=postBuild





Class	ISignalIPdu			
unusedBit Pattern	Integer	0..1	attr	AUTOSAR COM and AUTOSAR IPDUM are filling not used areas of an IPDU with this bit-pattern. This attribute is mandatory to avoid undefined behavior. This byte-pattern will be repeated throughout the IPdu.

Table A.621: ISignalIPdu

Class	ISignalPduGroup			
<b>Note</b>	The AUTOSAR COM Layer is able to start and to stop sending and receiving configurable groups of I-Pdus during runtime. An ISignalPduGroup contains either ISignalIPdus or ISignalPduGroups. <b>Tags:</b> atp.recommendedPackage=ISignalPduGroups			
<b>Base</b>	ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
communication Direction	Communication DirectionType	0..1	attr	This attribute determines in which direction IPdus that are contained in this IPduGroup will be transmitted (communication direction can be either In or Out).
communication Mode	String	0..1	attr	This attribute defines the use-case for this ISignalPdu Group (e.g. diagnostic, debugging etc.). For example, in a diagnostic mode all IPdus - which are not involved in diagnostic - are disabled. The use cases are not limited to a fixed enumeration and can be specified as a string.
contained ISignalPdu Group	ISignalPduGroup	*	ref	An I-Pdu group can be included in other I-Pdu groups. Contained I-Pdu groups shall not be referenced by the EcuInstance.
iSignalIPdu	ISignalIPdu	*	ref	Reference to a set of Signal I-Pdus, which are contained in the ISignal I-Pdu Group. <b>atpVariation:</b> The content of a ISignal I-Pdu group can vary (->vehicle modes). <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=iSignalIPdu.iSignalIPdu, iSignal IPdu.variationPoint.shortLabel vh.latestBindingTime=postBuild
nmPdu	NmPdu	*	ref	Reference to a set of NmPdus with NmUserData, which are contained in the ISignalPduGroup. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=nmPdu.nmPdu, nmPdu.variationPoint.short Label vh.latestBindingTime=postBuild

Table A.622: ISignalPduGroup

Class	ISignalMapping			
<b>Note</b>	Arranges those signals (or SignalGroups) that are transferred by the gateway from one channel to the other in pairs and defines the mapping between them. Each pair consists in a source and a target referencing to a ISignalTriggering.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	Gateway.signalMapping			
Attribute	Type	Mult.	Kind	Note
introduction	DocumentationBlock	0..1	aggr	This represents introductory documentation about the ISignal mapping.





Class	ISignalMapping			
sourceSignal	<a href="#">ISignalTriggering</a>	0..1	ref	Source destination of the referencing mapping.
targetSignal	<a href="#">ISignalTriggering</a>	0..1	ref	Target destination of the referencing mapping.

**Table A.623: ISignalMapping**

Class	ISignalPort			
<b>Note</b>	Connectors reception or send port on the referenced channel referenced by an ISignalTriggering. If different timeouts or DataFilters for ISignals need to be specified several ISignalPorts may be created.			
<b>Base</b>	<i>ARObject</i> , <a href="#">CommConnectorPort</a> , <i>Identifiable</i> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CommunicationConnector.ecuCommPortInstance</a>			
Attribute	Type	Mult.	Kind	Note
dataFilter	<a href="#">DataFilter</a>	0..1	aggr	Optional specification of a signal COM filter at the receiver side in case that the System Description doesn't use a complete Software Component Description (VFB View). This supports the inclusion of legacy system signals. If a full DataMapping exist for the SystemSignal this information may be available from a configured ReceiverComSpec. In this case the ReceiverComSpec overrides this optional specification.
ddsQosProfile	DdsCpQosProfile	0..1	ref	Reference to the DDS Qos profile used for this ISignal. <b>Tags:</b> atp.Status=candidate
firstTimeout	TimeValue	0..1	attr	<ul style="list-style-type: none"> <li>ISignalPort with communicationDirection = in: Optional first timeout value in seconds for the reception of the ISignal.</li> <li>ISignalPort with communicationDirection = out: Optional first timeout value in seconds for transmission deadline monitoring.</li> </ul>
handleInvalid	<a href="#">HandleInvalidEnum</a>	0..1	attr	This attribute defines how invalidation is applied to the ISignals received in the context of this ISignalPort.
timeout	TimeValue	0..1	attr	<ul style="list-style-type: none"> <li>ISignalPort with communicationDirection = in: Optional timeout value in seconds for the reception of the ISignal. The attribute value is used to configure the Com Timeout in the COM module. The RTE ignores this attribute. The timeout can also be specified with the NonqueuedReceiverComSpec.aliveTimeout attribute. If a full DataMapping exists for the SystemSignal and the value is available in the configured ReceiverComSpec, then the timeout value in the ReceiverComSpec overrides this optional timeout specification during the creation of the Base Ecu Configuration of the COM module.</li> <li>ISignalPort with communicationDirection = out: Optional timeout value in seconds for the transmission of the ISignal. The attribute value is used to configure the ComTimeout in the COM module. The RTE ignores this attribute. The timeout can also be specified with the SenderComSpec.transmissionAcknowledge.timeout attribute. If a full DataMapping exists for the System Signal and the value is available in the configured Sender ComSpec, then the timeout value in the SenderComSpec overrides this optional timeout specification during the creation of the Base Ecu Configuration of the COM module.</li> </ul> <p>This attribute can be used in the following cases:</p>







Class	ISignalPort			
				<ul style="list-style-type: none"> <li>• legacy signal where the System Description doesn't use a complete Software Component Description (VFB View) and where the DataMapping is missing.</li> <li>• bus monitoring use cases in which the DataMapping is ignored.</li> </ul>

Table A.624: ISignalPort

Class	ISignalPortToDiagnosticEventMapping			
<b>Note</b>	This mapping is used to identify the DiagnosticEvents that are reported if during the reception of an ISignalGroup on a specific Ecu an error is detected. <b>Tags:</b> atp.recommendedPackage=DiagnosticMappings			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">DiagnosticCommonElement</a> , DiagnosticMapping, DiagnosticSwMapping, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
comTimeoutError	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a diagnostic event that is used if a com timeout error (ISignalGroup is not received within expected time) occurred. <b>Tags:</b> xml.sequenceOffset=10
dataValueError	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a diagnostic event that is used if a data value error (invalid or out of range) occurred. <b>Tags:</b> xml.sequenceOffset=60
e2eCounterError	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a diagnostic event that is used if an E2E CRC counter error occurred. <b>Tags:</b> xml.sequenceOffset=30
e2eCrcError	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a diagnostic event that is used if an E2E CRC error occurred. <b>Tags:</b> xml.sequenceOffset=20
e2eTimeoutError	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a diagnostic event that is used if an E2E timeout error occurred. <b>Tags:</b> xml.sequenceOffset=40
iSignalPort	<a href="#">ISignalPort</a>	0..1	ref	Reference to an ISignalPort on which the ISignalGroup is received. <b>Tags:</b> xml.sequenceOffset=110
iSignalTriggering	<a href="#">ISignalTriggering</a>	0..1	ref	Reference to an ISignalTriggering of an ISignalGroup that is received on the ISignalPort. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=iSignalTriggering.iSignalTriggering, iSignalTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild xml.sequenceOffset=100
secureOnboardComError	<a href="#">DiagnosticEvent</a>	0..1	ref	Reference to a diagnostic event that is used if a SecOc error occurred. <b>Tags:</b> xml.sequenceOffset=50

Table A.625: ISignalPortToDiagnosticEventMapping

Class	ISignalToIPduMapping
<b>Note</b>	An ISignalToIPduMapping describes the mapping of ISignals to ISignalIPdus and defines the position of the ISignal within an ISignalIPdu.
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>







Class	ISignalToIPduMapping			
Aggregated by	ISignalIPdu.ISignalToPduMapping, NmPdu.ISignalToIPduMapping			
Attribute	Type	Mult.	Kind	Note
iSignal	ISignal	0..1	ref	Reference to a ISignal that is mapped into the ISignal IPdu. Each ISignal contained in the ISignalGroup shall be mapped into an IPdu by an own ISignalToIPduMapping. The references to the ISignal and to the ISignalGroup in an ISignalToIPduMapping are mutually exclusive.
iSignalGroup	ISignalGroup	0..1	ref	Reference to an ISignalGroup that is mapped into the SignalIPdu. If an ISignalToIPduMapping for an ISignal Group is defined, only the UpdateIndicationBitPosition and the transferProperty is relevant. The startPosition and the packingByteOrder shall be ignored. Each ISignal contained in the ISignalGroup shall be mapped into an IPdu by an own ISignalToIPduMapping. The references to the ISignal and to the ISignalGroup in an ISignalToIPduMapping are mutually exclusive.
packingByte Order	ByteOrderEnum	0..1	attr	This parameter defines the order of the bytes of the signal and the packing into the SignalIPdu. The byte ordering "Little Endian" (MostSignificantByteLast), "Big Endian" (MostSignificantByteFirst) and "Opaque" can be selected. For opaque data endianness conversion shall be configured to Opaque. The value of this attribute impacts the absolute position of the signal into the SignalIPdu (see the startPosition attribute description). For an ISignalGroup the packingByteOrder is irrelevant and shall be ignored.
startPosition	UnlimitedInteger	0..1	attr	This parameter is necessary to describe the bitposition of a signal within an SignalIPdu. It denotes the least significant bit for "Little Endian" and the most significant bit for "Big Endian" packed signals within the IPdu (see the description of the packingByteOrder attribute). In AUTOSAR the bit counting is always set to "sawtooth" and the bit order is set to "Decreasing". The bit counting in byte 0 starts with bit 0 (least significant bit). The most significant bit in byte 0 is bit 7. Please note that the way the bytes will be actually sent on the bus does not impact this representation: they will always be seen by the software as a byte array. If a mapping for the ISignalGroup is defined, this attribute is irrelevant and shall be ignored.
transferProperty	TransferPropertyEnum	0..1	attr	Defines how the referenced ISignal contributes to the send triggering of the ISignalIPdu.
update IndicationBit Position	UnlimitedInteger	0..1	attr	The UpdateIndicationBit indicates to the receivers that the signal (or the signal group) was updated by the sender. Length is always one bit. The UpdateIndicationBitPosition attribute describes the position of the update bit within the SignalIPdu. For Signals of a ISignalGroup this attribute is irrelevant and shall be ignored. Note that the exact bit position of the updateIndicationBit Position is linked to the value of the attribute packingByte Order because the method of finding the bit position is different for the values mostSignificantByteFirst and most SignificantByteLast. This means that if the value of packingByteOrder is changed while the value of update IndicationBitPosition remains unchanged the exact bit position of updateIndicationBitPosition within the enclosing ISignalIPdu still undergoes a change. This attribute denotes the least significant bit for "Little Endian" and the most significant bit for "Big Endian"





Class	ISignalToIPduMapping			
				<p>packed signals within the IPdu (see the description of the packingByteOrder attribute). In AUTOSAR the bit counting is always set to "sawtooth" and the bit order is set to "Decreasing". The bit counting in byte 0 starts with bit 0 (least significant bit). The most significant bit in byte 0 is bit 7.</p>

**Table A.626: ISignalToIPduMapping**

Class	ISignalTriggering			
<b>Note</b>	A ISignalTriggering allows an assignment of ISignals to physical channels.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">PhysicalChannel.iSignalTriggering</a>			
Attribute	Type	Mult.	Kind	Note
iSignal	<a href="#">ISignal</a>	0..1	ref	This reference shall be used if an ISignal is transported on the PhysicalChannel. This reference forms an XOR relationship with the ISignalTriggering-ISignalGroup reference.
iSignalGroup	<a href="#">ISignalGroup</a>	0..1	ref	This reference shall be used if an ISignalGroup is transported on the PhysicalChannel. This reference forms an XOR relationship with the ISignalTriggering-ISignal reference.
iSignalPort	<a href="#">ISignalPort</a>	*	ref	References to the ISignalPort on every ECU of the system which sends and/or receives the ISignal. References for both the sender and the receiver side shall be included when the system is completely defined.

**Table A.627: ISignalTriggering**

Enumeration	ISignalTypeEnum
<b>Note</b>	This enumeration defines ISignal types that are used for derivation of the ComSignalType in the COM configuration.
<b>Aggregated by</b>	<a href="#">ISignal.iSignalType</a>
<b>Literal</b>	<b>Description</b>
array	ISignal shall be interpreted as an array (UINT8_N, UINT8_DYN) <b>Tags:</b> atp.EnumerationLiteralIndex=0
primitive	ISignal shall be interpreted as a primitive type (e.g. UINT_8, SINT_32) <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.628: ISignalTypeEnum**

Class	Identifiable (abstract)
<b>Note</b>	Instances of this class can be referred to by their identifier (within the namespace borders). In addition to this, Identifiables are objects which contribute significantly to the overall structure of an AUTOSAR description. In particular, Identifiables might contain Identifiables.
<b>Base</b>	ARObject, <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>





Class	Identifiable (abstract)			
Subclasses	<p> <a href="#">ARPackage</a>, <a href="#">AbstractDolpLogicAddressProps</a>, <a href="#">AbstractEvent</a>, <a href="#">AbstractImplementationDataTypeElement</a>, <a href="#">AbstractSecurityEventFilter</a>, <a href="#">AbstractSecurityIdsmInstanceFilter</a>, <a href="#">AbstractServiceInstance</a>, <a href="#">AppOsTaskProxyToEcuTaskProxyMapping</a>, <a href="#">ApplicationEndpoint</a>, <a href="#">ApplicationError</a>, <a href="#">ApplicationPartitionToEcuPartitionMapping</a>, <a href="#">AppliedStandard</a>, <a href="#">AsynchronousServerCallResultPoint</a>, <a href="#">AtpBlueprint</a>, <a href="#">AtpBlueprintable</a>, <a href="#">AtpClassifier</a>, <a href="#">AtpFeature</a>, <a href="#">AutosarOperationArgumentInstance</a>, <a href="#">AutosarVariableInstance</a>, <a href="#">BinaryManifestAddressableObject</a>, <a href="#">BinaryManifestItemDefinition</a>, <a href="#">BinaryManifestResource</a>, <a href="#">BinaryManifestResourceDefinition</a>, <a href="#">BlockState</a>, <a href="#">BswInternalTriggeringPoint</a>, <a href="#">BswModuleDependency</a>, <a href="#">BuildActionEntity</a>, <a href="#">BuildActionEnvironment</a>, <a href="#">CanTpAddress</a>, <a href="#">CanTpChannel</a>, <a href="#">CanTpNode</a>, <a href="#">Chapter</a>, <a href="#">ClientIdDefinition</a>, <a href="#">ClientServerOperation</a>, <a href="#">Code</a>, <a href="#">CollectableElement</a>, <a href="#">ComManagementMapping</a>, <a href="#">CommConnectorPort</a>, <a href="#">CommunicationConnector</a>, <a href="#">CommunicationController</a>, <a href="#">Compiler</a>, <a href="#">ConsistencyNeeds</a>, <a href="#">ConsumedEventGroup</a>, <a href="#">CouplingElementAbstractDetails</a>, <a href="#">CouplingPort</a>, <a href="#">CouplingPortAbstractShaper</a>, <a href="#">CouplingPortStructuralElement</a>, <a href="#">CpSoftwareClusterResource</a>, <a href="#">CpSoftwareClusterResourceToApplicationPartitionMapping</a>, <a href="#">CpSoftwareClusterToApplicationPartitionMapping</a>, <a href="#">CpSoftwareClusterToEcuInstanceMapping</a>, <a href="#">CpSoftwareClusterToResourceMapping</a>, <a href="#">CryptoServiceMapping</a>, <a href="#">CyclicHandlingComDataToOsTaskProxyMapping</a>, <a href="#">DataPrototypeGroup</a>, <a href="#">DataPrototypeTransformationPropsIdent</a>, <a href="#">DataTransformation</a>, <a href="#">DdsAbstractServiceInstanceElementCp</a>, <a href="#">DdsCpDomain</a>, <a href="#">DdsCpPartition</a>, <a href="#">DdsCpQosProfile</a>, <a href="#">DdsCpTopic</a>, <a href="#">DependencyOnArtifact</a>, <a href="#">DiagEventDebounceAlgorithm</a>, <a href="#">DiagnosticAuthTransmitCertificateEvaluation</a>, <a href="#">DiagnosticConnectedIndicator</a>, <a href="#">DiagnosticDataElement</a>, <a href="#">DiagnosticDebounceAlgorithmProps</a>, <a href="#">DiagnosticExtendedDataRecordElement</a>, <a href="#">DiagnosticFunctionInhibitSource</a>, <a href="#">DiagnosticParameterElement</a>, <a href="#">DiagnosticRoutineSubfunction</a>, <a href="#">DltApplication</a>, <a href="#">DltArgument</a>, <a href="#">DltArgumentProps</a>, <a href="#">DltLogChannel</a>, <a href="#">DltMessage</a>, <a href="#">DolpInterface</a>, <a href="#">DolpLogicAddress</a>, <a href="#">DolpRoutingActivation</a>, <a href="#">ECUMapping</a>, <a href="#">EOCExecutableEntityRefAbstract</a>, <a href="#">EcuPartition</a>, <a href="#">EcuPartitionToCoreMapping</a>, <a href="#">EcucContainerValue</a>, <a href="#">EcucDefinitionElement</a>, <a href="#">EcucDestinationUriDef</a>, <a href="#">EcucEnumerationLiteralDef</a>, <a href="#">EcucQuery</a>, <a href="#">EcucValidationCondition</a>, <a href="#">EthernetWakeupSleepOnDatalineConfig</a>, <a href="#">EventHandler</a>, <a href="#">ExclusiveArea</a>, <a href="#">ExecutableEntity</a>, <a href="#">ExecutionTime</a>, <a href="#">FMAttributeDef</a>, <a href="#">FMFeatureMapAssertion</a>, <a href="#">FMFeatureMapCondition</a>, <a href="#">FMFeatureMapElement</a>, <a href="#">FMFeatureRelation</a>, <a href="#">FMFeatureRestriction</a>, <a href="#">FMFeatureSelection</a>, <a href="#">FlatInstanceDescriptor</a>, <a href="#">FlexrayArTpNode</a>, <a href="#">FlexrayTpConnectionControl</a>, <a href="#">FlexrayTpNode</a>, <a href="#">FlexrayTpPduPool</a>, <a href="#">FrameTriggering</a>, <a href="#">GeneralParameter</a>, <a href="#">GlobalTimeGateway</a>, <a href="#">GlobalTimeMaster</a>, <a href="#">GlobalTimeSlave</a>, <a href="#">HeapUsage</a>, <a href="#">HwAttributeDef</a>, <a href="#">HwAttributeLiteralDef</a>, <a href="#">HwPin</a>, <a href="#">HwPinGroup</a>, <a href="#">IEEE1722TpAcfBus</a>, <a href="#">IEEE1722TpAcfBusPart</a>, <a href="#">IPSecRule</a>, <a href="#">IPv6ExtHeaderFilterList</a>, <a href="#">ISignalToIPduMapping</a>, <a href="#">ISignalTriggering</a>, <a href="#">IdentCaption</a>, <a href="#">ImpositionTime</a>, <a href="#">InternalTriggeringPoint</a>, <a href="#">J1939Node</a>, <a href="#">J1939SharedAddressCluster</a>, <a href="#">J1939TpNode</a>, <a href="#">Keyword</a>, <a href="#">LifeCycleState</a>, <a href="#">LinScheduleTable</a>, <a href="#">LinTpNode</a>, <a href="#">Linker</a>, <a href="#">MacAddressVlanMembership</a>, <a href="#">MacMulticastGroup</a>, <a href="#">MacSecKayParticipant</a>, <a href="#">McDataInstance</a>, <a href="#">MemorySection</a>, <a href="#">ModeDeclaration</a>, <a href="#">ModeDeclarationMapping</a>, <a href="#">ModeSwitchPoint</a>, <a href="#">ModeSwitchSenderComSpecProps</a>, <a href="#">NetworkEndpoint</a>, <a href="#">NmCluster</a>, <a href="#">NmEcu</a>, <a href="#">NmNode</a>, <a href="#">NvBlockDescriptor</a>, <a href="#">PackageableElement</a>, <a href="#">ParameterAccess</a>, <a href="#">PduActivationRoutingGroup</a>, <a href="#">PduToFrameMapping</a>, <a href="#">PduTriggering</a>, <a href="#">PerInstanceMemory</a>, <a href="#">PhysicalChannel</a>, <a href="#">PortElementToCommunicationResourceMapping</a>, <a href="#">PortGroup</a>, <a href="#">PortInterfaceMapping</a>, <a href="#">QueuedReceiverComSpecProps</a>, <a href="#">ResourceConsumption</a>, <a href="#">RootSwCompositionPrototype</a>, <a href="#">RptComponent</a>, <a href="#">RptContainer</a>, <a href="#">RptExecutableEntity</a>, <a href="#">RptExecutableEntityEvent</a>, <a href="#">RptExecutionContext</a>, <a href="#">RptProfile</a>, <a href="#">RptServicePoint</a>, <a href="#">RteEventInCompositionSeparation</a>, <a href="#">RteEventInCompositionToOsTaskProxyMapping</a>, <a href="#">RteEventInSystemSeparation</a>, <a href="#">RteEventInSystemToOsTaskProxyMapping</a>, <a href="#">RunnableEntityGroup</a>, <a href="#">SdgAttribute</a>, <a href="#">SdgClass</a>, <a href="#">SecOcJobRequirement</a>, <a href="#">SecureCommunicationAuthenticationProps</a>, <a href="#">SecureCommunicationFreshnessProps</a>, <a href="#">SecurityEventContextDataElement</a>, <a href="#">SecurityEventContextProps</a>, <a href="#">ServerCallPoint</a>, <a href="#">ServerComSpecProps</a>, <a href="#">ServiceNeeds</a>, <a href="#">SignalServiceTranslationElementProps</a>, <a href="#">SignalServiceTranslationEventProps</a>, <a href="#">SignalServiceTranslationProps</a>, <a href="#">SocketAddress</a>, <a href="#">SomeipTpChannel</a>, <a href="#">StackUsage</a>, <a href="#">StaticSocketConnection</a>, <a href="#">StructuredReq</a>, <a href="#">SwGenericAxisParamType</a>, <a href="#">SwServiceArg</a>, <a href="#">SwcServiceDependency</a>, <a href="#">SwcToApplicationPartitionMapping</a>, <a href="#">SwcToEcuMapping</a>, <a href="#">SwcToImplMapping</a>, <a href="#">SwitchAsynchronousTrafficShaperGroupEntry</a>, <a href="#">SwitchAtsInstanceEntry</a>, <a href="#">SwitchFlowMeteringEntry</a>, <a href="#">SwitchStreamFilterActionDestPortModification</a>, <a href="#">SwitchStreamFilterEntry</a>, <a href="#">SwitchStreamFilterRule</a>, <a href="#">SwitchStreamGateEntry</a>, <a href="#">SwitchStreamIdentification</a>, <a href="#">SystemMapping</a>, <a href="#">SystemSignalGroupToCommunicationResourceMapping</a>, <a href="#">SystemSignalToCommunicationResourceMapping</a>, <a href="#">TDCpSoftwareClusterMapping</a>, <a href="#">TDCpSoftwareClusterResourceMapping</a>, <a href="#">TcpOptionFilterList</a>, <a href="#">TimingClock</a>, <a href="#">TimingClockSyncAccuracy</a>, <a href="#">TimingCondition</a>, <a href="#">TimingConstraint</a>, <a href="#">TimingDescription</a>, <a href="#">TimingExtensionResource</a>, <a href="#">TimingModelInstance</a>, <a href="#">TlsCryptoCipherSuite</a>, <a href="#">TlsCryptoCipherSuiteProps</a>, <a href="#">Topic1</a>, <a href="#">TpAddress</a>, <a href="#">TraceableTable</a>, <a href="#">TraceableText</a>, <a href="#">TracedFailure</a>, <a href="#">TransformationISignalPropsIdent</a>, <a href="#">TransformationProps</a>, <a href="#">TransformationTechnology</a>, <a href="#">Trigger</a>, <a href="#">VariableAccess</a>, <a href="#">VariationPointProxy</a>, <a href="#">ViewMap</a>, <a href="#">VlanConfig</a>, <a href="#">WaitPoint</a> </p>			
Attribute	Type	Mult.	Kind	Note
adminData	<a href="#">AdminData</a>	0..1	aggr	<p>This represents the administrative data for the identifiable object.</p> <p><b>Stereotypes:</b> atpSplittable</p> <p><b>Tags:</b></p> <p>atp.Splitkey=adminData</p> <p>xml.sequenceOffset=-40</p>





Class	Identifiable (abstract)			
annotation	Annotation	*	aggr	Possibility to provide additional notes while defining a model element (e.g. the ECU Configuration Parameter Values). These are not intended as documentation but are mere design notes. <b>Tags:</b> xml.sequenceOffset=-25
category	CategoryString	0..1	attr	The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints. <b>Tags:</b> xml.sequenceOffset=-50
desc	MultiLanguageOverview Paragraph	0..1	aggr	This represents a general but brief (one paragraph) description what the object in question is about. It is only one paragraph! Desc is intended to be collected into overview tables. This property helps a human reader to identify the object in question. More elaborate documentation, (in particular how the object is built or used) should go to "introduction". <b>Tags:</b> xml.sequenceOffset=-60
introduction	DocumentationBlock	0..1	aggr	This represents more information about how the object in question is built or is used. Therefore it is a DocumentationBlock. <b>Tags:</b> xml.sequenceOffset=-30
uuid	String	0..1	attr	The purpose of this attribute is to provide a globally unique identifier for an instance of a meta-class. The values of this attribute should be globally unique strings prefixed by the type of identifier. For example, to include a DCE UUID as defined by The Open Group, the UUID would be preceded by "DCE:". The values of this attribute may be used to support merging of different AUTOSAR models. The form of the UUID (Universally Unique Identifier) is taken from a standard defined by the Open Group (was Open Software Foundation). This standard is widely used, including by Microsoft for COM (GUIDs) and by many companies for DCE, which is based on CORBA. The method for generating these 128-bit IDs is published in the standard and the effectiveness and uniqueness of the IDs is not in practice disputed. If the id namespace is omitted, DCE is assumed. An example is "DCE:2fac1234-31f8-11b4-a222-08002b34c003". The uuid attribute has no semantic meaning for an AUTOSAR model and there is no requirement for AUTOSAR tools to manage the timestamp. <b>Tags:</b> xml.attribute=true

**Table A.629: Identifiable**

Primitive	Identifier			
Note	An Identifier is a string with a number of constraints on its appearance, satisfying the requirements typical programming languages define for their Identifiers. This datatype represents a string, that can be used as a c-Identifier. It shall start with a letter, may consist of letters, digits and underscores. <b>Tags:</b> xml.xsd.customType=IDENTIFIER xml.xsd.maxLength=128 xml.xsd.pattern=[a-zA-Z][a-zA-Z0-9_]* xml.xsd.type=string			
Attribute	Type	Mult.	Kind	Note





Primitive	Identifier			
blueprintValue	String	0..1	attr	This represents a description that documents how the value shall be defined when deriving objects from the blueprint. <b>Tags:</b> atp.Status=draft xml.attribute=true
namePattern	String	0..1	attr	This attribute represents a pattern which shall be used to define the value of the identifier if the identifier in question is part of a blueprint. For more details refer to TPS_StandardizationTemplate. <b>Tags:</b> xml.attribute=true

**Table A.630: Identifier**

Class	Implementation (abstract)			
Note	Description of an implementation a single software component or module. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Subclasses	BswImplementation, SwcImplementation			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
buildActionManifest	BuildActionManifest	0..1	ref	A manifest specifying the intended build actions for the software delivered with this implementation. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=buildActionManifest.buildActionManifest, buildActionManifest.variationPoint.shortLabel vh.latestBindingTime=codeGenerationTime
codeDescriptor	Code	*	aggr	Specifies the provided implementation code.
compiler	Compiler	*	aggr	Specifies the compiler for which this implementation has been released
generatedArtifact	DependencyOnArtifact	*	aggr	Relates to an artifact that will be generated during the integration of this Implementation by an associated generator tool. Note that this is an optional information since it might not always be in the scope of a single module or component to provide this information. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=generatedArtifact.shortName, generatedArtifact.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
hwElement	HwElement	*	ref	The hardware elements (e.g. the processor) required for this implementation.
linker	Linker	*	aggr	Specifies the linker for which this implementation has been released.
mcSupport	McSupportData	0..1	aggr	The measurement & calibration support data belonging to this implementation. The measurement & calibration support data belonging to this implementation. The aggregation is <<atpSplitable>> because in case of an already existing BSW Implementation model, this description will be added later in the process, namely at code generation time. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=mcSupport





Class	Implementation (abstract)			
programming Language	Programminglanguage Enum	0..1	attr	Programming language the implementation was created in.
requiredArtifact	<a href="#">DependencyOnArtifact</a>	*	aggr	Specifies that this Implementation depends on the existence of another artifact (e.g. a library). This aggregation of DependencyOnArtifact is subject to variability with the purpose to support variability in the implementations. Different algorithms in the implementation might cause different dependencies, e.g. the number of used libraries. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=requiredArtifact.shortName, requiredArtifact.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
required GeneratorTool	<a href="#">DependencyOnArtifact</a>	*	aggr	Relates this Implementation to a generator tool in order to generate additional artifacts during integration. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=requiredGeneratorTool.shortName, requiredGeneratorTool.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
resource Consumption	ResourceConsumption	0..1	aggr	All static and dynamic resources for each implementation are described within the ResourceConsumption class. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=resourceConsumption.shortName
swcBsw Mapping	<a href="#">SwcBswMapping</a>	0..1	ref	This allows a mapping between an SWC and a BSW behavior to be attached to an implementation description (for AUTOSAR Service, ECU Abstraction and Complex Driver Components). It is up to the methodology to define whether this reference has to be set for the Swc- or Bsw Implementation or for both.
swVersion	RevisionLabelString	0..1	attr	Software version of this implementation. The numbering contains three levels (like major, minor, patch), its values are vendor specific.
usedCode Generator	String	0..1	attr	Optional: code generator used.
vendorId	PositiveInteger	0..1	attr	Vendor ID of this Implementation according to the AUTOSAR vendor list

**Table A.631: Implementation**

Class	ImplementationDataType			
Note	Describes a reusable data type on the implementation level. This will typically correspond to a typedef in C-code. <b>Tags:</b> atp.recommendedPackage=ImplementationDataTypes			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AbstractImplementationDataType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">AutosarDataType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dynamicArray SizeProfile	String	0..1	attr	Specifies the profile which the array will follow in case this data type is a variable size array.





Class	ImplementationDataType			
isStructWithOptionalElement	Boolean	0..1	attr	This attribute is only valid if the attribute category is set to STRUCTURE. If set to true, this attribute indicates that the ImplementationDataType has been created with the intention to define at least one element of the structure as optional.
subElement (ordered)	ImplementationDataTypeElement	*	aggr	Specifies an element of an array, struct, or union data type. The aggregation of ImplementationDataTypeElement is subject to variability with the purpose to support the conditional existence of elements inside a ImplementationDataType representing a structure. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=subElement.shortName, subElement.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
symbolProps	SymbolProps	0..1	aggr	This represents the SymbolProps for the ImplementationDataType. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=symbolProps.shortName
typeEmitter	NameToken	0..1	attr	This attribute is used to control which part of the AUTOSAR toolchain is supposed to trigger data type definitions.

**Table A.632: ImplementationDataType**

Class	ImplementationDataTypeElement			
<b>Note</b>	Declares a data object which is locally aggregated. Such an element can only be used within the scope where it is aggregated. This element either consists of further subElements or it is further defined via its swDataDefProps. There are several use cases within the system of ImplementationDataTypes for such a local declaration: <ul style="list-style-type: none"> <li>• It can represent the elements of an array, defining the element type and array size</li> <li>• It can represent an element of a struct, defining its type</li> <li>• It can be the local declaration of a debug element.</li> </ul>			
<b>Base</b>	ARObject, AbstractImplementationDataTypeElement, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	AtpClassifier.atpFeature, ImplementationDataType.subElement, ImplementationDataTypeElement.subElement			
Attribute	Type	Mult.	Kind	Note
arrayImplPolicy	ArrayImplPolicyEnum	0..1	attr	This attribute controls the implementation of the payload of an array. It shall only be used if the enclosing ImplementationDataType constitutes an array.
arraySize	PositiveInteger	0..1	attr	The existence of this attributes (if bigger than 0) defines the size of an array and declares that this ImplementationDataTypeElement represents the type of each single array element. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
arraySizeHandling	ArraySizeHandlingEnum	0..1	attr	The way how the size of the array is handled in case of a variable size array.
arraySizeSemantics	ArraySizeSemanticsEnum	0..1	attr	This attribute controls the meaning of the value of the array size.







Class	ImplementationDataTypeElement			
isOptional	Boolean	0..1	attr	This attribute represents the ability to declare the enclosing <code>ImplementationDataTypeElement</code> as optional. This means that, at runtime, the <code>ImplementationDataTypeElement</code> may or may not have a valid value and shall therefore be ignored. The underlying runtime software provides means to set the <code>CppImplementationDataTypeElement</code> as not valid at the sending end of a communication and determine its validity at the receiving end.
subElement (ordered)	<a href="#">ImplementationDataTypeElement</a>	*	aggr	Element of an array, struct, or union in case of a nested declaration (i.e. without using "typedefs"). The aggregation of <code>ImplementationDataTypeElement</code> is subject to variability with the purpose to support the conditional existence of elements inside a <code>ImplementationDataType</code> representing a structure. <b>Stereotypes:</b> <code>atpSplitable</code> ; <code>atpVariation</code> <b>Tags:</b> <code>atp.Splitkey=subElement.shortName</code> , <code>subElement.variationPoint.shortLabel</code> <code>vh.latestBindingTime=preCompileTime</code>
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	The properties of this <code>ImplementationDataTypeElement</code> .

**Table A.633: ImplementationDataTypeElement**

Class	ImplementationDataTypeElementInPortInterfaceRef			
<b>Note</b>	This meta-class represents the ability to refer to the internal structure of an <code>AutosarDataPrototype</code> which is typed by an <code>ImplementationDatatype</code> in the context of a <code>PortInterface</code> . In other words, this meta-class shall not be used to model a reference to the <code>AutosarDataPrototype</code> as a target itself, even if the <code>AutosarDataPrototype</code> is typed by an <code>ImplementationDataType</code> and even if that <code>ImplementationDataType</code> represents a composite data type.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">DataPrototypeReference</a>			
<b>Aggregated by</b>	<a href="#">DataPrototypeTransformationProps.dataPrototypeInPortInterfaceRef</a> , <a href="#">SignalServiceTranslationElementProps.element</a> , <a href="#">TransmissionComSpecProps.onChangeDataPrototype</a>			
Attribute	Type	Mult.	Kind	Note
context Implementation DataElement (ordered)	<a href="#">AbstractImplementationDataTypeElement</a>	*	ref	This is a context in case there are subelements with explicit types. The reference has to be ordered to properly reflect the nested structure. <b>Tags:</b> <code>xml.sequenceOffset=20</code>
rootData Prototype	<a href="#">AutosarDataPrototype</a>	0..1	ref	This refers to the <code>AutosarDataPrototype</code> which is typed by the <code>ImplementationDatatype</code> . The <code>targetDataPrototype</code> and all defined <code>contextDataPrototypes</code> can be found within this <code>rootDataPrototype</code> . <b>Tags:</b> <code>xml.sequenceOffset=10</code>
target Implementation DataType Element	<a href="#">AbstractImplementationDataTypeElement</a>	0..1	ref	This is a target <code>ImplementationDataTypeElement</code> in case that the <code>rootDataPrototype</code> is composite and the target is a subElement of the <code>rootDataPrototype</code> . <b>Tags:</b> <code>xml.sequenceOffset=30</code>

**Table A.634: ImplementationDataTypeElementInPortInterfaceRef**

Class	ImplementationDataTypeSubElementRef
<b>Note</b>	This meta-class represents the specialization of <a href="#">SubElementMapping</a> with respect to <code>[ARMeta Class{ImplementationDataType}]s</code> .
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">SubElementRef</a>







Class	ImplementationDataTypeSubElementRef			
Aggregated by	SubElementMapping.firstElement, SubElementMapping.secondElement			
Attribute	Type	Mult.	Kind	Note
implementation DataType Element	ArVariableIn ImplementationData InstanceRef	0..1	aggr	This represents the referenced implementationDataType Element.
parameter Implementation DataType Element	ArParameterIn ImplementationData InstanceRef	0..1	aggr	This represents the referenced ImplementationDataType Element.

**Table A.635: ImplementationDataTypeSubElementRef**

Class	ImplementationElementInParameterInstanceRef			
Note	Describes a reference to a particular ImplementationDataTypeElement instance in the context of a given ParameterDataPrototype. Thus it refers to a particular element in the implementation description of a software data structure. Use Case: The RTE generator publishes its generated structure of calibration parameters in its BSW module description using the "constantMemory" role of ParameterDataPrototypes. Each ParameterDataPrototype describes a group of single calibration parameters. In order to point to these single parameters, this "instance ref" is needed. Note that this class follows the pattern of an InstanceRef but is not implemented based on the abstract classes because the ImplementationDataType isn't either, especially because ImplementationDataTypeElement isn't derived from AtpPrototype.			
Base	ARObject			
Aggregated by	McDataInstance.instanceInMemory			
Attribute	Type	Mult.	Kind	Note
context	ParameterData Prototype	0..1	ref	The context for the referred element. <b>Tags:</b> xml.sequenceOffset=20
target	AbstractImplementation DataTypeElement	0..1	ref	The referred data element. <b>Tags:</b> xml.sequenceOffset=30

**Table A.636: ImplementationElementInParameterInstanceRef**

Class	ImplementationProps (abstract)			
Note	Defines a symbol to be used as (depending on the concrete case) either a complete replacement or a prefix when generating code artifacts.			
Base	ARObject, Referrable			
Subclasses	BswSchedulerNamePrefix, ExecutableEntityActivationReason, SectionNamePrefix, SymbolProps, SymbolicNameProps			
Attribute	Type	Mult.	Kind	Note
symbol	CIdentifier	0..1	attr	The symbol to be used as (depending on the concrete case) either a complete replacement or a prefix.

**Table A.637: ImplementationProps**

Class	IndexedArrayElement			
Note	This element represents exactly one indexed element in the array. Either the applicationArrayElement or implementationArrayElement reference shall be used.			
Base	ARObject			
Aggregated by	SenderRecArrayElementMapping.indexedArrayElement			
Attribute	Type	Mult.	Kind	Note





Class	IndexedArrayElement			
applicationArrayElement	<a href="#">ApplicationArrayElement</a>	0..1	ref	Reference to an ApplicationArrayElement in an array.
implementationArrayElement	<a href="#">ImplementationDataTypeElement</a>	0..1	ref	Reference to an ImplementationDataTypeElement in an array.
index	Integer	0..1	attr	Position of an element in an array. Starting position is 0.

**Table A.638: IndexedArrayElement**

Class	InitEvent			
Note	This <a href="#">RTEEvent</a> is supposed to be used for initialization purposes, i.e. for starting and restarting a partition. It is not guaranteed that all <a href="#">RunnableEntity</a> s referenced by this <a href="#">InitEvent</a> are executed before the 'regular' <a href="#">RunnableEntity</a> s are executed for the first time. The execution order depends on the task mapping.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.639: InitEvent**

Class	InitialSdDelayConfig			
Note	This element is used to configure the offer behavior of the server and the find behavior on the client.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">SomeipSdClientServiceInstanceConfig.initialFindBehavior</a> , <a href="#">SomeipSdServerServiceInstanceConfig.initialOfferBehavior</a>			
Attribute	Type	Mult.	Kind	Note
initialDelayMaxValue	TimeValue	0..1	attr	Max Value in seconds to delay randomly the first offer (if aggregated by <a href="#">SdServerConfig</a> ) or the transmission of a find message (if aggregated by <a href="#">SdClientConfig</a> ).
initialDelayMinValue	TimeValue	0..1	attr	Min Value in seconds to delay randomly the first offer or the transmission of a find message (if aggregated by <a href="#">SdClientConfig</a> ).
initialRepetitionsBaseDelay	TimeValue	0..1	attr	The base delay for offer repetitions (if aggregated by <a href="#">SdServerConfig</a> ) or find repetitions (if aggregated by <a href="#">SdClientConfig</a> ). Successive find messages have an exponential back off delay.
initialRepetitionsMax	PositiveInteger	0..1	attr	Describes the maximum amount of offer repetitions (if aggregated by <a href="#">SdServerConfig</a> ) or the maximum amount of find repetitions (if aggregated by <a href="#">SdClientConfig</a> ).

**Table A.640: InitialSdDelayConfig**

<b>Class</b>	<b>InstantiationDataDefProps</b>			
<b>Note</b>	<p>This is a general class allowing to apply additional <a href="#">SwDataDefProps</a> to particular instantiations of a <a href="#">DataPrototype</a>. Typically the accessibility and further information like alias names for a particular data is modeled on the level of <a href="#">DataPrototypes</a> (especially <a href="#">VariableDataPrototypes</a>, <a href="#">ParameterDataPrototypes</a>). But due to the recursive structure of the meta-model concerning data types (a composite (data) type consists out of data prototypes) a part of the MCD information is described in the data type (in case of <a href="#">ApplicationCompositeDataType</a>).</p> <p>This is a strong restriction in the reuse of data typed because the data type should be re-used for different <a href="#">VariableDataPrototypes</a> and <a href="#">ParameterDataPrototypes</a> to guarantee type compatibility on C-implementation level (e.g. data of a Port is stored in PIM or a <a href="#">ParameterDataPrototype</a> used as ROM Block and shall be typed by the same data type as NVRAM Block). This class overcomes such a restriction if applied properly.</p>			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">NvBlockDescriptor.instantiationDataDefProps</a> , <a href="#">ParameterSwComponentType.instantiationDataDefProps</a> , <a href="#">SwcInternalBehavior.instantiationDataDefProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
parameter Instance	<a href="#">AutosarParameterRef</a>	0..1	aggr	This reference identifies the particular <a href="#">DataPrototype</a> (defined in the context of a composite <a href="#">ParameterDataPrototype</a> ) on which the swDataDef Props shall be applied.
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	These are the particular data definition properties which shall be applied <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=swDataDefProps
variableInstance	<a href="#">AutosarVariableRef</a>	0..1	aggr	This reference identifies the particular <a href="#">DataPrototype</a> (defined in the context of a composite <a href="#">VariableDataPrototype</a> ) on which the swDataDef Props shall be applied.

**Table A.641: InstantiationDataDefProps**

<b>Class</b>	<b>InstantiationRTEEventProps</b> (abstract)			
<b>Note</b>	This meta-class represents the ability to refine the properties of <a href="#">RTEEvents</a> for particular instances of a software component.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Subclasses</b>	<a href="#">InstantiationTimingEventProps</a>			
<b>Aggregated by</b>	<a href="#">CompositionSwComponentType.instantiationRTEEventProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
refinedEvent	<a href="#">RTEEvent</a>	0..1	iref	This instance ref denotes the Timing Event for which the period shall be refined on an instance level. <b>InstanceRef implemented by:</b> InstanceEventIn CompositionInstanceRef
shortLabel	<a href="#">Identifier</a>	0..1	attr	The main purpose of the shortLabel is to contribute to the splitkey of aggregations that are <<atpSplitable>>. <b>Stereotypes:</b> atpIdentityContributor

**Table A.642: InstantiationRTEEventProps**

<b>Class</b>	<b>InstantiationTimingEventProps</b>			
<b>Note</b>	This meta-class represents the ability to refine a timing event for particular instances of a software component. This approach supports an instance specific timing.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">InstantiationRTEEventProps</a>			
<b>Aggregated by</b>	<a href="#">CompositionSwComponentType.instantiationRTEEventProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
period	TimeValue	0..1	attr	This attribute represents the value of the refined activation period.

**Table A.643: InstantiationTimingEventProps**

<b>Class</b>	<b>InternalBehavior</b> (abstract)			
<b>Note</b>	Common base class (abstract) for the internal behavior of both software components and basic software modules/clusters.			
<b>Base</b>	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable			
<b>Subclasses</b>	BswInternalBehavior, SwcInternalBehavior			
<b>Aggregated by</b>	AtpClassifier.atpFeature			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
constantMemory	ParameterDataPrototype	*	aggr	Describes a read only memory object containing characteristic value(s) implemented by this Internal Behavior. The shortName of ParameterDataPrototype has to be equal to the 'C' identifier of the described constant. The characteristic value(s) might be shared between Sw ComponentPrototypes of the same SwComponentType. The aggregation of constantMemory is subject to variability with the purpose to support variability in the software component or module implementations. Typically different algorithms in the implementation are requiring different number of memory objects. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=constantMemory.shortName, constantMemory.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
constantValueMapping	ConstantSpecificationMappingSet	*	ref	Reference to the ConstantSpecificationMapping to be applied for the particular InternalBehavior <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=constantValueMapping
dataTypeMapping	DataTypeMappingSet	*	ref	Reference to the DataTypeMapping to be applied for the particular InternalBehavior <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=dataTypeMapping
exclusiveArea	ExclusiveArea	*	aggr	This specifies an ExclusiveArea for this InternalBehavior. The exclusiveArea is local to the component resp. module. The aggregation of ExclusiveAreas is subject to variability. Note: the number of ExclusiveAreas might vary due to the conditional existence of RunnableEntities or BswModuleEntities. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=exclusiveArea.shortName, exclusiveArea.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
exclusiveAreaNestingOrder	ExclusiveAreaNestingOrder	*	aggr	This represents the set of ExclusiveAreaNestingOrder owned by the InternalBehavior. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=exclusiveAreaNestingOrder.shortName, exclusiveAreaNestingOrder.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	InternalBehavior (abstract)			
staticMemory	<a href="#">VariableDataPrototype</a>	*	aggr	<p>Describes a read and writeable static memory object representing measurement variables implemented by this software component. The term "static" is used in the meaning of "non-temporary" and does not necessarily specify a linker encapsulation. This kind of memory is only supported if supportsMultipleInstantiation is FALSE. The shortName of the VariableDataPrototype has to be equal with the "C" identifier of the described variable. The aggregation of staticMemory is subject to variability with the purpose to support variability in the software component's implementations. Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=staticMemory.shortName, staticMemory.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>

Table A.644: InternalBehavior

Class	InternalTriggerOccurredEvent			
Note	This event is raised when the referenced <a href="#">InternalTriggeringPoint</a> has occurred.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
eventSource	<a href="#">InternalTriggeringPoint</a>	0..1	ref	The referenced <a href="#">InternalTriggeringPoint</a> raises this <a href="#">InternalTriggerOccurredEvent</a> .

Table A.645: InternalTriggerOccurredEvent

Class	InternalTriggeringPoint			
Note	If a <a href="#">RunnableEntity</a> owns an <a href="#">InternalTriggeringPoint</a> it is entitled to trigger the execution of <a href="#">RunnableEntity</a> s of the corresponding software-component.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractAccessPoint</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">RunnableEntity.internalTriggeringPoint</a>			
Attribute	Type	Mult.	Kind	Note
swImplPolicy	<a href="#">SwImplPolicyEnum</a>	0..1	attr	This attribute, when set to value queued, allows for a queued processing of Triggers.

Table A.646: InternalTriggeringPoint

Class	InterpolationRoutine			
Note	This represents an interpolation routine taken to evaluate the contents of a curve or map against a specific input value.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">InterpolationRoutineMapping.interpolationRoutine</a>			
Attribute	Type	Mult.	Kind	Note





Class	InterpolationRoutine			
interpolation Routine	<a href="#">BswModuleEntry</a>	0..1	ref	This specifies a BswModuleEntry which implements the current interpolation method for the given record layout. <b>Tags:</b> xml.sequenceOffset=30 This Attribute is only used by the AUTOSAR Classic Platform.
isDefault	Boolean	0..1	attr	This attribute specifies whether the enclosing InterpolationRoutine is considered the default in the context (defined by the System Template) of a given collection InterpolationRoutineMapping that owns the enclosing InterpolationRoutine. <b>Tags:</b> xml.sequenceOffset=20
shortLabel	<a href="#">Identifier</a>	0..1	attr	This is the name of the interpolation method which is implemented by the referenced bswModuleEntry. It corresponds to swInterpolationMethod in SwDataDef Props. <b>Tags:</b> xml.sequenceOffset=10

**Table A.647: InterpolationRoutine**

Class	InterpolationRoutineMapping			
<b>Note</b>	This meta-class provides a mapping between one record layout and its matching interpolation routines. This allows to formally specify the semantics of the interpolation routines. The use case is such that the curves/Maps define an interpolation method. This mapping table specifies which interpolation routine implements methods for a particular record layout. Using this information, the implementer of a software-component can select the appropriate interpolation routine.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">InterpolationRoutineMappingSet.interpolationRoutineMapping</a>			
Attribute	Type	Mult.	Kind	Note
interpolation Routine	<a href="#">InterpolationRoutine</a>	*	aggr	This is one particular interpolation routine which is mapped to the record layout.
swRecord Layout	<a href="#">SwRecordLayout</a>	0..1	ref	This refers to the record layout which is mapped to interpolation routines.

**Table A.648: InterpolationRoutineMapping**

Class	InterpolationRoutineMappingSet			
<b>Note</b>	This meta-class specifies a set of interpolation routine mappings. <b>Tags:</b> atp.recommendedPackage=InterpolationRoutineMappingSets			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
interpolation Routine Mapping	<a href="#">InterpolationRoutineMapping</a>	*	aggr	This specifies one particular mapping of recordlayout and its matching interpolationRoutines.

**Table A.649: InterpolationRoutineMappingSet**

Class	InvalidationPolicy
<b>Note</b>	Specifies whether the component can actively invalidate a particular <a href="#">dataElement</a> . If no <a href="#">invalidationPolicy</a> points to a <a href="#">dataElement</a> this is considered to yield the identical result as if the <a href="#">handleInvalid</a> attribute was set to <a href="#">dontInvalidate</a> .





<b>Class</b>	<b>InvalidationPolicy</b>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SenderReceiverInterface.invalidationPolicy			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataElement	VariableDataPrototype	0..1	ref	Reference to the <code>dataElement</code> for which the <code>InvalidationPolicy</code> applies.
handleInvalid	HandleInvalidEnum	0..1	attr	This attribute controls how invalidation is applied to the <code>dataElement</code> .

**Table A.650: InvalidationPolicy**

<b>Class</b>	<b>Ipv4ArpProps</b>			
<b>Note</b>	Specifies the configuration options for the ARP (Address Resolution Protocol).			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	Ipv4Props.arpProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
tcplpArpNum GratuitousArp OnStartup	PositiveInteger	0..1	attr	This attribute specifies the number of gratuitous ARP replies which shall be sent on assignment of a new IP address.
tcplpArpPacket QueueEnabled	Boolean	0..1	attr	This attribute enables (TRUE) or disables (FALSE) support of the ARP Packet Queue according to IETF RFC 1122, section 2.3.2.2.
tcplpArp Request Timeout	TimeValue	0..1	attr	This attribute specifies a timeout in seconds for the validity of ARP requests. After the transmission of an ARP request the Tcplp shall skip the transmission of any further ARP requests to the same destination within a duration of tcplpArpRequestTimeout seconds. (IETF RFC 1122, section 2.3.2.1).
tcplpArpTable EntryTimeout	TimeValue	0..1	attr	This attribute specifies the timeout in seconds after which an unused ARP entry is removed.

**Table A.651: Ipv4ArpProps**

<b>Class</b>	<b>Ipv4Configuration</b>			
<b>Note</b>	Internet Protocol version 4 (IPv4) configuration.			
<b>Base</b>	ARObject, <a href="#">NetworkEndpointAddress</a>			
<b>Aggregated by</b>	<a href="#">NetworkEndpoint.networkEndpointAddress</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
assignment Priority	PositiveInteger	0..1	attr	Priority of assignment (1 is highest). If a new address from an assignment method with a higher priority is available, it overwrites the IP address previously assigned by an assignment method with a lower priority.
defaultGateway	Ip4AddressString	0..1	attr	IP address of the default gateway.
dnsServer Address	Ip4AddressString	*	attr	IP addresses of preconfigured DNS servers. <b>Tags:</b> xml.namePlural=DNS-SERVER-ADDRESSES
ipAddressKeep Behavior	IpAddressKeepEnum	0..1	attr	Defines the lifetime of a dynamically fetched IP address.
ipv4Address	Ip4AddressString	0..1	attr	IPv4 Address. Notation: 255.255.255.255. The IP Address shall be declared in case the ipv4AddressSource is FIXED and thus no auto-configuration mechanism is used. <b>Stereotypes:</b> atpIdentityContributor





Class	Ipv4Configuration			
ipv4AddressSource	Ipv4AddressSourceEnum	0..1	attr	Defines how the node obtains its IP address.
networkMask	Ip4AddressString	0..1	attr	Network mask. Notation 255.255.255.255
ttl	PositiveInteger	0..1	attr	Lifespan of data (0..255). The purpose of the TimeToLive field is to avoid a situation in which an undeliverable datagram keeps circulating on a system.

**Table A.652: Ipv4Configuration**

Class	Ipv4FragmentationProps			
Note	Specifies the configuration options for IPv4 packet fragmentation/reassembly.			
Base	ARObject			
Aggregated by	Ipv4Props.fragmentationProps			
Attribute	Type	Mult.	Kind	Note
tcpIpIpFragmentationRxEnabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) support for reassembling of incoming datagrams that are fragmented according to IETF RFC 815 (IP Datagram Reassembly Algorithms).
tcpIpIpNumFragments	PositiveInteger	0..1	attr	Specifies the maximum number of IP fragments per datagram.
tcpIpIpNumReassDgrams	PositiveInteger	0..1	attr	Specifies the maximum number of fragmented IP datagrams that can be reassembled in parallel.
tcpIpIpReassTimeout	TimeValue	0..1	attr	Specifies the timeout in [s] after which an incomplete datagram gets discarded.

**Table A.653: Ipv4FragmentationProps**

Class	Ipv6Configuration			
Note	Internet Protocol version 6 (IPv6) configuration.			
Base	ARObject, <a href="#">NetworkEndpointAddress</a>			
Aggregated by	<a href="#">NetworkEndpoint.networkEndpointAddress</a>			
Attribute	Type	Mult.	Kind	Note
assignmentPriority	PositiveInteger	0..1	attr	Priority of assignment (1 is highest). If a new address from an assignment method with a higher priority is available, it overwrites the IP address previously assigned by an assignment method with a lower priority.
defaultRouter	Ip6AddressString	0..1	attr	IP address of the default router.
dnsServerAddress	Ip6AddressString	*	attr	IP addresses of pre configured DNS servers. <b>Tags:</b> xml.namePlural=DNS-SERVER-ADDRESSES
enableAnycast	Boolean	0..1	attr	This attribute is used to enable anycast addressing (i.e. to one of multiple receivers).
hopCount	PositiveInteger	0..1	attr	The distance between two hosts. The hop count n means that n gateways separate the source host from the destination host (Range 0..255)
ipAddressKeepBehavior	IpAddressKeepEnum	0..1	attr	Defines the lifetime of a dynamically fetched IP address.
ipAddressPrefixLength	PositiveInteger	0..1	attr	IPv6 prefix length defines the part of the IPv6 address that is the network prefix.







Class	Ipv6Configuration			
ipv6Address	Ip6AddressString	0..1	attr	IPv6 Address. Notation: FFFF:::FFFF. The IP Address shall be declared in case the ipv6AddressSource is FIXED and thus no auto-configuration mechanism is used. <b>Stereotypes:</b> atpIdentityContributor
ipv6Address Source	Ipv6AddressSource Enum	0..1	attr	Defines how the node obtains its IP address.

**Table A.654: Ipv6Configuration**

Class	Ipv6FragmentationProps			
<b>Note</b>	This meta-class specifies the configuration options for IPv6 packet fragmentation/reassembly.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	Ipv6Props.fragmentationProps			
Attribute	Type	Mult.	Kind	Note
tcpIpIp Reassembly BufferCount	PositiveInteger	0..1	attr	Number of buffers that can be used for fragment reassembly. In case of a reassembly error or if not all fragments are received in time this buffer will be blocked until the specified "Fragment Reassembly Timeout" has been exceeded. A value of 0 disables fragment reassembly.
tcpIpIp Reassembly BufferSize	PositiveInteger	0..1	attr	Size of each fragment tx buffer in bytes.
tcpIpIp Reassembly SegmentCount	PositiveInteger	0..1	attr	Specifies the maximum number of consecutive data segments that can be managed in each reassembly buffer. If all fragments are received in order, only one segment will be needed. To deal with fragments received out of order this value should be configured bigger than 1.
tcpIpIp Reassembly Timeout	TimeValue	0..1	attr	Specifies the timeout in seconds after which an incomplete datagram gets discarded.
tcpIpIpTx FragmentBuffer Count	PositiveInteger	0..1	attr	These buffers will be used if the IpV6 receives packets from the upper layer that do not fit into the MTU and thus must be fragmented. A value of 0 disables tx fragmentation.
tcpIpIpTx FragmentBuffer Size	PositiveInteger	0..1	attr	Size of each fragment tx buffer in bytes.

**Table A.655: Ipv6FragmentationProps**

Class	Ipv6NdpProps			
<b>Note</b>	This meta-class specifies the configuration options for the Neighbor Discovery Protocol for IPv6.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	Ipv6Props.ndpProps			
Attribute	Type	Mult.	Kind	Note
tcpIpNdpDefault ReachableTime	TimeValue	0..1	attr	Configuration of the ReachableTime (s) specified in [RFC4861 6.3.2. Host Variables].
tcpIpNdpDefault RetransTimer	TimeValue	0..1	attr	Configures the default value (s) for the RetransTimer variable specified in [RFC4861 6.3.2. Host Variables].





Class	Ipv6NdpProps			
tcplpNdpDefaultRouterListSize	PositiveInteger	0..1	attr	Maximum number of default router entries.
tcplpNdpDefensiveProcessing	Boolean	0..1	attr	If enabled the NDP shall only process Neighbor Advertisements which are received in reaction to a previously transmitted Neighbor Solicitation as well as skipping updates to the Neighbor Cache based on received Neighbor Solicitations. If disabled all Neighbor Advertisements and Solicitations shall be processed as specified in RFC4861.
tcplpNdpDelayFirstProbeTimeValue	TimeValue	0..1	attr	Delay before sending the first NUD probe in (s).
tcplpNdpDestinationCacheSize	PositiveInteger	0..1	attr	Maximum number of entries in the destination cache.
tcplpNdpDynamicHopLimitEnabled	Boolean	0..1	attr	If enabled the default hop limit may be reconfigured based on received Router Advertisements.
tcplpNdpDynamicMtuEnabled	Boolean	0..1	attr	Allow dynamic reconfiguration of link MTU via Router Advertisements.
tcplpNdpDynamicReachableTimeEnabled	Boolean	0..1	attr	If enabled the default Reachable Time value may be reconfigured based on received Router Advertisements.
tcplpNdpDynamicRetransTimeEnabled	Boolean	0..1	attr	If enabled the default Retransmit Timer value may be reconfigured based on received Router Advertisements.
tcplpNdpMaxRandomFactor	PositiveInteger	0..1	attr	Maximum random factor used for randomization
tcplpNdpMaxRtrSolicitationDelay	TimeValue	0..1	attr	Maximum delay before the first Router Solicitation will be sent after interface initialization in (s).
tcplpNdpMaxRtrSolicitations	PositiveInteger	0..1	attr	Maximum number of Router Solicitations that will be sent before the first Router Advertisement has been received.
tcplpNdpMinRandomFactor	PositiveInteger	0..1	attr	Minimum random factor used for randomization
tcplpNdpNeighborUnreachabilityDetectionEnabled	Boolean	0..1	attr	Neighbor Unreachability Detection is used to remove unused entries from the neighbor cache. This feature is a basic feature of NDP and should be turned on.
tcplpNdpNumMulticastSolicitations	PositiveInteger	0..1	attr	Maximum number of multicast solicitations that will be sent when performing address resolution.
tcplpNdpNumUnicastSolicitations	PositiveInteger	0..1	attr	Maximum number of unicast solicitations that will be sent when performing Neighbor Unreachability Detection.
tcplpNdpPacketQueueEnabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) support of a NDP Packet Queue according to IETF RFC 4861, section 7.2.2.
tcplpNdpPrefixListSize	PositiveInteger	0..1	attr	Maximum number of entries in the on-link prefix list.
tcplpNdpRandomReachableTimeEnabled	Boolean	0..1	attr	If enabled the value of ReachableTime will be multiplied with a random value between MIN_RANDOM_FACTOR and MAX_RANDOM_FACTOR in order to prevent multiple nodes from transmitting at exactly the same time.





Class	Ipv6NdpProps			
tcpIpNdpRndRtrSolicitationDelayEnabled	Boolean	0..1	attr	If enabled the first router solicitation will be delayed randomly from [0...MAX_RTR_SOLICITATION_DELAY]. Otherwise the first router solicitation will be sent after exactly MAX_RTR_SOLICITATION_DELAY milliseconds.
tcpIpNdpRtrSolicitationInterval	TimeValue	0..1	attr	Interval between consecutive Router Solicitations in (s).
tcpIpNdpSlaacDadNumberOfTransmissions	PositiveInteger	0..1	attr	Number of Neighbor Solicitations that have to be unanswered in order to set an autoconfigured address to PREFERRED (usable) state.
tcpIpNdpSlaacDadRetransmissionDelay	TimeValue	0..1	attr	Sets the maximum value for the address configuration delay (s).
tcpIpNdpSlaacDelayEnabled	Boolean	0..1	attr	If enabled transmission of the first DAD Neighbor Solicitation will be delayed by a random value from [0...MAX_DAD_DELAY].
tcpIpNdpSlaacOptimisticDadEnabled	Boolean	0..1	attr	Enable Optimistic Duplicate Address Detection (DAD) according to RFC4429.

Table A.656: Ipv6NdpProps

Class	«atpVariation» J1939Cluster			
Note	J1939 specific cluster attributes. Tags: atp.recommendedPackage=CommunicationClusters			
Base	ARElement, ARObject, AbstractCanCluster, CollectableElement, CommunicationCluster, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable, UploadableDesignElement, UploadablePackageElement			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
dcmBusType	J1939BusTypeEnum	0..1	attr	Identification of a network to which the broadcast of messages is started by the DM13 command message.
networkId	PositiveInteger	0..1	attr	This represents the network ID for the J1939 cluster. Tags: atp.Status=obsolete
request2Support	Boolean	0..1	attr	Enables support for the Request2 PGN (RQST2).
usesAddressArbitration	Boolean	0..1	attr	Defines whether the nodes attached to this channel use an initial address claim, and whether they react to contending address claims of other nodes. True: The initial address claim is sent, and the node reacts to address claims of other nodes. False: The node only sends an address claim upon request, and does not care for contending address claims.

Table A.657: J1939Cluster

Class	J1939ControllerApplication
Note	This element represents a J1939 controller application. Tags: atp.recommendedPackage=J1939ControllerApplications This Class is only used by the AUTOSAR Classic Platform.
Base	ARElement, ARObject, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable
Aggregated by	ARPackage.element





Class	J1939ControllerApplication			
Attribute	Type	Mult.	Kind	Note
functionId	PositiveInteger	0..1	attr	This attribute represents the numerical function id of the J1939 controller application.
swComponentPrototype	<a href="#">SwComponentPrototype</a>	0..1	iref	This represents the SwComponentPrototype (which is typically typed by a CompositionSwComponentType) that corresponds to the J1939ControllerApplication. <b>InstanceRef implemented by:</b> ComponentInSystem InstanceRef

**Table A.658: J1939ControllerApplication**

Class	J1939ControllerApplicationToJ1939NodeMapping			
Note	This meta-class represents the ability to map a J1939ControllerApplication to a J1939Node. Note that this is similar but not identical to the mapping of SwComponentPrototypes to EcucInstances; for J1939 the semantics of an EcucInstance itself is basically replaced by a J1939Node. This Class is only used by the AUTOSAR Classic Platform.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">SystemMapping.j1939ControllerApplicationToJ1939NodeMapping</a>			
Attribute	Type	Mult.	Kind	Note
j1939ControllerApplication	<a href="#">J1939ControllerApplication</a>	0..1	ref	Reference to the J1939 Controller Application that is mapped to the referenced J1939Node.
j1939Node	<a href="#">J1939Node</a>	0..1	ref	J1939Node that is the target of the J1939ControllerApplicationToJ1939NodeMapping.

**Table A.659: J1939ControllerApplicationToJ1939NodeMapping**

Class	J1939DcmIPdu			
Note	Represents the IPdus handled by J1939Dcm. <b>Tags:</b> atp.recommendedPackage=Pdus			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
diagnosticMessageType	PositiveInteger	0..1	attr	This attribute is used to identify the actual DMx message, e.g 1 means DM01, etc.

**Table A.660: J1939DcmIPdu**

Class	J1939NmCluster			
Note	J1939 specific NmCluster attributes This Class is only used by the AUTOSAR Classic Platform.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">NmCluster</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">NmConfig.nmCluster</a>			
Attribute	Type	Mult.	Kind	Note
addressClaimEnabled	Boolean	0..1	attr	This attribute specifies whether the J1939Nm Bsw module is used or not. If this attribute is set to false then the J1939Nm configuration shall not be derived from the system description. But even in this case the nmNodeId might still be necessary for the J1939Rm and J1939Tp.





Class	J1939NmCluster			
usesDynamicAddressing	Boolean	0..1	attr	<p>Defines whether fully dynamic address resolution according to SAE J1939-81 shall be supported on this J1939NmCluster.</p> <ul style="list-style-type: none"> <li>• True: The dynamically allocated addresses on the bus are matched at runtime to the configured addresses.</li> <li>• False: The addresses on the bus resemble the configured addresses.</li> </ul>

**Table A.661: J1939NmCluster**

Class	J1939NmNode			
Note	J1939 specific NM Node attributes. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">NmNode</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">NmCluster.nmNode</a>			
Attribute	Type	Mult.	Kind	Note
addressConfigurationCapability	J1939NmAddressConfigurationCapabilityEnum	0..1	attr	Defines the Address Configuration Capability of the J1939NmNode (corresponding to an SAE J1939 Controller Application, CA).
j1939Node	<a href="#">J1939Node</a>	0..1	ref	Reference to J1939Node that has a defined J1939Node Name and is associated with a J1939Controller Application.
nodeName	<a href="#">J1939NodeName</a>	0..1	aggr	<p>nodeName configuration</p> <p><b>Tags:</b> atp.Status=obsolete</p>

**Table A.662: J1939NmNode**

Class	J1939Node			
Note	J1939Node defined on the aggregating EcuInstance that is associated with J1939ControllerApplication via a J1939ControllerApplicationTo1939NodeMapping. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">EcuInstance.j1939Node</a>			
Attribute	Type	Mult.	Kind	Note
nodeName	<a href="#">J1939NodeName</a>	0..1	aggr	Collection of attributes to configure the nodeName.
pduTriggering	<a href="#">PduTriggering</a>	*	ref	<p>Reference to Pdus that are related to the J1939Node and in turn to a J1939ControllerApplication.</p> <p><b>Stereotypes:</b> atp.Splitable; atp.Variation</p> <p><b>Tags:</b> atp.Splitkey=pduTriggering.pduTriggering, pduTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>

**Table A.663: J1939Node**

Class	J1939NodeName			
Note	This element contains attributes to configure the J1939NmNode NAME. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject			
Aggregated by	<a href="#">J1939NmNode.nodeName</a> , <a href="#">J1939Node.nodeName</a>			
Attribute	Type	Mult.	Kind	Note





Class	J1939NodeName			
arbitrary Address Capable	Boolean	0..1	attr	Arbitrary Address Capable field of the NAME of this node.
ecuInstance	Integer	0..1	attr	ECU Instance field of the NAME of this node.
function	Integer	0..1	attr	Function field of the NAME of this node.
function Instance	Integer	0..1	attr	Function Instance field of the NAME of this node.
identityNumber	Integer	0..1	attr	Identity Number field of the NAME of this node.
industryGroup	Integer	0..1	attr	Industry Group field of the NAME of this node.
manufacturer Code	Integer	0..1	attr	Manufacturer Code field of the NAME of this node.
vehicleSystem	Integer	0..1	attr	Vehicle System field of the NAME of this node.
vehicleSystem Instance	Integer	0..1	attr	Vehicle System Instance field of the NAME of this node.

Table A.664: J1939NodeName

Class	J1939ProtectedIPdu			
Note	Represents the SDM (Safety Data Message) that contains the actual payload (signals) of the E2E protected J1939 message. <b>Tags:</b> atp.Status=draft atp.recommendedPackage=Pdus			
Base	ARElement, ARObject, CollectableElement, FibexElement, IPdu, Identifiable, MultilanguageReferrable, PackageableElement, Pdu, Referrable, UploadableDesignElement, UploadablePackageElement			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
payload	PduTriggering	0..1	ref	References the ISignalIPdu that represents the SDG (Safety Data Group) that contains both the payload (signals) and the E2E protection data of the protected J1939 message. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=payload.pduTriggering, payload.variation Point.shortLabel atp.Status=draft vh.latestBindingTime=postBuild
srvt	TimeValue	0..1	attr	Maximum time between SHM (Safety Header Message) and SDM (Safety Data Message) of one SDG (Safety Data Group) <b>Tags:</b> atp.Status=draft

Table A.665: J1939ProtectedIPdu

Class	J1939TpConfig			
Note	This element defines exactly one J1939 TP Configuration. One J1939TpConfig element shall be created for each J1939 Network in the System. <b>Tags:</b> atp.recommendedPackage=TpConfigs This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable, TpConfig			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note





Class	J1939TpConfig			
tpAddress	<a href="#">TpAddress</a>	*	aggr	Collection of TP Addresses. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpAddress.shortName, tpAddress.variation Point.shortLabel vh.latestBindingTime=postBuild
tpConnection	<a href="#">J1939TpConnection</a>	*	aggr	Configuration of J1939 TP connections. atpVariation: Derived, because TpNode can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpConnection, tpConnection.variation Point.shortLabel vh.latestBindingTime=postBuild
tpNode	<a href="#">J1939TpNode</a>	*	aggr	Senders and receivers of J1939 TP messages. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpNode.shortName, tpNode.variation Point.shortLabel vh.latestBindingTime=postBuild

**Table A.666: J1939TpConfig**

Class	J1939TpConnection			
<b>Note</b>	A J1939TpConnection represents an internal path for the transmission or reception of a Pdu via J1939Tp and describes the sender and the receiver of this particular communication. The J1939Tp module routes a Pdu (J1939 PGN) through the connection. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <a href="#">TpConnection</a>			
<b>Aggregated by</b>	<a href="#">J1939TpConfig.tpConnection</a>			
Attribute	Type	Mult.	Kind	Note
acceptVariable DA	Boolean	0..1	attr	The TP message is accepted independently of the actually used destination address (DA). Otherwise, only the destination address configured as receiver.tpAddress is accepted. Only derived for the receiving ECU.
acceptVariable SA	Boolean	0..1	attr	The TP message is accepted independently of the actually used source address (SA). Otherwise, only the source address configured as transmitter.tpAddress is accepted. Only derived for the receiving ECU.
bamTiming	TimeValue	0..1	attr	Timing of TP:DT frames of a BAM transmission. Range 10ms to 50ms, if not configured 50ms are assumed. Relevant for tpProtocolTypes bam, bam_cmdt, fd_bam, and fd_bam_cmdt.
bufferRatio	PositiveInteger	0..1	attr	Defines usage of available data for dynamic block size calculation when protocol retry is enabled. This attribute describes in percent of available buffer that shall be used for retry.
cancellation	Boolean	0..1	attr	Enable support for Tx/Rx cancellation.
dataPdu	<a href="#">NPdu</a>	0..1	ref	Data Message (TP:DT) used by CMDT and BAM. The DataNPdu has a fixed length of 8 bytes.
dynamicBs	Boolean	0..1	attr	Enable support for dynamic block size calculation.







Class	J1939TpConnection			
flowControlPdu	<a href="#">NPdu</a>	0..2	ref	Reference to the Command NPdus (TP.CM) that are used in the CMDT (Connection Mode Data Transfer) in both directions. BAM uses one TP.CM (Transport Protocol Command). The flowControlNPdu has a fixed length of 8 bytes. Please note that the role name "flowControlIPdu" is misleading and is kept for backward compatibility reasons.
maxBs	PositiveInteger	0..1	attr	Set maximum block size (number of packets in TP.CM_CTS).
maxExpBs	PositiveInteger	0..1	attr	Set maximum for expected block size (maximum number of packets in TP.CM_RTS).
receiver	<a href="#">J1939TpNode</a>	*	ref	The target of the TP connection.
retry	Boolean	0..1	attr	Enable support for protocol retry.
tpPg	<a href="#">J1939TpPg</a>	*	aggr	J1939 messages (parameter groups, PGs) that can be transferred via this connection.
tpProtocolType	J1939TpProtocolType Enum	0..1	attr	Protocol type used by the J1939TpConnection
transmitter	<a href="#">J1939TpNode</a>	0..1	ref	The source of the TP connection.
txPduPriority	PositiveInteger	0..1	attr	If configured, TP.CM and TP.DT frames shall be sent with this priority instead of the default priority 7. Range 0 to 7.
useVariableDA	Boolean	0..1	attr	The TP message is sent with variable destination address (DA). Otherwise, the destination address configured as receiver.tpAddress is always used. Only derived for the transmitting ECU.
useVariableSA	Boolean	0..1	attr	The TP message is sent with variable source address (SA). Otherwise, the source address configured as transmitter.tpAddress is always used. Only derived for the transmitting ECU.

**Table A.667: J1939TpConnection**

Class	J1939TpNode			
Note	TP Node (Sender or Receiver) provides the TP Address and the connection to the Topology description. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">J1939TpConfig.tpNode</a>			
Attribute	Type	Mult.	Kind	Note
connector	<a href="#">CommunicationConnector</a>	0..1	ref	Association to a CommunicationConnector in the topology description. In a System Description this reference is mandatory. In an ECU Extract this reference is optional (references to ECUs that are not part of the ECU Extract shall be avoided).
j1939Node	<a href="#">J1939Node</a>	0..1	ref	Reference to J1939Node that has a defined J1939Node Name and is associated with a J1939Controller Application.
tpAddress	<a href="#">TpAddress</a>	0..1	ref	Reference to the TP Address that is used by the TpNode. This reference is optional only when no TP is sent and only BAM is received.

**Table A.668: J1939TpNode**



<b>Class</b>	<b>J1939TpPg</b>			
<b>Note</b>	A J1939TpPg represents one J1939 message (parameter group, PG) identified by the PGN (parameter group number) that can be received or transmitted via J1939Tp. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	J1939TpConnection.tpPg			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
directPdu	NPdu	0..1	ref	In case of variable length IPdus (with system signals of variable length), an additional NPdu (with the PGN in the CAN ID) is used for messages with up to 8 bytes.
pgn	Integer	0..1	attr	Parameter group number (PGN) of a J1939 message (parameter group, PG) that can be received or transmitted via J1939Tp. The PGN may be omitted when the a directPdu is referenced and is mapped into a Can FrameTriggering with an identifier.
requestable	Boolean	0..1	attr	Parameter Group can be triggered by the J1939 request message.
sdu	IPdu	*	ref	Reference to IPdus that are segmented by the Transport Protocol. If more than one IPdu is referenced, the IPdus are used when the same PGN is received in parallel via different transport protocols (BAM, CMDT, direct) on the same J1939TpConnection.
txDirectPdu Priority	PositiveInteger	0..1	attr	If configured, direct frames shall be sent with this priority instead of the priority configured in the CAN ID.

**Table A.669: J1939TpPg**

<b>Class</b>	«atpMixedString» LParagraph			
<b>Note</b>	This is the text for a paragraph in one particular language. The language is denoted in the attribute l.			
<b>Base</b>	ARObject, LanguageSpecific, MixedContentForParagraph			
<b>Aggregated by</b>	MultiLanguageParagraph.l1			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.670: LParagraph**

<b>Enumeration</b>	<b>LatencyConstraintTypeEnum</b>			
<b>Note</b>	Specifies the latencyConstraintType for a LatencyTimingConstraint.			
<b>Aggregated by</b>	LatencyTimingConstraint.latencyConstraintType			
<b>Literal</b>	<b>Description</b>			
age	The LatencyTimingConstraint is seen from the perspective of the response event of the scope. Given a certain response event, the age interval of the latest stimulus is constrained. <b>Tags:</b> atp.EnumerationLiteralIndex=0			
reaction	The LatencyTimingConstraint is seen from the perspective of the stimulus event of the scope. Given a certain stimulus event, the reaction interval of the first response is constrained. <b>Tags:</b> atp.EnumerationLiteralIndex=1			

**Table A.671: LatencyConstraintTypeEnum**

Class	LatencyTimingConstraint			
Note	<p>Constrains the time duration between the occurrence of the <i>stimulus</i> and the occurrence of the corresponding <i>response</i> of that <i>scope</i>.  In contrast to <i>scope</i>, a causal dependency between the <i>stimulus</i> and the corresponding <i>response</i> of the <i>scope</i> is required.</p>			
Base	ARObject, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i> , <i>TimingConstraint</i> , <i>Traceable</i>			
Aggregated by	TimingExtension.timingGuarantee, TimingExtension.timingRequirement			
Attribute	Type	Mult.	Kind	Note
latencyConstraintType	LatencyConstraintTypeEnum	0..1	attr	The specific type of this latency constraint.
maximum	MultidimensionalTime	0..1	aggr	<p>The maximum latency between the occurrence of the stimulus and the occurrence of the corresponding response of the associated event chain.</p> <p><b>Tags:</b> xml.sequenceOffset=20</p>
minimum	MultidimensionalTime	0..1	aggr	<p>The minimum latency between the occurrence of the stimulus and the occurrence of the corresponding response of the associated event chain.</p> <p><b>Tags:</b> xml.sequenceOffset=10</p>
nominal	MultidimensionalTime	0..1	aggr	<p>The nominal latency between the occurrence of the stimulus and the occurrence of the corresponding response of the associated event chain.</p> <p><b>Tags:</b> xml.sequenceOffset=30</p>
scope	TimingDescriptionEventChain	0..1	ref	The event chain that defines the scope of the constraint.

Table A.672: LatencyTimingConstraint

Class	LifeCycleInfo			
Note	LifeCycleInfo describes the life cycle state of an element together with additional information like what to use instead			
Base	ARObject			
Aggregated by	LifeCycleInfoSet.lifeCycleInfo			
Attribute	Type	Mult.	Kind	Note
lcObject	Referrable	1	ref	Element(s) have the life cycle as described in lcState.
lcState	LifeCycleState	0..1	ref	This denotes the particular state assigned to the object. If no lcState is given then the default life cycle state of LifeCycleInfoSet is assumed.
periodBegin	LifeCyclePeriod	0..1	aggr	Starting point of period in which the element has the denoted life cycle state lcState. If no periodBegin is given then the default period begin of LifeCycleInfoSet is assumed.
periodEnd	LifeCyclePeriod	0..1	aggr	Expiry date, i.e. end point of period the element does not have the denoted life cycle state lcState any more. If no periodEnd is given then the default period begin of LifeCycleInfoSet is assumed.
remark	DocumentationBlock	0..1	aggr	<p>Remark describing for example</p> <ul style="list-style-type: none"> <li>• why the element was given the specified life cycle</li> <li>• the semantics of useInstead</li> </ul>
useInstead	Referrable	*	ref	<p>Element(s) that should be used instead of the one denoted in referrable.</p> <p>Only relevant in case of life cycle states lcState unlike "valid". In case there are multiple references the exact semantics shall be individually described in the remark.</p>

Table A.673: LifeCycleInfo

Class	LifeCycleInfoSet			
Note	This meta class represents the ability to attach a life cycle information to a particular set of elements. The information can be defined for a particular period. This supports the definition of transition plans. If no period is specified, the life cycle state applies forever. <b>Tags:</b> atp.recommendedPackage=LifeCycleInfoSets			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Packageable</a> Element, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
defaultLcState	<a href="#">LifeCycleState</a>	1	ref	This denotes the default life cycle state. To be used in all LifeCycleInfo elements within the LifeCycleInfoSet if no life cycle state is stated there explicitly. I.e. the defaultLc State can be overwritten in LifeCycleInfo elements.
defaultPeriod Begin	<a href="#">LifeCyclePeriod</a>	0..1	aggr	Default starting point of period in which all the specified lifeCycleInfo apply. Note that the default period can be overridden for each lifeCycleInfo individually.
defaultPeriod End	<a href="#">LifeCyclePeriod</a>	0..1	aggr	Default expiry date, i.e. default end point of period for which all specified lifeCycleInfo apply. Note that the default period can be overridden for each lifeCycleInfo individually.
lifeCycleInfo	<a href="#">LifeCycleInfo</a>	*	aggr	This represents one particular life cycle information.
usedLifeCycle StateDefinition Group	<a href="#">LifeCycleStateDefinition Group</a>	1	ref	This denotes the life cycle states applicable to the current life cycle info set.

**Table A.674: LifeCycleInfoSet**

Class	LifeCyclePeriod			
Note	This meta class represents the ability to specify a point of time within a specified period, e.g. the starting or end point, in which a specific life cycle state is valid/applies to.			
Base	ARObject			
Aggregated by	<a href="#">LifeCycleInfo.periodBegin</a> , <a href="#">LifeCycleInfo.periodEnd</a> , <a href="#">LifeCycleInfoSet.defaultPeriodBegin</a> , <a href="#">LifeCycleInfoSet.defaultPeriodEnd</a>			
Attribute	Type	Mult.	Kind	Note
arRelease Version	RevisionLabelString	0..1	attr	Version of the AUTOSAR Release the element referred to is part of. The numbering contains three levels (major, minor, revision) which are defined by AUTOSAR. <b>Tags:</b> xml.sequenceOffset=20
date	DateTime	0..1	attr	Date within period. <b>Tags:</b> xml.sequenceOffset=10
productRelease	RevisionLabelString	0..1	attr	Version of the product within the period. <b>Tags:</b> xml.sequenceOffset=30

**Table A.675: LifeCyclePeriod**

Class	LifeCycleState			
Note	This meta class represents one particular state in the LifeCycle.			
Base	ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">LifeCycleStateDefinitionGroup.lcState</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.676: LifeCycleState**

<b>Class</b>	<b>LifeCycleStateDefinitionGroup</b>			
<b>Note</b>	This meta class represents the ability to define the states and properties of one particular life cycle. <b>Tags:</b> atp.recommendedPackage=LifeCycleStateDefinitionGroups			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
lcState	<a href="#">LifeCycleState</a>	*	aggr	Describes a single life cycle state of this life cycle state definition group.

**Table A.677: LifeCycleStateDefinitionGroup**

<b>Primitive</b>	<b>Limit</b>			
<b>Note</b>	This class represents the ability to express a numerical limit. Note that this is in fact a NumericalVariation Point but has the additional attribute intervalType. <b>Tags:</b> xml.xsd.customType=LIMIT-VALUE xml.xsd.pattern=(0[xX][0-9a-fA-F+])((0[0-7]+) (0[bB][0-1]+) ([+-]?[1-9][0-9]+(\.[0-9]+)? ([+-]?[0-9](\.[0-9]+)?)([eE]([+-]?[0-9]+)? \.[0]INF -INF NaN xml.xsd.type=string			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
intervalType	IntervalTypeEnum	0..1	attr	This specifies the type of the interval. If the attribute is missing the interval shall be considered as "CLOSED". <b>Tags:</b> xml.attribute=true

**Table A.678: Limit**

<b>Class</b>	«atpVariation» <b>LinCluster</b>			
<b>Note</b>	LIN specific attributes <b>Tags:</b> atp.recommendedPackage=CommunicationClusters			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">CommunicationCluster</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.679: LinCluster**

<b>Class</b>	<b>LinCommunicationConnector</b>			
<b>Note</b>	LIN bus specific communication connector attributes. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">CommunicationConnector</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcuInstance.connector</a> , MachineDesign.communicationConnector			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initialNad	Integer	0..1	attr	Initial NAD of the LIN slave.
linConfigurableFrame	<a href="#">LinConfigurableFrame</a>	*	aggr	LinConfigurableFrames shall list all frames (unconditional frames, event-triggered frames and sporadic frames) processed by the slave node. This element is necessary for the LIN 2.0 Assign-Frame command.





Class	LinCommunicationConnector			
linOrderedConfigurableFrame	<a href="#">LinOrderedConfigurableFrame</a>	*	aggr	LinOrderedConfigurableFrames shall list all frames (unconditional frames, event-triggered frames and sporadic frames) processed by the slave node. This element is necessary for the LIN 2.1 Assign-Frame-PID-Range command.
scheduleChangeNextTimeBase	Boolean	0..1	attr	This attribute defines the point in time where a schedule table switch is performed. If this attribute is set to false or not present, the schedule table shall be switched after the current entry of the active schedule table is ended. If this attribute is enabled, the schedule table shall be switched when message transmission or reception within an entry has been completed, ensured by status checks for transmission and reception.

**Table A.680: LinCommunicationConnector**

Class	«atpVariation» <b>LinCommunicationController</b> (abstract)			
Note	LIN bus specific communication controller attributes. This Class is only used by the AUTOSAR Classic Platform.			
Base	<a href="#">ARObject</a> , <a href="#">CommunicationController</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">LinMaster</a> , <a href="#">LinSlave</a>			
Aggregated by	<a href="#">EcuInstance.commController</a> , <a href="#">MachineDesign.communicationController</a>			
Attribute	Type	Mult.	Kind	Note
protocolVersion	String	0..1	attr	Version specifier for a communication protocol.

**Table A.681: LinCommunicationController**

Class	LinConfigurableFrame			
Note	Assignment of messageIds to Frames. This element shall be used for the LIN 2.0 Assign-Frame command. This Class is only used by the AUTOSAR Classic Platform.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">LinCommunicationConnector.linConfigurableFrame</a> , <a href="#">LinSlaveConfig.linConfigurableFrame</a>			
Attribute	Type	Mult.	Kind	Note
frame	<a href="#">LinFrame</a>	0..1	ref	Reference to a Frame that is processed by the slave node.
messageId	PositiveInteger	0..1	attr	MessageId for the referenced frame

**Table A.682: LinConfigurableFrame**

Class	LinErrorResponse			
Note	Each slave node shall publish a one bit signal, named response_error, to the master node in one of its transmitted unconditional frames. The response_error signal shall be set whenever a frame (except for event triggered frame responses) that is transmitted or received by the slave node contains an error in the frame response. The response_error signal shall be cleared when the unconditional frame containing the response_error signal is successfully transmitted. This Class is only used by the AUTOSAR Classic Platform.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">LinSlave.linErrorResponse</a> , <a href="#">LinSlaveConfig.linErrorResponse</a>			
Attribute	Type	Mult.	Kind	Note
responseError	<a href="#">ISignalTriggering</a>	0..1	ref	This ISignal shall be taken to transport the responseError bit.

**Table A.683: LinErrorResponse**

<b>Class</b>	<b>LinEventTriggeredFrame</b>			
<b>Note</b>	<p>An event triggered frame is used as a placeholder to allow multiple slave nodes to provide its response. The header of an event triggered frame is transmitted when a frame slot allocated to the event triggered frame is processed. The publisher of an associated unconditional frame shall only transmit the response if at least one of the signals carried in its unconditional frame is updated. The LIN Master discovers and purges collisions with the collisionResolvingScheduleTable. The event controlled frame shall not contain any Pcus.</p> <p><b>Tags:</b> atp.recommendedPackage=Frames  This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARObject, CollectableElement, FibexElement, Frame, Identifiable, LinFrame, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
collision Resolving Schedule	LinScheduleTable	0..1	ref	Reference to the schedule table, which resolves a collision.
linUnconditional Frame	LinUnconditionalFrame	*	ref	<p>A list of slaves can respond to the master request if at least one of the signals carried in its unconditional frame is updated. For each response a LinFrameTriggering and a LinUnconditionalFrame shall be defined. Within a channel a LIN Frame shall be referenced by only one FrameTriggering. This allows a derivation of the identifier of a substituted Frame. The identifier is specified in FrameTriggering element. The Unconditional frames associated with an event triggered frame shall:</p> <ul style="list-style-type: none"> <li>• have equal length.</li> <li>• use the same checksum model (i.e. mixing LIN 1.x and LIN 2.x frames is not allowed).</li> <li>• reserve the first data field to its protected identifier (even if the associated unconditional frame is scheduled as a unconditional frame in the same or another schedule table).</li> <li>• be published by different slave nodes.</li> <li>• shall not be included directly in the same schedule table as the event triggered frame is scheduled.</li> </ul>

**Table A.684: LinEventTriggeredFrame**

<b>Class</b>	<b>LinFrame</b> (abstract)			
<b>Note</b>	Lin specific Frame element. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, CollectableElement, FibexElement, Frame, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Subclasses</b>	LinEventTriggeredFrame, LinSporadicFrame, LinUnconditionalFrame			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.685: LinFrame**

<b>Class</b>	<b>LinFrameTriggering</b>			
<b>Note</b>	LIN specific attributes to the FrameTriggering This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, FrameTriggering, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	PhysicalChannel.frameTriggering			





Class	LinFrameTriggering			
Attribute	Type	Mult.	Kind	Note
identifier	Integer	0..1	attr	To describe a frames identifier on the communication system, usually with a fixed identifierValue. For Lin SporadicFrames the attribute shall be ignored.
linChecksum	LinChecksumType	0..1	attr	Type of checksum that the frame is using. This attribute is optional because in case of sporadic frames it should not be set.

**Table A.686: LinFrameTriggering**

Class	«atpVariation» LinMaster			
Note	Describing the properties of the referring ecu as a LIN master. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">CommunicationController</a> , <a href="#">Identifiable</a> , <a href="#">LinCommunicationController</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">EcuInstance.commController</a> , MachineDesign.communicationController			
Attribute	Type	Mult.	Kind	Note
linSlave	<a href="#">LinSlaveConfig</a>	*	aggr	LinSlaves that are handled by the LinMaster.
timeBase	TimeValue	0..1	attr	Time base is mandatory for the master. It is not used for slaves. LIN 2.0 Spec states: "The time_base value specifies the used time base in the master node to generate the maximum allowed frame transfer time." The time base shall be specified AUTOSAR conform in seconds.
timeBaseJitter	TimeValue	0..1	attr	The attribute timeBaseJitter is a mandatory attribute for the master and not used for slaves. LIN 2.0 Spec states: "The jitter value specifies the differences between the maximum and minimum delay from time base start point to the frame header sending start point (falling edge of BREAK signal)." The jitter shall be specified AUTOSAR conform in seconds.

**Table A.687: LinMaster**

Class	LinOrderedConfigurableFrame			
Note	With the assignment of the index to a frame a mapping of Pids to Frames is possible. This element shall be used for the LIN 2.1 Assign-Frame-PID-Range command. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject			
Aggregated by	<a href="#">LinCommunicationConnector.linOrderedConfigurableFrame</a> , <a href="#">LinSlaveConfig.linOrderedConfigurableFrame</a>			
Attribute	Type	Mult.	Kind	Note
frame	<a href="#">LinFrame</a>	0..1	ref	Reference to a Frame that is processed by the slave node.
index	Integer	0..1	attr	This attribute is used to order the elements and allows an assignment of Pids to ConfigurableFrames that are defined in the slave.

**Table A.688: LinOrderedConfigurableFrame**

<b>Class</b>	<b>LinPhysicalChannel</b>			
<b>Note</b>	LIN specific attributes to the physicalChannel This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PhysicalChannel</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CommunicationCluster.physicalChannel</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
busIdleTimeoutPeriod	TimeValue	0..1	attr	This attribute shall be used to set an idle timeout period for the enclosing LinPhysicalChannel.
scheduleTable	<a href="#">LinScheduleTable</a>	*	aggr	Schedule tables organize the timings of the frames for LIN. atpVariation: If the transmitted frames are variable, the corresponding ScheduleTables shall be variable, too. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=scheduleTable.shortName, scheduleTable.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.689: LinPhysicalChannel**

<b>Class</b>	<b>LinScheduleTable</b>			
<b>Note</b>	The master task (in the master node) transmits frame headers based on a schedule table. The schedule table specifies the identifiers for each header and the interval between the start of a frame and the start of the following frame. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">LinPhysicalChannel.scheduleTable</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
resumePosition	ResumePosition	0..1	attr	Defines, where a schedule table shall be proceeded in case if it has been interrupted by a run-once table or MRF/SRF.
runMode	RunMode	0..1	attr	The schedule table can be executed in two different modes.
tableEntry	<a href="#">ScheduleTableEntry</a>	*	aggr	The scheduling table consists of table entries, which contain Frame slots.

**Table A.690: LinScheduleTable**

<b>Class</b>	«atpVariation» <b>LinSlave</b>			
<b>Note</b>	Describing the properties of the referring ecu as a LIN slave. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">CommunicationController</a> , <a href="#">Identifiable</a> , <a href="#">LinCommunicationController</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EcuInstance.commController</a> , <a href="#">MachineDesign.communicationController</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
assignNad	Boolean	0..1	attr	This attribute has the ability to control whether the node configuration command 'Assign NAD' is supported.
configuredNad	Integer	0..1	attr	To distinguish LIN slaves that are used twice or more within the same cluster.
functionId	PositiveInteger	0..1	attr	LIN function ID
initialNad	Integer	0..1	attr	This attribute represents the initial NAD.
linErrorResponse	<a href="#">LinErrorResponse</a>	0..1	aggr	Each slave node shall publish one response error in one of its transmitted unconditional frames.
nasTimeout	TimeValue	0..1	attr	Value of the N_AS timeout. Unit: seconds.







Class	«atpVariation» LinSlave			
supplierId	PositiveInteger	0..1	attr	LIN Supplier ID
variantId	PositiveInteger	0..1	attr	Specifies the Variant ID

**Table A.691: LinSlave**

Class	LinSlaveConfig			
<b>Note</b>	<p>Node attributes of LIN slaves that are handled by the LinMaster.</p> <p>In the System Description LIN slaves may be described in the context of the Lin Master.</p> <p>In an ECU Extract of the LinMaster the LinSlave Ecus shall not be available.</p> <p>The information that is described here is necessary in the ECU Extract for the configuration of the Lin Master.</p> <p>The values of attributes of LinSlaveConfig and the corresponding LinSlave shall be identical (if both are defined in a System Description).</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	LinMaster.linSlave			
Attribute	Type	Mult.	Kind	Note
configuredNad	Integer	0..1	attr	To distinguish LIN slaves that are used twice or more within the same cluster.
functionId	PositiveInteger	0..1	attr	LIN function ID.
ident	LinSlaveConfigIdent	0..1	aggr	This adds the ability to become referable to LinSlave Config.
initialNad	Integer	0..1	attr	Initial NAD of the LIN slave.
linConfigurableFrame	LinConfigurableFrame	*	aggr	List of all frames that are processed by the slave node
linErrorResponse	LinErrorResponse	0..1	aggr	Each slave node shall publish one response error in one of its transmitted unconditional frames.
linOrderedConfigurableFrame	LinOrderedConfigurableFrame	*	aggr	List of all frames (unconditional frames, event-triggered frames and sporadic frames) processed by the slave node. This element is necessary for the LIN 2.1 Assign-Frame-PID-Range command.
protocolVersion	String	0..1	attr	Version specifier for a communication protocol. Protocol version of the LinMaster and the LinSlaves may be different.
supplierId	PositiveInteger	0..1	attr	LIN Supplier ID.
variantId	PositiveInteger	0..1	attr	Specifies the Variant ID.

**Table A.692: LinSlaveConfig**

Class	LinSporadicFrame			
<b>Note</b>	<p>A sporadic frame is a group of unconditional frames that share the same frame slot. The sporadic frame shall not contain any Pcus.</p> <p><b>Tags:</b> atp.recommendedPackage=Frames</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARObject, CollectableElement, FibexElement, Frame, Identifiable, LinFrame, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note





Class	LinSporadicFrame			
substituted Frame (ordered)	<a href="#">LinUnconditionalFrame</a>	*	ref	Reference to a group of unconditional frames that share the same frame slot. In case that more than one of the declared frames needs to be transferred, the one first listed shall be chosen. Within a channel a LIN Frame shall be referenced by only one FrameTriggering. This allows a derivation of the identifier of a substituted Frame. The identifier is specified in FrameTriggering element. A LinUnconditionalFrame associated with a LinSporadicFrame may not be allocated in the same LinSchedule Table as the sporadic frame.

**Table A.693: LinSporadicFrame**

Class	LinTpConfig			
<b>Note</b>	This element defines exactly one Lin TP Configuration. One LinTpConfig element shall be created for each Lin Network in the System. <b>Tags:</b> atp.recommendedPackage=TpConfigs This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TpConfig</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
tpAddress	<a href="#">TpAddress</a>	*	aggr	Collection of TpAddresses. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=tpAddress.shortName, tpAddress.variation Point.shortLabel vh.latestBindingTime=postBuild
tpConnection	<a href="#">LinTpConnection</a>	*	aggr	Configuration of LIN TP channels. atpVariation: Derived, because TpNode can vary. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=tpConnection, tpConnection.variation Point.shortLabel vh.latestBindingTime=postBuild
tpNode	<a href="#">LinTpNode</a>	*	aggr	Senders and receivers of LIN TP messages. atpVariation: Derived, because EcuInstance can vary. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=tpNode.shortName, tpNode.variation Point.shortLabel vh.latestBindingTime=postBuild

**Table A.694: LinTpConfig**

Class	LinTpConnection			
<b>Note</b>	A LinTP channel represents an internal path for the transmission or reception of a Pdu via LinTp and describes the sender and the receiver of this particular communication. LinTp supports (per Lin Cluster) the configuration of one Rx Tp-SDU and one Tx Tp-SDU per NAD the LinMaster uses to address one or more of its Lin Slaves. To support this an arbitrary number of LinTp Connections shall be described. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">TpConnection</a>			
<b>Aggregated by</b>	<a href="#">LinTpConfig.tpConnection</a>			





Class	LinTpConnection			
Attribute	Type	Mult.	Kind	Note
dataPdu	NPdu	0..1	ref	Reference to an NPdu (Single Frame, First Frame or Consecutive Frame). The Single Frame network protocol data unit (SF N_PDU) shall be sent out by the sending network entity and can be received by one or multiple receiving network entities. The Single Frame (SF N_PDU) shall be sent out to transfer a service data unit that can be transferred via a single service request to the data link layer. This network protocol data unit shall be sent to transfer unsegmented messages. The First Frame network protocol data unit (FF N_PDU) identifies the first network protocol data unit (N_PDU) of a segmented message transmitted by a network sending entity and received by a receiving network entity. The Consecutive Frame network protocol data unit (CF N_PDU) transfers segments (N_Data) of the service data unit message data (<MessageData>). All network protocol data units (N_PDU) transmitted by the sending entity after the First Frame network protocol data unit (FF N_PDU) shall be encoded as Consecutive Frames network protocol data units (CF N_PDUs).
flowControl	NPdu	0..1	ref	Reference to the Flow Control NPdu. The Flow Control network protocol data unit (FC N_PDU) is identified by the Flow Control protocol control information (FC N_PCI). The Flow Control network protocol data unit (FC N_PDU) instructs a sending network entity to start, stop or resume transmission of CF N_PDUs. The Flow Control network protocol data unit shall be sent by the receiving network layer entity to the sending network layer entity, when ready to receive more data, after correct reception of: a) First Frame network protocol data unit (FF N_PDU) b) the last Consecutive Frame network protocol data unit (CF N_PDU) of a block of Consecutive Frames (CF N_PDU) if further Consecutive Frame network protocol data unit (CF N_PDU) need(s) to be sent.
linTpNSdu	IPdu	0..1	ref	Reference to the IPdu that is segmented by the Transport Protocol.
multicast	TpAddress	0..1	ref	TP address for 1:n connections.
receiver	LinTpNode	*	ref	The target of the TP connection.
timeoutAs	TimeValue	0..1	attr	Time for transmission of the LIN frame (any N-PDU) on the sender side. Specified in seconds.
timeoutCr	TimeValue	0..1	attr	This attribute defines the timeout value for waiting for a CF or FF-x (in case of retry) after receiving the last CF or after sending an FC or AF on the receiver side. Specified in seconds.
timeoutCs	TimeValue	0..1	attr	The attribute timeoutCs represents the time (in seconds) which elapses between the transmit request of a CF N-PDU until the transmit request of the next CF N-PDU.
transmitter	LinTpNode	0..1	ref	The source of the TP connection.

**Table A.695: LinTpConnection**

Class	LinTpNode
Note	TP Node (Sender or Receiver) provides the TP Address and the connection to the Topology description. This Class is only used by the AUTOSAR Classic Platform.
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>





Class	LinTpNode			
Aggregated by	LinTpConfig.tpNode			
Attribute	Type	Mult.	Kind	Note
connector	Communication Connector	0..1	ref	Association to a CommunicationConnector in the topology description. In a System Description this reference is mandatory. In an ECU Extract this reference is optional (references to ECUs that are not part of the ECU Extract shall be avoided).
dropNot RequestedNad	Boolean	0..1	attr	Configures if TP Frames of not requested LIN-Slaves are dropped or not.
maxNumberOf RespPending Frames	Integer	0..1	attr	Configures the maximum number of allowed response pending frames.
p2Max	TimeValue	0..1	attr	After reception of a response pending frame the P2 timeout counter is reloaded with the timeout time P2max.
p2Timing	TimeValue	0..1	attr	P2 timeout observation parameter.
tpAddress	TpAddress	0..1	ref	Reference to the TP Address that is used by the TpNode. This reference is optional in case that the multicast TP Address is used (reference from TpConnection).

Table A.696: LinTpNode

Class	LinUnconditionalFrame			
Note	Unconditional frames carry signals. The master sends a frame header in a scheduled frame slot and the designated slave node fills the frame with data. <b>Tags:</b> atp.recommendedPackage=Frames This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, CollectableElement, FibexElement, Frame, Identifiable, LinFrame, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

Table A.697: LinUnconditionalFrame

Class	MacAddressVlanMembership			
Note	Assigns a set of MAC-Multicast-Addresses which are addressable via the CouplingPort aggregating this MacAddressVlanMembership. Optionally also assigns a set of VLANs to this relation. This is a static pre-configuration and further addresses may be learned during runtime.			
Base	ARObject, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	CouplingPort.macAddressVlanAssignment			
Attribute	Type	Mult.	Kind	Note
macMulticast Address	MacMulticastGroup	*	ref	Defines a set of macMulticastAddresses to be mapped to the CouplingPort.
vlan	EthernetPhysical Channel	*	ref	Defines a set of VLANs the set of macMulticastAddress apply to.

Table A.698: MacAddressVlanMembership

<b>Class</b>	<b>MacMulticastConfiguration</b>			
<b>Note</b>	References a per cluster globally defined MAC-Multicast-Group.			
<b>Base</b>	ARObject, <a href="#">NetworkEndpointAddress</a>			
<b>Aggregated by</b>	<a href="#">NetworkEndpoint.networkEndpointAddress</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
macMulticast Group	<a href="#">MacMulticastGroup</a>	0..1	ref	Reference to a macMulticastGroup. <b>Stereotypes:</b> atpIdentityContributor

**Table A.699: MacMulticastConfiguration**

<b>Class</b>	<b>MacMulticastGroup</b>			
<b>Note</b>	Per EthernetCluster globally defined MacMulticastGroup. One sender can handle many receivers simultaneously if the receivers have all the same macMulticastAddress. The addresses need to be unique for the particular EthernetCluster.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EthernetCluster.macMulticastGroup</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
macMulticast Address	MacAddressString	0..1	attr	A multicast MAC address (Media Access Control address) is a identifier for a group of hosts in a network.

**Table A.700: MacMulticastGroup**

<b>Class</b>	<b>MacSecProps</b>			
<b>Note</b>	This meta-class allows to configure MACsec (Media access control security) and the MKA (MACsec Key Agreement) for the CouplingPort (PHY). <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">CouplingPort.macSecProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
autoStart	Boolean	0..1	attr	This attribute defines how the Port Access Entity (PAE) is started: • true := Autostart • false := Manual Start <b>Tags:</b> atp.Status=candidate
macSecKey Config	MacSecLocalKayProps	0..1	aggr	Properties to configure the MKA instance (KaY) for a controlled CouplingPort (PaE). <b>Tags:</b> atp.Status=candidate
onFail Permissive Mode	MacSecFailPermissive ModeEnum	0..1	attr	This attribute sets the behavior of the Port Access Entity in case MACsec does not succeed. <b>Tags:</b> atp.Status=candidate
onFail Permissive ModeTimeout	TimeValue	0..1	attr	Timeout in seconds to enable the controlled port in case onFailPermissiveMode is set to Timeout. <b>Tags:</b> atp.Status=candidate
sakRekeyTime Span	TimeValue	0..1	attr	Time in seconds to trigger the rekey of an in use SAK (Static Secure Association key). If set to 0, the rekey will not be triggered after a time span. <b>Tags:</b> atp.Status=candidate

**Table A.701: MacSecProps**

Class	McDataAccessDetails			
Note	<p>This meta-class allows to attach detailed information about the usage of a data buffer by the RTE to a corresponding McDataInstance.</p> <p>Use Case: Direct memory access to RTE internal buffers for rapid prototyping. In case of implicit communication, the various task local buffers need to be identified in relation to RTE events and variable access points.</p> <p>Note that the SwComponentPrototype, the RunnableEntity and the VariableDataPrototype are implicitly given be the referred instances of RTEEvent and VariableAccess.</p>			
Base	ARObject			
Aggregated by	McDataInstance.mcDataAccessDetails			
Attribute	Type	Mult.	Kind	Note
rteEvent	RTEEvent	*	iref	The RTE event used to receive the data via this buffer. <b>InstanceRef implemented by:</b> RteEventInEcuInstanceRef
variableAccess	VariableAccess	*	iref	The VariableAccess for which the data buffer is used. <b>InstanceRef implemented by:</b> VariableAccessInEcuInstanceRef

**Table A.702: McDataAccessDetails**

Class	McDataInstance			
Note	<p>Describes the specific properties of one data instance in order to support measurement and/or calibration of this data instance.</p> <p>The most important attributes are:</p> <ul style="list-style-type: none"> <li>• Its shortName is copied from the ECU Flat map (if applicable) and will be used as identifier and for display by the MC system.</li> <li>• The category is copied from the corresponding data type (ApplicationDataType if defined, otherwise ImplementationDataType) as far as applicable.</li> <li>• The symbol is the one used in the programming language. It will be used to find out the actual memory address by the final generation tool with the help of linker generated information.</li> </ul> <p>It is assumed that in the M1 model this part and all the aggregated and referred elements (with the exception of the Flat Map and the references from ImplementationElementInParameterInstanceRef and McAccessDetails) are completely generated from "upstream" information. This means, that even if an element like e.g. a CompuMethod is only used via reference here, it will be copied into the M1 artifact which holds the complete McSupportData for a given Implementation.</p>			
Base	ARObject, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Aggregated by	McDataInstance.subElement, McSupportData.mcParameterInstance, McSupportData.mcVariableInstance			
Attribute	Type	Mult.	Kind	Note
arraySize	PositiveInteger	0..1	attr	The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of number of elements.
displayIdentifier	McIdIdentifier	0..1	attr	An optional attribute to be used to set the ASAM ASAP2 DISPLAY_IDENTIFIER attribute.
flatMapEntry	FlatInstanceDescriptor	0..1	ref	<p>Reference to the corresponding entry in the ECU Flat Map. This allows to trace back to the original specification of the generated data instance. This link shall be added by the RTE generator mainly for documentation purposes. The reference is optional because</p> <ul style="list-style-type: none"> <li>• The McDataInstance may represent an array or struct in which only the subElements correspond to FlatMap entries.</li> <li>• The McDataInstance may represent a task local buffer for rapid prototyping access which is different from the "main instance" used for measurement access.</li> </ul> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>





Class	McDataInstance			
instanceInMemory	<a href="#">ImplementationElementInParameterInstanceRef</a>	0..1	aggr	Reference to the corresponding data instance in the description of calibration data structures published by the RTE generator. This is used to support emulation methods inside the ECU, it is not required for A2L generation.
mcDataAccessDetails	<a href="#">McDataAccessDetails</a>	0..1	aggr	Refers to "upstream" information on how the RTE uses this data instance. Use Case: Rapid Prototyping
mcDataAssignment	RoleBasedMcDataAssignment	*	aggr	An assignment between McDataInstances. This supports the indication of related McDataElement implementing the of "RP global buffer", "RP global measurement buffer", "RP enabler flag".
resultingProperties	<a href="#">SwDataDefProps</a>	0..1	aggr	These are the generated properties resulting from decisions taken by the RTE generator for the actually implemented data instance. Only those properties are relevant here, which are needed for the measurement and calibration system.
resultingRptSwPrototypingAccess	<a href="#">RptSwPrototypingAccess</a>	0..1	aggr	Describes the implemented accessibility of data and modes by the rapid prototyping tooling.
role	<a href="#">Identifier</a>	0..1	attr	An optional attribute to be used for additional information on the role of this data instance, for example in the context of rapid prototyping.
rptImplPolicy	<a href="#">RptImplPolicy</a>	0..1	aggr	Describes the implemented code preparation for rapid prototyping at data accesses for a hook based bypassing.
subElement (ordered)	<a href="#">McDataInstance</a>	*	aggr	This relation indicates, that the target element is part of a "struct" which is given by the source element. This information will be used by the final generator to set up the correct addressing scheme. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
symbol	SymbolString	0..1	attr	This String is used to determine the memory address during final generation of the MC configuration data (e.g. "A2L" file) . It shall be the name of the element in the programming language such that it can be identified in linker generated information. In case the McDataInstance is part of composite data in the programming language, the symbol String may include parts denoting the element context, unless the context is given by the symbol attribute of an enclosing McDataInstance. This means in particular for the C language that the "." character shall be used as a separator between the name of a "struct" variable the name of one of its elements. The symbol can differ from the shortName in case of generated C data declarations. It is an optional attribute since it may be missing in case the instance represents an element (e.g. a single array element) which has no name in the linker map. <b>Tags:</b> atp.Splitkey=symbol

**Table A.703: McDataInstance**

Class	McFunction			
<b>Note</b>	Represents a functional element to be used as input to support measurement and calibration. It is used to <ul style="list-style-type: none"> <li>• assign calibration parameters to a logical function</li> <li>• assign measurement variables to a logical function</li> <li>• structure functions hierarchically</li> </ul> <b>Tags:</b> atp.recommendedPackage=McFunctions			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
defCalprmSet	<a href="#">McFunctionDataRefSet</a>	0..1	aggr	Refers to the set of adjustable data (= calibration parameters) defined in this function. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=defCalprmSet xml.sequenceOffset=10
inMeasurementSet	<a href="#">McFunctionDataRefSet</a>	0..1	aggr	Refers to the set of measurable input data for this function. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=inMeasurementSet xml.sequenceOffset=30
locMeasurementSet	<a href="#">McFunctionDataRefSet</a>	0..1	aggr	Refers to the set of measurable local data in this function. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=locMeasurementSet xml.sequenceOffset=50
outMeasurementSet	<a href="#">McFunctionDataRefSet</a>	0..1	aggr	Refers to the set of measurable output data from this function. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=outMeasurementSet xml.sequenceOffset=60
refCalprmSet	<a href="#">McFunctionDataRefSet</a>	0..1	aggr	Refers to the set of adjustable data (= calibration parameters) referred by this function. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=refCalprmSet xml.sequenceOffset=20
subFunction	<a href="#">McFunction</a>	*	ref	A sub-function that is seen as part of the enclosing function. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=subFunction xml.sequenceOffset=70

**Table A.704: McFunction**

Class	«atpVariation» <a href="#">McFunctionDataRefSet</a>
<b>Note</b>	Refers to a set of data assigned to an McFunction in a particular role. The data are given <ul style="list-style-type: none"> <li>• either by entries in a FlatMap</li> <li>• or by data instances that are part of MC support data.</li> </ul> These two possibilities are exclusive within a given McFunctionDataRefSet. Which one to use depends on the process and tool environment. The set is subject to variability because the same functional model may be used with various representation of the data. <b>Tags:</b> vh.latestBindingTime=preCompileTime







<b>Class</b>	«atpVariation» <b>McFunctionDataRefSet</b>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	McFunction.defCalprmSet, McFunction.inMeasurementSet, McFunction.locMeasurementSet, McFunction.outMeasurementSet, McFunction.refCalprmSet			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
flatMapEntry	FlatInstanceDescriptor	*	ref	Refers to an entry in a FlatMap that is part of the set, for example a calibration parameter or measured variable. Note: This atpSplittable property has no atp.Splitkey due to atpVariation (PropertySetPattern). <b>Stereotypes:</b> atpSplittable <b>Tags:</b> xml.sequenceOffset=10 This Attribute is only used by the AUTOSAR Classic Platform.
mcDataInstance	McDataInstance	*	ref	Refers to a data instance within MC support data that is part of the set, i.e. a calibration parameter or measured variable. Note: This atpSplittable property has no atp.Splitkey due to atpVariation (PropertySetPattern). <b>Stereotypes:</b> atpSplittable <b>Tags:</b> xml.sequenceOffset=20

**Table A.705: McFunctionDataRefSet**

<b>Class</b>	<b>McGroup</b>			
<b>Note</b>	Represents a group element to be used as input to support measurement and calibration. It is used to provide selection lists (groups) of calibration parameters, measurement variables, and functions in a hierarchical manner (subGroups). <b>Tags:</b> atp.recommendedPackage=McFunctions			
<b>Base</b>	ARElement, ARObject, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
mcFunction	McFunction	*	ref	A McFunction that is seen as part of the enclosing group. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=mcFunction xml.sequenceOffset=40
refCalprmSet	McGroupDataRefSet	0..1	aggr	Refers to the set of adjustable data (= calibration parameters) referred by this McGroup. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=refCalprmSet xml.sequenceOffset=20
ref Measurement Set	McGroupDataRefSet	0..1	aggr	Refers to the set of measurable belonging to this Mc Group. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=refMeasurementSet xml.sequenceOffset=30
subGroup	McGroup	*	ref	A sub-group that is seen as part of the enclosing group. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=subGroup xml.sequenceOffset=10

**Table A.706: McGroup**

<b>Class</b>	«atpVariation» <b>McGroupDataRefSet</b>			
<b>Note</b>	<p>Refers to a set of data assigned to an McGroup in a particular role. The data are given</p> <ul style="list-style-type: none"> <li>• either by entries in a FlatMap</li> <li>• or by data instances that are part of MC support data.</li> </ul> <p>These two possibilities can be mixed within a given McGroupDataRefSet. Which one to use depends on the process and tool environment.</p> <p>The set is subject to variability because the same functional model may be used with various representation of the data.</p> <p><b>Tags:</b> vh.latestBindingTime=preCompileTime</p>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	McGroup.refCalprmSet, McGroup.refMeasurementSet			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
flatMapEntry	FlatInstanceDescriptor	*	ref	<p>Refers to an entry in a FlatMap that is part of the set, for example a calibration parameter or measured variable.</p> <p>Note: This atpSplitable property has no atp.Splitkey due to atpVariation (PropertySetPattern).</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> xml.sequenceOffset=50</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
mcDataInstance	McDataInstance	*	ref	<p>Refers to a data instance within MC support data that is part of the set, i.e. a calibration parameter or measured variable.</p> <p>Note: This atpSplitable property has no atp.Splitkey due to atpVariation (PropertySetPattern).</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> xml.sequenceOffset=60</p>

Table A.707: McGroupDataRefSet

<b>Class</b>	<b>McParameterElementGroup</b>			
<b>Note</b>	Denotes a group of calibration parameters which are handled by the RTE as one data structure.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	McSwEmulationMethodSupport.elementGroup			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ramLocation	VariableDataPrototype	0..1	ref	Refers to the RAM location of this parameter group. To be used for the init-RAM method.
romLocation	ParameterData Prototype	0..1	ref	Refers to the ROM location of this parameter group. To be used for the init-RAM method.
shortLabel	Identifier	0..1	attr	<p>Assigns a name to this element.</p> <p><b>Tags:</b> xml.sequenceOffset=-100</p>

Table A.708: McParameterElementGroup

<b>Class</b>	<b>McSupportData</b>			
<b>Note</b>	Root element for all measurement and calibration support data related to one Implementation artifact on an ECU. There shall be one such element related to the RTE implementation (if it owns MC data) and a separate one for each module or component, which owns private MC data.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	Implementation.mcSupport			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	McSupportData			
emulation Support	<a href="#">McSwEmulationMethodSupport</a>	*	aggr	Describes the calibration method used by the RTE. This information is not needed for A2L generation, but to setup software emulation in the ECU. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=emulationSupport, emulationSupport.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
mcParameter Instance	<a href="#">McDataInstance</a>	*	aggr	A data instance to be used for calibration. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=mcParameterInstance.shortName, mcParameterInstance.variationPoint.shortLabel vh.latestBindingTime=postBuild
mcVariable Instance	<a href="#">McDataInstance</a>	*	aggr	A data instance to be used for measurement. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=mcVariableInstance.shortName, mcVariableInstance.variationPoint.shortLabel vh.latestBindingTime=postBuild
measurable System ConstantValues	<a href="#">SwSystemconstantValueSet</a>	*	ref	Sets of system constant values to be transferred to the MCD system, because the system constants have been specified with "swCalibrationAccess" = readonly.
rptSupportData	<a href="#">RptSupportData</a>	0..1	aggr	The rapid prototyping support data belonging to this implementation. The aggregation is <<atpSplitable>> because in case of an already existing BSW Implementation model, this description will be added later in the process, namely at code generation time. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=rptSupportData

**Table A.709: McSupportData**

Class	McSwEmulationMethodSupport			
<b>Note</b>	<p>This denotes the method used by the RTE to handle the calibration data. It is published by the RTE generator and can be used e.g. to generate the corresponding emulation method in a Complex Driver. According to the actual method given by the category attribute, not all attributes are always needed:</p> <ul style="list-style-type: none"> <li>• double pointered method: only baseReference is mandatory</li> <li>• single pointered method: only referenceTable is mandatory</li> <li>• initRam method: only elementGroup(s) are mandatory</li> </ul> <p>Note: For single/double pointered method the group locations are implicitly accessed via the reference table and their location can be found from the initial values in the M1 model of the respective pointers. Therefore, the description of elementGroups is not needed in these cases. Likewise, for double pointered method the reference table description can be accessed via the M1 model under baseReference.</p>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">McSupportData.emulationSupport</a>			
Attribute	Type	Mult.	Kind	Note
baseReference	<a href="#">VariableDataPrototype</a>	0..1	ref	Refers to the base pointer in case of the double-pointered method.
category	<a href="#">Identifier</a>	0..1	attr	Identifies the actual method. The possible names shall correspond to the symbols of the ECU configuration parameter for the calibration method of the RTE, and can include vendor specific methods. <b>Tags:</b> xml.sequenceOffset=-90





Class	McSwEmulationMethodSupport			
elementGroup	<a href="#">McParameterElementGroup</a>	*	aggr	Denotes the grouping of calibration parameters in the actual RTE code. Depending on the category, this information maybe required to set up the emulation code.
referenceTable	<a href="#">VariableDataPrototype</a>	0..1	ref	Refers to the pointer table in case of the single-pointered method.
shortLabel	<a href="#">Identifier</a>	0..1	attr	Assigns a name to this element. <b>Tags:</b> xml.sequenceOffset=-100

**Table A.710: McSwEmulationMethodSupport**

Class	MeasuredExecutionTime			
Note	Specifies the ExecutionTime which has been gathered using measurement means.			
Base	<a href="#">ARObject</a> , <a href="#">ExecutionTime</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	ResourceConsumption.executionTime			
Attribute	Type	Mult.	Kind	Note
maximum ExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum measured execution time.
minimum ExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The minimum measured execution time.
nominal ExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The nominal measured execution time.

**Table A.711: MeasuredExecutionTime**

Class	MeasuredHeapUsage			
Note	The heap usage has been measured.			
Base	<a href="#">ARObject</a> , <a href="#">HeapUsage</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	ResourceConsumption.heapUsage			
Attribute	Type	Mult.	Kind	Note
averageMemory Consumption	PositiveInteger	0..1	attr	The average heap usage measured. Unit: byte.
maximum Memory Consumption	PositiveInteger	0..1	attr	The maximum heap usage measured. Unit: byte.
minimum Memory Consumption	PositiveInteger	0..1	attr	The minimum heap usage measured. Unit: byte.
testPattern	String	0..1	attr	Description of the test pattern used to acquire the measured values.

**Table A.712: MeasuredHeapUsage**

Class	MeasuredStackUsage			
Note	The stack usage has been measured.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">StackUsage</a>			
Aggregated by	ResourceConsumption.stackUsage			
Attribute	Type	Mult.	Kind	Note
averageMemory Consumption	PositiveInteger	0..1	attr	The average stack usage measured. Unit: byte.





Class	MeasuredStackUsage			
maximum Memory Consumption	PositiveInteger	0..1	attr	The maximum stack usage measured. Unit: byte.
minimum Memory Consumption	PositiveInteger	0..1	attr	The minimum stack usage measured. Unit: byte.
testPattern	String	0..1	attr	Description of the test pattern used to acquire the measured values.

**Table A.713: MeasuredStackUsage**

Enumeration	MemoryAllocationKeywordPolicyType
Note	Enumeration to specify the name pattern of the Memory Allocation Keyword.
Aggregated by	<a href="#">SwAddrMethod.memoryAllocationKeywordPolicy</a>
Literal	Description
addrMethodShort Name	The MemorySection shortNames of referring MemorySections and therefore the belonging Memory Allocation Keywords in the code are build with the shortName of the SwAddrMethod. This is the default value if the attribute does not exist. <b>Tags:</b> atp.EnumerationLiteralIndex=0
addrMethodShort NameAndAlignment	The MemorySection shortNames of referring MemorySections and therefore the belonging Memory Allocation Keywords in the code are build with the shortName of the SwAddrMethod and a variable alignment postfix. Thereby the alignment postfix needs to be consistent with the alignment attribute of the related MemorySection. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.714: MemoryAllocationKeywordPolicyType**

Class	MemorySection			
Note	<p>Provides a description of an abstract memory section used in the Implementation for code or data. It shall be declared by the Implementation Description of the module or component, which actually allocates the memory in its code. This means in case of data prototypes which are allocated by the RTE, that the generated Implementation Description of the RTE shall contain the corresponding MemorySections. The attribute "symbol" (if symbol is missing: "shortName") defines the module or component specific section name used in the code. For details see the document "Specification of Memory Mapping". Typically the section name is build according the pattern:</p> <p>&lt;SwAddrMethod shortName&gt;[_&lt;further specialization nominator&gt;][_&lt;alignment&gt;] where</p> <ul style="list-style-type: none"><li>• [<b>&lt;SwAddrMethod shortName&gt;</b>] is the shortName of the referenced SwAddrMethod</li><li>• [<b>&lt;further specialization nominator&gt;</b>] is an optional infix to indicate the specialization in the case that several MemorySections for different purpose of the same Implementation Description referring to the same or equally named SwAddrMethods.</li><li>• [<b>&lt;alignment&gt;</b>] is the alignment attributes value and is only applicable in the case that the memory AllocationKeywordPolicy value of the referenced SwAddrMethod is set to addrMethodShortNameAnd Alignment</li></ul> <p>MemorySection used to Implement the code of RunnableEntitys and BswSchedulableEntitys shall have a symbol (if missing: shortName) identical to the referred SwAddrMethod to conform to the generated RTE header files.</p> <p>In addition to the section name described above, a prefix is used in the corresponding macro code in order to define a name space. This prefix is by default given by the shortName of the BswModule Description resp. the SwComponentType. It can be superseded by the prefix attribute.</p>			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	ResourceConsumption.memorySection			
Attribute	Type	Mult.	Kind	Note





Class	MemorySection			
alignment	AlignmentType	0..1	attr	The attribute describes the typical alignment of objects within this memory section.
executableEntity	<a href="#">ExecutableEntity</a>	*	ref	Reference to the ExecutableEntities located in this section. This allows to locate different Executable Entities in different sections even if the associated Sw Addrmethod is the same. This is applicable to code sections only.
prefix	<a href="#">SectionNamePrefix</a>	0..1	ref	The prefix used to set the memory section's namespace in the code. The existence of a prefix element supersedes rules for a default prefix (such as the Bsw ModuleDescription's shortName). This allows the user to define several name spaces for memory sections within the scope of one module, cluster or SWC.
size	PositiveInteger	0..1	attr	The size in bytes of the section.
swAddrmethod	<a href="#">SwAddrMethod</a>	0..1	ref	This association indicates that this module specific (abstract) memory section is part of an overall SwAddr Method, referred by the upstream declarations (e.g. calibration parameters, data element prototypes, code entities) which share a common addressing strategy. This can be evaluated for the ECU configuration of the build support. This association shall always be declared by the Implementation description of the module or component, which allocates the memory in its code. This means in case of data prototypes which are allocated by the RTE, that the software components only declare the grouping of its data prototypes to SwAddrMethods, and the generated Implementation Description of the RTE actually sets up this association.
symbol	<a href="#">Identifier</a>	0..1	attr	Defines the section name as explained in the main description. By using this attribute for code generation (instead of the shortName) it is possible to define several different MemorySections having the same name - e.g. symbol = CODE - but using different sectionName Prefixes.

**Table A.715: MemorySection**

Class	MemorySectionLocation			
Note	Specifies in which hardware ProvidedMemorySegment the softwareMemorySection is located.			
Base	ARObject			
Aggregated by	<a href="#">ExecutionTime.memorySectionLocation</a>			
Attribute	Type	Mult.	Kind	Note
provided Memory	<a href="#">HwElement</a>	0..1	ref	Reference to the hardware ProvidedMemorySegment.
software MemorySection	<a href="#">MemorySection</a>	0..1	ref	Reference to the MemorySection which is mapped on a certain hardware memory segment.

**Table A.716: MemorySectionLocation**

Class	MetaDatumItem			
Note	This meta-class represents a single meta-data item.			
Base	ARObject			
Aggregated by	<a href="#">MetaDatumItemSet.metaDatumItem</a>			





Class	MetaDatum			
Attribute	Type	Mult.	Kind	Note
length	PositiveInteger	0..1	attr	This attribute determines the length of the <code>MetaDatum</code> at run-time. The length is given in bytes.
metaDatumType	<a href="#">TextValueSpecification</a>	0..1	aggr	This aggregation contributes the specification of the concrete meta-data item type.

**Table A.717: MetaDatum**

Class	MetaDatumSet			
Note	This meta-class represents the ability to define a set of meta-data items to be used in <a href="#">SenderReceiverInterfaces</a> .			
Base	<code>ARObject</code>			
Aggregated by	<a href="#">SenderReceiverInterface.metaDatumSet</a>			
Attribute	Type	Mult.	Kind	Note
dataElement	<a href="#">VariableDataPrototype</a>	*	ref	This reference identifies the dataElement for which the ordered list of meta-data items is defined.
metaDatum (ordered)	<a href="#">MetaDatum</a>	*	aggr	This aggregation represents the ordered definition of meta-data items.

**Table A.718: MetaDatumSet**

Enumeration	MirroringProtocolEnum			
Note	Enumeration that defines the supported bus mirroring protocol options) with two literals. This Enumeration is only used by the AUTOSAR Classic Platform.			
Aggregated by	<a href="#">BusMirrorChannelMapping.mirroringProtocol</a>			
Literal	Description			
none	mirroringProtocol is not used <b>Tags:</b> atp.EnumerationLiteralIndex=1			
version1	version1 of the mirroringProtocol is used <b>Tags:</b> atp.EnumerationLiteralIndex=0			

**Table A.719: MirroringProtocolEnum**

Class	«atpMixedString» <i>MixedContentForParagraph</i> (abstract)			
Note	This mainly represents the text model of a full blown paragraph within a documentation.			
Base	<code>ARObject</code>			
Subclasses	<a href="#">LParagraph</a> , <code>SIParagraph</code>			
Attribute	Type	Mult.	Kind	Note
br	Br	1	aggr	This element is the same as function here as in a HTML document i.e. it forces a line break. <b>Tags:</b> xml.sequenceOffset=40
e	EmphasisText	1	aggr	This is emphasized text. <b>Tags:</b> xml.sequenceOffset=70
ft	SIParagraph	1	aggr	This is a foot note within a paragraph.
ie	IndexEntry	1	aggr	This is an index entry. <b>Tags:</b> xml.sequenceOffset=110
std	<a href="#">Std</a>	1	aggr	This is a reference to a standard. <b>Tags:</b> xml.sequenceOffset=120





Class	«atpMixedString» <b>MixedContentForParagraph</b> (abstract)			
sub	Superscript	1	attr	This is subscript text. <b>Tags:</b> xml.sequenceOffset=100
sup	Superscript	1	attr	This is superscript text. <b>Tags:</b> xml.sequenceOffset=90
trace	<a href="#">Traceable</a>	1	ref	This allows to place an arbitrary reference to a traceable object in documentation.
tt	Tt	1	aggr	This is a technical term. <b>Tags:</b> xml.sequenceOffset=30
xdoc	<a href="#">Xdoc</a>	1	aggr	This is a reference to a printable external document. <b>Tags:</b> xml.sequenceOffset=130
xfile	<a href="#">Xfile</a>	1	aggr	This represents a reference to an external file which usually cannot be printed. <b>Tags:</b> xml.sequenceOffset=140
xref	Xref	1	aggr	This is a cross reference. <b>Tags:</b> xml.sequenceOffset=50
xrefTarget	<a href="#">XrefTarget</a>	1	aggr	This element specifies a reference target which can be scattered throughout the text. <b>Tags:</b> xml.sequenceOffset=60

**Table A.720: MixedContentForParagraph**

Class	<b>ModeAccessPoint</b>			
<b>Note</b>	A ModeAccessPoint is required by a RunnableEntity owned by a Mode Manager or Mode User. Its semantics implies the ability to access the current mode (provided by the RTE) of a ModeDeclaration GroupPrototype's ModeDeclarationGroup.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">RunnableEntity.modeAccessPoint</a>			
Attribute	Type	Mult.	Kind	Note
ident	ModeAccessPointIdent	0..1	aggr	The aggregation in the role ident provides the ability to make the ModeAccessPoint identifiable. From the semantical point of view, the ModeAccessPoint is considered a first-class Identifiable and therefore the aggregation in the role ident shall always exist (until it may be possible to let ModeAccessPoint directly inherit from Identifiable). <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> xml.sequenceOffset=-100
modeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	iref	The mode declaration group that is accessed by this runnable. <b>Tags:</b> xml.typeElement=true <b>InstanceRef implemented by:</b> ModeGroupInAtomicSwc InstanceRef

**Table A.721: ModeAccessPoint**

Enumeration	<b>ModeActivationKind</b>
<b>Note</b>	Kind of mode switch condition used for activation of an event, as further described for each enumeration field.
<b>Aggregated by</b>	<a href="#">BswModeSwitchEvent.activation</a> , <a href="#">SwcModeSwitchEvent.activation</a>
<b>Literal</b>	<b>Description</b>
onEntry	On entering the referred mode. <b>Tags:</b> atp.EnumerationLiteralIndex=0







Enumeration	ModeActivationKind
onExit	On exiting the referred mode. <b>Tags:</b> atp.EnumerationLiteralIndex=1
onTransition	On transition of the 1st referred mode to the 2nd referred mode. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.722: ModeActivationKind**

Class	ModeDeclaration			
<b>Note</b>	Declaration of one Mode. The name and semantics of a specific mode is not defined in the meta-model.			
<b>Base</b>	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	AtpClassifier.atpFeature, ModeDeclarationGroup.modeDeclaration			
Attribute	Type	Mult.	Kind	Note
value	PositiveInteger	0..1	attr	The RTE shall take the value of this attribute for generating the source code representation of this Mode Declaration.

**Table A.723: ModeDeclaration**

Class	ModeDeclarationGroup			
<b>Note</b>	A collection of Mode Declarations. Also, the initial mode is explicitly identified. <b>Tags:</b> atp.recommendedPackage=ModeDeclarationGroups			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable, UploadableDesignElement, UploadablePackageElement			
<b>Aggregated by</b>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
initialMode	ModeDeclaration	0..1	ref	The initial mode of the ModeDeclarationGroup. This mode is active before any mode switches occurred.
mode Declaration	ModeDeclaration	*	aggr	The ModeDeclarations collected in this ModeDeclaration Group. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=modeDeclaration.shortName, mode Declaration.variationPoint.shortLabel vh.latestBindingTime=blueprintDerivationTime
modeManager ErrorBehavior	ModeErrorBehavior	0..1	aggr	This represents the ability to define the error behavior expected by the mode manager in case of errors on the mode user side (e.g. terminated mode user). This Attribute is only used by the AUTOSAR Classic Platform.
modeTransition	ModeTransition	*	aggr	This represents the available ModeTransitions of the ModeDeclarationGroup This Attribute is only used by the AUTOSAR Classic Platform.
modeUserError Behavior	ModeErrorBehavior	0..1	aggr	This represents the definition of the error behavior expected by the mode user in case of errors on the mode manager side (e.g. terminated mode manager). This Attribute is only used by the AUTOSAR Classic Platform.





Class	ModeDeclarationGroup			
onTransition Value	PositiveInteger	0..1	attr	The value of this attribute shall be taken into account by the RTE generator for programmatically representing a value used for the transition between two statuses. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.724: ModeDeclarationGroup**

Class	ModeDeclarationGroupPrototype			
Note	The ModeDeclarationGroupPrototype specifies a set of Modes (ModeDeclarationGroup) which is provided or required in the given context.			
Base	ARObject, <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">BswModuleDescription.providedModeGroup</a> , <a href="#">BswModuleDescription.requiredModeGroup</a> , <a href="#">FirewallStateSwitchInterface.firewallStateMachine</a> , <a href="#">FunctionGroupSet.functionGroup</a> , <a href="#">ModeSwitchInterface.modeGroup</a> , <a href="#">Process.processStateMachine</a> , <a href="#">StateManagementStateNotification.stateMachine</a>			
Attribute	Type	Mult.	Kind	Note
swCalibration Access	<a href="#">SwCalibrationAccess Enum</a>	0..1	attr	This allows for specifying whether or not the enclosing ModeDeclarationGroupPrototype can be measured at run-time. This Attribute is only used by the AUTOSAR Classic Platform.
type	<a href="#">ModeDeclarationGroup</a>	0..1	tref	The "collection of ModeDeclarations" (= ModeDeclarationGroup) supported by a component <b>Stereotypes:</b> isOfType

**Table A.725: ModeDeclarationGroupPrototype**

Class	ModeDeclarationGroupPrototypeMapping			
Note	Defines the mapping of two particular ModeDeclarationGroupPrototypes (in the given context) that are unequally named and/or require a reference to a ModeDeclarationMappingSet in order to become compatible by definition of ModeDeclarationMappings.			
Base	ARObject			
Aggregated by	<a href="#">ModeInterfaceMapping.modeMapping</a>			
Attribute	Type	Mult.	Kind	Note
firstModeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	ModeDeclarationGroupPrototype to be mapped.
mode Declaration MappingSet	<a href="#">ModeDeclaration MappingSet</a>	0..1	ref	This represents the available mappings of Mode Declarations in the context of this ModeDeclarationGroup Prototype.
secondMode Group	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	ModeDeclarationGroupPrototype to be mapped.

**Table A.726: ModeDeclarationGroupPrototypeMapping**

Class	ModeDeclarationMapping			
Note	This meta-class implements a concrete mapping of two <a href="#">ModeDeclarations</a> .			
Base	ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">ModeDeclarationMappingSet.modeDeclarationMapping</a>			
Attribute	Type	Mult.	Kind	Note





Class	ModeDeclarationMapping			
firstMode	<a href="#">ModeDeclaration</a>	*	ref	This represents the first ModeDeclaration of the Mode DeclarationMapping. This reference has the multiplicity 0 ..* to support use cases where e.g. one mode of the mode user is mapped to several modes of the mode manager.
secondMode	<a href="#">ModeDeclaration</a>	0..1	ref	This represents the second ModeDeclaration of the Mode DeclarationMapping.

**Table A.727: ModeDeclarationMapping**

Class	ModeDeclarationMappingSet			
Note	This meta-class implements a container for <a href="#">ModeDeclarationGroupMappingS</a> Tags: <a href="#">atp.recommendedPackage=PortInterfaceMappingSets</a>			
Base	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
mode Declaration Mapping	<a href="#">ModeDeclaration Mapping</a>	*	aggr	This represents the collection of ModeDeclaration Mappings owned by the enclosing ModeDeclaration MappingSet.

**Table A.728: ModeDeclarationMappingSet**

Class	ModeDrivenTransmissionModeCondition			
Note	The condition defined by this class evaluates to true if one of the referenced modeDeclarations (OR associated) is active. All referenced modeDeclarations shall be from the same ModeDeclarationGroup. The condition is used to define which TransmissionMode shall be activated using Com_SwitchIpduTx Mode.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">TransmissionModeDeclaration.modeDrivenFalseCondition</a> , <a href="#">TransmissionModeDeclaration.modeDriven TrueCondition</a>			
Attribute	Type	Mult.	Kind	Note
mode Declaration	<a href="#">ModeDeclaration</a>	*	ref	Reference to one modeDeclaration which is OR associated in the context of the ModeDrivenTransmission ModeCondition.

**Table A.729: ModeDrivenTransmissionModeCondition**

Class	ModeErrorBehavior			
Note	This represents the ability to define the error behavior in the context of mode handling.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">ModeDeclarationGroup.modeManagerErrorBehavior</a> , <a href="#">ModeDeclarationGroup.modeUserErrorBehavior</a>			
Attribute	Type	Mult.	Kind	Note
defaultMode	<a href="#">ModeDeclaration</a>	0..1	ref	This represents the ModeDeclaration that is considered the error mode in the context of the enclosing Mode DeclarationGroup.
errorReaction Policy	<a href="#">ModeErrorReaction PolicyEnum</a>	0..1	attr	This represents the ability to define the policy in terms of which default model shall apply in case an error occurs.

**Table A.730: ModeErrorBehavior**

<b>Enumeration</b>	<b>ModeErrorReactionPolicyEnum</b>
<b>Note</b>	This represents the ability to specify the reaction on a mode error.
<b>Aggregated by</b>	<a href="#">ModeErrorBehavior.errorReactionPolicy</a>
<b>Literal</b>	<b>Description</b>
defaultMode	This represents the ability to switch to the defaultMode in case of a mode error. <b>Tags:</b> atp.EnumerationLiteralIndex=0
lastMode	This represents the ability to keep the last mode in case of a mode error. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.731: ModeErrorReactionPolicyEnum**

<b>Class</b>	<b>ModelInBswInstanceRef</b>			
<b>Note</b>	Instance reference to be capable of referencing a specific ModeDeclaration of a ModeDeclarationGroup Prototype utilized in a BSW module.			
<b>Base</b>	<i>ARObject</i> , <i>ModelInSwcBswInstanceRef</i>			
<b>Aggregated by</b>	TimingModelInstance.modelInstance			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
contextBsw Implementation	<a href="#">BswImplementation</a>	0..1	ref	Specifies the BSW implementation that manifests the context. <b>Tags:</b> xml.sequenceOffset=10 This Attribute is only used by the AUTOSAR Classic Platform.
contextMode Declaration GroupPrototype	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	Specifies the mode declaration group prototype that manifests the context. <b>Tags:</b> xml.sequenceOffset=20
targetMode Declaration	<a href="#">ModeDeclaration</a>	0..1	ref	Specifies the specific mode declaration in the given context. <b>Tags:</b> xml.sequenceOffset=30

**Table A.732: ModelInBswInstanceRef**

<b>Class</b>	<b>ModelInSwcInstanceRef</b>			
<b>Note</b>	Instance reference to be capable of referencing a ModeDeclaration at a specific Mode Switch Port of a SW-C.			
<b>Base</b>	<i>ARObject</i> , <i>AtpInstanceRef</i> , <i>ModelInSwcBswInstanceRef</i>			
<b>Aggregated by</b>	TimingModelInstance.modelInstance			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
base	<a href="#">SwComponentType</a>	0..1	ref	Specifies the SW component representing the base of the context. <b>Stereotypes:</b> atpDerived <b>Tags:</b> xml.sequenceOffset=10
context Component	<a href="#">SwComponent Prototype</a>	*	ref	Specifies the SW component prototype representing the context. <b>Tags:</b> xml.sequenceOffset=20
contextMode Declaration GroupPrototype	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	Specifies the mode declaration group prototype that manifests the context. <b>Tags:</b> xml.sequenceOffset=40
contextPort	<a href="#">PortPrototype</a>	0..1	ref	Specifies the port prototype representing the context. <b>Tags:</b> xml.sequenceOffset=30
targetMode Declaration	<a href="#">ModeDeclaration</a>	0..1	ref	Specifies the specific mode declaration in the given context. <b>Tags:</b> xml.sequenceOffset=50

**Table A.733: ModelInSwcInstanceRef**

<b>Class</b>	<b>ModelInterfaceMapping</b>			
<b>Note</b>	Defines the mapping of ModeDeclarationGroupPrototypes in context of two different ModelInterfaces.			
<b>Base</b>	ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PortInterfaceMapping</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	PortInterfaceMappingSet.portInterfaceMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeMapping	<a href="#">ModeDeclarationGroupPrototypeMapping</a>	0..1	aggr	Mapping of two ModeDeclarationGroupPrototypes in two different ModelInterfaces

**Table A.734: ModelInterfaceMapping**

<b>Class</b>	<b>ModePortAnnotation</b>			
<b>Note</b>	Annotation to a port used for calibration regarding a certain ModeDeclarationGroupPrototype.			
<b>Base</b>	ARObject, GeneralAnnotation			
<b>Aggregated by</b>	<a href="#">PortPrototype.modePortAnnotation</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	0..1	ref	The instance of annotated ModeDeclarationGroup Prototype.

**Table A.735: ModePortAnnotation**

<b>Class</b>	<b>ModeRequestTypeMap</b>			
<b>Note</b>	Specifies a mapping between a <a href="#">ModeDeclarationGroup</a> and an <a href="#">ImplementationDataType</a> . This <a href="#">ImplementationDataType</a> shall be used to implement the <a href="#">ModeDeclarationGroup</a> .			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">DataTypeMappingSet.modeRequestTypeMap</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
implementationDataType	<a href="#">AbstractImplementationDataType</a>	0..1	ref	This is the corresponding <a href="#">AbstractImplementationDataType</a> . It shall be modeled along the idea of an "unsigned integer-like" data type.
modeGroup	<a href="#">ModeDeclarationGroup</a>	0..1	ref	This is the corresponding <a href="#">ModeDeclarationGroup</a> .

**Table A.736: ModeRequestTypeMap**

<b>Class</b>	<b>ModeSwitchEventTriggeredActivity</b>			
<b>Note</b>	This meta-class defines an activity of the NvBlockSwComponentType for a specific NvBlock which is triggered by a ModeSwitchEvent.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">NvBlockDescriptor.modeSwitchEventTriggeredActivity</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
role	<a href="#">Identifier</a>	0..1	attr	This attribute indicates which service of the NvM for the NvBlock shall be requested.
swcModeSwitchEvent	<a href="#">SwcModeSwitchEvent</a>	0..1	ref	This reference identifies the SwcModeSwitchEvent that triggers the activity.

**Table A.737: ModeSwitchEventTriggeredActivity**

<b>Class</b>	<b>ModeSwitchInterface</b>			
<b>Note</b>	A mode switch interface declares a <a href="#">ModeDeclarationGroupPrototype</a> to be sent and received. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">PortInterface</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	0..1	aggr	The <a href="#">ModeDeclarationGroupPrototype</a> of this mode interface.

**Table A.738: ModeSwitchInterface**

<b>Class</b>	<b>ModeSwitchPoint</b>			
<b>Note</b>	A <a href="#">ModeSwitchPoint</a> is required by a <a href="#">RunnableEntity</a> owned a Mode Manager. Its semantics implies the ability to initiate a mode switch.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractAccessPoint</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">RunnableEntity.modeSwitchPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	0..1	iref	The mode declaration group that is switched by this runnable. <b>InstanceRef implemented by:</b> PModeGroupInAtomicSwcInstanceRef

**Table A.739: ModeSwitchPoint**

<b>Class</b>	<b>ModeSwitchReceiverComSpec</b>			
<b>Note</b>	Communication attributes of <a href="#">RPortPrototypes</a> with respect to mode communication			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">RPortComSpec</a>			
<b>Aggregated by</b>	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
enhancedModeApi	Boolean	0..1	attr	This controls the creation of the enhanced mode API that returns information about the previous mode and the next mode. If set to "true" the enhanced mode API is supposed to be generated. For more details please refer to the SWS_RTE.
modeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	0..1	ref	<a href="#">ModeDeclarationGroupPrototype</a> (of the same Port Interface) to which these communication attributes apply. <b>Stereotypes:</b> atpIdentityContributor
supportsAsynchronousModeSwitch	Boolean	0..1	attr	This attribute controls the behavior of the corresponding <a href="#">RPortPrototype</a> with respect to the question whether it can deal with asynchronous mode switch requests, i.e. if set to true, the <a href="#">RPortPrototype</a> is able to deal with an asynchronous mode switch request.

**Table A.740: ModeSwitchReceiverComSpec**

<b>Class</b>	<b>ModeSwitchSenderComSpec</b>			
<b>Note</b>	Communication attributes of <a href="#">PPortPrototypes</a> with respect to mode communication			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">PPortComSpec</a>			
<b>Aggregated by</b>	<a href="#">AbstractProvidedPortPrototype.providedComSpec</a> , <a href="#">PortPrototypeBlueprint.providedComSpec</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	ModeSwitchSenderComSpec			
enhancedModeApi	Boolean	0..1	attr	This controls the creation of the enhanced mode API that returns information about the previous mode and the next mode. If set to "true" the enhanced mode API is supposed to be generated. For more details please refer to the SWS_RTE.
modeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	0..1	ref	ModeDeclarationGroupPrototype (of the same Port Interface) to which these communication attributes apply. <b>Stereotypes:</b> atpIdentityContributor
modeSwitchedAck	<a href="#">ModeSwitchedAckRequest</a>	0..1	aggr	If this aggregation exists an acknowledgement for the successful processing of the mode switch request is required.
queueLength	PositiveInteger	0..1	attr	Length of call queue on the mode user side. The queue is implemented by the RTE. The value shall be greater or equal to 1. Setting the value of queueLength to 1 implies that incoming requests are rejected while another request that arrived earlier is being processed.

**Table A.741: ModeSwitchSenderComSpec**

Class	ModeSwitchedAckEvent			
Note	This event is raised when the referenced ModeSwitchPoint has been processed or an error occurred.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
eventSource	<a href="#">ModeSwitchPoint</a>	0..1	ref	The referenced ModeSwitchPoint raises this Mode SwitchedAckEvent when the ModeSwitchPoint has been processed.

**Table A.742: ModeSwitchedAckEvent**

Class	ModeSwitchedAckRequest			
Note	Requests acknowledgements that a mode switch has been proceeded successfully			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">ModeSwitchSenderComSpec.modeSwitchedAck</a>			
Attribute	Type	Mult.	Kind	Note
timeout	TimeValue	0..1	attr	Number of seconds before an error is reported or in case of allowed redundancy, the value is sent again.

**Table A.743: ModeSwitchedAckRequest**

Class	ModeTransition			
Note	This meta-class represents the ability to describe possible ModeTransitions in the context of a Mode DeclarationGroup.			
Base	<a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">ModeDeclarationGroup.modeTransition</a>			
Attribute	Type	Mult.	Kind	Note
enteredMode	<a href="#">ModeDeclaration</a>	0..1	ref	This represents the entered model of the ModeTransition.
exitedMode	<a href="#">ModeDeclaration</a>	0..1	ref	This represents the exited mode of the ModeTransition

**Table A.744: ModeTransition**



<b>Class</b>	<b>MultidimensionalTime</b>			
<b>Note</b>	Specifies a time value based on [13] see [TPS_GST_00354].			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">AgeConstraint.maximum</a> , <a href="#">AgeConstraint.minimum</a> , <a href="#">AnalyzedExecutionTime.bestCaseExecutionTime</a> , <a href="#">AnalyzedExecutionTime.worstCaseExecutionTime</a> , <a href="#">ArbitraryEventTriggering.maximumDistance</a> , <a href="#">ArbitraryEventTriggering.minimumDistance</a> , <a href="#">BurstPatternEventTriggering.minimumInterArrivalTime</a> , <a href="#">BurstPatternEventTriggering.patternJitter</a> , <a href="#">BurstPatternEventTriggering.patternLength</a> , <a href="#">BurstPatternEventTriggering.patternPeriod</a> , <a href="#">ConcretePatternEventTriggering.offset</a> , <a href="#">ConcretePatternEventTriggering.patternJitter</a> , <a href="#">ConcretePatternEventTriggering.patternLength</a> , <a href="#">ConcretePatternEventTriggering.patternPeriod</a> , <a href="#">ConfidenceInterval.lowerBound</a> , <a href="#">ConfidenceInterval.upperBound</a> , <a href="#">ExecutionTimeConstraint.maximum</a> , <a href="#">ExecutionTimeConstraint.minimum</a> , <a href="#">IoHwAbstractionServerAnnotation.age</a> , <a href="#">LatencyTimingConstraint.maximum</a> , <a href="#">LatencyTimingConstraint.minimum</a> , <a href="#">LatencyTimingConstraint.nominal</a> , <a href="#">MeasuredExecutionTime.maximumExecutionTime</a> , <a href="#">MeasuredExecutionTime.minimumExecutionTime</a> , <a href="#">MeasuredExecutionTime.nominalExecutionTime</a> , <a href="#">OffsetTimingConstraint.maximum</a> , <a href="#">OffsetTimingConstraint.minimum</a> , <a href="#">PeriodicEventTriggering.jitter</a> , <a href="#">PeriodicEventTriggering.minimumInterArrivalTime</a> , <a href="#">PeriodicEventTriggering.period</a> , <a href="#">ReceiverAnnotation.signalAge</a> , <a href="#">RoughEstimateOfExecutionTime.estimatedExecutionTime</a> , <a href="#">SimulatedExecutionTime.maximumExecutionTime</a> , <a href="#">SimulatedExecutionTime.minimumExecutionTime</a> , <a href="#">SimulatedExecutionTime.nominalExecutionTime</a> , <a href="#">SporadicEventTriggering.jitter</a> , <a href="#">SporadicEventTriggering.maximumInterArrivalTime</a> , <a href="#">SporadicEventTriggering.minimumInterArrivalTime</a> , <a href="#">SporadicEventTriggering.period</a> , <a href="#">SwDataDefProps.swRefreshTiming</a> , <a href="#">SynchronizationTimingConstraint.tolerance</a> , <a href="#">TDLETZoneClock.accuracyExt</a> , <a href="#">TDLETZoneClock.accuracyInt</a> , <a href="#">TimingClockSyncAccuracy.accuracy</a> , <a href="#">Trigger.triggerPeriod</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
cseCode	CseCodeType	0..1	attr	Specifies the time base by means of CSE codes.
cseCodeFactor	Integer	0..1	attr	The scaling factor for the time value based on the specified CSE code.

**Table A.745: MultidimensionalTime**

<b>Class</b>	<b>MultilanguageReferrable</b> (abstract)			
<b>Note</b>	Instances of this class can be referred to by their identifier (while adhering to namespace borders). They also may have a longName. But they are not considered to contribute substantially to the overall structure of an AUTOSAR description. In particular it does not contain other Referrables.			
<b>Base</b>	<i>ARObject</i> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">Caption</a> , <a href="#">DefItem</a> , <a href="#">DocumentationContext</a> , <a href="#">Identifiable</a> , <a href="#">SdgCaption</a> , <a href="#">TraceReferrable</a> , <a href="#">Traceable</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
longName	MultilanguageLong Name	0..1	aggr	This specifies the long name of the object. Long name is targeted to human readers and acts like a headline.

**Table A.746: MultilanguageReferrable**

<b>Class</b>	<b>MultiplexedIPdu</b>			
<b>Note</b>	A MultiplexedPdu (i.e. NOT a COM I-PDU) contains a DynamicPart, an optional StaticPart and a selector Field. In case of multiplexing this IPdu is routed between the Pdu Multiplexer and the Interface Layer. A multiplexer is used to define variable parts within an IPdu that may carry different signals. The receivers of such a IPdu can determine which signalPdus are transmitted by evaluating the selector field, which carries a unique selector code for each sub-part. <b>Tags:</b> atp.recommendedPackage=Pdus			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>







Class	MultiplexedIPdu			
dynamicPart	<a href="#">DynamicPart</a>	0..1	aggr	<p>According to the value of the selector field some parts of the IPdu have a different layout. In a complete System Description a MultiplexedIPdu shall contain a Dynamic Part. The following use cases support the multiplicity to be 0..1:</p> <ul style="list-style-type: none"> <li>• If a MultiplexedIPdu is received by a Pdu Gateway and is not delivered to the IPduM but routed directly to a bus interface then the content of the MultiplexedIPdu doesn't need to be described in the System Extract/Ecu Extract.</li> <li>• If a MultiplexedIPdu is received by an ECU which is only interested in the static part of the MultiplexedIPdu then the dynamicPart does not need to be described in the System Extract/Ecu Extract.</li> </ul> <p>atpVariation: Content of a multiplexed PDU can vary.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dynamicPart, dynamicPart.variation  Point.shortLabel  vh.latestBindingTime=postBuild</p>
selectorField ByteOrder	<a href="#">ByteOrderEnum</a>	0..1	attr	<p>This attribute defines the order of the bytes of the selector Field and the packing into the MultiplexedIPdu. Please consider that <a href="#">[constr_3247]</a> and <a href="#">[constr_3223]</a> are restricting the usage of this attribute.</p> <p>In a complete System Description this attribute is mandatory. If a MultiplexedPdu is received by a Pdu Gateway and is not delivered to the IPduM but routed directly to a bus interface then the content of the MultiplexedPdu doesn't need to be described in the System Extract/Ecu Extract. To support this use case the multiplicity is set to 0..1.</p>
selectorField Length	Integer	0..1	attr	<p>The size in bits of the selector field shall be configurable in a range of 1-16 bits. In a complete System Description this attribute is mandatory. If a MultiplexedPdu is received by a Pdu Gateway and is not delivered to the IPduM but routed directly to a bus interface then the content of the MultiplexedPdu doesn't need to be described in the System Extract/Ecu Extract. To support this use case the multiplicity is set to 0..1.</p>
selectorField StartPosition	Integer	0..1	attr	<p>This parameter is necessary to describe the position of the selector field within the IPdu.</p> <p>Note that the absolute position of the selectorField in the MultiplexedIPdu is determined by the definition of the selectorFieldByteOrder attribute of the Multiplexed Pdu. If Big Endian is specified, the start position indicates the bit position of the most significant bit in the IPdu. If Little Endian is specified, the start position indicates the bit position of the least significant bit in the IPdu. In AUTOSAR the bit counting is always set to "sawtooth" and the bit order is set to "Decreasing". The bit counting in byte 0 starts with bit 0 (least significant bit). The most significant bit in byte 0 is bit 7.</p> <p>In a complete System Description this attribute is mandatory. If a MultiplexedPdu is received by a Pdu Gateway and is not delivered to the IPduM but routed directly to a bus interface then the content of the MultiplexedPdu doesn't need to be described in the System Extract/Ecu Extract. To support this use case the multiplicity is set to 0..1.</p>





Class	MultiplexedIPdu			
staticPart	<a href="#">StaticPart</a>	0..1	aggr	The static part of the multiplexed IPdu is the same regardless of the selector field. The static part is optional. atpVariation: Content of a multiplexed PDU can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=staticPart, staticPart.variationPoint.shortLabel vh.latestBindingTime=postBuild
triggerMode	TriggerMode	0..1	attr	IPduM can be configured to send a transmission request for the new multiplexed IPdu to the PDU-Router because of the trigger conditions/ modes that are described in the TriggerMode enumeration. In a complete System Description this attribute is mandatory. If a MultiplexedPdu is received by a Pdu Gateway and is not delivered to the IPduM but routed directly to a bus interface then the content of the MultiplexedPdu doesn't need to be described in the System Extract/Ecu Extract. To support this use case the multiplicity is set to 0..1.
unusedBit Pattern	Integer	0..1	attr	AUTOSAR COM and AUTOSAR IPDUM are filling not used areas of an IPdu with this bit-pattern. This attribute is mandatory to avoid undefined behavior. This byte-pattern will be repeated throughout the IPdu. In a complete System Description this attribute is mandatory. If a MultiplexedPdu is received by a Pdu Gateway and is not delivered to the IPduM but routed directly to a bus interface then the content of the MultiplexedPdu doesn't need to be described in the System Extract/Ecu Extract. To support this use case the multiplicity is set to 0..1.

Table A.747: MultiplexedIPdu

Class	MultiplexedPart (abstract)			
Note	The StaticPart and the DynamicPart have common properties. Both can be separated in multiple segments within the multiplexed PDU.			
Base	ARObject			
Subclasses	<a href="#">DynamicPart</a> , <a href="#">StaticPart</a>			
Attribute	Type	Mult.	Kind	Note
segment Position	<a href="#">SegmentPosition</a>	*	aggr	The StaticPart and the DynamicPart can be separated in multiple segments within the multiplexed PDU. Therefore the StaticPart and the DynamicPart can contain multiple SegmentPositions.

Table A.748: MultiplexedPart

Class	NPdu			
Note	This is a Pdu of the Transport Layer. The main purpose of the TP Layer is to segment and reassemble IPdus. <b>Tags:</b> atp.recommendedPackage=Pdus			
Base	ARElement, ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

Table A.749: NPdu

<b>Class</b>	<b>NetworkEndpoint</b>			
<b>Note</b>	The network endpoint defines the network addressing (e.g. IP-Address or MAC multicast address).			
<b>Base</b>	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EthernetPhysicalChannel.networkEndpoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
fullyQualifiedDomainName	String	0..1	attr	Defines the fully qualified domain name (FQDN) e.g. some.example.host.
infrastructureServices	InfrastructureServices	0..1	aggr	Defines the network infrastructure services provided or consumed. This Attribute is only used by the AUTOSAR Classic Platform.
ipSecConfig	IPSecConfig	0..1	aggr	Optional IPSec configuration that provides security services for IP packets.
networkEndpointAddress	<a href="#">NetworkEndpointAddress</a>	*	aggr	Definition of a Network Address. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=networkEndpointAddress.ipv4Address, networkEndpointAddress.ipv6Address, networkEndpointAddress.macMulticastGroup xml.namePlural=NETWORK-ENDPOINT-ADDRESSES
priority	PositiveInteger	0..1	attr	Defines the frame priority where values from 0 (best effort) to 7 (highest) are allowed.

**Table A.750: NetworkEndpoint**

<b>Class</b>	<b>NetworkEndpointAddress</b> (abstract)			
<b>Note</b>	To build a valid network endpoint address there has to be either one MAC multicast group reference or an ipv4 configuration or an ipv6 configuration.			
<b>Base</b>	<i>ARObject</i>			
<b>Subclasses</b>	<a href="#">Ipv4Configuration</a> , <a href="#">Ipv6Configuration</a> , <a href="#">MacMulticastConfiguration</a>			
<b>Aggregated by</b>	<a href="#">NetworkEndpoint.networkEndpointAddress</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
—	—	—	—	—

**Table A.751: NetworkEndpointAddress**

<b>Class</b>	<b>NetworkSegmentIdentification</b>			
<b>Note</b>	This meta-class represents the ability to identify the PhysicalChannel on a system scope in a numerical way. One possible application of this approach is the Time Validation.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">GlobalTimeDomain.networkSegmentId</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
networkSegmentId	PositiveInteger	0..1	attr	This attribute represents the numerical identifier of a PhysicalChannel on system level scope.

**Table A.752: NetworkSegmentIdentification**

<b>Class</b>	<b>NmCluster</b> (abstract)			
<b>Note</b>	Set of NM nodes coordinated with use of the NM algorithm.			
<b>Base</b>	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">CanNmCluster</a> , <a href="#">FlexrayNmCluster</a> , <a href="#">J1939NmCluster</a> , <a href="#">UdpNmCluster</a>			





<b>Class</b>	<b>NmCluster</b> (abstract)			
<b>Aggregated by</b>	<a href="#">NmConfig.nmCluster</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
communication Cluster	<a href="#">CommunicationCluster</a>	0..1	ref	Association to a CommunicationCluster in the topology description.
nmChannel SleepMaster	Boolean	0..1	attr	This parameter shall be set to indicate if the sleep of this network can be absolutely decided by the local node only and that no other nodes can oppose that decision. This Attribute is only used by the AUTOSAR Classic Platform.
nmLightTimeout	TimeValue	0..1	attr	Defines the timeout (in seconds) after COMM_FULL_COMMUNICATION sub-state COMM_FULL_COM_READY_SLEEP is left.
nmNode	<a href="#">NmNode</a>	*	aggr	Collection of NmNodes of the NmCluster. <b>atpVariation:</b> Derived, because NmNode can be variable. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=nmNode.shortName, nmNode.variation Point.shortLabel vh.latestBindingTime=postBuild
nmNode Detection Enabled	Boolean	0..1	attr	Enables the Request Repeat Message Request support. Only valid if nmNodeEnabled is set to true. This Attribute is only used by the AUTOSAR Classic Platform.
nmNodeId Enabled	Boolean	0..1	attr	Enables the source node identifier. This Attribute is only used by the AUTOSAR Classic Platform.
nmPnc Participation	Boolean	0..1	attr	Defines whether this NmCluster contributes to the partial network mechanism.
nmRepeatMsg IndEnabled	Boolean	0..1	attr	Switch for enabling the Repeat Message Bit Indication. This Attribute is only used by the AUTOSAR Classic Platform.
nm Synchronizing Network	Boolean	0..1	attr	If this parameter is true, then this network is a synchronizing network for the NM coordination cluster which it belongs to. The network is expected to call Nm_SynchronizationPoint() at regular intervals. This Attribute is only used by the AUTOSAR Classic Platform.
pncCluster VectorLength	PositiveInteger	0..1	attr	Optionally defines the length of the PNC Vector per CommunicationCluster (and VLAN in case of UdpNm). If not defined then System.pncVectorLength applies. Should only make the PNC Vector shorter (or same length as defined in System.pncVectorLength).

**Table A.753: NmCluster**

<b>Class</b>	<b>NmConfig</b>			
<b>Note</b>	Contains the all configuration elements for AUTOSAR Nm. <b>Tags:</b> atp.recommendedPackage=NmConfigs			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	NmConfig			
nmCluster	<a href="#">NmCluster</a>	*	aggr	Collection of NM Clusters atpVariation: Derived, because cluster can be variable. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=nmCluster.shortName, nmCluster.variationPoint.shortLabel vh.latestBindingTime=postBuild
nmClusterCoupling	NmClusterCoupling	*	aggr	Collection of NmClusterCouplings atpVariation: Derived, because NmCluster can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=nmClusterCoupling, nmClusterCoupling.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.
nmIfEcu	<a href="#">NmEcu</a>	*	aggr	Collection of NM ECUs atpVariation: Derived, because EcuInstance can be variable. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=nmIfEcu.shortName, nmIfEcu.variationPoint.shortLabel vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.

Table A.754: NmConfig

Class	NmEcu			
<b>Note</b>	ECU on which NM is running. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">NmConfig.nmIfEcu</a>			
Attribute	Type	Mult.	Kind	Note
busDependentNmEcu	<a href="#">BusspecificNmEcu</a>	*	aggr	Cluster specific NmEcu attributes <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=busDependentNmEcu
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	Association to an ECUInstance in the topology description.
nmBusSynchronizationEnabled	Boolean	0..1	attr	Enables bus synchronization support.
nmComControlEnabled	Boolean	0..1	attr	Enables the Communication Control support.
nmCoordinator	NmCoordinator	0..1	aggr	Nm ECU may coordinate different clusters.
nmCycleTimeMainFunction	TimeValue	0..1	attr	The period between successive calls to the Main Function of the NM Interface in seconds.
nmPduRxIndicationEnabled	Boolean	0..1	attr	Switch for enabling the PDU Rx Indication.
nmRemoteSleepIndEnabled	Boolean	0..1	attr	Switch for enabling remote sleep indication support.
nmStateChangeIndEnabled	Boolean	0..1	attr	Enables the CAN Network Management state change notification.
nmUserDataEnabled	Boolean	0..1	attr	Switch for enabling user data support.

Table A.755: NmEcu

<b>Class</b>	<b>NmNode</b> (abstract)			
<b>Note</b>	The linking of NmEcus to NmClusters is realized via the NmNodes.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">CanNmNode</a> , <a href="#">FlexrayNmNode</a> , <a href="#">J1939NmNode</a> , <a href="#">UdpNmNode</a>			
<b>Aggregated by</b>	<a href="#">NmCluster.nmNode</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
controller	<a href="#">CommunicationController</a>	0..1	ref	Association to an CommunicationController in the topology description. This Attribute is only used by the AUTOSAR Classic Platform.
nmCoord Cluster	PositiveInteger	0..1	attr	NmCoordinationCluster identification number. This Attribute is only used by the AUTOSAR Classic Platform.
nmCoordinator Role	NmCoordinatorRole Enum	0..1	attr	This attribute indicates the role the NM Coordinator will have on this channel. This Attribute is only used by the AUTOSAR Classic Platform.
nmIfEcu	<a href="#">NmEcu</a>	0..1	ref	Reference to the NmEcu that contains this NmNode. (CommunicationController that is referenced by the Nm Node shall be contained in the EcuInstance that is referenced by the NmEcu). This Attribute is only used by the AUTOSAR Classic Platform.
nmNodeId	Integer	0..1	attr	Node identifier of local NmNode. Shall be unique in the NmCluster.
nmPassive ModeEnabled	Boolean	0..1	attr	Enables support of the Passive Mode. The passive mode is configurable per channel. This Attribute is only used by the AUTOSAR Classic Platform.
nmVariant	<a href="#">NmVariantEnum</a>	0..1	attr	Defines the functionality of Network Management.
rxNmPdu	<a href="#">NmPdu</a>	*	ref	receive NM Pdu. This Attribute is only used by the AUTOSAR Classic Platform.
txNmPdu	<a href="#">NmPdu</a>	*	ref	transmit NM Pdu This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.756: NmNode**

<b>Class</b>	<b>NmPdu</b>			
<b>Note</b>	Network Management Pdu <b>Tags:</b> atp.recommendedPackage=Pdus			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
iSignalToIPdu Mapping	<a href="#">ISignalToIPduMapping</a>	*	aggr	This optional aggregation is used to describe NmUser Data that is transmitted in the NmPdu. The counting of the startPosition starts at the beginning of the NmPdu regardless whether Cbv or Nid are used.
nmData Information	Boolean	0..1	attr	Defines if the Pdu contains NM Data. If the NmPdu does not aggregate any ISignalToIPduMappings it still may contain UserData that is set via Nm_SetUserData(). If the ISignalToIPduMapping exists then the nmDataInformation attribute shall be ignored.
nmVote Information	Boolean	0..1	attr	Defines if the Pdu contains NM Vote information.





Class	NmPdu			
unusedBitPattern	Integer	0..1	attr	AUTOSAR COM is filling not used areas of an Pdu with this bit-pattern. This attribute can only be used if the nmDataInformation attribute is set to true.

**Table A.757: NmPdu**

Enumeration	NmVariantEnum
Note	Supported NmCoordinator roles.
Aggregated by	<a href="#">NmNode.nmVariant</a>
Literal	Description
full	AUTOSAR NM is available <b>Tags:</b> atp.EnumerationLiteralIndex=3
light	No AUTOSAR NM is available, but functionality to shut down a channel <b>Tags:</b> atp.EnumerationLiteralIndex=1
none	No NM available <b>Tags:</b> atp.EnumerationLiteralIndex=0
passive	AUTOSAR NM running in passive mode available <b>Tags:</b> atp.EnumerationLiteralIndex=2
slaveActive	No NM is available. This is used for e.g. LIN slaves <b>Tags:</b> atp.EnumerationLiteralIndex=4
slavePassive	No NM is available. This used for e.g. Ethernet communication channels with OA TC10 compliant hardware <b>Tags:</b> atp.EnumerationLiteralIndex=5

**Table A.758: NmVariantEnum**

Class	NonqueuedReceiverComSpec			
Note	Communication attributes specific to non-queued receiving.			
Base	<a href="#">ARObject</a> , <a href="#">RPortComSpec</a> , <a href="#">ReceiverComSpec</a>			
Aggregated by	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
Attribute	Type	Mult.	Kind	Note
aliveTimeout	TimeValue	0..1	attr	Specify the amount of time (in seconds) after which the software component (via the RTE) needs to be notified if the corresponding data item have not been received according to the specified timing description. If the aliveTimeout attribute is 0 no timeout monitoring shall be performed. This Attribute is only used by the AUTOSAR Classic Platform.
enableUpdate	Boolean	0..1	attr	This attribute controls whether application code is entitled to check whether the value of the corresponding Variable DataPrototype has been updated. This Attribute is only used by the AUTOSAR Classic Platform.
filter	<a href="#">DataFilter</a>	0..1	aggr	The applicable filter algorithm for filtering the value of the corresponding dataElement.
handleDataStatus	Boolean	0..1	attr	If this attribute is set to true, then the Rte_IStatus API shall exist. If the attribute does not exist or is set to false, then the Rte_IStatus API may still exist in response to the existence of further conditions. This Attribute is only used by the AUTOSAR Classic Platform.





Class	NonqueuedReceiverComSpec			
handleNeverReceived	Boolean	0..1	attr	<p>This attribute specifies whether for the corresponding VariableDataPrototype the "never received" flag is available. If yes, the RTE is supposed to assume that initially the VariableDataPrototype has not been received before. After the first reception of the corresponding VariableDataPrototype the flag is cleared.</p> <ul style="list-style-type: none"> <li>If the value of this attribute is set to "true" the flag is required.</li> <li>If set to "false", the RTE shall not support the "never received" functionality for the corresponding VariableDataPrototype.</li> </ul> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
handleTimeoutType	HandleTimeoutEnum	0..1	attr	<p>This attribute controls the behavior with respect to the handling of timeouts.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
initValue	ValueSpecification	0..1	aggr	<p>Initial value to be used in case the sending component is not yet initialized. If the sender also specifies an initial value, then the receiver's value will be used.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
returnNoNewDataEnabled	Boolean	0..1	attr	<p>This attribute defines whether the RTE API functions related to the RPortPrototype shall return No New Data Error if no new data is received from COM.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
timeoutSubstitutionValue	ValueSpecification	0..1	aggr	<p>This attribute represents the substitution value applicable in the case of a timeout.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
transportErrorCountEnabled	Boolean	0..1	attr	<p>This attribute defines whether the RTE API functions related to the RPortPrototype shall return the number of transport errors (i.e. COM, SecOC errors) that happened since the last call of the respective API.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
valueErrorCountEnabled	Boolean	0..1	attr	<p>This attribute defines whether the RTE API functions related to the RPortPrototype shall return the number of value errors (i.e. out of range, invalid value) that happened since the last call of the respective API.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>

**Table A.759: NonqueuedReceiverComSpec**

Class	NonqueuedSenderComSpec			
Note	Communication attributes for non-queued sender/receiver communication (sender side)			
Base	ARObject, PPortComSpec, SenderComSpec			
Aggregated by	AbstractProvidedPortPrototype.providedComSpec, PortPrototypeBlueprint.providedComSpec			
Attribute	Type	Mult.	Kind	Note
dataFilter	DataFilter	0..1	aggr	The applicable filter algorithm for filtering the value of the corresponding dataElement.
initValue	ValueSpecification	0..1	aggr	Initial value to be sent if sender component is not yet fully initialized, but receiver needs data already.

**Table A.760: NonqueuedSenderComSpec**



<b>Class</b>	<b>NotAvailableValueSpecification</b>			
<b>Note</b>	This meta-class provides the ability to specify a ValueSpecification to state that the respective element is not available. This ability is needed to support the existence of ApplicationRecordElements where attribute isOptional ist set to the value true.			
<b>Base</b>	ARObject, <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
defaultPattern	PositiveInteger	0..1	attr	The content of this attribute shall be used to initialize gaps in the memory occupied by a structured data type in the case that an NotAvailableValueSpecification is used. Note that this pattern is only applied during initialization!

**Table A.761: NotAvailableValueSpecification**

<b>Primitive</b>	<b>Numerical</b>
<b>Note</b>	<p>This primitive specifies a numerical value. It can be denoted in different formats such as Decimal, Octal, Hexadecimal, Float. See the xsd pattern for details.</p> <p>The value can be expressed in octal, hexadecimal, binary representation. Negative numbers can only be expressed in decimal or float notation.</p> <p><b>Tags:</b></p> <p>xml.xsd.customType=NUMERICAL-VALUE</p> <p>xml.xsd.pattern=(0[xX][0-9a-fA-F]+)((0[0-7]+)((0[bB][0-1]+)(([+-]?[1-9][0-9]+(\.[0-9]+)? +-?[0-9](\.[0-9]+)?)([eE]([+-]?[0-9]+)?))\.[0-9]+) INF -INF NaN</p> <p>xml.xsd.type=string</p>

**Table A.762: Numerical**

<b>Class</b>	<b>NumericalOrText</b>			
<b>Note</b>	This meta-class represents the ability to yield either a numerical or a string. A typical use case is that two or more instances of this meta-class are aggregated with a VariationPoint where some instances yield strings while other instances yield numerical depending on the resolution of the binding expression.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">RuleArguments.vtf</a> , <a href="#">SwValues.vtf</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
vf	<a href="#">Numerical</a>	0..1	attr	<p>This attribute represents the ability to provide a numerical value. The latest binding time of the VariationPoint shall be preCompileTime.</p> <p><b>Stereotypes:</b> atpVariation</p> <p><b>Tags:</b></p> <p>vh.latestBindingTime=preCompileTime</p> <p>xml.sequenceOffset=10</p>
vt	String	0..1	attr	<p>This attribute represents the ability to provide a textual value.</p> <p><b>Tags:</b> xml.sequenceOffset=20</p>

**Table A.763: NumericalOrText**

<b>Class</b>	<b>NumericalRuleBasedValueSpecification</b>			
<b>Note</b>	This meta-class is used to support a rule-based initialization approach for data types with an array-nature (ImplementationDataType of category ARRAY).			
<b>Base</b>	ARObject, <a href="#">AbstractRuleBasedValueSpecification</a> , <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ruleBasedValues	<a href="#">RuleBasedValueSpecification</a>	0..1	aggr	This represents the rule based value specification for the array. <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=false xml.typeWrapperElement=false

**Table A.764: NumericalRuleBasedValueSpecification**

<b>Class</b>	<b>NumericalValueSpecification</b>			
<b>Note</b>	A numerical ValueSpecification which is intended to be assigned to a Primitive data element. Note that the numerical value is a variant, it can be computed by a formula.			
<b>Base</b>	ARObject, <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
value	<a href="#">Numerical</a>	0..1	attr	This is the value itself. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.765: NumericalValueSpecification**

<b>Class</b>	<b>NvBlockDataMapping</b>			
<b>Note</b>	<p>Defines the mapping between the VariableDataPrototypes in the NvBlockComponents ports and the VariableDataPrototypes of the RAM Block.</p> <p>The data types of the referenced VariableDataPrototypes in the ports and the referenced sub-element (inside a CompositeDataType) of the VariableDataPrototype representing the RAM Block shall be compatible.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	BulkNvDataDescriptor.nvBlockDataMapping, NvBlockDescriptor.nvBlockDataMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bitfieldTextTableMaskNvBlockDescriptor	PositiveInteger	0..1	attr	This attribute identifies the applicable bit mask on the side of the Nv Block.
bitfieldTextTableMaskPortPrototype	PositiveInteger	0..1	attr	This attribute identifies the applicable bit mask on the side of the PortPrototype.
nvRamBlockElement	<a href="#">AutosarVariableRef</a>	0..1	aggr	Reference to a VariableDataPrototype of a RAM Block.
readNvData	<a href="#">AutosarVariableRef</a>	0..1	aggr	Reference to a VariableDataPrototype of a pPort of the NvBlockComponent providing read access to the RAM Block. If there is no PortPrototype providing read access (write-only) the reference can be omitted.
writtenNvData	<a href="#">AutosarVariableRef</a>	0..1	aggr	Reference to a VariableDataPrototype of a rPort of the NvBlockComponent providing write access to the RAM Block. If there is no port providing write access (read-only) the reference can be omitted.
writtenReadNvData	<a href="#">AutosarVariableRef</a>	0..1	aggr	Reference to a VariableDataPrototype of a PRPort Prototype of the NvBlockSwComponentType providing write and read access to the RAM Block.

**Table A.766: NvBlockDataMapping**

<b>Class</b>	<b>NvBlockDescriptor</b>			
<b>Note</b>	<p>Specifies the properties of exactly one NVRAM Block.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
<b>Base</b>	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	AtpClassifier.atpFeature, NvBlockSwComponentType.nvBlockDescriptor			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
clientServerPort	<a href="#">RoleBasedPortAssignment</a>	*	aggr	<p>The RoleBasedPortAssignment defines which client server port of the NvBlockSwComponentType serves for which kind of service or notification. In case of notifications one common callback function is provided by the RTE for each individual kind of notification defined by the "role".</p> <p>The aggregation of RoleBasedPortAssignment is subject to variability with the purpose to support the conditional existence of ports.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=clientServerPort, clientServerPort.variation  Point.shortLabel  vh.latestBindingTime=preCompileTime</p>
constantValueMapping	<a href="#">ConstantSpecificationMappingSet</a>	*	ref	<p>Reference to the ConstantSpecificationMapping to be applied for the particular NVRAM Block</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=constantValueMapping</p>





Class	NvBlockDescriptor			
dataTypeMapping	<a href="#">DataTypeMappingSet</a>	*	ref	Reference to the DataTypeMapping to be applied for the particular NVRAM Block. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=dataTypeMapping
instantiationDataDefProps	<a href="#">InstantiationDataDefProps</a>	*	aggr	The purpose of InstantiationDataDefProps are the refinement of some data def properties of individual instantiations within the context of a NvBlockSw ComponentType. The aggregation of InstantiationDataDefProps is subject to variability with the purpose to support the conditional existence of ports, component internal memory objects and those attributes. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=instantiationDataDefProps, instantiationDataDefProps.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
modeSwitchEventTriggeredActivity	<a href="#">ModeSwitchEventTriggeredActivity</a>	*	aggr	This represents the collection of ModeSwitchEventTriggeredActivities related to the enclosing NvBlockDescriptor. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=modeSwitchEventTriggeredActivity, modeSwitchEventTriggeredActivity.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
nvBlockDataMapping	<a href="#">NvBlockDataMapping</a>	*	aggr	Defines the mapping between the VariableDataPrototypes in the NvBlockComponents ports and the VariableDataPrototypes of the RAM Block. The aggregation of NvBlockDataMapping is subject to variability with the purpose to support the conditional existence of nv data ports. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=nvBlockDataMapping, nvBlockDataMapping.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
nvBlockNeeds	<a href="#">NvBlockNeeds</a>	0..1	aggr	Specifies the abstract needs on the configuration of the NVRAM Manager for the single NVRAM Block described by this NvBlockDescriptor. In addition, it may define requirements for writing strategies in an implementation of an NvBlockSw ComponentType by the RTE. Please note that the attributes nDataSets and nRom Blocks are not relevant for this aggregation because the RTE will allocate just one block anyway. In a different context, however, they do make sense.
ramBlock	<a href="#">VariableDataPrototype</a>	0..1	aggr	Defines the RAM Block of the NVRAM Block provided by NvBlockSwComponentType.
romBlock	<a href="#">ParameterDataPrototype</a>	0..1	aggr	Defines the ROM Block of the NVRAM Block provided by NvBlockSwComponentType.
supportDirtyFlag	Boolean	0..1	attr	Specifies whether calling of NvM functions for writing and/or status control of potentially modified RAM Blocks to NV memory shall be controlled by the RTE.
timingEvent	<a href="#">TimingEvent</a>	0..1	ref	this reference can be taken to identify the TimingEvent to be used by the RTE for implementing a cyclic writing strategy for this block
writingStrategy	<a href="#">RoleBasedDataAssignment</a>	*	aggr	This attribute allows for assigning a specific writing strategy for an incoming AutosarDataPrototype.

**Table A.767: NvBlockDescriptor**

<b>Class</b>	<b>NvBlockNeeds</b>			
<b>Note</b>	Specifies the abstract needs on the configuration of a single NVRAM Block.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">NvBlockDescriptor.nvBlockNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
calcRamBlockCrc	Boolean	0..1	attr	Defines if CRC (re)calculation for the permanent RAM Block is required.
checkStaticBlockId	Boolean	0..1	attr	Defines if the Static Block Id check shall be enabled.
cyclicWritingPeriod	TimeValue	0..1	attr	This represents the period for cyclic writing of NvData to store the associated RAM Block.
nDataSets	PositiveInteger	0..1	attr	Number of data sets to be provided by the NVRAM manager for this block. This is the total number of ROM Blocks and RAM Blocks.
nRomBlocks	PositiveInteger	0..1	attr	Number of ROM Blocks to be provided by the NVRAM manager for this block. Please note that these multiple ROM Blocks are given in a contiguous area.
ramBlockStatusControl	RamBlockStatusControlEnum	0..1	attr	This attribute defines how the management of the RAM Block status is controlled.
readonly	Boolean	0..1	attr	true: data of this NVRAM Block are write protected for normal operation (but protection can be disabled) false: no restriction
reliability	<a href="#">NvBlockNeedsReliabilityEnum</a>	0..1	attr	Reliability against data loss on the non-volatile medium.
resistantToChangedSw	Boolean	0..1	attr	Defines whether an NVRAM Block shall be treated resistant to configuration changes (true) or not (false). For details how to handle initialization in the latter case, please refer to the NVRAM specification.
restoreAtStart	Boolean	0..1	attr	Defines whether the associated RAM Block shall be implicitly restored during startup by the basic software.
selectBlockForFirstInitAll	Boolean	0..1	attr	If this attribute is set to true the NvM shall process this block in the NvM_FirstInitAll() function.
storeAtShutdown	Boolean	0..1	attr	Defines whether or not the associated RAM Block shall be implicitly stored during shutdown by the basic software.
storeCyclic	Boolean	0..1	attr	Defines whether or not the associated RAM Block shall be implicitly stored periodically by the basic software.
storeEmergency	Boolean	0..1	attr	Defines whether or not the associated RAM Block shall be implicitly stored in case of ECU failure (e.g. loss of power) by the basic software. If the attribute storeEmergency is set to true the associated RAM Block shall be configured to have immediate priority.
storeImmediate	Boolean	0..1	attr	Defines whether or not the associated RAM Block shall be implicitly stored immediately during or after execution of the according SW-C RunnableEntity by the basic software.
storeOnChange	Boolean	0..1	attr	This attribute defines whether the associated RAM Block shall be stored immediately if the written value is different to the value stored in the associated RAM Block(s) during or after execution of the according SW-C RunnableEntity.
useAutoValidationAtShutDown	Boolean	0..1	attr	If set to true the RAM Block shall be auto validated during shutdown phase.
useCRCCompMechanism	Boolean	0..1	attr	If set to true the CRC of the RAM Block shall be compared during a write job with the CRC which was calculated during the last successful read or write job in order to skip unnecessary NVRAM writings.





Class	NvBlockNeeds			
writeOnlyOnce	Boolean	0..1	attr	Defines write protection after first write: true: This block is prevented from being changed/erased or being replaced with the default ROM data after first initialization by the software-component. false: No such restriction.
writeVerification	Boolean	0..1	attr	Defines if Write Verification shall be enabled for this NVRAM Block.
writingFrequency	PositiveInteger	0..1	attr	Provides the amount of updates to this block from the application point of view. It has to be provided in "number of write access per year".
writingPriority	NvBlockNeedsWritingPriorityEnum	0..1	attr	Requires the priority of writing this block in case of concurrent requests to write other blocks.

**Table A.768: NvBlockNeeds**

Enumeration	NvBlockNeedsReliabilityEnum
<b>Note</b>	Reliability against data loss on the non-volatile medium. These requirements give only a relative indication, for example on the required degree of redundancy for storage. They do, however, not specify by which means (e.g. software or hardware) the reliability is actually achieved.
<b>Aggregated by</b>	<a href="#">NvBlockNeeds.reliability</a>
<b>Literal</b>	<b>Description</b>
errorCorrection	Errors shall be corrected <b>Tags:</b> atp.EnumerationLiteralIndex=0
errorDetection	Errors shall be detected <b>Tags:</b> atp.EnumerationLiteralIndex=1
noProtection	Data need not to be handled with protection <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.769: NvBlockNeedsReliabilityEnum**

Class	NvBlockSwComponentType			
<b>Note</b>	The NvBlockSwComponentType defines non volatile data which data can be shared between Sw ComponentPrototypes. The non volatile data of the NvBlockSwComponentType are accessible via provided and required ports. <b>Tags:</b> atp.recommendedPackage=SwComponentTypes This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtomicSwComponentType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
bulkNvDataDescriptor	<a href="#">BulkNvDataDescriptor</a>	*	aggr	This aggregation formally defines the bulk Nv Blocks that are provided to the application software by the enclosing NvBlockSwComponentType. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=bulkNvDataDescriptor.shortName, bulkNvDataDescriptor.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	NvBlockSwComponentType			
nvBlockDescriptor	<a href="#">NvBlockDescriptor</a>	*	aggr	Specification of the properties of exactly one NVRAM Block. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=nvBlockDescriptor.shortName, nvBlockDescriptor.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.770: NvBlockSwComponentType**

Class	NvDataInterface			
<b>Note</b>	A non volatile data interface declares a number of <a href="#">VariableDataPrototypes</a> to be exchanged between non volatile block components and atomic software components. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">DataInterface</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">PortInterface</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
nvData	<a href="#">VariableDataPrototype</a>	*	aggr	The VariableDataPrototype of this nv data interface.

**Table A.771: NvDataInterface**

Class	NvDataPortAnnotation			
<b>Note</b>	Annotation to a port regarding a certain VariableDataPrototype.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">GeneralAnnotation</a>			
<b>Aggregated by</b>	<a href="#">PortPrototype.nvDataPortAnnotation</a>			
Attribute	Type	Mult.	Kind	Note
variable	<a href="#">VariableDataPrototype</a>	0..1	ref	The instance of nv data annotated.

**Table A.772: NvDataPortAnnotation**

Class	NvProvideComSpec			
<b>Note</b>	Communication attributes of <a href="#">PPortPrototypes</a> with respect to Nv data communication on the provided side.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">PPortComSpec</a>			
<b>Aggregated by</b>	<a href="#">AbstractProvidedPortPrototype.providedComSpec</a> , <a href="#">PortPrototypeBlueprint.providedComSpec</a>			
Attribute	Type	Mult.	Kind	Note
ramBlockInitValue	<a href="#">ValueSpecification</a>	0..1	aggr	This represents the initial value of the RAM Block that corresponds to the referenced variable.
romBlockInitValue	<a href="#">ValueSpecification</a>	0..1	aggr	This represents the initial value of the ROM block that corresponds to the referenced variable.
variable	<a href="#">VariableDataPrototype</a>	0..1	ref	This represents the variable for which the ComSpec is specified. <b>Stereotypes:</b> atpIdentityContributor

**Table A.773: NvProvideComSpec**



<b>Class</b>	<b>NvRequireComSpec</b>			
<b>Note</b>	Communication attributes of <a href="#">RPortPrototypes</a> with respect to Nv data communication on the required side.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">RPortComSpec</a>			
<b>Aggregated by</b>	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initValue	<a href="#">ValueSpecification</a>	0..1	aggr	The initial value owned by the NvComSpec
variable	<a href="#">VariableDataPrototype</a>	0..1	ref	The VariableDataPrototype the ComSpec applies for. <b>Stereotypes:</b> atpIdentityContributor

**Table A.774: NvRequireComSpec**

<b>Class</b>	<b>ObdControlServiceNeeds</b>			
<b>Note</b>	Specifies the abstract needs of a component or module on the configuration of OBD Service 08 (request control of on-board system) in relation to a particular test-Identifier (TID) supported by this component or module.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">DiagnosticCapabilityElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">Service Needs</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.775: ObdControlServiceNeeds**

<b>Class</b>	<b>ObdInfoServiceNeeds</b>			
<b>Note</b>	Specifies the abstract needs of a component or module on the configuration of OBD Services in relation to a given InfoType (OBD Service 09) which is supported by this component or module.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">DiagnosticCapabilityElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">Service Needs</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.776: ObdInfoServiceNeeds**

<b>Class</b>	<b>ObdPidServiceNeeds</b>			
<b>Note</b>	Specifies the abstract needs of a component or module on the configuration of OBD Services in relation to a particular PID (parameter identifier) which is supported by this component or module. In case of using a client/server communicated value, the related value shall be communicated via the port referenced by assignedPort. The details of this communication (e.g. appropriate naming conventions) are specified in the related software specifications (SWS).			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">DiagnosticCapabilityElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">Service Needs</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.777: ObdPidServiceNeeds**



<b>Enumeration</b>	<b>ObdRatioConnectionKindEnum</b>
<b>Note</b>	Defines the way how the IUMPR service connection between the Dem and the client component or module is handled (for details see the DEM Specification).
<b>Aggregated by</b>	<a href="#">ObdRatioServiceNeeds.connectionType</a>
<b>Literal</b>	<b>Description</b>
apiUse	The IUMPR service (of the DEM) uses an explicit API to connect to the component or module. <b>Tags:</b> atp.EnumerationLiteralIndex=0
observer	The IUMPR service (of the Dem) uses no API but "observes" the associated diagnostic event. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.778: ObdRatioConnectionKindEnum**

<b>Class</b>	<b>ObdRatioServiceNeeds</b>			
<b>Note</b>	Specifies the abstract needs of a component or module on the configuration of OBD Services in relation to a particular "ratio monitoring" which is supported by this component or module.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">DiagnosticCapabilityElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
connectionType	<a href="#">ObdRatioConnectionKindEnum</a>	0..1	attr	Defines how the DEM is connected to the component or module to perform the IUMPR (In use monitor performance ratio) service.
rateBasedMonitoredEvent	<a href="#">DiagnosticEventNeeds</a>	0..1	ref	The rate based monitored Diagnostic Event.
usedFid	<a href="#">FunctionInhibitionNeeds</a>	0..1	ref	This represents the primary Function Inhibition Identifier used for the rate based monitor. This is an optional attribute.

**Table A.779: ObdRatioServiceNeeds**

<b>Class</b>	<b>OffsetTimingConstraint</b>			
<b>Note</b>	Bounds the time offset between the occurrence of two timing events, without requiring a direct functional dependency between the <a href="#">source</a> and the <a href="#">target</a> . If the <a href="#">target</a> event occurs, it is expected to occur earliest with the <a href="#">minimum</a> , and latest with the <a href="#">maximum</a> offset relatively after the occurrence of the <a href="#">source</a> event. Note: not every <a href="#">source</a> event occurrence shall be followed by a <a href="#">target</a> event occurrence. In contrast to <a href="#">LatencyTimingConstraint</a> , there shall not necessarily be a causal dependency between the <a href="#">source</a> and <a href="#">target</a> event.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<a href="#">TimingExtension.timingGuarantee</a> , <a href="#">TimingExtension.timingRequirement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
maximum	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum offset the target event occurs relatively after the occurrence of the source event. <b>Tags:</b> xml.sequenceOffset=20
minimum	<a href="#">MultidimensionalTime</a>	0..1	aggr	The minimum offset the target event occurs relatively after the occurrence of the source event. <b>Tags:</b> xml.sequenceOffset=10
source	<a href="#">TimingDescriptionEvent</a>	0..1	ref	The timing event that the target event is to be synchronized with.
target	<a href="#">TimingDescriptionEvent</a>	0..1	ref	The timing event which is expected to occur timely after the source event.

**Table A.780: OffsetTimingConstraint**

Class	OperationInSystemInstanceRef			
Note				
Base	ARObject, <a href="#">AtpInstanceRef</a>			
Aggregated by	<a href="#">ClientDefinition.clientServerOperation</a> , <a href="#">ClientServerToSignalMapping.clientServerOperation</a> , <a href="#">PortElementToCommunicationResourceMapping.clientServerOperation</a> , <a href="#">ServerComSpecProps.clientServerOperation</a> , <a href="#">SwcToSwcOperationArguments.operation</a>			
Attribute	Type	Mult.	Kind	Note
base	<a href="#">System</a>	0..1	ref	<b>Stereotypes:</b> atpDerived <b>Tags:</b> xml.sequenceOffset=10
context Component (ordered)	<a href="#">SwComponent Prototype</a>	*	ref	<b>Tags:</b> xml.sequenceOffset=30
context Composition	<a href="#">RootSwComposition Prototype</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=20
contextPort	<a href="#">PortPrototype</a>	1	ref	<b>Tags:</b> xml.sequenceOffset=40
targetOperation	<a href="#">ClientServerOperation</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=50

**Table A.781: OperationInSystemInstanceRef**

Class	OperationInvokedEvent			
Note	This event is raised when the <a href="#">ClientServerOperation</a> referenced in <a href="#">OperationInvokedEvent.operation</a> shall be invoked.			
Base	ARObject, <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
operation	<a href="#">ClientServerOperation</a>	0..1	iref	This represents the ClientServerOperation which shall be invoked. <b>InstanceRef implemented by:</b> POperationInAtomicSwc InstanceRef

**Table A.782: OperationInvokedEvent**

Class	OsTaskExecutionEvent			
Note	This <a href="#">RTEEvent</a> is supposed to execute <a href="#">RunnableEntity</a> s which have to react on the execution of specific OsTasks. Therefore, this event is unconditionally raised whenever the OsTask on which it is mapped is executed. The main use case for this event is scheduling of <a href="#">RunnableEntity</a> s of Complex Drivers which have to react on task executions.			
Base	ARObject, <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.783: OsTaskExecutionEvent**

Class	OsTaskProxy			
Note	This meta-class represents a proxy for an OsTask in the System Description. <b>Tags:</b> atp.recommendedPackage=OsTaskProxies This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			





Class	OsTaskProxy			
Attribute	Type	Mult.	Kind	Note
period	TimeValue	0..1	attr	This attribute specifies the period in seconds of this task in case of a cyclically activated task. Please note that this attribute is informative and not directly relevant for the AUTOSAR OS. But the attribute value can be mapped into the OS configuration to support configuration work flows using a fixed set of OsTasks.
preemptability	OsTaskPreemptability Enum	0..1	attr	This attribute defines the preemptability of the task.
priority	PositiveInteger	0..1	attr	This attribute defines the priority of a task as a relative value, i.e. the values show only the relative ordering of the tasks.

**Table A.784: OsTaskProxy**

Class	PPortComSpec (abstract)			
Note	Communication attributes of a provided <a href="#">PortPrototype</a> . This class will contain attributes that are valid for all kinds of provide ports, independent of client-server or sender-receiver communication patterns.			
Base	<a href="#">ARObject</a>			
Subclasses	<a href="#">ModeSwitchSenderComSpec</a> , <a href="#">NvProvideComSpec</a> , <a href="#">ParameterProvideComSpec</a> , <a href="#">SenderComSpec</a> , <a href="#">ServerComSpec</a>			
Aggregated by	<a href="#">AbstractProvidedPortPrototype.providedComSpec</a> , <a href="#">PortPrototypeBlueprint.providedComSpec</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.785: PPortComSpec**

Class	PPortPrototype			
Note	Component port providing a certain port interface.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractProvidedPortPrototype</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PortPrototype</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwComponentType.port</a>			
Attribute	Type	Mult.	Kind	Note
provided Interface	<a href="#">PortInterface</a>	0..1	tref	The interface that this port provides. <b>Stereotypes:</b> isOfType

**Table A.786: PPortPrototype**

Class	PRPortPrototype			
Note	This kind of PortPrototype can take the role of both a required and a provided PortPrototype.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractProvidedPortPrototype</a> , <a href="#">AbstractRequiredPortPrototype</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PortPrototype</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwComponentType.port</a>			
Attribute	Type	Mult.	Kind	Note
provided Required Interface	<a href="#">PortInterface</a>	0..1	tref	This represents the <a href="#">PortInterface</a> used to type the <a href="#">PRPortPrototype</a> . <b>Stereotypes:</b> isOfType

**Table A.787: PRPortPrototype**

Class	ParameterAccess			
Note	The presence of a <code>ParameterAccess</code> implies that a <code>RunnableEntity</code> needs access to a <code>ParameterDataPrototype</code> .			
Base	<code>ARObject</code> , <code>AbstractAccessPoint</code> , <code>AtpClassifier</code> , <code>AtpFeature</code> , <code>AtpStructureElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>Referrable</code>			
Aggregated by	<code>AtpClassifier.atpFeature</code> , <code>RunnableEntity.parameterAccess</code>			
Attribute	Type	Mult.	Kind	Note
accessed Parameter	<code>AutosarParameterRef</code>	0..1	aggr	Reference to the accessed calibration parameter.
swDataDef Props	<code>SwDataDefProps</code>	0..1	aggr	This allows denote instance and access specific properties, mainly input values and common axis. <b>Stereotypes:</b> <code>atpSplitable</code> <b>Tags:</b> <code>atp.Splitkey=swDataDefProps</code>

**Table A.788: ParameterAccess**

Class	ParameterDataPrototype			
Note	A <code>ParameterDataPrototype</code> represents a formalized generic piece of information that is typically immutable by the application software layer, but mutable by measurement and calibration tools. <code>ParameterDataPrototype</code> is used in various contexts and the specific context gives the otherwise generic <code>ParameterDataPrototype</code> a dedicated semantics.			
Base	<code>ARObject</code> , <code>AtpFeature</code> , <code>AtpPrototype</code> , <code>AutosarDataPrototype</code> , <code>DataPrototype</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>Referrable</code>			
Aggregated by	<code>AtpClassifier.atpFeature</code> , <code>BswInternalBehavior.perInstanceParameter</code> , <code>InternalBehavior.constantMemory</code> , <code>NvBlockDescriptor.romBlock</code> , <code>ParameterInterface.parameter</code> , <code>SwcInternalBehavior.perInstanceParameter</code> , <code>SwcInternalBehavior.sharedParameter</code>			
Attribute	Type	Mult.	Kind	Note
initValue	<code>ValueSpecification</code>	0..1	aggr	Specifies initial value(s) of the <code>ParameterDataPrototype</code>

**Table A.789: ParameterDataPrototype**

Class	ParameterInAtomicSWCTypeInstanceRef			
Note	This class implements an instance reference which can be applied for variables as well as for parameters.			
Base	<code>ARObject</code> , <code>AtpInstanceRef</code>			
Aggregated by	<code>AutosarParameterRef.autosarParameter</code>			
Attribute	Type	Mult.	Kind	Note
base	<code>AtomicSwComponentType</code>	0..1	ref	<b>Stereotypes:</b> <code>atpDerived</code> <b>Tags:</b> <code>xml.sequenceOffset=10</code>
contextData Prototype (ordered)	<code>ApplicationCompositeElementDataPrototype</code>	*	ref	This ist the context in a <code>compositeDataType</code> . <b>Tags:</b> <code>xml.sequenceOffset=40</code>
portPrototype	<code>PortPrototype</code>	0..1	ref	This is the port providing the variable or the entry point to the variable structure. <b>Tags:</b> <code>xml.sequenceOffset=20</code>
rootParameter DataPrototype	<code>DataPrototype</code>	0..1	ref	This represents the entry point for references into a <code>CompositeDataType</code> . <b>Tags:</b> <code>xml.sequenceOffset=30</code>
targetData Prototype	<code>DataPrototype</code>	0..1	ref	This is the target parameter element. Note that this must be nested in <code>ParameterDataPrototype</code> . The target must be one of <code>ParameterDataPrototype</code> , <code>ApplicationCompositeElementDataPrototype</code> . <b>Tags:</b> <code>xml.sequenceOffset=50</code>

**Table A.790: ParameterInAtomicSWCTypeInstanceRef**

<b>Class</b>	<b>ParameterInterface</b>			
<b>Note</b>	A parameter interface declares a number of parameter and characteristic values to be exchanged between parameter components and software components. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">DataInterface</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">PortInterface</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
parameter	<a href="#">ParameterDataPrototype</a>	*	aggr	The ParameterDataPrototype of this ParameterInterface.

**Table A.791: ParameterInterface**

<b>Class</b>	<b>ParameterPortAnnotation</b>			
<b>Note</b>	Annotation to a port used for calibration regarding a certain ParameterDataPrototype.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">GeneralAnnotation</a>			
<b>Aggregated by</b>	<a href="#">PortPrototype.parameterPortAnnotation</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
parameter	<a href="#">ParameterDataPrototype</a>	0..1	ref	The instance of annotated ParameterDataPrototype.

**Table A.792: ParameterPortAnnotation**

<b>Class</b>	<b>ParameterProvideComSpec</b>			
<b>Note</b>	"Communication" specification that applies to parameters on the provided side of a connection.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">PPortComSpec</a>			
<b>Aggregated by</b>	<a href="#">AbstractProvidedPortPrototype.providedComSpec</a> , <a href="#">PortPrototypeBlueprint.providedComSpec</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initValue	<a href="#">ValueSpecification</a>	0..1	aggr	The initial value applicable for the corresponding ParameterDataPrototype.
parameter	<a href="#">ParameterDataPrototype</a>	0..1	ref	The ParameterDataPrototype to which the Parameter ComSpec applies. <b>Stereotypes:</b> atpIdentityContributor

**Table A.793: ParameterProvideComSpec**

<b>Class</b>	<b>ParameterRequireComSpec</b>			
<b>Note</b>	"Communication" specification that applies to parameters on the required side of a connection.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">RPortComSpec</a>			
<b>Aggregated by</b>	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initValue	<a href="#">ValueSpecification</a>	0..1	aggr	The initial value applicable for the corresponding ParameterDataPrototype.
parameter	<a href="#">ParameterDataPrototype</a>	0..1	ref	The ParameterDataPrototype to which the Parameter RequireComSpec applies. <b>Stereotypes:</b> atpIdentityContributor

**Table A.794: ParameterRequireComSpec**

Class	ParameterSwComponentType			
Note	The ParameterSwComponentType defines parameters and characteristic values accessible via provided Ports. The provided values are the same for all connected SwComponentPrototypes <b>Tags:</b> atp.recommendedPackage=SwComponentTypes			
Base	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
constant Mapping	<a href="#">ConstantSpecificationMappingSet</a>	*	ref	Reference to the ConstantSpecificationMapping to be applied for the particular ParameterSwComponentType <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=constantMapping
dataType Mapping	<a href="#">DataTypeMappingSet</a>	*	ref	Reference to the DataTypeMapping to be applied for the particular ParameterSwComponentType <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=dataTypeMapping
instantiation DataDefProps	<a href="#">InstantiationDataDefProps</a>	*	aggr	The purpose of this is that within the context of a given SwComponentType some data def properties of individual instantiations can be modified. The aggregation of InstantiationDataDefProps is subject to variability with the purpose to support the conditional existence of PortPrototypes <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=instantiationDataDefProps, instantiationDataDefProps.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

Table A.795: ParameterSwComponentType

Class	PassThroughSwConnector			
Note	This kind of <a href="#">SwConnector</a> can be used inside a <a href="#">CompositionSwComponentType</a> to connect two delegation <a href="#">PortPrototypes</a> .			
Base	ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">SwConnector</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">CompositionSwComponentType.connector</a>			
Attribute	Type	Mult.	Kind	Note
providedOuter Port	<a href="#">AbstractProvidedPortPrototype</a>	0..1	ref	This represents the provided outer delegation Port Prototype of the PassThroughSwConnector.
requiredOuter Port	<a href="#">AbstractRequiredPortPrototype</a>	0..1	ref	This represents the required outer delegation Port Prototype of the PassThroughSwConnector.

Table A.796: PassThroughSwConnector

Class	Pdu (abstract)			
Note	Collection of all Pdus that can be routed through a bus interface.			
Base	ARElement, ARObject, <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Subclasses	<a href="#">GeneralPurposePdu</a> , <a href="#">IPdu</a> , <a href="#">NmPdu</a> , <a href="#">UserDefinedPdu</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
hasDynamic Length	Boolean	0..1	attr	This attribute defines whether the Pdu has dynamic length (true) or not (false). Please note that the usage of this attribute is restricted by <a href="#">[constr_3448]</a> .





Class	Pdu (abstract)			
length	<a href="#">UnlimitedInteger</a>	0..1	attr	Pdu length in bytes. In case of dynamic length IPdus (containing a dynamical length signal), this value indicates the maximum data length. It should be noted that in former AUTOSAR releases (Rel 2.1, Rel 3.0, Rel 3.1, Rel 4.0 Rev. 1) this parameter was defined in bits. The Pdu length of zero bytes is allowed.

**Table A.797: Pdu**

Class	PduActivationRoutingGroup			
Note	Group of Pdus that can be activated or deactivated for transmission over a socket connection.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AbstractServiceInstance.methodActivationRoutingGroup</a> , <a href="#">ConsumedEventGroup.pduActivationRoutingGroup</a> , <a href="#">EventHandler.pduActivationRoutingGroup</a>			
Attribute	Type	Mult.	Kind	Note
eventGroup ControlType	<a href="#">EventGroupControlType Enum</a>	0..1	attr	This attribute defines the type of a RoutingGroup. There are RoutingGroups that activate the data path for unicast or multicast events of an event group. And there are RoutingGroups that activate the data path for initial events that are triggered, namely events that are sent out on the server side after a client got subscribed. Please note that this attribute is only valid for event communication (Sender Receiver communication) and shall be omitted in MethodActivationRoutingGroups.
iPduIdentifier Tcp	<a href="#">SoConIPduIdentifier</a>	*	ref	PduIdentifiers assigned for transmission over Tcp in case that the referencing PduActivationRoutingGroup is activated.
iPduIdentifier Udp	<a href="#">SoConIPduIdentifier</a>	*	ref	PduIdentifiers assigned for transmission over Udp in case that the referencing PduActivationRoutingGroup is activated.

**Table A.798: PduActivationRoutingGroup**

Class	PduMappingDefaultValue			
Note	Default Value which will be distributed if no I-Pdu has been received since last sending.			
Base	ARObject			
Aggregated by	<a href="#">TargetIPduRef.defaultValue</a>			
Attribute	Type	Mult.	Kind	Note
defaultValue Element	<a href="#">DefaultValueElement</a>	*	aggr	The default value consists of a number of elements. Each default value element is represented by the element and the position in an array.

**Table A.799: PduMappingDefaultValue**

Class	«atpPrototype» PduToFrameMapping			
Note	A PduToFrameMapping defines the composition of Pdus in each frame.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">Frame.pduToFrameMapping</a>			
Attribute	Type	Mult.	Kind	Note







Class	«atpPrototype» PduToFrameMapping			
packingByte Order	<a href="#">ByteOrderEnum</a>	0..1	attr	This attribute defines the order of the bytes of the Pdu and the packing into the Frame. Please consider that <a href="#">[constr_3246]</a> and <a href="#">[constr_3222]</a> are restricting the usage of this attribute.
pdu	<a href="#">Pdu</a>	0..1	ref	Reference to a I-Pdu, N-Pdu or NmPdu that is transmitted in the Frame.
startPosition	Integer	0..1	attr	This attribute describes the bitposition of a Pdu within a Frame. Please note that the absolute position of the Pdu in the Frame is determined by the definition of the packingByte Order attribute. If Big Endian is specified, the start position indicates the bit position of the most significant bit in the Frame. If Little Endian is specified, the start position indicates the bit position of the least significant bit in the Frame. The bit counting in byte 0 starts with bit 0 (least significant bit). The most significant bit in byte 0 is bit 7. The Pdus are byte aligned in a Frame and only the values 0, 8, 16, 24,... (for little endian) and 7, 15, 23, ... (for big endian) are allowed.
update IndicationBit Position	Integer	0..1	attr	Indication to the receivers that the corresponding Pdu was updated by the sender. This attribute describes the position of the update bit in the frame that aggregates this PDUToFrameMapping. Length is always one bit. Note that the exact bit position of the updateIndicationBit Position is linked to the value of the attribute packingByte Order because the method of finding the bit position is different for the values mostSignificantByteFirst and mostSignificantByteLast. This means that if the value of packingByteOrder is changed while the value of update IndicationBitPosition remains unchanged the exact bit position of updateIndicationBitPosition within the enclosing Frame still undergoes a change. This attribute denotes the least significant bit for "Little Endian" and the most significant bit for "Big Endian" packed signals within the IPdu (see the description of the packingByteOrder attribute). In AUTOSAR the bit counting is always set to "sawtooth" and the bit order is set to "Decreasing". The bit counting in byte 0 starts with bit 0 (least significant bit). The most significant bit in byte 0 is bit 7.

**Table A.800: PduToFrameMapping**

Class	PduTriggering			
Note	The PduTriggering describes on which channel the IPdu is transmitted. The Pdu routing by the PduR is only allowed for subclasses of IPdu. Depending on its relation to entities such channels and clusters it can be unambiguously deduced whether a fan-out is handled by the Pdu router or the Bus Interface. If the fan-out is specified between different clusters it shall be handled by the Pdu Router. If the fan-out is specified between different channels of the same cluster it shall be handled by the Bus Interface.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">PhysicalChannel.pduTriggering</a>			
Attribute	Type	Mult.	Kind	Note







Class	PduTriggering			
iPdu	<a href="#">Pdu</a>	0..1	ref	Reference to the Pdu for which the PduTriggering is defined. One I-Pdu can be triggered on different channels (PduR fan-out). The Pdu routing by the PduR is only allowed for subclasses of iPdu. Nevertheless is the reference to the Pdu element necessary since the PduTriggering element is also used to specify the sending and receiving connections to Ecu Ports.
iPduPort	<a href="#">IPduPort</a>	*	ref	References to the IPduPort on every ECU of the system which sends and/or receives the I-PDU. References for both the sender and the receiver side shall be included when the system is completely defined.
iSignalTriggering	<a href="#">ISignalTriggering</a>	*	ref	This reference provides the relationship to the ISignalTriggerings that are implemented by the PduTriggering. The reference is optional since no ISignalTriggering can be defined for DCM and Multiplexed Pdus. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=iSignalTriggering.iSignalTriggering, iSignalTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild
secOcCryptoMapping	SecOcCryptoServiceMapping	0..1	ref	This reference identifies the crypto profile applicable to the usage (send, receive) of the also referenced Secured IPdu. Obviously, this reference is only applicable if the PduTriggering also references a SecuredIPdu in the role i Pdu. <b>Tags:</b> atp.Status=obsolete
secOcCryptoServiceMapping	SecOcCryptoServiceMapping	0..1	ref	This reference identifies the crypto profile applicable to the usage (send, receive) of the also referenced Secured IPdu. Obviously, this reference is only applicable if the PduTriggering also references a SecuredIPdu in the role i Pdu. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=secOcCryptoServiceMapping.secOcCryptoServiceMapping, secOcCryptoServiceMapping.variationPoint.shortLabel vh.latestBindingTime=postBuild
triggerIPduSendCondition	<a href="#">TriggerIPduSendCondition</a>	*	aggr	Defines the trigger for the Com_TriggerIPDUSend API call. Only if all defined TriggerIPduSendConditions evaluate to true (AND associated) the Com_TriggerIPDUSend API shall be called.

Table A.801: PduTriggering

Class	PerInstanceMemory			
Note	Defines a 'C' typed memory-block that needs to be available for each instance of the SW-component. This is typically only useful if supportsMultipleInstantiation is set to "true" or if the software-component defines NVRAM access via permanent blocks.			
Base	<a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.perInstanceMemory</a>			
Attribute	Type	Mult.	Kind	Note
initValue	String	0..1	attr	Specifies initial value(s) of the PerInstanceMemory





Class	PerInstanceMemory			
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	This represents the ability to allocate RAM at specific memory sections, for example, to support the RAM Block recovery strategy by mapping to uninitialized RAM. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=swDataDefProps
type	CIdentifier	0..1	attr	The name of the "C"-type
typeDefinition	String	0..1	attr	A definition of the type with the syntax of a 'C' typedef.

**Table A.802: PerInstanceMemory**

Class	PerInstanceMemorySize			
<b>Note</b>	Resources needed by the allocation of PerInstanceMemory for each SWC instance. Note that these resources are not covered by an ObjectFileSection, because they are supposed to be allocated by the RTE.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">SwcImplementation.perInstanceMemorySize</a>			
Attribute	Type	Mult.	Kind	Note
alignment	PositiveInteger	0..1	attr	Required alignment (1,2,4,...) of the referenced Per InstanceMemory. Unit: byte.
perInstance Memory	<a href="#">PerInstanceMemory</a>	0..1	ref	This represents the referenced PerInstanceMemory.
size	PositiveInteger	0..1	attr	Size (in bytes) of the reference perInstanceMemory. The aggregation of PerInstanceMemorySize is subject to variability with the purpose to support variability in the software components implementations. Different algorithms in the implementation might require a different PerInstanceMemorySize. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.803: PerInstanceMemorySize**

Class	PeriodicEventTriggering			
<b>Note</b>	Describes the behavior of an event with a strict periodic occurrence pattern, given by <a href="#">period</a> . Additionally, it is possible to soften the strictness of the periodic occurrence behavior by specifying a <a href="#">jitter</a> , so that there can be a deviation from the <a href="#">period</a> up to the size of the <a href="#">jitter</a> .			
<b>Base</b>	<i>ARObject</i> , <a href="#">EventTriggeringConstraint</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<i>TimingExtension.timingGuarantee</i> , <i>TimingExtension.timingRequirement</i>			
Attribute	Type	Mult.	Kind	Note
jitter	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum deviation of the periodic event occurrence. <b>Tags:</b> xml.sequenceOffset=20
minimumInter ArrivalTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The minimum time distance between subsequent consecutive occurrences of the associated event. If the <a href="#">minimumInterArrivalTime</a> is less than the <a href="#">period</a> minus the <a href="#">jitter</a> , then the <a href="#">minimumInterArrivalTime</a> has no effect on the properties of the constraint. <b>Tags:</b> xml.sequenceOffset=10
period	<a href="#">MultidimensionalTime</a>	0..1	aggr	The periodic distance between subsequent occurrences of the event. <b>Tags:</b> xml.sequenceOffset=30

**Table A.804: PeriodicEventTriggering**

Class	PermissibleSignalPath			
Note	<p>The PermissibleSignalPath describes the way a data element shall take in the topology. The path is described by ordered references to PhysicalChannels.</p> <p>If more than one PermissibleSignalPath is defined for the same signal/operation attributes, any of them can be chosen. Such a signal path can be a constraint for the communication matrix. This path describes that one data element should take path A (e.g. 1. CAN channel, 2. LIN channel) and not path B (1. CAN channel, FlexRay channel A).</p> <p>This has an effect on the frame generation and the frame path.</p>			
Base	ARObject, SignalPathConstraint			
Aggregated by	SystemMapping.signalPathConstraint			
Attribute	Type	Mult.	Kind	Note
operation	SwcToSwcOperationArguments	*	aggr	The arguments of an operation that can take the predefined way in the topology.
physical Channel (ordered)	PhysicalChannel	*	ref	The SwcToSwcSignal can be transmitted on one of these physical channels.
signal	SwcToSwcSignal	*	aggr	The data element which can take the predefined way in the topology.

**Table A.805: PermissibleSignalPath**

Class	PhysConstrs			
Note	<p>This meta-class represents the ability to express physical constraints. Therefore it has (in opposite to InternalConstrs) a reference to a Unit.</p>			
Base	ARObject			
Aggregated by	DataConstrRule.physConstrs			
Attribute	Type	Mult.	Kind	Note
lowerLimit	Limit	0..1	attr	<p>This specifies the lower limit of the constraint.</p> <p><b>Stereotypes:</b> atpVariation</p> <p><b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=20</p>
maxDiff	Numerical	0..1	attr	<p>Maximum difference that is permitted between two consecutive values if the constraint is applied to an axis.</p> <p><b>Tags:</b> xml.sequenceOffset=60</p>
maxGradient	Numerical	0..1	attr	<p>This element specifies the maximum slope that may be used in curves and maps.</p> <p><b>Tags:</b> xml.sequenceOffset=50</p>
monotony	MonotonyEnum	0..1	attr	<p>This specifies the monotony constraints on the data object. Note that this applies only to curves and maps.</p> <p><b>Tags:</b> xml.sequenceOffset=70</p>
unit	Unit	0..1	ref	<p>This is the unit to which the physical constraints relate to. In particular, it is the physical unit of the specified limits.</p> <p><b>Tags:</b> xml.sequenceOffset=80</p>
upperLimit	Limit	0..1	attr	<p>This specifies the upper limit of the constraint.</p> <p><b>Stereotypes:</b> atpVariation</p> <p><b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=30</p>

**Table A.806: PhysConstrs**

<b>Class</b>	<b>PhysicalChannel</b> (abstract)			
<b>Note</b>	A physical channel is the transmission medium that is used to send and receive information between communicating ECUs. Each CommunicationCluster has at least one physical channel. Bus systems like CAN and LIN only have exactly one PhysicalChannel. A FlexRay cluster may have more than one PhysicalChannels that may be used in parallel for redundant communication. An ECU is part of a cluster if it contains at least one controller that is connected to at least one channel of the cluster.#			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AbstractCanPhysicalChannel</a> , <a href="#">EthernetPhysicalChannel</a> , <a href="#">FlexrayPhysicalChannel</a> , <a href="#">LinPhysicalChannel</a> , <a href="#">UserDefinedPhysicalChannel</a>			
<b>Aggregated by</b>	<a href="#">CommunicationCluster.physicalChannel</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
comm Connector	<a href="#">CommunicationConnector</a>	*	ref	Reference to the ECUInstance via a Communication Connector to which the channel is connected. atpVariation: Variable assignment of Physical Channels to different CommunicationConnectors is expressed with this variation. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=commConnector.communicationConnector, commConnector.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.
frameTriggering	<a href="#">FrameTriggering</a>	*	aggr	One frame triggering is defined for exactly one channel. Channels may have assigned an arbitrary number of frame triggerings. atpVariation: If signals/PDUs/frames are variable, the corresponding triggerings shall be variable, too. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=frameTriggering.shortName, frameTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.
iSignal Triggering	<a href="#">ISignalTriggering</a>	*	aggr	One ISignalTriggering is defined for exactly one channel. Channels may have assigned an arbitrary number of ISignaltriggerings. atpVariation: If signals/PDUs/frames are variable, the corresponding triggerings shall be variable, too. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=iSignalTriggering.shortName, iSignalTriggering.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.
managed Physical Channel	<a href="#">PhysicalChannel</a>	*	ref	Reference between a channel with role managing channel and a channel with role managed channel. This Attribute is only used by the AUTOSAR Classic Platform.





Class	PhysicalChannel (abstract)			
pduTriggering	<a href="#">PduTriggering</a>	*	aggr	<p>One PduTriggering is defined for exactly one channel. Channels may have assigned an arbitrary number of I-Pdu triggerings.</p> <p>atpVariation: If signals/PDUs/frames are variable, the corresponding triggerings shall be variable, too.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b></p> <p>atp.Splitkey=pduTriggering.shortName, pduTriggering.variationPoint.shortLabel</p> <p>vh.latestBindingTime=postBuild</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>

**Table A.807: PhysicalChannel**

Class	PhysicalDimension			
<b>Note</b>	<p>This class represents a physical dimension. If the physical dimension of two units is identical, then a conversion between them is possible. The conversion between units is related to the definition of the physical dimension.</p> <p>Note that the equivalence of the exponents does not per se define the convertibility. For example Energy and Torque share the same exponents (Nm).</p> <p>Please note further the value of an exponent does not necessarily have to be an integer number. It is also possible that the value yields a rational number, e.g. to compute the square root of a given physical quantity. In this case the exponent value would be a rational number where the numerator value is 1 and the denominator value is 2.</p> <p><b>Tags:</b> atp.recommendedPackage=PhysicalDimensions</p>			
<b>Base</b>	<i>ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a>, <a href="#">MultilanguageReferrable</a>, <a href="#">PackageableElement</a>, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
currentExp	<a href="#">Numerical</a>	0..1	attr	<p>This attribute represents the exponent of the physical dimension "electric current".</p> <p><b>Tags:</b> xml.sequenceOffset=50</p>
lengthExp	<a href="#">Numerical</a>	0..1	attr	<p>The exponent of the physical dimension "length".</p> <p><b>Tags:</b> xml.sequenceOffset=20</p>
luminousIntensityExp	<a href="#">Numerical</a>	0..1	attr	<p>The exponent of the physical dimension "luminous intensity".</p> <p><b>Tags:</b> xml.sequenceOffset=80</p>
massExp	<a href="#">Numerical</a>	0..1	attr	<p>The exponent of the physical dimension "mass".</p> <p><b>Tags:</b> xml.sequenceOffset=30</p>
molarAmountExp	<a href="#">Numerical</a>	0..1	attr	<p>The exponent of the physical dimension "quantity of substance".</p> <p><b>Tags:</b> xml.sequenceOffset=70</p>
temperatureExp	<a href="#">Numerical</a>	0..1	attr	<p>The exponent of the physical dimension "temperature".</p> <p><b>Tags:</b> xml.sequenceOffset=60</p>
timeExp	<a href="#">Numerical</a>	0..1	attr	<p>The exponent of the physical dimension "time".</p> <p><b>Tags:</b> xml.sequenceOffset=40</p>

**Table A.808: PhysicalDimension**

Class	PhysicalDimensionMapping
<b>Note</b>	This class represents a specific mapping between two PhysicalDimensions.
<b>Base</b>	<i>ARObject</i>
<b>Aggregated by</b>	PhysicalDimensionMappingSet.physicalDimensionMapping





Class	PhysicalDimensionMapping			
Attribute	Type	Mult.	Kind	Note
firstPhysicalDimension	<a href="#">PhysicalDimension</a>	0..1	ref	This represents the first PhysicalDimension of the enclosing PhysicalDimensionMapping.
secondPhysicalDimension	<a href="#">PhysicalDimension</a>	0..1	ref	This represents the first PhysicalDimension of the enclosing PhysicalDimensionMapping.

**Table A.809: PhysicalDimensionMapping**

Class	PlcaProps			
Note	This meta-class allows to configure the PLCA (Physical Layer Collision Avoidance) in case 10-BASE-T1S Ethernet is used and PLCA is enabled on the CouplingPort (PHY).			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">CouplingPort.plcaProps</a>			
Attribute	Type	Mult.	Kind	Note
plcaLocalNodeId	PositiveInteger	0..1	attr	This attribute defines the node ID when the PLCA mode for 10BASE-T1S is used.
plcaMaxBurstCount	PositiveInteger	0..1	attr	Defines maximum packets allowed to be transmitted within a TO. This configuration can be different from one ECU to another within the PLCA mixed segment.
plcaMaxBurstTimer	PositiveInteger	0..1	attr	Limits the burst frames in bit time. This configuration can be different from one ECU to another within the PLCA mixed segment. For PLCA burst mode to work properly this timer should be set greater than one IPG.

**Table A.810: PlcaProps**

Enumeration	PncGatewayTypeEnum
Note	Defines the PncGateway roles.
Aggregated by	<a href="#">CommunicationConnector.pncGatewayType</a>
Literal	Description
active	The active PncGateway functionality shall be performed <b>Tags:</b> atp.EnumerationLiteralIndex=0
none	No PncGateway functionality shall be performed <b>Tags:</b> atp.EnumerationLiteralIndex=1
passive	The passive PncGateway functionality shall be performed <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.811: PncGatewayTypeEnum**

Class	PncMapping			
Note	Describes a mapping between one or several Virtual Function Clusters onto Partial Network Clusters. A Virtual Function Cluster is realized by a PortGroup. A Partial Network Cluster is realized by one or more IPduGroups.			
Base	<a href="#">ARObject</a> , <a href="#">Describable</a>			
Aggregated by	<a href="#">SystemMapping.pncMapping</a>			
Attribute	Type	Mult.	Kind	Note





Class	PncMapping			
dynamicPncMappingPduGroup	<a href="#">ISignalIPduGroup</a>	*	ref	Reference to an ISignalIPduGroup that allows mapping of this PNC without statically mapping this PNC directly to a channel. This is needed to describe dynamic PNCs that can be learned only at run-time and which have also a relation to an ISignalIPduGroup. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=dynamicPncMappingPduGroup atp.Status=draft This Attribute is only used by the AUTOSAR Classic Platform.
ident	<a href="#">PncMappingIdent</a>	0..1	aggr	This adds the ability to become referrable to PncMapping.
physicalChannel	<a href="#">PhysicalChannel</a>	*	ref	This reference maps the partial network to a communication channel. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=physicalChannel
pncConsumedProvidedServiceInstanceGroup	ConsumedProvidedServiceInstanceGroup	*	ref	ConsumedProvidedServiceInstanceGroup used in a Partial Network Cluster. This reference is optional, since this could be used for starting and stopping ConsumedProvidedServiceInstanceGroup according to the requested partial network, but is not necessarily needed. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=pncConsumedProvidedServiceInstanceGroup.consumedProvidedServiceInstanceGroup, pncConsumedProvidedServiceInstanceGroup.variation Point.shortLabel vh.latestBindingTime=postBuild
pncGroup	<a href="#">ISignalIPduGroup</a>	*	ref	IPduGroup participating in a Partial Network Cluster. This reference is optional in case an ecu extract has only indirect pnc access, i.e. ecu is not directly connected to a network which supports partial network. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=pncGroup This Attribute is only used by the AUTOSAR Classic Platform.
pncIdentifier	PositiveInteger	0..1	attr	Identifier of the Partial Network Cluster. This number represents the absolute bit position of this Partial Network Cluster in the NM Pdu.
pncPdurGroup	<a href="#">PdurlPduGroup</a>	*	ref	This reference maps the Partial Network Cluster to a set of PdurlPduGroups. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=pncPdurGroup This Attribute is only used by the AUTOSAR Classic Platform.
pncWakeupEnable	Boolean	0..1	attr	If this parameter is available and set to true then this PNC will be woken up as soon as a channel wakeup occurs on a channel where this PNC is assigned to. This is ensured by adding this PNC to the corresponding channel wakeup sources during upstream mapping. <b>Tags:</b> atp.Status=obsolete





Class	PncMapping			
relevantForDynamicPncMapping	<a href="#">EcuInstance</a>	*	ref	Reference to a PNC Gateway ECU for PNCs which do not have a static channel mapping. This is needed to describe dynamic PNCs that can be learned only at run-time and which have no relation to an ISignalPdu Group. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=relevantForDynamicPncMapping atp.Status=draft This Attribute is only used by the AUTOSAR Classic Platform.
shortLabel	<a href="#">Identifier</a>	0..1	attr	This attribute specifies an identifying shortName for the PncMapping. It shall be unique in the System scope.
vfc	<a href="#">PortGroup</a>	*	iref	Virtual Function Cluster to be mapped onto a Partial Network Cluster. This reference is optional in case that the System Description doesn't use a complete Software Component Description (VFB View). This supports the inclusion of legacy systems. <b>InstanceRef implemented by:</b> PortGroupInSystem InstanceRef
wakeupFrame	<a href="#">FrameTriggering</a>	*	ref	Reference to collection of FrameTriggerings that are used for the wakeup of this PNC (Application Frames or Nm Frames can be used). This reference is only valid if this EcuExtract represents an ECU which has direct PNC access, i.e. ECU is directly connected to a network which supports partial network. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=wakeupFrame This Attribute is only used by the AUTOSAR Classic Platform.

Table A.812: PncMapping

Class	PncMappingIdent			
<b>Note</b>	This meta-class is created to add the ability to become the target of a reference to the non-Referrable PncMapping.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">PncMapping.ident</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

Table A.813: PncMappingIdent

Class	PortAPIOption			
<b>Note</b>	Options how to generate the signatures of calls for an AtomicSwComponentType in order to communicate over a PortPrototype (for calls into a RunnableEntity as well as for calls from a RunnableEntity to the PortPrototype).			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">SwcInternalBehavior.portAPIOption</a>			
Attribute	Type	Mult.	Kind	Note
enableTakeAddress	Boolean	0..1	attr	If set to true, the software-component is able to use the API reference for deriving a pointer to an object.







Class	PortAPIOption			
errorHandling	DataTransformationErrorHandlingEnum	0..1	attr	This specifies whether a RunnableEntity accessing a Port Prototype that is referenced by this PortAPIOption shall specifically handle transformer errors or not.
indirectAPI	Boolean	0..1	attr	If set to true this attribute specifies an "indirect API" to be generated for the associated port which means that the software-component is able to access the actions on a port via a pointer to an object representing a port. This allows e.g. iterating over ports in a loop. This option has no effect for PPortPrototypes of client/server interfaces.
port	<a href="#">PortPrototype</a>	0..1	ref	The option is valid for generated functions related to communication over this port <b>Stereotypes:</b> atpIdentityContributor
portArgValue (ordered)	<a href="#">PortDefinedArgumentValue</a>	*	aggr	An argument value defined by this port.
supportedFeature	SwcSupportedFeature	*	aggr	This collection specifies which features are supported by the RunnableEntitys which access a PortPrototype that it referenced by this PortAPIOption.
transformerStatusForwarding	DataTransformationStatusForwardingEnum	0..1	attr	This attribute specifies whether a RunnableEntity accessing a PortPrototype that is referenced by this PortAPIOption shall be able to forward a status code to the transformer chain.

Table A.814: PortAPIOption

Class	PortDefinedArgumentValue			
<b>Note</b>	A PortDefinedArgumentValue is passed to a RunnableEntity dealing with the ClientServerOperations provided by a given PortPrototype. Note that this is restricted to PPortPrototypes of a ClientServer Interface.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">PortAPIOption.portArgValue</a>			
Attribute	Type	Mult.	Kind	Note
value	<a href="#">ValueSpecification</a>	0..1	aggr	Specifies the actual value.
valueType	<a href="#">ImplementationDataType</a>	0..1	trf	The implementation type of this argument value. It should not be composite type or a pointer. <b>Stereotypes:</b> isOfType

Table A.815: PortDefinedArgumentValue

Class	PortElementToCommunicationResourceMapping			
<b>Note</b>	This meta class maps a communication resource to CP Software Clusters. In this case the kind of Port Prototype specified whether the Software Cluster has to provide or to require the resource. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	CpSoftwareClusterMappingSet.portElementToComResourceMapping, <a href="#">SystemMapping.portElementToComResourceMapping</a>			
Attribute	Type	Mult.	Kind	Note
clientServerOperation	<a href="#">ClientServerOperation</a>	0..1	iref	ClientServerOperation instance qualifying the communication resource <b>InstanceRef implemented by:</b> <a href="#">OperationInSystemInstanceRef</a>
communicationResource	<a href="#">CpSoftwareClusterCommunicationResource</a>	0..1	ref	Communication resource for which the mapping applies.





Class	PortElementToCommunicationResourceMapping			
mode Declaration GroupPrototype	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	iref	ModeDeclarationGroupPrototype instance qualifying the communication resource <b>InstanceRef implemented by:</b> ModeDeclarationGroupPrototypeInSystemInstanceRef
parameterData Prototype	<a href="#">ParameterData Prototype</a>	0..1	iref	ParameterDataPrototype instance qualifying the communication resource. <b>InstanceRef implemented by:</b> ParameterDataPrototypeInSystemInstanceRef
trigger	<a href="#">Trigger</a>	0..1	iref	Trigger instance qualifying the communication resource. <b>InstanceRef implemented by:</b> TriggerInSystemInstanceRef
variableData Prototype	<a href="#">VariableDataPrototype</a>	0..1	iref	VariableDataPrototype instance qualifying the communication resource <b>InstanceRef implemented by:</b> <a href="#">VariableDataPrototypeInSystemInstanceRef</a>

**Table A.816: PortElementToCommunicationResourceMapping**

Class	PortGroup			
<b>Note</b>	Group of ports which share a common functionality. Example: need specific network resources. This information shall be available on the VFB level in order to delegate it properly via compositions. When propagated into the ECU extract, this information is used as input for the configuration of Services like the Communication Manager. A PortGroup is defined locally in a component (which can be a composition) and refers to the "outer" ports belonging to the group as well as to the "inner" groups which propagate this group into the components which are part of a composition. A PortGroup within an atomic SWC cannot be linked to inner groups.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwComponentType.portGroup</a>			
Attribute	Type	Mult.	Kind	Note
innerGroup	<a href="#">PortGroup</a>	*	iref	Links a PortGroup in a composition to another PortGroup, that is defined in a component which is part of this CompositionSwComponentType. <b>InstanceRef implemented by:</b> InnerPortGroupInCompositionInstanceRef
outerPort	<a href="#">PortPrototype</a>	*	ref	Outer PortPrototype of this AtomicSwComponentType which belongs to the group. A port can belong to several groups or to no group at all. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=outerPort.portPrototype, outerPort.variation Point.shortLabel vh.latestBindingTime=preCompileTime

**Table A.817: PortGroup**

Class	PortInterface (abstract)			
<b>Note</b>	Abstract base class for an interface that is either provided or required by a port of a software component.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">ClientServerInterface</a> , <a href="#">DataInterface</a> , <a href="#">ModeSwitchInterface</a> , <a href="#">TriggerInterface</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note





Class	<b>PortInterface</b> (abstract)			
isService	Boolean	0..1	attr	<p>This flag is set if the <code>PortInterface</code> is to be used for communication between an</p> <ul style="list-style-type: none"> <li>• <a href="#">ApplicationSwComponentType</a> or</li> <li>• <a href="#">ServiceProxySwComponentType</a> or</li> <li>• <a href="#">SensorActuatorSwComponentType</a> or</li> <li>• <a href="#">ComplexDeviceDriverSwComponentType</a></li> <li>• <a href="#">ServiceSwComponentType</a></li> <li>• <a href="#">EcuAbstractionSwComponentType</a></li> </ul> <p>and a <a href="#">ServiceSwComponentType</a> (namely an AUTOSAR Service) located on the same ECU. Otherwise the flag is not set.</p> <p><b>Stereotypes:</b> <code>atpVariation</code>  <b>Tags:</b> <code>vh.latestBindingTime=blueprintDerivationTime</code></p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
serviceKind	ServiceProviderEnum	0..1	attr	<p>This attribute provides further details about the nature of the applied service.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>

**Table A.818: PortInterface**

Class	<b>PortInterfaceMapping</b> (abstract)			
Note	Specifies one <code>PortInterfaceMapping</code> to support the connection of Ports typed by two different <a href="#">PortInterfaces</a> with <code>PortInterface</code> elements having unequal names and/or unequal semantic (resolution or range).			
Base	<a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">ClientServerInterfaceMapping</a> , <a href="#">ModelInterfaceMapping</a> , <a href="#">TriggerInterfaceMapping</a> , <a href="#">VariableAndParameterInterfaceMapping</a>			
Aggregated by	<a href="#">PortInterfaceMappingSet.portInterfaceMapping</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.819: PortInterfaceMapping**

Class	<b>PortPrototype</b> (abstract)			
Note	Base class for the ports of an AUTOSAR software component. The aggregation of <code>PortPrototypes</code> is subject to variability with the purpose to support the conditional existence of ports.			
Base	<a href="#">ARObject</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpFeature</a> , <a href="#">AtpPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">AbstractProvidedPortPrototype</a> , <a href="#">AbstractRequiredPortPrototype</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwComponentType.port</a>			
Attribute	Type	Mult.	Kind	Note
clientServerAnnotation	<a href="#">ClientServerAnnotation</a>	*	aggr	Annotation of this <code>PortPrototype</code> with respect to client/server communication.
delegatedPortAnnotation	<a href="#">DelegatedPortAnnotation</a>	0..1	aggr	Annotations on this delegated port.
ioHwAbstractionServerAnnotation	<a href="#">IoHwAbstractionServerAnnotation</a>	*	aggr	Annotations on this IO Hardware Abstraction port.





Class	PortPrototype (abstract)			
modePort Annotation	<a href="#">ModePortAnnotation</a>	*	aggr	Annotations on this mode port.
nvDataPort Annotation	<a href="#">NvDataPortAnnotation</a>	*	aggr	Annotations on this non volatile data port.
parameterPort Annotation	<a href="#">ParameterPortAnnotation</a>	*	aggr	Annotations on this parameter port.
senderReceiver Annotation	<a href="#">SenderReceiverAnnotation</a>	*	aggr	Collection of annotations of this ports sender/receiver communication. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=senderReceiverAnnotation
triggerPort Annotation	<a href="#">TriggerPortAnnotation</a>	*	aggr	Annotations on this trigger port.

Table A.820: PortPrototype

Class	PortPrototypeBlueprint			
<b>Note</b>	This meta-class represents the ability to express a blueprint of a PortPrototype by referring to a particular PortInterface. This blueprint can then be used as a guidance to create particular PortPrototypes which are defined according to this blueprint. By this it is possible to standardize application interfaces without the need to also standardize software-components with PortPrototypes typed by the standardized Port Interfaces. <b>Tags:</b> atp.recommendedPackage=PortPrototypeBlueprints			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a> , <a href="#">AtpClassifier.atpFeature</a>			
Attribute	Type	Mult.	Kind	Note
initValue	PortPrototypeBlueprint InitValue	*	aggr	This specifies the init values for the dataElements in the particular PortPrototypeBlueprint.
interface	<a href="#">PortInterface</a>	1	ref	This is the interface for which the blueprint is defined. It may be a blueprint itself or a standardized PortInterface
providedCom Spec	<a href="#">PPortComSpec</a>	*	aggr	Provided communication attributes per interface element (data element or operation). <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=providedComSpec.dataElement, providedComSpec.getter, providedComSpec.modeGroup, providedComSpec.operation, providedComSpec.parameter, providedComSpec.setter, providedComSpec.variable
requiredCom Spec	<a href="#">RPortComSpec</a>	*	aggr	Required communication attributes, one for each interface element. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=requiredComSpec.dataElement, requiredComSpec.getter, requiredComSpec.modeGroup, requiredComSpec.operation, requiredComSpec.parameter, requiredComSpec.setter, requiredComSpec.variable

Table A.821: PortPrototypeBlueprint

Primitive	PositiveUnlimitedInteger
<b>Note</b>	This is a positive unlimited integer which can be denoted in decimal, binary, octal and hexadecimal. <b>Tags:</b> xml.xsd.customType=POSITIVE-UNLIMITED-INTEGER xml.xsd.pattern=0[ +]?[1-9][0-9]*[0xX][0-9a-fA-F]+ 0[bB][0-1]+ 0[0-7]+ xml.xsd.type=string

Table A.822: PositiveUnlimitedInteger

Class	PostBuildVariantCondition			
Note	This class specifies the value which shall be assigned to a particular variant criterion in order to bind the variation point. If multiple criterion/value pairs are specified, they shall all match to bind the variation point. In other words binding can be represented by (criterion1 == value1) && (condition2 == value2) ...			
Base	ARObject			
Aggregated by	VariationPoint.postBuildVariantCondition, VariationPointProxy.postBuildVariantCondition			
Attribute	Type	Mult.	Kind	Note
matching Criterion	PostBuildVariant Criterion	1	ref	This is the criterion which needs to match the value in order to make the PostbuildVariantCondition to be true.
value	Integer	1	attr	This is the particular value of the post-build variant criterion. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

Table A.823: PostBuildVariantCondition

Class	PredefinedVariant			
Note	This specifies one predefined variant. It is characterized by the union of all system constant values and post-build variant criterion values aggregated within all referenced system constant value sets and post build variant criterion value sets plus the value sets of the included variants. <b>Tags:</b> atp.recommendedPackage=PredefinedVariants			
Base	ARElement, ARObject, CollectableElement, Identifiable, MultilanguageReferrable, Packageable Element, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
includedVariant	PredefinedVariant	*	ref	The associated variants are considered part of this PredefinedVariant. This means the settings of the included variants are included in the settings of the referencing PredefinedVariant. Nevertheless the included variants might be included in several predefined variants.
postBuildVariant CriterionValue Set	PostBuildVariant CriterionValueSet	*	ref	This is the postBuildVariantCriterionValueSet contributing to the predefined variant.
sw Systemconstant ValueSet	SwSystemconstant ValueSet	*	ref	This ist the set of Systemconstant Values contributing to the predefined variant.

Table A.824: PredefinedVariant

Class	ProvidedServiceInstance			
Note	Service instances that are provided by the ECU that is connected via the ApplicationEndpoint to a CommunicationConnector.			
Base	ARObject, AbstractServiceInstance, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	ServiceInstanceCollectionSet.serviceInstance			
Attribute	Type	Mult.	Kind	Note





Class	ProvidedServiceInstance			
allowedServiceConsumer	<a href="#">NetworkEndpoint</a>	*	ref	<p>NetworkEndpoints on which the ConsumedServiceInstances that are communicating with this ProvidedServiceInstance are allowed to be located so that the ACL check in the ServiceDiscovery is successful and the connection is allowed to be established.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=allowedServiceConsumer.networkEndpoint, allowedServiceConsumer.variationPoint.shortLabel  atp.Status=draft  vh.latestBindingTime=postBuild</p>
autoAvailable	Boolean	0..1	attr	Defines that this ProvidedServiceInstance shall be offered by the service discovery at ECU start.
eventHandler	<a href="#">EventHandler</a>	*	aggr	<p>Collection of event groups provided by the ProvidedServiceInstance</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=eventHandler.shortName, eventHandler.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>
instanceIdentifier	PositiveInteger	0..1	attr	Instance identifier. Can be used for e.g. service discovery to identify the instance of the service.
loadBalancingPriority	PositiveInteger	0..1	attr	Defines the value to be used for load balancing priority in the service offer. Lower value means higher priority.
loadBalancingWeight	PositiveInteger	0..1	attr	Defines the value to be used for load balancing weight in the service offer. Higher value means higher probability to be chosen.
localUnicastAddress	<a href="#">ApplicationEndpoint</a>	0..2	ref	<p>The local address over which the PSI is provided (udp, tcp or both).</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=localUnicastAddress.applicationEndpoint, localUnicastAddress.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>
minorVersion	PositiveInteger	0..1	attr	Minor Version of the Service that is provided by this ProvidedServiceInstance.
priority	PositiveInteger	0..1	attr	Defines the frame priority where values from 0 (best effort) to 7 (highest) are allowed.
remoteMulticastSubscriptionAddress	<a href="#">ApplicationEndpoint</a>	*	ref	<p>This reference defines the remote multicast subscribed addresses of service consumers. This reference shall ONLY be used if the remote address of the clients is determined from the configuration and not at runtime.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=remoteMulticastSubscriptionAddress.applicationEndpoint, remoteMulticastSubscriptionAddress.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>
remoteUnicastAddress	<a href="#">ApplicationEndpoint</a>	*	ref	<p>This reference defines the remote addresses of service consumers. This reference shall ONLY be used if the remote address of the clients is determined from the configuration and not at runtime.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=remoteUnicastAddress.applicationEndpoint, remoteUnicastAddress.variationPoint.shortLabel  vh.latestBindingTime=postBuild</p>





Class	ProvidedServiceInstance			
sdServerTimerConfig	<a href="#">SomeipSdServerServiceInstanceConfig</a>	0..1	ref	Server specific configuration settings relevant for the SOME/IP service discovery. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=sdServerTimerConfig.someipSdServerServiceInstanceConfig, sdServerTimerConfig.variation Point.shortLabel vh.latestBindingTime=postBuild
serviceIdentifier	PositiveInteger	0..1	attr	This attribute represents the ability to describe the SOME/IP service ID that is offered.

**Table A.825: ProvidedServiceInstance**

Class	QueuedReceiverComSpec			
Note	Communication attributes specific to queued receiving.			
Base	<a href="#">ARObject</a> , <a href="#">RPortComSpec</a> , <a href="#">ReceiverComSpec</a>			
Aggregated by	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
Attribute	Type	Mult.	Kind	Note
queueLength	PositiveInteger	0..1	attr	Length of queue for received events. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.826: QueuedReceiverComSpec**

Class	QueuedSenderComSpec			
Note	Communication attributes specific to distribution of events ( <a href="#">PPortPrototype</a> , <a href="#">SenderReceiverInterface</a> and <a href="#">dataElement</a> carries an "event").			
Base	<a href="#">ARObject</a> , <a href="#">PPortComSpec</a> , <a href="#">SenderComSpec</a>			
Aggregated by	<a href="#">AbstractProvidedPortPrototype.providedComSpec</a> , <a href="#">PortPrototypeBlueprint.providedComSpec</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.827: QueuedSenderComSpec**

Class	<a href="#">RPortComSpec</a> (abstract)			
Note	Communication attributes of a required PortPrototype. This class will contain attributes that are valid for all kinds of require-ports, independent of client-server or sender-receiver communication patterns.			
Base	<a href="#">ARObject</a>			
Subclasses	<a href="#">ClientComSpec</a> , <a href="#">ModeSwitchReceiverComSpec</a> , <a href="#">NvRequireComSpec</a> , <a href="#">ParameterRequireComSpec</a> , <a href="#">ReceiverComSpec</a>			
Aggregated by	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.828: RPortComSpec**

<b>Class</b>	<b>RPortPrototype</b>			
<b>Note</b>	Component port requiring a certain port interface.			
<b>Base</b>	ARObject, AbstractRequiredPortPrototype, AtpBlueprintable, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, PortPrototype, Referrable			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwComponentType.port			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
mayBeUnconnected	Boolean	0..1	attr	If set to true, this attribute indicates that the enclosing RPortPrototype may be left unconnected and that this aspect has explicitly been considered in the software-component's design. This Attribute is only used by the AUTOSAR Classic Platform.
requiredInterface	PortInterface	0..1	tref	The interface that this port requires. <b>Stereotypes:</b> isOfType

**Table A.829: RPortPrototype**

<b>Class</b>	<b>RTEEvent</b> (abstract)			
<b>Note</b>	Abstract base class for all RTE-related events			
<b>Base</b>	ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable			
<b>Subclasses</b>	AsynchronousServerCallReturnsEvent, BackgroundEvent, DataReceiveErrorEvent, DataReceivedEvent, DataSendCompletedEvent, DataWriteCompletedEvent, ExternalTriggerOccurredEvent, InitEvent, InternalTriggerOccurredEvent, ModeSwitchedAckEvent, OperationInvokedEvent, OsTaskExecutionEvent, SwcModeManagerErrorEvent, SwcModeSwitchEvent, TimingEvent, TransformerHardErrorEvent			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwcInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
disabledMode	ModeDeclaration	*	iref	Reference to the Modes that disable the Event. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=disabledMode.contextPort, disabledMode.contextModeDeclarationGroupPrototype, disabledMode.targetModeDeclaration <b>InstanceRef implemented by:</b> RModelInAtomicSwc InstanceRef
startOnEvent	RunnableEntity	0..1	ref	The referenced RunnableEntity starts when the corresponding RTEEvent is raised.

**Table A.830: RTEEvent**

<b>Class</b>	<b>RapidPrototypingScenario</b>			
<b>Note</b>	This meta-class provides the ability to describe a Rapid Prototyping Scenario. Such a Rapid Prototyping Scenario consist out of two main aspects, the description of the byPassPoints and the relation to an rpt Hook. <b>Tags:</b> atp.recommendedPackage=RapidPrototypingScenarios			
<b>Base</b>	ARElement, ARObject, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
hostSystem	System	0..1	ref	System which describes the software components of the host ECU.







Class	RapidPrototypingScenario			
rptContainer	<a href="#">RptContainer</a>	*	aggr	Top-level rptContainer definitions of this specific rapid prototyping scenario. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptContainer.shortName, rptContainer.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
rptProfile	<a href="#">RptProfile</a>	*	aggr	Defiens the applicable Rapid Prototyping profls which are especially defining the smbol of the service functions and the valid id range. The order of the RptProfiles determines the order of the service function invocation by RTE. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=rptProfile.shortName
rptSystem	<a href="#">System</a>	0..1	ref	System which describes the rapid prototyping algorithm in the format of AUTOSAR Software Components. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=rptSystem

**Table A.831: RapidPrototypingScenario**

Class	<i>ReceiverComSpec</i> (abstract)			
Note	Receiver-specific communication attributes (RPortPrototype typed by SenderReceiverInterface).			
Base	ARObject, <a href="#">RPortComSpec</a>			
Subclasses	<a href="#">NonqueuedReceiverComSpec</a> , <a href="#">QueuedReceiverComSpec</a>			
Aggregated by	<a href="#">AbstractRequiredPortPrototype.requiredComSpec</a> , <a href="#">PortPrototypeBlueprint.requiredComSpec</a>			
Attribute	Type	Mult.	Kind	Note
composite Network Representation	<a href="#">CompositeNetworkRepresentation</a>	*	aggr	This represents a CompositeNetworkRepresentation defined in the context of a ReceiverComSpec. The purpose of this aggregation is to be able to specify the network representation of leaf elements of Application CompositeDataTypes. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=compositeNetworkRepresentation This Attribute is only used by the AUTOSAR Classic Platform.
dataElement	<a href="#">AutosarDataPrototype</a>	0..1	ref	Data element these attributes belong to. <b>Stereotypes:</b> atpIdentityContributor
handleOutOfRange	<a href="#">HandleOutOfRangeEnum</a>	0..1	attr	This attribute controls how values that are out of the specified range are handled according to the values of HandleOutOfRangeEnum. This Attribute is only used by the AUTOSAR Classic Platform.
handleOutOfRangeStatus	HandleOutOfRangeStatusEnum	0..1	attr	Control the way how return values are created in case of an out-of-range situation. This Attribute is only used by the AUTOSAR Classic Platform.
network Representation	<a href="#">SwDataDefProps</a>	0..1	aggr	A networkRepresentation is used to define how the data Element is mapped to a communication bus. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=networkRepresentation This Attribute is only used by the AUTOSAR Classic Platform.
receptionProps	<a href="#">ReceptionComSpecProps</a>	0..1	aggr	"This aggregation represents the definition transmission props in the context of the enclosing ReceiverComSpec.





Class	ReceiverComSpec (abstract)			
replaceWith	VariableAccess	0..1	aggr	This aggregation is used to identify the AutosarData Prototype to be taken for sourcing an external replacement in the out-of-range and invalidValue handling. This Attribute is only used by the AUTOSAR Classic Platform.
transformationComSpecProps	TransformationComSpecProps	*	aggr	This references the TransformationComSpecProps which define port-specific configuration for data transformation. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=transformationComSpecProps

**Table A.832: ReceiverComSpec**

Class	ReceptionComSpecProps			
Note	This meta-class defines a set of reception attributes which the application software is assumed to implement.			
Base	ARObject			
Aggregated by	ReceiverComSpec.receptionProps			
Attribute	Type	Mult.	Kind	Note
comHandlerTaskMappingEnabled	Boolean	0..1	attr	This attribute defines whether the ComHandler Task Mapping is activated or deactivated. This Attribute is only used by the AUTOSAR Classic Platform.
dataUpdatePeriod	TimeValue	0..1	attr	This attribute defines the period in which the application shall check for updated data. This attribute is used for the configuration of the E2E protection, but may also indicate a general data reception period.
invalidValueBitfieldErrorsEnabled	Boolean	0..1	attr	This attribute defines whether the the invalid value error bitfield shall be used which contains the information of invalid value errors of the direct child elements of the enclosing structure and not of elements of sub-structures. This Attribute is only used by the AUTOSAR Classic Platform.
outOfRangeBitfieldErrorsEnabled	Boolean	0..1	attr	This attribute defines whether the the out-of-range error bitfield shall be used which contains the information of out-of-range errors of the direct child elements of the enclosing structure and not of elements of sub-structures. This Attribute is only used by the AUTOSAR Classic Platform.
timeout	TimeValue	0..1	attr	This attribute defines the time interval after which the application shall assume that the to be received data reception has timed out, i.e. the respective data has not been received for that amount of time.

**Table A.833: ReceptionComSpecProps**

<b>Class</b>	<b>RecordValueSpecification</b>			
<b>Note</b>	Specifies the values for a record.			
<b>Base</b>	ARObject, <a href="#">CompositeValueSpecification</a> , <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">CompositeRuleBasedValueSpecification.argument</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
field (ordered)	<a href="#">ValueSpecification</a>	*	aggr	The value for a single record field. This could also be mapped explicitly to a record element of the data type using the shortName of the ValueSpecification. But this would introduce a relationship to the data type that is too strong. As of now, it is only important that the structure of the data type matches the structure of the ValueSpecification independently of the shortNames. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=field, field.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.834: RecordValueSpecification**

<b>Enumeration</b>	<b>ReentrancyLevelEnum</b>
<b>Note</b>	Specifies if and in which kinds of environments an entity is reentrant.
<b>Aggregated by</b>	<a href="#">ExecutableEntity.reentrancyLevel</a>
<b>Literal</b>	<b>Description</b>
multicoreReentrant	Unlimited concurrent execution of this entity is possible, including preemption and parallel execution on multi core systems. <b>Tags:</b> atp.EnumerationLiteralIndex=0
nonReentrant	Concurrent execution of this entity is not possible. <b>Tags:</b> atp.EnumerationLiteralIndex=1
singleCoreReentrant	Pseudo-concurrent execution (i.e. preemption) of this entity is possible on single core systems. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.835: ReentrancyLevelEnum**

<b>Primitive</b>	<b>Ref</b>
<b>Note</b>	<p>This primitive denotes a name based reference. For detailed syntax see the xsd.pattern.</p> <ul style="list-style-type: none"> <li>• first slash (relative or absolute reference) [optional]</li> <li>• Identifier [required]</li> <li>• a sequence of slashes and Identifiers [optional]</li> </ul> <p>This primitive is used by the meta-model tools to create the references.</p> <p><b>Tags:</b>  xml.xsd.customType=REF  xml.xsd.pattern=/?[a-zA-Z][a-zA-Z0-9_]{0,127}/([a-zA-Z][a-zA-Z0-9_]{0,127})*  xml.xsd.type=string</p>





<b>Primitive</b>	<b>Ref</b>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
base	Identifier	0..1	attr	This attribute reflects the base to be used for this reference. <b>Tags:</b> xml.attribute=true
blueprintValue	String	0..1	attr	This represents a description that documents how the value shall be defined when deriving objects from the blueprint. <b>Tags:</b> atp.Status=valid xml.attribute=true
index	PositiveInteger	0..1	attr	This attribute supports the use case to point on specific elements in an array. This is in particular required if arrays are used to implement particular data objects. The counting of array indices starts with the value 0, i.e. the index of the first array element is 0. <b>Tags:</b> xml.attribute=true

**Table A.836: Ref**

<b>Class</b>	<b>ReferenceBase</b>			
<b>Note</b>	This meta-class establishes a basis for relative references. Reference bases are identified by the short Label which shall be unique in the current package.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	ARPackage.referenceBase			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
globalElement	ReferrableSubtypes Enum	*	attr	This attribute represents a meta-class for which the global referencing is supported via this reference base. <b>Tags:</b> xml.sequenceOffset=29
globalInPackage	ARPackage	*	ref	This represents the ability to express that global elements live in various packages which do not have a common ancestor package. Packages mentioned by ReferenceBase.globalInPackage are used in addition to the one in ReferenceBase.package. <b>Tags:</b> xml.sequenceOffset=28
package	ARPackage	0..1	ref	This association specifies the basis of all relative references with the base equals shortLabel. <b>Tags:</b> xml.sequenceOffset=30
shortLabel	Identifier	1	attr	This is the name of the reference base. By this name, particular references can denote the applicable base. <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> xml.sequenceOffset=10

**Table A.837: ReferenceBase**

<b>Class</b>	<b>ReferenceValueSpecification</b>			
<b>Note</b>	Specifies a reference to a data prototype to be used as an initial value for a pointer in the software.			
<b>Base</b>	<i>ARObject</i> , <a href="#">ValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
referenceValue	<a href="#">DataPrototype</a>	0..1	ref	The referenced data prototype.

**Table A.838: ReferenceValueSpecification**

<b>Class</b>	<b>Referrable</b> (abstract)			
<b>Note</b>	Instances of this class can be referred to by their identifier (while adhering to namespace borders).			
<b>Base</b>	<i>ARObject</i>			
<b>Subclasses</b>	<a href="#">AtpDefinition</a> , <a href="#">BswDistinguishedPartition</a> , <a href="#">BswModuleCallPoint</a> , <a href="#">BswModuleClientServerEntry</a> , <a href="#">BswVariableAccess</a> , <a href="#">CouplingPortTrafficClassAssignment</a> , <a href="#">DiagnosticEnvModeElement</a> , <a href="#">EthernetPriorityRegeneration</a> , <a href="#">ExclusiveAreaNestingOrder</a> , <a href="#">HwDescriptionEntity</a> , <a href="#">ImplementationProps</a> , <a href="#">LinSlaveConfigIdent</a> , <a href="#">ModeTransition</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PncMappingIdent</a> , <a href="#">SingleLanguageReferrable</a> , <a href="#">SoConIPdulIdentifier</a> , <a href="#">TpConnectionIdent</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
shortName	<a href="#">Identifier</a>	1	attr	This specifies an identifying shortName for the object. It needs to be unique within its context and is intended for humans but even more for technical reference. <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> xml.enforceMinMultiplicity=true xml.sequenceOffset=-100
shortName Fragment	ShortNameFragment	*	aggr	This specifies how the Referrable.shortName is composed of several shortNameFragments. <b>Tags:</b> xml.sequenceOffset=-90

**Table A.839: Referrable**

<b>Class</b>	<b>RelativeTolerance</b>			
<b>Note</b>	Maximum allowable deviation			
<b>Base</b>	<i>ARObject</i> , <a href="#">TimeRangeTypeTolerance</a>			
<b>Aggregated by</b>	<a href="#">TimeRangeType.tolerance</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
relative	Integer	0..1	attr	Maximum allowable deviation in percent (percent of the corresponding TimeValue).

**Table A.840: RelativeTolerance**

<b>Class</b>	<b>RequestResponseDelay</b>			
<b>Note</b>	Time to wait before answering the query.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">SomeipSdClientEventGroupTimingConfig.requestResponseDelay</a> , <a href="#">SomeipSdServerEventGroupTimingConfig.requestResponseDelay</a> , <a href="#">SomeipSdServerServiceInstanceConfig.requestResponseDelay</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
maxValue	TimeValue	0..1	attr	Maximum allowable response delay to entries received by multicast in seconds.
minValue	TimeValue	0..1	attr	Minimum allowable response delay to entries received by multicast in seconds.

**Table A.841: RequestResponseDelay**

<b>Class</b>	<b>RoleBasedBswModuleEntryAssignment</b>			
<b>Note</b>	This class specifies an assignment of a role to a particular BswModuleEntry (usually a configurable callback). With this assignment, the role of the callback is mapped to a specific ServiceNeeds element, so that a tool is able to create appropriate configuration values for the module that implements the AUTOSAR Service.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.assignedEntryRole</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
assignedEntry	<a href="#">BswModuleEntry</a>	0..1	ref	The assigned entry. It should be an implementedEntry or expectedEntry of the module or cluster that requires the ServiceNeeds. This Attribute is only used by the AUTOSAR Classic Platform.
role	<a href="#">Identifier</a>	0..1	attr	This is the role of the assigned BswModuleEntry in the given context. The attribute is required (for example) because different kind of callbacks may be associated with the same ServiceNeeds (e.g. end-notification vs. error-notification). The value shall be the role name of a configurable function call (usually a callback) as standardized in the Software Specification of the related AUTOSAR Service.

**Table A.842: RoleBasedBswModuleEntryAssignment**

<b>Class</b>	<b>RoleBasedDataAssignment</b>			
<b>Note</b>	This class specifies an assignment of a role to a particular data object in either <ul style="list-style-type: none"> <li>the SwcInternalBehavior of a software component (or in the BswInternalBehavior of a BSW module or BSW cluster) in the context of an AUTOSAR Service or</li> <li>an NvBlockDescriptor to sort out the assignment of event-based writing strategies to data elements in a PortPrototype.</li> </ul> With this assignment, the role of the data can be mapped to a DataPrototype that is used in the context of the definition of a specific ServiceNeeds or NvBlockDescriptor, so that a tool is able to create the correct access or writing strategy.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">BswServiceDependency.assignedData</a> , <a href="#">NvBlockDescriptor.writingStrategy</a> , <a href="#">SwcServiceDependency.assignedData</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	RoleBasedDataAssignment			
role	<a href="#">Identifier</a>	0..1	attr	This is the role of the assigned data in the given context. Possible values need to be specified on M1 level. Additionally the TPS Software Component Template provides a list of applicable roles for various service dependencies and service use cases in chapter 13 "Service Dependencies and Service Use Cases" (e.g., ramBlock in case of the needs for a permanent RAM block).
usedData Element	<a href="#">AutosarVariableRef</a>	0..1	aggr	The VariableDataPrototype used in this role, e.g. <ul style="list-style-type: none"> <li>Permanent RAM Block of an NVRAM Block which shall belong to the same SwcInternalBehavior or Bsw InternalBehavior.</li> <li>In the role signalBasedDiagnostics it has to refer to a VariableDataPrototype in a SenderReceiverInterface or a NvDataInterface.</li> </ul>
usedParameter Element	<a href="#">AutosarParameterRef</a>	0..1	aggr	The ParameterDataPrototype used in this role, e.g. <ul style="list-style-type: none"> <li>ROM Block of an NVRAM Block. It shall belong to the same SwcInternalBehavior or BswInternalbehavior.</li> <li>In the role signalBasedDiagnostics it has to refer to a ParameterDataPrototype in a ParameterInterface.</li> </ul>
usedPim	<a href="#">PerInstanceMemory</a>	0..1	ref	The (untyped) PerInstanceMemory used in this role (e.g. as a Permanent RAM Block for an NVRAM Block).

**Table A.843: RoleBasedDataAssignment**

Class	RoleBasedDataTypeAssignment			
<b>Note</b>	This class specifies an assignment of a role to a particular data type of a software component (or in the BswModuleBehavior of a module or cluster) in the context of an AUTOSAR Service. With this assignment, the role of the data type can be mapped to a specific ServiceNeeds element, so that a tool is able to create the correct access.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">ServiceDependency.assignedDataType</a>			
Attribute	Type	Mult.	Kind	Note
role	<a href="#">Identifier</a>	0..1	attr	This is the role of the associated data type in the given context.
used Implementation DataType	<a href="#">ImplementationDataType</a>	0..1	ref	This represents the associated ImplementationDataType.

**Table A.844: RoleBasedDataTypeAssignment**

Class	RoleBasedPortAssignment			
<b>Note</b>	This class specifies an assignment of a role to a particular service port (RPortPrototype or PPort Prototype) of an AtomicSwComponentType. With this assignment, the role of the service port can be mapped to a specific ServiceNeeds element, so that a tool is able to create the correct connector.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">NvBlockDescriptor.clientServerPort</a> , <a href="#">SwcServiceDependency.assignedPort</a>			
Attribute	Type	Mult.	Kind	Note
portPrototype	<a href="#">PortPrototype</a>	0..1	ref	Service PortPrototype used in the assigned role. This PortPrototype shall either belong to the same AtomicSw ComponentType as the SwcInternalBehavior which owns the ServiceDependency or to the same NvBlockSw ComponentType as the NvBlockDescriptor.





Class	RoleBasedPortAssignment			
role	Identifier	0..1	attr	This is the role of the assigned Port in the given context. The value shall be a shortName of the Blueprint of a Port Interface as standardized in the Software Specification of the related AUTOSAR Service.

**Table A.845: RoleBasedPortAssignment**

Class	RootSwCompositionPrototype			
Note	<p>The RootSwCompositionPrototype represents the top-level-composition of software components within a given System.</p> <p>According to the use case of the System, this may for example be a more or less complete VFB description, the software of a System Extract or the software of a flat ECU Extract with only atomic SWCs. Therefore the RootSwComposition will only occasionally contain all atomic software components that are used in a complete VFB System. The OEM is primarily interested in the required functionality and the interfaces defining the integration of the Software Component into the System. The internal structure of such a component contains often substantial intellectual property of a supplier. Therefore a top-level software composition will often contain empty compositions which represent subsystems.</p> <p>The contained SwComponentPrototypes are fully specified by their SwComponentTypes (including Port Prototypes, PortInterfaces, VariableDataPrototypes, SwcInternalBehavior etc.), and their ports are interconnected using SwConnectorPrototypes.</p>			
Base	ARObject, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	AtpClassifier.atpFeature, System.rootSoftwareComposition			
Attribute	Type	Mult.	Kind	Note
calibration ParameterValue Set	CalibrationParameter ValueSet	*	ref	Used CalibrationParameterValueSet for instance specific initialization of calibration parameters. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=calibrationParameterValueSet This Attribute is only used by the AUTOSAR Classic Platform.
flatMap	FlatMap	0..1	ref	The FlatMap used in the scope of this RootSw CompositionPrototype. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=flatMap This Attribute is only used by the AUTOSAR Classic Platform.
software Composition	CompositionSw ComponentType	0..1	tref	We assume that there is exactly one top-level composition that includes all Component instances of the system. <b>Stereotypes:</b> isOfType

**Table A.846: RootSwCompositionPrototype**

Class	RoughEstimateHeapUsage			
Note	Rough estimation of the heap usage.			
Base	ARObject, HeapUsage, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	ResourceConsumption.heapUsage			
Attribute	Type	Mult.	Kind	Note
memory Consumption	PositiveInteger	0..1	attr	Rough estimate of the heap usage. Unit: byte.

**Table A.847: RoughEstimateHeapUsage**



<b>Class</b>	<b>RoughEstimateOfExecutionTime</b>			
<b>Note</b>	Provides a description of a rough estimate on the ExecutionTime.			
<b>Base</b>	ARObject, <a href="#">ExecutionTime</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ResourceConsumption.executionTime			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
additional Information	String	0..1	attr	Provides description on the rough estimate of the ExecutionTime.
estimated ExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The estimated execution time.

**Table A.848: RoughEstimateOfExecutionTime**

<b>Class</b>	<b>RoughEstimateStackUsage</b>			
<b>Note</b>	Rough estimation of the stack usage.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">StackUsage</a>			
<b>Aggregated by</b>	ResourceConsumption.stackUsage			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
memory Consumption	PositiveInteger	0..1	attr	Rough estimate of the stack usage. Unit: byte.

**Table A.849: RoughEstimateStackUsage**

<b>Class</b>	<b>RptComponent</b>			
<b>Note</b>	Description of component instance for which rapid prototyping support is implemented.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">RptSupportData.rptComponent</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
mcData Assignment	RoleBasedMcData Assignment	*	aggr	Reference to related McDataElement describing the implementation of "RP global buffer", "RP global measurement buffer", "RP enabler flag" and the "RP runnable disabler flag".
rplImplPolicy	<a href="#">RptImplPolicy</a>	0..1	aggr	Describes the implemented code preparation for rapid prototyping at data accesses.
rptExecutable Entity	<a href="#">RptExecutableEntity</a>	*	aggr	ExecutableEntity instance which can be bypassed. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptExecutableEntity.shortName, rpt ExecutableEntity.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.850: RptComponent**

<b>Class</b>	<b>RptContainer</b>			
<b>Note</b>	This meta-class defines a byPassPoint and the relation to a rptHook. Additionally it may contain further rptContainers if the byPassPoint is not atomic. For example a byPass Point referencing to a RunnableEntity may contain rptContainers referring to the data access points of the RunnableEntity. The RptContainer structure on M1 shall follow the M1 structure of the Software Component Descriptions. The category attribute denotes which level of the Software Component Description is annotated.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">RapidPrototypingScenario.rptContainer</a> , <a href="#">RptContainer.rptContainer</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	RptContainer			
byPassPoint	<a href="#">AtpFeature</a>	*	iref	byPassPoint describes the required preparation of the host ECU. At a byPassPoint the host ECU shall be capable to communicate with a RPT System in order to support the execution of the rapid prototyping algorithms with the original data calculated by the host system and to replace dedicated results of the host system by the results of the rapid prototyping algorithm. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=byPassPoint.contextElement, byPassPoint.target, byPassPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime <b>InstanceRef implemented by:</b> <a href="#">AnyInstanceRef</a>
explicitRptProfileSelection	<a href="#">RptProfile</a>	*	ref	This attribute defines the applicable RptProfiles for the specific RptContainer. If not any references to a specific RptProfile is defined, all RptProfiles defined in the Rapid PrototypingScenario are applicable. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=explicitRptProfileSelection
rptContainer	<a href="#">RptContainer</a>	*	aggr	Sub-level rptContainer definitions of this specific rapid prototyping scenario. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptContainer.shortName, rptContainer.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
rptExecutableEntityProperties	<a href="#">RptExecutableEntityProperties</a>	0..1	aggr	Describes the required code preparation for rapid prototyping at ExecutableEntity invocation.
rptHook	<a href="#">RptHook</a>	0..1	aggr	The rptHook describes the link between a byPassPoint and the rapid prototyping algorithm. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptHook, rptHook.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
rptImplPolicy	<a href="#">RptImplPolicy</a>	0..1	aggr	Describes the required code preparation for rapid prototyping at data accesses.
rptSwPrototypingAccess	<a href="#">RptSwPrototypingAccess</a>	0..1	aggr	Describes the required accessibility of data and modes by the rapid prototyping tooling.

**Table A.851: RptContainer**

Class	RptExecutableEntity			
<b>Note</b>	This describes a ExecutableEntity instance which can be bypassed.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">RptComponent.rptExecutableEntity</a>			
Attribute	Type	Mult.	Kind	Note
rptExecutableEntityEvent	<a href="#">RptExecutableEntityEvent</a>	*	aggr	ExecutableEntity event instance activation the owning Rpt ExecutableEntity. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptExecutableEntityEvent.shortName, rptExecutableEntityEvent.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	RptExecutableEntity			
rptRead	RoleBasedMcData Assignment	*	aggr	read access to a variable <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptRead, rptRead.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
rptWrite	RoleBasedMcData Assignment	*	aggr	write access to a variable <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptWrite, rptWrite.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
symbol	CIdentifier	0..1	attr	The symbol describing this ExecutableEntity's entry point.

**Table A.852: RptExecutableEntity**

Class	RptExecutableEntityEvent			
<b>Note</b>	This describes an ExecutableEntity event instance which can be bypassed.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">RptExecutableEntity.rptExecutableEntityEvent</a>			
Attribute	Type	Mult.	Kind	Note
execution Context	RptExecutionContext	*	ref	This describes the context in which the event of the executable entity is executed.
mcData Assignment	RoleBasedMcData Assignment	*	aggr	Reference to related McDataElements describing the implementation of "RP runnable disabler flag" and "stimulation enabler flag" The possible roles of the RoleBasedMcData Assignment.role attribute are: • RpRunnableDisablerFlag
rptEventId	PositiveInteger	0..1	attr	RPT event id used for service points call.
rptExecutable EntityProperties	<a href="#">RptExecutableEntity Properties</a>	0..1	aggr	Describes the implemented code preparation for rapid prototyping at ExecutableEntity invocation.
rptImplPolicy	<a href="#">RptImplPolicy</a>	0..1	aggr	Describes the RptImplPolicy of a RptExecutableEvent for service based bypassing.
rptServicePoint Post	<a href="#">RptServicePoint</a>	*	ref	This describes the applicable Post Service Points for a RTEEvent / BswEvent of a bypassed ExecutableEntity.
rptServicePoint Pre	<a href="#">RptServicePoint</a>	*	ref	This describes the applicable Pre Service Points for a RTEEvent / BswEvent of a bypassed ExecutableEntity.

**Table A.853: RptExecutableEntityEvent**

Class	RptExecutableEntityProperties			
<b>Note</b>	Describes the code preparation for rapid prototyping at ExecutableEntity invocation.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">RptContainer.rptExecutableEntityProperties</a> , <a href="#">RptExecutableEntityEvent.rptExecutableEntityProperties</a>			
Attribute	Type	Mult.	Kind	Note
maxRptEventId	PositiveInteger	0..1	attr	Highest RPT event id usable for RTE generated service points. This attribute is relevant, if dedicated id range shall be applied to the ExecutableEntitys of a software component or specific ExecutableEntitys.





Class	RptExecutableEntityProperties			
minRptEventId	PositiveInteger	0..1	attr	Lowest RPT event id usable for RTE generated service points. This attribute is relevant, if dedicated id range shall be applied to the ExecutableEntitys of a software component or specific ExecutableEntitys.
rptExecutionControl	RptExecutionControlEnum	0..1	attr	This attribute specifies the rapid prototyping control of the executable
rptServicePoint	RptServicePointEnum	0..1	attr	Enables generation of service points by the RTE generator.

**Table A.854: RptExecutableEntityProperties**

Class	RptHook			
Note	This meta-class provide the ability to describe a rapid prototyping hook. This can either be described by an other AUTOSAR system with the category RPT_SYSTEM or as a non AUTOSAR software.			
Base	ARObject			
Aggregated by	RptContainer.rptHook			
Attribute	Type	Mult.	Kind	Note
codeLabel	CIdentifier	0..1	attr	This attribute provides a code label which is used in the implementation of the hook. For example this can be an C function name or the name of data definition.
mcdIdentifier	NameToken	0..1	attr	This attribute provides an identifier which shall be used in a MCD System to display the Rpt Hook.
rptArHook	AtpFeature	0..1	iref	This describes the hook with the means of another AUTOSAR system. <b>InstanceRef implemented by:</b> AnyInstanceRef
sdg	Sdg	*	aggr	This property allows to keep special data which is not represented by the standard model. It can be utilized to keep e.g. tool specific data.

**Table A.855: RptHook**

Class	RptImplPolicy			
Note	Describes the code preparation for rapid prototyping at data accesses.			
Base	ARObject			
Aggregated by	McDataInstance.rptImplPolicy, RptComponent.rptImplPolicy, RptContainer.rptImplPolicy, RptExecutableEntityEvent.rptImplPolicy			
Attribute	Type	Mult.	Kind	Note
rptEnablerImplType	RptEnablerImplTypeEnum	0..1	attr	For Level 2 or Level3 this property determines how the RTE implements the additional "RP enabler" flag.
rptPreparationLevel	RptPreparationEnum	0..1	attr	Mandates RP preparation level for access to VariableData Prototype within generated RTE implementation.

**Table A.856: RptImplPolicy**

Class	RptProfile			
Note	The RptProfile describes the common properties of a Rapid Prototyping method.			
Base	ARObject, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	RapidPrototypingScenario.rptProfile			
Attribute	Type	Mult.	Kind	Note





Class	RptProfile			
maxServicePointId	PositiveInteger	0..1	attr	Highest service point id useable for RTE generated service points.
minServicePointId	PositiveInteger	0..1	attr	Lowest service point id useable for RTE generated service points.
servicePointSymbolPost	CIdentifier	0..1	attr	Complete symbol of the function implementing the post service point. This symbol is used for post-build hooking purposes.
servicePointSymbolPre	CIdentifier	0..1	attr	Complete symbol of the function implementing the pre service point. This symbol is used for post-build hooking purposes.
stimEnabler	RptEnablerImplType Enum	0..1	attr	Defines if the service points support the stimulation enabler. If RptProfile.stimEnabler is "none" then no stimulation enabler is passed to the service function. Otherwise the stimulation enabler will be passed as a parameter.

Table A.857: RptProfile

Class	RptServicePoint			
Note	Description of a Service Point implemented for rapid prototyping.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">RptSupportData.rptServicePoint</a>			
Attribute	Type	Mult.	Kind	Note
serviceId	PositiveInteger	0..1	attr	Unique ID (Range: 0 ... 65535) representing the service point.
symbol	CIdentifier	0..1	attr	Complete symbol of the function implementing the service point. This symbol is used for post-build hooking purposes.

Table A.858: RptServicePoint

Class	RptSupportData			
Note	Root element for rapid prototyping support data related to one Implementation artifact on an ECU, in particular the RTE. The rapid prototyping support data may reference to elements provided for McSupportData.			
Base	ARObject			
Aggregated by	<a href="#">McSupportData.rptSupportData</a>			
Attribute	Type	Mult.	Kind	Note
executionContext	RptExecutionContext	*	aggr	Defines an environment for the execution of Executable Entities.
rptComponent	<a href="#">RptComponent</a>	*	aggr	Description of components for which rapid prototyping support is implemented. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rptComponent.shortName, rptComponent.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	RptSupportData			
rptServicePoint	<a href="#">RptServicePoint</a>	*	aggr	This aggregation represents the collection of service points associated with the enclosing RptSupportData <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=rptServicePoint.shortName, rptServicePoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

**Table A.859: RptSupportData**

Class	RptSwPrototypingAccess			
<b>Note</b>	Describes the accessibility of data and modes by the rapid prototyping tooling.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">McDataInstance.resultingRptSwPrototypingAccess</a> , <a href="#">RptContainer.rptSwPrototypingAccess</a>			
Attribute	Type	Mult.	Kind	Note
rptHookAccess	RptAccessEnum	0..1	attr	The related data element can be modified using a post-build hooking tool. An ENABLED VariableData Prototype is implicitly READABLE/WRITEABLE.
rptReadAccess	RptAccessEnum	0..1	attr	The related data element can be used as input for bypass functionality by RP tool. If rptImplPolicy is not specified then RTE generation shall ensure at least suitable MC read points are created.
rptWriteAccess	RptAccessEnum	0..1	attr	The related data element can be used as output for bypass functionality by RP tool. The data element shall be prepared to rptLevel2 and related write service points are present.

**Table A.860: RptSwPrototypingAccess**

Enumeration	RteApiReturnValueProvisionEnum
<b>Note</b>	This meta-class provides values to control how return values from RTE APIs are provided. This Enumeration is only used by the AUTOSAR Classic Platform.
<b>Aggregated by</b>	<a href="#">AbstractAccessPoint.returnValueProvision</a>
Literal	Description
noReturnValueProvided	The RTE API shall not provide a return value. <b>Tags:</b> atp.EnumerationLiteralIndex=1
returnValueProvided	The RTE API shall provide a return value. <b>Tags:</b> atp.EnumerationLiteralIndex=0

**Table A.861: RteApiReturnValueProvisionEnum**

Class	RtePluginProps			
<b>Note</b>	The properties of a communication graph with respect to the utilization of RTE Implementation Plug-in. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">FlatInstanceDescriptor.rtePluginProps</a>			
Attribute	Type	Mult.	Kind	Note
associatedCrossSwClusterComRtePlugin	<a href="#">EcucContainerValue</a>	0..1	ref	This associates a communication graph to a specific RTE Implementation Plug-in handling cross Software Cluster communication.





Class	RtePluginProps			
associatedRtePlugin	<a href="#">EcucContainerValue</a>	0..1	ref	This associates a communication graph to a specific RTE Implementation Plug-in handling local Software Cluster communication or communication in a non-cluster ECU.

**Table A.862: RtePluginProps**

Class	«atpMixed» RuleArguments			
Note	This represents the arguments for a rule-based value specification.			
Base	ARObject			
Aggregated by	<a href="#">RuleBasedValueSpecification.arguments</a>			
Attribute	Type	Mult.	Kind	Note
v	<a href="#">Numerical</a>	0..1	attr	This represents a numerical value for the RuleBased ValueSpecification.
vf	<a href="#">Numerical</a>	0..1	attr	This represents a numerical value for the RuleBased ValueSpecification which may subject to variability. The latest binding time of the VariationPoint shall be pre CompileTime. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
vt	VerbatimString	0..1	attr	This represents a textual value for the RuleBasedValue Specification.
vtf	<a href="#">NumericalOrText</a>	0..1	aggr	This aggregation represents the ability to provide a value that is either numerical or text which existence is subject to variability. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.863: RuleArguments**

Class	RuleBasedAxisCont			
Note	This represents the values for the axis of a compound primitive (curve, map). For standard and fix axes, SwAxisCont contains the values of the axis directly. The axis values of SwAxisCont with the category COM_AXIS, RES_AXIS are for display only. For editing and processing, only the values in the related GroupAxis are binding.			
Base	ARObject			
Aggregated by	<a href="#">ApplicationRuleBasedValueSpecification.swAxisCont</a>			
Attribute	Type	Mult.	Kind	Note
category	<a href="#">CalprmAxisCategory Enum</a>	0..1	attr	This category specifies the particular axis types: <ul style="list-style-type: none"> <li>• STD_AXIS</li> <li>• COM_AXIS</li> <li>• RES_AXIS (swArraysize necessary)</li> </ul> <b>Tags:</b> xml.sequenceOffset=20
ruleBasedValues	<a href="#">RuleBasedValue Specification</a>	0..1	aggr	This represents the rule based value specification for the axis of a compound primitive (curve, map). <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=false xml.sequenceOffset=80 xml.typeWrapperElement=false





Class	RuleBasedAxisCont			
swArraysize	<a href="#">ValueList</a>	0..1	aggr	For multidimensional compound primitives (curve, map ...) it is necessary to know the dimensions. They are specified using swArraySize. <b>Tags:</b> xml.sequenceOffset=40
swAxisIndex	AxisIndexType	0..1	attr	This property allows to explicitly assign the axis contents to a particular axis. It is specified by numbers where 1 corresponds to the x-axis. It is also possible to derive the axis association from the sequence of the parent. <b>Tags:</b> xml.sequenceOffset=50
unit	<a href="#">Unit</a>	0..1	ref	This represents the physical unit of the provided values. <b>Tags:</b> xml.sequenceOffset=30

**Table A.864: RuleBasedAxisCont**

Class	RuleBasedValueCont			
<b>Note</b>	This represents the values of a compound primitive (CURVE, MAP, CUBOID, CUBE_4, CUBE_5, VAL_BLK) or an array.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">ApplicationRuleBasedValueSpecification.swValueCont</a>			
Attribute	Type	Mult.	Kind	Note
ruleBasedValues	<a href="#">RuleBasedValueSpecification</a>	0..1	aggr	This represents the rule based value specification for the array or compound primitive (CURVE, MAP, CUBOID, CUBE_4, CUBE_5, VAL_BLK). <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=ruleBasedValues xml.roleElement=true xml.roleWrapperElement=false xml.sequenceOffset=80 xml.typeWrapperElement=false
swArraysize	<a href="#">ValueList</a>	0..1	aggr	This attribute defines the size of each dimension for compound primitives CURVE, MAP, CUBOID, CUBE_4, CUBE_5, COM_AXIS, RES_AXIS, VAL_BLK. For each dimension one value has to be defined, e.g. one in case of COM_AXIS and two or more in case of MAP. <b>Tags:</b> xml.sequenceOffset=40
unit	<a href="#">Unit</a>	0..1	ref	This represents the physical unit of the provided values. <b>Tags:</b> xml.sequenceOffset=30

**Table A.865: RuleBasedValueCont**

Class	RuleBasedValueSpecification			
<b>Note</b>	This meta-class is used to support a rule-based initialization approach for data types with an array-nature (ApplicationArrayDataType and ImplementationDataType of category ARRAY) or a compound ApplicationPrimitiveDataType (which also boils down to an array-nature).			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">NumericalRuleBasedValueSpecification.ruleBasedValues</a> , <a href="#">RuleBasedAxisCont.ruleBasedValues</a> , <a href="#">RuleBasedValueCont.ruleBasedValues</a>			
Attribute	Type	Mult.	Kind	Note







Class	RuleBasedValueSpecification			
arguments	<a href="#">RuleArguments</a>	0..1	aggr	This represents the arguments for the RuleBasedValue Specification. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=30
maxSizeToFill	Integer	0..1	attr	If a rule is chosen which does not fill until the end, this determines until which size the rule shall fill the values. <b>Tags:</b> xml.sequenceOffset=40
rule	<a href="#">Identifier</a>	0..1	attr	This denotes the name of the rule of the RuleBasedValue Specification. The rule determines the calculation specification according which the arguments are used to calculated the values. <b>Tags:</b> xml.sequenceOffset=20

**Table A.866: RuleBasedValueSpecification**

Class	RunnableEntity			
<b>Note</b>	A <code>RunnableEntity</code> represents the smallest code-fragment that is provided by an <a href="#">AtomicSwComponentType</a> and are executed under control of the RTE. <code>RunnableEntity</code> s are for instance set up to respond to data reception or operation invocation on a server.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">ExecutableEntity</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.runnable</a>			
Attribute	Type	Mult.	Kind	Note
argument (ordered)	<a href="#">RunnableEntity</a> <a href="#">Argument</a>	*	aggr	This represents the formal definition of a an argument to a <code>RunnableEntity</code> .
asynchronous ServerCall ResultPoint	<a href="#">AsynchronousServer</a> <a href="#">CallResultPoint</a>	*	aggr	The server call result point admits a runnable to fetch the result of an asynchronous server call. The aggregation of <code>AsynchronousServerCallResultPoint</code> is subject to variability with the purpose to support the conditional existence of client server PortPrototypes and the variant existence of server call result points in the implementation. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=asynchronousServerCallResultPoint.short Name, asynchronousServerCallResultPoint.variation Point.shortLabel vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.
canBeInvoked Concurrently	Boolean	0..1	attr	If the value of this attribute is set to "true" the enclosing <code>RunnableEntity</code> can be invoked concurrently (even for one instance of the corresponding <a href="#">AtomicSwComponentType</a> ). This implies that it is the responsibility of the implementation of the <code>RunnableEntity</code> to take care of this form of concurrency.





Class	RunnableEntity			
dataRead Access	VariableAccess	*	aggr	<p>RunnableEntity has implicit read access to dataElement of a sender-receiver PortPrototype or nv data of a nv data PortPrototype.</p> <p>The aggregation of dataReadAccess is subject to variability with the purpose to support the conditional existence of sender receiver ports or the variant existence of dataReadAccess in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataReadAccess.shortName, dataReadAccess.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
dataReceive PointBy Argument	VariableAccess	*	aggr	<p>RunnableEntity has explicit read access to dataElement of a sender-receiver PortPrototype or nv data of a nv data PortPrototype. The result is passed back to the application by means of an argument in the function signature.</p> <p>The aggregation of dataReceivePointByArgument is subject to variability with the purpose to support the conditional existence of sender receiver PortPrototype or the variant existence of data receive points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataReceivePointByArgument.shortName, dataReceivePointByArgument.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
dataReceive PointByValue	VariableAccess	*	aggr	<p>RunnableEntity has explicit read access to dataElement of a sender-receiver PortPrototype or nv data of a nv data PortPrototype.</p> <p>The result is passed back to the application by means of the return value. The aggregation of dataReceivePointByValue is subject to variability with the purpose to support the conditional existence of sender receiver ports or the variant existence of data receive points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataReceivePointByValue.shortName, dataReceivePointByValue.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
dataSendPoint	VariableAccess	*	aggr	<p>RunnableEntity has explicit write access to dataElement of a sender-receiver PortPrototype or nv data of a nv data PortPrototype.</p> <p>The aggregation of dataSendPoint is subject to variability with the purpose to support the conditional existence of sender receiver PortPrototype or the variant existence of data send points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataSendPoint.shortName, dataSendPoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>





Class	RunnableEntity			
dataWrite Access	<a href="#">VariableAccess</a>	*	aggr	<p>RunnableEntity has implicit write access to dataElement of a sender-receiver PortPrototype or nv data of a nv data PortPrototype.</p> <p>The aggregation of dataWriteAccess is subject to variability with the purpose to support the conditional existence of sender receiver ports or the variant existence of dataWriteAccess in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataWriteAccess.shortName, dataWriteAccess.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
external TriggeringPoint	<a href="#">ExternalTriggeringPoint</a>	*	aggr	<p>The aggregation of ExternalTriggeringPoint is subject to variability with the purpose to support the conditional existence of trigger ports or the variant existence of external triggering points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=externalTriggeringPoint.ident.shortName, externalTriggeringPoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
internal TriggeringPoint	<a href="#">InternalTriggeringPoint</a>	*	aggr	<p>The aggregation of InternalTriggeringPoint is subject to variability with the purpose to support the variant existence of internal triggering points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=internalTriggeringPoint.shortName, internalTriggeringPoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
modeAccess Point	<a href="#">ModeAccessPoint</a>	*	aggr	<p>The runnable has a mode access point. The aggregation of ModeAccessPoint is subject to variability with the purpose to support the conditional existence of mode ports or the variant existence of mode access points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=modeAccessPoint.ident.shortName, modeAccessPoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
modeSwitch Point	<a href="#">ModeSwitchPoint</a>	*	aggr	<p>The runnable has a mode switch point. The aggregation of ModeSwitchPoint is subject to variability with the purpose to support the conditional existence of mode ports or the variant existence of mode switch points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=modeSwitchPoint.shortName, modeSwitchPoint.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>





Class	RunnableEntity			
parameter Access	<a href="#">ParameterAccess</a>	*	aggr	<p>The presence of a <a href="#">ParameterAccess</a> implies that a <a href="#">RunnableEntity</a> needs read only access to a <a href="#">ParameterDataPrototype</a> which may either be local or within a <a href="#">PortPrototype</a>.</p> <p>The aggregation of <a href="#">ParameterAccess</a> is subject to variability with the purpose to support the conditional existence of parameter ports and component local parameters as well as the variant existence of <a href="#">ParameterAccess</a> (points) in the implementation.</p> <p><b>Stereotypes:</b> <a href="#">atpSplitable</a>; <a href="#">atpVariation</a></p> <p><b>Tags:</b>  <a href="#">atp.Splitkey</a>=<a href="#">parameterAccess.shortName</a>, <a href="#">parameterAccess.variationPoint.shortLabel</a>  <a href="#">vh.latestBindingTime</a>=<a href="#">preCompileTime</a></p>
readLocal Variable	<a href="#">VariableAccess</a>	*	aggr	<p>The presence of a <a href="#">readLocalVariable</a> implies that a <a href="#">RunnableEntity</a> needs read access to a <a href="#">VariableDataPrototype</a> in the role of <a href="#">implicitInterRunnableVariable</a> or <a href="#">explicitInterRunnableVariable</a>.</p> <p>The aggregation of <a href="#">readLocalVariable</a> is subject to variability with the purpose to support the conditional existence of <a href="#">implicitInterRunnableVariable</a> and <a href="#">explicitInterRunnableVariable</a> or the variant existence of <a href="#">readLocalVariable</a> (points) in the implementation.</p> <p><b>Stereotypes:</b> <a href="#">atpSplitable</a>; <a href="#">atpVariation</a></p> <p><b>Tags:</b>  <a href="#">atp.Splitkey</a>=<a href="#">readLocalVariable.shortName</a>, <a href="#">readLocalVariable.variationPoint.shortLabel</a>  <a href="#">vh.latestBindingTime</a>=<a href="#">preCompileTime</a></p>
serverCallPoint	<a href="#">ServerCallPoint</a>	*	aggr	<p>The <a href="#">RunnableEntity</a> has a <a href="#">ServerCallPoint</a>. The aggregation of <a href="#">ServerCallPoint</a> is subject to variability with the purpose to support the conditional existence of client server <a href="#">PortPrototypes</a> or the variant existence of server call points in the implementation.</p> <p><b>Stereotypes:</b> <a href="#">atpSplitable</a>; <a href="#">atpVariation</a></p> <p><b>Tags:</b>  <a href="#">atp.Splitkey</a>=<a href="#">serverCallPoint.shortName</a>, <a href="#">serverCallPoint.variationPoint.shortLabel</a>  <a href="#">vh.latestBindingTime</a>=<a href="#">preCompileTime</a>  This Attribute is only used by the AUTOSAR Classic Platform.</p>
symbol	<a href="#">CIdentifier</a>	0..1	attr	<p>The symbol describing this <a href="#">RunnableEntity</a>'s entry point. This is considered the API of the <a href="#">RunnableEntity</a> and is required during the RTE contract phase.</p>
waitPoint	<a href="#">WaitPoint</a>	*	aggr	<p>The <a href="#">WaitPoint</a> associated with the <a href="#">RunnableEntity</a>.</p>
writtenLocal Variable	<a href="#">VariableAccess</a>	*	aggr	<p>The presence of a <a href="#">writtenLocalVariable</a> implies that a <a href="#">RunnableEntity</a> needs write access to a <a href="#">VariableDataPrototype</a> in the role of <a href="#">implicitInterRunnableVariable</a> or <a href="#">explicitInterRunnableVariable</a>.</p> <p>The aggregation of <a href="#">writtenLocalVariable</a> is subject to variability with the purpose to support the conditional existence of <a href="#">implicitInterRunnableVariable</a> and <a href="#">explicitInterRunnableVariable</a> or the variant existence of <a href="#">writtenLocalVariable</a> (points) in the implementation.</p> <p><b>Stereotypes:</b> <a href="#">atpSplitable</a>; <a href="#">atpVariation</a></p> <p><b>Tags:</b>  <a href="#">atp.Splitkey</a>=<a href="#">writtenLocalVariable.shortName</a>, <a href="#">writtenLocalVariable.variationPoint.shortLabel</a>  <a href="#">vh.latestBindingTime</a>=<a href="#">preCompileTime</a></p>

Table A.867: RunnableEntity

<b>Class</b>	<b>RunnableEntityArgument</b>			
<b>Note</b>	This meta-class represents the ability to provide specific information regarding the arguments to a RunnableEntity.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	RunnableEntity.argument			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
direction	ArgumentDirectionEnum	0..1	attr	This attribute denotes the direction of the argument.
implementationDataType	ImplementationDataType	0..1	ref	This reference represents the implementationDataType used to type the RunnableEntityArgument if the RunnableEntityArgument represents an argument of a ClientServerOperation, rather than a port-defined argument value.
serverArgumentImplPolicy	ServerArgumentImplPolicyEnum	0..1	attr	This attribute defines how the argument type of the server's RunnableEntity is implemented. If the attribute is not defined this has the same semantics as if the attribute is set to the value useArgumentType for primitive arguments and structures.
symbol	CIdentifier	0..1	attr	This represents the symbol to be generated into the actual signature on the level of the C programming language.

**Table A.868: RunnableEntityArgument**

<b>Enumeration</b>	<b>RxAcceptContainedIPduEnum</b>
<b>Note</b>	Defines whether this ContainerIPdu has a fixed set of containedIPdus assigned for reception.
<b>Aggregated by</b>	ContainerIPdu.rxAcceptContainedIPdu
<b>Literal</b>	<b>Description</b>
acceptAll	No fixed set of containedIPdus is defined for reception, any known containedIPdu (based on headerId) shall be expected within this ContainerIPdu. <b>Tags:</b> atp.EnumerationLiteralIndex=0
acceptConfigured	A fixed set of containedIPdus is defined for reception. Only these assigned containedIPdus (based on headerId) are expected in this ContainerIPdu. If a not assigned containedIPdu is received within this ContainerIPdu this containedIPdu is discarded. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.869: RxAcceptContainedIPduEnum**

<b>Class</b>	<b>RxIdentifierRange</b>			
<b>Note</b>	Optional definition of a CanId range to reduce the effort of specifying every possible FrameTriggering within the defined Id range during reception. All frames received within a range are mapped to the same Pdu that is passed to a upper layer module (e.g. Nm, CDD, PduR).			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	CanFrameTriggering.rxIdentifierRange, CanXINmNodeProps.rxIdentifierRange, IEEE1722TpAcfCanPart.canIdentifierRange			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
lowerCanId	PositiveInteger	0..1	attr	This attribute can be used together with the upperCanId attribute to define a range of CanIds.
upperCanId	PositiveInteger	0..1	attr	This attribute can be used together with the lowerCanId attribute to define a range of CanIds.

**Table A.870: RxIdentifierRange**

<b>Class</b>	<b>SOMEIPTransformationDescription</b>			
<b>Note</b>	The SOMEIPTransformationDescription is used to specify SOME/IP transformer specific attributes.			
<b>Base</b>	ARObject, Describable, <a href="#">TransformationDescription</a>			
<b>Aggregated by</b>	<a href="#">TransformationTechnology.transformationDescription</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
alignment	PositiveInteger	0..1	attr	Defines the padding for alignment purposes that will be added by the SOME/IP transformer after the serialized data of the variable data length data element. The alignment shall be specified in Bits.
byteOrder	<a href="#">ByteOrderEnum</a>	0..1	attr	Defines which byte order shall be serialized by the SOME/IP transformer
interfaceVersion	PositiveInteger	0..1	attr	The interface version the SOME/IP transformer shall use.

**Table A.871: SOMEIPTransformationDescription**

<b>Class</b>	«atpVariation» <b>SOMEIPTransformationISignalProps</b>			
<b>Note</b>	The class SOMEIPTransformationISignalProps specifies ISignal specific configuration properties for SOME/IP transformer attributes.			
<b>Base</b>	ARObject, Describable, <a href="#">TransformationISignalProps</a>			
<b>Aggregated by</b>	<a href="#">ISignal.transformationISignalProps</a> , <a href="#">ISignalGroup.transformationISignalProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
interfaceVersion	PositiveInteger	0..1	attr	The interface version the SOME/IP transformer shall use.
isDynamicLengthFieldSize	Boolean	0..1	attr	This attribute shall be used to determine the wire type in the context of using the TLV encoding.
messageType	SOMEIPMessageTypeEnum	0..1	attr	The Message Type which shall be placed into the SOME/IP header.
sizeOfArrayLengthFields	PositiveInteger	0..1	attr	The size of all length fields (in Bytes) of fixed-size arrays or dynamic size arrays in the SOME/IP message. This attribute is valid for all available occurrences of fixed-size arrays or dynamic size arrays in the SOME/IP message.
sizeOfStringLengthFields	PositiveInteger	0..1	attr	The size of all length fields (in Bytes) of dynamic length strings in the SOME/IP message. This attribute is valid for all available occurrences of strings in the SOME/IP message.
sizeOfStructLengthFields	PositiveInteger	0..1	attr	The size of all length fields (in Bytes) of structs in the SOME/IP message. This attribute is valid for all available occurrences of structures in the SOME/IP message. For a more fine granular modeling on the level of Data Prototypes the DataPrototypeTransformationProps shall be used.
sizeOfUnionLengthFields	PositiveInteger	0..1	attr	The size of all length fields (in Bytes) of unions in the SOME/IP message. This attribute is valid for all available occurrences of Unions in the SOME/IP message. For a more fine granular modeling on the level of Data Prototypes the DataPrototypeTransformationProps shall be used.
tlvDataIdDefinition	<a href="#">TlvDataIdDefinitionSet</a>	*	ref	This reference identifies the TlvDataIdDefinitions relevant for the enclosing SOMEIPTransformationISignalProps

**Table A.872: SOMEIPTransformationISignalProps**

<b>Class</b>	<b>SOMEIPTransformationProps</b>			
<b>Note</b>	The class SOMEIPTransformationProps specifies SOME/IP specific configuration properties.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TransformationProps</a>			
<b>Aggregated by</b>	TransformationPropsSet.transformationProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
alignment	PositiveInteger	0..1	attr	Defines the padding for alignment purposes that will be added by the SOME/IP transformer after the serialized data of the variable data length data element. The alignment shall be specified in Bits.
sizeOfArrayLengthField	PositiveInteger	0..1	attr	This attribute describes the size of the length field (in Bytes) that will be put in front of the referenced Array in the SOME/IP message.
sizeOfStringLengthField	PositiveInteger	0..1	attr	This attribute describes the size of the length field (in Bytes) that will be put in front of the referenced String in the SOME/IP message.
sizeOfStructLengthField	PositiveInteger	0..1	attr	This attribute describes the size of the length field (in Bytes) that will be put in front of a Structure in the SOME/IP message.
sizeOfUnionLengthField	PositiveInteger	0..1	attr	This attribute describes the size of the length field (in Bytes) that will be put in front of a Union in the SOME/IP message.

**Table A.873: SOMEIPTransformationProps**

<b>Class</b>	<b>ScheduleTableEntry</b> (abstract)			
<b>Note</b>	Table entry in a LinScheduleTable. Specifies what will be done in the frame slot. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">ApplicationEntry</a> , <a href="#">FreeFormatEntry</a> , <a href="#">LinConfigurationEntry</a>			
<b>Aggregated by</b>	<a href="#">LinScheduleTable.tableEntry</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
delay	TimeValue	0..1	attr	Relative delay between this tableEntry and the start of the successor in the schedule table in seconds.
introduction	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents introductory documentation about the schedule table entry. <b>Tags:</b> xml.sequenceOffset=-10
positionInTable	Integer	0..1	attr	Relative position in the schedule table. The first entry index in the schedule table is 0.

**Table A.874: ScheduleTableEntry**

<b>Class</b>	<b>SdgClass</b>			
<b>Note</b>	An SdgClass specifies the name and structure of the SDG that may be used to store proprietary data in an AUTOSAR model. The SdgClass is similar to an UML stereotype.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">SdgElementWithGid</a>			
<b>Aggregated by</b>	<a href="#">SdgDef.sdgClass</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
attribute (ordered)	SdgAttribute	*	aggr	Defintion of the structure of the Sdg <b>Tags:</b> xml.sequenceOffset=30
caption	Boolean	0..1	attr	Specifies if a caption is required. Note: only Sdgs that have a caption can be referenced <b>Tags:</b> xml.sequenceOffset=20





Class	SdgClass			
extendsMeta Class	MetaClassName	0..1	attr	The AUTOSAR Meta-Class that may be extended by this SdgClass. <b>Tags:</b> xml.sequenceOffset=10
sdgConstraint	<a href="#">TraceableText</a>	*	ref	Semantic constraints that restrict the structure of the special data group. <b>Tags:</b> xml.sequenceOffset=40

**Table A.875: SdgClass**

Class	SdgDef			
<b>Note</b>	A SdgDef groups several SdgClasses which belong to the same extension. The concept of an SdgDef is similar to an UML Profile. <b>Tags:</b> atp.recommendedPackage=SdgDefs			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <i>PackageableElement</i> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
sdgClass	<a href="#">SdgClass</a>	*	aggr	The owned sdgClasses which define the structure of the Sdgs <b>Tags:</b> xml.namePlural=SDG-CLASSES

**Table A.876: SdgDef**

Primitive	SectionInitializationPolicyType
<b>Note</b>	<p>SectionInitializationPolicyType describes the intended initialization of MemorySections. The following values are standardized in AUTOSAR Methodology:</p> <ul style="list-style-type: none"> <li>• <b>INIT:</b> To be used for (explicitly or not explicitly) initialized variables.</li> <li>• <b>CLEARED:</b> To be used for not explicitly initialized variables.</li> <li>• <b>POWER-ON-CLEARED:</b> To be used for variables that are not explicitly initialized (cleared) during normal start-up. Instead these are cleared only after power on reset.</li> </ul> <p>Please note that the values are defined similar to the representation of enumeration types in the XML schema to ensure backward compatibility.</p> <p><b>Tags:</b>  xml.xsd.customType=SECTION-INITIALIZATION-POLICY-TYPE  xml.xsd.type=NMTOKEN</p>

**Table A.877: SectionInitializationPolicyType**

Class	SectionNamePrefix			
<b>Note</b>	A prefix to be used for generated code artifacts defining a memory section name in the source code of the using module or SWC.			
<b>Base</b>	<i>ARObject</i> , <a href="#">ImplementationProps</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ResourceConsumption.sectionNamePrefix			
Attribute	Type	Mult.	Kind	Note
implementedIn	<a href="#">DependencyOnArtifact</a>	0..1	ref	Optional reference that allows to Indicate the code artifact (header file) containing the preprocessor implementation of memory sections with this prefix. The usage of this link supersedes the usage of a memory mapping header with the default name (derived from the BswModuleDescription's shortName).

**Table A.878: SectionNamePrefix**



<b>Class</b>	<b>SecureCommunicationAuthenticationProps</b>			
<b>Note</b>	Authentication properties used to configure SecuredIPdus.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	SecureCommunicationPropsSet.authenticationProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
authInfoTxLength	PositiveInteger	0..1	attr	This attribute defines the length in bits of the authentication code to be included in the payload of the authenticated Pdu.

**Table A.879: SecureCommunicationAuthenticationProps**

<b>Class</b>	<b>SecureCommunicationFreshnessProps</b>			
<b>Note</b>	Freshness properties used to configure SecuredIPdus.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	SecureCommunicationPropsSet.freshnessProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
freshnessCounterSyncAttempts	PositiveInteger	0..1	attr	This attribute defines the number of Freshness Counter re-synchronization attempts when a verification failed for a Secured I-PDU. If the value is zero, there will be no additional verification attempt to synchronize with a potentially better fitting Freshness Counter value. This attribute is only applicable if useFreshnessTimestamp is FALSE.
freshnessTimestampTimePeriodFactor	PositiveInteger	0..1	attr	This attribute defines a factor that specifies the time period for the Freshness Timestamp. It holds a multiplication factor that specifies the concrete meaning of a Freshness Timestamp increment by one on basis of microseconds.
freshnessValueLength	PositiveInteger	0..1	attr	This attribute defines the complete length in bits of the Freshness Value. As long as the key doesn't change the counter shall not overflow. The length of the counter shall be determined based on the expected life time of the corresponding key and frequency of usage of the counter.
freshnessValueTxLength	PositiveInteger	0..1	attr	This attribute defines the length in bits of the Freshness Value to be included in the payload of the Secured I-PDU. This length is specific to the least significant bits of the complete Freshness Counter. If the attribute is 0 no Freshness Value is included in the Secured I-PDU.
useFreshnessTimestamp	Boolean	0..1	attr	This attribute specifies whether the Freshness Value is generated through individual Freshness Counters or by a Timestamps. The value is set to TRUE when Timestamps are used.

**Table A.880: SecureCommunicationFreshnessProps**

<b>Class</b>	<b>SecureCommunicationProps</b>			
<b>Note</b>	This meta-class contains configuration settings that are specific for an individual SecuredIPdu.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">SecuredIPdu.secureCommunicationProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
authDataFreshnessLength	PositiveInteger	0..1	attr	This attribute defines the length in bits of the authentic PDU data that is passed to the SWC that verifies and generates the Freshness.





Class	SecureCommunicationProps			
authData FreshnessStart Position	PositiveInteger	0..1	attr	This value determines the start position in bits of the Authentic PDU that shall be passed on to the SWC that verifies and generates the Freshness. The bit counting is done according to TPS_SYST_01068.
authentication BuildAttempts	PositiveInteger	0..1	attr	This attribute specifies the number of authentication build attempts.
authentication Retries	PositiveInteger	0..1	attr	This attribute defines the additional number of authentication attempts that are to be carried out when the generation of the authentication information failed for a given SecuredIPdu. If zero is set than only one authentication attempt is done.
dataId	PositiveInteger	0..1	attr	This attribute defines a numerical identifier for the Secured I-PDU.
freshnessValue Id	PositiveInteger	0..1	attr	This attribute defines the Id of the Freshness Value. The Freshness Value might be a normal counter or a time value.
messageLink Length	PositiveInteger	0..1	attr	SecOC links an AuthenticIPdu and CryptographicIPdu together by repeating a specific part (Message Linker) of the AuthenticIPdu in the CryptographicIPdu. This attribute defines the length in bits of the messageLinker.
messageLink Position	PositiveInteger	0..1	attr	SecOC links an AuthenticIPdu and CryptographicIPdu together by repeating a specific part (Message Linker) of the AuthenticIPdu in the CryptographicIPdu. This attribute defines the startPosition in bits of the messageLinker.
secondary FreshnessValue Id	PositiveInteger	0..1	attr	This attribute defines the Id of the Secondary Freshness Value. The Secondary Freshness Value might be a normal counter or a time value. Please note that this attribute is for documentation only to allow the configuration of required freshness value manager and no upstream mapping is defined for it.
securedArea Length	PositiveInteger	0..1	attr	This attribute defines the length in bytes of the area within the payload Pdu which will be secured.
securedArea Offset	PositiveInteger	0..1	attr	This attribute defines the start position (offset in byte) of the area within the payload Pdu which will be secured.

**Table A.881: SecureCommunicationProps**

Class	SecuredIPdu			
<b>Note</b>	If useAsCryptographicPdu is not set or set to false this IPdu contains the payload of an Authentic IPdu supplemented by additional Authentication Information (Freshness Counter and an Authenticator). If useAsCryptographicPdu is set to true this IPdu contains the Authenticator for a payload that is transported in a separate message. The separate Authentic IPdu is described by the Pdu that is referenced with the payload reference from this SecuredIPdu. <b>Tags:</b> atp.recommendedPackage=Pdus			
<b>Base</b>	ARElement, ARObjekt, CollectableElement, FibexElement, IPdu, Identifiable, MultilanguageReferrable, PackageableElement, Pdu, Referrable, UploadableDesignElement, UploadablePackageElement			
<b>Aggregated by</b>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
authentication Props	SecureCommunication AuthenticationProps	0..1	ref	Reference to authentication properties that are valid for this SecuredIPdu.





Class	SecuredIPdu			
dynamic RuntimeLength Handling	Boolean	0..1	attr	Defines whether the length information for handling this SecuredIPdu with SecuredIPdu.useSecuredPdu Header=noHeader is taken from the configuration or from the actually provided length information during runtime. true: SecuredIPdu length information is taken from the actually provided length information during runtime. false: SecuredIPdu length information is taken from the configuration.
freshnessProps	<a href="#">SecureCommunicationFreshnessProps</a>	0..1	ref	Reference to freshness properties that are valid for this SecuredIPdu.
payload	<a href="#">PduTriggering</a>	0..1	ref	Reference to a Pdu that will be protected against unauthorized manipulation and replay attacks.
secure Communication Props	<a href="#">SecureCommunicationProps</a>	0..1	aggr	Specific configuration properties for this SecuredIPdu.
useAs Cryptographic IPdu	Boolean	0..1	attr	If this attribute is set to true the SecuredIPdu contains the Authentication Information for an AuthenticIPdu that is transmitted in a separate message. The AuthenticIPdu contains the original payload, i.e. the secured data. If this attribute is set to false this SecuredIPdu contains the payload of an Authentic IPdu supplemented by additional Authentication Information.
useSecuredPdu Header	SecuredPduHeader Enum	0..1	attr	This attribute defines the size of the header which is inserted into the SecuredIPdu. If this attribute is set to anything but noHeader, the SecuredIPdu contains the Secured I-PDU Header to indicate the length of the AuthenticIPdu. The AuthenticIPdu contains the original payload, i.e. the secured data.

**Table A.882: SecuredIPdu**

Class	SecurityEventContextProps			
<b>Note</b>	This meta-class specifies the SecurityEventDefinition to be mapped to an IdsmInstance and adds mapping-dependent properties of this security event valid only for this specific mapping. <b>Tags:</b> atp.Status=candidate			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	SecurityEventContextMapping.mappedSecurityEvent			
Attribute	Type	Mult.	Kind	Note
default ReportingMode	SecurityEventReporting ModeEnum	0..1	attr	This attribute defines the default reporting mode for the referenced security event. <b>Tags:</b> atp.Status=candidate
persistent Storage	Boolean	0..1	attr	This attribute controls whether qualified reportings of the referenced security event shall be stored persistently by the mapped IdsmInstance or not. <b>Tags:</b> atp.Status=candidate
securityEvent	SecurityEventDefinition	0..1	ref	This reference defines the security event that is mapped and enriched by SecurityEventMappingProps with mapping dependent properties. <b>Stereotypes:</b> atp.Splitable; atp.Variation <b>Tags:</b> atp.Splitkey=securityEvent.securityEventDefinition, securityEvent.variationPoint.shortLabel atp.Status=candidate vh.latestBindingTime=systemDesignTime





Class	SecurityEventContextProps			
sensorInstanceId	PositiveInteger	0..1	attr	This attribute defines the ID of the security sensor that detects the referenced security event. <b>Tags:</b> atp.Status=candidate
severity	PositiveInteger	0..1	attr	This attribute defines how critical/severe the referenced security event is. Please note that currently, the severity level meanings of specific integer values is not specified by AUTOSAR but left to the party responsible for the IDS system design (e.g. the OEM). <b>Tags:</b> atp.Status=candidate

**Table A.883: SecurityEventContextProps**

Class	SegmentPosition			
<b>Note</b>	The StaticPart and the DynamicPart can be separated in multiple segments within the multiplexed PDU. The ISignalPdus are copied bit by bit into the MultiplexedIPdu. If the space of the first segment is 5 bits large than the first 5 bits of the ISignalPdu are copied into this first segment and so on.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	MultiplexedPart.segmentPosition			
Attribute	Type	Mult.	Kind	Note
segmentByteOrder	ByteOrderEnum	0..1	attr	This attribute defines the order of the bytes of the segment and the packing into the MultiplexedIPdu. Please consider that [constr_3247] and [constr_3224] are restricting the usage of this attribute.
segmentLength	Integer	0..1	attr	Data Length of the segment in bits.
segmentPosition	Integer	0..1	attr	Segments bit position relatively to the beginning of a multiplexed IPdu. Note that the absolute position of the segment in the MultiplexedIPdu is determined by the definition of the segmentByteOrder attribute of the SegmentPosition. If Big Endian is specified, the start position indicates the bit position of the most significant bit in the IPdu. If Little Endian is specified, the start position indicates the bit position of the least significant bit in the IPdu. In AUTOSAR the bit counting is always set to "sawtooth" and the bit order is set to "Decreasing". The bit counting in byte 0 starts with bit 0 (least significant bit). The most significant bit in byte 0 is bit 7.

**Table A.884: SegmentPosition**

Class	SenderComSpec (abstract)			
<b>Note</b>	Communication attributes for a sender port (PPortPrototype typed by SenderReceiverInterface).			
<b>Base</b>	ARObject, PPortComSpec			
<b>Subclasses</b>	NonqueuedSenderComSpec, QueuedSenderComSpec			
<b>Aggregated by</b>	AbstractProvidedPortPrototype.providedComSpec, PortPrototypeBlueprint.providedComSpec			
Attribute	Type	Mult.	Kind	Note
compositeNetworkRepresentation	CompositeNetworkRepresentation	*	aggr	This represents a CompositeNetworkRepresentation defined in the context of a SenderComSpec. <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=compositeNetworkRepresentation This Attribute is only used by the AUTOSAR Classic Platform.





Class	SenderComSpec (abstract)			
dataElement	<a href="#">AutosarDataPrototype</a>	0..1	ref	Data element these quality of service attributes apply to. <b>Stereotypes:</b> atpIdentityContributor
handleOutOfRange	<a href="#">HandleOutOfRangeEnum</a>	0..1	attr	This attribute controls how out-of-range values shall be dealt with. This Attribute is only used by the AUTOSAR Classic Platform.
networkRepresentation	<a href="#">SwDataDefProps</a>	0..1	aggr	A networkRepresentation is used to define how the data Element is mapped to a communication bus. <b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=networkRepresentation This Attribute is only used by the AUTOSAR Classic Platform.
transmissionAcknowledgement	<a href="#">TransmissionAcknowledgementRequest</a>	0..1	aggr	Requested transmission acknowledgement for data element. This Attribute is only used by the AUTOSAR Classic Platform.
transmissionProps	<a href="#">TransmissionComSpecProps</a>	0..1	aggr	This aggregation represents the definition transmission props in the context of the enclosing SenderComSpec.
usesEndToEndProtection	Boolean	0..1	attr	This indicates whether the corresponding dataElement shall be transmitted using end-to-end protection. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.885: SenderComSpec**

Class	SenderRecArrayElementMapping			
<b>Note</b>	<p>The SenderRecArrayElement may be a primitive one or a composite one. If the element is primitive, it will be mapped to the SystemSignal (multiplicity 1). If the VariableDataPrototype that is referenced by SenderReceiverToSignalGroupMapping is typed by an ApplicationDataType the reference to the ApplicationArrayElement shall be used. If the VariableDataPrototype is typed by the ImplementationDataType the reference to the ImplementationArrayElement shall be used.</p> <p>If the element is composite, there will be no mapping to the SystemSignal (multiplicity 0). In this case the ArrayElementMapping element will aggregate the TypeMapping element. In that way also the composite datatypes can be mapped to SystemSignals.</p> <p>Regardless whether composite or primitive array element is mapped the indexed element always needs to be specified.</p>			
<b>Base</b>	AObject			
<b>Aggregated by</b>	SenderRecArrayTypeMapping.arrayElementMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
complexTypeMapping	<a href="#">SenderRecCompositeTypeMapping</a>	0..1	aggr	This aggregation will be used if the element is composite.
indexedArrayElement	<a href="#">IndexedArrayElement</a>	0..1	aggr	Reference to an indexed array element in the context of the dataElement or in the context of a composite element.
systemSignal	<a href="#">SystemSignal</a>	0..1	ref	Reference to the system signal used to carry the primitive ApplicationArrayElement.

**Table A.886: SenderRecArrayElementMapping**

<b>Class</b>	<b>SenderRecCompositeTypeMapping</b> (abstract)			
<b>Note</b>	<p>Two mappings exist for the composite data types: "ArrayTypeMapping" and "RecordTypeMapping". In both, a primitive datatype will be mapped to a system signal.</p> <p>But it is also possible to combine the arrays and the records, so that an "array" could be an element of a "record" and in the same manner a "record" could be an element of an "array". Nesting these data types is also possible.</p> <p>If an element of a composite data type is again a composite one, the "CompositeTypeMapping" element will be used one more time (aggregation between the ArrayElementMapping and CompositeTypeMapping or aggregation between the RecordElementMapping and CompositeTypeMapping).</p>			
<b>Base</b>	ARObject			
<b>Subclasses</b>	SenderRecArrayTypeMapping, SenderRecRecordTypeMapping			
<b>Aggregated by</b>	<a href="#">SenderRecArrayElementMapping.complexTypeMapping</a> , <a href="#">SenderReceiverCompositeElementToSignalMapping.typeMapping</a> , <a href="#">SenderReceiverToSignalGroupMapping.typeMapping</a> , <a href="#">SenderRecRecordElementMapping.complexTypeMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.887: SenderRecCompositeTypeMapping**

<b>Class</b>	<b>SenderRecRecordElementMapping</b>			
<b>Note</b>	<p>Mapping of a primitive record element to a SystemSignal. If the VariableDataPrototype that is referenced by SenderReceiverToSignalGroupMapping is typed by an ApplicationDataType the reference applicationRecordElement shall be used. If the VariableDataPrototype is typed by the ImplementationDataType the reference implementationRecordElement shall be used. Either the implementationRecordElement or applicationRecordElement reference shall be used.</p> <p>If the element is composite, there will be no mapping to the SystemSignal (multiplicity 0). In this case the RecordElementMapping element will aggregate the complexTypeMapping element. In that way also the composite datatypes can be mapped to SystemSignals.</p>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SenderRecRecordTypeMapping.recordElementMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
applicationRecordElement	<a href="#">ApplicationRecordElement</a>	0..1	ref	Reference to an ApplicationRecordElement in the context of the dataElement or in the context of a composite element.
complexTypeMapping	<a href="#">SenderRecCompositeTypeMapping</a>	0..1	aggr	This aggregation will be used if the element is composite.
implementationRecordElement	<a href="#">ImplementationDataTypeElement</a>	0..1	ref	Reference to an ImplementationRecordElement in the context of the dataElement or in the context of a composite element.
senderToSignalTextTableMapping	<a href="#">TextTableMapping</a>	0..1	aggr	This mapping allows for the text-table translation between the sending DataPrototype that is defined in the Port Prototype and the physicalProps defined for the System Signal.
signalToReceiverTextTableMapping	<a href="#">TextTableMapping</a>	0..1	aggr	This mapping allows for the text-table translation between the physicalProps defined for the SystemSignal and a receiving DataPrototype that is defined in the Port Prototype.
systemSignal	<a href="#">SystemSignal</a>	0..1	ref	Reference to the system signal used to carry the primitive ApplicationRecordElement.

**Table A.888: SenderRecRecordElementMapping**

<b>Class</b>	<b>SenderReceiverAnnotation</b> (abstract)			
<b>Note</b>	Annotation of the data elements in a port that realizes a sender/receiver interface.			
<b>Base</b>	ARObject, GeneralAnnotation			
<b>Subclasses</b>	ReceiverAnnotation, SenderAnnotation			
<b>Aggregated by</b>	<a href="#">PortPrototype.senderReceiverAnnotation</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
computed	Boolean	0..1	attr	Flag whether this data element was not measured directly but instead was calculated from possibly several other measured or calculated values.
dataElement	<a href="#">VariableDataPrototype</a>	0..1	ref	The instance of VariableDataPrototype annotated.
limitKind	DataLimitKindEnum	0..1	attr	This min or max has not to be mismatched with the min- and max for data-value in a compu-method. For example, this annotation shows when the result of the calculation performed in a RunnableEntity owned by one AtomicSw ComponentType is transmitted to another AtomicSw ComponentType whose RunnableEntity will use this value as a limit, e.g. the max.power which can be used by that software-component, or the current min. slip.
processingKind	ProcessingKindEnum	0..1	attr	This attribute controls how data is processed according to the possible values of ProcessingKindEnum.

**Table A.889: SenderReceiverAnnotation**

<b>Class</b>	<b>SenderReceiverCompositeElementToSignalMapping</b>			
<b>Note</b>	Mapping of an Variable Data Prototype which is aggregated within a composite datatype to a System Signal (only one element of the composite data type is mapped).			
<b>Base</b>	ARObject, <a href="#">DataMapping</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.dataMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataElement	<a href="#">VariableDataPrototype</a>	0..1	iref	Reference to a data element with a composite datatype from which one element is mapped to a SystemSignal. <b>InstanceRef implemented by:</b> <a href="#">VariableDataPrototypeInSystemInstanceRef</a>
systemSignal	<a href="#">SystemSignal</a>	0..1	ref	Reference to the SystemSignal to which one primitive of the composite type is mapped.
typeMapping	<a href="#">SenderRecCompositeTypeMapping</a>	0..1	aggr	The CompositeTypeMapping maps one VariableData Prototype of the composite data type to a SystemSignal.

**Table A.890: SenderReceiverCompositeElementToSignalMapping**

<b>Class</b>	<b>SenderReceiverInterface</b>			
<b>Note</b>	A sender/receiver interface declares a number of data elements to be sent and received. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , CollectableElement, <a href="#">DataInterface</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">PortInterface</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataElement	<a href="#">VariableDataPrototype</a>	*	aggr	The data elements of this SenderReceiverInterface.
invalidation Policy	<a href="#">InvalidationPolicy</a>	*	aggr	InvalidationPolicy for a particular dataElement
metaDataItem Set	<a href="#">MetaDataItemSet</a>	*	aggr	This aggregation defines fixed sets of meta-data items associated with dataElements of the enclosing SenderReceiverInterface

**Table A.891: SenderReceiverInterface**



<b>Class</b>	<b>SenderReceiverToSignalGroupMapping</b>			
<b>Note</b>	Mapping of a sender receiver communication data element with a composite datatype to a signal group.			
<b>Base</b>	ARObject, <a href="#">DataMapping</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.dataMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataElement	<a href="#">VariableDataPrototype</a>	0..1	iref	Reference to a data element with a composite datatype which is mapped to a signal group. <b>InstanceRef implemented by:</b> <a href="#">VariableDataPrototypeInSystemInstanceRef</a>
signalGroup	<a href="#">SystemSignalGroup</a>	0..1	ref	Reference to the signal group, which contain all primitive datatypes of the composite type
typeMapping	<a href="#">SenderRecCompositeTypeMapping</a>	0..1	aggr	The CompositeTypeMapping maps the ApplicationArray Elements and ApplicationRecordElements to Signals of the SignalGroup.

**Table A.892: SenderReceiverToSignalGroupMapping**

<b>Class</b>	<b>SenderReceiverToSignalMapping</b>			
<b>Note</b>	Mapping of a sender receiver communication data element to a signal.			
<b>Base</b>	ARObject, <a href="#">DataMapping</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.dataMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataElement	<a href="#">VariableDataPrototype</a>	0..1	iref	Reference to the data element. <b>InstanceRef implemented by:</b> <a href="#">VariableDataPrototypeInSystemInstanceRef</a>
senderToSignal TextTable Mapping	<a href="#">TextTableMapping</a>	0..1	aggr	This mapping allows for the text-table translation between the sending DataPrototype that is defined in the Port Prototype and the physicalProps defined for the System Signal.
signalTo ReceiverText TableMapping	<a href="#">TextTableMapping</a>	0..1	aggr	This mapping allows for the text-table translation between the physicalProps defined for the SystemSignal and a receiving DataPrototype that is defined in the Port Prototype.
systemSignal	<a href="#">SystemSignal</a>	0..1	ref	Reference to the system signal used to carry the data element.

**Table A.893: SenderReceiverToSignalMapping**

<b>Class</b>	<b>SensorActuatorSwComponentType</b>			
<b>Note</b>	The SensorActuatorSwComponentType introduces the possibility to link from the software representation of a sensor/actuator to its hardware description provided by the ECU Resource Template. <b>Tags:</b> atp.recommendedPackage=SwComponentTypes			
<b>Base</b>	ARElement, ARObject, <a href="#">AtomicSwComponentType</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
sensorActuator	<a href="#">HwDescriptionEntity</a>	0..1	ref	Reference from the Sensor Actuator Software Component Type to the description of the actual hardware.

**Table A.894: SensorActuatorSwComponentType**



<b>Enumeration</b>	<b>ServerArgumentImplPolicyEnum</b>
<b>Note</b>	This defines how the argument type of the server's <a href="#">RunnableEntity</a> is implemented.
<b>Aggregated by</b>	<a href="#">ArgumentDataPrototype.serverArgumentImplPolicy</a> , <a href="#">RunnableEntityArgument.serverArgumentImplPolicy</a>
<b>Literal</b>	<b>Description</b>
useArgumentType	The argument type of the <a href="#">RunnableEntity</a> is derived from the <a href="#">AutosarDataType</a> of the <a href="#">ArgumentPrototype</a> . <b>Tags:</b> atp.EnumerationLiteralIndex=0
useVoid	The argument type of the <a href="#">RunnableEntity</a> is void. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.895: ServerArgumentImplPolicyEnum**

<b>Class</b>	<b>ServerCallPoint</b> (abstract)			
<b>Note</b>	If a <a href="#">RunnableEntity</a> owns a <a href="#">ServerCallPoint</a> it is entitled to invoke a particular <a href="#">ClientServerOperation</a> of a specific <a href="#">RPortPrototype</a> of the corresponding <a href="#">AtomicSwComponentType</a> . This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractAccessPoint</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">AsynchronousServerCallPoint</a> , <a href="#">SynchronousServerCallPoint</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">RunnableEntity.serverCallPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operation	<a href="#">ClientServerOperation</a>	0..1	iref	The operation that is called by this runnable. <b>InstanceRef implemented by:</b> <a href="#">ROperationInAtomicSwcInstanceRef</a>
timeout	TimeValue	0..1	attr	Time in seconds before the server call times out and returns with an error message. It depends on the call type (synchronous or asynchronous) how this is reported.

**Table A.896: ServerCallPoint**

<b>Class</b>	<b>ServerComSpec</b>			
<b>Note</b>	Communication attributes for a server port ( <a href="#">PPortPrototype</a> and <a href="#">ClientServerInterface</a> ).			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">PPortComSpec</a>			
<b>Aggregated by</b>	<a href="#">AbstractProvidedPortPrototype.providedComSpec</a> , <a href="#">PortPrototypeBlueprint.providedComSpec</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operation	<a href="#">ClientServerOperation</a>	0..1	ref	Operation these communication attributes apply to. <b>Stereotypes:</b> atpIdentityContributor
queueLength	PositiveInteger	0..1	attr	Length of call queue on the server side. The queue is implemented by the RTE. The value shall be greater or equal to 1. Setting the value of queueLength to 1 implies that incoming requests are rejected while another request that arrived earlier is being processed.
transformationComSpecProps	TransformationComSpecProps	*	aggr	This references the <a href="#">TransformationComSpecProps</a> which define port-specific configuration for data transformation. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=transformationComSpecProps

**Table A.897: ServerComSpec**

<b>Class</b>	<b>ServiceDependency</b> (abstract)			
<b>Note</b>	Collects all dependencies of a software module or component on an AUTOSAR Service related to a specific item (e.g. an NVRAM Block, a diagnostic event etc.). It defines the quality of service (Service Needs) of this item as well as (optionally) references to additional elements. This information is required for tools in order to generate the related basic software configuration and ServiceSwComponentTypes.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	BswServiceDependency, SwcServiceDependency			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
assignedData Type	RoleBasedDataType Assignment	0..1	aggr	This is the role of the assignment data type in the given context. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=assignedDataType, assignedDataType.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
diagnostic Relevance	ServiceDiagnostic RelevanceEnum	0..1	attr	If this attribute indicates a relevance for diagnostics then the integrator has a much easier time identifying the candidates for the configuration of the diagnostic stack. Example: identification of mode conditions (e.g. communication between application and BswM) relevant for the Dcm.
symbolicName Props	SymbolicNameProps	0..1	aggr	This attribute can be taken to contribute to the creation of symbolic name values.

**Table A.898: ServiceDependency**

<b>Class</b>	<b>ServiceNeeds</b> (abstract)			
<b>Note</b>	This expresses the abstract needs that a Software Component or Basic Software Module has on the configuration of an AUTOSAR Service to which it will be connected. "Abstract needs" means that the model abstracts from the Configuration Parameters of the underlying Basic Software.			
<b>Base</b>	ARObject, Identifiable, MultilanguageReferrable, Referrable			
<b>Subclasses</b>	BswMgrNeeds, ChargeManagerNeeds, ComMgrUserNeeds, CryptoKeyManagementNeeds, CryptoServiceJobNeeds, CryptoServiceNeeds, DiagnosticCapabilityElement, DltUserNeeds, DtpServiceNeeds, EcuStateMgrUserNeeds, ErrorTracerNeeds, FunctionInhibitionAvailabilityNeeds, FunctionInhibitionNeeds, GeneralPurposeTimerServiceNeeds, GlobalSupervisionNeeds, IdsMgrCustomTimestampNeeds, IdsMgrNeeds, IndicatorStatusNeeds, J1939DcmDm19Support, J1939RmIncomingRequestServiceNeeds, J1939RmOutgoingRequestServiceNeeds, NvBlockNeeds, SecureOnBoardCommunicationNeeds, SupervisedEntityCheckpointNeeds, SupervisedEntityNeeds, SyncTimeBaseMgrUserNeeds, V2xDataManagerNeeds, V2xFacUserNeeds, V2xMUserNeeds, VendorSpecificServiceNeeds			
<b>Aggregated by</b>	BswServiceDependency.serviceNeeds, SwcServiceDependency.serviceNeeds			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.899: ServiceNeeds**

Class	ServiceProxySwComponentType			
Note	<p>This class provides the ability to express a software-component which provides access to an internal service for remote ECUs. It acts as a proxy for the service providing access to the service.</p> <p>An important use case is the request of vehicle mode switches: Such requests can be communicated via sender-receiver interfaces across ECU boundaries, but the mode manager being responsible to perform the mode switches is an AUTOSAR Service which is located in the Basic Software and is not visible in the VFB view. To handle this situation, a ServiceProxySwComponentType will act as proxy for the mode manager. It will have R-Ports to be connected with the mode requestors on VFB level and Service-Ports to be connected with the local mode manager at ECU integration time.</p> <p>Apart from the semantics, a ServiceProxySwComponentType has these specific properties:</p> <ul style="list-style-type: none"> <li>• A prototype of it can be mapped to more than one ECUs in the system description.</li> <li>• Exactly one additional instance of it will be created in the ECU-Extract per ECU to which the prototype has been mapped.</li> <li>• For remote communication, it can have only R-Ports with sender-receiver interfaces and 1:n semantics.</li> <li>• There shall be no connectors between two prototypes of any ServiceProxySwComponentType.</li> </ul> <p><b>Tags:</b> atp.recommendedPackage=SwComponentTypes</p>			
Base	ARElement, ARObject, <a href="#">AtomicSwComponentType</a> , AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.900: ServiceProxySwComponentType**

Class	ServiceSwComponentType			
Note	<p>ServiceSwComponentType is used for configuring services for a given ECU. Instances of this class are only to be created in ECU Configuration phase for the specific purpose of the service configuration.</p> <p><b>Tags:</b> atp.recommendedPackage=SwComponentTypes</p>			
Base	ARElement, ARObject, <a href="#">AtomicSwComponentType</a> , AtpBlueprint, AtpBlueprintable, <a href="#">AtpClassifier</a> , <a href="#">AtpType</a> , CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , <a href="#">SwComponentType</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
—	—	—	—	—

**Table A.901: ServiceSwComponentType**

Enumeration	ServiceVersionAcceptanceKindEnum			
Note	Defined the possible acceptance kinds for required service instances.			
Aggregated by	<a href="#">ConsumedServiceInstance.versionDrivenFindBehavior</a> , RequiredSomeipServiceInstance.versionDrivenFindBehavior			
Literal	Description			
exactOrAnyMinorVersion	Search for ANY or specific minor version service instance and select either ALL returned service instances (in case of ANY) or exactly the specific minor version service instances defined in required MinorVersion. <b>Tags:</b> atp.EnumerationLiteralIndex=0			
minimumMinorVersion	Search for ANY minor version service instance and select only those service instances which have an equal or greater minor version than given in requiredMinorVersion. <b>Tags:</b> atp.EnumerationLiteralIndex=1			

**Table A.902: ServiceVersionAcceptanceKindEnum**

Enumeration	SignalServiceTranslationControlEnum
Note	This enumeration allows to define how the service instance offer/subscribe control shall behave.
Aggregated by	<a href="#">SignalServiceTranslationProps.serviceControl</a>
Literal	Description
allPartialNetworks Active	Defines the start of service control when all specified partial networks are active. <b>Tags:</b> atp.EnumerationLiteralIndex=3 This EnumerationLiteral is only used by the AUTOSAR Classic Platform.
anyPartialNetwork Active	Defines the start of service control when any specified partial network is active. <b>Tags:</b> atp.EnumerationLiteralIndex=4 This EnumerationLiteral is only used by the AUTOSAR Classic Platform.
serviceDiscovery	Defines the start of service control when other service is available. <b>Tags:</b> atp.EnumerationLiteralIndex=2
translationStart	Defines the start of service control at translation start. <b>Tags:</b> atp.EnumerationLiteralIndex=0

**Table A.903: SignalServiceTranslationControlEnum**

Class	SignalServiceTranslationElementProps			
Note	Defined translation properties for individual mapped elements. This Class is only used by the AUTOSAR Classic Platform.			
Base	<i>ARObject</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Aggregated by	<a href="#">SignalServiceTranslationEventProps.elementProps</a>			
Attribute	Type	Mult.	Kind	Note
element	<a href="#">DataPrototypeReference</a>	0..1	aggr	Reference to the leaf element the SignalServiceTranslationElementProps apply to.
filter	<a href="#">DataFilter</a>	0..1	aggr	Defines an optional filter to be applied during translation.
transmission Trigger	Boolean	0..1	attr	Defines whether the source element (which is mapped to the referenced element) triggers the sending of the respective payload.

**Table A.904: SignalServiceTranslationElementProps**

Class	SignalServiceTranslationEventProps			
Note	This element allows to define the properties which are applicable for the signal/service translation event.			
Base	<i>ARObject</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Aggregated by	<a href="#">SignalServiceTranslationProps.signalServiceTranslationEventProps</a>			
Attribute	Type	Mult.	Kind	Note
elementProps	<a href="#">SignalServiceTranslationElementProps</a>	*	aggr	Defines properties for a single translated element. This Attribute is only used by the AUTOSAR Classic Platform.
safeTranslation	Boolean	0..1	attr	Defined whether the translation shall happen in a safe way.
secure Translation	Boolean	0..1	attr	Defined whether the translation shall happen in a secure way.
translation Target	<a href="#">VariableDataPrototype</a>	0..1	iref	Reference to a VariableDataPrototype representing the target of signal/service translation. <b>InstanceRef implemented by:</b> <a href="#">VariableDataPrototypeInSystemInstanceRef</a> This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.905: SignalServiceTranslationEventProps**

<b>Class</b>	<b>SignalServiceTranslationProps</b>			
<b>Note</b>	This element allows to define the properties which are applicable for the signal/service translation service.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	SignalServiceTranslationPropsSet.signalServiceTranslationProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
controlConsumedEventGroup	<a href="#">ConsumedEventGroup</a>	*	ref	Reference to the EventGroup which encapsulates the signal-based payload. This Attribute is only used by the AUTOSAR Classic Platform.
controlPnc	<a href="#">PncMappingIdent</a>	*	ref	Reference to the PNCs which control the offer/subscribe behavior of the translated service instance. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=controlPnc This Attribute is only used by the AUTOSAR Classic Platform.
controlProvidedEventGroup	<a href="#">EventHandler</a>	*	ref	Reference to the provided event group (aka Event Handler) which is automatically available when service Control equals translationStart. This Attribute is only used by the AUTOSAR Classic Platform.
serviceControl	<a href="#">SignalServiceTranslationControlEnum</a>	0..1	attr	Defines how the service instance control shall behave.
signalServiceTranslationEventProps	<a href="#">SignalServiceTranslationEventProps</a>	*	aggr	Defines properties for a single translated event.

**Table A.906: SignalServiceTranslationProps**

<b>Class</b>	<b>SimulatedExecutionTime</b>			
<b>Note</b>	Specifies the ExecutionTime which has been gathered using simulation means.			
<b>Base</b>	ARObject, <a href="#">ExecutionTime</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ResourceConsumption.executionTime			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
maximumExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum simulated execution time.
minimumExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The minimum simulated execution time.
nominalExecutionTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The nominal simulated execution time.

**Table A.907: SimulatedExecutionTime**

<b>Class</b>	<b>SoAdConfig</b>			
<b>Note</b>	SoAd Configuration for one specific Physical Channel.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">EthernetPhysicalChannel.soAdConfig</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
socketAddress	<a href="#">SocketAddress</a>	*	aggr	Collection of SoAdAddresses. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=socketAddress.shortName, socketAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table A.908: SoAdConfig**

Class	SoConIPdulIdentifier			
Note	Identification of Pdu content on a socket connection. This Identifier is required in case that multiple Pdus are transmitted over the same socket connection.			
Base	ARObject, <a href="#">Referrable</a>			
Aggregated by	SocketConnectionIpdulIdentifierSet.iPdulIdentifier			
Attribute	Type	Mult.	Kind	Note
headerId	PositiveInteger	0..1	attr	If multiple Pdus are transmitted over the same connection this headerId can be used to distinguish between the different Pdus. For the constraints on constructing the headerId for SOME/IP also see PRS_SOMEIP_00245.
pduCollection PduTimeout	TimeValue	0..1	attr	Defines the timeout in seconds the PDU collection shall be transmitted at the latest after this PDU has been put into the buffer.
pduCollection Semantics	PduCollection SemanticsEnum	0..1	attr	Specifies if the referenced PduTriggering shall be collected using a queued (i.e. all PDU instances) or last-is-best (i.e. only the last PDU instance) semantics. If this attribute is not present the behavior of "queued" is assumed.
pduCollection Trigger	PduCollectionTrigger Enum	0..1	attr	Defines whether the referenced Pdu contributes to the triggering of the socket transmission if Pdu collection is enabled for this socket.
pduTriggering	<a href="#">PduTriggering</a>	0..1	ref	Reference to a Pdu that is transmitted over a socket connection.

**Table A.909: SoConIPdulIdentifier**

Class	SocketAddress			
Note	This meta-class represents a socket address towards the rest of the meta-model. The actual semantics of the represented socket address, however, is contributed by aggregation of an ApplicationEndpoint.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	SoAdConfig.socketAddress			
Attribute	Type	Mult.	Kind	Note
allowedIPv6Ext Headers	<a href="#">IPv6ExtHeaderFilterList</a>	0..1	ref	Reference to a list of IPv6 Extension Headers allowed for this SocketConnection. If no list is referenced all IPv6 Extension Headers are allowed and processed.
allowedTcp Options	<a href="#">TcpOptionFilterList</a>	0..1	ref	Reference to a list of TCP options allowed for this Socket Connection. This Attribute is only used by the AUTOSAR Classic Platform.
application Endpoint	<a href="#">ApplicationEndpoint</a>	0..1	aggr	Application addressing
connector	<a href="#">EthernetCommunication Connector</a>	0..1	ref	Association to a CommunicationConnector in the topology description. This reference shall be used if the SocketAddress describes an IP unicast address for an ECU that is part of the model.
differentiated ServiceField	PositiveInteger	0..1	attr	The 6-bit Differentiated Service Field in the IP headers may be used for classifying network traffic. If not set a value of zero is used to indicate packets that have not been classified.
flowLabel	PositiveInteger	0..1	attr	The 20-bit Flow Label field in the IPv6 header may be used by a source to label sequences of packets for which it requests special handling by the IPv6 routers, such as non-default quality of service. If not set a Flow Label of zero is used to indicate packets that have not been labeled.





Class	SocketAddress			
multicast Connector	<a href="#">EthernetCommunicationConnector</a>	*	ref	Association to a CommunicationConnector in the topology description. This reference shall be used if the SocketAddress describes an IP multicast address, i.e. if the aggregated ApplicationEndpoint references a NetworkEndpoint that describes an IP Address in the IP multicast range. Such a SocketAddress contains references to those Ecus (via the multicastConnector reference) in the model that will receive multicast messages via the SocketAddress that is defined by the aggregated ApplicationEndpoint and NetworkEndpoint, i.e. IP Address and UDP Port combination. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=multicastConnector
pathMtu Discovery Enabled	Boolean	0..1	attr	Defines whether the Path MTU Discovery shall be performed for the related socket. <b>Tags:</b> atp.Status=obsolete
pduCollection MaxBufferSize	PositiveInteger	0..1	attr	Defines the maximum buffer size in Byte which shall be filled before a socket with Pdu collection enabled shall be transmitted to the lower layer.
pduCollection Timeout	TimeValue	0..1	attr	Defines the time in seconds which shall pass before a socket with Pdu collection enabled shall be transmitted to the lower layer after the first Pdu has been put into the socket buffer.
staticSocket Connection	<a href="#">StaticSocketConnection</a>	*	aggr	Definition of a static SocketConnection. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=staticSocketConnection.shortName, static SocketConnection.variationPoint.shortLabel vh.latestBindingTime=postBuild
ttl	PositiveInteger	0..1	attr	This attribute defines a value set in the header of an Internet Protocol (IP) packet that tells network devices the maximum number of router hops the packet can make before it is discarded. The TTL value is a counter that is decremented by 1 every time the packet passes through a router.
udpChecksum Handling	UdpChecksum CalculationEnum	0..1	attr	Specifies if UDP checksum handling shall be enabled (udpChecksumEnabled) or skipped (udpChecksum Disabled) on the related socket connection.

**Table A.910: SocketAddress**

Class	SoftwareContext			
<b>Note</b>	Specifies the context of the software for this resource consumption.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">ExecutionTime.softwareContext</a> , <a href="#">HeapUsage.softwareContext</a> , <a href="#">StackUsage.softwareContext</a>			
Attribute	Type	Mult.	Kind	Note
input	String	0..1	attr	Specifies the input vector which is used to provide the ExecutionTime.
state	String	0..1	attr	Specifies the state the software is in when the Execution Time is provided.

**Table A.911: SoftwareContext**



Class	SomeipSdClientEventGroupTimingConfig			
Note	This meta-class is used to specify configuration related to service discovery in the context of an event group on SOME/IP. <b>Tags:</b> atp.recommendedPackage=SomeipSdTimingConfigs			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
request ResponseDelay	<a href="#">RequestResponseDelay</a>	0..1	aggr	The Service Discovery shall delay answers to unicast messages triggered by multicast messages (e.g. Subscribe Eventgroup after Offer Service).
subscribe Eventgroup RetryDelay	TimeValue	0..1	attr	This attribute defines the interval in seconds to re-trigger a subscription to a Eventgroup, if a retry to subscribe to a Eventgroup is configured (subscribeEventgroupRetryMax > 0).
subscribe Eventgroup RetryMax	PositiveInteger	0..1	attr	This attribute define the maximum counts of retries to subscribe to an Eventgroup. If the value is set to 0 no retry shall be done. If the value is set to 255 the retry shall be done as along as the Eventgroup is requested and no SubscribeEventGroupAck was received.
timeToLive	PositiveInteger	0..1	attr	Defines the time in seconds the subscription of this event is expected by the client. this value is sent from the client to the server in the SD-subscribeEvent message.

**Table A.912: SomeipSdClientEventGroupTimingConfig**

Class	SomeipSdClientServiceInstanceConfig			
Note	Client specific settings that are relevant for the configuration of SOME/IP Service-Discovery. <b>Tags:</b> atp.recommendedPackage=SomeipSdTimingConfigs			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
initialFind Behavior	<a href="#">InitialSdDelayConfig</a>	0..1	aggr	Controls initial find behavior of clients.
priority	PositiveInteger	0..1	attr	This attribute defines the VLAN frame priority for Service Discovery messages that result from RequiredSomeip ServiceInstances that are referncing this SomeipSdClient ServiceInstanceConfig (Find, SubscribeEventGroup, Stop SubscribeEventgroup). Values from 0 (best effort) to 7 (highest) are allowed.
serviceFind TimeToLive	PositiveInteger	0..1	attr	This attribute represents the ability to define the time in seconds the service find is valid. Note! The TTL value for FindService entries is not used and shall be ignored by the server service. This configuration is only kept for backward compatibility. Default value if not specified shall be 0xFFFFF. This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.913: SomeipSdClientServiceInstanceConfig**

Class	SomeipSdServerEventGroupTimingConfig			
Note	EventGroup specific timing configuration settings. <b>Tags:</b> atp.recommendedPackage=SomeipSdTimingConfigs			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a> , UploadableDesignElement, UploadablePackageElement			







Class	SomeipSdServerEventGroupTimingConfig			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
request ResponseDelay	RequestResponseDelay	0..1	aggr	The Service Discovery shall delay answers to unicast messages triggered by multicast messages (e.g. Subscribe Eventgroup after Offer Service).

**Table A.914: SomeipSdServerEventGroupTimingConfig**

Class	SomeipSdServerServiceInstanceConfig			
Note	Server specific settings that are relevant for the configuration of SOME/IP Service-Discovery. <b>Tags:</b> atp.recommendedPackage=SomeipSdTimingConfigs			
Base	ARElement, ARObject, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable, UploadableDesignElement, UploadablePackageElement			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
initialOffer Behavior	InitialSdDelayConfig	0..1	aggr	Controls offer behavior of the server.
offerCyclicDelay	TimeValue	0..1	attr	Optional attribute to define cyclic offers. Cyclic offer is active, if the delay is set (in seconds) and greater then 0.
priority	PositiveInteger	0..1	attr	This attribute defines the VLAN frame priority for Service Discovery messages that result from ProvidedSomeip ServiceInstances that are referencing the SomeipSd ServerServiceInstanceConfig (OfferService, StopOffer Service, SubscribeEventGroupAck). Values from 0 (best effort) to 7 (highest) are allowed.
request ResponseDelay	RequestResponseDelay	0..1	aggr	Maximum/Minimum allowable response delay to entries received by multicast in seconds. The Service Discovery shall delay answers to entries that were transported in a multicast SOME/IP-SD message (e.g. FindService).
serviceOffer TimeToLive	PositiveInteger	0..1	attr	Defines the time in seconds the service offer is valid.

**Table A.915: SomeipSdServerServiceInstanceConfig**

Class	SomeipServiceVersion			
Note	This meta-class represents the ability to describe a version of a SOME/IP Service.			
Base	ARObject			
Aggregated by	ConsumedServiceInterface.blocklistedVersion, RequiredSomeipServiceInstance.blocklistedVersion, SomeipServiceInterfaceDeployment.serviceInterfaceVersion			
Attribute	Type	Mult.	Kind	Note
majorVersion	PositiveInteger	0..1	attr	Major Version of the ServiceInterface. <b>Tags:</b> xml.sequenceOffset=10
minorVersion	PositiveInteger	0..1	attr	Minor Version of the ServiceInterface. <b>Tags:</b> xml.sequenceOffset=20

**Table A.916: SomeipServiceVersion**

<b>Class</b>	<b>SomeipTpConnection</b>			
<b>Note</b>	A connection identifies the sender and the receiver of this particular communication. The SOME/IP TP module routes a Pdu through this connection.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	SomeipTpConfig.tpConnection			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
tpChannel	SomeipTpChannel	0..1	ref	Assignment of configuration properties valid for this SomeipTpConnection.
tpConcurrentProcessingSdu	<a href="#">PduTriggering</a>	*	ref	Reference to a set of IPdus that are used to implement concurrent processing of several upper layer IPdus related to one transportPdu by the SOME/IP TP segmenter. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=tpConcurrentProcessingSdu.pduTriggering, tpConcurrentProcessingSdu.variationPoint.shortLabel vh.latestBindingTime=postBuild
tpSdu	<a href="#">PduTriggering</a>	0..1	ref	Reference to an IPdu that is segmented by the SOME/IP Transport Protocol. This reference defines the non concurrent processing of that IPdu by the SOME/IP TP segmenter. If concurrent processing is required, then tpConcurrentProcessingSdu references shall be used.
transportPdu	<a href="#">PduTriggering</a>	0..1	ref	Reference to the segmented IPdu.

**Table A.917: SomeipTpConnection**

<b>Class</b>	<b>SporadicEventTriggering</b>			
<b>Note</b>	Describes the behavior of an event which occurs occasionally or singularly.			
<b>Base</b>	<i>ARObject</i> , <a href="#">EventTriggeringConstraint</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<i>TimingExtension.timingGuarantee</i> , <i>TimingExtension.timingRequirement</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
jitter	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum deviation of the sporadic event occurrence. Jitter=max  nthPeriod - standardPeriod  <b>Tags:</b> xml.sequenceOffset=30
maximumInterArrivalTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum time distance between two consecutive (subsequent) occurrences of the associated event. <b>Tags:</b> xml.sequenceOffset=20
minimumInterArrivalTime	<a href="#">MultidimensionalTime</a>	0..1	aggr	The minimum time distance between two consecutive (subsequent) occurrences of the associated event. <b>Tags:</b> xml.sequenceOffset=10
period	<a href="#">MultidimensionalTime</a>	0..1	aggr	The periodic distance between subsequent occurrences of the event. <b>Tags:</b> xml.sequenceOffset=40

**Table A.918: SporadicEventTriggering**

<b>Class</b>	<b>StateDependentFirewall</b>			
<b>Note</b>	Firewall rules that are defined in a firewall state <b>Tags:</b> atp.Status=candidate atp.recommendedPackage=StateDependentFirewallRules			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			





Class	StateDependentFirewall			
Attribute	Type	Mult.	Kind	Note
defaultAction	FirewallActionEnum	0..1	attr	This attribute defines a defaultAction in case that the VehicleMode is not yet set. <b>Tags:</b> atp.Status=candidate
firewallRule Props (ordered)	FirewallRuleProps	*	aggr	Collection of firewall rules that apply in the vehicle mode <b>Tags:</b> atp.Status=candidate
firewallState Mode Declaration	<a href="#">ModeDeclaration</a>	*	ref	Reference to firewall states in which the Firewall is active. If one of the referenced ModeDeclarations is the current firewall state then the firewall rule shall be considered as active. <b>Tags:</b> atp.Status=candidate This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.919: StateDependentFirewall**

Class	StaticPart			
Note	Some parts/signals of the I-PDU may be the same regardless of the selector field. Such a part is called static part. The static part is optional.			
Base	<i>ARObject</i> , <a href="#">MultiplexedPart</a>			
Aggregated by	<a href="#">MultiplexedIPdu.staticPart</a>			
Attribute	Type	Mult.	Kind	Note
iPdu	<a href="#">ISignalIPdu</a>	0..1	ref	Reference to a Com IPdu which is routed to the IPduM module and is combined to a multiplexedPdu.

**Table A.920: StaticPart**

Class	StaticSocketConnection			
Note	Definition of static SocketConnection between the Socket that is defined by the aggregating Socket Address and the remoteAddress.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">SocketAddress.staticSocketConnection</a>			
Attribute	Type	Mult.	Kind	Note
iPduIdentifier	<a href="#">SoConIPduIdentifier</a>	*	ref	Assignment of IPduIdentifiers that are transmitted over the static SocketConnection. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=iPduIdentifier.soConIPduIdentifier, iPduIdentifier.variationPoint.shortLabel vh.latestBindingTime=postBuild
remoteAddress	<a href="#">SocketAddress</a>	0..1	ref	RemoteAddress of the static SocketConnection. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=remoteAddress.socketAddress, remoteAddress.variationPoint.shortLabel vh.latestBindingTime=postBuild
tcpConnect Timeout	TimeValue	0..1	attr	Specifies the time in seconds how long TCP connect attempts are repeated to reach SOAD_SOCON_ONLINE. This attribute is restricted to socket connection groups which are initiating a TCP connection and are under control of SoAd.
tcpRole	TcpRoleEnum	0..1	attr	Defines whether the local Address (that is aggregating the StaticSocketConnection) does a listen or a connect.

**Table A.921: StaticSocketConnection**

<b>Class</b>	<b>Std</b>			
<b>Note</b>	This represents a reference to external standards.			
<b>Base</b>	ARObject, <a href="#">Referrable</a> , <a href="#">SingleLanguageReferrable</a>			
<b>Aggregated by</b>	<a href="#">MixedContentForParagraph.std</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
date	DateTime	0..1	attr	This element specifies the release date of the external standard if applicable. <b>Tags:</b> xml.sequenceOffset=50
position	String	0..1	attr	This represents the reference to the relevant positions of a standard. Kept as a string. <b>Tags:</b> xml.sequenceOffset=70
state	String	0..1	attr	This represents version and state of a standard. Kept as a string. <b>Tags:</b> xml.sequenceOffset=40
subtitle	String	0..1	attr	This represents the subtitle of the standard. <b>Tags:</b> xml.sequenceOffset=30
url	Url	0..1	aggr	This represents the URL of the standard. <b>Tags:</b> xml.sequenceOffset=60

**Table A.922: Std**

<b>Class</b>	<b>StructuredReq</b>			
<b>Note</b>	This represents a structured requirement. This is intended for a case where specific requirements for features are collected. Note that this can be rendered as a labeled list.			
<b>Base</b>	ARObject, <a href="#">DocumentViewSelectable</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Paginateable</a> , <a href="#">Referrable</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<a href="#">DocumentationBlock.structuredReq</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
appliesTo	StandardNameEnum	*	attr	This attribute represents the platform the requirement is assigned to. <b>Tags:</b> xml.namePlural=APPLIES-TO-DEPENDENCIES xml.sequenceOffset=25
conflicts	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents an informal specification of conflicts. <b>Tags:</b> xml.sequenceOffset=40
date	DateTime	1	attr	This represents the date when the requirement was initiated. <b>Tags:</b> xml.sequenceOffset=5
dependencies	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents an informal specification of dependencies. Note that upstream tracing should be formalized in the property trace provided by the superclass <a href="#">Traceable</a> . <b>Tags:</b> xml.sequenceOffset=30
description	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents the general description of the requirement. <b>Tags:</b> xml.sequenceOffset=10
importance	String	1	attr	This allows to represent the importance of the requirement. <b>Tags:</b> xml.sequenceOffset=8
issuedBy	String	1	attr	This represents the person, organization or authority which issued the requirement. <b>Tags:</b> xml.sequenceOffset=6
rationale	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents the rationale of the requirement. <b>Tags:</b> xml.sequenceOffset=20





Class	StructuredReq			
remark	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents an informal remark. Note that this is not modeled as annotation, since these remark is still essential part of the requirement. <b>Tags:</b> xml.sequenceOffset=60
supportingMaterial	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents an informal specification of the supporting material. <b>Tags:</b> xml.sequenceOffset=50
testedItem	<a href="#">Traceable</a>	*	ref	This association represents the ability to trace on the same specification level. This supports for example the of acceptance tests. <b>Tags:</b> xml.sequenceOffset=70
type	String	1	attr	This attribute allows to denote the type of requirement to denote for example is it an "enhancement", "new feature" etc. <b>Tags:</b> xml.sequenceOffset=7
useCase	<a href="#">DocumentationBlock</a>	0..1	aggr	This describes the relevant use cases. Note that formal references to use cases should be done in the trace relation. <b>Tags:</b> xml.sequenceOffset=35

**Table A.923: StructuredReq**

Class	SubElementMapping			
Note	This meta-class allows for the definition of mappings of elements of a composite data type.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">DataPrototypeMapping.subElementMapping</a>			
Attribute	Type	Mult.	Kind	Note
firstElement	SubElementRef	0..1	aggr	This represents the first element referenced in the scope of the mapping. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=firstElement, firstElement.variation Point.shortLabel vh.latestBindingTime=preCompileTime
secondElement	SubElementRef	0..1	aggr	This represents the second element referenced in the scope of the mapping. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=secondElement, secondElement.variation Point.shortLabel vh.latestBindingTime=preCompileTime
textTableMapping	<a href="#">TextTableMapping</a>	0..2	aggr	This allows for the text-table translation of individual elements of a composite data type.

**Table A.924: SubElementMapping**

Class	SupervisedEntityNeeds			
Note	Specifies the abstract needs on the configuration of the Watchdog Manager for one specific Supervised Entity.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
Aggregated by	<a href="#">BswServiceDependency.serviceNeeds</a> , <a href="#">SwcServiceDependency.serviceNeeds</a>			
Attribute	Type	Mult.	Kind	Note





Class	SupervisedEntityNeeds			
activateAtStart	Boolean	0..1	attr	true/false: supervision activation status of Supervised Entity shall be enabled/disabled at start.
checkpoints	SupervisedEntity CheckpointNeeds	*	ref	This reference indicates the checkpoints belonging to the Supervised Entity. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=checkpoints.supervisedEntityCheckpointNeeds, checkpoints.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
enable Deactivation	Boolean	0..1	attr	true: software-component shall be allowed to deactivate supervision of this SupervisedEntity false: software-component shall be not allowed to deactivate supervision of this SupervisedEntity
expectedAlive Cycle	TimeValue	0..1	attr	Expected cycle time of alive trigger of this Supervised Entity (in seconds).
maxAliveCycle	TimeValue	0..1	attr	Maximum cycle time of alive trigger of this Supervised Entity (in seconds).
minAliveCycle	TimeValue	0..1	attr	Minimum cycle time of alive trigger of this Supervised Entity (in seconds).
toleratedFailed Cycles	PositiveInteger	0..1	attr	Number of consecutive failed alive cycles for this SupervisedEntity which shall be tolerated until the supervision status of the SupervisedEntity is set to WdGM_ALIVE_EXPIRED (see SWS WdGM for more details). Note that this value has to be recalculated with respect to the WdGM's own cycle time for ECU configuration.

**Table A.925: SupervisedEntityNeeds**

Enumeration	SupportBufferLockingEnum
<b>Note</b>	This enumeration represents the ability to define the buffer locking behavior.
<b>Aggregated by</b>	<a href="#">CommunicationBufferLocking.supportBufferLocking</a>
<b>Literal</b>	<b>Description</b>
doesNotSupport BufferLocking	Buffer locking is not supported. <b>Tags:</b> atp.EnumerationLiteralIndex=0
supportsBuffer Locking	Buffer locking is supported. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.926: SupportBufferLockingEnum**

Class	SwAddrMethod			
<b>Note</b>	Used to assign a common addressing method, e.g. common memory section, to data or code objects. These objects could actually live in different modules or components. <b>Tags:</b> atp.recommendedPackage=SwAddrMethods			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage Referrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
memory Allocation KeywordPolicy	<a href="#">MemoryAllocation KeywordPolicyType</a>	0..1	attr	Enumeration to specify the name pattern of the Memory Allocation Keyword.





Class	SwAddrMethod			
option	Identifier	*	attr	This attribute introduces the ability to specify further intended properties of the MemorySection in with the related objects shall be placed. These properties are handled as to be selected. The intended options are mentioned in the list. In the Memory Mapping configuration, this option list is used to determine an appropriate MemMapAddressing ModeSet.
section Initialization Policy	SectionInitialization PolicyType	0..1	attr	Specifies the expected initialization of the variables (inclusive those which are implementing VariableData Prototypes). Therefore this is an implementation constraint for initialization code of BSW modules (especially RTE) as well as the start-up code which initializes the memory segment to which the AutosarData Prototypes referring to the SwAddrMethod's are later on mapped. If the attribute is not defined it has the identical semantic as the attribute value "INIT"
sectionType	MemorySectionType	0..1	attr	Defines the type of memory sections which can be associated with this addressing method.

Table A.927: SwAddrMethod

Class	SwAxisCont			
Note	This represents the values for the axis of a compound primitive (curve, map). For standard and fix axes, SwAxisCont contains the values of the axis directly. The axis values of SwAxisCont with the category COM_AXIS, RES_AXIS are for display only. For editing and processing, only the values in the related GroupAxis are binding.			
Base	ARObject			
Aggregated by	ApplicationValueSpecification.swAxisCont			
Attribute	Type	Mult.	Kind	Note
category	CalprmAxisCategory Enum	0..1	attr	This category specifies the particular axis types: <ul style="list-style-type: none"> <li>• STD_AXIS</li> <li>• COM_AXIS</li> <li>• RES_AXIS (swArraysize necessary)</li> </ul> <b>Tags:</b> xml.sequenceOffset=20
swArraysize	ValueList	0..1	aggr	For multidimensional compound primitives (curve, map ...) it is necessary to know the dimensions. They are specified using swArraySize. <ul style="list-style-type: none"> <li>• RES_AXIS</li> </ul> <b>Tags:</b> xml.sequenceOffset=70
swAxisIndex	AxisIndexType	0..1	attr	This property allows to explicitly assign the axis contents to a particular axis. It is specified by numbers where 1 corresponds to the x-axis. It is also possible to derive the axis association from the sequence of the parent. <b>Tags:</b> xml.sequenceOffset=50
swValuesPhys	SwValues	0..1	aggr	swValuesPhys represents the values in the physical domain. <b>Tags:</b> xml.sequenceOffset=80
unit	Unit	0..1	ref	This represents the physical unit of the provided values. <b>Tags:</b> xml.sequenceOffset=30
unitDisplay Name	SingleLanguageUnit Names	0..1	aggr	This represents the display name which is used for the physical unit of the axis. <b>Tags:</b> xml.sequenceOffset=40

Table A.928: SwAxisCont

<b>Class</b>	<b>SwAxisGeneric</b>			
<b>Note</b>	This meta-class defines a generic axis. In a generic axis the axispoints points are calculated in the ECU. The ECU is equipped with a fixed calculation algorithm. Parameters for the algorithm can be stored in the data component of the ECU. Therefore these parameters are specified in the data declaration, not in the calibration data.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SwAxisIndividual.swAxisGeneric			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
swAxisType	SwAxisType	0..1	ref	Associated axis calculation strategy. <b>Tags:</b> xml.sequenceOffset=20
swGenericAxisParam	SwGenericAxisParam	*	aggr	Specific parameter of a generic axis. <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=40 xml.typeElement=false xml.typeWrapperElement=false

Table A.929: SwAxisGeneric

<b>Class</b>	<b>SwAxisGrouped</b>			
<b>Note</b>	An SwAxisGrouped is an axis which is shared between multiple calibration parameters.			
<b>Base</b>	ARObject, SwCalprmAxisTypeProps			
<b>Aggregated by</b>	SwCalprmAxis.swCalprmAxisTypeProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
sharedAxisType	ApplicationPrimitiveDataType	0..1	ref	This is the datatype of the calibration parameter providing the shared axis.
swAxisIndex	AxisIndexType	0..1	attr	Describes which axis of the referenced calibration parameter provides the values for the group axis. The index satisfies the following convention: <ul style="list-style-type: none"> <li>• 0 = value axis. in this case, the interpolation result of the referenced parameter is used as a base point index.</li> <li>• The index should only be specified if the parameter under swCalprm contains more than one axis. It is standard practice for the axis index of parameters with more than one axis, to be set to 1, if data has not been assigned to swAxisIndex.</li> </ul> <b>Tags:</b> xml.sequenceOffset=20
swCalprmRef	SwCalprmRefProxy	1	aggr	This property specifies the calibration parameter which serves as the input axis. In AUTOSAR, the type of the referenced Calibration parameter shall be compatible to the type specified by sharedAxisType. Please note that the multiplicity of this aggregation cannot be set to 0..1 based on the non-mainstream schema generation instructions defined at the aggregation. However, the multiplicity has to be factually considered 0..1 (i.e. a SwAxisGrouped that does not aggregate the role swCalprmRef is still valid according to the XML schema, depending on the use case documented in [constr_1015]). <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=30 xml.typeElement=false xml.typeWrapperElement=false

Table A.930: SwAxisGrouped



<b>Class</b>	<b>SwAxisIndividual</b>			
<b>Note</b>	This meta-class describes an axis integrated into a parameter (field etc.). The integration makes this individual to each parameter. The so-called grouped axis represents the counterpart to this. It is conceived as an independent parameter (see class SwAxisGrouped).			
<b>Base</b>	ARObject, SwCalprmAxisTypeProps			
<b>Aggregated by</b>	SwCalprmAxis.swCalprmAxisTypeProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
compuMethod	CompuMethod	0..1	ref	This is the compuMethod which is expected for the axis. It is used in early stages if the particular input-value is not yet available. <b>Tags:</b> xml.sequenceOffset=30
dataConstr	DataConstr	0..1	ref	Refers to constraints, e.g. for plausibility checks. <b>Tags:</b> xml.sequenceOffset=80
inputVariableType	ApplicationPrimitiveDataType	0..1	ref	This is the datatype of the input value for the axis. This allows to define e.g. a type of curve, where the input value is finalized at the access point.
swAxisGeneric	SwAxisGeneric	0..1	aggr	this specifies the properties of a generic axis if applicable. <b>Tags:</b> xml.sequenceOffset=90
swMaxAxisPoints	Integer	0..1	attr	Maximum number of base points contained in the axis of a map or curve. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=60
swMinAxisPoints	Integer	0..1	attr	Minimum number of base points contained in the axis of a map or curve. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=70
swVariableRef (ordered)	SwVariableRefProxy	*	aggr	Refers to input variables of the axis. It is possible to specify more than one variable. Here the following is valid: <ul style="list-style-type: none"> <li>The variable with the highest priority shall be given first. It is used in the generation of the code and is also displayed first in the application system.</li> <li>All variables referenced shall be of the same physical nature. This is usually detected in that the conversion formulae affected refer back to the same SI-units.</li> </ul> In AUTOSAR this ensured by the constraint, that the referenced input variables shall use a type compatible to "inputVariableType". <ul style="list-style-type: none"> <li>This multiple referencing allows a base point distribution for more than one input variable to be used. One example of this are the temperature curves which can depend both on the induction air temperature and the engine temperature.</li> </ul> These variables can be displayed simultaneously by MCD systems (adjustment systems), enabling operating points to be shown in the curves.  <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=true xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false





Class	SwAxisIndividual			
unit	<a href="#">Unit</a>	0..1	ref	This represents the physical unit of the input value of the axis. It is provided to support the case that the particular input variable is not yet known. <b>Tags:</b> xml.sequenceOffset=40

**Table A.931: SwAxisIndividual**

Class	SwBaseType			
<b>Note</b>	This meta-class represents a base type used within ECU software. <b>Tags:</b> atp.recommendedPackage=BaseTypes			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpBlueprint</a> , <a href="#">AtpBlueprintable</a> , <a href="#">BaseType</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.932: SwBaseType**

Enumeration	SwCalibrationAccessEnum
<b>Note</b>	Determines the access rights to a data object w.r.t. measurement and calibration.
<b>Aggregated by</b>	<a href="#">ModeDeclarationGroupPrototype.swCalibrationAccess</a> , <a href="#">SwCalprmAxis.swCalibrationAccess</a> , <a href="#">SwDataDefProps.swCalibrationAccess</a>
Literal	Description
notAccessible	The element will not be accessible via MCD tools, i.e. will not appear in the ASAP file. <b>Tags:</b> atp.EnumerationLiteralIndex=0
readOnly	The element will only appear as read-only in an ASAP file. <b>Tags:</b> atp.EnumerationLiteralIndex=1
readWrite	The element will appear in the ASAP file with both read and write access. <b>Tags:</b> atp.EnumerationLiteralIndex=2

**Table A.933: SwCalibrationAccessEnum**

Class	SwCalprmAxis			
<b>Note</b>	This element specifies an individual input parameter axis (abscissa).			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">SwCalprmAxisSet.swCalprmAxis</a>			
Attribute	Type	Mult.	Kind	Note
category	<a href="#">CalprmAxisCategoryEnum</a>	0..1	attr	This property specifies the category of a particular axis. <b>Tags:</b> xml.sequenceOffset=30
displayFormat	DisplayFormatString	0..1	attr	This property specifies how the axis values shall be displayed e.g. in documents or in measurement and calibration tools. <b>Tags:</b> xml.sequenceOffset=100
swAxisIndex	AxisIndexType	0..1	attr	This attribute specifies which axis is specified by the containing SwCalprmAxis. For example in a curve this is usually "1". In a map this is "1" or "2". <b>Tags:</b> xml.sequenceOffset=20
swCalibrationAccess	<a href="#">SwCalibrationAccessEnum</a>	0..1	attr	Describes the applicability of parameters and variables. <b>Tags:</b> xml.sequenceOffset=90





Class	SwCalprmAxis			
swCalprmAxis TypeProps	SwCalprmAxisType Props	0..1	aggr	specific properties depending on the type of the axis. <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=40 xml.typeElement=true xml.typeWrapperElement=false

Table A.934: SwCalprmAxis

Class	SwCalprmAxisSet			
<b>Note</b>	This element specifies the input parameter axes (abscissas) of parameters (and variables, if these are used adaptively).			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SwDataDefProps.swCalprmAxisSet			
Attribute	Type	Mult.	Kind	Note
swCalprmAxis	SwCalprmAxis	*	aggr	One axis belonging to this SwCalprmAxisSet <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=false xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false

Table A.935: SwCalprmAxisSet

Class	SwCalprmRefProxy			
<b>Note</b>	Wrapper class for different kinds of references to a calibration parameter.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SwAxisGrouped.swCalprmRef, SwDataDependencyArgs.swCalprmRef			
Attribute	Type	Mult.	Kind	Note
arParameter	AutosarParameterRef	0..1	aggr	This represents a Parameter within AUTOSAR. Note that the Datatype of the referenced ParameterDataPrototype shall be an ApplicationDataType of category VALUE.
mcDataInstance	McDataInstance	0..1	ref	This reference is used in the McSupport file to express the final instance of group axis etc. It is not allowed to use this outside of an McDataInstance. The referenced mcDataInstance shall be originated from a ParameterDataPrototype.

Table A.936: SwCalprmRefProxy

Class	SwComponentPrototype			
<b>Note</b>	Role of a software component within a composition.			
<b>Base</b>	ARObject, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	AtpClassifier.atpFeature, CompositionSwComponentType.component			
Attribute	Type	Mult.	Kind	Note
type	SwComponentType	0..1	tref	Type of the instance. <b>Stereotypes:</b> isOfType

Table A.937: SwComponentPrototype

<b>Class</b>	<b>SwComponentPrototypeAssignment</b>			
<b>Note</b>	This meta-class is only required to allow for the variant modeling of an instanceRef. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">CpSoftwareCluster.swComponentAssignment</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
swComponent	<a href="#">SwComponentPrototype</a>	0..1	iref	hierarchical tree(s) of Software Components belonging to this CP Software Cluster. This reference is used to describe the belonging SWCs if the CP Software Cluster is described in the context of a System, <b>InstanceRef implemented by:</b> ComponentInSystem InstanceRef

**Table A.938: SwComponentPrototypeAssignment**

<b>Class</b>	<b>SwComponentType</b> (abstract)			
<b>Note</b>	Base class for AUTOSAR software components.			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>AtpBlueprint</i> , <i>AtpBlueprintable</i> , <i>AtpClassifier</i> , <i>AtpType</i> , <i>CollectableElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
<b>Subclasses</b>	<a href="#">AtomicSwComponentType</a> , <a href="#">CompositionSwComponentType</a> , <a href="#">ParameterSwComponentType</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
consistencyNeeds	<a href="#">ConsistencyNeeds</a>	*	aggr	This represents the collection of <a href="#">ConsistencyNeeds</a> owned by the enclosing <a href="#">SwComponentType</a> . <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=consistencyNeeds.shortName, consistencyNeeds.variationPoint.shortLabel vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.
port	<a href="#">PortPrototype</a>	*	aggr	The <a href="#">PortPrototypes</a> through which this <a href="#">SwComponentType</a> can communicate. The aggregation of <a href="#">PortPrototype</a> is subject to variability with the purpose to support the conditional existence of <a href="#">PortPrototypes</a> . <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=port.shortName, port.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
portGroup	<a href="#">PortGroup</a>	*	aggr	A port group being part of this component. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=portGroup.shortName, portGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
swcMappingConstraint	<a href="#">SwComponentMappingConstraints</a>	*	ref	Reference to constraints that are valid for this <a href="#">SwComponentType</a> . This Attribute is only used by the AUTOSAR Classic Platform.
swComponentDocumentation	<a href="#">SwComponentDocumentation</a>	0..1	aggr	This adds a documentation to the <a href="#">SwComponentType</a> . <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=swComponentDocumentation, swComponentDocumentation.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=-10





Class	<b>SwComponentType</b> (abstract)			
unitGroup	UnitGroup	*	ref	This allows for the specification of which <code>UnitGroups</code> are relevant in the context of referencing <code>SwComponentType</code> . This Attribute is only used by the AUTOSAR Classic Platform.

**Table A.939: SwComponentType**

Class	<b>SwConnector</b> (abstract)			
Note	The base class for connectors between ports. Connectors have to be identifiable to allow references from the system constraint template.			
Base	<code>ARObject</code> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Subclasses	<a href="#">AssemblySwConnector</a> , <a href="#">DelegationSwConnector</a> , <a href="#">PassThroughSwConnector</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">CompositionSwComponentType.connector</a>			
Attribute	Type	Mult.	Kind	Note
mapping	<a href="#">PortInterfaceMapping</a>	0..1	ref	Reference to a <a href="#">PortInterfaceMapping</a> specifying the mapping of unequal named <a href="#">PortInterface</a> elements of the two different <a href="#">PortInterfaces</a> typing the two <a href="#">PortPrototypes</a> which are referenced by the <code>SwConnector</code> .

**Table A.940: SwConnector**

Class	«atpVariation» <b>SwDataDefProps</b>
Note	<p>This class is a collection of properties relevant for data objects under various aspects. One could consider this class as a "pattern of inheritance by aggregation". The properties can be applied to all objects of all classes in which <code>SwDataDefProps</code> is aggregated.</p> <p>Note that not all of the attributes or associated elements are useful all of the time. Hence, the process definition (e.g. expressed with an OCL or a Document Control Instance MSR-DCI) has the task of implementing limitations.</p> <p><code>SwDataDefProps</code> covers various aspects:</p> <ul style="list-style-type: none"> <li>Structure of the data element for calibration use cases: is it a single value, a curve, or a map, but also the <code>recordLayouts</code> which specify how such elements are mapped/converted to the <code>DataTypes</code> in the programming language (or in AUTOSAR). This is mainly expressed by properties like <code>swRecordLayout</code> and <code>swCalprmAxisSet</code></li> <li>Implementation aspects, mainly expressed by <code>swImplPolicy</code>, <code>swVariableAccessImplPolicy</code>, <code>swAddrMethod</code>, <code>swPointerTargetProps</code>, <code>baseType</code>, <code>implementationDataType</code> and <code>additionalNativeTypeQualifier</code></li> <li>Access policy for the MCD system, mainly expressed by <code>swCalibrationAccess</code></li> <li>Semantics of the data element, mainly expressed by <code>compuMethod</code> and/or <code>unit</code>, <code>dataConstr</code>, <code>invalidValue</code></li> <li>Code generation policy provided by <code>swRecordLayout</code></li> </ul> <p><b>Tags:</b> <code>vh.latestBindingTime=codeGenerationTime</code></p>
Base	<code>ARObject</code>





Class	«atpVariation» SwDataDefProps			
Aggregated by	<a href="#">AutosarDataType.swDataDefProps</a> , <a href="#">CompositeNetworkRepresentation.networkRepresentation</a> , <a href="#">CppImplementationDataTypeElement.swDataDefProps</a> , <a href="#">DataPrototype.swDataDefProps</a> , <a href="#">DataPrototypeTransformationProps.networkRepresentationProps</a> , <a href="#">DiagnosticDataElement.swDataDefProps</a> , <a href="#">DiagnosticEnvDataElementCondition.swDataDefProps</a> , <a href="#">DiagnosticExtendedDataRecordElement.swDataDefProps</a> , <a href="#">DiagnosticSovdPrimitiveContentElement.swDataDefProps</a> , <a href="#">DltArgumentProps.networkRepresentation</a> , <a href="#">FlatInstanceDescriptor.swDataDefProps</a> , <a href="#">ImplementationDataTypeElement.swDataDefProps</a> , <a href="#">InstantiationDataDefProps.swDataDefProps</a> , <a href="#">ISignal.networkRepresentationProps</a> , <a href="#">McDataInstance.resultingProperties</a> , <a href="#">ParameterAccess.swDataDefProps</a> , <a href="#">PerInstanceMemory.swDataDefProps</a> , <a href="#">ReceiverComSpec.networkRepresentation</a> , <a href="#">SecurityEventContextDataElement.networkRepresentation</a> , <a href="#">SenderComSpec.networkRepresentation</a> , <a href="#">SomeipDataPrototypeTransformationProps.networkRepresentation</a> , <a href="#">SwPointerTargetProps.swDataDefProps</a> , <a href="#">SwServiceArg.swDataDefProps</a> , <a href="#">SwSystemconst.swDataDefProps</a> , <a href="#">SystemSignal.physicalProps</a>			
Attribute	Type	Mult.	Kind	Note
additionalNativeTypeQualifier	NativeDeclarationString	0..1	attr	<p>This attribute is used to declare native qualifiers of the programming language which can neither be deduced from the baseType (e.g. because the data object describes a pointer) nor from other more abstract attributes. Examples are qualifiers like "volatile", "strict" or "enum" of the C-language. All such declarations have to be put into one string.</p> <p><b>Tags:</b> xml.sequenceOffset=235</p>
annotation	Annotation	*	aggr	<p>This aggregation allows to add annotations (yellow pads ...) related to the current data object.</p> <p><b>Tags:</b>  xml.roleElement=true  xml.roleWrapperElement=true  xml.sequenceOffset=20  xml.typeElement=false  xml.typeWrapperElement=false </p>
baseType	<a href="#">SwBaseType</a>	0..1	ref	<p>Base type associated with the containing data object.</p> <p><b>Tags:</b> xml.sequenceOffset=50</p>
compuMethod	<a href="#">CompuMethod</a>	0..1	ref	<p>Computation method associated with the semantics of this data object.</p> <p><b>Tags:</b> xml.sequenceOffset=180</p>
dataConstr	<a href="#">DataConstr</a>	0..1	ref	<p>Data constraint for this data object.</p> <p><b>Tags:</b> xml.sequenceOffset=190</p>
displayFormat	DisplayFormatString	0..1	attr	<p>This property describes how a number is to be rendered e.g. in documents or in a measurement and calibration system.</p> <p><b>Tags:</b> xml.sequenceOffset=210</p>
displayPresentation	DisplayPresentationEnum	0..1	attr	<p>This attribute controls the presentation of the related data for measurement and calibration tools.</p>
implementationDataType	<a href="#">AbstractImplementationDataType</a>	0..1	ref	<p>This association denotes the ImplementationDataType of a data declaration via its aggregated SwDataDefProps. It is used whenever a data declaration is not directly referring to a base type. Especially</p> <ul style="list-style-type: none"> <li>• redefinition of an ImplementationDataType via a "typedef" to another ImplementationDatatype</li> <li>• the target type of a pointer (see SwPointerTarget Props), if it does not refer to a base type directly</li> <li>• the data type of an array or record element within an ImplementationDataType, if it does not refer to a base type directly</li> <li>• the data type of an SwServiceArg, if it does not refer to a base type directly</li> </ul> <p><b>Tags:</b> xml.sequenceOffset=215</p>





Class	«atpVariation» SwDataDefProps			
invalidValue	<a href="#">ValueSpecification</a>	0..1	aggr	Optional value to express invalidity of the actual data element. <b>Tags:</b> xml.sequenceOffset=255
stepSize	Float	0..1	attr	This attribute can be used to define a value which is added to or subtracted from the value of a DataPrototype when using up/down keys while calibrating.
swAddrMethod	<a href="#">SwAddrMethod</a>	0..1	ref	Addressing method related to this data object. Via an association to the same SwAddrMethod it can be specified that several DataPrototypes shall be located in the same memory without already specifying the memory section itself. <b>Tags:</b> xml.sequenceOffset=30
swAlignment	AlignmentType	0..1	attr	The attribute describes the intended typical alignment of the DataPrototype. If the attribute is not defined the alignment is determined by the swBaseType size and the memoryAllocationKeywordPolicy of the referenced Sw AddrMethod. <b>Tags:</b> xml.sequenceOffset=33
swBit Representation	SwBitRepresentation	0..1	aggr	Description of the binary representation in case of a bit variable. <b>Tags:</b> xml.sequenceOffset=60
swCalibration Access	<a href="#">SwCalibrationAccess Enum</a>	0..1	attr	Specifies the read or write access by MCD tools for this data object. <b>Tags:</b> xml.sequenceOffset=70
swCalprmAxis Set	<a href="#">SwCalprmAxisSet</a>	0..1	aggr	This specifies the properties of the axes in case of a curve or map etc. This is mainly applicable to calibration parameters. <b>Tags:</b> xml.sequenceOffset=90
swComparison Variable	<a href="#">SwVariableRefProxy</a>	*	aggr	Variables used for comparison in an MCD process. <b>Tags:</b> xml.sequenceOffset=170 xml.typeElement=false
swData Dependency	SwDataDependency	0..1	aggr	Describes how the value of the data object has to be calculated from the value of another data object (by the MCD system). <b>Tags:</b> xml.sequenceOffset=200
swHostVariable	<a href="#">SwVariableRefProxy</a>	0..1	aggr	Contains a reference to a variable which serves as a host-variable for a bit variable. Only applicable to bit objects. <b>Tags:</b> xml.sequenceOffset=220 xml.typeElement=false
swImplPolicy	<a href="#">SwImplPolicyEnum</a>	0..1	attr	Implementation policy for this data object. <b>Tags:</b> xml.sequenceOffset=230
swIntended Resolution	<a href="#">Numerical</a>	0..1	attr	The purpose of this element is to describe the requested quantization of data objects early on in the design process. The resolution ultimately occurs via the conversion formula present (compuMethod), which specifies the transition from the physical world to the standardized world (and vice-versa) (here, "the slope per bit" is present implicitly in the conversion formula). In the case of a development phase without a fixed conversion formula, a pre-specification can occur through swIntendedResolution. The resolution is specified in the physical domain according to the property "unit". <b>Tags:</b> xml.sequenceOffset=240





Class	«atpVariation» SwDataDefProps			
swInterpolationMethod	Identifier	0..1	attr	This is a keyword identifying the mathematical method to be applied for interpolation. The keyword needs to be related to the interpolation routine which needs to be invoked. <b>Tags:</b> xml.sequenceOffset=250
swIsVirtual	Boolean	0..1	attr	This element distinguishes virtual objects. Virtual objects do not appear in the memory, their derivation is much more dependent on other objects and hence they shall have a swDataDependency . <b>Tags:</b> xml.sequenceOffset=260
swPointerTargetProps	SwPointerTargetProps	0..1	aggr	Specifies that the containing data object is a pointer to another data object. <b>Tags:</b> xml.sequenceOffset=280
swRecordLayout	SwRecordLayout	0..1	ref	Record layout for this data object. <b>Tags:</b> xml.sequenceOffset=290
swRefreshTiming	MultidimensionalTime	0..1	aggr	This element specifies the frequency in which the object involved shall be or is called or calculated. This timing can be collected from the task in which write access processes to the variable run. But this cannot be done by the MCD system. So this attribute can be used in an early phase to express the desired refresh timing and later on to specify the real refresh timing. <b>Tags:</b> xml.sequenceOffset=300
swTextProps	SwTextProps	0..1	aggr	the specific properties if the data object is a text object. <b>Tags:</b> xml.sequenceOffset=120
swValueBlockSize	Numerical	0..1	attr	This represents the size of a Value Block <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=80
swValueBlockSizeMult (ordered)	Numerical	*	attr	This attribute is used to specify the dimensions of a value block (VAL_BLK) for the case that that value block has more than one dimension. The dimensions given in this attribute are ordered such that the first entry represents the first dimension, the second entry represents the second dimension, and so on. For one-dimensional value blocks the attribute swValueBlockSize shall be used and this attribute shall not exist. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
unit	Unit	0..1	ref	Physical unit associated with the semantics of this data object. This attribute applies if no compuMethod is specified. If both units (this as well as via compuMethod) are specified the units shall be compatible. <b>Tags:</b> xml.sequenceOffset=350
valueAxisDataType	ApplicationPrimitiveDataType	0..1	ref	The referenced ApplicationPrimitiveDataType represents the primitive data type of the value axis within a compound primitive (e.g. curve, map). It supersedes CompuMethod, Unit, and BaseType. <b>Tags:</b> xml.sequenceOffset=355

Table A.941: SwDataDefProps



<b>Class</b>	<b>SwGenericAxisParam</b>			
<b>Note</b>	This meta-class describes a specific parameter of a generic axis. The name of the parameter is defined through a reference to a parameter type defined on a corresponding axis type. The value of the parameter is given here in case that it is not changeable during calibration. Example is shift / offset in a fixed axis.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">SwAxisGeneric.swGenericAxisParam</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
swGenericAxisParamType	<a href="#">SwGenericAxisParamType</a>	0..1	ref	Parameter type defined on a corresponding axis type. References can only be made to axis parameters types which are defined within the referenced axis type. <b>Tags:</b> xml.sequenceOffset=20
vf (ordered)	<a href="#">Numerical</a>	*	attr	This attribute represents the value of the generic axis parameter. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.roleElement=true xml.roleWrapperElement=false xml.sequenceOffset=30 xml.typeElement=false

**Table A.942: SwGenericAxisParam**

<b>Class</b>	<b>SwGenericAxisParamType</b>			
<b>Note</b>	This meta-class describes a generic axis parameter type, namely: <ul style="list-style-type: none"> <li>Plausibility checks can be specified via dataConstr.</li> <li>Textual description (desc), as a formal description is not of any use, due to the large variety of possibilities.</li> <li>If this parameter contains structures, these can be simulated through the recursive use of SwGenericAxisParamTypes.</li> </ul>			
<b>Base</b>	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">SwAxisType.swGenericAxisParamType</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataConstr	<a href="#">DataConstr</a>	0..1	ref	This reference denoted data constraints applicable to the generic axis parameter. <b>Tags:</b> xml.sequenceOffset=20

**Table A.943: SwGenericAxisParamType**

<b>Enumeration</b>	<b>SwImplPolicyEnum</b>			
<b>Note</b>	Specifies the implementation strategy with respect to consistency mechanisms of variables.			
<b>Aggregated by</b>	<a href="#">BswInternalTriggeringPoint.swImplPolicy</a> , <a href="#">InternalTriggeringPoint.swImplPolicy</a> , <a href="#">SwDataDefProps.swImplPolicy</a> , <a href="#">Trigger.swImplPolicy</a>			
<b>Literal</b>	<b>Description</b>			
const	forced implementation such that the running software within the ECU shall not modify it. For example implemented with the "const" modifier in C. This can be applied for parameters (not for those in NVRAM) as well as argument data prototypes. <b>Tags:</b> atp.EnumerationLiteralIndex=0			
fixed	This data element is fixed. In particular this indicates, that it might also be implemented e.g. as in place data, (#DEFINE). <b>Tags:</b> atp.EnumerationLiteralIndex=1			





Enumeration	SwImplPolicyEnum
measurementPoint	The data element is created for measurement purposes only. The data element is never read directly within the ECU software. In contrast to a "standard" data element in an unconnected provide port is, this unconnection is guaranteed for measurementPoint data elements. <b>Tags:</b> atp.EnumerationLiteralIndex=2
queued	The content of the data element is queued and the data element has 'event' semantics, i.e. data elements are stored in a queue and all data elements are processed in 'first in first out' order. The queuing is intended to be implemented by RTE Generator. This value is not applicable for parameters. <b>Tags:</b> atp.EnumerationLiteralIndex=3
standard	This is applicable for all kinds of data elements. For variable data prototypes the 'last is best' semantics applies. For parameter there is no specific implementation directive. <b>Tags:</b> atp.EnumerationLiteralIndex=4

**Table A.944: SwImplPolicyEnum**

Class	SwPointerTargetProps			
<b>Note</b>	This element defines, that the data object (which is specified by the aggregating element) contains a reference to another data object or to a function in the CPU code. This corresponds to a pointer in the C-language. The attributes of this element describe the category and the detailed properties of the target which is either a data description or a function signature.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SwDataDefProps.swPointerTargetProps			
Attribute	Type	Mult.	Kind	Note
functionPointer Signature	BswModuleEntry	0..1	ref	The referenced BswModuleEntry serves as the signature of a function pointer definition. Primary use case: function pointer passed as argument to other function. <b>Tags:</b> xml.sequenceOffset=40 This Attribute is only used by the AUTOSAR Classic Platform.
swDataDef Props	SwDataDefProps	0..1	aggr	The properties of the target data type. <b>Tags:</b> xml.sequenceOffset=30
targetCategory	Identifier	0..1	attr	This specifies the category of the target: <ul style="list-style-type: none"> <li>In case of a data pointer, it shall specify the category of the referenced data.</li> <li>In case of a function pointer, it could be used to denote the category of the referenced BswModuleEntry.</li> </ul> <b>Tags:</b> xml.sequenceOffset=5

**Table A.945: SwPointerTargetProps**

Class	SwRecordLayout			
<b>Note</b>	Defines how the data objects (variables, calibration parameters etc.) are to be stored in the ECU memory. As an example, this definition specifies the sequence of axis points in the ECU memory. Iterations through axis values are stored within the sub-elements swRecordLayoutGroup. <b>Tags:</b> atp.recommendedPackage=SwRecordLayouts			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note





Class	SwRecordLayout			
swRecordLayoutGroup	SwRecordLayoutGroup	0..1	aggr	<p>This is the top level record layout group.</p> <p><b>Tags:</b>  xml.roleElement=true  xml.roleWrapperElement=false  xml.sequenceOffset=20  xml.typeElement=false  xml.typeWrapperElement=false</p>

Table A.946: SwRecordLayout

Class	SwServiceArg			
<b>Note</b>	<p>Specifies the properties of a data object exchanged during the call of an SwService, e.g. an argument or a return value.</p> <p>The SwServiceArg can also be used in the argument list of a C-macro. For this purpose the category shall be set to "MACRO". A reference to implementationDataType can optional be added if the actual argument has an implementationDataType.</p>			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswModuleEntry.argument</a> , <a href="#">BswModuleEntry.returnType</a>			
Attribute	Type	Mult.	Kind	Note
direction	<a href="#">ArgumentDirectionEnum</a>	0..1	attr	<p>Specifies the direction of the data transfer. The direction shall indicate the direction of the actual information that is being consumed by the caller and/or the callee, not the direction of formal arguments in C.</p> <p>The attribute is optional for backwards compatibility reasons. For example, if a pointer is used to pass a memory address for the expected result, the direction shall be "out". If a pointer is used to pass a memory address with content to be read by the callee, its direction shall be "in".</p> <p><b>Tags:</b> xml.sequenceOffset=10</p>
swArraysize	<a href="#">ValueList</a>	0..1	aggr	<p>This turns the argument of the service to an array.</p> <p><b>Tags:</b> xml.sequenceOffset=20</p>
swDataDefProps	<a href="#">SwDataDefProps</a>	0..1	aggr	<p>Data properties of this SwServiceArg.</p> <p><b>Tags:</b> xml.sequenceOffset=30</p>

Table A.947: SwServiceArg

Class	SwSystemconst			
<b>Note</b>	<p>This element defines a system constant which serves an input to select a particular variation point. In particular a system constant serves as an operand of the binding function (swSyscond) in a Variation point.</p> <p>Note that the binding process can only happen if a value was assigned to to the referenced system constants.</p> <p><b>Tags:</b> atp.recommendedPackage=SwSystemconst</p>			
<b>Base</b>	ARElement, ARObject, AtpDefinition, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note





Class	SwSystemconst			
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	<p>This denotes the data definition properties of the system constant. This supports to express the limits and optionally a conversion within the internal to physical values by a compu method.</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=swDataDefProps xml.sequenceOffset=40</p>

Table A.948: SwSystemconst

Class	SwSystemconstValue			
Note	This meta-class assigns a particular value to a system constant.			
Base	ARObject			
Aggregated by	<a href="#">SwSystemconstantValueSet.swSystemconstantValue</a>			
Attribute	Type	Mult.	Kind	Note
annotation	Annotation	*	aggr	<p>This provides the ability to add information why the value is set like it is.</p> <p><b>Tags:</b> xml.sequenceOffset=30</p>
swSystemconst	<a href="#">SwSystemconst</a>	1	ref	<p>This is the system constant to which the value applies.</p> <p><b>Tags:</b> xml.sequenceOffset=10</p>
value	<a href="#">Numerical</a>	1	attr	<p>This is the particular value of a system constant. It is specified as Numerical. Further restrictions may apply by the definition of the system constant.</p> <p>The value attribute defines the internal value of the Sw Systemconst as it is processed in the Formula Language.</p> <p><b>Stereotypes:</b> atpVariation</p> <p><b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=20</p>

Table A.949: SwSystemconstValue

Class	SwSystemconstantValueSet			
Note	<p>This meta-class represents the ability to specify a set of system constant values.</p> <p><b>Tags:</b> atp.recommendedPackage=SwSystemconstantValueSets</p>			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , PackageableElement, <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
sw Systemconstant Value	<a href="#">SwSystemconstValue</a>	*	aggr	<p>This is one particular value of a system constant.</p>

Table A.950: SwSystemconstantValueSet

Class	SwTextProps			
Note	This meta-class expresses particular properties applicable to strings in variables or calibration parameters.			
Base	ARObject			
Aggregated by	<a href="#">SwDataDefProps.swTextProps</a>			
Attribute	Type	Mult.	Kind	Note





Class	SwTextProps			
arraySize Semantics	<a href="#">ArraySizeSemantics Enum</a>	0..1	attr	This attribute controls the semantics of the arraysize for the array representing the string in an <a href="#">ImplementationDataType</a> . It is there to support a safe conversion between <a href="#">ApplicationDataType</a> and <a href="#">ImplementationDataType</a> , even for variable length strings as required e.g. for Support of SAE J1939.
baseType	<a href="#">SwBaseType</a>	0..1	ref	This is the base type of one character in the string. In particular this baseType denotes the intended encoding of the characters in the string on level of <a href="#">ApplicationDataType</a> . <b>Tags:</b> xml.sequenceOffset=30
swFillCharacter	Integer	0..1	attr	Filler character for text parameter to pad up to the maximum length <a href="#">swMaxTextSize</a> . The value will be interpreted according to the encoding specified in the associated base type of the data object, e.g. 0x30 (hex) represents the ASCII character zero as filler character and 0 (dec) represents an end of string as filler character. The usage of the fill character depends on the <a href="#">arraySizeSemantics</a> . <b>Tags:</b> xml.sequenceOffset=40
swMaxTextSize	Integer	0..1	attr	Specifies the maximum text size in characters. Note the size in bytes depends on the encoding in the corresponding <a href="#">baseType</a> . <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=20

**Table A.951: SwTextProps**

Class	SwValueCont			
<b>Note</b>	This metaclass represents the content of one particular SwInstance.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">ApplicationValueSpecification.swValueCont</a>			
Attribute	Type	Mult.	Kind	Note
swArraysize	<a href="#">ValueList</a>	0..1	aggr	This attribute defines the size of each dimension for compound primitives CURVE, MAP, CUBOID, CUBE_4, CUBE_5, COM_AXIS, RES_AXIS, VAL_BLK. For each dimension one value has to be defined, e.g. one in case of COM_AXIS and two or more in case of MAP. <b>Tags:</b> xml.sequenceOffset=40
swValuesPhys	<a href="#">SwValues</a>	0..1	aggr	swValuesPhys represents the values in the physical domain. <b>Tags:</b> xml.sequenceOffset=50
unit	<a href="#">Unit</a>	0..1	ref	This represents the physical unit of the provided values. <b>Tags:</b> xml.sequenceOffset=20
unitDisplay Name	SingleLanguageUnit Names	0..1	aggr	This specifies how the physical units of the current value set shall be displayed in documents or in user interfaces of tools. <b>Tags:</b> xml.sequenceOffset=30

**Table A.952: SwValueCont**

<b>Class</b>	«atpMixed» <b>SwValues</b>			
<b>Note</b>	<p>This meta-class represents a list of values. These values can either be the input values of a curve (abscissa values) or the associated values (ordinate values).  For multidimensional structures, the values are ordered such that they follow the memory layout, see [TPS_SWCT_01882]  In particular for maps and cuboids etc. the resulting long value list can be subsectioned using Value Group. But the processing needs to be done as if vg is not there.  Note that numerical values and textual values should not be mixed.</p>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SwAxisCont.swValuesPhys, SwValueCont.swValuesPhys, ValueGroup.vgContents			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
v	Numerical	0..1	attr	<p>This is a non variant Value. It is provided for sake of Compatibility to ASAM CDF.  <b>Tags:</b> xml.sequenceOffset=40</p>
vf	Numerical	0..1	attr	<p>This allows to specify the value as VariationPoint. It is distinguished to non variant for sake of compatibility to ASAM CDF 2.0.  <b>Stereotypes:</b> atpVariation  <b>Tags:</b>  vh.latestBindingTime=preCompileTime  xml.sequenceOffset=20</p>
vg	ValueGroup	0..1	aggr	<p>This allows to have intersections in the values in order to support specific rendering (eg. using stylesheets). For tools it is important that the v values are always processed in the same (flattened) order and the tool is able to interpret it without respecting vg.  <b>Tags:</b> xml.sequenceOffset=50</p>
vt	VerbatimString	0..1	attr	<p>This represents the values of textual data elements (Strings). Note that vt uses the   to separate the values for the different bitfield masks in case that the semantics of the related DataPrototype is described by means of a BITFIELD_TEXTTABLE in the associated CompuMethod.  <b>Tags:</b> xml.sequenceOffset=30</p>
vtf	NumericalOrText	0..1	aggr	<p>This aggregation represents the ability to provide a value that is either numerical or text which existence is subject to variability.  <b>Stereotypes:</b> atpVariation  <b>Tags:</b> vh.latestBindingTime=preCompileTime</p>

Table A.953: SwValues

<b>Class</b>	<b>SwVariableRefProxy</b>			
<b>Note</b>	Proxy class for several kinds of references to a variable.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	SwAxisIndividual.swVariableRef, SwDataDefProps.swComparisonVariable, SwDataDefProps.swHostVariable, SwDataDependencyArgs.swVariable			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
autosarVariable	AutosarVariableRef	0..1	aggr	<p>This represents the reference to a Variable in an Autosar system. Note that the target of the reference within AutosarVariableRef shall be typed by a primitive data type</p>
mcDataInstanceVar	McDataInstance	0..1	ref	<p>This reference is used in the McSupport file to express the final instance of input values etc. It is not allowed to use this outside of an McDataInstance.  The referenced mcDataInstance shall be originated from a VariableDataPrototype.</p>

Table A.954: SwVariableRefProxy

<b>Class</b>	<b>SwcBswMapping</b>			
<b>Note</b>	Maps an SwcInternalBehavior to an BswInternalBehavior. This is required to coordinate the API generation and the scheduling for AUTOSAR Service Components, ECU Abstraction Components and Complex Driver Components by the RTE and the BSW scheduling mechanisms. <b>Tags:</b> atp.recommendedPackage=SwcBswMappings This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a> , <a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswBehavior	<a href="#">BswInternalBehavior</a>	0..1	ref	The mapped BswInternalBehavior
runnable Mapping	<a href="#">SwcBswRunnableMapping</a>	*	aggr	A mapping between a pair of SWC and BSW runnables. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=runnableMapping, runnableMapping.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
swcBehavior	<a href="#">SwcInternalBehavior</a>	0..1	ref	The mapped SwcInternalBehavior.
synchronized ModeGroup	<a href="#">SwcBswSynchronizedModeGroupPrototype</a>	*	aggr	A pair of SWC and BSW mode group prototypes to be synchronized by the scheduler. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=synchronizedModeGroup, synchronizedModeGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
synchronized Trigger	<a href="#">SwcBswSynchronizedTrigger</a>	*	aggr	A pair of SWC and BSW Triggers to be synchronized by the scheduler. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=synchronizedTrigger, synchronizedTrigger.variationPoint.shortLabel vh.latestBindingTime=preCompileTime

Table A.955: SwcBswMapping

<b>Class</b>	<b>SwcBswRunnableMapping</b>			
<b>Note</b>	Maps a BswModuleEntity to a RunnableEntity if it is implemented as part of a BSW module (in the case of an AUTOSAR Service, a Complex Driver or an ECU Abstraction). The mapping can be used by a tool to find relevant information on the behavior, e.g. whether the bswEntity shall be running in interrupt context.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">SwcBswMapping.runnableMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
bswEntity	<a href="#">BswModuleEntity</a>	0..1	ref	The mapped BswModuleEntity
swcRunnable	<a href="#">RunnableEntity</a>	0..1	ref	The mapped SWC runnable.

Table A.956: SwcBswRunnableMapping

<b>Class</b>	<b>SwcBswSynchronizedModeGroupPrototype</b>			
<b>Note</b>	Synchronizes a mode group provided by a component via a port with a mode group provided by a BSW module or cluster.			
<b>Base</b>	<a href="#">ARObject</a>			
<b>Aggregated by</b>	<a href="#">SwcBswMapping.synchronizedModeGroup</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	SwcBswSynchronizedModeGroupPrototype			
bswModeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	The BSW mode group prototype.
swcModeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	iref	The SWC mode group prototype provided by a particular port. <b>InstanceRef implemented by:</b> PModeGroupInAtomicSwcInstanceRef

**Table A.957: SwcBswSynchronizedModeGroupPrototype**

Class	SwcBswSynchronizedTrigger			
Note	Synchronizes a Trigger provided by a component via a port with a Trigger provided by a BSW module or cluster.			
Base	ARObject			
Aggregated by	<a href="#">SwcBswMapping.synchronizedTrigger</a>			
Attribute	Type	Mult.	Kind	Note
bswTrigger	<a href="#">Trigger</a>	0..1	ref	The BSW Trigger.
swcTrigger	<a href="#">Trigger</a>	0..1	iref	The SWC Trigger provided by a particular port. <b>InstanceRef implemented by:</b> PTriggerInAtomicSwcTypeInstanceRef

**Table A.958: SwcBswSynchronizedTrigger**

Class	SwcExclusiveAreaPolicy			
Note	Options how to generate the ExclusiveArea related APIs. If no SwcExclusiveAreaPolicy is specified for an ExclusiveArea the default values apply.			
Base	ARObject			
Aggregated by	<a href="#">SwcInternalBehavior.exclusiveAreaPolicy</a>			
Attribute	Type	Mult.	Kind	Note
apiPrinciple	ApiPrincipleEnum	0..1	attr	Specifies for this ExclusiveArea if either one common set of Enter and Exit APIs for the whole software component is requested from the Rte or if the set of Enter and Exit APIs is expected per RunnableEntity. The default value is "common".
exclusiveArea	<a href="#">ExclusiveArea</a>	0..1	ref	This reference represents the ExclusiveArea for which the policy applies.

**Table A.959: SwcExclusiveAreaPolicy**

Class	SwcImplementation			
Note	This meta-class represents a specialization of the general Implementation meta-class with respect to the usage in application software. <b>Tags:</b> atp.recommendedPackage=SwcImplementations This Class is only used by the AUTOSAR Classic Platform.			
Base	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">Implementation</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
behavior	<a href="#">SwcInternalBehavior</a>	0..1	ref	The internal behavior implemented by this Implementation.







Class	SwcImplementation			
perInstanceMemorySize	<a href="#">PerInstanceMemorySize</a>	*	aggr	Allows a definition of the size of the per-instance memory for this implementation. The aggregation of PerInstanceMemorySize is subject to variability with the purpose to support variability in the software components implementations. Typically different algorithms in the implementation are requiring different number of memory objects, in this case PerInstanceMemory. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=perInstanceMemorySize, perInstanceMemorySize.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
requiredRTEVendor	String	0..1	attr	Identify a specific RTE vendor. This information is potentially important at the time of integrating (in particular: linking) the application code with the RTE. The semantics is that (if the association exists) the corresponding code has been created to fit to the vendor-mode RTE provided by this specific vendor. Attempting to integrate the code with another RTE generated in vendor mode is in general not possible.

Table A.960: SwcImplementation

Class	SwcInternalBehavior			
Note	The SwcInternalBehavior of an <a href="#">AtomicSwComponentType</a> describes the relevant aspects of the software-component with respect to the RTE, i.e. the <a href="#">RunnableEntities</a> and the <a href="#">RTEEvents</a> they respond to.			
Base	<a href="#">ARObject</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">InternalBehavior</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtomicSwComponentType.internalBehavior</a> , <a href="#">AtpClassifier.atpFeature</a>			
Attribute	Type	Mult.	Kind	Note
arTypedPerInstanceMemory	<a href="#">VariableDataPrototype</a>	*	aggr	Defines an AUTOSAR typed memory-block that needs to be available for each instance of the SW-component. This is typically only useful if <a href="#">supportsMultipleInstantiation</a> is set to "true" or if the component defines NVRAM access via permanent blocks. The aggregation of <a href="#">arTypedPerInstanceMemory</a> is subject to variability with the purpose to support variability in the software component's implementations. Typically different algorithms in the implementation are requiring different number of memory objects. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=arTypedPerInstanceMemory.shortName, arTypedPerInstanceMemory.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	SwcInternalBehavior			
event	RTEEvent	*	aggr	<p>This is a RTEEvent specified for the particular SwcInternalBehavior.</p> <p>The aggregation of RTEEvent is subject to variability with the purpose to support the conditional existence of RTEEvents. Note: the number of RTEEvents might vary due to the conditional existence of PortPrototypes using DataReceivedEvents or due to different scheduling needs of algorithms.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=event.shortName, event.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
exclusiveArea Policy	SwcExclusiveArea Policy	*	aggr	<p>Options how to generate the ExclusiveArea related APIs. When no SwcExclusiveAreaPolicy is specified for an ExclusiveArea the default values apply.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=exclusiveAreaPolicy, exclusiveAreaPolicy.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
explicitInter Runnable Variable	VariableDataPrototype	*	aggr	<p>Implement state message semantics for establishing communication among runnables of the same component. The aggregation of explicitInterRunnableVariable is subject to variability with the purpose to support variability in the software components implementations. Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=explicitInterRunnableVariable.shortName, explicitInterRunnableVariable.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
implicitInter Runnable Variable	VariableDataPrototype	*	aggr	<p>Implement state message semantics for establishing communication among runnables of the same component. The aggregation of implicitInterRunnableVariable is subject to variability with the purpose to support variability in the software components implementations. Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=implicitInterRunnableVariable.shortName, implicitInterRunnableVariable.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
includedData TypeSet	IncludedDataTypeSet	*	aggr	<p>The includedDataTypeSet is used by a software component for its implementation.</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=includedDataTypeSet</p>
includedMode Declaration GroupSet	IncludedMode DeclarationGroupSet	*	aggr	<p>This aggregation represents the included Mode DeclarationGroups</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=includedModeDeclarationGroupSet</p>





Class	SwcInternalBehavior			
instantiationDataDefProps	<a href="#">InstantiationDataDefProps</a>	*	aggr	<p>The purpose of this is that within the context of a given <code>SwComponentType</code> some data def properties of individual instantiations can be modified. The aggregation of <code>InstantiationDataDefProps</code> is subject to variability with the purpose to support the conditional existence of Port Prototypes and component local memories like "per InstanceParameter" or "arTypedPerInstanceMemory".</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=instantiationDataDefProps, instantiationDataDefProps.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
perInstanceMemory	<a href="#">PerInstanceMemory</a>	*	aggr	<p>Defines a per-instance memory object needed by this software component. The aggregation of <code>PerInstanceMemory</code> is subject to variability with the purpose to support variability in the software components implementations. Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=perInstanceMemory.shortName, perInstanceMemory.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
perInstanceParameter	<a href="#">ParameterDataPrototype</a>	*	aggr	<p>Defines parameter(s) or characteristic value(s) that needs to be available for each instance of the software-component. This is typically only useful if <code>supportsMultipleInstantiation</code> is set to "true". The aggregation of <code>perInstanceParameter</code> is subject to variability with the purpose to support variability in the software components implementations. Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=perInstanceParameter.shortName, perInstanceParameter.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
portAPIOption	<a href="#">PortAPIOption</a>	*	aggr	<p>Options for generating the signature of port-related calls from a runnable to the RTE and vice versa. The aggregation of <code>PortAPIOption</code> is subject to variability with the purpose to support the conditional existence of ports.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=portAPIOption.port, portAPIOption.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
runnable	<a href="#">RunnableEntity</a>	*	aggr	<p>This is a <a href="#">RunnableEntity</a> specified for the particular <code>SwcInternalBehavior</code>.</p> <p>The aggregation of <code>RunnableEntity</code> is subject to variability with the purpose to support the conditional existence of <code>RunnableEntity</code>s. Note: the number of <code>RunnableEntity</code>s might vary due to the conditional existence of <code>PortPrototypes</code> using <code>DataReceivedEvents</code> or due to different scheduling needs of algorithms.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=runnable.shortName, runnable.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>





Class	SwcInternalBehavior			
service Dependency	<a href="#">SwcService Dependency</a>	*	aggr	<p>Defines the requirements on AUTOSAR Services for a particular item.</p> <p>The aggregation of SwcServiceDependency is subject to variability with the purpose to support the conditional existence of ports as well as the conditional existence of ServiceNeeds.</p> <p>The SwcServiceDependency owned by an SwcInternalBehavior can be located in a different physical file in order to support that SwcServiceDependency might be provided in later development steps or even by different expert domain (e.g OBD expert for Obd related Service Needs) tools. Therefore the aggregation is &lt;&lt;atp Splitable&gt;&gt;.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=serviceDependency.shortName, service  Dependency.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
shared Parameter	<a href="#">ParameterData Prototype</a>	*	aggr	<p>Defines parameter(s) or characteristic value(s) shared between SwComponentPrototypes of the same Sw ComponentType The aggregation of sharedParameter is subject to variability with the purpose to support variability in the software components implementations. Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=sharedParameter.shortName, shared  Parameter.variationPoint.shortLabel  vh.latestBindingTime=preCompileTime</p>
supports Multiple Instantiation	Boolean	0..1	attr	<p>Indicate whether the corresponding software-component can be multiply instantiated on one ECU. In this case the attribute will result in an appropriate component API on programming language level (with or without instance handle).</p>
variationPoint Proxy	<a href="#">VariationPointProxy</a>	*	aggr	<p>Proxy of a variation points in the C/C++ implementation.</p> <p><b>Stereotypes:</b> atpSplitable</p> <p><b>Tags:</b> atp.Splitkey=variationPointProxy.shortName</p>

Table A.961: SwcInternalBehavior

Class	SwcModeManagerErrorEvent			
Note	This event is raised when an error occurred during the handling of the referenced ModeDeclarationGroup Prototype.			
Base	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">Multilanguage</a> , <a href="#">Referrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
modeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	iref	<p>This represents the ModeDeclarationGroupPrototype for which this SwcModeManagerErrorEvent is raised in case of an error.</p> <p><b>InstanceRef implemented by:</b> PModeGroupInAtomic SwcInstanceRef</p>

Table A.962: SwcModeManagerErrorEvent

<b>Class</b>	<b>SwcModeSwitchEvent</b>			
<b>Note</b>	This event is raised when the specified mode change occurs.			
<b>Base</b>	ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, RTEEvent, Referrable			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwcInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
activation	ModeActivationKind	0..1	attr	Specifies if the event is raised on entering or exiting a specific mode or is raised on the transition between two modes.
mode (ordered)	ModeDeclaration	0..2	iref	The referenced mode or the transition between two modes raises this SwcModeSwitchEvent. <b>InstanceRef implemented by:</b> RModelInAtomicSwc InstanceRef

**Table A.963: SwcModeSwitchEvent**

<b>Class</b>	<b>SwcServiceDependency</b>			
<b>Note</b>	Specialization of ServiceDependency in the context of an SwcInternalBehavior. It allows to associate ports, port groups and (in special cases) data defined for an atomic software component to a given ServiceNeeds element.			
<b>Base</b>	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable, ServiceDependency			
<b>Aggregated by</b>	AdaptiveSwcInternalBehavior.serviceDependency, AtpClassifier.atpFeature, SwcInternalBehavior.serviceDependency			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
assignedData	RoleBasedData Assignment	*	aggr	Defines the role of an associated data object of the same component. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=assignedData, assignedData.variation Point.shortLabel vh.latestBindingTime=preCompileTime
assignedPort	RoleBasedPort Assignment	*	aggr	Defines the role of an associated port of the same component. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=assignedPort, assignedPort.variation Point.shortLabel vh.latestBindingTime=preCompileTime
representedPort Group	PortGroup	0..1	ref	This reference specifies an association between the ServiceNeeds and a PortGroup, for example to request a communication mode which applies for communication via these ports. The referred PortGroup shall be local to this atomic SWC, but via the links between the Port Groups, a tool can evaluate this information such that all the ports linked via this port group on the same ECU can be found.
serviceNeeds	ServiceNeeds	0..1	aggr	The associated ServiceNeeds.

**Table A.964: SwcServiceDependency**

<b>Class</b>	<b>SwcToApplicationPartitionMapping</b>			
<b>Note</b>	Allows to map a given SwComponentPrototype to a formally defined partition at a point in time when the corresponding EcuInstance is not yet known or defined. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, Identifiable, MultilanguageReferrable, Referrable			





Class	SwcToApplicationPartitionMapping			
Aggregated by	CpSoftwareClusterMappingSet.swcToApplicationPartitionMapping, SwComponentMappingConstraints.swcToApplicationPartitionMapping, <a href="#">SystemMapping.swcToApplicationPartitionMapping</a>			
Attribute	Type	Mult.	Kind	Note
application Partition	<a href="#">ApplicationPartition</a>	0..1	ref	Reference to an ApplicationPartition to which a Sw ComponentPrototype is mapped.
swComponent Prototype	<a href="#">SwComponentPrototype</a>	0..1	iref	References to the software component instances that are mapped to the referenced ApplicationPartition. If the component prototype referenced is a composition, this indicates that all atomic software components within the composition are mapped to the ApplicationPartition. If there is additionally a mapping of some SwComponent Prototype INSIDE the Composition to another Application Partition the inner mapping overrides the outer mapping. <b>InstanceRef implemented by:</b> ComponentInSystem InstanceRef

**Table A.965: SwcToApplicationPartitionMapping**

Class	SwcToEcuMapping			
Note	<p>This meta-class is used:</p> <ul style="list-style-type: none"> <li>• to map SwComponentPrototypes to a specific ECU Instance unit,</li> <li>• optionally to map SwComponentPrototypes to a HwElement with category ProcessingUnit,</li> <li>• optionally to map SwComponentPrototypes typed by SensorActuatorSwComponentType to a Hw Element with category SensorActuator.</li> </ul> <p>For each combination of ECUInstance and the optional ProcessingUnit and the optional SensorActuator only one SwcToEcuMapping shall be used.</p> <p>This Class is only used by the AUTOSAR Classic Platform.</p>			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">SystemMapping.swMapping</a>			
Attribute	Type	Mult.	Kind	Note
component	<a href="#">SwComponentPrototype</a>	*	iref	References to the software component instances that are mapped to the referenced ECUInstance. If the component prototype referenced is a composition, this indicates that all atomic software components within the composition are mapped to the ECU. If there is additionally a mapping of some SwComponent Prototype INSIDE the Composition to another ECU Instance the inner mapping overrides the outer mapping. <b>InstanceRef implemented by:</b> ComponentInSystem InstanceRef
controlledHw Element	<a href="#">HwElement</a>	0..1	ref	Optional mapping of SwComponentPrototypes that are typed by SensorActuatorSwComponentType to a Hw Element with category SensorActuator. <b>Tags:</b> atp.Status=obsolete
ecuInstance	<a href="#">EcuInstance</a>	0..1	ref	Reference to a specific ECU Instance description.
processingUnit	<a href="#">HwElement</a>	0..1	ref	Optional mapping of software components to individual microcontroller cores residing in one ECU. A microcontroller core is described in the ECU Resource Template by the HwElement of HwCategory Processing Unit. <b>Tags:</b> atp.Status=obsolete

**Table A.966: SwcToEcuMapping**

<b>Class</b>	<b>SwcToImplMapping</b>			
<b>Note</b>	Map instances of an AtomicSwComponentType to a specific Implementation. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.swlImplMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
component	<a href="#">SwComponentPrototype</a>	*	iref	Reference to the software component instances that are being mapped to the specified Implementation. The targeted SwComponentPrototype needs be of the Atomic SwComponentType being implemented by the referenced Implementation. <b>InstanceRef implemented by:</b> ComponentInSystem InstanceRef
component Implementation	<a href="#">SwcImplementation</a>	0..1	ref	Reference to a specific Implementation description. Implementation to be used by the specified SW component instance. This allows to achieve more precise estimates for the resource consumption that results from mapping the instance of an atomic SW component onto an ECU.

**Table A.967: SwcToImplMapping**

<b>Class</b>	<b>SwcToSwcOperationArguments</b>			
<b>Note</b>	The SwcToSwcOperationArguments describes the information (client server operation arguments, plus the operation identification, if required) that are exchanged between two SW Components from exactly one client to one server, or from one server back to one client. The direction attribute defines which direction is described. If direction == IN, all arguments sent from the client to the server are described by the SwcToSwcOperationArguments, in direction == OUT, it's the arguments sent back from server to client.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	CommonSignalPath.operation, <a href="#">ForbiddenSignalPath.operation</a> , <a href="#">PermissibleSignalPath.operation</a> , SeparateSignalPath.operation			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
direction	SwcToSwcOperationArgumentsDirection Enum	0..1	attr	Direction addressed by this SwcToSwcClientServer Operation element.
operation	<a href="#">ClientServerOperation</a>	*	iref	Reference to the operation at the client and at the server side whose arguments are described by SwcToSwc OperationArguments. The two ports referenced shall be connected by a connector in the software component description. <b>InstanceRef implemented by:</b> <a href="#">OperationInSystem InstanceRef</a>

**Table A.968: SwcToSwcOperationArguments**

<b>Class</b>	<b>SwcToSwcSignal</b>			
<b>Note</b>	The SwcToSwcSignal describes the information (data element) that is exchanged between two SW Components. On the SWC Level it is possible that a SW Component sends one data element from one P-Port to two different SW Components (1:n Communication). The SwcToSwcSignal describes exactly the information which is exchanged between one P-Port of a SW Component and one R-Port of another SW Component.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	CommonSignalPath.signal, <a href="#">ForbiddenSignalPath.signal</a> , <a href="#">PermissibleSignalPath.signal</a> , SeparateSignalPath.signal			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>







Class	SwcToSwcSignal			
dataElement	<a href="#">VariableDataPrototype</a>	*	iref	Reference to a data element on the PPortPrototype and to the same data element on the RPortPrototype. <b>InstanceRef implemented by:</b> <a href="#">VariableDataPrototypeInSystemInstanceRef</a>

**Table A.969: SwcToSwcSignal**

Enumeration	SwitchMacAddressLearningEnum
Note	Defines the MAC address learning mode.
Aggregated by	<a href="#">CouplingElement.switchMacAddressLearningMode</a>
Literal	Description
independentVlan Learning	Defines the Independent Vlan Learning (IVL) mode. <b>Tags:</b> atp.EnumerationLiteralIndex=1
sharedVlan Learning	Defines the Shared Vlan Learning (SVL) mode. <b>Tags:</b> atp.EnumerationLiteralIndex=0

**Table A.970: SwitchMacAddressLearningEnum**

Class	SymbolProps			
Note	This meta-class represents the ability to attach with the symbol attribute a symbolic name that is conform to C language requirements to another meta-class, e.g. <a href="#">AtomicSwComponentType</a> , that is a potential subject to a name clash on the level of RTE source code.			
Base	ARObject, <a href="#">ImplementationProps</a> , <a href="#">Referrable</a>			
Aggregated by	Allocator.namespace, ApApplicationErrorDomain.namespace, <a href="#">AtomicSwComponentType.symbolProps</a> , <a href="#">CppImplementationDataType.namespace</a> , <a href="#">ImplementationDataType.symbolProps</a> , <a href="#">PortInterface.namespace</a> , <a href="#">SecurityEventDefinition.eventSymbolName</a> , <a href="#">TraceSwitchConfig.namespace</a>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.971: SymbolProps**

Class	SynchronizationTimingConstraint
Note	<p>This constraint is used to restrict the timing behavior of different, but correlated events or event chains, with regard to synchronization. Two scenarios are supported:</p> <ul style="list-style-type: none"> <li>If (<a href="#">synchronizationConstraintType</a>==responseSynchronization) <ul style="list-style-type: none"> <li><a href="#">TimingDescriptionEvents</a>: An arbitrary number of correlated events which play the role of responses shall occur synchronously with respect to a predefined tolerance.</li> <li><a href="#">TimingDescriptionEventChains</a>: An arbitrary number of correlated event chains with a common stimulus, but different responses, where the responses shall occur synchronously with respect to a predefined tolerance.</li> </ul> </li> <li>If (<a href="#">synchronizationConstraintType</a>==stimulusSynchronization) <ul style="list-style-type: none"> <li><a href="#">TimingDescriptionEvents</a>: An arbitrary number of correlated events which play the role of stimuli shall occur synchronously with respect to a predefined tolerance.</li> <li><a href="#">TimingDescriptionEventChains</a>: An arbitrary number of correlated event chains with a common response, but different stimuli, where the stimuli shall occur synchronously with respect to a predefined tolerance.</li> </ul> </li> </ul> <p>In case the constraint is imposed on events the following two scenarios are supported:</p>







Class	SynchronizationTimingConstraint			
	<div>△</div> <ul style="list-style-type: none"> <li>If (<code>eventOccurrenceKind==singleOccurrence</code>): any of the events shall occur only once in the given time interval.</li> <li>If (<code>eventOccurrenceKind==multipleOccurrences</code>): any of the events may occur more than once in the given time interval. In other words multiple occurrences of an event within the given time interval are permitted.</li> </ul>			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingConstraint</a> , <a href="#">Traceable</a>			
Aggregated by	<a href="#">TimingExtension.timingGuarantee</a> , <a href="#">TimingExtension.timingRequirement</a>			
Attribute	Type	Mult.	Kind	Note
eventOccurrenceKind	EventOccurrenceKind Enum	0..1	attr	Indicates whether the referenced events shall occur only once (single occurrence) or multiple times (multiple occurrences) in the given time interval.
scope	<a href="#">TimingDescriptionEventChain</a>	*	ref	The event chains that are in the scope of the constraint. Mutually exclusive to <a href="#">scopeEvent</a> , see ([ <a href="#">constr_4522</a> ]).
scopeEvent	<a href="#">TimingDescriptionEvent</a>	*	ref	The events that are in the scope of the constraint. Mutually exclusive to <a href="#">scope</a> , see ([ <a href="#">constr_4522</a> ])
synchronizationConstraintType	SynchronizationType Enum	0..1	attr	Indicates whether the associated events of the SynchronizationTimingConstraint have a common stimulus or response.
tolerance	<a href="#">MultidimensionalTime</a>	0..1	aggr	The maximum time interval, within which the synchronized events shall occur. The events may occur in any order within this time interval. The time interval starts at the point-in-time when one of the referenced events occurs.

Table A.972: SynchronizationTimingConstraint

Class	SynchronousServerCallPoint			
Note	This means that the RunnableEntity is supposed to perform a blocking wait for a response from the server. This Class is only used by the AUTOSAR Classic Platform.			
Base	ARObject, <a href="#">AbstractAccessPoint</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServerCallPoint</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">RunnableEntity.serverCallPoint</a>			
Attribute	Type	Mult.	Kind	Note
calledFromWithinExclusiveArea	ExclusiveAreaNesting Order	0..1	ref	This indicates that the call point is located at the deepest level inside one or more ExclusiveAreas that are nested in the given order.

Table A.973: SynchronousServerCallPoint

Class	System			
Note	The top level element of the System Description. The System description defines five major elements: Topology, Software, Communication, Mapping and Mapping Constraints. The System element directly aggregates the elements describing the Software, Mapping and Mapping Constraints; it contains a reference to an ASAM FIBEX description specifying Communication and Topology. <b>Tags:</b> atp.recommendedPackage=Systems			
Base	ARElement, ARObject, <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
Aggregated by	<a href="#">ARPackage.element</a> , <a href="#">AtpClassifier.atpFeature</a>			
Attribute	Type	Mult.	Kind	Note





Class	System			
clientIdDefinitionSet	ClientIdDefinitionSet	*	ref	Set of Client Identifiers that are used for inter-ECU client-server communication in the System. This Attribute is only used by the AUTOSAR Classic Platform.
containerIPduHeaderByteOrder	ByteOrderEnum	0..1	attr	Defines the byteOrder of the header in ContainerIPdus. This Attribute is only used by the AUTOSAR Classic Platform.
ecuExtractVersion	RevisionLabelString	0..1	attr	Version number of the Ecu Extract. This Attribute is only used by the AUTOSAR Classic Platform.
fibexElement	FibexElement	*	ref	Reference to ASAM FIBEX elements specifying Communication and Topology. All Fibex Elements used within a System Description shall be referenced from the System Element. atpVariation: In order to describe a product-line, all Fibex Elements can be optional. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=fibexElement.fibexElement, fibexElement.variationPoint.shortLabel vh.latestBindingTime=postBuild
interpolationRoutineMappingSet	InterpolationRoutineMappingSet	*	ref	This reference identifies the InterpolationRoutineMapping Sets that are relevant in the context of the enclosing System. This Attribute is only used by the AUTOSAR Classic Platform.
j1939SharedAddressCluster	J1939SharedAddressCluster	*	aggr	Collection of J1939Clusters that share a common address space for the routing of messages. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=j1939SharedAddressCluster.shortName, j1939SharedAddressCluster.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.
mapping	SystemMapping	*	aggr	Aggregation of all mapping aspects (mapping of SW components to ECUs, mapping of data elements to signals, and mapping constraints). In order to support OEM / Tier 1 interaction and shared development for one common System this aggregation is atpSplitable and atpVariation. The content of System Mapping can be provided by several parties using different names for the SystemMapping. This element is not required when the System description is used for a network-only use-case. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=mapping.shortName, mapping.variationPoint.shortLabel vh.latestBindingTime=postBuild
pncVectorLength	PositiveInteger	0..1	attr	Length of the partial networking request release information vector (in bytes).
pncVectorOffset	PositiveInteger	0..1	attr	Absolute offset (with respect to the NM-PDU) of the partial networking request release information vector that is defined in bytes as an index starting with 0.





Class	System			
rootSoftwareComposition	<a href="#">RootSwCompositionPrototype</a>	0..1	aggr	Aggregation of the root software composition, containing all software components in the System in a hierarchical structure. This element is not required when the System description is used for a network-only use-case. <b>atpVariation:</b> The RootSwCompositionPrototype can vary. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=rootSoftwareComposition.shortName, rootSoftwareComposition.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.
swCluster	<a href="#">CpSoftwareCluster</a>	*	ref	CP Software Clusters of this System <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=swCluster.cpSoftwareCluster, swCluster.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.
systemComSpecDefinition	SystemComSpecDefinitionSet	*	ref	Reference to the set of ComSpec definitions that are used for inter-ECU communication in the System.
systemDocumentation	<a href="#">Chapter</a>	*	aggr	Possibility to provide additional documentation while defining the System. The System documentation can be composed of several chapters. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=systemDocumentation.shortName, systemDocumentation.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime xml.sequenceOffset=-10 This Attribute is only used by the AUTOSAR Classic Platform.
systemVersion	RevisionLabelString	0..1	attr	Version number of the System Description.

**Table A.974: System**

Class	SystemMapping			
<b>Note</b>	The system mapping aggregates all mapping aspects (mapping of SW components to ECUs, mapping of data elements to signals, and mapping constraints).			
<b>Base</b>	<i>ARObject</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<a href="#">System.mapping</a>			
Attribute	Type	Mult.	Kind	Note
applicationPartitionToEcuPartitionMapping	<a href="#">ApplicationPartitionToEcuPartitionMapping</a>	*	aggr	Mapping of ApplicationPartitions to EcuPartitions <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=applicationPartitionToEcuPartitionMapping.shortName, applicationPartitionToEcuPartitionMapping.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.
appOsTaskProxyToEcuTaskProxyMapping	<a href="#">AppOsTaskProxyToEcuTaskProxyMapping</a>	*	aggr	Mapping of an OsTaskProxy that was created in the context of a SwComponent to an OsTaskProxy that was created in the context of an Ecu. This Attribute is only used by the AUTOSAR Classic Platform.





Class	SystemMapping			
com Management Mapping	ComManagement Mapping	*	aggr	<p>Mappings between Mode Management PortGroups and communication channels.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=comManagementMapping.shortName, com ManagementMapping.variationPoint.shortLabel  vh.latestBindingTime=systemDesignTime  This Attribute is only used by the AUTOSAR Classic Platform.</p>
cryptoService Mapping	CryptoServiceMapping	*	aggr	<p>This aggregation represents the collection of crypto service mappings in the context of the enclosing System Mapping.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=cryptoServiceMapping.shortName, crypto ServiceMapping.variationPoint.shortLabel  vh.latestBindingTime=postBuild  This Attribute is only used by the AUTOSAR Classic Platform.</p>
cyclicHandling ComDataToOs TaskProxy Mapping	<a href="#">CyclicHandlingCom DataToOsTaskProxy Mapping</a>	*	aggr	<p>Mapping of VariableDataPrototypes to an OsTaskProxy for the Cyclic Handling of Communication Data in the RTE.</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
dataMapping	<a href="#">DataMapping</a>	*	aggr	<p>The data mappings defined.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=dataMapping, dataMapping.variation Point.shortLabel  vh.latestBindingTime=postBuild  This Attribute is only used by the AUTOSAR Classic Platform.</p>
ddsISignalTo TopicMapping	<a href="#">DdsCplSignalToDds TopicMapping</a>	*	aggr	<p>Collection of DdsISignalToDdsTopicMappings.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=ddsISignalToTopicMapping, ddsISignalTo TopicMapping.variationPoint.shortLabel  atp.Status=candidate  vh.latestBindingTime=postBuild  This Attribute is only used by the AUTOSAR Classic Platform.</p>
ecuPartitionTo CoreMapping	<a href="#">EcuPartitionToCore Mapping</a>	*	aggr	<p>Mapping of EcuPartitions to a Cores.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=ecuPartitionToCoreMapping.shortName, ecu PartitionToCoreMapping.variationPoint.shortLabel  vh.latestBindingTime=systemDesignTime  This Attribute is only used by the AUTOSAR Classic Platform.</p>
ecuResource Mapping	<a href="#">ECUMapping</a>	*	aggr	<p>Mapping of hardware related topology elements onto their counterpart definitions in the ECU Resource Template.</p> <p>atpVariation: The ECU Resource type might be variable.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b>  atp.Splitkey=ecuResourceMapping.shortName, ecu ResourceMapping.variationPoint.shortLabel  vh.latestBindingTime=systemDesignTime  This Attribute is only used by the AUTOSAR Classic Platform.</p>





Class	SystemMapping			
j1939ControllerApplicationToJ1939NmNodeMapping	J1939ControllerApplicationToJ1939NmNodeMapping	*	aggr	Mapping of a J1939ControllerApplication to a J1939NmNode. <b>Tags:</b> atp.Status=obsolete This Attribute is only used by the AUTOSAR Classic Platform.
j1939ControllerApplicationToJ1939NodeMapping	J1939ControllerApplicationToJ1939NodeMapping	*	aggr	Mapping of a J1939ControllerApplication to a J1939Node. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=j1939ControllerApplicationToJ1939NodeMapping, j1939ControllerApplicationToJ1939NodeMapping.variationPoint.shortLabel vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.
mappingConstraint	MappingConstraint	*	aggr	Constraints that limit the mapping freedom for the mapping of SW components to ECUs. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=mappingConstraint, mappingConstraint.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.
pncMapping	PncMapping	*	aggr	Mappings between Virtual Function Clusters and Partial Network Clusters. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=pncMapping, pncMapping.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime
portElementToComResourceMapping	PortElementToCommunicationResourceMapping	*	aggr	maps a communication resource to CP Software Clusters <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=portElementToComResourceMapping.shortName, portElementToComResourceMapping.variationPoint.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.
resourceEstimation	EcuResourceEstimation	*	aggr	Resource estimations for this set of mappings, zero or one per ECU instance. atpVariation: Used ECUs are variable. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=resourceEstimation, resourceEstimation.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.
resourceToApplicationPartitionMapping	CpSoftwareClusterResourceToApplicationPartitionMapping	*	aggr	Maps a Software Cluster resource to an Application Partition to restrict the usage. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=resourceToApplicationPartitionMapping.shortName, resourceToApplicationPartitionMapping.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.





Class	SystemMapping			
rteEvent Separation	RteEventInSystem Separation	*	aggr	Separation constraint that limits the mapping freedom for the mapping of RteEvents to OsTasks in the System context. This Attribute is only used by the AUTOSAR Classic Platform.
rteEventToOs TaskProxy Mapping	RteEventInSystemToOs TaskProxyMapping	*	aggr	Constraint that enforces a mapping of RteEvent to a particular OsTask in the System context. This Attribute is only used by the AUTOSAR Classic Platform.
signalPath Constraint	SignalPathConstraint	*	aggr	Constraints that limit the mapping freedom for the mapping of data elements to signals. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=signalPathConstraint, signalPath Constraint.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.
softwareCluster ToApplication Partition Mapping	<a href="#">CpSoftwareClusterTo ApplicationPartition Mapping</a>	*	aggr	The mapping of ApplicationPartitions to a CpSoftware Cluster. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=softwareClusterToApplicationPartition Mapping.shortName, softwareClusterToApplication PartitionMapping.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.
softwareCluster ToResource Mapping	<a href="#">CpSoftwareClusterTo ResourceMapping</a>	*	aggr	maps a service resource to CP Software Clusters <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=softwareClusterToResourceMapping.short Name, softwareClusterToResourceMapping.variation Point.shortLabel vh.latestBindingTime=preCompileTime This Attribute is only used by the AUTOSAR Classic Platform.
swCluster Mapping	<a href="#">CpSoftwareClusterTo EcuInstanceMapping</a>	*	aggr	The mappings of SW cluster to ECUs. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=swClusterMapping.shortName, swCluster Mapping.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime This Attribute is only used by the AUTOSAR Classic Platform.
swcTo Application Partition Mapping	<a href="#">SwcToApplication PartitionMapping</a>	*	aggr	Allows to map a given SwComponentPrototype to a formally defined partition at a point in time when the corresponding EcuInstance is not yet known or defined. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=swcToApplicationPartitionMapping.short Name, swcToApplicationPartitionMapping.variation Point.shortLabel vh.latestBindingTime=postBuild This Attribute is only used by the AUTOSAR Classic Platform.





Class	SystemMapping			
swImplMapping	<a href="#">SwcToImplMapping</a>	*	aggr	<p>The mappings of AtomicSoftwareComponent Instances to Implementations.</p> <p>atpVariation: Derived, because SwcToEcuMapping is variable.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b></p> <p>atp.Splitkey=swImplMapping.shortName, swImplMapping.variationPoint.shortLabel</p> <p>vh.latestBindingTime=preCompileTime</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
swMapping	<a href="#">SwcToEcuMapping</a>	*	aggr	<p>The mappings of SW components to ECUs.</p> <p>atpVariation: SWC shall be mapped to other ECUs.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b></p> <p>atp.Splitkey=swMapping.shortName, swMapping.variationPoint.shortLabel</p> <p>vh.latestBindingTime=preCompileTime</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
systemSignalGroupToComResourceMapping	<a href="#">SystemSignalGroupToCommunicationResourceMapping</a>	*	aggr	<p>Mapping of a communication resource to a SystemSignal Group.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b></p> <p>atp.Splitkey=systemSignalGroupToComResourceMapping.shortName, systemSignalGroupToComResourceMapping.variationPoint.shortLabel</p> <p>vh.latestBindingTime=systemDesignTime</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>
systemSignalToComResourceMapping	<a href="#">SystemSignalToCommunicationResourceMapping</a>	*	aggr	<p>Mapping of a communication resource to a SystemSignal.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b></p> <p>atp.Splitkey=systemSignalToComResourceMapping.shortName, systemSignalToComResourceMapping.variationPoint.shortLabel</p> <p>vh.latestBindingTime=systemDesignTime</p> <p>This Attribute is only used by the AUTOSAR Classic Platform.</p>

**Table A.975: SystemMapping**

Class	SystemSignal			
<b>Note</b>	<p>The system signal represents the communication system's view of data exchanged between SW components which reside on different ECUs. The system signals allow to represent this communication in a flattened structure, with exactly one system signal defined for each data element prototype sent and received by connected SW component instances.</p> <p><b>Tags:</b> atp.recommendedPackage=SystemSignals</p>			
<b>Base</b>	<i>ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a>, <a href="#">MultilanguageReferrable</a>, <a href="#">PackageableElement</a>, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
dynamicLength	Boolean	0..1	attr	<p>The length of dynamic length signals is variable in run-time. Only a maximum length of such a signal is specified in the configuration (attribute length in ISignal element).</p>







Class	SystemSignal			
physicalProps	<a href="#">SwDataDefProps</a>	0..1	aggr	Specification of the physical representation. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=physicalProps

**Table A.976: SystemSignal**

Class	SystemSignalGroup			
<b>Note</b>	A signal group refers to a set of signals that shall always be kept together. A signal group is used to guarantee the atomic transfer of AUTOSAR composite data types. The SystemSignalGroup defines a signal grouping on VFB level. On cluster level the Signal grouping is described by the ISignalGroup element. <b>Tags:</b> atp.recommendedPackage=SystemSignalGroups			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
systemSignal	<a href="#">SystemSignal</a>	*	ref	Reference to a set of SystemSignals that shall always be kept together.
transformingSystemSignal	<a href="#">SystemSignal</a>	0..1	ref	Optional reference to the SystemSignal which shall contain the transformed (linear) data.

**Table A.977: SystemSignalGroup**

Class	SystemSignalGroupToCommunicationResourceMapping			
<b>Note</b>	This meta class maps a communication resource to a SystemSignalGroup. This mapping can be used in an early process stage in which the DataMapping linking the Ports and mapped CpSoftwareCluster CommunicationResource(s) to SystemSignals of a SystemSignalGroup is not yet available. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.systemSignalGroupToComResourceMapping</a>			
Attribute	Type	Mult.	Kind	Note
softwareClusterComResource	<a href="#">CpSoftwareClusterCommunicationResource</a>	0..1	ref	Communication resource for which the mapping applies.
systemSignalGroup	<a href="#">SystemSignalGroup</a>	0..1	ref	SystemSignalGroup to which the communication resource is assigned

**Table A.978: SystemSignalGroupToCommunicationResourceMapping**

Class	SystemSignalToCommunicationResourceMapping			
<b>Note</b>	This meta class maps a communication resource to a SystemSignal. This mapping can be used in an early process stage in which the DataMapping linking the Ports and mapped CpSoftwareCluster CommunicationResource(s) to the SystemSignal is not yet available. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.systemSignalToComResourceMapping</a>			
Attribute	Type	Mult.	Kind	Note
softwareClusterComResource	<a href="#">CpSoftwareClusterCommunicationResource</a>	0..1	ref	Communication resource for which the mapping applies.
systemSignal	<a href="#">SystemSignal</a>	0..1	ref	SystemSignal to which the communication resource is assigned

**Table A.979: SystemSignalToCommunicationResourceMapping**



<b>Class</b>	<b>SystemTiming</b>			
<b>Note</b>	A model element used to refine timing descriptions and constraints (from a VfbTiming) at System level, utilizing information about topology, software deployment, and signal mapping described in the System Template. TimingDescriptions aggregated by SystemTiming are restricted to events which are derived from the class TDEventVfb, TDEventSwcInternalBehavior and TDEventCom. <b>Tags:</b> atp.recommendedPackage=TimingExtensions			
<b>Base</b>	ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TimingExtension</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
system	<a href="#">System</a>	0..1	ref	This defines the scope of a SystemTiming. All corresponding timing descriptions and constraints shall be defined within this scope.

**Table A.980: SystemTiming**

<b>Class</b>	<b>TDCpSoftwareClusterMapping</b>			
<b>Note</b>	This is used to specify a mapping between a software cluster that provides temporal and dynamic resources and the software clusters that need these resources. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	TDCpSoftwareClusterMappingSet.tdCpSoftwareClusterToTdMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
provider	<a href="#">CpSoftwareCluster</a>	0..1	ref	This is the software cluster that provides the temporal and dynamic resource.
requestor	<a href="#">CpSoftwareCluster</a>	*	ref	This is the software cluster that requests the temporal and dynamic resource.
timing Description	<a href="#">TimingDescription</a>	0..1	ref	The timing description representing the temporal and dynamic resource.

**Table A.981: TDCpSoftwareClusterMapping**

<b>Class</b>	<b>TDCpSoftwareClusterResourceMapping</b>			
<b>Note</b>	This is used to assign an unequivocal global resource identification to a temporal and dynamic resource. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	TDCpSoftwareClusterMappingSet.tdCpSoftwareClusterResourceToTdMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
resource	<a href="#">CpSoftwareClusterResource</a>	0..1	ref	The specific resource identification assigned to the temporal and dynamic resource.
timing Description	<a href="#">TimingDescription</a>	0..1	ref	The timing description representing the temporal and dynamic resource.

**Table A.982: TDCpSoftwareClusterResourceMapping**

<b>Class</b>	<b>TDEventBsw</b> (abstract)			
<b>Note</b>	This is used to describe timing events related to BSW modules. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Subclasses</b>	<a href="#">TDEventBswModeDeclaration</a> , <a href="#">TDEventBswModule</a>			
<b>Aggregated by</b>	<a href="#">TimingExtension.timingDescription</a>			





Class	TDEventBsw (abstract)			
Attribute	Type	Mult.	Kind	Note
bswModule Description	<a href="#">BswModuleDescription</a>	0..1	ref	The scope of this timing event.

**Table A.983: TDEventBsw**

Class	TDEventBswInternalBehavior			
Note	This is used to describe timing events related to the BswInternalBehavior of a BSW module. This Class is only used by the AUTOSAR Classic Platform.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<i>TimingExtension</i> .timingDescription			
Attribute	Type	Mult.	Kind	Note
bswModule Entity	<a href="#">BswModuleEntity</a>	0..1	ref	The scope of this timing event.
tdEventBsw Internal BehaviorType	TDEventBswInternal BehaviorTypeEnum	0..1	attr	The specific type of this timing event.

**Table A.984: TDEventBswInternalBehavior**

Class	TDEventBswModeDeclaration			
Note	This is used to describe timing events related to the mode communication on BSW level. This Class is only used by the AUTOSAR Classic Platform.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventBsw</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<i>TimingExtension</i> .timingDescription			
Attribute	Type	Mult.	Kind	Note
entryMode Declaration	<a href="#">ModeDeclaration</a>	0..1	ref	Optional parameter which refines the scope of the TDEventBswModeDeclaration. If the parameter is set, the event occurs only if the mode declaration group prototype instance shall enter into the referenced ModeDeclaration.
exitMode Declaration	<a href="#">ModeDeclaration</a>	0..1	ref	Optional parameter which refines the scope of the TDEventBswModeDeclaration. If the parameter is set, the event occurs only if the mode declaration group prototype instance shall exit from the referenced ModeDeclaration.
mode Declaration	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	The scope of this timing event.
tdEventBsw Mode DeclarationType	TDEventBswMode DeclarationTypeEnum	0..1	attr	The specific type of this timing event.

**Table A.985: TDEventBswModeDeclaration**

Class	TDEventBswModule			
Note	This is used to describe timing events related to the interaction between BSW modules. This Class is only used by the AUTOSAR Classic Platform.			
Base	<i>ARObject</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventBsw</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<i>TimingExtension</i> .timingDescription			
Attribute	Type	Mult.	Kind	Note





Class	TDEventBswModule			
bswModuleEntry	<a href="#">BswModuleEntry</a>	0..1	ref	The scope of this timing event.
tdEventBswModuleType	TDEventBswModuleTypeEnum	0..1	attr	The specific type of this timing event.

**Table A.986: TDEventBswModule**

Class	TDEventComplex			
Note	This is used to describe complex timing events. The context of a complex timing event either is described informally, e.g. using the documentation block, or is described formally by the associated TDEventOccurrenceExpression.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	TimingExtension.timingDescription			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.987: TDEventComplex**

Class	TDEventCycleStart (abstract)			
Note	This is the abstract parent class to describe timing events related to a point in time where a communication cycle starts. Via the attribute "cycleRepetition", a filtered view to the cycle start can be defined.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , TDEventCom, <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Subclasses	<a href="#">TDEventFrClusterCycleStart</a>			
Aggregated by	TimingExtension.timingDescription			
Attribute	Type	Mult.	Kind	Note
cycleRepetition	Integer	0..1	attr	The start of every <cycleRepetition> cycle is targeted by this event.

**Table A.988: TDEventCycleStart**

Class	TDEventFrClusterCycleStart			
Note	This is used to describe the timing event related to a point in time where a communication cycle starts on a FlexRay cluster.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , TDEventCom, <a href="#">TDEventCycleStart</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	TimingExtension.timingDescription			
Attribute	Type	Mult.	Kind	Note
frCluster	<a href="#">FlexrayCluster</a>	0..1	ref	The scope of this timing event.

**Table A.989: TDEventFrClusterCycleStart**

Class	TDEventFrame			
Note	This is used to describe timing events related to the exchange of frames between the communication controller and the bus specific (FlexRay / CAN / LIN) Interface BSW module.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , TDEventCom, <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	TimingExtension.timingDescription			





Class	TDEventFrame			
Attribute	Type	Mult.	Kind	Note
frame	<a href="#">Frame</a>	0..1	ref	The scope of this timing event.
physical Channel	<a href="#">PhysicalChannel</a>	0..1	ref	The PhysicalChannel on which the Frame is transmitted.
tdEventType	TDEventFrameType Enum	0..1	attr	The specific type of this timing event.

Table A.990: TDEventFrame

Class	TDEventFrameEthernet			
Note	This is used to describe timing description events related to the exchange of Ethernet frames between an Ethernet communication controller and the BSW Ethernet interface and driver module.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventCom</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<a href="#">TimingExtension</a> .timingDescription			
Attribute	Type	Mult.	Kind	Note
staticSocket Connection	<a href="#">StaticSocketConnection</a>	0..1	ref	Specifies the SocketConnection by the means of which Physical Data Units (PDU) are transmitted or received within an Ethernet Frame.
tdEventType	TDEventFrameEthernet TypeEnum	0..1	attr	This is used to describe the specific event type of a TDEventFrameEthernet.
tdHeaderIdFilter	<a href="#">TDHeaderIdRange</a>	*	aggr	Specifies the header identifier or a range of header identifiers that if contained in the Ethernet frame let the TDEventFrameEthernet occur.
tdPduTriggering Filter	<a href="#">PduTriggering</a>	*	ref	Specifies the PDU that if contained in the Ethernet frame let the TDEventFrameEthernet occur.

Table A.991: TDEventFrameEthernet

Class	TDEventIPdu			
Note	Describe timing events related to the exchange of <a href="#">IPdus</a> between the bus specific (FlexRay / CAN / LIN) Interface BSW module and COM.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventCom</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<a href="#">TimingExtension</a> .timingDescription			
Attribute	Type	Mult.	Kind	Note
iPdu	<a href="#">IPdu</a>	0..1	ref	The scope of this timing event.
physical Channel	<a href="#">PhysicalChannel</a>	0..1	ref	The PhysicalChannel on which the IPdu is transmitted.
tdEventType	TDEventIPduTypeEnum	0..1	attr	The specific type of this timing event.

Table A.992: TDEventIPdu

Class	TDEventISignal			
Note	Describe timing events related to the exchange of <a href="#">TDEventISignals</a> between COM and RTE.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventCom</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<a href="#">TimingExtension</a> .timingDescription			
Attribute	Type	Mult.	Kind	Note
iSignal	<a href="#">ISignal</a>	0..1	ref	The scope of this timing event.





Class	TDEventISignal			
physical Channel	<a href="#">PhysicalChannel</a>	0..1	ref	The PhysicalChannel on which the ISignal is transmitted.
tdEventType	TDEventISignalType Enum	0..1	attr	The specific type of this timing event.

**Table A.993: TDEventISignal**

Class	TDEventModeDeclaration			
Note	A <a href="#">TimingDescriptionEvent</a> triggered by a mode switch in a <a href="#">ModeSwitchInterface</a> on VFB level.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventVfb</a> , <a href="#">TDEventVfbPort</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<a href="#">TimingExtension.timingDescription</a>			
Attribute	Type	Mult.	Kind	Note
entryMode Declaration	<a href="#">ModeDeclaration</a>	0..1	ref	Optional parameter which refines the scope of the TDEventModeDeclaration. If the parameter is set, the event occurs only if the mode declaration group prototype instance shall enter into the referenced ModeDeclaration.
exitMode Declaration	<a href="#">ModeDeclaration</a>	0..1	ref	Optional parameter which refines the scope of the TDEventModeDeclaration. If the parameter is set, the event occurs only if the mode declaration group prototype instance shall exit from the referenced ModeDeclaration.
mode Declaration	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	The referenced <a href="#">ModeDeclarationGroupPrototype</a> from a{ <a href="#">ModeSwitchInterface</a> }].
tdEventMode DeclarationType	TDEventMode DeclarationTypeEnum	0..1	attr	The specific type of this timing event.

**Table A.994: TDEventModeDeclaration**

Class	TDEventOccurrenceExpression			
Note	This is used to specify a filter on the occurrences of <a href="#">TimingDescriptionEvents</a> by means of a TDEventOccurrenceExpressionFormula. Filter criteria can be <a href="#">variable</a> and <a href="#">argument</a> values, i.e. the timing event only occurs for specific values, as well as the temporal characteristics of the occurrences of arbitrary timing events.			
Base	<a href="#">ARObject</a>			
Aggregated by	<a href="#">TimingDescriptionEvent.occurrenceExpression</a>			
Attribute	Type	Mult.	Kind	Note
argument	<a href="#">AutosarOperation ArgumentInstance</a>	*	aggr	An occurrence expression can reference an arbitrary number of OperationArgumentPrototypes in its expression. This association aggregates instance references to OperationArgumentPrototypes which can be referenced in the expression.
formula	<a href="#">TDEventOccurrence ExpressionFormula</a>	0..1	aggr	This is the expression formula which is used to describe the occurrence expression.
mode	<a href="#">TimingModelInstance</a>	*	aggr	An occurrence expression can reference an arbitrary number of TimingModelInstances in its expression. This association aggregates instance references to Mode Declaration which can be referenced in the expression.
variable	<a href="#">AutosarVariable Instance</a>	*	aggr	An occurrence expression can reference an arbitrary number of VariableDataPrototypes in its expression. This association aggregates instance references to Variable DataPrototypes which can be referenced in the expression.

**Table A.995: TDEventOccurrenceExpression**

<b>Class</b>	«atpMixedString» <b>TDEventOccurrenceExpressionFormula</b>			
<b>Note</b>	This is an extension of the FormulaExpression for the AUTOSAR Timing Extensions. A TDEventOccurrenceExpressionFormula provides the means to express the temporal characteristics of timing event occurrences in correlation with specific variable and argument values. The formal definition of the extended functions (ExtUnaryFunctions) is described in detail in the AUTOSAR Timing Extensions.			
<b>Base</b>	ARObject, FormulaExpression			
<b>Aggregated by</b>	TDEventOccurrenceExpression.formula			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
argument	<a href="#">AutosarOperationArgumentInstance</a>	0..1	ref	This is one particular argument value used in the expression formula.
event	<a href="#">TimingDescriptionEvent</a>	0..1	ref	This is one particular timing description event used in the expression formula.
mode	TimingModelInstance	0..1	ref	This is one particular mode used in the expression formula.
variable	<a href="#">AutosarVariableInstance</a>	0..1	ref	This is one particular variable value used in the expression formula.

**Table A.996: TDEventOccurrenceExpressionFormula**

<b>Class</b>	<b>TDEventOperation</b>			
<b>Note</b>	A <a href="#">TimingDescriptionEvent</a> triggered by the sending/receiving of a <a href="#">ClientServerOperation</a> in a <a href="#">ClientServerInterface</a> on VFB level.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventVfb</a> , <a href="#">TDEventVfbPort</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Aggregated by</b>	TimingExtension.timingDescription			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operation	<a href="#">ClientServerOperation</a>	0..1	ref	The referenced <a href="#">ClientServerOperation</a> from a <a href="#">ClientServerInterface</a> .
tdEvent OperationType	<a href="#">TDEventOperationTypeEnum</a>	0..1	attr	The specific type of this timing event.

**Table A.997: TDEventOperation**

<b>Enumeration</b>	<b>TDEventOperationTypeEnum</b>			
<b>Note</b>	This is used to describe the specific event type of a TDEventOperation.			
<b>Aggregated by</b>	<a href="#">TDEventOperation.tdEventOperationType</a>			
<b>Literal</b>	<b>Description</b>			
operationCalled	A point in time where the referenced operation is called by the client SWC. <b>Tags:</b> atp.EnumerationLiteralIndex=0			
operationCall Received	A point in time where the call of the referenced operation is received by the server SWC. <b>Tags:</b> atp.EnumerationLiteralIndex=1			
operationCall ResponseReceived	A point in time where the client SWC has received the response of the referenced operation call. <b>Tags:</b> atp.EnumerationLiteralIndex=2			
operationCall ResponseSent	A point in time where the server SWC has terminated with the execution of the referenced operation, and has sent out a response. <b>Tags:</b> atp.EnumerationLiteralIndex=3			

**Table A.998: TDEventOperationTypeEnum**

<b>Class</b>	<b>TDEventSwc</b> (abstract)			
<b>Note</b>	This is the abstract parent class to describe timing events at Software Component (SW-C) level. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Subclasses</b>	<a href="#">TDEventSwcInternalBehavior</a> , <a href="#">TDEventSwcInternalBehaviorReference</a>			
<b>Aggregated by</b>	TimingExtension.timingDescription			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
component	<a href="#">SwComponent</a> <a href="#">Prototype</a>	0..1	iref	The context for the scope of this timing event. <b>InstanceRef implemented by:</b> ComponentInCompositionInstanceRef

**Table A.999: TDEventSwc**

<b>Class</b>	<b>TDEventSwcInternalBehavior</b>			
<b>Note</b>	This is used to describe timing events related to the SwcInternalBehavior of an AtomicSwComponent Type. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventSwc</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Aggregated by</b>	TimingExtension.timingDescription			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
runnable	<a href="#">RunnableEntity</a>	0..1	ref	The scope of this timing event.
tdEventSwcInternalBehaviorType	<a href="#">TDEventSwcInternalBehaviorTypeEnum</a>	0..1	attr	The specific type of this timing event.
variableAccess	<a href="#">VariableAccess</a>	0..1	ref	The scope of this timing event.

**Table A.1000: TDEventSwcInternalBehavior**

<b>Class</b>	<b>TDEventSwcInternalBehaviorReference</b>			
<b>Note</b>	This is used to reference timing description events related to the Software Component (SW-C) view which are specified in other timing views. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventSwc</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Aggregated by</b>	TimingExtension.timingDescription			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
referenced TDEventSwc	<a href="#">TDEventSwc</a>	0..1	ref	The referenced timing description event.

**Table A.1001: TDEventSwcInternalBehaviorReference**

<b>Enumeration</b>	<b>TDEventSwcInternalBehaviorTypeEnum</b>			
<b>Note</b>	This is used to describe the specific event type of a TDEventSwcInternalBehavior. This Enumeration is only used by the AUTOSAR Classic Platform.			
<b>Aggregated by</b>	<a href="#">TDEventSwcInternalBehavior</a> . <a href="#">tdEventSwcInternalBehaviorType</a>			
<b>Literal</b>	<b>Description</b>			
runnableEntity Activated	A point in time where the associated RunnableEntity has been activated, which means that it has entered the state "to be started". <b>Tags:</b> atp.EnumerationLiteralIndex=0			





Enumeration	TDEventSwcInternalBehaviorTypeEnum
runnableEntity Started	A point in time where the associated RunnableEntity has entered the state "started" after its activation. <b>Tags:</b> atp.EnumerationLiteralIndex=1
runnableEntity Terminated	A point in time where the associated RunnableEntity has terminated and entered the state "suspended". <b>Tags:</b> atp.EnumerationLiteralIndex=2
runnableEntity VariableAccess	A point in time where the associated variable is accessed. <b>Tags:</b> atp.EnumerationLiteralIndex=3

**Table A.1002: TDEventSwcInternalBehaviorTypeEnum**

Class	TDEventTrigger			
Note	A <a href="#">TimingDescriptionEvent</a> triggered by a <a href="#">Trigger</a> in a <a href="#">TriggerInterface</a> on VFB level.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventVfb</a> , <a href="#">TDEventVfbPort</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<a href="#">TimingExtension.timingDescription</a>			
Attribute	Type	Mult.	Kind	Note
tdEventTrigger Type	<a href="#">TDEventTriggerTypeEnum</a>	0..1	attr	The specific type of this timing event.
trigger	<a href="#">Trigger</a>	0..1	ref	The referenced <a href="#">Trigger</a> from a <a href="#">TriggerInterface</a> .

**Table A.1003: TDEventTrigger**

Enumeration	TDEventTriggerTypeEnum
Note	This is used to describe the specific event type of a TDEventTrigger.
Aggregated by	<a href="#">TDEventTrigger.tdEventTriggerType</a>
Literal	Description
triggerActivated	A point in time where the referenced trigger has been successfully released and is activating runnable entities of the receiving SW-C. <b>Tags:</b> atp.EnumerationLiteralIndex=0
triggerReleased	A point in time where the referenced trigger has been successfully released by the emitting SW-C. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.1004: TDEventTriggerTypeEnum**

Class	TDEventVariableDataPrototype			
Note	A <a href="#">TimingDescriptionEvent</a> triggered by the sending/receiving of a <a href="#">VariableDataPrototype</a> in a <a href="#">SenderReceiverInterface</a> on VFB level.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventVfb</a> , <a href="#">TDEventVfbPort</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
Aggregated by	<a href="#">TimingExtension.timingDescription</a>			
Attribute	Type	Mult.	Kind	Note
dataElement	<a href="#">VariableDataPrototype</a>	0..1	ref	The referenced <a href="#">VariableDataPrototype</a> from a <a href="#">SenderReceiverInterface</a> .
tdEventVariable DataPrototype Type	<a href="#">TDEventVariableDataPrototypeTypeEnum</a>	0..1	attr	The specific type of this timing event.

**Table A.1005: TDEventVariableDataPrototype**



<b>Enumeration</b>	<b>TDEventVariableDataPrototypeTypeEnum</b>
<b>Note</b>	This is used to describe the specific event type of a TDEventVariableDataPrototype
<b>Aggregated by</b>	<a href="#">TDEventVariableDataPrototype.tdEventVariableDataPrototypeType</a>
<b>Literal</b>	<b>Description</b>
variableData PrototypeReceived	A point in time where the referenced variable data prototype has been successfully transmitted and is available in the related communication buffer (of the RTE) for the receiving SWC. <b>Tags:</b> atp.EnumerationLiteralIndex=0
variableData PrototypeSent	A point in time where the referenced variable data prototype has been successfully sent out by the sending SWC, so that it is available in the related communication buffer (of the RTE) for transmission. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table A.1006: TDEventVariableDataPrototypeTypeEnum**

<b>Class</b>	<b>TDEventVfb</b> (abstract)			
<b>Note</b>	A <a href="#">TimingDescriptionEvent</a> occurring on a Virtual Functional Bus (VFB) <a href="#">PortPrototype</a> .			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Subclasses</b>	<a href="#">TDEventVfbPort</a> , TDEventVfbPortGroup, <a href="#">TDEventVfbReference</a>			
<b>Aggregated by</b>	TimingExtension.timingDescription			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.1007: TDEventVfb**

<b>Class</b>	<b>TDEventVfbPort</b> (abstract)			
<b>Note</b>	A <a href="#">TimingDescriptionEvent</a> occurring on a <a href="#">PortPrototype</a> .			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventVfb</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Subclasses</b>	<a href="#">TDEventModeDeclaration</a> , <a href="#">TDEventOperation</a> , <a href="#">TDEventTrigger</a> , <a href="#">TDEventVariableDataPrototype</a>			
<b>Aggregated by</b>	TimingExtension.timingDescription			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
isExternal	Boolean	0..1	attr	This attribute is used to refer to external events that are related to hardware I/O, like physical sensors and actuators, at Virtual Functional Bus (VFB) level. This Attribute is only used by the AUTOSAR Classic Platform.
portPrototype	<a href="#">PortPrototype</a>	0..1	iref	<a href="#">PortPrototype</a> on which the TimingEvent occurs <b>Tags:</b> atp.Status=draft <b>InstanceRef implemented by:</b> PortInCompositionType InstanceRef
portPrototype Blueprint	<a href="#">PortPrototypeBlueprint</a>	0..1	ref	port on which the TimingEvent shall apply (in the context of an AUTOSAR blueprint)

**Table A.1008: TDEventVfbPort**

<b>Class</b>	<b>TDEventVfbReference</b>			
<b>Note</b>	Reference to "other" <a href="#">TimingDescriptionEvents</a> . These other <a href="#">TimingDescriptionEvents</a> may be specified in other views and re-used in this view.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TDEventVfb</a> , <a href="#">TimingDescription</a> , <a href="#">TimingDescriptionEvent</a>			
<b>Aggregated by</b>	TimingExtension.timingDescription			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
referenced TDEventVfb	<a href="#">TDEventVfb</a>	0..1	ref	The referenced timing description event.

**Table A.1009: TDEventVfbReference**

<b>Class</b>	<b>TDHeaderIdRange</b>			
<b>Note</b>	Specifies a range of PDU header identifiers. This range is specified by a minimum and maximum header identifier; and the maximum header identifier shall be greater than or equal the minimum header identifier.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	TDEventFrameEthernet.tdHeaderIdFilter			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
maxHeaderId	Integer	0..1	attr	Specifies the maximum PDU header identifier, in other words the upper bound of a range of PDU header identifiers.
minHeaderId	Integer	0..1	attr	Specifies the minimum PDU header identifier, in other words the lower bound of a range of PDU header identifiers.

**Table A.1010: TDHeaderIdRange**

<b>Class</b>	<b>TargetIPduRef</b>			
<b>Note</b>	Target destination of the referencing mapping.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	IPduMapping.targetIPdu			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
defaultValue	PduMappingDefault Value	0..1	aggr	If no I-Pdu has been received a default value will be distributed.
targetIPdu	PduTriggering	0..1	ref	IPdu Reference

**Table A.1011: TargetIPduRef**

<b>Class</b>	<b>Tcplplcmpv4Props</b>			
<b>Note</b>	This meta-class specifies the configuration options for ICMPv4 (Internet Control Message Protocol).			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	EthTcplplcmpProps.icmpV4Props			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
tcplplcmpV4EchoReplyEnabled	Boolean	0..1	attr	This attribute enables or disables transmission of ICMP echo reply message in case of a ICMP echo reception.
tcplplcmpV4Ttl	PositiveInteger	0..1	attr	This attribute is only relevant in case that ICMP (Internet Control Message Protocol) is used. It specifies the default Time-to-live value of outgoing ICMP packets.

**Table A.1012: Tcplplcmpv4Props**

<b>Class</b>	<b>Tcplplcmpv6Props</b>			
<b>Note</b>	This meta-class specifies the configuration options for ICMPv6 (Internet Control Message Protocol).			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	EthTcplplcmpProps.icmpV6Props			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
tcplplcmpV6EchoReplyAvoidFragmentation	Boolean	0..1	attr	This attribute defines whether the echo reply is only transmitted in case that the incoming ICMPv6 Echo Request (Pings) fits the MTU of the respective interface, i.e. can be transmitted without IPv6 fragmentation.





Class	TcpIplcmpv6Props			
tcpIplcmpV6 EchoReply Enabled	Boolean	0..1	attr	This attribute enables or disables transmission of ICMP echo reply message in case of a ICMP echo reception.
tcpIplcmpV6 HopLimit	PositiveInteger	0..1	attr	Default Hop-Limit value of outgoing ICMPv6 packets.
tcpIplcmpV6 MsgDestination Unreachable Enabled	Boolean	0..1	attr	This attribute Enables/Disables the transmission of Destination Unreachable Messages.
tcpIplcmpV6 MsgParameter Problem Enabled	Boolean	0..1	attr	If enabled an ICMPv6 parameter problem message will be sent if a received packet has been dropped due to unknown options or headers that are found in the packet.

**Table A.1013: TcpIplcmpv6Props**

Class	TcpOptionFilterList			
<b>Note</b>	Permitted list for the filtering of TCP options. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	TcpOptionFilterSet.tcpOptionFilterList			
Attribute	Type	Mult.	Kind	Note
allowedTcp Option	PositiveInteger	*	attr	TCP option kind allowed by this filter.

**Table A.1014: TcpOptionFilterList**

Class	TcpProps			
<b>Note</b>	This meta-class specifies the configuration options for TCP (Transmission Control Protocol).			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	EthTcpIpProps.tcpProps			
Attribute	Type	Mult.	Kind	Note
tcpCongestion Avoidance Enabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) support of TCP congestion avoidance algorithm according to IETF RFC 5681.
tcpDelayedAck Timeout	TimeValue	0..1	attr	The maximal time an acknowledgement is delayed for transmission in seconds.
tcpFast Recovery Enabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) support of TCP Fast Recovery according to IETF RFC 5681.
tcpFast Retransmit Enabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) support of TCP Fast Retransmission according to IETF RFC 5681.
tcpFinWait2 Timeout	TimeValue	0..1	attr	Timeout in [s] to receive a FIN from the remote node (after this node has initiated connection termination), i.e. maximum time waiting in FINWAIT-2 for a connection termination request from the remote TCP.
tcpKeepAlive Enabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) TCP Keep Alive Probes according to IETF RFC 1122 chapter 4.2.3.6.
tcpKeepAlive Interval	TimeValue	0..1	attr	Specifies the interval in seconds between subsequent keepalive probes.





Class	TcpProps			
tcpKeepAliveProbesMax	PositiveInteger	0..1	attr	Maximum number of times that a TCP Keep Alive is retransmitted before the connection is closed.
tcpKeepAliveTime	TimeValue	0..1	attr	Specifies the time in [s] between the last data packet sent (simple ACKs are not considered data) and the first keepalive probe.
tcpMaxRtx	PositiveInteger	0..1	attr	Maximum number of times that a TCP segment is retransmitted before the TCP connection is closed. This parameter is only valid if tcpRetransmissionTimeout is configured. Note: This parameter also applies for FIN retransmissions.
tcpMsl	TimeValue	0..1	attr	Maximum segment lifetime in [s].
tcpNagleEnabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) support of Nagle's algorithm according to IETF RFC 1122 (chapter 4.2.3.4 When to Send Data). If enabled the Nagle's algorithm is activated per default for all TCP sockets, but can be deactivated per Socket (with the attribute TcpTp.nagleAlgorithm).
tcpReceiveWindowMax	PositiveInteger	0..1	attr	Default value of maximum receive window in bytes.
tcpRetransmissionTimeout	TimeValue	0..1	attr	Timeout in [s] before an unacknowledged TCP segment is sent again. If the timeout is disabled, no TCP segments shall be retransmitted.
tcpSlowStartEnabled	Boolean	0..1	attr	Enables (TRUE) or disables (FALSE) support of TCP slow start algorithm according to IETF RFC 5681.
tcpSynMaxRtx	PositiveInteger	0..1	attr	Maximum number of times that a TCP SYN is retransmitted.
tcpSynReceivedTimeout	TimeValue	0..1	attr	Timeout in [s] to complete a remotely initiated TCP connection establishment, i.e. maximum time waiting in SYN-RECEIVED for a confirming connection request acknowledgement after having both received and sent a connection request.
tcpTtl	PositiveInteger	0..1	attr	Default Time-to-live value of outgoing TCP packets.

**Table A.1015: TcpProps**

Class	TcpTp			
Note	Content Model for TCP configuration.			
Base	ARObject, TcpUdpConfig, TransportProtocolConfiguration			
Aggregated by	ApApplicationEndpoint.tpConfiguration, <a href="#">ApplicationEndpoint.tpConfiguration</a>			
Attribute	Type	Mult.	Kind	Note
keepAliveInterval	TimeValue	0..1	attr	Specifies the interval in seconds between subsequent keepalive probes.
keepAliveProbesMax	PositiveInteger	0..1	attr	Maximum number of times that TCP retransmits an individual data segment before aborting the connection.
keepAlives	Boolean	0..1	attr	Indicates if Keep-Alive messages are sent.
keepAliveTime	TimeValue	0..1	attr	Specifies the time in seconds between the last data packet sent and the first keepalive probe.
naglesAlgorithm	Boolean	0..1	attr	Indicates if Nagle's Algorithm is used.
receiveWindowMin	PositiveInteger	0..1	attr	Minimum size of the TCP receive window in bytes.





Class	TcpTp			
tcp Retransmission Timeout	TimeValue	0..1	attr	Defines the timeout in seconds before an unacknowledged TCP segment is sent again. If the tcp RetransmissionTimeout is not defined or set to "INF", no TCP segments shall be re-transmitted.
tcpTpPort	TpPort	0..1	aggr	TCP Port configuration.

**Table A.1016: TcpTp**

Class	TextTableMapping			
Note	Defines the mapping of two <a href="#">DataPrototypes</a> typed by <a href="#">AutosarDataTypes</a> that refer to <a href="#">CompuMethods</a> of category TEXTTABLE, SCALE_LINEAR_AND_TEXTTABLE or BITFIELD_TEXTTABLE.			
Base	ARObject			
Aggregated by	<a href="#">DataPrototypeMapping.textTableMapping</a> , <a href="#">SenderRecArrayTypeMapping.senderToSignalTextTableMapping</a> , <a href="#">SenderRecArrayTypeMapping.signalToReceiverTextTableMapping</a> , <a href="#">SenderReceiverToSignalMapping.senderToSignalTextTableMapping</a> , <a href="#">SenderReceiverToSignalMapping.signalToReceiverTextTableMapping</a> , <a href="#">SenderRecRecordElementMapping.senderToSignalTextTableMapping</a> , <a href="#">SenderRecRecordElementMapping.signalToReceiverTextTableMapping</a> , <a href="#">SubElementMapping.textTableMapping</a>			
Attribute	Type	Mult.	Kind	Note
bitfieldTextTableMaskFirst	PositiveInteger	0..1	attr	This attribute can be used to support the mapping of bit field to bit field, boolean values to bit fields, and vice versa. The attribute defines the bit mask for the first element of the TextTableMapping. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
bitfieldTextTableMaskSecond	PositiveInteger	0..1	attr	This attribute can be used to support the mapping of bit field to bit field, boolean values to bit fields, and vice versa. The attribute defines the bit mask for the second element of the TextTableMapping. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime
identicalMapping	Boolean	0..1	attr	If identicalMapping is set == true the values of the two referenced DataPrototypes do not need any conversion of the values.
mappingDirection	MappingDirectionEnum	0..1	attr	Specifies the conversion direction for which the TextTableMapping is applicable.
valuePair	<a href="#">TextTableValuePair</a>	*	aggr	Defines a pair of values which are translated into each other.

**Table A.1017: TextTableMapping**

Class	TextTableValuePair			
Note	Defines a pair of text values which are translated into each other.			
Base	ARObject			
Aggregated by	<a href="#">TextTableMapping.valuePair</a>			
Attribute	Type	Mult.	Kind	Note
firstValue	<a href="#">Numerical</a>	0..1	attr	Value of first DataPrototype provided similar to a numerical ValueSpecification which is intended to be assigned to a Primitive data element. Note that the numerical value is a variant, it can be computed by a formula. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime





Class	TextTableValuePair			
secondValue	Numerical	0..1	attr	Value of second DataPrototype provided similar to a numerical ValueSpecification which is intended to be assigned to a Primitive data element. Note that the numerical value is a variant, it can be computed by a formula. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime

**Table A.1018: TextTableValuePair**

Class	TextValueSpecification			
Note	The purpose of TextValueSpecification is to define the labels that correspond to enumeration values.			
Base	ARObject, ValueSpecification			
Aggregated by	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, ArrayValueSpecification.element, CalibrationParameterValue.applInitValue, CalibrationParameterValue.implInitValue, ConstantSpecification.valueSpec, CryptoServiceKey.developmentValue, DiagnosticEnvDataCondition.compareValue, DiagnosticEnvDataElementCondition.compareValue, DiagnosticEnvSovdDataCondition.compareValue, FieldSenderComSpec.initValue, ISignal.initValue, ISignal.receptionDefaultValue, ISignal.timeoutSubstitutionValue, MetaDataItem.metaDataItemValue, NonqueuedReceiverComSpec.initValue, NonqueuedReceiverComSpec.timeoutSubstitutionValue, NonqueuedSenderComSpec.initValue, NvProvideComSpec.ramBlockInitValue, NvProvideComSpec.romBlockInitValue, NvRequireComSpec.initValue, ParameterDataPrototype.initValue, ParameterProvideComSpec.initValue, ParameterRequireComSpec.initValue, PersistencyDataRequiredComSpec.initValue, PersistencyKeyValuePair.initValue, PortDefinedArgumentValue.value, PortPrototypeBlueprintInitValue.value, RecordValueSpecification.field, SomeipEventDeployment.eventReceptionDefaultValue, StateManagementCompareCondition.compareValue, SwDataDefProps.invalidValue, UserDefinedEventDeployment.eventReceptionDefaultValue, VariableDataPrototype.initValue			
Attribute	Type	Mult.	Kind	Note
value	VerbatimString	0..1	attr	This is the value itself. Note that vt uses the   operator to separate the values for the different bitfield masks in case that the semantics of the related DataPrototype is described by means of a BITFIELD_TEXTTABLE in the associated CompuMethod.

**Table A.1019: TextValueSpecification**

Class	TimeRangeType			
Note	The timeRange can be specified with the value attribute. Optionally a tolerance can be defined.			
Base	ARObject			
Aggregated by	CyclicTiming.timeOffset, CyclicTiming.timePeriod, EventControlledTiming.repetitionPeriod			
Attribute	Type	Mult.	Kind	Note
tolerance	TimeRangeType Tolerance	0..1	aggr	Optional specification of a tolerance.
value	TimeValue	0..1	attr	Average value of a date (in seconds)

**Table A.1020: TimeRangeType**

Class	TimingDescription (abstract)			
Note	The abstract parent class of the model elements that are used to define the scope of a timing constraint.			
Base	ARObject, Identifiable, MultilanguageReferrable, Referrable			
Subclasses	TimingDescriptionEvent, TimingDescriptionEventChain			
Aggregated by	TimingExtension.timingDescription			





Class	TimingDescription (abstract)			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.1021: TimingDescription**

Class	TimingDescriptionEvent (abstract)			
Note	A timing event is the abstract representation of a specific system behavior -- that can be observed at runtime -- in the AUTOSAR specification. Timing events are used to define the scope for timing constraints. Depending on the specific scope, the view on the system, and the level of abstraction different types of events are defined. In order to avoid confusion with existing event descriptions in the AUTOSAR templates the timing specific event types use the prefix TD.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingDescription</a>			
Subclasses	<a href="#">TDEventBsw</a> , <a href="#">TDEventBswInternalBehavior</a> , <a href="#">TDEventCom</a> , <a href="#">TDEventComplex</a> , <a href="#">TDEventSwc</a> , <a href="#">TDEventVfb</a>			
Aggregated by	TimingExtension.timingDescription			
Attribute	Type	Mult.	Kind	Note
clockReference	TimingClock	0..1	ref	Optional reference to a clock that holds the time base for an TD event. <b>Tags:</b> atp.Status=draft
occurrence Expression	<a href="#">TDEventOccurrence Expression</a>	0..1	aggr	The occurrence expression for this event.

**Table A.1022: TimingDescriptionEvent**

Class	TimingDescriptionEventChain			
Note	An event chain describes the causal order for a set of functionally dependent timing events. Each event chain has a well defined stimulus and response, which describe its start and end point. Furthermore, it can be hierarchically decomposed into an arbitrary number of sub-chains, so called <i>event chain segments</i> .			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">TimingDescription</a>			
Aggregated by	TimingExtension.timingDescription			
Attribute	Type	Mult.	Kind	Note
isPipelining Permitted	Boolean	0..1	attr	States whether the scheduled entities in an LET interval shall use pipelined execution or not i.e. "permitted pipelining property" If TRUE, then the scheduled entities must implement pipelining. If FALSE or undefined, no pipelining applies. <b>Tags:</b> atp.Status=draft
response	<a href="#">TimingDescriptionEvent</a>	0..1	ref	The response event representing the point in time where the event chain is terminated. <b>Tags:</b> xml.sequenceOffset=20
segment	<a href="#">TimingDescriptionEvent Chain</a>	*	ref	A composed event chain consists of an arbitrary number of sub-chains. <b>Tags:</b> xml.sequenceOffset=30
stimulus	<a href="#">TimingDescriptionEvent</a>	0..1	ref	The stimulus event representing the point in time where the event chain is activated. <b>Tags:</b> xml.sequenceOffset=10

**Table A.1023: TimingDescriptionEventChain**

<b>Class</b>	<b>TimingEvent</b>			
<b>Note</b>	This event is used to start <a href="#">RunnableEntity</a> s that shall be executed periodically.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
offset	TimeValue	0..1	attr	The value makes an assumption about the time offset of the first activation of the <a href="#">RunnableEntity</a> triggered by the mapped <a href="#">TimingEvent</a> relative to the periodic activation of the time base of this <a href="#">TimingEvent</a> . Unit: second.
period	TimeValue	0..1	attr	Period of timing event in seconds. The value of this attribute shall be greater than zero.

**Table A.1024: TimingEvent**

<b>Class</b>	<b>TlsCryptoCipherSuite</b>			
<b>Note</b>	This meta-class represents a cipher suite for describing cryptographic operations in the context of establishing a connection of ApplicationEndpoints that is protected by TLS.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">TlsCryptoServiceMapping.tlsCipherSuite</a> , <a href="#">TlsSecureComProps.tlsCipherSuite</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
authentication	<a href="#">CryptoServicePrimitive</a>	0..1	ref	This reference identifies the crypto service primitive for the generation and verification of MACs.
authentication Key	<a href="#">CryptoServiceKey</a>	0..1	ref	This reference identifies the private key or pre-shared key used for authentication.
certificate	<a href="#">CryptoServiceCertificate</a>	0..1	ref	This reference identifies the applicable local certificate.
cipherSuiteId	PositiveInteger	0..1	attr	Identification of the CipherSuite according to the IANA assignments list.
cipherSuite ShortLabel	String	0..1	attr	Name of the CipherSuite according to the IANA assignments list.
ellipticCurve	CryptoEllipticCurve Props	*	ref	This references point to the properties of elliptic curves.
encryption	<a href="#">CryptoServicePrimitive</a>	0..1	ref	This reference identifies the crypto service primitive for the execution of encryption.
keyExchange	<a href="#">CryptoServicePrimitive</a>	*	ref	This reference identifies the individual (i.e. per cipher suite) crypto service primitive for the execution of key exchange during the handshake phase.
keyExchange Authentication	<a href="#">CryptoServicePrimitive</a>	*	ref	This reference identifies the crypto service primitives for the generation and verification of signatures during the key exchange algorithm.
priority	PositiveInteger	0..1	attr	This attribute identifies the priority of the cipher suite. Range: 1..65535. Lower values represent higher priorities.
props	TlsCryptoCipherSuite Props	0..1	aggr	The aggregated TlsCryptoCipherSuiteProps provide details for the TLS Cipher Suite.
pskIdentity	<a href="#">TlsPskIdentity</a>	0..1	aggr	Pre-shared key identity shared during the handshake among the communication parties, to establish a TLS connection if the handshake is based on the existence of a pre-shared key.
remote Certificate	<a href="#">CryptoServiceCertificate</a>	0..1	ref	This reference identifies the applicable remote certificate.







Class	TlsCryptoCipherSuite			
signature Scheme	CryptoSignature Scheme	*	ref	This reference points to the properties of a TLS Signature Scheme.
version	TlsVersionEnum	0..1	attr	This attribute supports the definition of the applicable version of TLS.

**Table A.1025: TlsCryptoCipherSuite**

Class	TlsCryptoServiceMapping			
Note	This meta-class has the ability to represent a crypto service mapping for the socket-based configuration of Transport Layer Security (TLS).			
Base	ARObject, CryptoServiceMapping, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	SystemMapping.cryptoServiceMapping			
Attribute	Type	Mult.	Kind	Note
keyExchange	CryptoServicePrimitive	*	ref	This reference identifies the shared(i.e. applicable for each of the aggregated cipher suites) crypto service primitive for the execution of key exchange during the handshake phase.
tlsCipherSuite	TlsCryptoCipherSuite	*	aggr	This aggregation represents the collection of supported cipher suites.
useClient Authentication Request	Boolean	0..1	attr	Defines if client authentication shall be applied for this TLS connection.
useSecurity Extension RecordSize Limit	Boolean	0..1	attr	Defines if the security extension for max_fragment_length shall be supported as defined in IETF RFC 8449, chapter 4.1.

**Table A.1026: TlsCryptoServiceMapping**

Class	TlsPskIdentity			
Note	This element is used to describe the pre-shared key shared during the handshake among the communication parties, to establish a TLS connection if the handshake is based on the existence of a pre-shared key.			
Base	ARObject			
Aggregated by	TlsCryptoCipherSuite.pskIdentity			
Attribute	Type	Mult.	Kind	Note
pskIdentity	String	0..1	attr	This attribute provides the key identification.
pskIdentityHint	String	0..1	attr	This attribute provides the identity hint for a pre-shared key.

**Table A.1027: TlsPskIdentity**

Class	TlvDataIdDefinition			
Note	This meta-class represents the ability to define the tlvDataId.			
Base	ARObject			
Aggregated by	TlvDataIdDefinitionSet.tlvDataIdDefinition			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	0..1	attr	This attribute represents the definition of the value of the TlvDataId <b>Stereotypes:</b> atpIdentityContributor





Class	TlvDataIdDefinition			
tlvArgument	<a href="#">ArgumentDataPrototype</a>	0..1	ref	This reference assigns a tlvDataId to a given argument of a ClientServerOperation.
tlvImplementationDataTypeElement	<a href="#">AbstractImplementationDataTypeElement</a>	0..1	ref	This reference associates the definition of a TLV data id with a given AbstractImplementationDataTypeElement.
tlvRecordElement	<a href="#">ApplicationRecordElement</a>	0..1	ref	This reference associates the definition of a TLV data id with a given ApplicationRecordElement.

**Table A.1028: TlvDataIdDefinition**

Class	TlvDataIdDefinitionSet			
Note	This meta-class acts as a container of TlvDataIdDefinitions to be used in a given context <b>Tags:</b> atp.recommendedPackage=TlvDataDefinitionSets			
Base	<i>ARElement, ARObject, CollectableElement, <a href="#">Identifiable</a>, <a href="#">MultilanguageReferrable</a>, PackageableElement, <a href="#">Referrable</a>, UploadableDesignElement, UploadablePackageElement</i>			
Aggregated by	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
tlvDataIdDefinition	<a href="#">TlvDataIdDefinition</a>	*	aggr	This aggregation represents the collection of TlvDataIdDefinitions aggregated by the TlvDataIdDefinitionSet <b>Stereotypes:</b> atp.Splitable <b>Tags:</b> atp.Splitkey=tlvDataIdDefinition.id

**Table A.1029: TlvDataIdDefinitionSet**

Class	Topic1			
Note	This meta-class represents a topic of a documentation. Topics are similar to chapters but they cannot be nested. They also do not appear in the table of content. Topics can be used to produce intermediate headlines thus structuring a chapter internally.			
Base	<i>ARObject, DocumentViewSelectable, <a href="#">Identifiable</a>, <a href="#">MultilanguageReferrable</a>, <a href="#">Paginateable</a>, <a href="#">Referrable</a></i>			
Aggregated by	MsrQueryResultTopic1.topic1, TopicOrMsrQuery.topic1			
Attribute	Type	Mult.	Kind	Note
helpEntry	String	0..1	attr	This specifies an entry point in an online help system to be linked with the parent class. The syntax shall be defined by the applied help system respectively help system generator. <b>Tags:</b> xml.attribute=true
topicContent	TopicContentOrMsrQuery	0..1	aggr	This is the content of the topic. <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false

**Table A.1030: Topic1**

<b>Class</b>	<b>TpAddress</b>			
<b>Note</b>	An ECUs TP address on the referenced channel. This represents the diagnostic Address.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">FlexrayArTpConfig.tpAddress</a> , <a href="#">FlexrayTpConfig.tpAddress</a> , <a href="#">J1939TpConfig.tpAddress</a> , <a href="#">LinTpConfig.tpAddress</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
tpAddress	Integer	0..1	attr	An ECUs TP address on the referenced channel. This represents the diagnostic Address.

**Table A.1031: TpAddress**

<b>Class</b>	<b>TpConfig</b> (abstract)			
<b>Note</b>	Contains all configuration elements for AUTOSAR TP.			
<b>Base</b>	ARObject, <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">CanTpConfig</a> , <a href="#">DolpTpConfig</a> , <a href="#">EthTpConfig</a> , <a href="#">FlexrayArTpConfig</a> , <a href="#">FlexrayTpConfig</a> , <a href="#">IEEE1722TpConfig</a> , <a href="#">J1939TpConfig</a> , <a href="#">LinTpConfig</a> , <a href="#">SomeipTpConfig</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
communication Cluster	<a href="#">CommunicationCluster</a>	0..1	ref	A TpConfig is existing always in the context of exactly one CommunicationCluster.

**Table A.1032: TpConfig**

<b>Class</b>	<b>TpConnection</b> (abstract)			
<b>Note</b>	TpConnection Base Class.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">CanTpConnection</a> , <a href="#">DolpTpConnection</a> , <a href="#">EthTpConnection</a> , <a href="#">FlexrayArTpConnection</a> , <a href="#">FlexrayTpConnection</a> , <a href="#">J1939TpConnection</a> , <a href="#">LinTpConnection</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ident	<a href="#">TpConnectionIdent</a>	0..1	aggr	This adds the ability to become referrable to Tp Connection.

**Table A.1033: TpConnection**

<b>Class</b>	<b>TpConnectionIdent</b>			
<b>Note</b>	This meta-class is created to add the ability to become the target of a reference to the non-Referrable Tp Connection.			
<b>Base</b>	ARObject, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">TpConnection.ident</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.1034: TpConnectionIdent**

<b>Class</b>	<b>TpPort</b>			
<b>Note</b>	Dynamic or direct assignment of a PortNumber.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">TcpTp.tcpTpPort</a> , <a href="#">UdpTp.udpTpPort</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
portNumber	PositiveInteger	0..1	attr	Port Number.

**Table A.1035: TpPort**

<b>Class</b>	<b>Traceable</b> (abstract)			
<b>Note</b>	This meta class represents the ability to be subject to tracing within an AUTOSAR model. Note that it is expected that its subclasses inherit either from MultilanguageReferrable or from Identifiable. Nevertheless it also inherits from MultilanguageReferrable in order to provide a common reference target for all Traceables.			
<b>Base</b>	ARObject, <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">StructuredReq</a> , <a href="#">TimingConstraint</a> , TraceableTable, <a href="#">TraceableText</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
trace	<a href="#">Traceable</a>	*	ref	This association represents the ability to trace to upstream requirements / constraints. This supports for example the bottom up tracing ProjectObjectives <- MainRequirements <- Features <- RequirementSpecs <- BSW/AI <b>Tags:</b> xml.sequenceOffset=20

Table A.1036: Traceable

<b>Class</b>	<b>TraceableText</b>			
<b>Note</b>	Represents a paragraph level text which can be referenced in order to establish tracing. It supports specific tracing of document items as specified in [TPS_STDT_00098]. The following approach applies: <ul style="list-style-type: none"> <li>• <a href="#">shortName</a>: represents the tag for tracing</li> <li>• <a href="#">longName</a>: represents the headline</li> <li>• <a href="#">category</a>: represents the kind of the tagged text</li> </ul>			
<b>Base</b>	ARObject, <a href="#">DocumentViewSelectable</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Paginateable</a> , <a href="#">Referrable</a> , <a href="#">Traceable</a>			
<b>Aggregated by</b>	<a href="#">DocumentationBlock.trace</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
text	<a href="#">DocumentationBlock</a>	1	aggr	This represents the text to which the tag applies. <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=30 xml.typeElement=false xml.typeWrapperElement=false

Table A.1037: TraceableText

<b>Enumeration</b>	<b>TransferPropertyEnum</b>
<b>Note</b>	Transfer Properties of a Signal.
<b>Aggregated by</b>	<a href="#">ISignalToIPduMapping.transferProperty</a>
<b>Literal</b>	<b>Description</b>
pending	If the signal has the TransferProperty pending, then the function Com_SendSignal shall not perform a transmission of the IPdu associated with the signal. <b>Tags:</b> atp.EnumerationLiteralIndex=0
triggered	The signal in the assigned IPdu is updated and a request for the IPdu's transmission is made. <b>Tags:</b> atp.EnumerationLiteralIndex=1
triggeredOnChange	The signal in the assigned IPdu is updated and a request for the IPdus transmission is made only if the signal value is different from the already stored signal value. <b>Tags:</b> atp.EnumerationLiteralIndex=2
triggeredOnChange WithoutRepetition	The signal in the assigned IPdu is updated and a request for the IPdus transmission is made only if the signal value is different from the already stored signal value. In the DIRECT/N-TIMES or MIXED transmission mode (EventControlledTiming) the IPdu will be transmitted just once without a repetition, independent of the defined NumberOfRepeats. <b>Tags:</b> atp.EnumerationLiteralIndex=3





Enumeration	TransferPropertyEnum
triggeredWithoutRepetition	The signal in the assigned IPdu is updated and a request for the IPdu's transmission is made. In the DIRECT/N-TIMES or MIXED transmission mode (EventControlledTiming) the IPdu will be transmitted just once without a repetition, independent of the defined NumberOfRepeats. <b>Tags:</b> atp.EnumerationLiteralIndex=4

**Table A.1038: TransferPropertyEnum**

Class	TransformationDescription (abstract)			
Note	The TransformationDescription is the abstract class that can be used by specific transformers to add transformer specific properties.			
Base	ARObject, Describable			
Subclasses	DdsTransformationDescription, EndToEndTransformationDescription, SOMEIPTransformationDescription, UserDefinedTransformationDescription			
Aggregated by	TransformationTechnology.transformationDescription			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table A.1039: TransformationDescription**

Class	«atpVariation» TransformationISignalProps (abstract)			
Note	TransformationISignalProps holds all the attributes for the different TransformationTechnologies that are ISignal specific. <b>Tags:</b> vh.latestBindingTime=postBuild			
Base	ARObject, Describable			
Subclasses	DdsTransformationISignalProps, EndToEndTransformationISignalProps, SOMEIPTransformationISignalProps, UserDefinedTransformationISignalProps			
Aggregated by	ISignal.transformationISignalProps, ISignalGroup.transformationISignalProps			
Attribute	Type	Mult.	Kind	Note
csErrorReaction	CSTransformerErrorReactionEnum	0..1	attr	Defines whether the transformer chain of client/server communication coordinates an autonomous error reaction together with the RTE or whether any error reaction is the responsibility of the application.
dataPrototypeTransformationProps	DataPrototypeTransformationProps	*	aggr	Fine granular modeling of TransformationProps on the level of DataPrototypes. Note: This atpSplitable property has no atp.Splitkey due to atpVariation (PropertySetPattern). <b>Stereotypes:</b> atpSplitable
ident	TransformationISignalPropsIdent	0..1	aggr	This adds the ability to add a shortName to TransformationISignalProps. Please note that the short-name needs to be provided if the splitable mechanism is used. <b>Stereotypes:</b> atpIdentityContributor
transformer	TransformationTechnology	0..1	ref	Reference to the TransformationTechnology description that contains transformer specific and ISignal independent configuration properties.

**Table A.1040: TransformationISignalProps**

Class	TransformationTechnology			
Note	A TransformationTechnology is a transformer inside a transformer chain. <b>Tags:</b> xml.namePlural=TRANSFORMATION-TECHNOLOGIES			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	DataTransformationSet.transformationTechnology			
Attribute	Type	Mult.	Kind	Note
bufferProperties	<a href="#">BufferProperties</a>	0..1	aggr	Aggregation of the mandatory BufferProperties.
hasInternalState	Boolean	0..1	attr	This attribute defines whether the Transformer has an internal state or not.
needsOriginalData	Boolean	0..1	attr	Specifies whether this transformer gets access to the SWC's original data.
protocol	String	0..1	attr	Specifies the protocol that is implemented by this transformer.
transformationDescription	<a href="#">TransformationDescription</a>	0..1	aggr	A transformer can be configured with transformer specific parameters which are represented by the TransformerDescription. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=transformationDescription, transformationDescription.variationPoint.shortLabel vh.latestBindingTime=postBuild
transformerClass	<a href="#">TransformerClassEnum</a>	0..1	attr	Specifies to which transformer class this transformer belongs.
version	String	0..1	attr	Version of the implemented protocol.

**Table A.1041: TransformationTechnology**

Enumeration	TransformerClassEnum
Note	Specifies the transformer class of a transformer.
Aggregated by	<a href="#">TransformationTechnology.transformerClass</a>
Literal	Description
custom	The transformer is a custom transformer. <b>Tags:</b> atp.EnumerationLiteralIndex=0
safety	The transformer is a safety transformer. <b>Tags:</b> atp.EnumerationLiteralIndex=1
security	The transformer is a security transformer. <b>Tags:</b> atp.EnumerationLiteralIndex=2
serializer	The transformer is a serializing transformer. <b>Tags:</b> atp.EnumerationLiteralIndex=3

**Table A.1042: TransformerClassEnum**

Class	TransformerHardErrorEvent			
Note	This event is raised when data are received which should trigger a Client/Server operation or an external Trigger but during transformation of the data a hard transformer error occurred.			
Base	ARObject, <a href="#">AbstractEvent</a> , <a href="#">AtpClassifier</a> , <a href="#">AtpFeature</a> , <a href="#">AtpStructureElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
operation	<a href="#">ClientServerOperation</a>	0..1	iref	This represents the ClientServerOperation for which the transformer can raise this TransformerHardErrorEvent. <b>InstanceRef implemented by:</b> POperationInAtomicSwc InstanceRef





Class	TransformerHardErrorEvent			
requiredTrigger	<a href="#">Trigger</a>	0..1	iref	This represents the Trigger for which the transformer can raise this TransformerHardErrorEvent. <b>InstanceRef implemented by:</b> RTriggerInAtomicSwc InstanceRef

**Table A.1043: TransformerHardErrorEvent**

Class	TransmissionAcknowledgementRequest			
Note	Requests transmission acknowledgement that data has been sent successfully. Success/failure is reported via a SendPoint of a <a href="#">RunnableEntity</a> .			
Base	ARObject			
Aggregated by	<a href="#">SenderComSpec.transmissionAcknowledge</a>			
Attribute	Type	Mult.	Kind	Note
timeout	TimeValue	0..1	attr	Number of seconds before an error is reported or in case of allowed redundancy, the value is sent again.

**Table A.1044: TransmissionAcknowledgementRequest**

Class	TransmissionComSpecProps			
Note	This meta-class defines a set of transmission attributes which the application software is assumed to implement.			
Base	ARObject			
Aggregated by	<a href="#">SenderComSpec.transmissionProps</a>			
Attribute	Type	Mult.	Kind	Note
dataUpdate Period	TimeValue	0..1	attr	This attribute defines the period in which the application is assumed to transmit the respective data.
minimumSend Interval	TimeValue	0..1	attr	This attribute defines the minimum interval between two consecutive transmissions of the respective data the application is assumed to ensure.
onChangeData Prototype	<a href="#">DataPrototype Reference</a>	*	aggr	This reference defines which DataPrototypes trigger the onChange transmission of the data. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=onChangeDataPrototype
transmission Mode	TransmissionMode DefinitionEnum	0..1	attr	The attribute defines the mode in which the application is assumed to transmit the respective data.

**Table A.1045: TransmissionComSpecProps**

Class	TransmissionModeCondition			
Note	Possibility to attach a condition to each signal within an I-PDU. If at least one condition evaluates to true, TRANSMISSION MODE True shall be used for this I-Pdu. In all other cases, the TRANSMISSION MODE FALSE shall be used.			
Base	ARObject			
Aggregated by	<a href="#">TransmissionModeDeclaration.transmissionModeCondition</a>			
Attribute	Type	Mult.	Kind	Note
dataFilter	<a href="#">DataFilter</a>	0..1	aggr	Possibilities to define conditions
iSignalInIPdu	<a href="#">ISignalToIPduMapping</a>	0..1	ref	Reference to a signal to which a condition is attached.

**Table A.1046: TransmissionModeCondition**

Class	TransmissionModeDeclaration			
Note	<p>AUTOSAR COM provides the possibility to define two different TRANSMISSION MODES (True and False) for each I-PDU.</p> <p>As TransmissionMode selector the signal content can be evaluated via transmissionModeCondition (implemented directly in the COM module) or mode conditions can be defined with the modeDrivenTrueCondition or modeDrivenFalseCondition (evaluated by BswM and invoking Com_SwitchIpduTxMode COM API). If modeDrivenTrueCondition and modeDrivenFalseCondition are defined they shall never evaluate to true both at the same time.</p> <p>The mixing of Transmission Mode Switch via API and signal value is not allowed.</p>			
Base	ARObject			
Aggregated by	IPduTiming.transmissionModeDeclaration			
Attribute	Type	Mult.	Kind	Note
modeDrivenFalseCondition	ModeDrivenTransmissionModeCondition	*	aggr	Defines the trigger for the Com_SwitchIpduTxMode Transmission Mode switch. Only if all defined modeDrivenFalseConditions evaluate to true (AND associated) the transmissionModeFalseTiming shall be activated. modeDrivenTrueCondition and modeDrivenFalseCondition shall never evaluate to true both at the same time.
modeDrivenTrueCondition	ModeDrivenTransmissionModeCondition	*	aggr	Defines the trigger for the Com_SwitchIpduTxMode Transmission Mode switch. Only if all defined modeDrivenTrueConditions evaluate to true (AND associated) the transmissionModeTrueTiming shall be activated. modeDrivenTrueCondition and modeDrivenFalseCondition shall never evaluate to true both at the same time.
transmissionModeCondition	TransmissionModeCondition	*	aggr	The Transmission Mode Selector evaluates the conditions for a subset of signals and decides which transmission mode should be used. In case only one transmission mode is used there is no need for the "TransmissionModeCondition" and its sub-structure. In case the transmission mode shall be switched using the COM-API "Com_SwitchIpduTxMode" there is no need for the "TransmissionModeCondition" and its sub-structure.
transmissionModeFalseTiming	TransmissionModeTiming	0..1	aggr	Timing Specification if the COM Transmission Mode is false. The Transmission Mode Selector is defined to be false, if all Conditions evaluate to false.
transmissionModeTrueTiming	TransmissionModeTiming	0..1	aggr	Timing Specification if the COM Transmission Mode is true. The Transmission Mode Selector is defined to be true, if at least one Condition evaluates to true.

**Table A.1047: TransmissionModeDeclaration**

Class	TransmissionModeTiming			
Note	<p>If the COM Transmission Mode is false the timing is aggregated by the TransmissionModeTiming element in the role of transmissionModeFalseTiming. If the COM Transmission Mode is true the timing is aggregated by the TransmissionModeTiming element in the role of transmissionModeTrueTiming. COM supports the following Transmission Modes:</p> <ul style="list-style-type: none"> <li>• Periodic (Cyclic Timing)</li> <li>• Direct /n-times (EventControlledTiming)</li> <li>• Mixed (Cyclic and EventControlledTiming are assigned)</li> <li>• None (no timing is assigned)</li> </ul>			
Base	ARObject			
Aggregated by	TransmissionModeDeclaration.transmissionModeFalseTiming, TransmissionModeDeclaration.transmissionModeTrueTiming			
Attribute	Type	Mult.	Kind	Note
cyclicTiming	CyclicTiming	0..1	aggr	Periodic Transmission Mode.
eventControlledTiming	EventControlledTiming	0..1	aggr	Direct Transmission Mode.

**Table A.1048: TransmissionModeTiming**



Class	Trigger			
Note	A trigger which is provided (i.e. released) or required (i.e. used to activate something) in the given context.			
Base	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	AtpClassifier.atpFeature, BswModuleDescription.releasedTrigger, BswModuleDescription.requiredTrigger, ServiceInterface.trigger, TriggerInterface.trigger			
Attribute	Type	Mult.	Kind	Note
swImplPolicy	SwImplPolicyEnum	0..1	attr	This attribute, when set to value queued, allows for a queued processing of Triggers. This Attribute is only used by the AUTOSAR Classic Platform.
triggerPeriod	MultidimensionalTime	0..1	aggr	Optional definition of a period in case of a periodically (time or angle) driven external trigger. This Attribute is only used by the AUTOSAR Classic Platform.

Table A.1049: Trigger

Class	TriggerIPduSendCondition			
Note	The condition defined by this class evaluates to true if one of the referenced modeDeclarations (OR associated) is active. The condition is used to define when the Pdu is triggered with the Com_Trigger IPDUSend API call.			
Base	ARObject			
Aggregated by	PduTriggering.triggerIPduSendCondition			
Attribute	Type	Mult.	Kind	Note
mode Declaration	ModeDeclaration	*	ref	Reference to one modeDeclaration which is OR associated in the context of the TriggerIPduSend Condition.

Table A.1050: TriggerIPduSendCondition

Class	TriggerInterface			
Note	A trigger interface declares a number of triggers that can be sent by an trigger source. Tags: atp.recommendedPackage=PortInterfaces			
Base	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, PortInterface, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
trigger	Trigger	*	aggr	The Trigger of this trigger interface.

Table A.1051: TriggerInterface

Class	TriggerInterfaceMapping			
Note	Defines the mapping of unequal named Triggers in context of two different TriggerInterfaces.			
Base	ARObject, AtpBlueprint, AtpBlueprintable, Identifiable, MultilanguageReferrable, PortInterfaceMapping, Referrable			
Aggregated by	PortInterfaceMappingSet.portInterfaceMapping			
Attribute	Type	Mult.	Kind	Note
triggerMapping	TriggerMapping	*	aggr	Mapping of two Trigger in two different TriggerInterface

Table A.1052: TriggerInterfaceMapping

<b>Class</b>	<b>TriggerMapping</b>			
<b>Note</b>	Defines the mapping of two particular unequally named Triggers in the given context.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">TriggerInterfaceMapping.triggerMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
firstTrigger	<a href="#">Trigger</a>	0..1	ref	A Trigger to be mapped.
secondTrigger	<a href="#">Trigger</a>	0..1	ref	A Trigger to be mapped.

**Table A.1053: TriggerMapping**

<b>Class</b>	<b>TriggerPortAnnotation</b>			
<b>Note</b>	Annotation to a port used for calibration regarding a certain Trigger.			
<b>Base</b>	ARObject, GeneralAnnotation			
<b>Aggregated by</b>	<a href="#">PortPrototype.triggerPortAnnotation</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
trigger	<a href="#">Trigger</a>	0..1	ref	The instance of annotated trigger.

**Table A.1054: TriggerPortAnnotation**

<b>Class</b>	<b>TriggerToSignalMapping</b>			
<b>Note</b>	This meta-class represents the ability to map a trigger to a SystemSignal of size 0. The Trigger does not transport any other information than its existence, therefore the limitation in terms of signal length.			
<b>Base</b>	ARObject, <a href="#">DataMapping</a>			
<b>Aggregated by</b>	<a href="#">SystemMapping.dataMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
systemSignal	<a href="#">SystemSignal</a>	0..1	ref	This is the SystemSignal taken to transport the Trigger over the network. <b>Tags:</b> xml.sequenceOffset=20
trigger	<a href="#">Trigger</a>	0..1	iref	This represents the Trigger that shall be used to trigger RunnableEntities deployed to a remote ECU. <b>InstanceRef implemented by:</b> TriggerInSystemInstanceRef

**Table A.1055: TriggerToSignalMapping**

<b>Class</b>	<b>UdpNmCluster</b>			
<b>Note</b>	Udp specific NmCluster attributes			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">NmCluster</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">NmConfig.nmCluster</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
nmCbvPosition	Integer	0..1	attr	Defines the position of the control bit vector within the Nm Pdu (Byte position). If this attribute is not configured, the Control Bit Vector is not used.
nmImmediateNmCycleTime	TimeValue	0..1	attr	Defines the immediate NmPdu cycle time in seconds which is used for nmImmediateNmTransmissions NmPdu transmissions. This attribute is only valid if nmImmediateNmTransmissions is greater one.
nmImmediateNmTransmissions	PositiveInteger	0..1	attr	Defines the number of immediate NmPdus which shall be transmitted. If the value is zero no immediate NmPdus are transmitted. The cycle time of immediate NmPdus is defined by nmImmediateNmCycleTime.





Class	UdpNmCluster			
nmMessageTimeoutTime	TimeValue	0..1	attr	Timeout of a NmPdu in seconds. It determines how long the NM shall wait with notification of transmission failure while communication errors occur on the bus. This Attribute is only used by the AUTOSAR Classic Platform.
nmMsgCycleTime	TimeValue	0..1	attr	Period of a NmPdu in seconds. It determines the periodic rate in the periodic transmission mode with bus load reduction and is the basis for transmit scheduling in the periodic transmission mode without bus load reduction.
nmNetworkTimeout	TimeValue	0..1	attr	Network Timeout for NmPdus in seconds. It denotes the time how long the UdpNm shall stay in the Network Mode before transition into Prepare Bus-Sleep Mode shall take place.
nmNidPosition	Integer	0..1	attr	Defines the byte position of the source node identifier within the NmPdu. If this attribute is not configured, the Node Identification is not used.
nmPnHandleMultipleNetworkRequests	Boolean	0..1	attr	Defines if Nm performs an additional transition from Network Mode to Repeat Message State (true) or not (false).
nmRemoteSleepIndicationTime	TimeValue	0..1	attr	Timeout for Remote Sleep Indication in seconds. It defines the time how long it shall take to recognize that all other nodes are ready to sleep. This Attribute is only used by the AUTOSAR Classic Platform.
nmRepeatMessageTime	TimeValue	0..1	attr	Timeout for Repeat Message State in seconds. Defines the time how long the NM shall stay in the Repeat Message State.
nmWaitBusSleepTime	TimeValue	0..1	attr	Timeout for bus calm down phase in seconds. It denotes the time how long the CanNm shall stay in the Prepare Bus-Sleep Mode before transition into Bus-Sleep Mode shall take place.
vlan	<a href="#">EthernetPhysicalChannel</a>	0..1	ref	Reference to the vlan (represented by the Ethernet PhysicalChannel) this UdpNmCluster shall apply to.

**Table A.1056: UdpNmCluster**

Class	UdpNmNode			
Note	Udp specific NM Node attributes.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">NmNode</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">NmCluster.nmNode</a>			
Attribute	Type	Mult.	Kind	Note
allNmMessagesKeepAwake	Boolean	0..1	attr	Specifies if Nm drops irrelevant NM PDUs. false: Only NM PDUs with a Partial Network Information Bit (PNI) = true and containing a Partial Network request for this ECU trigger the standard RX indication handling and thus keep the ECU awake true: Every NM PDU triggers the standard RX indication handling and keeps the ECU awake
nmMsgCycleOffset	TimeValue	0..1	attr	Node specific time offset in the periodic transmission node. It determines the start delay of the transmission. Specified in seconds.

**Table A.1057: UdpNmNode**

<b>Class</b>	<b>UdpProps</b>			
<b>Note</b>	This meta-class specifies the configuration options for UDP (User Datagram Protocol).			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	EthTcpIpProps.udpProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
udpTtl	PositiveInteger	0..1	attr	Default Time-to-live value of outgoing UDP packets.

**Table A.1058: UdpProps**

<b>Class</b>	<b>UdpTp</b>			
<b>Note</b>	Content Model for UDP configuration.			
<b>Base</b>	<i>ARObject</i> , <i>TcpUdpConfig</i> , <i>TransportProtocolConfiguration</i>			
<b>Aggregated by</b>	ApApplicationEndpoint.tpConfiguration, <a href="#">ApplicationEndpoint.tpConfiguration</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
udpTpPort	<a href="#">TpPort</a>	0..1	aggr	Udp Port configuration.

**Table A.1059: UdpTp**

<b>Class</b>	<b>UnassignFrameId</b>			
<b>Note</b>	Schedule entry for an Unassign Frame Id master request where the protected identifier is assigned the value 0x40. This will disable reception/transmission of a previously dynamically assigned frame identifier. This Class is only used by the AUTOSAR Classic Platform.			
<b>Base</b>	<i>ARObject</i> , <i>LinConfigurationEntry</i> , <a href="#">ScheduleTableEntry</a>			
<b>Aggregated by</b>	<a href="#">LinScheduleTable.tableEntry</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
unassignedFrameTriggering	<a href="#">LinFrameTriggering</a>	0..1	ref	The frame whose identifier is reset by this assignment.

**Table A.1060: UnassignFrameId**

<b>Class</b>	<b>Unit</b>			
<b>Note</b>	<p>This is a physical measurement unit. All units that might be defined should stem from SI units. In order to convert one unit into another factor and offset are defined.</p> <p>For the calculation from SI-unit to the defined unit the factor (factorSiToUnit ) and the offset (offsetSiToUnit ) are applied as follows:</p> $x \{unit\} := y \{siUnit\} * factorSiToUnit \{unit\}/\{siUnit\} + offsetSiToUnit \{unit\}$ <p>For the calculation from a unit to SI-unit the reciprocal of the factor (factorSiToUnit ) and the negation of the offset (offsetSiToUnit ) are applied.</p> $y \{siUnit\} := (x \{unit\} - offsetSiToUnit \{unit\}) / factorSiToUnit \{unit\}/\{siUnit\}$ <p><b>Tags:</b> atp.recommendedPackage=Units</p>			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <i>PackageableElement</i> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
displayName	SingleLanguageUnitNames	0..1	aggr	<p>This specifies how the unit shall be displayed in documents or in user interfaces of tools. The displayName corresponds to the Unit.Display in an ASAM MCD-2MC file.</p> <p><b>Tags:</b> xml.sequenceOffset=20</p>
factorSiToUnit	Float	0..1	attr	<p>This is the factor for the conversion from SI Units to units. The inverse is used for conversion from units to SI Units.</p> <p><b>Tags:</b> xml.sequenceOffset=30</p>





Class	Unit			
offsetSiToUnit	Float	0..1	attr	This is the offset for the conversion from and to siUnits. <b>Tags:</b> xml.sequenceOffset=40
physical Dimension	<a href="#">PhysicalDimension</a>	0..1	ref	This association represents the physical dimension to which the unit belongs to. Note that only values with units of the same physical dimensions might be converted. <b>Tags:</b> xml.sequenceOffset=50

**Table A.1061: Unit**

Primitive	UnlimitedInteger
<b>Note</b>	An instance of UnlimitedInteger is an element in the set of integer numbers ( ..., -2, -1, 0, 1, 2, ...). The range is limited by constraint 2534. The value can be expressed in decimal, octal, hexadecimal and binary representation. Negative numbers can only be expressed in decimal notation. <b>Tags:</b> xml.xsd.customType=UNLIMITED-INTEGER xml.xsd.pattern=0 [\+ -]?[1-9][0-9]*[0[xX]][0-9a-fA-F]+ 0[bB][0-1]+ 0[0-7]+ xml.xsd.type=string

**Table A.1062: UnlimitedInteger**

Class	UserDefinedIPdu			
<b>Note</b>	UserDefinedIPdu allows to describe PDU-based communication over Complex Drivers. If a new BSW module is added above the PduR (e.g. a Diagnostic Service ) then this IPdu element shall be used to describe the communication. <b>Tags:</b> atp.recommendedPackage=Pdus			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">IPdu</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
cddType	String	0..1	attr	This attribute defines the CDD that transmits or receives the UserDefinedPdu. If several CDDs are defined this attribute is used to distinguish between them.

**Table A.1063: UserDefinedIPdu**

Class	UserDefinedPdu			
<b>Note</b>	UserDefinedPdu allows to describe PDU-based communication over Complex Drivers. If a new BSW module is added above the BusIf (e.g. a new Nm module) then this Pdu element shall be used to describe the communication. <b>Tags:</b> atp.recommendedPackage=Pdus			
<b>Base</b>	<a href="#">ARElement</a> , <a href="#">ARObject</a> , <a href="#">CollectableElement</a> , <a href="#">FibexElement</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Pdu</a> , <a href="#">Referrable</a> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
cddType	String	0..1	attr	This attribute defines the CDD that transmits or receives the UserDefinedIPdu. If several CDDs are defined this attribute is used to distinguish between them.

**Table A.1064: UserDefinedPdu**

<b>Class</b>	<b>UserDefinedPhysicalChannel</b>			
<b>Note</b>	This element allows the modeling of arbitrary Physical Channels.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PhysicalChannel</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">CommunicationCluster.physicalChannel</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.1065: UserDefinedPhysicalChannel**

<b>Class</b>	«atpMixed» <b>ValueList</b>			
<b>Note</b>	This is a generic list of numerical values.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">RuleBasedAxisCont.swArraysize</a> , <a href="#">RuleBasedValueCont.swArraysize</a> , <a href="#">SwAxisCont.swArraysize</a> , <a href="#">SwServiceArg.swArraysize</a> , <a href="#">SwValueCont.swArraysize</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
v	<a href="#">Numerical</a>	0..1	attr	This is a particular numerical value without variation. <b>Tags:</b> xml.sequenceOffset=30
vf (ordered)	<a href="#">Numerical</a>	*	attr	This is one entry in the list of numerical values <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.roleElement=true xml.roleWrapperElement=false xml.typeElement=false xml.typeWrapperElement=false

**Table A.1066: ValueList**

<b>Class</b>	<b>ValueSpecification</b> (abstract)			
<b>Note</b>	Base class for expressions leading to a value which can be used to initialize a data object.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	<a href="#">AbstractRuleBasedValueSpecification</a> , <a href="#">ApplicationValueSpecification</a> , <a href="#">CompositeValueSpecification</a> , <a href="#">ConstantReference</a> , <a href="#">NotAvailableValueSpecification</a> , <a href="#">NumericalValueSpecification</a> , <a href="#">ReferenceValueSpecification</a> , <a href="#">TextValueSpecification</a>			
<b>Aggregated by</b>	ApplicationAssocMapElementValueSpecification.key, ApplicationAssocMapElementValueSpecification.value, <a href="#">ArrayValueSpecification.element</a> , <a href="#">CalibrationParameterValue.applInitValue</a> , <a href="#">CalibrationParameterValue.implInitValue</a> , <a href="#">ConstantSpecification.valueSpec</a> , <a href="#">CryptoServiceKey.developmentValue</a> , <a href="#">DiagnosticEnvDataCondition.compareValue</a> , <a href="#">DiagnosticEnvDataElementCondition.compareValue</a> , <a href="#">DiagnosticEnvSovdDataCondition.compareValue</a> , <a href="#">FieldSenderComSpec.initValue</a> , <a href="#">ISignal.initValue</a> , <a href="#">ISignal.receptionDefaultValue</a> , <a href="#">ISignal.timeoutSubstitutionValue</a> , <a href="#">NonqueuedReceiverComSpec.initValue</a> , <a href="#">NonqueuedReceiverComSpec.timeoutSubstitutionValue</a> , <a href="#">NonqueuedSenderComSpec.initValue</a> , <a href="#">NvProvideComSpec.ramBlockInitValue</a> , <a href="#">NvProvideComSpec.romBlockInitValue</a> , <a href="#">NvRequireComSpec.initValue</a> , <a href="#">ParameterDataPrototype.initValue</a> , <a href="#">ParameterProvideComSpec.initValue</a> , <a href="#">ParameterRequireComSpec.initValue</a> , <a href="#">PersistencyDataRequiredComSpec.initValue</a> , <a href="#">PersistencyKeyValuePair.initValue</a> , <a href="#">PortDefinedArgumentValue.value</a> , <a href="#">PortPrototypeBlueprintInitValue.value</a> , <a href="#">RecordValueSpecification.field</a> , <a href="#">SomeipEventDeployment.eventReceptionDefaultValue</a> , <a href="#">StateManagementCompareCondition.compareValue</a> , <a href="#">SwDataDefProps.invalidValue</a> , <a href="#">UserDefinedEventDeployment.eventReceptionDefaultValue</a> , <a href="#">VariableDataPrototype.initValue</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
shortLabel	<a href="#">Identifier</a>	0..1	attr	This can be used to identify particular value specifications for human readers, for example elements of a record type.

**Table A.1067: ValueSpecification**

Class	VariableAccess			
Note	The presence of a <code>VariableAccess</code> implies that a <code>RunnableEntity</code> needs access to a <code>VariableDataPrototype</code> . The kind of access is specified by the role in which the class is used.			
Base	<code>ARObject</code> , <code>AbstractAccessPoint</code> , <code>AtpClassifier</code> , <code>AtpFeature</code> , <code>AtpStructureElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>Referrable</code>			
Aggregated by	<code>AtpClassifier.atpFeature</code> , <code>ReceiverComSpec.replaceWith</code> , <code>RunnableEntity.dataReadAccess</code> , <code>RunnableEntity.dataReceivePointByArgument</code> , <code>RunnableEntity.dataReceivePointByValue</code> , <code>RunnableEntity.dataSendPoint</code> , <code>RunnableEntity.dataWriteAccess</code> , <code>RunnableEntity.readLocalVariable</code> , <code>RunnableEntity.writtenLocalVariable</code>			
Attribute	Type	Mult.	Kind	Note
accessed Variable	<code>AutosarVariableRef</code>	0..1	aggr	This denotes the accessed variable.
scope	<code>VariableAccessScope Enum</code>	0..1	attr	This attribute allows for constraining the scope of the corresponding communication. For example, it possible to express whether the communication is intended to cross the boundary of an ECU or whether it is intended not to cross the boundary of a single partition.

Table A.1068: VariableAccess

Class	VariableAndParameterInterfaceMapping			
Note	Defines the mapping of <code>VariableDataPrototypes</code> or <code>ParameterDataPrototypes</code> in context of two different <code>SenderReceiverInterfaces</code> , <code>NvDataInterfaces</code> or <code>ParameterInterfaces</code> .			
Base	<code>ARObject</code> , <code>AtpBlueprint</code> , <code>AtpBlueprintable</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PortInterfaceMapping</code> , <code>Referrable</code>			
Aggregated by	<code>PortInterfaceMappingSet.portInterfaceMapping</code>			
Attribute	Type	Mult.	Kind	Note
dataMapping	<code>DataPrototypeMapping</code>	*	aggr	Defines the mapping of two particular <code>VariableDataPrototypes</code> or <code>ParameterDataPrototypes</code> with unequal names and/or unequal semantic (resolution or range) in context of two different <code>SenderReceiverInterfaces</code> , <code>NvDataInterfaces</code> or <code>ParameterInterfaces</code> <b>Stereotypes:</b> <code>atpSplitable</code> <b>Tags:</b> <code>atp.Splitkey=dataMapping</code>

Table A.1069: VariableAndParameterInterfaceMapping

Class	VariableDataPrototype			
Note	A <code>VariableDataPrototype</code> represents a formalized generic piece of information that is typically mutable by the application software layer. <code>VariableDataPrototype</code> is used in various contexts and the specific context gives the otherwise generic <code>VariableDataPrototype</code> a dedicated semantics.			
Base	<code>ARObject</code> , <code>AtpFeature</code> , <code>AtpPrototype</code> , <code>AutosarDataPrototype</code> , <code>DataPrototype</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>Referrable</code>			
Aggregated by	<code>ApplicationInterface.indication</code> , <code>AtpClassifier.atpFeature</code> , <code>BswInternalBehavior.arTypedPerInstanceMemory</code> , <code>BswModuleDescription.providedData</code> , <code>BswModuleDescription.requiredData</code> , <code>BulkNvDataDescriptor.bulkNvBlock</code> , <code>DiagnosticSovdAccessArgument.contentObject</code> , <code>InternalBehavior.staticMemory</code> , <code>NvBlockDescriptor.ramBlock</code> , <code>NvDataInterface.nvData</code> , <code>SenderReceiverInterface.dataElement</code> , <code>ServiceInterface.event</code> , <code>SwcInternalBehavior.arTypedPerInstanceMemory</code> , <code>SwcInternalBehavior.explicitInterRunnableVariable</code> , <code>SwcInternalBehavior.implicitInterRunnableVariable</code>			
Attribute	Type	Mult.	Kind	Note
initValue	<code>ValueSpecification</code>	0..1	aggr	Specifies initial value(s) of the <code>VariableDataPrototype</code>

Table A.1070: VariableDataPrototype

Class	VariableDataPrototypeInSystemInstanceRef			
Note				
Base	ARObject, <a href="#">AtpInstanceRef</a>			
Aggregated by	<a href="#">CyclicHandlingComDataToOsTaskProxyMapping.variableDataPrototype</a> , <a href="#">PortElementToCommunicationResourceMapping.variableDataPrototype</a> , <a href="#">QueuedReceiverComSpecProps.dataElement</a> , <a href="#">SenderReceiverCompositeElementToSignalMapping.dataElement</a> , <a href="#">SenderReceiverToSignalGroupMapping.dataElement</a> , <a href="#">SenderReceiverToSignalMapping.dataElement</a> , <a href="#">SignalServiceTranslationEventProps.translationTarget</a> , <a href="#">SwcToSwcSignal.dataElement</a>			
Attribute	Type	Mult.	Kind	Note
base	<a href="#">System</a>	0..1	ref	<b>Stereotypes:</b> atpDerived
context Component (ordered)	<a href="#">SwComponent Prototype</a>	*	ref	
context Composition	<a href="#">RootSwComposition Prototype</a>	0..1	ref	
contextPort	<a href="#">PortPrototype</a>	1	ref	
targetData Prototype	<a href="#">VariableDataPrototype</a>	0..1	ref	

**Table A.1071: VariableDataPrototypeInSystemInstanceRef**

Class	VariableInAtomicSWCTypeInstanceRef			
Note				
Base	ARObject, <a href="#">AtpInstanceRef</a>			
Aggregated by	<a href="#">AutosarVariableRef.autosarVariable</a>			
Attribute	Type	Mult.	Kind	Note
base	<a href="#">AtomicSwComponent Type</a>	0..1	ref	<b>Stereotypes:</b> atpDerived <b>Tags:</b> xml.sequenceOffset=10
contextData Prototype (ordered)	<a href="#">ApplicationComposite ElementDataPrototype</a>	*	ref	This is the context in a compositeDataType. <b>Tags:</b> xml.sequenceOffset=40
portPrototype	<a href="#">PortPrototype</a>	0..1	ref	This is the port providing the parameter or the entry point to the parameter structure. <b>Tags:</b> xml.sequenceOffset=20
rootVariable DataPrototype	<a href="#">VariableDataPrototype</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=30
targetData Prototype	<a href="#">DataPrototype</a>	0..1	ref	This is the target of the instance ref. Note that it shall be one of ApplicationCompositeElementDataPrototype of VariableDataPrototype. <b>Tags:</b> xml.sequenceOffset=50

**Table A.1072: VariableInAtomicSWCTypeInstanceRef**

Class	VariationPoint			
Note	This meta-class represents the ability to express a "structural variation point". The container of the variation point is part of the selected variant if swSyscond evaluates to true and each postBuildVariant Criterion is fulfilled.			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note







Class	VariationPoint			
blueprintCondition	<a href="#">DocumentationBlock</a>	0..1	aggr	This represents a description that documents how the variation point shall be resolved when deriving objects from the blueprint. Note that variationPoints are not allowed within a blueprintCondition. <b>Tags:</b> xml.sequenceOffset=28
desc	MultiLanguageOverviewParagraph	0..1	aggr	This allows to describe shortly the purpose of the variation point. <b>Tags:</b> xml.sequenceOffset=20
formalBlueprintGenerator	BlueprintGenerator	0..1	aggr	This represents a description that documents how the variation point shall be resolved when deriving objects from the blueprint by using ARMQL. Note that variationPoints are not allowed within a formalBlueprintGenerator. <b>Tags:</b> atp.Status=draft xml.sequenceOffset=30
postBuildVariantCondition	<a href="#">PostBuildVariantCondition</a>	*	aggr	This is the set of post build variant conditions which all shall be fulfilled in order to (postbuild) bind the variation point. <b>Tags:</b> xml.sequenceOffset=40
sdg	Sdg	0..1	aggr	An optional special data group is attached to every variation point. These data can be used by external software systems to attach application specific data. For example, a variant management system might add an identifier, an URL or a specific classifier. <b>Tags:</b> xml.sequenceOffset=50
shortLabel	<a href="#">Identifier</a>	0..1	attr	This provides a name to the particular variation point to support the RTE generator. It is necessary for supporting splittable aggregations and if binding time is later than codeGenerationTime, as well as some RTE conditions. It needs to be unique with in the enclosing Identifiables with the same ShortName. <b>Stereotypes:</b> atpIdentityContributor <b>Tags:</b> xml.sequenceOffset=10
swSyscond	<a href="#">ConditionByFormula</a>	0..1	aggr	This condition acts as Binding Function for the Variation Point. Note that the multiplicity is 0..1 in order to support pure postBuild variants. <b>Tags:</b> xml.sequenceOffset=30

**Table A.1073: VariationPoint**

Class	VariationPointProxy			
<b>Note</b>	The VariationPointProxy represents variation points of the C/C++ implementation. In case of bindingTime = compileTime the RTE provides defines which can be used for Pre Processor directives to implement compileTime variability.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">BswInternalBehavior.variationPointProxy</a> , <a href="#">SwcInternalBehavior.variationPointProxy</a>			
Attribute	Type	Mult.	Kind	Note
conditionAccess	<a href="#">ConditionByFormula</a>	0..1	aggr	This condition acts as Binding Function for the Variation Point.
implementationDataType	<a href="#">AbstractImplementationDataType</a>	0..1	ref	This association to ImplementationDataType shall be taken as an implementation hint by the RTE generator.





Class	VariationPointProxy			
postBuildValueAccess	PostBuildVariantCriterion	0..1	ref	This represents the applicable PostBuildVariantCriterion in the context of a VariationPointProxy. Note that the technical details how to access the particular postBuildValueAccess are still considered internal to the RTE and are consequently not standardized.
postBuildVariantCondition	<a href="#">PostBuildVariantCondition</a>	*	aggr	This represents that applicable PostBuildVariantCondition in the context of aVariationPointProxy.
valueAccess	<a href="#">AttributeValueVariationPoint</a>	0..1	aggr	This value acts as Binding Function for the VariationPoint.

**Table A.1074: VariationPointProxy**

Class	VfbTiming			
<b>Note</b>	A model element used to define timing descriptions and constraints at VFB level. TimingDescriptions aggregated by VfbTiming are restricted to event chains referring to events which are derived from the class TDEventVfb. <b>Tags:</b> atp.recommendedPackage=TimingExtensions			
<b>Base</b>	ARElement, ARObjct, AtpBlueprint, AtpBlueprintable, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a> , <a href="#">TimingExtension</a>			
<b>Aggregated by</b>	<a href="#">ARPackage.element</a>			
Attribute	Type	Mult.	Kind	Note
component	<a href="#">SwComponentType</a>	0..1	ref	This defines the scope of a VfbTiming. All corresponding timing descriptions and constraints shall be defined within this scope.

**Table A.1075: VfbTiming**

Class	VlanConfig			
<b>Note</b>	VLAN Configuration attributes			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">EthernetPhysicalChannel.vlan</a>			
Attribute	Type	Mult.	Kind	Note
vlanIdentifier	PositiveInteger	0..1	attr	A VLAN is identified by this attribute according to IEEE 802.1Q. The allowed values range is from 0..4095.

**Table A.1076: VlanConfig**

Class	VlanMembership			
<b>Note</b>	Static logical channel or VLAN binding to a switch-port. The reference to an EthernetPhysicalChannel without a VLAN defined represents the handling of untagged frames.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">CouplingPort.vlanMembership</a>			
Attribute	Type	Mult.	Kind	Note





Class	VlanMembership			
defaultPriority	PositiveInteger	0..1	attr	Standard output-priority outgoing Frames will be tagged with. Defines the priority that received frames are assigned together with the VLAN Id (defaultVlan). The values from 0 (best effort) to 7 (highest) are allowed. In case modifyVlan and an already tagged received frame, the actual priority of the received frame is not modified.
dhcpAddress Assignment	DhcpServer Configuration	0..1	aggr	Specifies the IP Address which will be assigned to a DHCP Client at this SwitchPort. If no dhcpAddress Assignment is provided all DHCP-Discover messages received at this Port will be discarded by the DHCP Server.
sendActivity	EthernetSwitchVlan EgressTaggingEnum	0..1	attr	Attribute denotes whether a VLAN tagged ethernet frame will be 1. sent with its VLAN tag (sentTagged) 2. sent without a VLAN tag (sentUntagged) 3. will be dropped at this port (notSent or VLAN not member of this list)
vlan	<a href="#">EthernetPhysical Channel</a>	0..1	ref	References a channel that represents a VLAN or an untagged channel.

**Table A.1077: VlanMembership**

Class	WaitPoint			
Note	This defines a wait-point for which the <a href="#">RunnableEntity</a> can wait.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">RunnableEntity.waitPoint</a>			
Attribute	Type	Mult.	Kind	Note
timeout	TimeValue	0..1	attr	Time in seconds before the WaitPoint times out and the blocking wait call returns with an error indicating the timeout.
trigger	<a href="#">RTEEvent</a>	0..1	ref	This is the <a href="#">RTEEvent</a> this WaitPoint is waiting for.

**Table A.1078: WaitPoint**

Class	WorstCaseHeapUsage			
Note	Provides a formal worst case heap usage.			
Base	<a href="#">ARObject</a> , <a href="#">HeapUsage</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
Aggregated by	<a href="#">ResourceConsumption.heapUsage</a>			
Attribute	Type	Mult.	Kind	Note
memory Consumption	PositiveInteger	0..1	attr	Worst case heap consumption. Unit: byte.

**Table A.1079: WorstCaseHeapUsage**

Class	WorstCaseStackUsage			
Note	Provides a formal worst case stack usage.			
Base	<a href="#">ARObject</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">StackUsage</a>			
Aggregated by	<a href="#">ResourceConsumption.stackUsage</a>			





Class	WorstCaseStackUsage			
Attribute	Type	Mult.	Kind	Note
memory Consumption	PositiveInteger	0..1	attr	Worst case stack consumption. Unit: byte.

**Table A.1080: WorstCaseStackUsage**

Class	Xdoc			
Note	This meta-class represents the ability to refer to an external document which can be rendered as printed matter.			
Base	ARObject, <a href="#">Referrable</a> , <a href="#">SingleLanguageReferrable</a>			
Aggregated by	<a href="#">MixedContentForParagraph.xdoc</a>			
Attribute	Type	Mult.	Kind	Note
date	DateTime	0..1	attr	This element specifies the release date of the external document if applicable. <b>Tags:</b> xml.sequenceOffset=50
number	String	0..1	attr	This represents document number of an external document that is referenced. Kept as a string. <b>Tags:</b> xml.sequenceOffset=30
position	String	0..1	attr	This represents the reference to the relevant positions of a standard. Kept as a string. <b>Tags:</b> xml.sequenceOffset=80
publisher	String	0..1	attr	This represents the publisher of an external document that is being referenced. Kept as a string. <b>Tags:</b> xml.sequenceOffset=60
state	String	0..1	attr	This represents version and state of the external document. Kept as a string. <b>Tags:</b> xml.sequenceOffset=40
url	Url	0..1	aggr	This specifies the URL of the external document. <b>Tags:</b> xml.sequenceOffset=70

**Table A.1081: Xdoc**

Class	Xfile			
Note	This represents to reference an external file within a documentation.			
Base	ARObject, <a href="#">Referrable</a> , <a href="#">SingleLanguageReferrable</a>			
Aggregated by	<a href="#">MixedContentForParagraph.xfile</a>			
Attribute	Type	Mult.	Kind	Note
tool	String	0..1	attr	This element describes the tool which was used to generate the corresponding Xfile . Kept as a string since no specific syntax can be provided to denote a tool. <b>Tags:</b> xml.sequenceOffset=50
toolVersion	String	0..1	attr	This element describes the tool version which was used to generate the corresponding xfile. Kept as a string, since no specific syntax can be specified. <b>Tags:</b> xml.sequenceOffset=60
url	Url	0..1	aggr	This represents the URL of the external file. <b>Tags:</b> xml.sequenceOffset=30

**Table A.1082: Xfile**

<b>Class</b>	<b>XrefTarget</b>			
<b>Note</b>	This element specifies a reference target which can be scattered throughout the text.			
<b>Base</b>	ARObject, <a href="#">Referrable</a> , <a href="#">SingleLanguageReferrable</a>			
<b>Aggregated by</b>	<a href="#">MixedContentForOverviewParagraph.xrefTarget</a> , <a href="#">MixedContentForParagraph.xrefTarget</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table A.1083: XrefTarget**

## B Change history of AUTOSAR traceable items

Please note that the lists in this chapter also include traceable items that have been removed from the specification in a later version. These items do not appear as hyperlinks in the document.

### B.1 Traceable item history of this document according to AUTOSAR Release R25-11

#### B.1.1 Added Constraints in R25-11

Number	Heading
[ <a href="#">constr_10632</a> ]	Compatibility of <a href="#">SwTextProps</a>
[ <a href="#">constr_10642</a> ]	Existence of <a href="#">DiagnosticEventPortMapping.diagnosticEvent</a> for one specific <a href="#">DiagnosticEvent</a>
[ <a href="#">constr_10645</a> ]	Value of <a href="#">DiagnosticEvent.confirmationThreshold</a> for an n:1 mapping to <a href="#">DiagnosticTroubleCodeUds</a>
[ <a href="#">constr_10646</a> ]	Value of attributes of <a href="#">DiagnosticConnectedIndicator</a> for an n:1 mapping to <a href="#">DiagnosticTroubleCodeUds</a> where all affected <a href="#">DiagnosticEvents</a> transitively refer to the identical <a href="#">DiagnosticIndicator</a>
[ <a href="#">constr_10647</a> ]	In an n:1 mapping between <a href="#">DiagnosticEvent</a> and <a href="#">DiagnosticTroubleCodeUds</a> , all <a href="#">DiagnosticEvents</a> shall be mapped to the same <a href="#">DiagnosticOperationCycle</a>
[ <a href="#">constr_10656</a> ]	Value of a <a href="#">SwSystemconst</a> used in the context of the <i>formula language for post-build configuration</i>
[ <a href="#">constr_10665</a> ]	Existence of attribute <a href="#">DiagnosticCommonProps.authenticationTimeout</a>
[ <a href="#">constr_10667</a> ]	Simple compatibility of <a href="#">ImplementationDataTypes</a>
[ <a href="#">constr_10668</a> ]	Restriction for the existence of attributes of <a href="#">RunnableEntityArgument</a> for port-defined argument values
[ <a href="#">constr_10669</a> ]	Existence of reference <a href="#">RunnableEntityArgument.implementationDataType</a>
[ <a href="#">constr_10670</a> ]	Compatibility between the corresponding <a href="#">ClientServerOperation.argument</a> and <a href="#">RunnableEntity.argument</a>
[ <a href="#">constr_10671</a> ]	<a href="#">ReceptionComSpecProps.comHandlerTaskMappingEnabled</a> vs. implicit data read access
[ <a href="#">constr_10672</a> ]	Applicability of <a href="#">transportErrorCountEnabled</a> , <a href="#">valueErrorCountEnabled</a> , <a href="#">returnNoNewDataEnabled</a>
[ <a href="#">constr_10673</a> ]	Existence of <a href="#">ReceptionComSpecProps.comHandlerTaskMappingEnabled</a> vs. <a href="#">ReceptionComSpecProps.timeout</a>
[ <a href="#">constr_10674</a> ]	Existence of attribute <a href="#">ReceptionComSpecProps.outOfRangeBitfieldErrorsEnabled</a>
[ <a href="#">constr_10675</a> ]	Existence of attribute <a href="#">ReceptionComSpecProps.invalidValueBitfieldErrorsEnabled</a>





Number	Heading
[constr_10676]	Allowed attribute of attribute <a href="#">DiagnosticExtendedDataRecordElement.swDataDefProps</a>
[constr_10677]	Allowed values for attribute <a href="#">DiagnosticExtendedDataRecordElement.swDataDefProps.baseType.baseTypeSize</a>
[constr_10678]	Existence of <a href="#">DiagnosticEdrSenderPortMapping.dataPrototype</a>
[constr_10679]	Existence of <a href="#">DiagnosticEdrSenderPortMapping.recordElement</a>
[constr_10680]	Existence of <a href="#">DiagnosticEdrServerPortMapping.swcServiceDependencyInSystem</a> vs. <a href="#">bswServiceDependency</a>
[constr_10681]	Existence of <a href="#">DiagnosticEdrServerPortMapping.recordElement</a>
[constr_10687]	Existence of reference <a href="#">ISignalPortToDiagnosticEventMapping.iSignalTriggering</a>
[constr_10688]	Existence of reference <a href="#">ISignalPortToDiagnosticEventMapping.iSignalPort</a>
[constr_10689]	Restriction for attribute <a href="#">communicationDirection</a> of an <a href="#">ISignalPort</a> that is referenced by <a href="#">ISignalPortToDiagnosticEventMapping</a>
[constr_13000]	Existence of reference in the role <a href="#">EcucContainerDef.destinationUri</a> for an <a href="#">EcucContainerDef</a> aggregated in the role <a href="#">EcucDestinationUriPolicy.container</a>
[constr_2641]	Mixed content elements cannot be split into different partial models
[constr_3796]	Applicable attributes of <a href="#">IEEE1722TpIidcConnection</a> for category <a href="#">IIDC</a>
[constr_3797]	Applicable attributes of <a href="#">IEEE1722TpIidcConnection</a> for category <a href="#">IEC61883</a>
[constr_3799]	DDS Fire & Forget Method definition
[constr_3800]	Existence of <a href="#">DdsCpServiceInstance.discoveryType</a>
[constr_3801]	Existence of <a href="#">DdsCpServiceInstance.serviceInterfaceId</a>
[constr_3802]	Existence of <a href="#">DdsCpServiceInstance.majorVersion</a>
[constr_3803]	Existence of <a href="#">DdsCpServiceInstance.serviceMinorVersion</a>
[constr_3804]	Existence of <a href="#">DdsCpServiceInstance.transportProtocol</a>
[constr_3805]	Existence of <a href="#">DdsServiceInstanceEventCp.eventTriggering</a>
[constr_3806]	Existence of <a href="#">DdsServiceInstanceOperationCp.operationRequestTriggering</a>
[constr_3807]	Existence of <a href="#">DdsServiceInstanceFieldCp</a> reference
[constr_3808]	Existence of <a href="#">DdsCpProvidedServiceInstance.providedServiceInstanceId</a>
[constr_3809]	Existence of <a href="#">DdsCpConsumedServiceInstance.requiredServiceInstanceId</a>
[constr_3810]	Value range of <a href="#">DdsCpProvidedServiceInstance.providedServiceInstanceId</a>
[constr_3811]	<a href="#">DdsCpProvidedServiceInstance.localUnicastAddress</a> shall be IP Unicast
[constr_3812]	<a href="#">DdsCpProvidedServiceInstance.staticRemoteUnicastAddress</a> shall be IP Unicast
[constr_3813]	<a href="#">DdsCpProvidedServiceInstance</a> unicast address references target





Number	Heading
[constr_3814]	Multiple <a href="#">SocketAddress</a> entries with the same IP Address and Port in the context of a given <a href="#">EcuInstance</a>
[constr_3815]	DDS Service communication is restricted to one VLAN
[constr_3816]	Value range of <a href="#">DdsCpConsumedServiceInstance.requiredServiceInstanceId</a>
[constr_3817]	<a href="#">DdsCpConsumedServiceInstance.localUnicastAddress</a> shall be IP Unicast
[constr_3818]	<a href="#">DdsCpConsumedServiceInstance.staticRemoteUnicastAddress</a> shall be IP Unicast
[constr_3819]	<a href="#">DdsCpConsumedServiceInstance</a> unicast address references target
[constr_3820]	DDS Service communication is restricted to one VLAN
[constr_3821]	DDS transformer configuration
[constr_3822]	No further transformers in scope of the DDS transformer
[constr_3824]	No <a href="#">explicitWakeupChannel</a> reference for <a href="#">channelSynchronousWakeup</a> = TRUE
[constr_9349]	An <a href="#">ISignal</a> shall not be used for SOME/IP and DDS transport at the same time
[constr_9354]	Definition of unconditional IPdu Timing
[constr_9355]	Category of <a href="#">HwElement</a> for <a href="#">EcuPartitionToCoreMapping</a>
[constr_9357]	Existence of attributes of <a href="#">McDataInstance</a> depending on the category
[constr_9358]	<a href="#">ISignal</a> that references a <a href="#">DataTransformation</a> shall have the <a href="#">dataTypePolicy</a> set to <a href="#">transformingISignal</a>
[constr_9359]	Different <a href="#">EcuPartitionToCoreMapping.coreId</a> attribute values shall not be assigned to the same <a href="#">processingUnit</a>
[constr_9360]	<a href="#">DataMapping</a> not available for elements of <a href="#">PortInterfaces</a> with <a href="#">isService</a> = true
[constr_9361]	<a href="#">FlatInstanceDescriptor.dataPrototype</a> reference restriction
[constr_9362]	Mutually exclusive existence of <a href="#">FlatInstanceDescriptor.dataPrototype</a> and <a href="#">FlatInstanceDescriptor.bswImplementation</a> vs. <a href="#">FlatInstanceDescriptor.ecuExtractReference</a>
[constr_9363]	<a href="#">FlatInstanceDescriptor.dataPrototype</a> and <a href="#">FlatInstanceDescriptor.bswImplementation</a>
[constr_9366]	<a href="#">GlobalTimeSlave.followUpTimeoutValue</a> not applicable to <a href="#">GlobalTimeFrSlave</a>
[constr_9367]	Definition of several local <a href="#">ApplicationEndpoints</a> with identical properties (IP, Port, Protocol) is forbidden
[constr_9368]	Applicable attributes for an Ethernet switch
[constr_9369]	Applicable attributes for an Ethernet node on the classic platform
[constr_9371]	Compatibility of <a href="#">CompuMethod</a> defined in the context of a <a href="#">SystemSignal</a> and <a href="#">CompuMethod</a> defined in the context of the <a href="#">DataPrototype</a> in a <a href="#">RPortPrototype</a> mapped to the <a href="#">SystemSignal</a>
[constr_9372]	Compatibility of <a href="#">CompuMethod</a> defined in the context of a <a href="#">SystemSignal</a> and <a href="#">CompuMethod</a> defined in the context of the <a href="#">DataPrototype</a> in a <a href="#">PPortPrototype</a> mapped to the <a href="#">SystemSignal</a>







Number	Heading
[constr_9373]	Compatibility of <code>DataConstr</code> between <code>SystemSignal</code> and <code>DataPrototype</code> in a <code>PPortPrototype</code>
[constr_9374]	Compatibility of <code>DataConstr</code> between <code>SystemSignal</code> and <code>DataPrototype</code> in a <code>RPortPrototype</code>
[constr_9375]	Compatibility of <code>CompuScales</code> defined in the context of a <code>SystemSignal</code> and <code>CompuScales</code> defined in the context of a <code>DataPrototype</code> of a <code>PPortPrototype</code> mapped to the <code>SystemSignal</code>
[constr_9376]	Compatibility of <code>CompuScales</code> defined in the context of a <code>SystemSignal</code> and <code>CompuScales</code> defined in the context of a <code>DataPrototype</code> of a <code>RPortPrototype</code> mapped to the <code>SystemSignal</code>
[constr_9377]	<code>J1939Node.pduTriggering</code> reference restriction
[constr_9378]	<code>J1939Nodes</code> on the same <code>EcuInstance</code> shall not share <code>PduTriggerings</code>
[constr_9379]	Consistent mapping of software-component to <code>J1939Node</code>
[constr_9380]	Consistent mapping of <code>J1939ControllerApplication</code> to <code>EcuInstance</code>
[constr_9381]	<code>J1939Node</code> shall be referenced by a single <code>J1939ControllerApplicationToJ1939NodeMapping</code>
[constr_9382]	<code>AppOsTaskProxyToEcuTaskProxyMapping.appTaskProxy</code> shall only target <code>AppTaskProxy</code>
[constr_9383]	<code>AppOsTaskProxyToEcuTaskProxyMapping.ecuTaskProxy</code> shall only target <code>EcuTaskProxy</code>
[constr_9384]	Relation between both <code>CyclicHandlingComDataToOsTaskProxyMapping.rxCycleProcessTime</code> and <code>CyclicHandlingComDataToOsTaskProxyMapping.offset</code> and <code>OsTaskProxy.period</code>
[constr_9385]	Existence of <code>CyclicHandlingComDataToOsTaskProxyMapping.osTaskProxy</code>
[constr_9386]	Existence of <code>CyclicHandlingComDataToOsTaskProxyMapping.variableDataPrototype</code>
[constr_9387]	One <code>CyclicHandlingComDataToOsTaskProxyMapping</code> for every <code>VariableDataPrototype</code> with <code>ReceptionComSpecProps.comHandlerTaskMappingEnabled = TRUE</code>
[constr_9388]	<code>CanNmNode.txNmPdu</code> reference restriction
[constr_9389]	<code>UdpNmNode.txNmPdu</code> reference restriction
[constr_9390]	<code>J1939NmNode.txNmPdu</code> reference restriction
[constr_9391]	<code>FlexrayNmNode.txNmPdu</code> reference restriction
[constr_9395]	Each call <code>ISignal</code> shall have exactly one corresponding return <code>ISignal</code> that is associated with the same <code>ClientServerOperation</code> and <code>PhysicalChannel</code>
[constr_9396]	<code>SomeipTpConnection.tpConcurrentProcessingSdu</code> reference restriction
[constr_9397]	Exclusive usage of <code>tpSdu</code> or <code>tpConcurrentProcessingSdu</code>

**Table B.1: Added Constraints in R25-11**

## B.1.2 Changed Constraints in R25-11

Number	Heading
[constr_10044]	Existence of attribute <a href="#">DiagnosticCommonProps.occurrenceCounterProcessing</a>
[constr_10072]	Allowed multiplicities of <a href="#">SenderComSpec</a> attributes for communication between <a href="#">NvBlockSwComponentType</a> and <a href="#">ApplicationSwComponentType</a>
[constr_10089]	Existence of attribute <a href="#">DiagnosticCommonProps.eventCombinationReportingBehavior</a>
[constr_1022]	Limits shall be defined for each direction of <a href="#">CompuMethod</a>
[constr_10368]	Restriction regarding the reference <a href="#">DiagnosticDataIdentifierSet.diagnosticDataIdentifier</a>
[constr_1050]	Extended compatibility of <a href="#">ImplementationDataTypes</a>
[constr_1051]	Compatibility of <a href="#">SwDataDefProps</a>
[constr_1311]	Appearance of safety-related possible values of <a href="#">SwAddrMethod.option</a>
[constr_1375]	Existence of attributes of <a href="#">CompuMethod</a> and related meta-classes depending on the value of the <a href="#">category</a>
[constr_1381]	Appearance of core-related possible values of <a href="#">SwAddrMethod.option</a>
[constr_1402]	Applicability of core-related possible values of <a href="#">SwAddrMethod.option</a> related to <a href="#">SwAddrMethod.sectionInitializationPolicy</a>
[constr_1435]	Debouncing in the presence of a <a href="#">DiagnosticEventPortMapping</a>
[constr_1669]	Existence of <a href="#">PduTriggering.secOcCryptoServiceMapping</a>
[constr_1756]	Existence of attributes <a href="#">DiagnosticExtendedDataRecord.trigger</a> and <a href="#">update</a>
[constr_1760]	Existence of <a href="#">DiagnosticExtendedDataRecord.element</a>
[constr_1768]	Existence of attribute <a href="#">DiagnosticEvent.associatedEventIdentification</a>
[constr_1847]	Existence of reference <a href="#">DiagnosticEdrDataProviderMapping.extendedDataRecordElement</a>
[constr_2502]	Merged model shall be compliant to the meta-model
[constr_2515]	Categories of packages shall not conflict
[constr_2549]	Units of input axis shall be consistent
[constr_2550]	Units of value axis shall be consistent
[constr_2630]	M1 elements with same identity but different type are not allowed
[constr_3021]	Mapping of <a href="#">SensorActuatorSwComponents</a> to <a href="#">SensorActuatorHwElements</a>
[constr_3060]	Allowed Attributes for <a href="#">networkRepresentationProps</a> and <a href="#">physicalProps</a>
[constr_3082]	Value of category in <a href="#">GeneralPurposeIPdu</a>
[constr_3096]	Allowed values for <a href="#">diagnosticMessageType</a>
[constr_3102]	Restriction on usage of <a href="#">J1939NodeName</a> attributes
[constr_3120]	Applicable attributes when <a href="#">destinationUriNestingContract</a> is set to <a href="#">targetContainer</a>





Number	Heading
[constr_3215]	<code>TransformationTechnology.version</code> and <code>TransformationTechnology.protocol</code> settings for request and response of a client/server communication on the same <code>TransformationTechnology</code>
[constr_3249]	Category of <code>HwElement</code> for <code>SwcToEcuMapping</code>
[constr_3263]	Restriction of usage of <code>SwcToEcuMapping</code> in a <code>System</code>
[constr_3266]	<code>TransformationTechnology.hasInternalState</code> setting for a SOME/IP Transformer
[constr_3739]	Value of <code>ISignal.dataTypePolicy</code> for all <code>ISignals</code> associated with a <code>DdsCpServiceInstance</code>
[constr_3740]	Existence of <code>DdsServiceInstanceEventCp.ddsEventTopic</code>
[constr_4526]	Specifying <code>maxCycleRepetitions</code> and <code>maxSlotsPerCycle</code> in a Repetitive Execution Order Constraint
[constr_4529]	Number of nested elements referenced by the <i>root</i> <code>EOCExecutableEntityRefGroup</code>
[constr_4531]	Number of nested elements referenced by <code>EOCExecutableEntityRefGroup</code> representing a cycle
[constr_4540]	<code>maxCycleRepetitions</code> and <code>maxSlotsPerCycle</code> shall not be zero
[constr_5273]	One <code>ISignalTriggering</code> pair allowed per <code>EthernetPhysicalChannel</code> for a <code>ClientServerOperation</code>
[constr_5378]	<code>PduTriggering</code> shall only be referenced once from a <code>SomeipTpConnection</code> in the role <code>tpSdu</code> or <code>tpConcurrentProcessingSdu</code>
[constr_5521]	<code>multiplicityConfigClass</code> attribute of <code>symbolicNameValue</code> parameters
[constr_5522]	<code>postBuildVariantMultiplicity</code> attribute of <code>symbolicNameValue</code> parameters
[constr_6900]	Dual existence of <code>TDEventVfb.portPrototype</code> and <code>TDEventVfb.portPrototypeBlueprint</code>
[constr_6914]	Restriction of the <code>portPrototype</code> context of an <code>AgeConstraint</code>

**Table B.2: Changed Constraints in R25-11**

### B.1.3 Deleted Constraints in R25-11

Number	Heading
[constr_1000]	End-to-end protection is limited to sender/receiver communication
[constr_1001]	Value of <code>dataId</code> shall be unique
[constr_1002]	End-to-end protection does not support n:1 communication
[constr_1025]	Avoid division by zero in rational formula
[constr_10371]	<code>DiagnosticDataElements</code> owned by a <code>DiagnosticExtendedDataRecord</code>
[constr_1040]	Conversion of <code>SenderReceiverInterfaces</code>
[constr_1041]	Conversion of <code>ClientServerInterfaces</code>
[constr_10548]	Uniqueness of <code>ReceiverComSpec.dataElement</code>





Number	Heading
[constr_10549]	Uniqueness of <a href="#">SenderComSpec.dataElement</a>
[constr_10550]	Uniqueness of <a href="#">ClientComSpec.operation</a>
[constr_10551]	Uniqueness of <a href="#">ServerComSpec.operation</a>
[constr_10552]	Uniqueness of <a href="#">ModeSwitchSenderComSpec.modeGroup</a>
[constr_10553]	Uniqueness of <a href="#">ModeSwitchReceiverComSpec.modeGroup</a>
[constr_10554]	Uniqueness of <a href="#">ParameterProvideComSpec.parameter</a>
[constr_10555]	Uniqueness of <a href="#">ParameterRequireComSpec.parameter</a>
[constr_10556]	Uniqueness of <a href="#">NvRequireComSpec.variable</a>
[constr_10557]	Uniqueness of <a href="#">NvProvideComSpec.variable</a>
[constr_1111]	Constraints of dataId in PROFILE_01
[constr_1112]	Constraints of dataIdMode in PROFILE_01
[constr_1113]	Existence of attributes of meta-class EndToEndDescription in PROFILE_01
[constr_1114]	Constraints of crcOffset in PROFILE_01
[constr_1115]	Constraints of counterOffset in PROFILE_01
[constr_1116]	Constraints of dataLength in PROFILE_01
[constr_1117]	Constraints of maxDeltaCounterInit in PROFILE_01
[constr_1118]	Existence of attributes of meta-class EndToEndDescription in PROFILE_02
[constr_1119]	Constraints of dataLength in PROFILE_02
[constr_1120]	Constraints of dataId in PROFILE_02
[constr_1121]	Constraints of maxDeltaCounterInit in PROFILE_02
[constr_1170]	Existence of attribute EndToEndDescription.maxDeltaCounterInit for PROFILE_01
[constr_1171]	Existence of attribute EndToEndDescription.maxDeltaCounterInit for PROFILE_02
[constr_1183]	EndToEndProtectionVariablePrototypes aggregated by EndToEndProtection
[constr_1211]	Constraints of maxNoNewOrRepeatedData in PROFILE_01
[constr_1212]	Constraints of syncCounterInit in PROFILE_01
[constr_1213]	Constraints of maxNoNewOrRepeatedData in PROFILE_02
[constr_1214]	Constraints of syncCounterInit in PROFILE_02
[constr_1215]	Existence of attribute EndToEndDescription.maxNoNewOrRepeatedData for PROFILE_01
[constr_1216]	Existence of attribute EndToEndDescription.syncCounterInit for PROFILE_01
[constr_1217]	Existence of attribute EndToEndDescription.maxNoNewOrRepeatedData for PROFILE_02
[constr_1218]	Existence of attribute EndToEndDescription.syncCounterInit for PROFILE_02
[constr_1261]	Applicability for EndToEndDescription.dataIdNibbleOffset
[constr_1463]	Applicable values for <a href="#">J1939Cluster.networkId</a>





Number	Heading
[constr_1612]	Reference from <a href="#">DiagnosticRoutineControl</a> to <a href="#">DiagnosticAccessPermission</a> has no meaning
[constr_1761]	Existence of attribute <a href="#">DiagnosticConnectedIndicator.healingCycle</a>
[constr_1782]	Usage of internal data elements only for extended data records
[constr_1901]	Existence of attribute <a href="#">EndToEndDescription.category</a>
[constr_1902]	Existence of attribute <a href="#">EndToEndProtection.endToEndProfile</a>
[constr_2510]	Only one default <a href="#">ReferenceBase</a>
[constr_2548]	Data constraint of value axis shall match
[constr_2573]	ICS shall not reference examples
[constr_2608]	Custom extensions shall be part of the <a href="#">Documentation</a> that is referenced by the <a href="#">Baseline</a>
[constr_2609]	Single revision per AUTOSAR standard
[constr_2610]	No alternativeName if matching via <a href="#">shortName</a>
[constr_2611]	Referenced AUTOSAR Specification Elements shall be part of the AUTOSAR Specification Baseline
[constr_2612]	<a href="#">shortName</a> of <a href="#">ConcreteClassTailoring</a> shall match the name of an AUTOSAR specified concrete meta-class
[constr_2613]	<a href="#">shortName</a> of <a href="#">AbstractClassTailoring</a> shall match the name of an AUTOSAR specified abstract meta-class
[constr_2614]	<a href="#">PrimitiveAttributeCondition.attribute</a> shall reference invariant owned <a href="#">PrimitiveAttributeTailoring</a> , only
[constr_2615]	<a href="#">AggregationCondition.aggregation</a> shall reference invariant owned <a href="#">AggregationTailoring</a> , only
[constr_2616]	<a href="#">ReferenceCondition.reference</a> shall reference invariant owned <a href="#">ReferenceTailoring</a> , only
[constr_2617]	<a href="#">ClassTailoring.variationRestriction</a> only applicable for «atpVariation» classes
[constr_2618]	ShortName of <a href="#">AttributeTailoring</a> shall match owned or inherited attributes
[constr_2619]	No <a href="#">AttributeTailoring</a> for Derived or Abstract Attributes
[constr_2620]	<a href="#">shortName</a> of <a href="#">PrimitiveAttributeTailoring</a> shall be a primitive attribute in the referenced <a href="#">Baseline</a>
[constr_2621]	The <a href="#">shortName</a> of <a href="#">AggregationTailoring</a> shall match the name of an AUTOSAR specified aggregation of the meta-class
[constr_2622]	The <a href="#">shortName</a> of <a href="#">ReferenceTailoring</a> shall match the name of an AUTOSAR specified reference of the meta-class
[constr_2623]	Referenced <a href="#">SdgClass</a> shall be part of a <a href="#">SdgDef</a> that is referenced by the <a href="#">Baseline</a>
[constr_2624]	<a href="#">AttributeTailoring.variationRestriction</a> only applicable for «atpVariation» attributes
[constr_2632]	No postbuild variation for attribute values
[constr_3119]	Necessary content of <a href="#">EcucDestinationUriDefs</a> that are referenced by an <a href="#">EcucContainerDef</a>
[constr_3239]	Consistent mapping of software-component to <a href="#">J1939NmNode</a>





Number	Heading
[constr_3240]	Consistent mapping of <a href="#">J1939ControllerApplication</a> to <a href="#">EcuInstance</a>
[constr_3257]	TimeSyncTechnology of servers and clients in a time synchronized network.
[constr_3299]	<a href="#">SocketAddress.pathMtuDiscoveryEnabled</a> setting dependency
[constr_3435]	Applicability of <a href="#">CouplingPort.macMulticastAddress</a>
[constr_3509]	Applicability of <a href="#">scope</a> attribute
[constr_3738]	<a href="#">ISignal</a> that has <a href="#">dataTypePolicy</a> set to <a href="#">ddsSignal</a> or to <a href="#">ddsService</a> shall not reference a <a href="#">DataTransformation</a>
[constr_3779]	Number of <a href="#">ISignal.receptionDefaultValue</a> elements
[constr_3780]	<a href="#">ISignal.receptionDefaultValue</a> definition in case that the SOME/IP Serializer receives less data than expected
[constr_4055]	ICS may not contain blueprints
[constr_5029]	<a href="#">J1939NmCluster</a> is not allowed to reference a <a href="#">TtcanCluster</a>
[constr_5459]	Existence of <a href="#">dataLength</a>
[constr_5460]	Existence of <a href="#">policyAction</a>
[constr_5461]	Existence of <a href="#">timeInterval</a>
[constr_6848]	Existence of <a href="#">VfbTiming.component</a>
[constr_6878]	Existence of <a href="#">TDEventTTCanCycleStart.ttCanCluster</a>
[constr_9112]	Existence of <a href="#">GenericTp.tpTechnology</a>
[constr_9115]	Existence of <a href="#">RtpTp.ssrc</a>
[constr_9116]	Existence of <a href="#">RtpTp.tcpUdpConfig</a>
[constr_9119]	Existence of <a href="#">Ieee1722Tp.streamIdentifier</a>
[constr_9120]	Existence of <a href="#">HttpTp.protocolVersion</a>
[constr_9121]	Existence of <a href="#">HttpTp.tcpTpConfig</a>
[constr_9207]	Existence of <a href="#">EndToEndProtectionISignalIPdu.iSignalIPdu</a>
[constr_9208]	Existence of <a href="#">EndToEndProtectionISignalIPdu.iSignalGroup</a>
[constr_9209]	Existence of <a href="#">EndToEndProtectionISignalIPdu.dataOffset</a>
[constr_9267]	Existence of <a href="#">J1939TpConnection.broadcast</a>
[constr_9272]	Existence of <a href="#">TlsPskIdentity.preSharedKey</a>
[constr_9309]	Existence of <a href="#">GlobalTimeCanMaster.syncConfirmationTimeout</a>

**Table B.3: Deleted Constraints in R25-11**

## B.2 Traceable item history of this document according to AUTOSAR Release R24-11

### B.2.1 Added Constraints in R24-11

Number	Heading
[constr_10520]	Multiplicity of <code>AssemblySwConnector.provider</code>
[constr_10521]	Multiplicity of <code>AssemblySwConnector.requester</code>
[constr_10522]	OBD trouble code shall only be placed in primary fault memory
[constr_10523]	Existence of role <code>DiagnosticTroubleCodeUdsToTroubleCodeObdMapping.troubleCodeUds</code>
[constr_10524]	Existence of role <code>DiagnosticTroubleCodeUdsToTroubleCodeObdMapping.troubleCodeObd</code>
[constr_10525]	Existence of attribute <code>ApplicationValueSpecification.category</code>
[constr_10527]	Existence of <code>RoleBasedDataAssignment.usedDataElement.autosarVariable</code> for <code>RoleBasedDataAssignment.role = ramBlock</code>
[constr_10529]	Existence of <code>AsynchronousServerCallResultPoint</code> for <code>AsynchronousServerCallPoint</code> where attribute <code>timeout</code> is defined
[constr_10532]	Restriction for <code>SenderComSpec.transmissionProps.onChangeDataPrototype</code>
[constr_10533]	Existence of <code>TransmissionComSpecProps.onChangeDataPrototype.dataPrototypeInSenderReceiverInterface.rootDataPrototypeInSr</code>
[constr_10534]	Existence of <code>TransmissionComSpecProps.onChangeDataPrototype.rootDataPrototype</code>
[constr_10538]	Existence of attribute <code>ReceiverComSpec.dataElement</code>
[constr_10539]	Existence of attribute <code>SenderComSpec.dataElement</code>
[constr_10542]	<code>RunnableEntity</code> is referenced by an <code>OperationInvokedEvent</code>
[constr_10543]	Uniqueness of reference <code>PortAPIOption.port</code>
[constr_10544]	Ownership of reference <code>PortAPIOption.port</code>
[constr_10545]	Existence of <code>DiagnosticParameterIdentifier.dataElement</code>
[constr_10548]	Uniqueness of <code>ReceiverComSpec.dataElement</code>
[constr_10549]	Uniqueness of <code>SenderComSpec.dataElement</code>
[constr_10550]	Uniqueness of <code>ClientComSpec.operation</code>
[constr_10551]	Uniqueness of <code>ServerComSpec.operation</code>
[constr_10552]	Uniqueness of <code>ModeSwitchSenderComSpec.modeGroup</code>
[constr_10553]	Uniqueness of <code>ModeSwitchReceiverComSpec.modeGroup</code>
[constr_10554]	Uniqueness of <code>ParameterProvideComSpec.parameter</code>
[constr_10555]	Uniqueness of <code>ParameterRequireComSpec.parameter</code>
[constr_10556]	Uniqueness of <code>NvRequireComSpec.variable</code>
[constr_10557]	Uniqueness of <code>NvProvideComSpec.variable</code>







Number	Heading
[constr_10558]	SwBaseType associated with corresponding ApplicationRecordElement and ImplementationDataTypeElement
[constr_10559]	Uniqueness of DataPrototypeMapping.firstDataPrototype and secondDataPrototype
[constr_10560]	Uniqueness of ClientServerOperationMapping.firstOperation and secondOperation
[constr_10561]	Uniqueness of ClientServerApplicationErrorMapping.firstApplicationError and secondApplicationError
[constr_10562]	Uniqueness of ModeDeclarationGroupPrototypeMapping.firstModeGroup and secondModeGroup
[constr_10563]	Uniqueness of ModeDeclarationMapping.firstMode and secondMode
[constr_10564]	Uniqueness of TriggerMapping.firstTrigger and secondTrigger
[constr_10565]	Uniqueness of SubElementMapping.firstElement and secondElement
[constr_10573]	Existence of attribute DiagnosticServiceTable. diagnosticServiceInstance
[constr_10575]	No multiple instantiation of NvBlockSwComponentType
[constr_10577]	Existence of DiagnosticResponseOnEventClass.storeEventEnabled
[constr_10606]	Existence of ConstantSpecificationMapping or CalibrationParameterValue for ApplicationValueSpecification or ApplicationRuleBasedValueSpecification of category CURVE, MAP, CUBOID, CUBE_4, and CUBE_5
[constr_10607]	Number of ConstantSpecificationMappings that are allowed to reference a ApplicationValueSpecification or ApplicationRuleBasedValueSpecification in the context of an InternalBehavior
[constr_10608]	Number of ConstantSpecificationMappings that are allowed to reference a ApplicationValueSpecification or ApplicationRuleBasedValueSpecification in the context of a ParameterSwComponentType
[constr_10610]	Compatibility of PhysicalDimensions in the context is the creation of an ApplicationValueSpecification
[constr_3763]	Allowed value for maxDeltaCounter in the context of a profileName
[constr_3764]	Applicability of CouplingPort.macAddressVlanAssignment
[constr_3765]	Applicability of MacAddressVlanMembership.vlan
[constr_3766]	Valid MacAddressVlanMembership.vlan target EthernetPhysicalChannel
[constr_3767]	NmNode.nmVariant setting to slavePassive
[constr_3768]	NmNode.nmVariant setting to slaveActive
[constr_3769]	NmNode.nmVariant setting to full
[constr_3770]	NmNode.nmVariant setting to passive
[constr_3771]	Range of NmCluster.nmLightTimeout
[constr_3779]	Number of ISignal.receptionDefaultValue elements
[constr_3780]	ISignal.receptionDefaultValue definition in case that the SOME/IP Serializer receives less data than expected







Number	Heading
[constr_3781]	Each PNC assigned to multiple <code>PhysicalChannels</code> shall have a top level PNC-Coordinator
[constr_3782]	Consistent <code>framePreemptionSupport</code> setting in the scope of one <code>CouplingPortConnection</code>
[constr_3783]	Definition of <code>CouplingPortFifo.trafficClassPreemptionSupport</code> only in context of an Ethernet switch
[constr_3784]	Applicable <code>CouplingPortFifo</code> as predecessor for <code>portScheduler = enhancedTrafficShaper</code>
[constr_3785]	Exclusive definition of <code>etsAvailableBandwidthInPercent</code> or <code>etsAvailableBandwidthInWeightValue</code>
[constr_3786]	Consistent usage of either <code>etsAvailableBandwidthInPercent</code> or <code>etsAvailableBandwidthInWeightValue</code> for <code>portScheduler = enhancedTrafficShaper</code>
[constr_3787]	Existence of <code>CouplingPortTrafficClassAssignment.trafficClass</code>
[constr_3788]	Existence of <code>CouplingPortFifo.assignedTrafficClass</code>
[constr_3789]	Allowed values for <code>CouplingPortFifo.assignedTrafficClass</code>
[constr_3790]	Existence of <code>CouplingPortDetails.defaultTrafficClass</code>
[constr_3791]	Allowed values for <code>CouplingPortDetails.defaultTrafficClass</code>
[constr_3792]	<code>FrameMapping</code> between identical bus systems
[constr_3793]	Usage of <code>KeepLocalPduBuffer</code>
[constr_3794]	Usage of <code>PduBufferAlignment</code>
[constr_6918]	Referenced <code>TimingDescriptions</code> in <code>TDCpSoftwareClusterMapping</code> and <code>TDCpSoftwareClusterResourceMapping</code>
[constr_6919]	Referenced <code>CpSoftwareCluster</code> of <code>TDCpSoftwareClusterMapping</code>
[constr_6920]	Existence of <code>LatencyTimingConstraint.minimum</code> used in an LET interval
[constr_6921]	Disallow <code>TimingDescriptionEventChain</code> segmental circular-referencing
[constr_9316]	Multi instantiated BSW Modules not mappable
[constr_9317]	<code>StateDependentFirewall.firewallStateModeDeclaration</code> reference restriction
[constr_9318]	Reception of <code>CanFrameTriggerings</code> with the same <code>identifier</code> by an <code>EcuInstance</code>
[constr_9319]	Value of <code>BusMirrorChannelMappingCan.mirroringProtocol</code>
[constr_9320]	Value of <code>BusMirrorChannelMappingFlexray.mirroringProtocol</code>
[constr_9321]	Same time base for all <code>BusMirrorChannelMappings</code> of one <code>EcuInstance</code>
[constr_9326]	Exclusive existence of <code>ISignalTriggering.iSignal</code> and <code>ISignalTriggering.iSignalGroup</code>
[constr_9330]	Derivation of network representation in case that several <code>DataMappings</code> are defined that map the same <code>SystemSignal</code> to different <code>VariableDataPrototypes</code>
[constr_9331]	E2E protection of a <code>ClientServerOperation</code>
[constr_9332]	Existence of <code>J1939TpConnection.tpProtocolType</code>
[constr_9333]	<code>FibexElements</code> in ECU_EXTRACT





Number	Heading
[constr_9343]	Allowed <code>J1939ProtectedIPdu.payload</code> reference target
[constr_9346]	Existence of <code>EthernetVlanTranslationTable.translatedVlanId</code>
[constr_9347]	Range of <code>EthernetVlanTranslationTable.ingressVlanId</code> and <code>EthernetVlanTranslationTable.translatedVlanId</code>
[constr_9348]	<code>EthernetVlanTranslationTable.translatedVlanId</code> and <code>vlanMembership</code>

**Table B.4: Added Constraints in R24-11**

## B.2.2 Changed Constraints in R24-11

Number	Heading
[constr_1000]	End-to-end protection is limited to sender/receiver communication
[constr_1001]	Value of <code>dataId</code> shall be unique
[constr_1002]	End-to-end protection does not support n:1 communication
[constr_10024]	Existence of reference in the role <code>DiagnosticSecurityEventReportingModeMapping.dataElement</code>
[constr_1007]	Allowed attributes of <code>SwDataDefProps</code> for <code>ApplicationDataTypes</code>
[constr_10088]	Relation between event and DTC without event combination
[constr_10099]	Allowed values of the attribute <code>SwDataDefProps.swImplPolicy</code> vs. <code>DataPrototypes</code> and their roles
[constr_1012]	Value of <code>category</code> is <code>FIXED_LENGTH</code>
[constr_1053]	Compatibility of <code>PhysicalDimensions</code> in the context of the creation of a <code>SwConnector</code>
[constr_1070]	Compatibility of <code>PortPrototypes</code> of different <code>DataInterfaces</code> in the context of <code>DelegationSwConnectors</code>
[constr_1087]	<code>AssemblySwConnector</code> inside <code>CompositionSwComponentType</code>
[constr_1088]	<code>DelegationSwConnector</code> inside <code>CompositionSwComponentType</code>
[constr_1111]	Constraints of <code>dataId</code> in <code>PROFILE_01</code>
[constr_1112]	Constraints of <code>dataIdMode</code> in <code>PROFILE_01</code>
[constr_1113]	Existence of attributes of meta-class <code>EndToEndDescription</code> in <code>PROFILE_01</code>
[constr_1114]	Constraints of <code>crcOffset</code> in <code>PROFILE_01</code>
[constr_1115]	Constraints of <code>counterOffset</code> in <code>PROFILE_01</code>
[constr_1116]	Constraints of <code>dataLength</code> in <code>PROFILE_01</code>
[constr_1117]	Constraints of <code>maxDeltaCounterInit</code> in <code>PROFILE_01</code>
[constr_1118]	Existence of attributes of meta-class <code>EndToEndDescription</code> in <code>PROFILE_02</code>
[constr_1119]	Constraints of <code>dataLength</code> in <code>PROFILE_02</code>
[constr_1120]	Constraints of <code>dataId</code> in <code>PROFILE_02</code>
[constr_1121]	Constraints of <code>maxDeltaCounterInit</code> in <code>PROFILE_02</code>





Number	Heading
[constr_1170]	Existence of attribute <code>EndToEndDescription.maxDeltaCounterInit</code> for <code>PROFILE_01</code>
[constr_1171]	Existence of attribute <code>EndToEndDescription.maxDeltaCounterInit</code> for <code>PROFILE_02</code>
[constr_1183]	<code>EndToEndProtectionVariablePrototypes</code> aggregated by <code>EndToEndProtection</code>
[constr_1211]	Constraints of <code>maxNoNewOrRepeatedData</code> in <code>PROFILE_01</code>
[constr_1212]	Constraints of <code>syncCounterInit</code> in <code>PROFILE_01</code>
[constr_1213]	Constraints of <code>maxNoNewOrRepeatedData</code> in <code>PROFILE_02</code>
[constr_1214]	Constraints of <code>syncCounterInit</code> in <code>PROFILE_02</code>
[constr_1215]	Existence of attribute <code>EndToEndDescription.maxNoNewOrRepeatedData</code> for <code>PROFILE_01</code>
[constr_1216]	Existence of attribute <code>EndToEndDescription.syncCounterInit</code> for <code>PROFILE_01</code>
[constr_1217]	Existence of attribute <code>EndToEndDescription.maxNoNewOrRepeatedData</code> for <code>PROFILE_02</code>
[constr_1218]	Existence of attribute <code>EndToEndDescription.syncCounterInit</code> for <code>PROFILE_02</code>
[constr_1261]	Applicability for <code>EndToEndDescription.dataIdNibbleOffset</code>
[constr_1295]	<code>PortInterfaces</code> and <code>category</code> <code>DATA_REFERENCE</code>
[constr_1349]	Value of <code>udsDtcValue</code> shall be unique
[constr_1363]	Existence of attributes of <code>DiagnosticValueNeeds</code>
[constr_1519]	Existence of attributes vs. <code>category</code> of <code>ApplicationValueSpecification</code>
[constr_1768]	Existence of attribute <code>DiagnosticEvent.associatedEventIdentification</code>
[constr_1829]	Existence of reference <code>DiagnosticConnectedIndicator.indicator</code>
[constr_1901]	Existence of attribute <code>EndToEndDescription.category</code>
[constr_1902]	Existence of attribute <code>EndToEndProtection.endToEndProfile</code>
[constr_1986]	Existence of the reference <code>DiagnosticRoutineNeeds.diagRoutineType</code>
[constr_3153]	E2E header field reservation required by COM Based transformer
[constr_3163]	<code>EndToEndTransformationISignalProps.minDataLength</code> and <code>EndToEndTransformationISignalProps.maxDataLength</code> in <code>PROFILE_04</code> , <code>PROFILE_06</code> , <code>PROFILE_07</code> , <code>PROFILE_08</code> , <code>PROFILE_04m</code> , <code>PROFILE_07m</code> , <code>PROFILE_08m</code> , <code>PROFILE_44</code> , <code>PROFILE_44m</code> , and <code>PROFILE_76</code>
[constr_3164]	<code>EndToEndTransformationISignalProps.dataLength</code> in <code>PROFILE_04</code> , <code>PROFILE_06</code> , <code>PROFILE_07</code> , <code>PROFILE_08</code> , <code>PROFILE_04m</code> , <code>PROFILE_07m</code> , <code>PROFILE_08m</code> , <code>PROFILE_44</code> , <code>PROFILE_44m</code> , and <code>PROFILE_76</code>
[constr_3167]	Effect of <code>EndToEndTransformationDescription.upperHeaderBitsToShift</code> value in <code>PROFILE_04</code> , <code>PROFILE_05</code> , <code>PROFILE_06</code> , <code>PROFILE_07</code> , <code>PROFILE_08</code> , <code>PROFILE_04m</code> , <code>PROFILE_07m</code> , <code>PROFILE_08m</code> , <code>PROFILE_44</code> , <code>PROFILE_44m</code> and <code>PROFILE_76</code>
[constr_3169]	<code>EndToEndTransformationDescription.offset</code> value in <code>PROFILE_02</code> , <code>PROFILE_22</code> and <code>PROFILE_76</code>





Number	Heading
[constr_3174]	<a href="#">EndToEndTransformationDescription</a> settings not allowed in PROFILE_04, PROFILE_05, PROFILE_06, PROFILE_07, PROFILE_08, PROFILE_11, PROFILE_22, PROFILE_04m, PROFILE_07m, PROFILE_08m, PROFILE_44, PROFILE_44m and PROFILE_76
[constr_3186]	Multiplicity of <a href="#">EndToEndTransformationDescription.dataIdMode</a> in PROFILE_02, PROFILE_04, PROFILE_05, PROFILE_06, PROFILE_07, PROFILE_08, PROFILE_22, PROFILE_04m, PROFILE_07m, PROFILE_08m, PROFILE_44, PROFILE_44m, PROFILE_76
[constr_3188]	Multiplicity of <a href="#">EndToEndTransformationDescription.counterOffset</a> in PROFILE_02, PROFILE_04, PROFILE_05, PROFILE_06, PROFILE_07, PROFILE_08, PROFILE_22, PROFILE_04m, PROFILE_07m, PROFILE_08m, PROFILE_44, PROFILE_44m, PROFILE_76
[constr_3190]	Multiplicity of <a href="#">EndToEndTransformationDescription.crcOffset</a> in PROFILE_02, PROFILE_04, PROFILE_05, PROFILE_06, PROFILE_07, PROFILE_08, PROFILE_22, PROFILE_04m, PROFILE_07m, PROFILE_08m, PROFILE_44, PROFILE_44m, PROFILE_76
[constr_3192]	Multiplicity of <a href="#">EndToEndTransformationDescription.dataIdNibbleOffset</a> in PROFILE_02, PROFILE_04, PROFILE_05, PROFILE_06, PROFILE_07, PROFILE_08, PROFILE_22, PROFILE_04m, PROFILE_07m, PROFILE_08m, PROFILE_44, PROFILE_44m and PROFILE_76 or <a href="#">dataIdMode</a> different from <a href="#">lower12Bit</a>
[constr_3194]	Multiplicity of <a href="#">EndToEndTransformationDescription.offset</a> in PROFILE_02, PROFILE_04, PROFILE_05, PROFILE_06, PROFILE_07, PROFILE_08, PROFILE_22, PROFILE_04m, PROFILE_07m, PROFILE_08m, PROFILE_44, PROFILE_44m, PROFILE_76
[constr_3257]	TimeSyncTechnology of servers and clients in a time synchronized network.
[constr_3267]	<a href="#">PduTriggerings</a> in Service Discovery <a href="#">StaticSocketConnections</a>
[constr_3268]	Service Discovery <a href="#">StaticSocketConnection</a> aggregation by a <a href="#">SocketAddress</a>
[constr_3269]	Service Discovery <a href="#">StaticSocketConnection</a> <a href="#">remoteAddress</a> reference to a <a href="#">TpPort</a>
[constr_3270]	Service Discovery <a href="#">SocketConnection</a> <a href="#">remoteAddress</a> reference to an IP Address
[constr_3272]	<a href="#">SoConIPduIdentifier.headerId</a> setting for SD <a href="#">StaticSocketConnections</a>
[constr_3273]	Service Discovery multicast <a href="#">StaticSocketConnection</a> 's aggregation by an <a href="#">ApplicationEndpoint</a>
[constr_3274]	Service Discovery unicast <a href="#">StaticSocketConnection</a> 's aggregation by an <a href="#">ApplicationEndpoint</a>
[constr_3519]	Value of <a href="#">category</a> of <a href="#">GlobalTimeDomain</a>
[constr_3600]	Setting of <a href="#">EthernetCommunicationController.slaveActAsPassiveCommunicationSlave</a>
[constr_3697]	Latest existence time of <a href="#">CanControllerXlConfiguration</a> and <a href="#">CanControllerXlConfigurationRequirements</a>
[constr_3714]	Multiple top level PNC-coordinators shall be allowed
[constr_3716]	<a href="#">SecuredIPdu.dynamicRuntimeLengthHandling</a> for dynamic length <a href="#">Pdus</a>





Number	Heading
[constr_4014]	Call type and execution context
[constr_4016]	BswCalledEntity constraints
[constr_4018]	BswInterruptEntity constraints
[constr_4071]	Synchronized runnables and schedulable entities shall be consistent
[constr_4089]	Association callbackHeader is only applicable for BSW modules
[constr_4090]	The callbackHeader reference has to be consistent with behavior reference
[constr_4102]	Semantics of McGroupDataRefSet.mcDataInstance
[constr_4500]	Restricted usage of Occurrence Expression functions
[constr_4502]	Use references only as function operands
[constr_4503]	Restricted usage of AutosarOperationArgumentInstance for Content Filter
[constr_4504]	Restriction of the scope of an AgeConstraint
[constr_4505]	Specifying minimum and maximum number of occurrences
[constr_4506]	Specifying minimum inter-arrival time and pattern length
[constr_4507]	Specifying pattern length, pattern jitter and patter period
[constr_4508]	Existence of TDEventVfbPort.portPrototypeBlueprint
[constr_4510]	Specifying references to RunnableEntity and VariableAccess
[constr_4511]	Validity of referencing RunnableEntity
[constr_4512]	Validity of referencing VariableAccess
[constr_4513]	SynchronizationTimingConstraint shall reference at least two events
[constr_4514]	SynchronizationTimingConstraint shall reference at least two event chains
[constr_4515]	Orthogonality of stimulus and response in a TimingDescriptionEventChain
[constr_4516]	Completeness of a composed TimingDescriptionEventChain
[constr_4518]	Specifying end-points of a composed TimingDescriptionEventChain
[constr_4519]	Specifying patternLength
[constr_4520]	Specifying attribute synchronizationConstraintType
[constr_4521]	Specifying attribute synchronizationConstraintType
[constr_4522]	SynchronizationTimingConstraint shall either reference events or event chains
[constr_4523]	Restriction of maxCycleRepetitions and maxSlotsPerCycle to Repetitive Execution Order Constraint
[constr_4525]	Precedence of successor relationships successor and directSuccessor
[constr_4526]	Specifying maxCycles and maxSlots in a Repetitive Execution Order Constraint
[constr_4527]	Referencing TimingDescriptionEvent in a Repetitive Execution Order Constraint
[constr_4528]	The root EOExecutableEntityRefGroup shall reference only EOExecutableEntityRefGroups
[constr_4529]	Number of nested elements referenced by the root EOExecutableEntityRefGroup
[constr_4530]	An EOExecutableEntityRefGroup representing a cycle shall reference only EOExecutableEntityRefs respectively EOEventRefs





Number	Heading
[constr_4531]	Number of nested elements referenced by <a href="#">EOCExecutableEntityRefGroup</a> representing a cycle
[constr_4532]	Successor relationship is not self-referencing
[constr_4533]	Maximum number of successor relationships
[constr_4534]	Maximum number of <a href="#">directSuccessor</a> relationships
[constr_4536]	Compatible recurrence of any <a href="#">ExecutableEntity</a>
[constr_4537]	References among elements in an <a href="#">ExecutionOrderConstraint</a>
[constr_4538]	Hierarchical Execution Order Constraint: <a href="#">EOCExecutableEntityRef</a> , <a href="#">EOCEventRef</a> , and <a href="#">EOCExecutableEntityRefGroup</a> shall be target or source of a successor relationship
[constr_4539]	The successor relationships <a href="#">successor</a> and <a href="#">directSuccessor</a> shall not be used
[constr_4540]	<a href="#">maxCycles</a> and <a href="#">maxSlots</a> shall not be zero
[constr_4541]	Existence of <a href="#">EOCExecutableEntityRef.executable</a> in an Ordinary Execution Order Constraint
[constr_4542]	Existence of <a href="#">EOCExecutableEntityRef.executable</a> in a Hierarchical Execution Order Constraint
[constr_4543]	Maximum value of <a href="#">minimumInterArrivalTime</a>
[constr_4544]	Specifying <a href="#">patternLength</a> , <a href="#">patternJitter</a> and <a href="#">patternPeriod</a>
[constr_4545]	Referring either <a href="#">ExecutableEntity</a> s or <a href="#">AbstractEvents</a>
[constr_4546]	Setting the attribute <a href="#">isEvent</a>
[constr_4547]	Restriction of <a href="#">ExecutionOrderConstraint.permitMultipleReferencesToEE</a>
[constr_4548]	Existence of <a href="#">EOCEventRef.event</a> in an Ordinary Execution Order Constraint
[constr_4549]	Existence of <a href="#">EOCEventRef.event</a> in a Hierarchical Execution Order Constraint
[constr_4551]	Use only Numericals in <a href="#">TDEventOccurrenceExpression</a>
[constr_4552]	Restricted usage of <a href="#">AutosarVariableInstance</a> for Content Filter
[constr_4554]	Restriction of the referenced <a href="#">TimingDescriptionEventChain</a> for a <a href="#">letInterval</a>
[constr_4559]	Restriction of <a href="#">TimingDescriptionEvent.category</a>
[constr_4561]	Usage of the category value <a href="#">DISPATCH_ENTRY_POINT</a> in <a href="#">TimingDescriptionEvent</a>
[constr_4562]	Usage of the category value <a href="#">DISPATCH_EXIT_POINT</a> in <a href="#">TimingDescriptionEvent</a>
[constr_4565]	Consistency of <a href="#">TDCpSoftwareClusterMapping.timingDescription</a> and <a href="#">TDCpSoftwareClusterResourceMapping.timingDescription</a>
[constr_5049]	Ethernet switch packet to traffic class assignment restriction
[constr_5091]	Relevance of <a href="#">tcpRole</a> attribute
[constr_5105]	Mapping of <a href="#">Pdu</a> with dynamic length in a <a href="#">FlexrayFrame</a>
[constr_5168]	<a href="#">pncGatewayType</a> <a href="#">passive</a> and connected ECUs







Number	Heading
[constr_5221]	Multiplicity of <a href="#">EndToEndTransformationISignalProps.sourceId</a> in <a href="#">PROFILE_01</a> , <a href="#">PROFILE_02</a> , <a href="#">PROFILE_04</a> , <a href="#">PROFILE_05</a> , <a href="#">PROFILE_06</a> , <a href="#">PROFILE_07</a> , <a href="#">PROFILE_11</a> , <a href="#">PROFILE_22</a> , and <a href="#">PROFILE_76</a>
[constr_5273]	One <a href="#">ISignalTriggering</a> pair allowed per <a href="#">EthernetPhysicalChannel</a> for a <a href="#">ClientServerOperation</a>
[constr_5380]	Assignment of the same event <a href="#">Pdu</a> to several <a href="#">EventHandlers</a> is forbidden in case one of the <a href="#">EventHandlers</a> has the <a href="#">multicastThreshold</a> set to a value greater than 0 in the context of an <a href="#">EcuInstance</a>
[constr_6816]	Restricted usage of <a href="#">TimingDescriptionEventChain.isPipeliningPermitted</a> in <a href="#">TimingDescriptionEventChain</a>
[constr_6817]	Restricted usage of <a href="#">TimingDescriptionEvent.clockReference</a>
[constr_6818]	Existence of <a href="#">EventTriggeringConstraint.event</a>
[constr_6819]	Existence of <a href="#">PeriodicEventTriggering.jitter</a>
[constr_6820]	Existence of <a href="#">PeriodicEventTriggering.minimumInterArrivalTime</a>
[constr_6821]	Existence of <a href="#">PeriodicEventTriggering.period</a>
[constr_6822]	Existence of <a href="#">SporadicEventTriggering.maximumInterArrivalTime</a>
[constr_6823]	Existence of <a href="#">SporadicEventTriggering.minimumInterArrivalTime</a>
[constr_6824]	Existence of <a href="#">ConcretePatternEventTriggering.patternLength</a>
[constr_6825]	Existence of <a href="#">BurstPatternEventTriggering.maxNumberOfOccurrences</a>
[constr_6826]	Existence of <a href="#">BurstPatternEventTriggering.minimumInterArrivalTime</a>
[constr_6827]	Existence of <a href="#">BurstPatternEventTriggering.patternLength</a>
[constr_6828]	Existence of <a href="#">ArbitraryEventTriggering.minimumDistance</a>
[constr_6829]	Existence of <a href="#">ArbitraryEventTriggering.maximumDistance</a>
[constr_6830]	Existence of <a href="#">ConfidenceInterval.lowerBound</a>
[constr_6831]	Existence of <a href="#">ConfidenceInterval.propability</a>
[constr_6832]	Existence of <a href="#">ConfidenceInterval.upperBound</a>
[constr_6833]	Existence of <a href="#">ExecutionOrderConstraint.orderedElement</a>
[constr_6834]	Existence of <a href="#">EOExecutableEntityRefGroup.nestedElement</a>
[constr_6835]	Existence of <a href="#">ExecutionTimeConstraint.executionTimeType</a>
[constr_6836]	Existence of <a href="#">ExecutionTimeConstraint.executable</a>
[constr_6837]	Existence of <a href="#">LatencyTimingConstraint.latencyConstraintType</a>
[constr_6838]	Existence of <a href="#">LatencyTimingConstraint.maximum</a>
[constr_6839]	Existence of <a href="#">LatencyTimingConstraint.minimum</a>
[constr_6841]	Existence of <a href="#">LatencyTimingConstraint.scope</a>
[constr_6842]	Existence of <a href="#">OffsetTimingConstraint.maximum</a>
[constr_6843]	Existence of <a href="#">OffsetTimingConstraint.minimum</a>
[constr_6844]	Existence of <a href="#">OffsetTimingConstraint.source</a>
[constr_6845]	Existence of <a href="#">OffsetTimingConstraint.target</a>
[constr_6846]	Existence of <a href="#">SynchronizationTimingConstraint.synchronizationConstraintType</a>
[constr_6847]	Existence of <a href="#">SynchronizationTimingConstraint.tolerance</a>





Number	Heading
[constr_6848]	Existence of <a href="#">VfbTiming.component</a>
[constr_6849]	Existence of <a href="#">SystemTiming.system</a>
[constr_6850]	Existence of <a href="#">BswModuleTiming.behavior</a>
[constr_6851]	Existence of <a href="#">BswCompositionTiming.implementation</a>
[constr_6852]	Existence of <a href="#">EcuTiming.ecuConfiguration</a>
[constr_6853]	Existence of <a href="#">ModeInBswInstanceRef.contextModeDeclarationGroupPrototype</a>
[constr_6854]	Existence of <a href="#">ModeInBswInstanceRef.targetModeDeclaration</a>
[constr_6855]	Existence of <a href="#">ModeInSwcInstanceRef.contextModeDeclarationGroupPrototype</a>
[constr_6856]	Existence of <a href="#">ModeInSwcInstanceRef.contextPort</a>
[constr_6857]	Existence of <a href="#">ModeInSwcInstanceRef.targetModeDeclaration</a>
[constr_6858]	Existence of <a href="#">TDEventBswInternalBehavior.tdEventBswInternalBehaviorType</a>
[constr_6859]	Existence of <a href="#">TDEventBswInternalBehavior.bswModuleEntity</a>
[constr_6860]	Existence of <a href="#">TDEventBswModule.tdEventBswModuleType</a>
[constr_6861]	Existence of <a href="#">TDEventBswModule.bswModuleEntry</a>
[constr_6862]	Existence of <a href="#">TDEventBswModeDeclaration.tdEventBswModeDeclarationType</a>
[constr_6863]	Existence of <a href="#">TDEventBswModeDeclaration.modeDeclaration</a>
[constr_6864]	Existence of <a href="#">TDEventISignal.tdEventType</a>
[constr_6865]	Existence of <a href="#">TDEventISignal.iSignal</a>
[constr_6866]	Existence of <a href="#">TDEventISignal.physicalChannel</a>
[constr_6867]	Existence of <a href="#">TDEventIPdu.tdEventType</a>
[constr_6868]	Existence of <a href="#">TDEventIPdu.iPdu</a>
[constr_6869]	Existence of <a href="#">TDEventIPdu.physicalChannel</a>
[constr_6870]	Existence of <a href="#">TDEventFrame.tdEventType</a>
[constr_6871]	Existence of <a href="#">TDEventFrame.frame</a>
[constr_6872]	Existence of <a href="#">TDEventFrame.physicalChannel</a>
[constr_6873]	Existence of <a href="#">TDEventFrameEthernet.tdEventType</a>
[constr_6874]	Existence of <a href="#">TDHeaderIdRange.maxHeaderId</a>
[constr_6875]	Existence of <a href="#">TDHeaderIdRange.minHeaderId</a>
[constr_6876]	Existence of <a href="#">TDEventCycleStart.cycleRepetition</a>
[constr_6877]	Existence of <a href="#">TDEventFrClusterCycleStart.frCluster</a>
[constr_6878]	Existence of <a href="#">TDEventTTCanCycleStart.ttCanCluster</a>
[constr_6879]	Existence of <a href="#">TDEventOccurrenceExpression.formula</a>
[constr_6880]	Existence of <a href="#">AutosarVariableInstance.variableInstance</a>
[constr_6881]	Existence of <a href="#">AutosarOperationArgumentInstance.operationArgumentInstance</a>
[constr_6882]	Existence of <a href="#">TDEventSwcInternalBehavior.tdEventSwcInternalBehaviorType</a>







Number	Heading
[constr_6883]	Existence of <code>TDEventSwcInternalBehavior.runnable</code>
[constr_6884]	Existence of <code>TDEventSwcInternalBehaviorReference.referencedTDEventSwc</code>
[constr_6885]	Existence of <code>TDEventVfbPort.isExternal</code>
[constr_6886]	Existence of <code>TDEventVfbReference.referencedTDEventVfb</code>
[constr_6887]	Existence of <code>TDEventVariableDataPrototype.tdEventVariableDataPrototypeType</code>
[constr_6888]	Existence of <code>TDEventVariableDataPrototype.dataElement</code>
[constr_6889]	Existence of <code>TDEventOperation.tdEventOperationType</code>
[constr_6890]	Existence of <code>TDEventOperation.operation</code>
[constr_6891]	Existence of <code>TDEventModeDeclaration.tdEventModeDeclarationType</code>
[constr_6892]	Existence of <code>TDEventModeDeclaration.modeDeclaration</code>
[constr_6893]	Existence of <code>TDEventTrigger.tdEventTriggerType</code>
[constr_6894]	Existence of <code>TDEventTrigger.trigger</code>
[constr_6895]	Existence of <code>TimingDescriptionEventChain.response</code>
[constr_6896]	Existence of <code>TimingDescriptionEventChain.stimulus</code>
[constr_6897]	Existence of <code>TimingDescriptionEventChain.segment</code>
[constr_6898]	Existence of <code>ConcretePatternEventTriggering.offset</code>
[constr_6899]	Existence of <code>ModeInSwcInstanceRef.base</code>
[constr_6900]	Dual existence of <code>TDEventVfb.port</code> and <code>TDEventVfb.portPrototypeBlueprint</code>
[constr_6901]	Existence of <code>TDEventBsw.bswModuleDescription</code>
[constr_6906]	Conformity of <code>stimulus</code> and <code>response</code> in a <code>TimingDescriptionEventChain</code>
[constr_6907]	Restriction of <code>EOCExecutableEntityRefGroup.triggeringEvent</code>
[constr_6908]	Restriction of <code>EOCExecutableEntityRefGroup.letDataExchangeParadigm</code>
[constr_6909]	Singleton <code>ROOT_GROUP</code> in a Hierarchical Execution Order Constraint
[constr_6910]	Referencing <b>from</b> a <code>ROOT_GROUP</code> in a Hierarchical Execution Order Constraint
[constr_6911]	Referencing <b>to</b> a <code>ROOT_GROUP</code> in a Hierarchical Execution Order Constraint
[constr_6912]	Mandatory specification of LET interval <b>recurrence</b>
[constr_6913]	Restriction on <code>RTEEvents</code> used in an LET interval
[constr_6914]	Restriction of the <code>port</code> context of an <code>AgeConstraint</code>
[constr_6915]	Affinity of <code>ISignal</code> in <code>TDEventISignal</code>
[constr_6916]	Affinity of <code>Frame</code> in <code>TDEventFrame</code>
[constr_6917]	Affinity of <code>IPdu</code> in <code>TDEventIPdu</code>
[constr_9112]	Existence of <code>GenericTp.tpTechnology</code>
[constr_9115]	Existence of <code>RtpTp.ssrc</code>
[constr_9116]	Existence of <code>RtpTp.tcpUdpConfig</code>
[constr_9119]	Existence of <code>Ieee1722Tp.streamIdentifier</code>
[constr_9120]	Existence of <code>HttpTp.protocolVersion</code>
[constr_9121]	Existence of <code>HttpTp.tcpTpConfig</code>





Number	Heading
[constr_9207]	Existence of EndToEndProtectionISignalIPdu.iSignalIPdu
[constr_9208]	Existence of EndToEndProtectionISignalIPdu.iSignalGroup
[constr_9209]	Existence of EndToEndProtectionISignalIPdu.dataOffset
[constr_9267]	Existence of J1939TpConnection.broadcast

**Table B.5: Changed Constraints in R24-11**

### B.2.3 Deleted Constraints in R24-11

Number	Heading
[constr_10017]	
[constr_1364]	
[constr_1433]	
[constr_1796]	
[constr_1891]	
[constr_2051]	
[constr_2525]	
[constr_2540]	
[constr_3522]	
[constr_4086]	
[constr_4517]	
[constr_4550]	
[constr_4560]	
[constr_4563]	
[constr_4564]	
[constr_4567]	
[constr_4568]	
[constr_5169]	
[constr_5391]	

**Table B.6: Deleted Constraints in R24-11**