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## Known Limitations

- Not all VFB communication features are supported
- The Proxy Modules are not specified for all BSW Services
- No run-time separation is defined

Additional limitations are described in document [\[1\]](#)

# 1 Introduction and functional overview

This specification describes the functionality, API and the configuration for the AUTOSAR Basic Software module [Software Cluster Connection](#).

## 2 Acronyms and abbreviations

The glossary below includes acronyms and abbreviations relevant to Requirements on Software Cluster Connection that are not included in the AUTOSAR Glossary [2].

Abbreviation / Acronym:	Description:
SwCluC	Software Cluster Connection

**Table 2.1: Acronyms and Abbreviations**

Terms:	Description:
Software Cluster	A <a href="#">Software Cluster</a> groups all AUTOSAR artifacts that are relevant to deploy software on a machine. The full definition is given in document [2]
Software Cluster Connection	The <a href="#">Software Cluster Connection</a> is the BSW module that provides the features to <ul style="list-style-type: none"> <li>connect the <a href="#">Binary Objects</a> deployed on the same machine</li> <li>substitute not locally-available BSW modules in an <a href="#">Application Software Cluster</a>, whose interfaces are required for the integrated SW, by so called <a href="#">Proxy Modules</a>.</li> <li>implement the VFB communication features between <a href="#">Software Clusters</a> together with RTE by means of an <a href="#">RTE Implementation Plug-In</a></li> </ul>
machine	A <a href="#">machine</a> consists of a set of computing resources - such as microcontroller cores, memory or peripheral (e.g. communication) devices - and has the ability to execute software applications. The representation of a <a href="#">machine</a> in the AUTOSAR Classic Platform could be done with an <a href="#">EcuInstance</a> , but note that this semantic is currently in clarification. Further information is given in document [2].
binary-identical	Bit for Bit identical
Binary Object	A set of files, which contains the binary executable code and data. This binary executable code and data will not be modified again, before programming it on the target ECU.
Binary Manifest	The <a href="#">Binary Manifest</a> is the well-defined interface of the <a href="#">Software Cluster's Binary Object</a> , providing the meta information of a resources and information - so called handles - to access such a resource.
Application Software Cluster	A <a href="#">Software Cluster</a> that mainly contains software components, and only selected BSW modules (e.g. a Service module, transformers, e.t.c.)
Host Software Cluster	The single <a href="#">Software Cluster</a> that contains the major part of the BSW, and especially the micro controller dependent lower layer BSW Modules, e.g. OS and MCAL.
Substitution Software Cluster	The single <a href="#">Software Cluster</a> that can override the provided resources of other <a href="#">Software Clusters</a> for bug fixing purpose.

Terms:	Description:
Proxy Module	A Proxy Module substitutes a BSW module in an <a href="#">Application Software Cluster</a> . A Proxy module itself is split into <a href="#">High Proxy Module</a> and <a href="#">Low Proxy Module</a> . The <a href="#">High Proxy Module</a> provides dedicated interfaces for modules in higher layers or same layer, and the functionality to connect them via the <a href="#">Binary Manifest</a> to the <a href="#">Low Proxy Module</a> in the <a href="#">Host Software Cluster</a> .
High Proxy Module	The part of the Proxy Module residing in an <a href="#">Application Software Cluster</a> .
Low Proxy Module	The part of the Proxy Module residing in the <a href="#">Host Software Cluster</a> .
Os Proxy	The <a href="#">Proxy Module</a> for Os.
Os High Proxy	A type of Proxy Module implementing Os APIs in the <a href="#">Application Software Cluster</a> .
Os Low Proxy	A type of proxy Module implementing an Os abstraction in the <a href="#">Host Software Cluster</a> .
NvM Proxy	The <a href="#">Proxy Module</a> for NvM.
NvM High Proxy	A type of Proxy Module substituting the NVRAM Manager in the <a href="#">Application Software Cluster</a> .
NvM Low Proxy	A type of Proxy Module connecting the <a href="#">NvM High Proxys</a> module to the NVRAM Manager in the <a href="#">Host Software Cluster</a> .
LdCom Proxy	The <a href="#">Proxy Module</a> for LdCom.
LdCom High Proxy	A type of Proxy Module implementing default LdCom (Callback) APIs in the <a href="#">Application Software Cluster</a> .
LdCom Low Proxy	A type of proxy Module connecting <a href="#">LdCom High Proxys</a> module to the LdCom in the <a href="#">Host Software Cluster</a> .
Com Proxy	The <a href="#">Proxy Module</a> for Com.
Com High Proxy	A type of Proxy Module implementing default Com (Callback) APIs in the <a href="#">Application Software Cluster</a> .
Com Low Proxy	A type of proxy Module connecting <a href="#">Com High Proxys</a> module to the Com in the <a href="#">Host Software Cluster</a> .
Dcm Proxy	The <a href="#">Proxy Module</a> for Dcm.
Dcm High Proxy	A type of Proxy Module substituting the Dcm in the <a href="#">Application Software Cluster</a> .
Dcm Low Proxy	A type of proxy Module connecting <a href="#">Dcm High Proxys</a> module to the Dcm in the <a href="#">Host Software Cluster</a> .
Dem Proxy	The <a href="#">Proxy Module</a> for Dem.
Dem High Proxy	A type of Proxy Module substituting the Dem in the <a href="#">Application Software Cluster</a> .
Dem Low Proxy	A type of proxy Module connecting <a href="#">Dem High Proxys</a> module to the Dem in the <a href="#">Host Software Cluster</a> .
FiM Proxy	The <a href="#">Proxy Module</a> for FiM.
FiM High Proxy	A type of Proxy Module substituting the FiM in the <a href="#">Application Software Cluster</a> .
FiM Low Proxy	A type of proxy Module connecting <a href="#">FiM High Proxys</a> module to the FiM in the <a href="#">Host Software Cluster</a> .
Cross Cluster Communication	The <a href="#">Cross Cluster Communication</a> implements the VFB communication between <a href="#">Software Clusters</a> .
Software Cluster Connector	The <a href="#">Software Cluster Connector</a> reads the information of the unconnected <a href="#">Binary Manifests</a> and calculates the modifiable <a href="#">Binary Manifest</a> parts.

Terms:	Description:
RTE Implementation Plug-In	A <a href="#">RTE Implementation Plug-In</a> is a part of the overall RTE implementation, which is not provided by the RTE Generator, but from an additional source (e.g. a Plug-In Generator or a manually implemented source code).
RTE Implementation Plug-In Service	A <a href="#">RTE Implementation Plug-In Service</a> is a single entry point into the <a href="#">RTE Implementation Plug-In</a> implementing a low level service for the RTE. For instance access to a specific buffer.
Local Software Cluster Communication Plug-In	A <a href="#">Local Software Cluster Communication Plug-In</a> is an <a href="#">RTE Implementation Plug-In</a> , which handles the communication locally inside a <a href="#">Software Cluster</a> . This includes the Transformer handling, if a <a href="#">DataMapping</a> exist for the according <a href="#">Communication Graph</a>
Cross Software Cluster Communication Plug-In	A <a href="#">Cross Software Cluster Communication Plug-In</a> is an <a href="#">RTE Implementation Plug-In</a> that handles the communication towards other <a href="#">Software Clusters</a> . This includes the Transformer handling, if intra ECU transformation is configured.
Communication Graph	The sum of all <a href="#">AbstractAccessPoints</a> to elements of <a href="#">PortInterfaces</a> , instantiated in <a href="#">PortPrototypes</a> which are connected to each other; or the sum of all accesses from <a href="#">BswModuleEntitys</a> to interface elements in a <a href="#">BswModuleDescriptions</a> connected to each other.
Data Communication Graph	The sum of all <a href="#">VariableAccesses</a> to <a href="#">VariableDataPrototypes</a> instantiated in <a href="#">PortPrototypes</a> , which are connected to each other; or the sum of all <a href="#">VariableAccesses</a> to <a href="#">VariableDataPrototypes</a> in the <a href="#">InternalBehavior</a> ; or the sum of all <a href="#">BswVariableAccesses</a> to <a href="#">VariableDataPrototypes</a> in <a href="#">BswModuleDescriptions</a> connected to each other.
Parameter Communication Graph	The sum of all <a href="#">ParameterAccesses</a> to <a href="#">ParameterDataPrototypes</a> instantiated in <a href="#">PortPrototypes</a> , which are connected to each other; or the sum of all <a href="#">ParameterAccesses</a> to <a href="#">ParameterDataPrototypes</a> in the <a href="#">InternalBehavior</a> .
Client Server Communication Graph	The sum of all <a href="#">ServerCallPoints</a> to <a href="#">operations</a> instantiated in <a href="#">PortPrototypes</a> , which are connected to each other, including the associated <a href="#">server runnable</a> .
client	A client is defined as one <a href="#">ClientServerOperation</a> in one <a href="#">RPortPrototype</a> of one Software Component instance. For the definition of the client neither the number of <a href="#">ServerCallPoints</a> nor <a href="#">RunnableEntity</a> accesses to the <a href="#">ServerCallPoint</a> are relevant. A Software Component instance can appear as several clients to the same server if it defines <a href="#">ServerCallPoints</a> for several <a href="#">PortPrototypes</a> of the same <a href="#">PortInterface</a> 's <a href="#">ClientServerOperation</a> .
server	A server is defined as one <a href="#">RunnableEntity</a> which is the target of an <a href="#">OperationInvokedEvent</a> . Call serialization is on activation of <a href="#">RunnableEntity</a> .
server runnable	A server that is triggered by an <a href="#">OperationInvokedEvent</a> . It has a mixed behavior between a runnable and a function call. In certain situations, RTE can implement the client server communication as a simple function call.
Trigger Communication Graph	The sum of all <a href="#">ExternalTriggeringPoints</a> for <a href="#">triggers</a> instantiated in <a href="#">PortPrototypes</a> , which are connected to each other, including the associated <a href="#">triggered runnable</a> .



Terms:	Description:
Mode Communication Graph	The sum of all <a href="#">ModeAccessPoints</a> and <a href="#">ModeSwitchPoints</a> to <a href="#">ModeDeclarationGroupPrototypes</a> instantiated in <a href="#">PortPrototypes</a> , which are connected to each other; or the sum of all <a href="#">managedModeGroups</a> and <a href="#">accessedModeGroups</a> to <a href="#">ModeDeclarationGroupPrototypes</a> in <a href="#">BswModuleDescriptions</a> connected to each other.
mode manager	Entering and leaving modes is initiated by a <i>mode manager</i> . A <i>mode manager</i> is either a software component that provides a p-port typed by a <a href="#">ModeSwitchInterface</a> , or a BSW module that defines in its <a href="#">BswModuleDescription</a> a <a href="#">ModeDeclarationGroupPrototype</a> in the role <a href="#">providedModeGroup</a> .
mode switch notification	The communication of a mode switch from the <i>mode manager</i> to the <i>mode user</i> , using either the <a href="#">ModeSwitchInterface</a> or <a href="#">providedModeGroup</a> and <a href="#">requiredModeGroup</a> <a href="#">ModeDeclarationGroupPrototypes</a> .
mode switch port	The port for receiving (or sending) a mode switch notification. For this purpose, a <i>mode switch port</i> is typed by a <a href="#">ModeSwitchInterface</a> .
mode user	An <i>AUTOSAR SW-C</i> or <i>AUTOSAR Basic Software Module</i> that depends on modes, is called a mode user. The dependency can occur through a <a href="#">SwcModeSwitchEvent</a> / <a href="#">BswModeSwitchEvent</a> , a <a href="#">ModeAccessPoint</a> for a provided/required <i>mode switch port</i> , or a <a href="#">accessedModeGroup</a> for a <a href="#">providedModeGroup</a> / <a href="#">requiredModeGroup</a> <a href="#">ModeDeclarationGroupPrototype</a> .
on-entry ExecutableEntity	A <a href="#">RunnableEntity</a> that is triggered by a <a href="#">SwcModeSwitchEvent</a> with <i>ModeActivationKind</i> 'entry'; or a <a href="#">BswSchedulableEntity</a> that is triggered by a <a href="#">BswModeSwitchEvent</a> with <i>ModeActivationKind</i> 'entry'.
on-exit ExecutableEntity	A <a href="#">RunnableEntity</a> that is triggered by a <a href="#">SwcModeSwitchEvent</a> with <i>ModeActivationKind</i> 'exit'; or a <a href="#">BswSchedulableEntity</a> that is triggered by a <a href="#">BswModeSwitchEvent</a> with <i>ModeActivationKind</i> 'exit'.
on-transition ExecutableEntity	A <a href="#">RunnableEntity</a> that is triggered by a <a href="#">SwcModeSwitchEvent</a> with <i>ModeActivationKind</i> 'transition'; or a <a href="#">BswSchedulableEntity</a> that is triggered by a <a href="#">BswModeSwitchEvent</a> with <i>ModeActivationKind</i> 'transition'.
trigger port	A <a href="#">PortPrototype</a> , which is typed by an <a href="#">TriggerInterface</a>
trigger sink	A <i>trigger sink</i> relies on the activation of <a href="#">RunnableEntity</a> or a <a href="#">BswSchedulableEntity</a> , if a particular <a href="#">Trigger</a> is raised. A <i>trigger sink</i> has a dedicated require <a href="#">trigger port</a> (s) and / or <a href="#">requiredTrigger</a> <a href="#">Trigger</a> (s) to communicate to the <a href="#">trigger source</a> (s).
trigger source	A <i>trigger source</i> administrates the particular <a href="#">Trigger</a> , and informs the RTE or <i>Basic Software Scheduler</i> if the <a href="#">Trigger</a> is raised. A <i>trigger source</i> has dedicated provide <a href="#">trigger port</a> (s) and / or <a href="#">releasedTrigger</a> <a href="#">Trigger</a> (s) to communicate to the <a href="#">trigger sink</a> (s).

Terms:	Description:
triggered BswSchedulableEntity	A <a href="#">BswSchedulableEntity</a> that is triggered at least by one <a href="#">BswExternalTriggerOccurredEvent</a> or <a href="#">BswInternalTriggerOccurredEvent</a> . In particular cases, the <i>Trigger Event Communication</i> or the <i>Inter Basic Software Schedulable Entity Triggering</i> is implemented by the <i>Basic Software Scheduler</i> as a direct or trusted function call of the <a href="#">triggered ExecutableEntity</a> , by the triggering <a href="#">ExecutableEntity</a> .
triggered ExecutableEntity	A <a href="#">RunnableEntity</a> that is triggered by at least one <a href="#">ExternalTriggerOccurredEvent</a> / <a href="#">InternalTriggerOccurredEvent</a> ; or a <a href="#">BswSchedulableEntity</a> that is triggered by at least one <a href="#">BswExternalTriggerOccurredEvent</a> / <a href="#">BswInternalTriggerOccurredEvent</a> . In particular cases, the <i>Trigger Event Communication</i> or the <i>Inter Runnable Triggering</i> is implemented by RTE or <i>Basic Software Scheduler</i> as a direct or trusted function call of the <a href="#">triggered ExecutableEntity</a> , by the triggering <a href="#">ExecutableEntity</a> .
triggered runnable	A <a href="#">RunnableEntity</a> that is triggered at least by one <a href="#">ExternalTriggerOccurredEvent</a> or <a href="#">InternalTriggerOccurredEvent</a> . In particular cases, the <i>Trigger Event Communication</i> or the <i>Inter Runnable Triggering</i> is implemented by RTE as a direct or trusted function call of the <i>triggered runnable</i> , by the triggering runnable.

**Table 2.2: Terms**

## 3 Related documentation

### 3.1 Input documents & related standards and norms

- [1] Explanation of Software Cluster Design And Integration Guideline for Classic Platform  
AUTOSAR\_CP\_EXP\_SwClusterDesignAndIntegrationGuideline
- [2] Glossary  
AUTOSAR\_FO\_TR\_Glossary
- [3] General Specification of Basic Software Modules  
AUTOSAR\_CP\_SWS\_BSWGeneral
- [4] Specification of RTE Software  
AUTOSAR\_CP\_SWS\_RTE
- [5] Specification of Operating System  
AUTOSAR\_CP\_SWS\_OS
- [6] Specification of NVRAM Manager  
AUTOSAR\_CP\_SWS\_NVRAMManager
- [7] Specification of Communication Stack Types  
AUTOSAR\_CP\_SWS\_CommunicationStackTypes
- [8] Specification of Large Data COM  
AUTOSAR\_CP\_SWS\_LargeDataCOM
- [9] Specification of Communication  
AUTOSAR\_CP\_SWS\_COM
- [10] Specification of Diagnostic Communication Manager  
AUTOSAR\_CP\_SWS\_DiagnosticCommunicationManager
- [11] Specification of Diagnostic Event Manager  
AUTOSAR\_CP\_SWS\_DiagnosticEventManager
- [12] Specification of Function Inhibition Manager  
AUTOSAR\_CP\_SWS\_FunctionInhibitionManager
- [13] Requirements on Software Cluster Connection module  
AUTOSAR\_CP\_SRS\_SoftwareClusterConnection
- [14] General Requirements on Basic Software Modules  
AUTOSAR\_CP\_SRS\_BSWGeneral
- [15] System Template  
AUTOSAR\_CP\_TPS\_SystemTemplate
- [16] Specification of CRC Routines  
AUTOSAR\_CP\_SWS\_CRCLibrary

- [17] Specification of Memory Mapping  
AUTOSAR\_CP\_SWS\_MemoryMapping
- [18] Specification of ECU Configuration  
AUTOSAR\_CP\_TPS\_ECUConfiguration
- [19] Software Component Template  
AUTOSAR\_CP\_TPS\_SoftwareComponentTemplate
- [20] Specification of Watchdog Manager  
AUTOSAR\_CP\_SWS\_WatchdogManager
- [21] Specification of Platform Types for Classic Platform  
AUTOSAR\_CP\_SWS\_PlatformTypes
- [22] Specification of Standard Types  
AUTOSAR\_CP\_SWS\_StandardTypes
- [23] ISO 17356-3:Road vehicles – Open interface for embedded automotive applications – Part 3:OSEK/VDX Operating System (OS)

### 3.2 Related specification

AUTOSAR provides a General Specification on Basic Software modules [3, SWS BSW General], which is also valid for [Software Cluster Connection](#).

Thus, the specification SWS BSW General shall be considered as additional and required specification for [Software Cluster Connection](#).

## 4 Constraints and assumptions

### 4.1 Limitations

The specification currently supports a limited number of BSW modules. Furthermore, for the supported BSW modules, the functionality and APIs available for [Application Software Clusters](#) is only subset of the overall functionality. In addition, the available VFB communication features are restricted.

### 4.2 Applicability to car domains

The specification focus on larger ECUs centralizing software functionality - so called domain or zone controllers. It assumes that the software components which are mapped to different [Software Clusters](#) are rather loosely coupled w.r.t. to interfaces and time domain. The software components supposed to implement mainly control loop software - usually time driven but may also react on limited numbers of sporadic events. Further information can be found in document [1].

## 5 Dependencies to other modules

### 5.1 Binary Manifest

#### 5.1.1 Header File structure

[SWS\_SwCluC\_00013] [The [Binary Manifest of the Software Cluster Connection](#) shall provide the header file `SwCluC_BManif.h`.

]([SRS\\_SwCluC\\_00006](#))

[SWS\_SwCluC\_00014] [The header file `SwCluC_BManif.h` shall include all header files configured in [SwCluCBManifHeaderIncludes](#) in the containers [SwCluCBManifProvideResourceEntryGroup](#) and [SwCluCBManifRequireResourceEntryGroup](#).]([SRS\\_SwCluC\\_00006](#))

### 5.2 Cross Cluster Communication

The [Cross Cluster Communication of the Software Cluster Connection](#) depends on the RTE [4].

### 5.3 Proxy Modules

The `SwCluC` module has following dependencies for its sub-functionalities in the [Proxy Modules](#):

Each [Low Proxy Module](#) depends on its specific BSW module

- [Os Low Proxy](#) depends on OS [5]
- [NvM Low Proxy](#) depends on NvM [6]
- [LdCom High Proxy](#) depends on [Communication Stack Types](#) [7]
- [LdCom Low Proxy](#) depends on [LdCom](#) [8] and [Communication Stack Types](#) [7]
- [Com Low Proxy](#) depends on [Com](#) [9]
- [Dcm Low Proxy](#) depends on [Dcm](#) [10]
- [Dem Low Proxy](#) depends on [Dem](#) [11]
- [FiM Low Proxy](#) depends on [FiM](#) [12]

## 6 Requirements Tracing

The following tables reference the requirements specified in [13], SRS\_SoftwareClusterConnection and [14], SRS\_BSWGeneral and links to the fulfillment of these. Please note that if column “Satisfied by” is empty for a specific requirement this means that this requirement is not fulfilled by this document.

Requirement	Description	Satisfied by
[SRS_BSW_00101]	The Basic Software Module shall be able to initialize variables and hardware in a separate initialization function	[SWS_SwCluC_02143] [SWS_SwCluC_11000] [SWS_SwCluC_11001] [SWS_SwCluC_12000] [SWS_SwCluC_12100] [SWS_SwCluC_12200] [SWS_SwCluC_12300] [SWS_SwCluC_12400] [SWS_SwCluC_13000] [SWS_SwCluC_13001]
[SRS_BSW_00159]	All modules of the AUTOSAR Basic Software shall support a tool based configuration	[SWS_SwCluC_02005] [SWS_SwCluC_02006] [SWS_SwCluC_02007]
[SRS_BSW_00167]	All AUTOSAR Basic Software Modules shall provide configuration rules and constraints to enable plausibility checks	[SWS_SwCluC_CONSTR_00078] [SWS_SwCluC_CONSTR_00096] [SWS_SwCluC_CONSTR_02130] [SWS_SwCluC_CONSTR_02131] [SWS_SwCluC_CONSTR_02145] [SWS_SwCluC_CONSTR_02146] [SWS_SwCluC_CONSTR_02158] [SWS_SwCluC_CONSTR_02159] [SWS_SwCluC_CONSTR_02231] [SWS_SwCluC_CONSTR_02232] [SWS_SwCluC_CONSTR_02233] [SWS_SwCluC_CONSTR_02234] [SWS_SwCluC_CONSTR_02235] [SWS_SwCluC_CONSTR_02236] [SWS_SwCluC_CONSTR_02237] [SWS_SwCluC_CONSTR_02427] [SWS_SwCluC_CONSTR_02428] [SWS_SwCluC_CONSTR_02429] [SWS_SwCluC_CONSTR_02553] [SWS_SwCluC_CONSTR_02664] [SWS_SwCluC_CONSTR_02720] [SWS_SwCluC_CONSTR_02721] [SWS_SwCluC_CONSTR_02752] [SWS_SwCluC_CONSTR_03020] [SWS_SwCluC_CONSTR_03021] [SWS_SwCluC_CONSTR_03032] [SWS_SwCluC_CONSTR_03053] [SWS_SwCluC_CONSTR_03054] [SWS_SwCluC_CONSTR_03059] [SWS_SwCluC_CONSTR_03063] [SWS_SwCluC_CONSTR_03069] [SWS_SwCluC_CONSTR_03093] [SWS_SwCluC_CONSTR_03210] [SWS_SwCluC_CONSTR_03211] [SWS_SwCluC_CONSTR_03400] [SWS_SwCluC_CONSTR_03403]
[SRS_BSW_00172]	The scheduling strategy that is built inside the Basic Software Modules shall be compatible with the strategy used in the system	[SWS_SwCluC_03170] [SWS_SwCluC_03173] [SWS_SwCluC_91002]
[SRS_BSW_00310]	API naming convention	[SWS_SwCluC_10000] [SWS_SwCluC_10001] [SWS_SwCluC_10002] [SWS_SwCluC_10003] [SWS_SwCluC_10004] [SWS_SwCluC_10005] [SWS_SwCluC_10006] [SWS_SwCluC_10007] [SWS_SwCluC_10008] [SWS_SwCluC_10011] [SWS_SwCluC_10020] [SWS_SwCluC_10021] [SWS_SwCluC_10022] [SWS_SwCluC_10023] [SWS_SwCluC_10032] [SWS_SwCluC_10033] [SWS_SwCluC_10034] [SWS_SwCluC_11000] [SWS_SwCluC_11001] [SWS_SwCluC_12000] [SWS_SwCluC_12100] [SWS_SwCluC_12200] [SWS_SwCluC_12300] [SWS_SwCluC_12400] [SWS_SwCluC_13000] [SWS_SwCluC_13001]
[SRS_BSW_00323]	All AUTOSAR Basic Software Modules shall check passed API parameters for validity	[SWS_SwCluC_02137] [SWS_SwCluC_02138] [SWS_SwCluC_02139] [SWS_SwCluC_02533] [SWS_SwCluC_02534] [SWS_SwCluC_02636] [SWS_SwCluC_02637] [SWS_SwCluC_02638] [SWS_SwCluC_02751] [SWS_SwCluC_03217] [SWS_SwCluC_03218] [SWS_SwCluC_09000]
[SRS_BSW_00327]	Error values naming convention	[SWS_SwCluC_02140] [SWS_SwCluC_02426] [SWS_SwCluC_02545] [SWS_SwCluC_02650] [SWS_SwCluC_02750] [SWS_SwCluC_03216] [SWS_SwCluC_09001]





Requirement	Description	Satisfied by
[SRS_BSW_00337]	Classification of development errors	[SWS_SwCluC_02140] [SWS_SwCluC_02426] [SWS_SwCluC_02545] [SWS_SwCluC_02650] [SWS_SwCluC_02750] [SWS_SwCluC_03216] [SWS_SwCluC_09001]
[SRS_BSW_00350]	All AUTOSAR Basic Software Modules shall allow the enabling/disabling of detection and reporting of development errors.	[SWS_SwCluC_02137] [SWS_SwCluC_02138] [SWS_SwCluC_02139] [SWS_SwCluC_02533] [SWS_SwCluC_02534] [SWS_SwCluC_02636] [SWS_SwCluC_02637] [SWS_SwCluC_02638] [SWS_SwCluC_02751] [SWS_SwCluC_03217] [SWS_SwCluC_03218]
[SRS_BSW_00358]	The return type of init() functions implemented by AUTOSAR Basic Software Modules shall be void	[SWS_SwCluC_11000] [SWS_SwCluC_11001] [SWS_SwCluC_12000] [SWS_SwCluC_12100] [SWS_SwCluC_12200] [SWS_SwCluC_12300] [SWS_SwCluC_12400] [SWS_SwCluC_13000] [SWS_SwCluC_13001]
[SRS_BSW_00369]	All AUTOSAR Basic Software Modules shall not return specific development error codes via the API	[SWS_SwCluC_02137] [SWS_SwCluC_02138] [SWS_SwCluC_02139] [SWS_SwCluC_02533] [SWS_SwCluC_02534] [SWS_SwCluC_02636] [SWS_SwCluC_02637] [SWS_SwCluC_02638] [SWS_SwCluC_02751] [SWS_SwCluC_03217] [SWS_SwCluC_03218] [SWS_SwCluC_09000]
[SRS_BSW_00373]	The main processing function of each AUTOSAR Basic Software Module shall be named according the defined convention	[SWS_SwCluC_09000] [SWS_SwCluC_91001] [SWS_SwCluC_91002]
[SRS_BSW_00385]	List possible error notifications	[SWS_SwCluC_02140] [SWS_SwCluC_02426] [SWS_SwCluC_02545] [SWS_SwCluC_02650] [SWS_SwCluC_02750] [SWS_SwCluC_03216] [SWS_SwCluC_09001]
[SRS_BSW_00407]	Each BSW module shall provide a function to read out the version information of a dedicated module implementation	[SWS_SwCluC_91001] [SWS_SwCluC_CONSTR_03404]
[SRS_BSW_00441]	Naming convention for type, macro and function	[SWS_SwCluC_01000] [SWS_SwCluC_01002]
[SRS_BSW_00480]	Null pointer errors shall follow a naming rule	[SWS_SwCluC_02140] [SWS_SwCluC_02426] [SWS_SwCluC_02545] [SWS_SwCluC_02650] [SWS_SwCluC_02750] [SWS_SwCluC_03216] [SWS_SwCluC_09001]
[SRS_BSW_00482]	Get version information function shall follow a naming rule	[SWS_SwCluC_09000] [SWS_SwCluC_91001]
[SRS_BSW_00487]	Errors for module initialization shall follow a naming rule	[SWS_SwCluC_02140] [SWS_SwCluC_02426] [SWS_SwCluC_02545] [SWS_SwCluC_02650] [SWS_SwCluC_02750] [SWS_SwCluC_03216] [SWS_SwCluC_09001]







Requirement	Description	Satisfied by
[SRS_SwCluC_00001]	Easy target machine interpretation	[SWS_SwCluC_00001] [SWS_SwCluC_00003] [SWS_SwCluC_00004] [SWS_SwCluC_00005] [SWS_SwCluC_00006] [SWS_SwCluC_00007] [SWS_SwCluC_00008] [SWS_SwCluC_00009] [SWS_SwCluC_00010] [SWS_SwCluC_00011] [SWS_SwCluC_00012] [SWS_SwCluC_00015] [SWS_SwCluC_00016] [SWS_SwCluC_00017] [SWS_SwCluC_00018] [SWS_SwCluC_00019] [SWS_SwCluC_00020] [SWS_SwCluC_00021] [SWS_SwCluC_00022] [SWS_SwCluC_00023] [SWS_SwCluC_00024] [SWS_SwCluC_00025] [SWS_SwCluC_00026] [SWS_SwCluC_00027] [SWS_SwCluC_00028] [SWS_SwCluC_00029] [SWS_SwCluC_00030] [SWS_SwCluC_00031] [SWS_SwCluC_00032] [SWS_SwCluC_00033] [SWS_SwCluC_00034] [SWS_SwCluC_00035] [SWS_SwCluC_00036] [SWS_SwCluC_00037] [SWS_SwCluC_00040] [SWS_SwCluC_00041] [SWS_SwCluC_00042] [SWS_SwCluC_00056] [SWS_SwCluC_00070] [SWS_SwCluC_00072] [SWS_SwCluC_00079] [SWS_SwCluC_00080] [SWS_SwCluC_00081] [SWS_SwCluC_00082] [SWS_SwCluC_00083] [SWS_SwCluC_00085] [SWS_SwCluC_00086] [SWS_SwCluC_00088] [SWS_SwCluC_00090] [SWS_SwCluC_00095] [SWS_SwCluC_CONSTR_00073]
[SRS_SwCluC_00002]	Identification of intended connections by unique IDs	[SWS_SwCluC_00015] [SWS_SwCluC_00021] [SWS_SwCluC_00034] [SWS_SwCluC_00035] [SWS_SwCluC_00043]
[SRS_SwCluC_00003]	Bidirectional connections	[SWS_SwCluC_00024] [SWS_SwCluC_00026]
[SRS_SwCluC_00004]	Connection multiplicity	[SWS_SwCluC_00027] [SWS_SwCluC_00045] [SWS_SwCluC_00046] [SWS_SwCluC_00047] [SWS_SwCluC_00088] [SWS_SwCluC_00089]
[SRS_SwCluC_00005]	Substitute Resource Providers	[SWS_SwCluC_00008] [SWS_SwCluC_00054] [SWS_SwCluC_00055] [SWS_SwCluC_CONSTR_00087]
[SRS_SwCluC_00006]	C API	[SWS_SwCluC_00002] [SWS_SwCluC_00013] [SWS_SwCluC_00014] [SWS_SwCluC_00062] [SWS_SwCluC_00063] [SWS_SwCluC_00064] [SWS_SwCluC_00065] [SWS_SwCluC_00066] [SWS_SwCluC_00067] [SWS_SwCluC_00068] [SWS_SwCluC_00069] [SWS_SwCluC_01000] [SWS_SwCluC_01002] [SWS_SwCluC_10000] [SWS_SwCluC_10001] [SWS_SwCluC_10002] [SWS_SwCluC_10003] [SWS_SwCluC_10004] [SWS_SwCluC_10005] [SWS_SwCluC_10006] [SWS_SwCluC_10007] [SWS_SwCluC_10008] [SWS_SwCluC_10009] [SWS_SwCluC_10010] [SWS_SwCluC_10011] [SWS_SwCluC_10020] [SWS_SwCluC_10021] [SWS_SwCluC_10022] [SWS_SwCluC_10023] [SWS_SwCluC_10032] [SWS_SwCluC_10033] [SWS_SwCluC_10034]
[SRS_SwCluC_00008]	Retrieve connection status and connected Software Cluster	[SWS_SwCluC_10021] [SWS_SwCluC_10023]
[SRS_SwCluC_00009]	Support missing interface partners	[SWS_SwCluC_00015] [SWS_SwCluC_00019] [SWS_SwCluC_00030] [SWS_SwCluC_00034] [SWS_SwCluC_00035] [SWS_SwCluC_00044]
[SRS_SwCluC_00010]	Static safeguard of Software Cluster connections	[SWS_SwCluC_00015] [SWS_SwCluC_00022] [SWS_SwCluC_03005] [SWS_SwCluC_03033] [SWS_SwCluC_03034] [SWS_SwCluC_03035] [SWS_SwCluC_03036] [SWS_SwCluC_03037] [SWS_SwCluC_03038] [SWS_SwCluC_03039] [SWS_SwCluC_03040] [SWS_SwCluC_03041] [SWS_SwCluC_03042] [SWS_SwCluC_03043] [SWS_SwCluC_03044] [SWS_SwCluC_03045] [SWS_SwCluC_03046] [SWS_SwCluC_03047]
[SRS_SwCluC_00011]	Separation of immutable memory and memory modifiable at the connection phase	[SWS_SwCluC_00001] [SWS_SwCluC_00003] [SWS_SwCluC_00004] [SWS_SwCluC_00005] [SWS_SwCluC_00006] [SWS_SwCluC_00007] [SWS_SwCluC_00008] [SWS_SwCluC_00009] [SWS_SwCluC_00010] [SWS_SwCluC_00011] [SWS_SwCluC_00012] [SWS_SwCluC_00015] [SWS_SwCluC_00028] [SWS_SwCluC_00029] [SWS_SwCluC_00030] [SWS_SwCluC_00031] [SWS_SwCluC_00032] [SWS_SwCluC_00033] [SWS_SwCluC_00034] [SWS_SwCluC_00035] [SWS_SwCluC_00042] [SWS_SwCluC_00070] [SWS_SwCluC_00072] [SWS_SwCluC_00079] [SWS_SwCluC_00080] [SWS_SwCluC_00081] [SWS_SwCluC_00082] [SWS_SwCluC_00083] [SWS_SwCluC_00085]





Requirement	Description	Satisfied by
[SRS_SwCluC_00012]	direct linkage	[SWS_SwCluC_00057] [SWS_SwCluC_00058] [SWS_SwCluC_00059] [SWS_SwCluC_00060] [SWS_SwCluC_00061]
[SRS_SwCluC_00013]	Initialization with C-compiler and linker means	[SWS_SwCluC_00001] [SWS_SwCluC_00003] [SWS_SwCluC_00004] [SWS_SwCluC_00005] [SWS_SwCluC_00006] [SWS_SwCluC_00007] [SWS_SwCluC_00008] [SWS_SwCluC_00009] [SWS_SwCluC_00010] [SWS_SwCluC_00011] [SWS_SwCluC_00012] [SWS_SwCluC_00029] [SWS_SwCluC_00030] [SWS_SwCluC_00031] [SWS_SwCluC_00032] [SWS_SwCluC_00033] [SWS_SwCluC_00034] [SWS_SwCluC_00035] [SWS_SwCluC_00042] [SWS_SwCluC_00070] [SWS_SwCluC_00072]
[SRS_SwCluC_00014]	Standardized persistence in memory	[SWS_SwCluC_00001] [SWS_SwCluC_00003] [SWS_SwCluC_00004] [SWS_SwCluC_00005] [SWS_SwCluC_00006] [SWS_SwCluC_00007] [SWS_SwCluC_00008] [SWS_SwCluC_00009] [SWS_SwCluC_00010] [SWS_SwCluC_00011] [SWS_SwCluC_00012] [SWS_SwCluC_00015] [SWS_SwCluC_00016] [SWS_SwCluC_00017] [SWS_SwCluC_00018] [SWS_SwCluC_00019] [SWS_SwCluC_00020] [SWS_SwCluC_00021] [SWS_SwCluC_00022] [SWS_SwCluC_00023] [SWS_SwCluC_00024] [SWS_SwCluC_00025] [SWS_SwCluC_00026] [SWS_SwCluC_00027] [SWS_SwCluC_00028] [SWS_SwCluC_00029] [SWS_SwCluC_00030] [SWS_SwCluC_00031] [SWS_SwCluC_00032] [SWS_SwCluC_00033] [SWS_SwCluC_00034] [SWS_SwCluC_00035] [SWS_SwCluC_00036] [SWS_SwCluC_00037] [SWS_SwCluC_00040] [SWS_SwCluC_00041] [SWS_SwCluC_00042] [SWS_SwCluC_00056] [SWS_SwCluC_00070] [SWS_SwCluC_00072] [SWS_SwCluC_00079] [SWS_SwCluC_00080] [SWS_SwCluC_00081] [SWS_SwCluC_00082] [SWS_SwCluC_00083] [SWS_SwCluC_00085] [SWS_SwCluC_00086] [SWS_SwCluC_00088] [SWS_SwCluC_00090] [SWS_SwCluC_00095] [SWS_SwCluC_00097] [SWS_SwCluC_CONSTR_00073] [SWS_SwCluC_CONSTR_00091] [SWS_SwCluC_CONSTR_00092] [SWS_SwCluC_CONSTR_00093] [SWS_SwCluC_CONSTR_00094]
[SRS_SwCluC_00100]	Cross Software Cluster Communication Plug-Ins	[SWS_SwCluC_03000] [SWS_SwCluC_03001] [SWS_SwCluC_03002] [SWS_SwCluC_03003] [SWS_SwCluC_03004] [SWS_SwCluC_03006] [SWS_SwCluC_03007] [SWS_SwCluC_03008] [SWS_SwCluC_03009] [SWS_SwCluC_03010] [SWS_SwCluC_03011] [SWS_SwCluC_03064] [SWS_SwCluC_03065] [SWS_SwCluC_03068] [SWS_SwCluC_03080] [SWS_SwCluC_03081] [SWS_SwCluC_03082] [SWS_SwCluC_03083] [SWS_SwCluC_03084] [SWS_SwCluC_03085] [SWS_SwCluC_03086] [SWS_SwCluC_03087] [SWS_SwCluC_03088] [SWS_SwCluC_03089] [SWS_SwCluC_03090] [SWS_SwCluC_03091] [SWS_SwCluC_03092] [SWS_SwCluC_03094] [SWS_SwCluC_03095] [SWS_SwCluC_03096] [SWS_SwCluC_03097] [SWS_SwCluC_03098] [SWS_SwCluC_03099] [SWS_SwCluC_03101] [SWS_SwCluC_03102] [SWS_SwCluC_03103] [SWS_SwCluC_03106] [SWS_SwCluC_03107] [SWS_SwCluC_03108] [SWS_SwCluC_03109] [SWS_SwCluC_03110] [SWS_SwCluC_03111] [SWS_SwCluC_03112] [SWS_SwCluC_03113] [SWS_SwCluC_03120] [SWS_SwCluC_03121] [SWS_SwCluC_03122] [SWS_SwCluC_03123] [SWS_SwCluC_03124] [SWS_SwCluC_03126] [SWS_SwCluC_03130] [SWS_SwCluC_03131] [SWS_SwCluC_03132] [SWS_SwCluC_03133] [SWS_SwCluC_03134] [SWS_SwCluC_03135] [SWS_SwCluC_03136] [SWS_SwCluC_03137] [SWS_SwCluC_03138] [SWS_SwCluC_03139] [SWS_SwCluC_03140] [SWS_SwCluC_03142] [SWS_SwCluC_03143] [SWS_SwCluC_03144] [SWS_SwCluC_03145] [SWS_SwCluC_03146] [SWS_SwCluC_03147] [SWS_SwCluC_03150] [SWS_SwCluC_03152] [SWS_SwCluC_03153] [SWS_SwCluC_03154] [SWS_SwCluC_03155] [SWS_SwCluC_03156] [SWS_SwCluC_03158] [SWS_SwCluC_03159] [SWS_SwCluC_03160] [SWS_SwCluC_03161] [SWS_SwCluC_03162] [SWS_SwCluC_03163] [SWS_SwCluC_03164] [SWS_SwCluC_03165] [SWS_SwCluC_03166] [SWS_SwCluC_03167] [SWS_SwCluC_03168] [SWS_SwCluC_03169] [SWS_SwCluC_03170] [SWS_SwCluC_03171] [SWS_SwCluC_03173] [SWS_SwCluC_03176] [SWS_SwCluC_03177] [SWS_SwCluC_03178] [SWS_SwCluC_03401] [SWS_SwCluC_03402] [SWS_SwCluC_03405] [SWS_SwCluC_03406] [SWS_SwCluC_11000]





Requirement	Description	Satisfied by
		[SWS_SwCluC_11001] [SWS_SwCluC_CONSTR_03066] [SWS_SwCluC_CONSTR_03067] [SWS_SwCluC_CONSTR_03069] [SWS_SwCluC_CONSTR_03093] [SWS_SwCluC_CONSTR_03400] [SWS_SwCluC_CONSTR_03403]
[SRS_SwCluC_00101]	'1:n' Sender-receiver communication	[SWS_SwCluC_03034] [SWS_SwCluC_03035] [SWS_SwCluC_03036] [SWS_SwCluC_03037] [SWS_SwCluC_03038] [SWS_SwCluC_03039] [SWS_SwCluC_03040] [SWS_SwCluC_03041] [SWS_SwCluC_03042] [SWS_SwCluC_03043] [SWS_SwCluC_03044] [SWS_SwCluC_03064] [SWS_SwCluC_03065] [SWS_SwCluC_03068] [SWS_SwCluC_03080] [SWS_SwCluC_03081] [SWS_SwCluC_03082] [SWS_SwCluC_03084] [SWS_SwCluC_03085] [SWS_SwCluC_03101] [SWS_SwCluC_03102] [SWS_SwCluC_03103] [SWS_SwCluC_03106] [SWS_SwCluC_03107] [SWS_SwCluC_03108] [SWS_SwCluC_03109] [SWS_SwCluC_03110] [SWS_SwCluC_03111] [SWS_SwCluC_03112] [SWS_SwCluC_03113] [SWS_SwCluC_03120] [SWS_SwCluC_03121] [SWS_SwCluC_03122] [SWS_SwCluC_03123] [SWS_SwCluC_03124] [SWS_SwCluC_03126] [SWS_SwCluC_03130] [SWS_SwCluC_03131] [SWS_SwCluC_03132] [SWS_SwCluC_03133] [SWS_SwCluC_03135] [SWS_SwCluC_03136] [SWS_SwCluC_03137] [SWS_SwCluC_03138] [SWS_SwCluC_03139] [SWS_SwCluC_03140] [SWS_SwCluC_03142] [SWS_SwCluC_03143] [SWS_SwCluC_03144] [SWS_SwCluC_03156] [SWS_SwCluC_03158] [SWS_SwCluC_03159] [SWS_SwCluC_03405] [SWS_SwCluC_03406]
[SRS_SwCluC_00102]	'n:1' Sender-receiver communication	[SWS_SwCluC_03034] [SWS_SwCluC_03035] [SWS_SwCluC_03036] [SWS_SwCluC_03037] [SWS_SwCluC_03038] [SWS_SwCluC_03039] [SWS_SwCluC_03040] [SWS_SwCluC_03041] [SWS_SwCluC_03042] [SWS_SwCluC_03043] [SWS_SwCluC_03044]
[SRS_SwCluC_00103]	'n:1' Client-server communication	[SWS_SwCluC_03035] [SWS_SwCluC_03036] [SWS_SwCluC_03037] [SWS_SwCluC_03038] [SWS_SwCluC_03039] [SWS_SwCluC_03040] [SWS_SwCluC_03041] [SWS_SwCluC_03042] [SWS_SwCluC_03043] [SWS_SwCluC_03044] [SWS_SwCluC_03047] [SWS_SwCluC_03083] [SWS_SwCluC_03086] [SWS_SwCluC_03087] [SWS_SwCluC_03088] [SWS_SwCluC_03089] [SWS_SwCluC_03090] [SWS_SwCluC_03091] [SWS_SwCluC_03092] [SWS_SwCluC_03094] [SWS_SwCluC_03095] [SWS_SwCluC_03096] [SWS_SwCluC_03097] [SWS_SwCluC_03098] [SWS_SwCluC_03099] [SWS_SwCluC_03134] [SWS_SwCluC_03145] [SWS_SwCluC_03146] [SWS_SwCluC_03147] [SWS_SwCluC_03150] [SWS_SwCluC_03152] [SWS_SwCluC_03153] [SWS_SwCluC_03154] [SWS_SwCluC_03155] [SWS_SwCluC_03160] [SWS_SwCluC_03161] [SWS_SwCluC_03162] [SWS_SwCluC_03163] [SWS_SwCluC_03164] [SWS_SwCluC_03165] [SWS_SwCluC_03166] [SWS_SwCluC_03167] [SWS_SwCluC_03168] [SWS_SwCluC_03169] [SWS_SwCluC_03170] [SWS_SwCluC_03171] [SWS_SwCluC_03173] [SWS_SwCluC_03176] [SWS_SwCluC_03177] [SWS_SwCluC_03178] [SWS_SwCluC_03401] [SWS_SwCluC_03402] [SWS_SwCluC_CONSTR_03093] [SWS_SwCluC_CONSTR_03403]
[SRS_SwCluC_00104]	'1:n' Mode Switch Communication	[SWS_SwCluC_03015] [SWS_SwCluC_03016] [SWS_SwCluC_03017] [SWS_SwCluC_03018] [SWS_SwCluC_03019] [SWS_SwCluC_03022] [SWS_SwCluC_03023] [SWS_SwCluC_03024] [SWS_SwCluC_03025] [SWS_SwCluC_03026] [SWS_SwCluC_03027] [SWS_SwCluC_03028] [SWS_SwCluC_03029] [SWS_SwCluC_03030] [SWS_SwCluC_03031] [SWS_SwCluC_03045] [SWS_SwCluC_03057] [SWS_SwCluC_03061] [SWS_SwCluC_03062] [SWS_SwCluC_03063] [SWS_SwCluC_CONSTR_03020] [SWS_SwCluC_CONSTR_03021] [SWS_SwCluC_CONSTR_03032]
[SRS_SwCluC_00105]	'1:n' External Trigger communication	[SWS_SwCluC_03046] [SWS_SwCluC_03048] [SWS_SwCluC_03049] [SWS_SwCluC_03050] [SWS_SwCluC_03051] [SWS_SwCluC_03052] [SWS_SwCluC_03055] [SWS_SwCluC_03056] [SWS_SwCluC_03058] [SWS_SwCluC_03060] [SWS_SwCluC_CONSTR_03053] [SWS_SwCluC_CONSTR_03054] [SWS_SwCluC_CONSTR_03059]





Requirement	Description	Satisfied by
[SRS_SwCluC_00106]	'1:n' Parameter Communication	[SWS_SwCluC_03006] [SWS_SwCluC_03007] [SWS_SwCluC_03008] [SWS_SwCluC_03009] [SWS_SwCluC_03010] [SWS_SwCluC_03011] [SWS_SwCluC_03034] [SWS_SwCluC_03035] [SWS_SwCluC_03036] [SWS_SwCluC_03037] [SWS_SwCluC_03038] [SWS_SwCluC_03039] [SWS_SwCluC_03040] [SWS_SwCluC_03041] [SWS_SwCluC_03042] [SWS_SwCluC_03043] [SWS_SwCluC_03044]
[SRS_SwCluC_00107]	Support unspecific preemption scenarios	[SWS_SwCluC_03084] [SWS_SwCluC_03085]
[SRS_SwCluC_00108]	Prevent from writing directly to memory of other Software Clusters	[SWS_SwCluC_11000] [SWS_SwCluC_11001]
[SRS_SwCluC_00201]	Standardized AUTOSAR Interfaces for software components	[SWS_SwCluC_02002] [SWS_SwCluC_02003] [SWS_SwCluC_02121] [SWS_SwCluC_02301] [SWS_SwCluC_02302] [SWS_SwCluC_02303] [SWS_SwCluC_02309] [SWS_SwCluC_02310] [SWS_SwCluC_02311] [SWS_SwCluC_02316] [SWS_SwCluC_02317] [SWS_SwCluC_02318] [SWS_SwCluC_02323] [SWS_SwCluC_02324] [SWS_SwCluC_02330] [SWS_SwCluC_02334] [SWS_SwCluC_02703] [SWS_SwCluC_02723] [SWS_SwCluC_02724] [SWS_SwCluC_02725] [SWS_SwCluC_02726] [SWS_SwCluC_02727] [SWS_SwCluC_02740] [SWS_SwCluC_02741] [SWS_SwCluC_02742] [SWS_SwCluC_02743] [SWS_SwCluC_03204]
[SRS_SwCluC_00202]	Standardized Interfaces for local BSW modules	[SWS_SwCluC_02001] [SWS_SwCluC_02125] [SWS_SwCluC_02212] [SWS_SwCluC_02225] [SWS_SwCluC_02507] [SWS_SwCluC_02510] [SWS_SwCluC_02511] [SWS_SwCluC_02512] [SWS_SwCluC_02513] [SWS_SwCluC_02514] [SWS_SwCluC_02515] [SWS_SwCluC_02516] [SWS_SwCluC_02517] [SWS_SwCluC_02609] [SWS_SwCluC_02610] [SWS_SwCluC_02611] [SWS_SwCluC_02612] [SWS_SwCluC_02618] [SWS_SwCluC_02619] [SWS_SwCluC_02620] [SWS_SwCluC_02621] [SWS_SwCluC_02622] [SWS_SwCluC_02623] [SWS_SwCluC_02702] [SWS_SwCluC_02703] [SWS_SwCluC_02704] [SWS_SwCluC_02705] [SWS_SwCluC_02706] [SWS_SwCluC_02707] [SWS_SwCluC_02736] [SWS_SwCluC_02737] [SWS_SwCluC_02738] [SWS_SwCluC_02739] [SWS_SwCluC_03202] [SWS_SwCluC_10012]
[SRS_SwCluC_00203]	Id abstraction	[SWS_SwCluC_02000]
[SRS_SwCluC_00204]	Modular Software Cluster Connection	[SWS_SwCluC_02007] [SWS_SwCluC_02101] [SWS_SwCluC_02144] [SWS_SwCluC_02200] [SWS_SwCluC_02201] [SWS_SwCluC_02338] [SWS_SwCluC_02339] [SWS_SwCluC_02500] [SWS_SwCluC_02501] [SWS_SwCluC_02600] [SWS_SwCluC_02601] [SWS_SwCluC_02748] [SWS_SwCluC_02749] [SWS_SwCluC_03214] [SWS_SwCluC_03215]
[SRS_SwCluC_00205]	Safeguarding connections between Software Clusters	[SWS_SwCluC_00015] [SWS_SwCluC_00022] [SWS_SwCluC_00042] [SWS_SwCluC_00043] [SWS_SwCluC_00077] [SWS_SwCluC_03005] [SWS_SwCluC_03033] [SWS_SwCluC_03034] [SWS_SwCluC_03035] [SWS_SwCluC_03036] [SWS_SwCluC_03037] [SWS_SwCluC_03038] [SWS_SwCluC_03039] [SWS_SwCluC_03040] [SWS_SwCluC_03041] [SWS_SwCluC_03042] [SWS_SwCluC_03043] [SWS_SwCluC_03044] [SWS_SwCluC_03045] [SWS_SwCluC_03046] [SWS_SwCluC_03047]





Requirement	Description	Satisfied by
[SRS_SwCluC_00206]	NV blocks in Application Software Cluster	[SWS_SwCluC_02101] [SWS_SwCluC_02102] [SWS_SwCluC_02103] [SWS_SwCluC_02104] [SWS_SwCluC_02105] [SWS_SwCluC_02106] [SWS_SwCluC_02107] [SWS_SwCluC_02108] [SWS_SwCluC_02109] [SWS_SwCluC_02110] [SWS_SwCluC_02111] [SWS_SwCluC_02112] [SWS_SwCluC_02113] [SWS_SwCluC_02114] [SWS_SwCluC_02115] [SWS_SwCluC_02116] [SWS_SwCluC_02117] [SWS_SwCluC_02118] [SWS_SwCluC_02119] [SWS_SwCluC_02120] [SWS_SwCluC_02121] [SWS_SwCluC_02122] [SWS_SwCluC_02123] [SWS_SwCluC_02124] [SWS_SwCluC_02125] [SWS_SwCluC_02126] [SWS_SwCluC_02127] [SWS_SwCluC_02128] [SWS_SwCluC_02129] [SWS_SwCluC_02132] [SWS_SwCluC_02133] [SWS_SwCluC_02136] [SWS_SwCluC_02137] [SWS_SwCluC_02138] [SWS_SwCluC_02139] [SWS_SwCluC_02142] [SWS_SwCluC_02143] [SWS_SwCluC_02144] [SWS_SwCluC_02147] [SWS_SwCluC_02149] [SWS_SwCluC_02150] [SWS_SwCluC_02151] [SWS_SwCluC_02152] [SWS_SwCluC_02153] [SWS_SwCluC_02154] [SWS_SwCluC_02155] [SWS_SwCluC_02156] [SWS_SwCluC_02157] [SWS_SwCluC_CONSTR_02130] [SWS_SwCluC_CONSTR_02131] [SWS_SwCluC_CONSTR_02134] [SWS_SwCluC_CONSTR_02135] [SWS_SwCluC_CONSTR_02141] [SWS_SwCluC_CONSTR_02145] [SWS_SwCluC_CONSTR_02146] [SWS_SwCluC_CONSTR_02148] [SWS_SwCluC_CONSTR_02158] [SWS_SwCluC_CONSTR_02159] [SWS_SwCluC_CONSTR_02160]
[SRS_SwCluC_00207]	LdCom Invocation from Application Software Cluster	[SWS_SwCluC_02500] [SWS_SwCluC_02501] [SWS_SwCluC_02502] [SWS_SwCluC_02503] [SWS_SwCluC_02504] [SWS_SwCluC_02505] [SWS_SwCluC_02506] [SWS_SwCluC_02507] [SWS_SwCluC_02508] [SWS_SwCluC_02509] [SWS_SwCluC_02510] [SWS_SwCluC_02511] [SWS_SwCluC_02512] [SWS_SwCluC_02513] [SWS_SwCluC_02514] [SWS_SwCluC_02515] [SWS_SwCluC_02516] [SWS_SwCluC_02517] [SWS_SwCluC_02518] [SWS_SwCluC_02519] [SWS_SwCluC_02520] [SWS_SwCluC_02521] [SWS_SwCluC_02522] [SWS_SwCluC_02523] [SWS_SwCluC_02524] [SWS_SwCluC_02525] [SWS_SwCluC_02526] [SWS_SwCluC_02527] [SWS_SwCluC_02528] [SWS_SwCluC_02529] [SWS_SwCluC_02530] [SWS_SwCluC_02531] [SWS_SwCluC_02532] [SWS_SwCluC_02533] [SWS_SwCluC_02534] [SWS_SwCluC_02535] [SWS_SwCluC_02536] [SWS_SwCluC_02537] [SWS_SwCluC_02538] [SWS_SwCluC_02539] [SWS_SwCluC_02540] [SWS_SwCluC_02541] [SWS_SwCluC_02542] [SWS_SwCluC_02543] [SWS_SwCluC_02544] [SWS_SwCluC_02550] [SWS_SwCluC_02551] [SWS_SwCluC_02552] [SWS_SwCluC_10012] [SWS_SwCluC_13008] [SWS_SwCluC_13009] [SWS_SwCluC_13010] [SWS_SwCluC_13011] [SWS_SwCluC_13012] [SWS_SwCluC_13013] [SWS_SwCluC_13014] [SWS_SwCluC_13015] [SWS_SwCluC_CONSTR_02546] [SWS_SwCluC_CONSTR_02547] [SWS_SwCluC_CONSTR_02553] [SWS_SwCluC_CONSTR_02555] [SWS_SwCluC_CONSTR_02556] [SWS_SwCluC_CONSTR_02557] [SWS_SwCluC_CONSTR_02558] [SWS_SwCluC_CONSTR_02559] [SWS_SwCluC_CONSTR_02560] [SWS_SwCluC_CONSTR_02561] [SWS_SwCluC_CONSTR_02562]







Requirement	Description	Satisfied by
[SRS_SwCluC_00208]	Dcm contribution by Application Software Cluster	[SWS_SwCluC_02300] [SWS_SwCluC_02301] [SWS_SwCluC_02302] [SWS_SwCluC_02303] [SWS_SwCluC_02304] [SWS_SwCluC_02305] [SWS_SwCluC_02306] [SWS_SwCluC_02307] [SWS_SwCluC_02308] [SWS_SwCluC_02309] [SWS_SwCluC_02310] [SWS_SwCluC_02311] [SWS_SwCluC_02312] [SWS_SwCluC_02313] [SWS_SwCluC_02314] [SWS_SwCluC_02315] [SWS_SwCluC_02316] [SWS_SwCluC_02317] [SWS_SwCluC_02318] [SWS_SwCluC_02319] [SWS_SwCluC_02320] [SWS_SwCluC_02321] [SWS_SwCluC_02322] [SWS_SwCluC_02323] [SWS_SwCluC_02324] [SWS_SwCluC_02325] [SWS_SwCluC_02330] [SWS_SwCluC_02331] [SWS_SwCluC_02332] [SWS_SwCluC_02333] [SWS_SwCluC_02334] [SWS_SwCluC_02335] [SWS_SwCluC_02336] [SWS_SwCluC_02337] [SWS_SwCluC_02338] [SWS_SwCluC_02339] [SWS_SwCluC_02341] [SWS_SwCluC_02342] [SWS_SwCluC_02350] [SWS_SwCluC_02351] [SWS_SwCluC_02352] [SWS_SwCluC_02353] [SWS_SwCluC_02354] [SWS_SwCluC_02355] [SWS_SwCluC_02356] [SWS_SwCluC_02357] [SWS_SwCluC_02358] [SWS_SwCluC_02359] [SWS_SwCluC_02360] [SWS_SwCluC_02361] [SWS_SwCluC_02362] [SWS_SwCluC_02363] [SWS_SwCluC_02364] [SWS_SwCluC_02365] [SWS_SwCluC_02366] [SWS_SwCluC_02367] [SWS_SwCluC_02368] [SWS_SwCluC_02369] [SWS_SwCluC_02370] [SWS_SwCluC_02371] [SWS_SwCluC_02372] [SWS_SwCluC_02373] [SWS_SwCluC_02374] [SWS_SwCluC_02375] [SWS_SwCluC_02376] [SWS_SwCluC_02380] [SWS_SwCluC_02381] [SWS_SwCluC_02382] [SWS_SwCluC_02383] [SWS_SwCluC_02384] [SWS_SwCluC_02385] [SWS_SwCluC_02386] [SWS_SwCluC_02387] [SWS_SwCluC_02388] [SWS_SwCluC_02400] [SWS_SwCluC_02401] [SWS_SwCluC_02402] [SWS_SwCluC_02403] [SWS_SwCluC_02404] [SWS_SwCluC_02405] [SWS_SwCluC_02406] [SWS_SwCluC_02407] [SWS_SwCluC_02408] [SWS_SwCluC_02409] [SWS_SwCluC_02410] [SWS_SwCluC_02411] [SWS_SwCluC_02412] [SWS_SwCluC_02413] [SWS_SwCluC_02414] [SWS_SwCluC_02415] [SWS_SwCluC_02416] [SWS_SwCluC_02417] [SWS_SwCluC_02418] [SWS_SwCluC_02419] [SWS_SwCluC_02420] [SWS_SwCluC_02421] [SWS_SwCluC_02422] [SWS_SwCluC_02423] [SWS_SwCluC_02424] [SWS_SwCluC_02425] [SWS_SwCluC_CONSTR_02427] [SWS_SwCluC_CONSTR_02428] [SWS_SwCluC_CONSTR_02429] [SWS_SwCluC_CONSTR_02752]
[SRS_SwCluC_00209]	Diagnostic Monitors in Application Software Cluster	[SWS_SwCluC_02700] [SWS_SwCluC_02701] [SWS_SwCluC_02702] [SWS_SwCluC_02703] [SWS_SwCluC_02704] [SWS_SwCluC_02705] [SWS_SwCluC_02706] [SWS_SwCluC_02707] [SWS_SwCluC_02708] [SWS_SwCluC_02709] [SWS_SwCluC_02710] [SWS_SwCluC_02711] [SWS_SwCluC_02712] [SWS_SwCluC_02713] [SWS_SwCluC_02714] [SWS_SwCluC_02715] [SWS_SwCluC_02716] [SWS_SwCluC_02717] [SWS_SwCluC_02718] [SWS_SwCluC_02719] [SWS_SwCluC_02723] [SWS_SwCluC_02724] [SWS_SwCluC_02725] [SWS_SwCluC_02726] [SWS_SwCluC_02727] [SWS_SwCluC_02728] [SWS_SwCluC_02729] [SWS_SwCluC_02730] [SWS_SwCluC_02731] [SWS_SwCluC_02732] [SWS_SwCluC_02733] [SWS_SwCluC_02734] [SWS_SwCluC_02735] [SWS_SwCluC_02736] [SWS_SwCluC_02737] [SWS_SwCluC_02738] [SWS_SwCluC_02739] [SWS_SwCluC_02740] [SWS_SwCluC_02741] [SWS_SwCluC_02742] [SWS_SwCluC_02743] [SWS_SwCluC_02744] [SWS_SwCluC_02745] [SWS_SwCluC_02746] [SWS_SwCluC_02747] [SWS_SwCluC_02748] [SWS_SwCluC_02749] [SWS_SwCluC_02751] [SWS_SwCluC_CONSTR_02720] [SWS_SwCluC_CONSTR_02721]
[SRS_SwCluC_00210]	Usage of Function Inhibitions in Application Software Cluster	[SWS_SwCluC_03200] [SWS_SwCluC_03201] [SWS_SwCluC_03202] [SWS_SwCluC_03203] [SWS_SwCluC_03204] [SWS_SwCluC_03205] [SWS_SwCluC_03206] [SWS_SwCluC_03207] [SWS_SwCluC_03208] [SWS_SwCluC_03209] [SWS_SwCluC_03210] [SWS_SwCluC_03211] [SWS_SwCluC_03212] [SWS_SwCluC_03213] [SWS_SwCluC_03214] [SWS_SwCluC_03215] [SWS_SwCluC_03217] [SWS_SwCluC_03218] [SWS_SwCluC_CONSTR_03210] [SWS_SwCluC_CONSTR_03211]





Requirement	Description	Satisfied by
[SRS_SwCluC_00211]	Com Invocation from Application Software Cluster	[SWS_SwCluC_02548] [SWS_SwCluC_02549] [SWS_SwCluC_02600] [SWS_SwCluC_02601] [SWS_SwCluC_02602] [SWS_SwCluC_02603] [SWS_SwCluC_02604] [SWS_SwCluC_02605] [SWS_SwCluC_02606] [SWS_SwCluC_02607] [SWS_SwCluC_02608] [SWS_SwCluC_02609] [SWS_SwCluC_02610] [SWS_SwCluC_02611] [SWS_SwCluC_02612] [SWS_SwCluC_02613] [SWS_SwCluC_02614] [SWS_SwCluC_02615] [SWS_SwCluC_02616] [SWS_SwCluC_02617] [SWS_SwCluC_02618] [SWS_SwCluC_02619] [SWS_SwCluC_02620] [SWS_SwCluC_02621] [SWS_SwCluC_02622] [SWS_SwCluC_02623] [SWS_SwCluC_02624] [SWS_SwCluC_02625] [SWS_SwCluC_02626] [SWS_SwCluC_02627] [SWS_SwCluC_02628] [SWS_SwCluC_02629] [SWS_SwCluC_02630] [SWS_SwCluC_02631] [SWS_SwCluC_02632] [SWS_SwCluC_02633] [SWS_SwCluC_02634] [SWS_SwCluC_02636] [SWS_SwCluC_02637] [SWS_SwCluC_02638] [SWS_SwCluC_02639] [SWS_SwCluC_02640] [SWS_SwCluC_02642] [SWS_SwCluC_02643] [SWS_SwCluC_02644] [SWS_SwCluC_02645] [SWS_SwCluC_02646] [SWS_SwCluC_02647] [SWS_SwCluC_02648] [SWS_SwCluC_02649] [SWS_SwCluC_02651] [SWS_SwCluC_02652] [SWS_SwCluC_02661] [SWS_SwCluC_02662] [SWS_SwCluC_02663] [SWS_SwCluC_10012] [SWS_SwCluC_13002] [SWS_SwCluC_13003] [SWS_SwCluC_13004] [SWS_SwCluC_13005] [SWS_SwCluC_13006] [SWS_SwCluC_13007] [SWS_SwCluC_CONSTR_02554] [SWS_SwCluC_CONSTR_02653] [SWS_SwCluC_CONSTR_02654] [SWS_SwCluC_CONSTR_02655] [SWS_SwCluC_CONSTR_02656] [SWS_SwCluC_CONSTR_02657] [SWS_SwCluC_CONSTR_02658] [SWS_SwCluC_CONSTR_02659] [SWS_SwCluC_CONSTR_02660] [SWS_SwCluC_CONSTR_02664]
[SRS_SwCluC_00212]	Post Build connection between Software Clusters	[SWS_SwCluC_00048] [SWS_SwCluC_00049] [SWS_SwCluC_00050] [SWS_SwCluC_00051] [SWS_SwCluC_00052] [SWS_SwCluC_00053] [SWS_SwCluC_00075] [SWS_SwCluC_00076] [SWS_SwCluC_00077] [SWS_SwCluC_00086] [SWS_SwCluC_02008] [SWS_SwCluC_02390] [SWS_SwCluC_02391] [SWS_SwCluC_02392] [SWS_SwCluC_02393] [SWS_SwCluC_02394] [SWS_SwCluC_02395] [SWS_SwCluC_02396] [SWS_SwCluC_02397] [SWS_SwCluC_02544] [SWS_SwCluC_02551] [SWS_SwCluC_02646] [SWS_SwCluC_02647] [SWS_SwCluC_02662] [SWS_SwCluC_02663] [SWS_SwCluC_02744] [SWS_SwCluC_02745] [SWS_SwCluC_02746] [SWS_SwCluC_02747] [SWS_SwCluC_03003] [SWS_SwCluC_03012] [SWS_SwCluC_03013] [SWS_SwCluC_03142] [SWS_SwCluC_03210] [SWS_SwCluC_03211] [SWS_SwCluC_03212] [SWS_SwCluC_03213] [SWS_SwCluC_CONSTR_00078] [SWS_SwCluC_CONSTR_00096] [SWS_SwCluC_CONSTR_03063]
[SRS_SwCluC_00213]	Support unconnected interfaces from other Software Clusters	[SWS_SwCluC_02004] [SWS_SwCluC_02107] [SWS_SwCluC_02108] [SWS_SwCluC_02113] [SWS_SwCluC_02114] [SWS_SwCluC_02266] [SWS_SwCluC_02380] [SWS_SwCluC_02381] [SWS_SwCluC_02382] [SWS_SwCluC_02383] [SWS_SwCluC_02384] [SWS_SwCluC_02385] [SWS_SwCluC_02386] [SWS_SwCluC_02387] [SWS_SwCluC_02388] [SWS_SwCluC_02402] [SWS_SwCluC_02405] [SWS_SwCluC_02408] [SWS_SwCluC_02411] [SWS_SwCluC_02414] [SWS_SwCluC_02417] [SWS_SwCluC_02420] [SWS_SwCluC_02423] [SWS_SwCluC_02508] [SWS_SwCluC_02530] [SWS_SwCluC_02531] [SWS_SwCluC_02532] [SWS_SwCluC_02612] [SWS_SwCluC_02613] [SWS_SwCluC_02614] [SWS_SwCluC_02634] [SWS_SwCluC_02710] [SWS_SwCluC_02711] [SWS_SwCluC_02712] [SWS_SwCluC_02713] [SWS_SwCluC_02714] [SWS_SwCluC_02715] [SWS_SwCluC_02716] [SWS_SwCluC_02717] [SWS_SwCluC_02718] [SWS_SwCluC_02734] [SWS_SwCluC_02735] [SWS_SwCluC_03010] [SWS_SwCluC_03107] [SWS_SwCluC_03112] [SWS_SwCluC_03130] [SWS_SwCluC_03131] [SWS_SwCluC_03137] [SWS_SwCluC_03143] [SWS_SwCluC_03164] [SWS_SwCluC_03167] [SWS_SwCluC_03205] [SWS_SwCluC_03206] [SWS_SwCluC_03405] [SWS_SwCluC_CONSTR_02134]





Requirement	Description	Satisfied by
[SRS_SwCluC_00214]	Software Cluster local RTE	[SWS_SwCluC_02202] [SWS_SwCluC_02204] [SWS_SwCluC_02205] [SWS_SwCluC_02206] [SWS_SwCluC_02210] [SWS_SwCluC_02211] [SWS_SwCluC_02212] [SWS_SwCluC_02213] [SWS_SwCluC_02214] [SWS_SwCluC_02215] [SWS_SwCluC_02216] [SWS_SwCluC_02217] [SWS_SwCluC_02218] [SWS_SwCluC_02219] [SWS_SwCluC_02220] [SWS_SwCluC_02221] [SWS_SwCluC_02222] [SWS_SwCluC_02223] [SWS_SwCluC_02224] [SWS_SwCluC_02225] [SWS_SwCluC_02226] [SWS_SwCluC_02227] [SWS_SwCluC_02229] [SWS_SwCluC_02230] [SWS_SwCluC_02250] [SWS_SwCluC_02251] [SWS_SwCluC_02252] [SWS_SwCluC_02253] [SWS_SwCluC_02254] [SWS_SwCluC_02255] [SWS_SwCluC_02256] [SWS_SwCluC_02259] [SWS_SwCluC_02262] [SWS_SwCluC_02263] [SWS_SwCluC_02264] [SWS_SwCluC_02265] [SWS_SwCluC_02270] [SWS_SwCluC_02271] [SWS_SwCluC_02272] [SWS_SwCluC_02273] [SWS_SwCluC_02274] [SWS_SwCluC_02275] [SWS_SwCluC_02276] [SWS_SwCluC_02277] [SWS_SwCluC_02278] [SWS_SwCluC_02279] [SWS_SwCluC_02280] [SWS_SwCluC_CONSTR_02203] [SWS_SwCluC_CONSTR_02231] [SWS_SwCluC_CONSTR_02232] [SWS_SwCluC_CONSTR_02233] [SWS_SwCluC_CONSTR_02234] [SWS_SwCluC_CONSTR_02235] [SWS_SwCluC_CONSTR_02236] [SWS_SwCluC_CONSTR_02237] [SWS_SwCluC_CONSTR_02281] [SWS_SwCluC_CONSTR_02282] [SWS_SwCluC_CONSTR_02283]
[SRS_SwCluC_00300]	A2L Generation Support	[SWS_SwCluC_03071] [SWS_SwCluC_03072] [SWS_SwCluC_03073] [SWS_SwCluC_03074] [SWS_SwCluC_03075] [SWS_SwCluC_03076] [SWS_SwCluC_03077]

**Table 6.1: RequirementsTracing**



## 7 Functional specification

### 7.1 Binary Manifest

#### 7.1.1 Overview

With the concept of [Software Clusters](#), the overall software of an AUTOSAR Classic Platform Architecture can be split into smaller units. In such a clustered AUTOSAR Classic Platform Architecture a resource is used to describes any capability which

- is needed to operate the software in [Software Clusters](#)

AND

- which is provided by one [Software Cluster](#) for another [Software Clusters](#)

Please note as well document [15] with its description about [CpSoftwareClusterResources](#).

Each [Software Cluster](#) is an independent build unit, and the result of the cluster-specific build processes are the [Binary Objects](#). The [Binary Manifests](#) provide the means to connect the [Binary Objects](#) that are deployed on the same [machine](#). Hence, the [Binary Manifest](#) is the well-defined interface of the [Software Cluster's Binary Object](#).

The [Binary Manifest](#) provides any information, which is required to access a resource inside a [Software Cluster](#), and to connect provided and required resources of [Software Clusters](#). A resource, in this context, can be anything that is required to operate the software. For example, a sender receiver interface of the [Software Cluster](#) or a NV block. An obvious property of such a resource is, whether it is provided or required by a [Software Cluster](#).

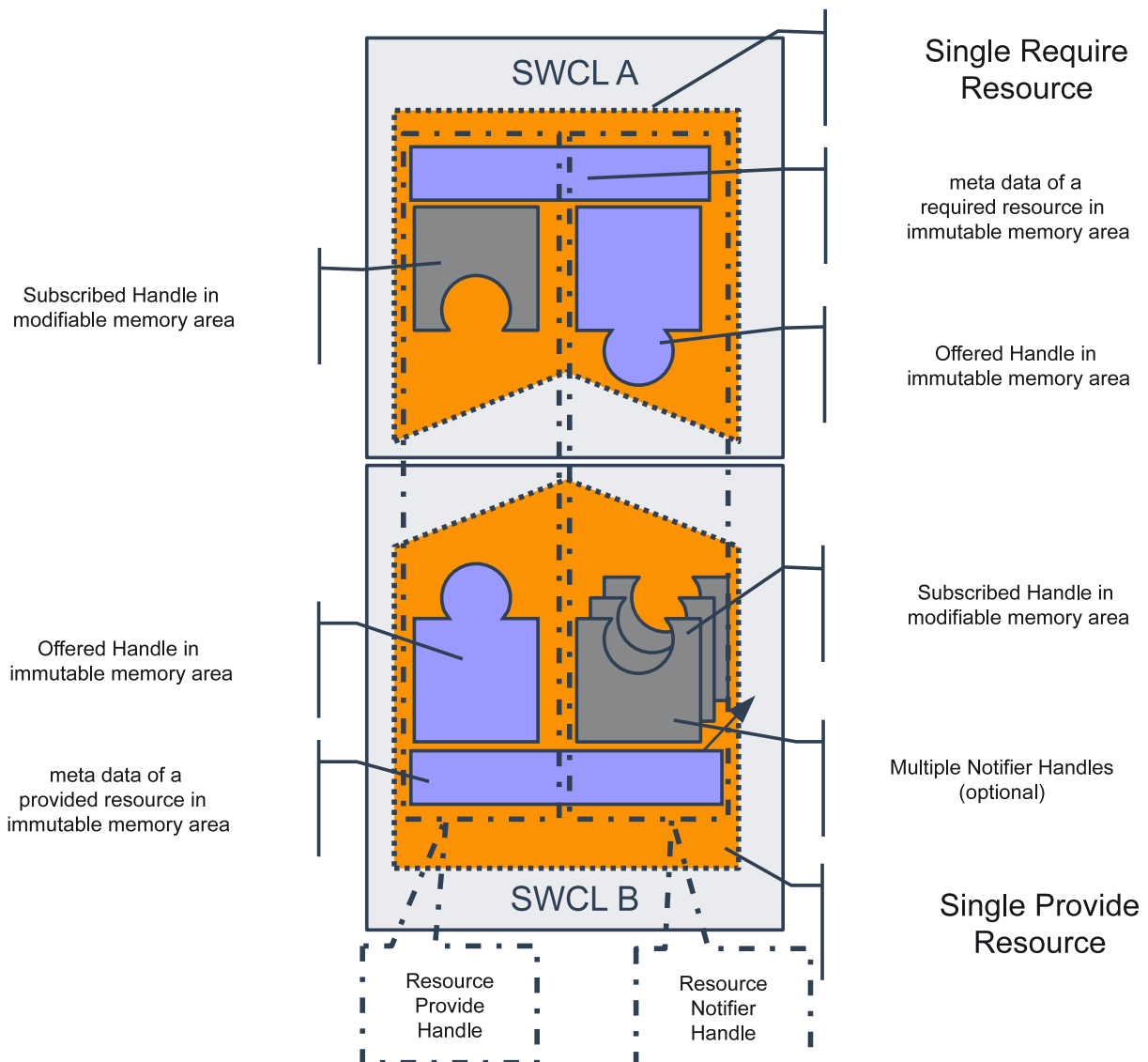
The [Binary Manifest](#) has the following core characteristics:

- The [Binary Manifest](#) gets created during the build of the [Software Cluster](#), since it has to store information which might be build dependent (e.g. data and function addresses, ID values to use BSW APIs, attribute values, hashes)
- The [Binary Manifest](#) provides a C interface towards [Software Cluster's](#) implementation. This supports an abstraction in the other functional blocks of the [Software Cluster Connection](#) from the [Binary Manifest's](#) table implementation. The C interface is also accessible by implementations of CDDs requiring the usage of the [Binary Manifest](#).
- The [Binary Manifest](#) defines an ECU-C interface to [Software Cluster's](#) build tools. This supports an abstract usage of the [Binary Manifest](#) by other functional blocks of the [Software Cluster Connection](#), as well as the usage of the [Binary Manifest](#) by CDDs.

- The **Binary Manifest** format can be easily interpreted by the target **machine**. Note: In contrast to concepts for other domains (e.g. Java, Android), in this specification it is not the goal to provide a textual manifest (XML, JSON).
- An unique identifier per resource is used for the connection process. These are explicitly assigned since hash numbers are not suitable.
- The **Binary Manifest** shall have guarding information, to ensure that only compatible interfaces are getting connected. These guarding values consist of a hash over certain interface properties (see 7.3.2.2 and 7.5).

### 7.1.2 Logical structure of a Binary Manifest

The Figure 7.1 provides an overview of the conceptual elements of the **Binary Manifest** necessary for a fictional example resource.



**Figure 7.1: Logical structure of a Binary Manifest**

The [Binary Manifest](#) provides the ability to connect required and provided resources of Software Clusters. Each resource is qualified by a set of meta data, e.g.

- the unique identifier of the resource
- the type of the resource (e.g. a sender receiver communication or connection of NV blocks)
- the nature, whether a resource is required or provided by this [Software Cluster](#)
- in case of required resources, whether it is mandatory for the operation of the [Software Cluster](#)
- guarding information (e.g. hash values) to ensure that only compatible resources are getting connected
- the number of stored handles, and where those handles can be found in the the according tables

Each type of resource is qualified by the number of handles, their purpose for the connection, and the order in which they are placed in the [Binary Manifest](#). The handles hold the information, which the [Software Cluster](#) requesting a resource needs to access it in the providing [Software Cluster](#).

A single handle can be

- a data pointer
- a function pointer
- a value

In some cases, a connection of a resource may require the exchange of handles in both directions. Consistently the [Binary Manifest](#) distinguishes between two types of handles on the logical level:

- [Provide Handle](#) to publish a handle from resource provider to resource requester
- [Notifier Handle](#) to publish a handle from resource requester to resource provider

An example for a [Provide Handle](#) would be a propagated API function to call an AUTOSAR Service from a [Application Software Cluster](#).

An example for a [Notifier Handle](#) would be a callback notification from a connected AUTOSAR Service.

In addition, it is supported that a resource provider gets connected to multiple resource requester even if it utilizes [Notifier Handles](#). But in this case for each potential resource requester a own set of [Notifier Handles](#) needs to be reserved for each resource requester. Hence a [Notifier Handle Set](#) holds all the [Notifier Handles](#) for one resource requester.

The [Binary Manifest](#) is composed of the following parts:

- the [Binary Manifest Header](#). It is the central entry point, provides administrative data and references to the other parts of the manifest.
- the [Interface Descriptor Table](#). It contains one row of meta information per [Resource Entry](#) (required or provided interface) - unique ID, properties to operate the resource at run-time, hash values about interface characteristics and semantics.
- the [Offered Interface](#). It contains all handles that are offered to other clusters - as explained above, either because a resource is provided, or because a required resource also needs a handle in the other direction.
- the [Subscribed Interface](#). Vice versa, it contains all handles that this [Software Cluster](#) holds that were offered by other [Software Clusters](#)
- checksums and markers ([Immutable Tables Checksum](#), [Subscribed Interface Validity Marker](#))

Some parts of the [Binary Manifest](#) are fixed when building a [Software Cluster](#), called immutable, while others have to be changed in the connection process, called modifiable:

- immutable
  - the [Binary Manifest Header](#)
  - the [Interface Descriptor Table](#)
  - offered handles
  - the default value for subscribed handles, to support operation in the unconnected state
- modifiable

To establish a connection, this memory area has to store the handles from other SWCLs. Additionally, information might be stored to identify whether the resource is connected at all (only defaults are visible) and to which SWCL.

### 7.1.3 Mapping between Logical structure and Configuration structure

The logical structure shown in [Figure 7.1](#) is also reflected in the configuration structure of the [Binary Manifest](#).

The set of handles, relevant to connect one type of resource, is defined in the [SwCluCBManifResourceType](#). A [Resource Type](#) is characterized by a defined set of [Provide Handles](#) and [Notifier Handles](#), with specific types in a well defined order.

Handles can optionally exist. This is useful for resources which do not always need the full set of handles in all feature configurations. For instance, sender receiver communication works with or without `sendIndication`. Spending always a new `resource type id` (`SwCluCBManifResourceId`) is not appropriate due to the limited numberspace! But the `Resource Provider` and `Resource Requester` have to have the same mutual understanding of the optionality conditions and both have to see a matching configuration to determine the identical handle configuration for a particular `CpSoftwareClusterResource`.

This is the prerequisite to enable the connection between Software Clusters.

Optional handles are always added after the non-optional ones!

In addition it is highly recommended that the configuration values resulting in different handle configurations are also considered for the guard value calculation.

Each required or provided resource of this `Software Cluster` corresponds to one `Resource Entry` in the `Binary Manifest`.

One `Resource Entry` corresponds to exactly one row in the `Interface Descriptor Table`, plus one or several handles in the `Offered Interface` and / or `Subscribed Interface`. Depending whether the resource is required or provided, `Provide Handles` and `Notifier Handles` are implemented in the `Software Cluster` or expected to be set by the other `Software Cluster`. Please note as well Table 7.1.

Therefore, the configuration provides two distinct definitions for `Provide Resource Entries` as `SwCluCBManifProvideResourceEntry` and `Require Resource Entries` as `SwCluCBManifRequireResourceEntry`.

From a `Binary Manifest` user perspective, it is an important use case to iterate over uniform `Resource Entries` by an index. For this purpose, the configuration provides the ability to group `Resource Entries` of the same `Resource Type` in `Resource Entry Groups`. A `Provide Resource Entry Group`, being a group of `Provide Resource Entries`, is represented as `SwCluCBManifProvideResourceEntryGroup`. Correspondingly, a `Require Resource Entry Group`, being a group of `Require Resource Entries`, is represented as `SwCluCBManifRequireResourceEntryGroup`.

In this and the previous section, three pairs of terms have been introduced, for three different logical layers within the `Binary Manifest`:

1. provide and require resources
2. `Provide Handles` and `Notifier Handles`
3. offered and subscribed handles

A single connection (between provide and require resource, 1), consists of one or more logical channels (provide and notifier handles, 2), which are implemented in the binary manifest (offered and subscribed handles, 3).

An analogy might help to clarify these terms.

Consider a satellite receiver connected to a TV via a cable, which internally contains many wires. The satellite receiver provides 'video', the TV requests it (provide and require resource). To make a single connection between provide and require side, multiple separate data flows (provide and notifier handles) are required. Some transmit the video and audio signal from the provider to the requestor, while others transmit remote control signals in the opposite direction. Both the TV and the satellite receiver have a connector with many pins (provide and notifier handles).

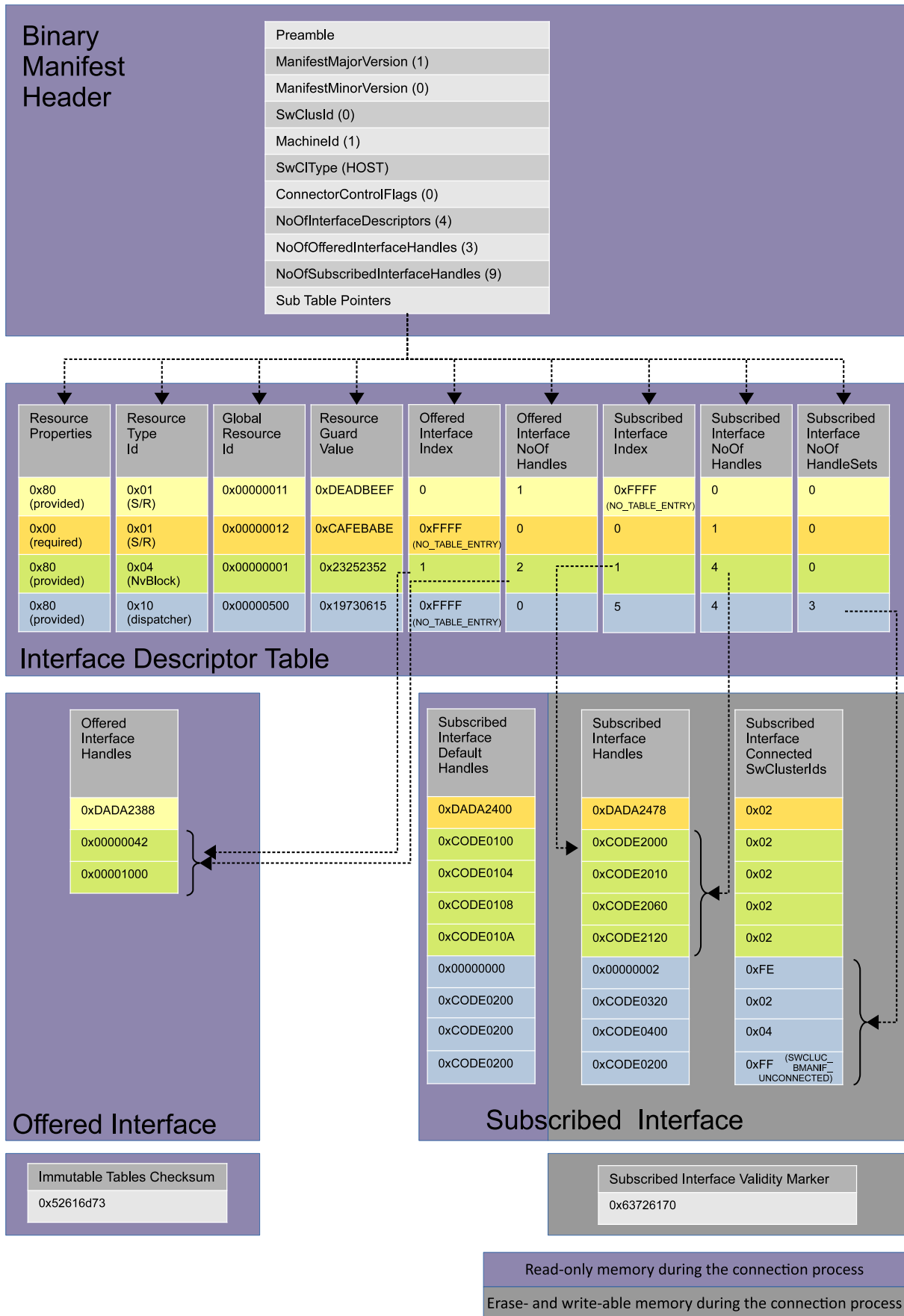
For the 'left audio channel' ([Provide Handle](#)), a certain pin is used. On that pin, the satellite receiver sends a signal (an offered handle implements this [Provide Handle](#)), which the TV reads from the same pin (a subscribed handle implements this [Provide Handle](#)). For the 'remote control signal' ([Notifier Handle](#)) pin, the TV sends the signal (offered handle implements the [Notifier Handles](#)), while the satellite receiver reads the signal (subscribed handle implements the [Notifier Handles](#)).

The possible combinations of the three layers are shown in table [7.1](#).

#### 7.1.4 Implementation structure of a Binary Manifest

Usually, in AUTOSAR the implementation of BSW modules is not standardized. But the various data tables of the [Binary Manifest](#) implement an interface to [Software Cluster](#) connector algorithms. Therefore, the implemented layout and semantic of the tables is standardized in this document. Furthermore, an abstract set of requirements for such connector algorithms is defined in section [7.1.5](#).

The Figure [7.2](#) provides an overview about the individual tables of the [Binary Manifest](#), and their main relationships.



**Figure 7.2: Implementation structure of a Binary Manifest**



### 7.1.4.1 Implementation Overview

Each `Software Cluster`'s `Binary Manifest` has a central entry point, called the `Binary Manifest Header`. It contains the AUTOSAR standardized meta data of a `Software Cluster`, and pointers to the sub tables (and their columns, as explained below) of the `Binary Manifest`. It is specified in [7.1.4.3](#).

Each row in the `Interface Descriptor Table` stores the properties of a single resource. For instance, the global resource Id. To avoid alignment gaps and padding bytes, which could occur if multiple elements are put in a structure, the table is not stored as an array of such a structure. Instead, the individual properties are organized in separate arrays. The individual arrays of the `Interface Descriptor Table` are required to have exactly the same number of elements and the identical order. In other words, these arrays can be seen as the columns of the `Interface Descriptor Table` and the identical index denotes the table row. Each row describes one resource. It is specified in [7.1.4.4](#).

Each of these resources can now use a dedicated number of handles in the offered and / or subscribed handle tables. The indication of the associated handles is done with the start index for the interface table(s) and the number of handles in the interface table(s). Since the number and placement of offered and subscribed handles can differ, a separate 'index' and a separate 'number of handles' for offered and subscribed handle tables exist. A special `NO_TABLE_ENTRY` value in the index indicates that no handle exists in that table. In this case, the number of handles is set to zero.

For example, in figure [7.2](#), the resource with id `0x11` (marked yellow) has 1 offered handle at index 0 and no subscribed handle (indicated by `NO_TABLE_ENTRY`). The resource with id `0x1` (marked green), has two handles in the offered table (starting at index 1) and four handles in the subscribed table (also starting at index 1).

The Offered Interface consists of one array - the Offered Interface Handle Column - to store the fixed handles, which are offered for the connection process (for example, in the case of a send port, the addresses of the data buffer related to the port that this software cluster provides). It is specified in [7.1.4.5](#)

The Subscribed Interface consists out of three arrays:

- Subscribed Interface Default Handle Column offers default values for the subscribed handles, which are used in case the connection process does not have a connection partner in another `Software Cluster`.
- Subscribed Interface Handle Column holds the handles modified by the connection process. Those values are taken during the connection process from the Offered Interface Handle Column of another `Software Cluster`.
- The Subscribed Interface Connected SwClusterId Column holds the Software Cluster Id, from which the handle values are taken.

It is specified in [7.1.4.6](#).



Please note that the [Subscribed Interface Handle Column](#) and [Subscribed Interface Connected SwClusterId Column](#) need to be located in a memory area that can be erased and re-written during the connection process. In contrast, the [Subscribed Interface Default Handle Column](#) (like all the other [Binary Manifest](#) tables) needs to be located in a memory area which is read-only during the connection process. This split ensures that the connection process can be re-started at any point of time - even if the [Subscribed Interface Handle Column](#) and [Subscribed Interface Connected SwClusterId Column](#) is already erased and not yet re-written.

#### 7.1.4.2 Multiple Notifier Sets Introduction

To support 1:n connections that require individual notifications of the requesters, the [Binary Manifest](#) supports the storage of multiple [Notifier Handle Sets](#). In this case, the `SubscribedInterfaceNoOfHandleSets` field describes how many handles sets of other Software Clusters can be connected. Please note that the value 0 means that only a single connection is supported. 1..n means multiple connections are possible. If this is selected, the first handle entry is used to store the actual number of connected [Software Clusters](#) - similar to a dynamic length array. With this handling, it possible to preserve the `MULTIPLE_NOTIFIER_SETS` semantic for a [Binary Manifest](#) user, even if only at most one connection is supported.

It is also possible to connect interfaces that require more than one handle per connection. The number of handles per connection is not stored in the [Binary Manifest](#), but if it is required, it can be calculated as  $(\text{SubscribedInterfaceNoOfHandles} - 1) / \text{SubscribedInterfaceNoOfHandleSets}$ .

As an example, in figure 7.2, the resource with id 0x500 (marked blue) has 3 handle sets (the entry in the column `SubscribedInterfaceNoOfHandleSets` is set to 3). So at most three connections can be made to this resource. In this example, each of the three handle set consists of one handle, and since one more row is used for meta information, `SubscribedInterfaceNoOfHandles` is set to  $3 * 1 + 1 = 4$ .

As explained above, the number of established connections is stored in the first handle entry. In this case, the entry is set to 0x2, so two connections are used and one is unused. The value 0xFE in `SubscribedInterfaceConnectedClusterIds` additionally indicates that this row does not contain a handle. The next two rows each show the target address of the handle and the cluster id. Since the last connection is currently unused, in the last row the handle value is set to the default value, and `SubscribedInterfaceConnectedClusterIds` is set to `SWCLUC_BMANIF_UNCONNECTED (0xFF)`.

More in depth information about multiple [Notifier Handle Sets](#) can be found in 7.1.5.4. As part of that chapter, table 7.2 also shows an example with four sets, where each set consists of two handles.

### 7.1.4.3 Binary Manifest Header

**[SWS\_SwCluC\_00001]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall provide exactly one instance of the [Binary Manifest Header](#)

```
1 const SwCluC_BManif_HeaderType SwCluC_BManif_Header =  
2   { <initialization> };
```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00002]** [The header file `SwCluC_BManif.h` shall export the declaration of the [Binary Manifest Header](#)

```
1 extern const SwCluC_BManif_HeaderType SwCluC_BManif_Header;
```

]([SRS\\_SwCluC\\_00006](#))

**[SWS\_SwCluC\_00003]** [The element `Preamble` of the [Binary Manifest Header](#) shall be set to the value `0x41524350464C4558`.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00014](#))

Note: The purpose of the `Preamble` is to serve as an obvious marker of the [Binary Manifest](#)'s begin in memory. In addition, the value is chosen so that byte and word order can be detected, when the [Binary Manifest](#) is read in a byte stream or from a [Binary Object](#) file.

**[SWS\_SwCluC\_00004]** [The element `ManifestMajorVersion` of the [Binary Manifest Header](#) shall be set to the value `0x01`.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00005]** [The element `ManifestMinorVersion` of the [Binary Manifest Header](#) shall be set to the value `0x01`.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00006]** [The element `SwClusterId` of the [Binary Manifest Header](#) shall be set to the value of the configuration parameter `SwCluC-SoftwareClusterId` of the selected [SwCluCDefinition](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00007]** [The element `MachineId` of the [Binary Manifest Header](#) shall be set to the value of the configuration parameter `SwCluCMachineId` of the selected [SwCluCDefinition](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00008]** [The element `SwClusterType` of the [Binary Manifest Header](#) shall be set according to the value of the configuration parameter `SwCluC-SoftwareClusterType` of the selected [SwCluCDefinition](#) with the following encoding:

- `HOST_SW_CLUSTER` : 0x00
- `APPLICATION_SW_CLUSTER` : 0x01

- `SUBSTITUTION_SW_CLUSTER` : 0xFF

|(SRS\_SwCluC\_00001, SRS\_SwCluC\_00011, SRS\_SwCluC\_00013, SRS\_SwCluC\_00014, SRS\_SwCluC\_00005)

**[SWS\_SwCluC\_00009]** [The bit `SWCLUC_BMANIF_DISABLE_ON_ECU_CONNECTION` in the element `ConnectorControlFlags` of the `Binary Manifest Header` shall be set if the `SwCluCBManifOnBoardConnectorControl` is set to `DISABLE_ON_ECU_CONNECTOR`. Otherwise, the bit is not set (value 0).](SRS\_SwCluC\_00001, SRS\_SwCluC\_00011, SRS\_SwCluC\_00013, SRS\_SwCluC\_00014) Note: It is not specified, if it is possible to reflash a cluster with changed addresses, how a system would detect this, and how it would behave in this case. This might change in future releases of this specification.

**[SWS\_SwCluC\_00010]** [The element `NoOfInterfaceDescriptors` of the `Binary Manifest Header` shall be set to the number of `SwCluCBManifProvideResourceEntry` + number of `SwCluCBManifRequireResourceEntry` containers in the configuration.](SRS\_SwCluC\_00001, SRS\_SwCluC\_00011, SRS\_SwCluC\_00013, SRS\_SwCluC\_00014)

**[SWS\_SwCluC\_00011]** [The element `NoOfOfferedInterfaceHandles` of the `Binary Manifest Header` shall be set to the number of offered handles.](SRS\_SwCluC\_00001, SRS\_SwCluC\_00011, SRS\_SwCluC\_00013, SRS\_SwCluC\_00014)

**[SWS\_SwCluC\_00012]** [The element `NoOfSubscribedInterfaceHandles` of the `Binary Manifest Header` shall be set to the number of handles in the `Subscribed Interface`.](SRS\_SwCluC\_00001, SRS\_SwCluC\_00011, SRS\_SwCluC\_00013, SRS\_SwCluC\_00014)

**[SWS\_SwCluC\_00070]** [The element `ImmutableTablesChecksumPtr` of the `Binary Manifest Header` shall reference the `Immutable Tables Checksum`.](SRS\_SwCluC\_00001, SRS\_SwCluC\_00011, SRS\_SwCluC\_00013, SRS\_SwCluC\_00014)

**[SWS\_SwCluC\_00072]** [The element `SubscribedInterfaceValidityMarkerPtr` of the `Binary Manifest Header` shall reference the `Subscribed Interface Validity Marker`.](SRS\_SwCluC\_00001, SRS\_SwCluC\_00011, SRS\_SwCluC\_00013, SRS\_SwCluC\_00014)

**[SWS\_SwCluC\_00042]** [The elements

- `ResourcePropertiesDescriptorColumnPtr`
- `ResourceTypeDescriptorColumnPtr`
- `GlobalResourceIdDescriptorColumnPtr`
- `ResourceGuardValueDescriptorColumnPtr`
- `OfferedInterfaceIndexDescriptorColumnPtr`
- `OfferedInterfaceNoOfHandlesDescriptorColumnPtr`

- SubscribedInterfaceIndexDescriptorColumnPtr
- SubscribedInterfaceNoOfHandlesDescriptorColumnPtr
- SubscribedInterfaceNoOfHandleSetsDescriptorColumnPtr
- OfferedInterfaceHandleColumnPtr
- SubscribedInterfaceHandleDefaultColumnPtr
- SubscribedInterfaceHandleColumnPtr
- SubscribedInterfaceConnectedSwClusterIdColumnPtr

of the [Binary Manifest Header](#) shall reference the according array of the [Interface Descriptor Table](#) if the [SwCluC\\_BManifDescriptorTreatment](#) is set to [EMBED\\_DESCRIPTOR](#)s. Otherwise the elements are initialized to `NULL_PTR`. ([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00205](#))

The order of the elements given by the data type [SwCluC\\_BManif\\_HeaderType](#).

#### 7.1.4.4 Interface Descriptor Table

**[SWS\_SwCluC\_00015]** [If the [SwCluC\\_BManifDescriptorTreatment](#) is set to [EMBED\\_DESCRIPTOR](#)s the [Binary Manifest](#) of the [Software Cluster Connection](#) shall provide exactly one instance of the [Interface Descriptor Table](#) composed out of the following column arrays:

```

1  /* descriptor table column for resource properties */
2  const SwCluC_BManif_ResourcePropertiesType
      SwCluC_BManif_ResourcePropertiesDescriptorColumn[
          SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
3
4  /* descriptor table column for resource type Ids */
5  const SwCluC_BManif_ResourceTypeIdType
      SwCluC_BManif_ResourceTypeIdDescriptorColumn[
          SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
6
7  /* descriptor table column for global resource Ids */
8  const SwCluC_BManif_GlobalResourceIdType
      SwCluC_BManif_GlobalResourceIdDescriptorColumn[
          SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
9
10 /* descriptor table column for guard values */
11 const SwCluC_BManif_ResourceGuardValueType
      SwCluC_BManif_ResourceGuardValueDescriptorColumn[
          SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
12
13 /* descriptor table column for offered interface table index */
14 const SwCluC_BManif_TableIndexType
      SwCluC_BManif_OfferedInterfaceIndexDescriptorColumn[
          SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
15

```

```

16  /* descriptor table column for number of handles in offered interface
    table*/
17  const SwCluC_BManif_HandleIndexType
    SwCluC_BManif_OfferedInterfaceNoOfHandlesDescriptorColumn[
    SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
18
19  /* descriptor table column for subscribed interface table index */
20  const SwCluC_BManif_TableIndexType
    SwCluC_BManif_SubscribedInterfaceIndexDescriptorColumn[
    SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
21
22  /* descriptor table column for number of handles in subscribed
    interface table*/
23  const SwCluC_BManif_HandleIndexType
    SwCluC_BManif_SubscribedInterfaceNoOfHandlesDescriptorColumn[
    SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };
24
25  /* descriptor table column for number of handle sets in subscribed
    interface table*/
26  const SwCluC_BManif_HandleIndexType
    SwCluC_BManif_SubscribedInterfaceNoOfHandleSetsDescriptorColumn[
    SWCLUC_BMANIF_NO_OF_DESCRIPTOR] = { <initialization> };

```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00002](#), [SRS\\_SwCluC\\_00009](#), [SRS\\_SwCluC\\_00010](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00205](#))

**[SWS\_SwCluC\_00016]** [For each [SwCluC\\_BManif\\_ProvideResourceEntry](#) and [SwCluC\\_BManif\\_RequireResourceEntry](#) in a Software Cluster's configuration, the [Binary Manifest](#) of the [Software Cluster Connection](#) shall provide one row in the [Interface Descriptor Table](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

Note: This means that each array in the [Interface Descriptor Table](#) gets one element per row. In the below requirements, the term 'element of the X column' refers to one cell of the [Interface Descriptor Table](#) at a certain row and column. In this way, the content of each cell of the [Interface Descriptor Table](#) is specified.

**[SWS\_SwCluC\_00017]** [The rows in the [Interface Descriptor Table](#) shall be sorted in ascending order of resource type Ids and rows with equal resource type Ids shall be sorted in turn in ascending order of global resource Ids.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00018]** [The bit `SWCLUC_BMANIF_PROVIDED_RESOURCE` in the element of the 'resource properties' column shall be set, if the row belongs to a [SwCluC\\_BManif\\_ProvideResourceEntry](#). Otherwise the bit `SWCLUC_BMANIF_PROVIDED_RESOURCE` shall not be set.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00019]** [The bit `SWCLUC_BMANIF_MANDATORY_RESOURCE` in the element of the 'resource properties' column shall be set, if the row belongs to a [SwCluC\\_BManif\\_RequireResourceEntry](#) where the [SwCluC\\_BManif\\_IsMandatory](#)

is true. Otherwise the bit `SWCLUC_BMANIF_MANDATORY_RESOURCE` shall not be set.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00009](#))

Please note that for `SwCluCManifestProvideResourceEntry`s the `SWCLUC_BMANIF_MANDATORY_RESOURCE` bit is always 0.

**[SWS\_SwCluC\_00090]** [The reserved bits 5 .. 0 in the element of the 'resource properties' column shall be set to 0]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00020]** [The element in the 'resource type Id' column shall be set to the `SwCluCManifestResourceId` of the applicable `SwCluCManifestResourceType`.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

Note: The applicable `SwCluCManifestResourceType` is referenced by the owning `SwCluCManifestProvideResourceEntryGroup` / `SwCluCManifestRequireResourceEntryGroup`

**[SWS\_SwCluC\_00021]** [The element in the 'global resource Id' column shall be set to the attribute value `globalResourceId` of the referenced `CpSoftwareClusterResource` as given via `SwCluCManifestResourceRef`. If the reference `SwCluCManifestResourceRef` is not set, the element in the global resource Id column shall be set to 0.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00002](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00022]** [The element in the 'guard value' column shall be set to the `SwCluCManifestResourceGuardValue` of the `SwCluCManifestProvideResourceEntry` / `SwCluCManifestRequireResourceEntry` container in the configuration.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00010](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00205](#))

**[SWS\_SwCluC\_00023]** [The element in the 'offered interface table index' column shall be set to the index of the `Offered Interface` where the first offered handle for this resource is allocated. In case the resource has no offered handle the value is set to `NO_TABLE_ENTRY`.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00024]** [The element in the 'number of handles in offered interface table' column shall be set to number of offered handles for this resource. In case the resource has no offered handle, the value is set to 0.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00003](#))

**[SWS\_SwCluC\_00025]** [The element in the 'subscribed interface table index' column shall be set to the index of the `Subscribed Interface` where the first subscribed handle for this resource is allocated. In case the resource has no subscribed handle the value is set to `NO_TABLE_ENTRY`.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00026]** [The element in the 'number of handles in subscribed interface table' column shall be set to number of subscribed handles for this resource. In case the resource has no subscribed handle, the value is set to 0.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00003](#))

**[SWS\_SwCluC\_00027]** [The element in the 'number of handle sets in subscribed interface table' column shall be set to the `SwCluCManifestMaxNumberOfNotifier`

Sets if the applicable `SwCluCBManifResourceType` has set `SwCluCBManifMultipleNotifierSupport` to `MULTIPLE_NOTIFIER_SETS`. Otherwise the value is set to 0.](*SRS\_SwCluC\_00001*, *SRS\_SwCluC\_00014*, *SRS\_SwCluC\_00004*)

Depending whether a resource is provided or required by a `Software Cluster`, the `Provide Handles` and `Notifier Handles` need to be put either in the `Offered Interface` or in the `Subscribed Interface`. The table 7.1 defines, how many of the handles for a `SwCluCBManifProvideResourceEntry` / `SwCluCBManifRequireResourceEntry` are created in the `Offered Interface` or `Subscribed Interface`.



**[SWS\_SwCluC\_00088] Number of offered and subscribed handles, depending on the resource direction** [

	Provide Handle	Notifier Handle
<b>Provided Resource</b>	<p>One handle in the <a href="#">Offered Interface</a> per defined <a href="#">SwCluCManifProvideHandle</a></p> <p>The handles are initialized with the <a href="#">SwCluCManifProvideSymbols</a> in the given order.</p>	<p><b>SINGLE_NOTIFIER_SET</b></p> <p>One handle in the <a href="#">Subscribed Interface</a> per defined <a href="#">SwCluCManifNotifierHandle</a></p> <p>The handles are initialized with the <a href="#">SwCluCManifDefaultNotifierSymbols</a> in the given order.</p> <p>The Software Cluster Ids are set to <code>SWCLUC_BMANIF_UNCONNECTED</code></p>
		<p><b>MULTIPLE_NOTIFIER_SETS</b></p> <p>One handle in the <a href="#">Subscribed Interface</a> per defined <a href="#">SwCluCManifNotifierHandle</a> multiplied by <a href="#">SwCluCManifMaxNumberOfNotifierSets</a> plus one</p> <p>The first handle is initialized to 0.</p> <p>The remaining handles are initialized with consecutive sets of <a href="#">SwCluCManifDefaultNotifierSymbols</a> in the given order.</p> <p>The Software Cluster Ids are set to <code>SWCLUC_BMANIF_UNCONNECTED</code>.</p>
<b>Required Resource</b>	<p>One handle in the <a href="#">Subscribed Interface</a> per defined <a href="#">SwCluCManifProvideHandle</a></p> <p>The handles are initialized with the <a href="#">SwCluCManifDefaultProvideSymbols</a> in the given order.</p>	<p>One handle in the <a href="#">Offered Interface</a> per defined <a href="#">SwCluCManifNotifierHandle</a></p> <p>The handles are initialized with the <a href="#">SwCluCManifNotifierSymbols</a> in the given order.</p>

**Table 7.1: Number of offered and subscribed handles, depending on the resource direction**

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00004](#))



#### 7.1.4.5 Offered Interface Table

**[SWS\_SwCluC\_00028]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall provide exactly one instance of the [Offered Interface Handle Column](#)

```
1 const SwCluC_BManif_HandleType
   SwCluC_BManif_OfferedInterfaceHandleColumn[
   SWCLUC_BMANIF_NO_OF_OFFERED_HANDLES] = { <initialization> };
```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#))

**[SWS\_SwCluC\_00029]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall allocate and initialize the number of handles in the [Offered Interface](#) according to [\[SWS\\_SwCluC\\_00088\]](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#))

#### 7.1.4.6 Subscribed Interface Table

**[SWS\_SwCluC\_00030]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall provide exactly one instance of the [Subscribed Interface Default Handle Column](#)

```
1 const SwCluC_BManif_HandleType
   SwCluC_BManif_SubscribedInterfaceDefaultHandleColumn[
   SWCLUC_BMANIF_NO_OF_SUBSCRIBED_HANDLES] = { <initialization> };
```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00009](#))

**[SWS\_SwCluC\_00031]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall allocate and initialize the number of handles in the [Subscribed Interface Default Handle Column](#) according to [\[SWS\\_SwCluC\\_00088\]](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#))

**[SWS\_SwCluC\_00032]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall provide exactly one instance of the [Subscribed Interface Handle Column](#)

```
1 const SwCluC_BManif_HandleType
   SwCluC_BManif_SubscribedInterfaceHandleColumn[
   SWCLUC_BMANIF_NO_OF_SUBSCRIBED_HANDLES] = { <initialization> };
```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#))

**[SWS\_SwCluC\_00033]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall allocate and initialize the number of handles in the [Subscribed Interface Handle Column](#) according to [\[SWS\\_SwCluC\\_00088\]](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#))

**[SWS\_SwCluC\_00034]** [The [Binary Manifest of the Software Cluster Connection](#) shall provide exactly one instance of the [Subscribed Interface Connected SwClusterId Column](#)

```
1 const SwCluC_BManif_SwClusterIdType
   SwCluC_BManif_SubscribedInterfaceConnectedSwClusterIdColumn[
   SWCLUC_BMANIF_NO_OF_SUBSCRIBED_HANDLES] = { <initialization> };
```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00009](#), [SRS\\_SwCluC\\_00002](#))

**[SWS\_SwCluC\_00035]** [The [Binary Manifest of the Software Cluster Connection](#) shall allocate and initialize the number of handles in the [Subscribed Interface Connected SwClusterId Column](#) according to [\[SWS\\_SwCluC\\_00088\]](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00013](#), [SRS\\_SwCluC\\_00009](#), [SRS\\_SwCluC\\_00002](#))

## 7.1.4.7 Administrative Data

### 7.1.4.7.1 Immutable Tables Checksum

The [Immutable Tables Checksum](#) is built over all those constants of the [Binary Manifest](#) that are not changed by the Software Cluster connection step.

This includes

- the [Binary Manifest Header](#)
- all arrays of the [Interface Descriptor Table](#)
- all arrays of the [Offered Interface](#)
- the [Subscribed Interface Default Handle Column](#)

The checksum is created as part of the software build.

**[SWS\_SwCluC\_00036]** [The [Binary Manifest of the Software Cluster Connection](#) shall provide exactly one instance of the [Immutable Tables Checksum](#)

```
1 const uint32 SwCluC_BManif_ImmutableTablesChecksum = <initialization>;
```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00037]** [The [Immutable Tables Checksum](#) shall be set to the value of the configuration parameter [SwCluCBManifImmutableTablesChecksum](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_CONSTR\_00073]** [The [Immutable Tables Checksum](#) shall be calculated on the binary representation in memory of the immutable memory area (inclusive reserved memory space) in ascending order of memory address as CRC32 according to 32-bit Ethernet CRC Calculation as described in document [\[16\]](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

### 7.1.4.7.2 Subscribed Interface Validity Marker

The [Subscribed Interface Validity Marker](#) indicates that all subscribed tables are written after the Software Cluster connection step. It needs to be set to the valid value after the Software Cluster connection step. The invalid /valid values are not standardized, since those values need to be chosen according to the flash technology storing the [Binary Manifest](#).

**[SWS\_SwCluC\_00040]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall provide exactly one instance of the [Subscribed Interface Validity Marker](#)

```
1  const uint32 SwCluC_BManif_SubscribedInterfaceValidityMarker = <
    initialization>;
```

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00041]** [Initially the [Subscribed Interface Validity Marker](#) shall be set to the value of the configuration parameter [SwCluC\\_BManif\\_SubscribedInterfaceValidityMarker](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00095]** [After a completed connection process, the [Subscribed Interface Validity Marker](#) shall be set to the value 0xFFFA5A500.]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00014](#))

### 7.1.4.8 Memory Mapping

**[SWS\_SwCluC\_00079]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall use the `<feature> = BMANIF` according to [\[SWS\\_MemMap\\_00040\]](#) of document [\[17\]](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_00080]** [The [Binary Manifest](#) of the [Software Cluster Connection](#) shall map the [Binary Manifest Header](#) to a constant, 32 bit aligned memory section named `CONST_IMMUTABLE_HEADER[_{safety}]_32`.

The optional name part `[_{safety}]` shall be set according [\[SWS\\_SwCluC\\_00097\]](#).]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00014](#))

#### Example 7.1

```
1  #define SWCLUC_BMANIF_START_SEC_CONST_IMMUTABLE_HEADER_ASIL_D_32
2  #include "SwCluC_MemMap.h"
3
4  const SwCluC_BManif_HeaderType SwCluC_BManif_Header = ...;
5
6  #define SWCLUC_BMANIF_STOP_SEC_CONST_IMMUTABLE_HEADER_ASIL_D_32
7  #include "SwCluC_MemMap.h"
```

**[SWS\_SwCluC\_00081]** [The [Binary Manifest of the Software Cluster Connection](#) shall map the immutable columns of all tables to a constant, 32 bit aligned memory section named `CONST_IMMUTABLE_COLUMNS[_{safety}]_32`.

The optional name part `[_{safety}]` shall be set according [\[SWS\\_SwCluC\\_00097\]](#).

The immutable columns are:

- all columns of the [Interface Descriptor Table](#)
- [Offered Interface Handle Column](#)
- [Subscribed Interface Default Handle Column](#)

]([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00014](#))

### Example 7.2

```

1 #define SWCLUC_BMANIF_START_SEC_CONST_IMMUTABLE_COLUMNS_ASIL_D_32
2 #include "SwCluC_MemMap.h"
3
4 const SwCluC_BManif_ResourcePropertiesType
   SwCluC_BManif_ResourcePropertiesDescriptorColumn[
   SWCLUC_BMANIF_NO_OF_DESCRIPTORS] = ...;
5
6 ...
7
8 const SwCluC_BManif_HandleType
   SwCluC_BManif_SubscribedInterfaceDefaultHandleColumn[
   SWCLUC_BMANIF_NO_OF_SUBSCRIBED_HANDLES] = ...;
9
10 #define SWCLUC_BMANIF_STOP_SEC_CONST_IMMUTABLE_COLUMNS_ASIL_D_32
11 #include "SwCluC_MemMap.h"

```

**[SWS\_SwCluC\_00082]** [The [Binary Manifest of the Software Cluster Connection](#) shall map the modifiable columns to a constant, 32 bit aligned memory section named `CONST_MODIFIABLE_COLUMNS[_{safety}]_32`.

The optional name part `[_{safety}]` shall be set according [\[SWS\\_SwCluC\\_00097\]](#).

The modifiable columns are

- [Subscribed Interface Handle Column](#)
- [Subscribed Interface Connected SwClusterId Column](#)

.)([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00014](#))

### Example 7.3

```

1 #define SWCLUC_BMANIF_START_SEC_CONST_MODIFIABLE_COLUMNS_ASIL_D_32
2 #include "SwCluC_MemMap.h"
3
4 const SwCluC_BManif_HandleType
   SwCluC_BManif_SubscribedInterfaceHandleColumn[
   SWCLUC_BMANIF_NO_OF_SUBSCRIBED_HANDLES] = ...;

```

```

5
6  const SwCluC_BManif_SwClusterIdType
      SwCluC_BManif_SubscribedInterfaceConnectedSwClusterIdColumn[
          SWCLUC_BMANIF_NO_OF_SUBSCRIBED_HANDLES] = ...;
7
8  #define SWCLUC_BMANIF_STOP_SEC_CONST_MODIFIABLE_COLUMNS_ASIL_D_32
9  #include "SwCluC_MemMap.h"

```

**[SWS\_SwCluC\_00083]** [The [Binary Manifest of the Software Cluster Connection](#) shall map the [Immutable Tables Checksum](#) to a constant, 32 bit aligned memory section named `CONST_IMMUTABLE_TABLES_CHECKSUM[_{safety}]_32`.

The optional name part `[_{safety}]` shall be set according [\[SWS\\_SwCluC\\_00097\]](#). ([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00014](#))

Rationale: Checksums handling in memory might need a fixed location.

#### Example 7.4

```

1  #define
      SWCLUC_BMANIF_START_SEC_CONST_IMMUTABLE_TABLES_CHECKSUM_ASIL_D_32
2  #include "SwCluC_MemMap.h"
3
4  const uint32 SwCluC_BManif_ImmutableTablesChecksum = ...;
5
6  #define
      SWCLUC_BMANIF_STOP_SEC_CONST_IMMUTABLE_TABLES_CHECKSUM_ASIL_D_32
7  #include "SwCluC_MemMap.h"

```

**[SWS\_SwCluC\_00085]** [The [Binary Manifest of the Software Cluster Connection](#) shall map the [Subscribed Interface Validity Marker](#) to a constant, 32 bit aligned memory section named `CONST_SUBSCRIBED_INTERFACE_VALIDITY_MARKER[_{safety}]_32`.

The optional name part `[_{safety}]` shall be set according [\[SWS\\_SwCluC\\_00097\]](#). ([SRS\\_SwCluC\\_00001](#), [SRS\\_SwCluC\\_00011](#), [SRS\\_SwCluC\\_00014](#))

Rationale: Validity handling in memory might need a fixed location.

#### Example 7.5

```

1  #define
      SWCLUC_BMANIF_START_SEC_CONST_SUBSCRIBED_TABLES_MARKER_ASIL_D_32
2  #include "SwCluC_MemMap.h"
3
4  const uint32 SwCluC_BManif_SubscribedInterfaceValidityMarker = ...;
5
6  #define SWCLUC_BMANIF_STOP_SEC_CONST_SUBSCRIBED_TABLES_MARKER_ASIL_D_32
7  #include "SwCluC_MemMap.h"

```

**[SWS\_SwCluC\_00097]** [The name part {safety} shall contain the safety integrity level with at most one of the strings QM, ASIL\_A, ASIL\_B, ASIL\_C, ASIL\_D. In case of QM the complete name part [\_{safety}] may be omitted.] (*SRS\_SwCluC\_00014*)

Please note: The name part {safety} is vendor specific and set according the highest supported safety integrity level of the product.

See also [SWS\_MemMap\_00037] in document [17].

## 7.1.5 Connecting Software Clusters

### 7.1.5.1 Overview

The AUTOSAR Methodology supports two different approaches to connect the [Binary Objects](#) of the different [Software Clusters](#).

- The [Software Clusters](#) are connected after the individual and unconnected [Binary Objects](#) are programmed on the target ECU, here called [On-board](#).
- The [Software Clusters](#) are connected before the [Binary Objects](#) are programmed on the target ECU outside the target [machine](#), here called [Off-board](#).

In the [On-board](#) case, the [On-board Software Cluster Connector](#) is a software, which is executed on the target ECU during the reprogramming phase. After reprogramming one or more unconnected [Binary Objects](#), the [Software Cluster Connector](#) stores the connection result into the modifiable area of the [Subscribed Interface](#) of the [Binary Manifest](#).

Please note: The design of the [Binary Manifest](#) assumes that a connection phase might get aborted at any point in time (e.g. power loss), and a restart or recovery of the connection phase should be supported.

In the [Off-board](#) case, the [Off-board Software Cluster Connector](#) is a tool, which is used to read the files of the [Binary Objects](#), and to store the result of the connection in files. When reprogramming the ECU, already connected [Binary Objects](#) are used. Such an [Off-board](#) process supports additionally the variant to store meta data contained in the [Interface Descriptor Table](#) outside the [Binary Objects](#), with the benefit that no ROM for this meta data is occupied.

Most requirements given in the section are kept universal, and can be applied for the [On-board](#) and [Off-board](#) case. If requirements are specific to one case, this is indicated in the requirement. Since AUTOSAR does not standardize the architecture of a flash boot loader, no further interfaces for the [On-board Software Cluster Connector](#) are standardized.

Some general remarks on [machines](#):

Direct connections between [Software Clusters](#) based on the [Binary Manifest](#) are only made locally (on the same machine). Connecting [Software Clusters](#)

across 'virtual' machines on the same micro controller is not possible, as it would break the separation between the virtual machines.

### 7.1.5.2 Connecting Resources

[SWS\_SwCluC\_00043] [The [Software Cluster Connector](#) shall connect a required resource with a provided resource, if all of the following conditions are fulfilled:

- the machine Id of the [Software Cluster](#) providing the resource and the machine Id of the [Software Cluster](#)(s) requesting the resource are identical
- the global resource Id of provided resource and required resource(s) are equal
- the global resource Id is not 0
- the resource type Id of provided resource and required resource is equal
- the guard value of provided resource and required resource is equal
- the number of [Provide Handles](#) of provided resource and required resource is equal
- the number of [Notifier Handles](#) of provided resource and required resource is equal
- in case [Notifier Handles](#) exist, the provided resource has a [Notifier Handle Sets](#) available for the required resource

]([SRS\\_SwCluC\\_00002](#), [SRS\\_SwCluC\\_00205](#))

Note: The global resource Id = 0 is reserved to indicate the absence of a valid Id. The [Software Cluster Connector](#) shall only connect if the global resource Id != 0.

### 7.1.5.3 Handling of the [Substitution Software Cluster](#)

The purpose of the [Substitution Software Cluster](#) is to temporarily overwrite the output of a [Software Cluster](#) for development purposes. For instance, if a sender receiver signal 'Y' of Software Cluster A does not have the right functional behavior, it is possible to add a [Substitution Software Cluster](#) which provides a fixed version of sender receiver signal 'Y'. The fixed version of sender receiver signal 'Y' is provided with the identical global resource Id. In such a case, all [Software Clusters](#) requiring the sender receiver signal 'Y' are getting connected to the [Substitution Software Cluster](#) instead of the original providing [Software Cluster](#). If the [Substitution Software Cluster](#) additionally requires the sender receiver signal 'Y', it gets connected to the original providing [Software Cluster](#). With this principle, it is possible to take the original version of the signal as a basis for the overwriting one.



The utilization of a [Substitution Software Cluster](#) is only intended for development purposes, and not supported in productive systems. It is intended as a quick means for problem solving during development (for example, if a signal that is provided by a third party needs to be modified). At a [machine](#), at most one [Substitution Software Cluster](#) is supported to avoid ambiguity about the effective resource provider.

**[SWS\_SwCluC\_CONSTR\_00087]** [At a [machine](#), at most one [Substitution Software Cluster](#) shall exist.]([SRS\\_SwCluC\\_00005](#))

**[SWS\_SwCluC\_00054]** [In case a resource is provided by the [Substitution Software Cluster](#), the [Software Cluster Connector](#) shall connect all [Software Clusters](#) requiring the resource, except the [Substitution Software Cluster](#) itself, to the resource of the [Substitution Software Cluster](#). This happens, regardless if another [Software Cluster](#) provides the resource as well. Nevertheless, the matching criteria defined in [\[SWS\\_SwCluC\\_00043\]](#) apply.]([SRS\\_SwCluC\\_00005](#))

**[SWS\_SwCluC\_00055]** [In case a resource is required by a [Substitution Software Cluster](#), the [Software Cluster Connector](#) shall connect this required resource only to provided resources of [Software Clusters](#) not being a [Substitution Software Cluster](#). Nevertheless, the matching criteria defined in [\[SWS\\_SwCluC\\_00043\]](#) apply.]([SRS\\_SwCluC\\_00005](#))

#### 7.1.5.4 Multiple Notifier Sets

Note: A provided resource can optionally have the ability to handle multiple notifier sets. In this case, the number of handle sets in the [Interface Descriptor Table](#) indicates how many handle sets the [Software Cluster Connector](#) can register at most. The first handle in the [Subscribed Interface Handle Column](#) provides the number of actual registered [Notifier Handle Sets](#). The subsequent handles in the [Subscribed Interface Handle Column](#) are store N sets of handles in a consecutive order. The order of the different handle sets written by the [Software Cluster Connector](#) are determined by the [Software Cluster Id](#).

**[SWS\_SwCluC\_00045]** [In case the provided resource supports multiple [Notifier Handle Sets](#), the [Software Cluster Connector](#) shall sort the [Notifier Handle Sets](#) in ascending order of [Software Cluster Id](#) of the according required resource(s), and place them in the [Subscribed Interface Handle Column](#) of the providing [Software Cluster](#), starting at the second handle.]([SRS\\_SwCluC\\_00004](#))

**[SWS\_SwCluC\_00046]** [In case the provided resource supports multiple [Notifier Handle Sets](#), the [Software Cluster Connector](#) shall write as first entry the actual number of used [Notifier Handle Sets](#) in the [Subscribed Interface Handle Column](#).]([SRS\\_SwCluC\\_00004](#))



Note: the actual number of used **Notifier Handle Sets** is equal to the actual number of connected required resources, since each resource occupies one **Notifier Handle Set**.

**[SWS\_SwCluC\_00089]** [In case the provided resource supports multiple **Notifier Handle Sets**, the **Software Cluster Connector** shall write as first entry in the **Subscribed Interface Connected SwClusterId Column** the value `0xFE`.] (*SRS\_SwCluC\_00004*)

Note: the value `0xFE` indicates that the corresponding cell in the **Subscribed Interface Handle Column** holds the actual number of used notifier sets.

**[SWS\_SwCluC\_00047]** [In case the provide resource supports multiple **Notifier Handle Sets**, and less required resources are connected, the **Software Cluster Connector** shall fill the remaining handles in the **Subscribed Interface Handle Column** with the default values from the **Subscribed Interface Default Handle Column** of the **Software Cluster** providing the resource.] (*SRS\_SwCluC\_00004*)

The example in table 7.2 shows a connection of a resource provider offering at most 4 **Notifier Handle** sets. The resource type uses two **Notifier Handles**. The provided resource is connected to two different **Software Clusters**, and the remaining two **Notifier Handle** sets are filled with defaults.

Subscribed Interface Handle Column	Subscribed Interface Connected SwClusterId Column	remark
2	0xFE	actual number of used notifier sets, entry in <b>Subscribed Interface Connected SwClusterId Column</b> is set to 0
0xABCDABCD	2	first handle of required resource in Software Cluster 2
0xABC04711	2	second handle of required resource in Software Cluster 2
0xDADA0010	5	first handle of required resource in Software Cluster 5
0xDADA0020	5	second handle of required resource in Software Cluster 5
0xC0CAC01A	0xFF	first default handle of resource provider, entry in <b>Subscribed Interface Connected SwClusterId Column</b> is set to <code>SWCLUC_BMANIF_UNCONNECTED</code>
0xADD511FE	0xFF	second default handle of resource provider, entry in <b>Subscribed Interface Connected SwClusterId Column</b> is set to <code>SWCLUC_BMANIF_UNCONNECTED</code>
0xC0CAC01A	0xFF	first default handle of resource provider, entry in <b>Subscribed Interface Connected SwClusterId Column</b> is set to <code>SWCLUC_BMANIF_UNCONNECTED</code>
0xADD511FE	0xFF	second default handle of resource provider, entry in <b>Subscribed Interface Connected SwClusterId Column</b> is set to <code>SWCLUC_BMANIF_UNCONNECTED</code>

**Table 7.2: Example of multiple notifier set connection**

### 7.1.5.5 Unconnected Resources

**[SWS\_SwCluC\_00044]** [The `Software Cluster Connector` shall copy the `Subscribed Interface Default Handle Column` entries to the `Subscribed Interface Handle Column`, and set the related entries in the `Subscribed Interface Connected SwClusterId Column` to `SWCLUC_BMANIF_UNCONNECTED` for

- all `Provide Handles` of any required resources, for which no connect was applied

AND

- all `Notifier Handles` of any provided resources, for which no connect was applied

](*SRS\_SwCluC\_00009*)

### 7.1.5.6 Disabling of the On-board Software Cluster Connection

In general, it is possible that an ECU is equipped with an `On-board Software Cluster Connector` but this connector should not be used or shall only be used on specific `machines`.

One reason to do so is a configuration where the software on one `machine` requires a certification applied on the whole `machine`'s software whereas the software on the other `machine` can be updated cluster-wise.

For example, such a configuration uses two `machines` on the same microcontroller, here called `Machine A` and `Machine B`.

`Machine A` needs a certification, which is only granted for the whole software on the `machine`. Nevertheless, the software is developed by multiple parties, with the means of `Software Clusters`. The `Software Clusters` still needs to be connected, which is done with the `Off-board Software Cluster Connector` before the certification is done.

For `Machine B`, this restriction does not apply. Here, the `On-board Software Cluster Connector` shall be used to do some in-field partial updates which requires a working `On-board Software Cluster Connector`. Since the flash-boot-loader for the whole microcontroller still has to work, the `On-board Software Cluster Connector` is disabled for `Machine A`, in order to protect it from unintended changes, caused by an `On-board Software Cluster Connector` run intended for `Machine B`.

**[SWS\_SwCluC\_00056]** [If the bit `SWCLUC_BMANIF_DISABLE_ON_ECU_CONNECTION` in the `ConnectorControlFlags` of the `Binary Manifest Header` of the `Host Software Cluster` is set, the `Software Cluster Connection On-board` for this `machine` is not executed.](*SRS\_SwCluC\_00001*, *SRS\_SwCluC\_00014*)

### 7.1.5.7 Errors during software cluster connection

In some cases, the information inside the [Binary Manifests](#) might be incompatible with the cluster connector, be incomplete or inconsistent. For example, reading a [Binary Manifest](#), which is structurally incompatible to the [Software Cluster Connector](#)'s implementation, may have completely undefined results. This section lists a set of conditions that lead to an abort of the connection process.

The behavior of the system after an abort is currently not specified. The implementation of recovery mechanisms is advisable.

**[SWS\_SwCluC\_00048]** [The [Software Cluster Connector](#) shall detect, if the [ManifestMajorVersion](#) and [ManifestMinorVersion](#) numbers given in the [Binary Manifest Header](#) are compatible to the [Software Cluster Connector](#)'s implementation. In case of any incompatible version number, the connection process for this specific [machine](#) shall be aborted.]([SRS\\_SwCluC\\_00212](#))

If the [Software Cluster Ids](#) are not unique on the same [machine](#), the [Subscribed Interface Connected SwClusterId Column](#) cannot be set unambiguous:

**[SWS\_SwCluC\_00049]** [The [Software Cluster Connector](#) shall detect, if the [Software Cluster Ids](#) of all [Software Clusters](#) belonging to same [machine](#) are not unique. In this case, the connection process for this specific [machine](#) shall be aborted.]([SRS\\_SwCluC\\_00212](#))

If a [Software Cluster](#) requires a mandatory resource that no other [Software Cluster](#) provides, the operation of the [Software Cluster](#) is not possible.

**[SWS\_SwCluC\_00050]** [The [Software Cluster Connector](#) shall detect, if for a [Software Cluster](#) any mandatory required resource is not provided by any other [Software Cluster](#). In this case, the connection process for this specific [Software Cluster](#) shall be aborted.]([SRS\\_SwCluC\\_00212](#))

In general, a resource shall only be provided once. The only exception is a second provision by the [Substitution Software Cluster](#), which overrides the provision by another [Software Cluster](#).

**[SWS\_SwCluC\_00051]** [The [Software Cluster Connector](#) shall detect, if for a [machine](#) a resource with the identical resource type id and identical global resource Id is provided twice by [Software Clusters](#), none of which is a [Substitution Software Cluster](#). In this case, the connection process for this specific [machine](#) shall be aborted.]([SRS\\_SwCluC\\_00212](#))

**[SWS\_SwCluC\_00052]** [In case the resource does not support multiple notifier sets, but uses [Notifier Handles](#), the [Software Cluster Connector](#) shall detect if for a [machine](#) a resource with the identical resource type id and identical global resource Id is required more than one time. In this case, the connection process for this specific [machine](#) shall be aborted.]([SRS\\_SwCluC\\_00212](#))

**[SWS\_SwCluC\_00053]** [In case the resource does support multiple notifier sets, the [Software Cluster Connector](#) shall detect if for a [machine](#) a resource with the

identical resource type id and identical global resource Id is required more often as notifier sets are available. In this case, the connection process for this specific `machine` shall be aborted. [\]\(SRS\\_SwCluC\\_00212\)](#)

## 7.1.6 Software Cluster Binary Manifest Descriptor

The Software Cluster Binary Manifest Descriptor describes the `Binary Manifest` in the `Binary Object`. This is mandatory for `Off-board` connection, but also supporting the `On-board` connection, since it enables to apply checks outside the target ECU.

**[SWS\_SwCluC\_00086]** [The `Binary Manifest` of the `Software Cluster Connection` shall provide one instance of the `CpSoftwareClusterBinaryManifestDescriptor`, which holds the description of the generated `Binary Manifest`. This includes

- the `cpSoftwareCluster` reference to the given `CpSoftwareCluster`
- the `softwareClusterId` of the given `CpSoftwareCluster`
- the `metaDataFields` for `IMMUTABLE_TABLES_CHECKSUM` and `SUBSCRIBED_INTERFACE_VALIDITY_MARKER`
- a `provideResources` for each `Provide Resource Entry`
- a `requireResources` for each `Require Resource Entry`
- a `resourceDefinitions` for each `Resource Type`

[\]\(SRS\\_SwCluC\\_00001, SRS\\_SwCluC\\_00014, SRS\\_SwCluC\\_00212\)](#)

## 7.1.7 Error Classification

On source code level, the implementation of the `Binary Manifest` is a set of constant tables accessible with a set of C-Macros. Those in turn need to be capable to be static C-initializers. Since the constant tables cannot change at runtime, any implementation of run-time detecting error code is not useful. Therefore, the following sections do not define error codes, and are marked as not applicable.

### 7.1.7.1 Development Errors

Development errors are not applicable for the `Binary Manifest` of the `Software Cluster Connection`.

### 7.1.7.2 Runtime Errors

Runtime errors are not applicable for the [Binary Manifest](#) of the [Software Cluster Connection](#).

### 7.1.7.3 Transient Faults

Transient Faults are not applicable for the [Binary Manifest](#) of the [Software Cluster Connection](#).

### 7.1.7.4 Production Errors

Production Errors are not applicable for the [Binary Manifest](#) of the [Software Cluster Connection](#).

### 7.1.7.5 Extended Production Errors

Extended Production Errors are not applicable for the [Binary Manifest](#) of the [Software Cluster Connection](#).

## 7.2 Software Cluster Base Configuration Check

The [Software Cluster Base Configuration Check](#) provides a basic mechanism, to avoid that [Application Software Clusters](#) with severe configuration incompatibilities are connected to the [Host Software Cluster](#). This mechanism utilizes the guard value and mandatory feature of the [Binary Manifest](#). The configuration information collected in the two parameters [SwCluCAutoBaseConfigDescriptor](#) and [SwCluCUserBaseConfigDescriptor](#) is used to calculate the guard value for a mandatory connection.

In case of deviating configurations in the [Host Software Cluster](#) and [Application Software Cluster](#), the connection fails. In this case, the whole [Application Software Cluster](#) stays unconnected, and is skipped in the connection process (treated, as if it was not present). Please note as well [[SWS\\_SwCluC\\_00050](#)].

It is implementation dependent, which configuration settings are automatically collected into the [SwCluCAutoBaseConfigDescriptor](#). But it is strongly recommended, to consider only those ECU / [machine](#) wide settings that are functional critical, in order to avoid frequent incompatibilities. For instance, compiler settings impacting the EAIB compatibility, like fill byte usage, stack usage, machine register usage.

**[SWS\_SwCluC\_00075]** [In the [Host Software Cluster](#), the [Software Cluster Base Configuration Check](#) of the [Software Cluster Connection](#)

shall create one `Provide Resource Entry` for each configured `SwCluCBaseConfigurationCheck`, and add it to the `Binary Manifest`.] ([SRS\\_SwCluC\\_00212](#))

[**SWS\_SwCluC\_00076**] [In the `Application Software Cluster`, the `Software Cluster Base Configuration Check` of the `Software Cluster Connection` shall create one **mandatory** `Require Resource Entry` for each configured `SwCluCBaseConfigurationCheck`, and add them to the `Binary Manifest`.] ([SRS\\_SwCluC\\_00212](#))

[**SWS\_SwCluC\_00077**] [The `SwCluCBManifResourceGuardValue` of the `Resource Entries` of [[SWS\\_SwCluC\\_00075](#)] and [[SWS\\_SwCluC\\_00076](#)] shall be calculated out of the given multi line strings in `SwCluCAutoBaseConfigDescriptor` and `SwCluCUserBaseConfigDescriptor`.] ([SRS\\_SwCluC\\_00205](#), [SRS\\_SwCluC\\_00212](#))

## 7.3 Cross Cluster Communication

### 7.3.1 Overview

The `Cross Cluster Communication` implements the VFB communication between `Software Clusters`. For this purpose, the `Cross Cluster Communication` implements a `Cross Software Cluster Communication Plug-In`, as specified in document [4].

Due to the intended separation of `Software Clusters` (e.g. well separated build units, independent timing), some VFB communication features would either become very inefficient or would break the intended separation. Hence, this specification selected a subset of the most common VFB features expected for such systems, as explained in document [1].

Those are in brief:

- 1:n last is the best sender-receiver communication
- n:1 queued sender-receiver communication
- n:1 client server communication - asynchronous server calls only
- 1:n mode switch communication
- 1:n parameter communication
- limited applicability of `PortInterfaceMappings`, see [7.3.2.2](#)
- `DataReceivedEvents` are polled
- `AsynchronousServerCallReturnsEvent` are polled
- `OperationInvokedEvents` for `Cross Cluster Communication` calls are polled

When designing an implementation of a [Cross Cluster Communication](#), this intended separation has to be considered. Since each [Software Clusters](#) is built by its own, only a limited knowledge about the other [Software Clusters](#) is in place. It is also not the target of this [Cross Cluster Communication](#) to break the goal of independent development of [Software Clusters](#) by exchange of detailed [Software Clusters](#) internal design and configuration information.

Instead, the code design patterns have to deal with limited knowledge about the communication counter part.

Due to the limited knowledge about the communication partner, the execution of code might fail in partitioned systems.

**[SWS\_SwCluC\_CONSTR\_03066]** [The implementation of a [Cross Cluster Communication](#) of an [Application Software Clusters](#) shall not execute code belonging to any other [Software Cluster](#), except from special entry points provided by the [Host Software Cluster](#) (e.g. to implement event passing)]([SRS\\_SwCluC\\_00100](#))

For this reason, [SynchronousServerCallPoints](#) are not supported for [Cross Cluster Communication](#). Please note as well [SWS\_Rte\_72023] in document [4].

In addition, inside a partitioned system it is not guaranteed that the RAM is writable for each [Software Cluster](#) or any given partition of a [Software Cluster](#).

**[SWS\_SwCluC\_CONSTR\_03067]** [The implementation of a [Cross Cluster Communication](#) of an [Application Software Cluster](#) shall only write into the memory of other [Software Clusters](#), if that write does not cross a Partition border. To determine this, the [Application Software Cluster](#) needs to determine if the [CpSoftwareClusterResource](#) is assigned to the same partition.]([SRS\\_SwCluC\\_00100](#))

Please note: It might be required to restrict some communication patterns to intra-partition communication, for example to reach a certain performance. But this decreases the overall flexibility in the design and integration of [Software Clusters](#), and therefore should only be done in rare, exceptional cases.

## 7.3.2 General Requirements

### 7.3.2.1 Cross Software Cluster Communication Plug-In

**[SWS\_SwCluC\_03000]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall implement a [Cross Software Cluster Communication Plug-In](#) according to document [4].]([SRS\\_SwCluC\\_00100](#))

[[SWS\\_SwCluC\\_03000](#)] means among other things:

**[SWS\_SwCluC\_03001]** [The [Vendor Specific Module Definition](#) (see document [18]) of the [Software Cluster Connection](#) shall provide a definition of the



container `RteRipsPluginProps` as a `subContainer` of the container `SwCluCXCc` with the `shortName` `RteRipsPluginProps`.](*SRS\_SwCluC\_00100*)

Please note that the `shortName` of the `EcucContainerValue` related to the `RteRipsPluginProps` container can be freely chosen. This name will be used to determine the name part `<PlugIn>` in the `RTE Implementation Plug-In Services` according to [SWS\_Rte\_70034].

**[SWS\_SwCluC\_CONSTR\_03069]** [The `EcucModuleConfigurationValues` of the `SwCluC` module shall set the `RteRipsPluginCommunicationScope` to `RTE_RIPS_CROSS_SW_CLUSTER_COM`.](*SRS\_SwCluC\_00100*, *SRS\_BSW\_00167*)

Note: It is possible to use multiple `Cross Software Cluster Communication Plug-Ins` in one `Software Cluster`, but this might be rarely used in practice.

Additionally, the `Cross Cluster Communication` of the `Software Cluster Connection` has to provide all the `RTE Implementation Plug-In Services` according to the given input configuration.

**[SWS\_SwCluC\_03002]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall implement the `RTE Implementation Plug-In` functionality for a `Communication Graph`, if

- a `FlatInstanceDescriptor` references the `Communication Graph`
- AND
- and the `rtePluginProps.associatedCrossSwClusterComRtePlugin` references the `RteRipsPluginProps` container of **this** `Cross Cluster Communication` implementation.

](*SRS\_SwCluC\_00100*)

### 7.3.2.2 Cross Cluster Communication and Binary Manifest

**[SWS\_SwCluC\_03003]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall put one `Resource Entry` for each associated `Communication Graph` into the `Binary Manifest`.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00212*)

**[SWS\_SwCluC\_03004]** [The `SwCluCBManifResourceRef` of the `Resource Entry` shall reference the `CpSoftwareClusterCommunicationResource` which is mapped by the `PortElementToCommunicationResourceMapping` to the `Communication Graph`.](*SRS\_SwCluC\_00100*)

**[SWS\_SwCluC\_03005]** [The `SwCluCBManifResourceGuardValue` of the `Resource Entry` shall be calculated out of the following properties:

- data range
- resolution



- physical meaning
- encoding
- structure in memory

]([SRS\\_SwCluC\\_00010](#), [SRS\\_SwCluC\\_00205](#))

**[SWS\_SwCluC\_03033]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall normalize the numerical values of attributes, before using them for the [SwCluCManifResourceGuardValue](#) calculation, in such a way that compatible numerical values according to [TPS\_GST\_02501] result in the identical guard value.]([SRS\\_SwCluC\\_00010](#), [SRS\\_SwCluC\\_00205](#))

Note: [\[SWS\\_SwCluC\\_03033\]](#) shall ensure that the calculated guard value result is independent from the number format (e.g. decimal, binary, octal and hexadecimal) of the given attributes. For instance the values, 1, 1.0, 0x000001 are semantically equivalent, and have to result in the identical guard value contribution.

Additionally, the below requirements on the guard value calculation in some cases define default values for optional existing attributes. This ensures an identical guard value on provider an requester side, even if one side expresses the default value explicitly and the other side omits it.

Only in special cases, the [shortName](#) of AUTOSAR model elements has an explicit semantic. Hence, [shortNames](#) are not relevant for the guard value, except if it is explicitly specified.

The list of attributes relevant for the guard value, specified in the following requirements, guarantee that different implementations of [Software Cluster Connections](#) treat the same set of required and provided ports as compatible, if these conditions apply:

- the elements in the [PortInterfaces](#) are compatible according to document [\[19\]](#) without [PortInterfaceMappings](#)
- or if a [PortInterfaceMappings](#) would be applied, it does not result in
  - Data Scaling  
NOR
  - utilization of a [SubElementMapping](#)  
NOR
  - utilization of a [ClientServerOperationMapping](#)  
NOR
  - utilization of a [ClientServerApplicationErrorMapping](#)  
NOR
  - utilization of a [ModeDeclarationMappingSet](#)

Please note:

In case the following requirements about guard value calculation list references as attributes, the calculation has to consider the attributes of the referenced model element. The fully qualified shortName (building the reference) is not part of the guard value. For example, the attribute `requiredInterface` is a reference to a `PortInterface`. In this case, the mentioned attributes of the referenced `PortInterface` are relevant instead of the fully qualified shortName (e.g. `/Example/PortInterfaces/MyS-RInterface`)

### 7.3.2.2.1 Guard value calculation for Data Communication Graphs

**[SWS\_SwCluC\_03034]** [The `Cross Cluster Communication` shall use the following attributes for the `SwCluCBManifResourceGuardValue` calculation for a `Data Communication Graph`:

- `PPortPrototype.providedInterface`
- `RPortPrototype.requiredInterface`
- `CpSoftwareClusterCommunicationResource.communicationResourceProps.sendIndication`
  - in case of `SenderReceiverInterface`
    - \* `VariableDataPrototype.type`
    - \* `VariableDataPrototype.swDataDefProps`
    - \* `SenderReceiverInterface.invalidationPolicy.handleInvalid` (if existing for the `VariableDataPrototype`, else `dontInvalidate` applies)
  - in case of `ParameterInterface`
    - \* `ParameterDataPrototype.type`
    - \* `ParameterDataPrototype.swDataDefProps`

Additionally, attributes of `VariableDataPrototype` / `ParameterDataPrototype.type` according to [SWS\_SwCluC\_03035] and [SWS\_SwCluC\_03036] apply.

](*SRS\_SwCluC\_00010*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00102*, *SRS\_SwCluC\_00106*, *SRS\_SwCluC\_00205*)

### 7.3.2.2.2 Guard value calculation for Client Server Communication Graphs

**[SWS\_SwCluC\_03047]** [The Cross Cluster Communication shall use the following attributes for the SwCluCManifResourceGuardValue calculation for a Client Server Communication Graph:

- PPortPrototype.providedInterface
- RPortPrototype.requiredInterface
  - ClientServerOperation.arguments {ordered}
    - \* ArgumentDataPrototype.type
    - \* ArgumentDataPrototype.direction
  - ClientServerOperation.possibleError.errorCode (if existing, else one errorCode = 0 is applied)

Additionally, attributes of ArgumentDataPrototype.type according to [SWS\_SwCluC\_03035] and [SWS\_SwCluC\_03036] apply.

](SRS\_SwCluC\_00010, SRS\_SwCluC\_00103, SRS\_SwCluC\_00205)

### 7.3.2.2.3 Guard value calculation for Mode Communication Graphs

**[SWS\_SwCluC\_03045]** [The Cross Cluster Communication shall use the following attributes for the SwCluCManifResourceGuardValue calculation for a Mode Communication Graph:

- PPortPrototype.providedInterface
- RPortPrototype.requiredInterface
- ModeDeclarationGroupPrototype.type
- ModeDeclarationGroup.category
- ModeDeclarationGroup.initialMode
- ModeDeclarationGroup.modeDeclarations
- ModeDeclarationGroup.onTransitionValue (in case ModeDeclarationGroup.category == EXPLICIT\_ORDER)
- ModeDeclarationGroup.modeUserErrorBehavior (if existing)
- ModeDeclarationGroup.modeManagerErrorBehavior (if existing)
- ModeDeclarationGroup.modeTransitions (if existing) for each ModeDeclaration the following attributes apply:
  - ModeDeclaration.shortName

- `ModeDeclaration.value` (in case `ModeDeclarationGroup.category == EXPLICIT_ORDER`)

for each `ModeErrorBehavior` the following attributes apply:

- `ModeErrorBehavior.errorReactionPolicy`
- `ModeErrorBehavior.defaultMode` (if existing)

for each `ModeTransition` the following attributes apply:

- `ModeTransition.exitedMode`
- `ModeTransition.enteredMode`

]([SRS\\_SwCluC\\_00010](#), [SRS\\_SwCluC\\_00104](#), [SRS\\_SwCluC\\_00205](#))

#### 7.3.2.2.4 Guard value calculation for Trigger Communication Graphs

[SWS\_SwCluC\_03046] [The Cross Cluster Communication shall use the following attributes for the `SwCluCBManifResourceGuardValue` calculation for a Trigger Communication Graph:

- `PPortPrototype.providedInterface`
- `RPortPrototype.requiredInterface`
- `Trigger.swImplPolicy` (if existing, else `standard` applies)

]([SRS\\_SwCluC\\_00010](#), [SRS\\_SwCluC\\_00105](#), [SRS\\_SwCluC\\_00205](#))

#### 7.3.2.2.5 Guard value calculation for DataPrototypes

[SWS\_SwCluC\_03035] [The Cross Cluster Communication shall use the following attributes for the referenced `ApplicationDataType` for the `SwCluCBManifResourceGuardValue` calculation:

- in case the `AutosarDataPrototype.type` refers to a `ApplicationPrimitiveDataType`
  - `ApplicationPrimitiveDataType.category`
  - `ApplicationPrimitiveDataType.swDataDefProps`
- in case the `AutosarDataPrototype.type` refers to a `ApplicationArrayDataType`
  - `ApplicationArrayDataType.dynamicArraySizeProfile` (if existing)
  - `ApplicationArrayDataType.element`

- `ApplicationArrayElement.type`
- `ApplicationArrayElement.arraySizeSemantics` (if existing, else `fixedSize` applies)
- `ApplicationArrayElement.arraySizeHandling` (if existing)
- `ApplicationArrayElement.maxNumberOfElements`
- in case the `AutosarDataPrototype.type` refers to a `ApplicationRecordDataType`
  - `ApplicationRecordDataType.elements` {ordered}
  - `ApplicationRecordElement.type`
  - `ApplicationRecordElement.isOptional` (if existing, else `false` applies)

Additionally, the attributes of the mapped `ImplementationDataType` according to [SWS\_SwCluC\_03036] and the attributes of `SwDataDefProps` according to [SWS\_SwCluC\_03037] apply. (*SRS\_SwCluC\_00010, SRS\_SwCluC\_00101, SRS\_SwCluC\_00102, SRS\_SwCluC\_00103, SRS\_SwCluC\_00106, SRS\_SwCluC\_00205*)

**[SWS\_SwCluC\_03036]** [The Cross Cluster Communication shall use the following attributes for the referenced or mapped `ImplementationDataType` for the `SwCluCManifResourceGuardValue` calculation:

- in case the `AutosarDataPrototype.type` refers to an `ImplementationDataType` of category `TYPE_REFERENCE` or the `ApplicationDataType` according to [SWS\_SwCluC\_03036] is mapped to an `ImplementationDataType` of category `TYPE_REFERENCE`
  - `ImplementationDataType.swDataDefProps`
- in case the `AutosarDataPrototype.type` refers to an `ImplementationDataType` of category `VALUE` or the `ApplicationDataType` according to [SWS\_SwCluC\_03036] is mapped to an `ImplementationDataType` of category `VALUE`
  - `ImplementationDataType.swDataDefProps`
- in case the `AutosarDataPrototype.type` refers to an `ImplementationDataType` of category `ARRAY` or the `ApplicationDataType` according to [SWS\_SwCluC\_03036] is mapped to an `ImplementationDataType` of category `ARRAY`
  - `ImplementationDataType.dynamicArraySizeProfile` (if existing)
  - `ImplementationDataType.swDataDefProps`
  - `ImplementationDataType.subElement`

- `ImplementationDataTypeElement.arraySizeSemantics` (if existing, else `fixedSize` applies)
- `ImplementationDataTypeElement.arraySizeHandling` (if existing)
- `ImplementationDataTypeElement.swDataDefProps`
- in case `AutosarDataPrototype.type` refers to an `ImplementationDataType` of category `STRUCTURE` or the `ApplicationDataType` according to [SWS\_SwCluC\_03036] is mapped to an `ImplementationDataType` of category `STRUCTURE`
  - `ImplementationDataType.swDataDefProps`
  - `ImplementationDataType.isStructWithOptionalElement` (if existing, else `false` applies)
  - `ImplementationDataType.subElement` {ordered}
  - `ImplementationDataTypeElement.arraySizeSemantics` (if existing, else `fixedSize` applies)
  - `ImplementationDataTypeElement.arraySizeHandling` (if existing)
  - `ImplementationDataTypeElement.swDataDefProps`

Additionally, the attributes of `SwDataDefProps` according to [SWS\_SwCluC\_03037] apply.

]([SRS\\_SwCluC\\_00010](#), [SRS\\_SwCluC\\_00101](#), [SRS\\_SwCluC\\_00102](#), [SRS\\_SwCluC\\_00103](#), [SRS\\_SwCluC\\_00106](#), [SRS\\_SwCluC\\_00205](#))

**[SWS\_SwCluC\_03037]** [The Cross Cluster Communication shall use the following attributes for the given `SwDataDefProps` for the `SwCluCManifResourceGuardValue` calculation:

- `SwDataDefProps.additionalNativeTypeQualifier` (if existing)
- `SwDataDefProps.swImplPolicy` (if existing, else `standard` applies)
- `SwDataDefProps.invalidValue` (if existing)
- `SwDataDefProps.unit` (if existing, else `CompuMethod.unit` applies)
- `SwDataDefProps.dataConstr` (if existing)
- `SwDataDefProps.compuMethod` (if existing)
- `SwDataDefProps.swTextProps` (if existing)
- `SwDataDefProps.baseType` (if existing)
- `SwDataDefProps.swValueBlockSize` (if existing)
- `SwDataDefProps.swValueBlockSizeMult` (if existing)

- `SwDataDefProps.valueAxisDataType` (if existing)
- `SwDataDefProps.implementationDataType` (if existing)

Here, the prioritization of `SwDataDefProps` attributes according to [constr\_1015] applies. Only the most prior `SwDataDefProps` attributes are considered.

Additionally, the attributes of `Unit`, `CompuMethod`, `DataConstr`, and `BaseType` according to [SWS\_SwCluC\_03038], [SWS\_SwCluC\_03039], [SWS\_SwCluC\_03042], [SWS\_SwCluC\_03043], and [SWS\_SwCluC\_03044] apply.

](*SRS\_SwCluC\_00010*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00102*, *SRS\_SwCluC\_00103*, *SRS\_SwCluC\_00106*, *SRS\_SwCluC\_00205*)

**[SWS\_SwCluC\_03038]** [The `Cross Cluster Communication` shall use the following attributes for the given `Unit` for the `SwCluCManifResourceGuardValue` calculation:

- `Unit.factorSiToUnit` (if existing, else 1 applies)
- `Unit.offsetSiToUnit` (if existing, else 0 applies)
- `Unit.physicalDimension` (if existing, else [SWS\_SwCluC\_03041] applies)

Additionally, the attributes of `PhysicalDimension` according to [SWS\_SwCluC\_03040] and [SWS\_SwCluC\_03041] apply.](*SRS\_SwCluC\_00010*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00102*, *SRS\_SwCluC\_00103*, *SRS\_SwCluC\_00106*, *SRS\_SwCluC\_00205*)

**[SWS\_SwCluC\_03039]** [In case **no** `Unit` is given for the `SwCluCManifResourceGuardValue` calculation, the `Cross Cluster Communication` shall use the following attribute values:

- `Unit.factorSiToUnit` = 1
- `Unit.offsetSiToUnit` = 0
- `Unit.physicalDimension` according to [SWS\_SwCluC\_03041]

Additionally, the attributes of `PhysicalDimension` according to [SWS\_SwCluC\_03041] apply.](*SRS\_SwCluC\_00010*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00102*, *SRS\_SwCluC\_00103*, *SRS\_SwCluC\_00106*, *SRS\_SwCluC\_00205*)

**[SWS\_SwCluC\_03040]** [The `Cross Cluster Communication` shall use the following attributes for the given `PhysicalDimension` for the `SwCluCManifResourceGuardValue` calculation:

- `PhysicalDimension.shortName`
- `PhysicalDimension.currentExp` (if existing, else 0 applies)
- `PhysicalDimension.lengthExp` (if existing, else 0 applies)
- `PhysicalDimension.luminousIntensityExp` (if existing, else 0 applies)



- `PhysicalDimension.massExp` (if existing, else 0 applies)
- `PhysicalDimension.molarAmountExp` (if existing, else 0 applies)
- `PhysicalDimension.temperatureExp` (if existing, else 0 applies)
- `PhysicalDimension.timeExp` (if existing, else 0 applies)

](`SRS_SwCluC_00010`, `SRS_SwCluC_00101`, `SRS_SwCluC_00102`, `SRS_SwCluC_00103`, `SRS_SwCluC_00106`, `SRS_SwCluC_00205`)

**[SWS\_SwCluC\_03041]** [In case **no** `PhysicalDimension` is given, the `Cross Cluster Communication` shall use the following attribute values for the `SwCluCBManifResourceGuardValue` calculation:

- `PhysicalDimension.shortName` = `NoDimension`
- `PhysicalDimension.currentExp` = 0
- `PhysicalDimension.lengthExp` = 0
- `PhysicalDimension.luminousIntensityExp` = 0
- `PhysicalDimension.massExp` = 0
- `PhysicalDimension.molarAmountExp` = 0
- `PhysicalDimension.temperatureExp` = 0
- `PhysicalDimension.timeExp` = 0

](`SRS_SwCluC_00010`, `SRS_SwCluC_00101`, `SRS_SwCluC_00102`, `SRS_SwCluC_00103`, `SRS_SwCluC_00106`, `SRS_SwCluC_00205`)

The guard value calculation has to consider the intended compatibility of `CompuMethod` with different `category`, as defined in document [19] with [constr\_1176] and [constr\_1192]. Please note as well [constr\_1375] w.r.t the existence of attributes of `CompuMethods`. Nevertheless, not all attributes are considered for the guard value, in order to increase compatibility between provider and requesters.

**[SWS\_SwCluC\_03042]** [The `Cross Cluster Communication` shall use the following attributes for the given `CompuMethod` for the `SwCluCBManifResourceGuardValue` calculation:

- `CompuMethod.unit`
- in case the `CompuMethod.category` is `IDENTICAL`
  - it is treated like a `CompuMethod` where the `category` is `LINEAR` where the `CompuMethod.compuPhysToInternal.compuScale` yield the conversion

$$int = \frac{N_0 + N_1 * phys}{D_0} \text{ if } N_0 \sim 0 \ \&\& \ N_1 \sim 1 \ \&\& \ D_0 \sim 0$$

- in case the `CompuMethod.category` is `LINEAR`

- `CompuMethod.compuPhysToInternal.compuScale`
- OR
- `CompuMethod.compuInternalToPhys.compuScale`
- where the `compuInternalToPhys` coefficients are converted to equivalent `compuPhysToInternal` coefficients.
  - \* `CompuScale.compuNumerator.vs {ordered}`
  - \* `CompuScale.compuDenominator.v`
- in case the `CompuMethod.category` is `SCALE_LINEAR`
  - `CompuMethod.compuPhysToInternal.compuScales`
  - `CompuMethod.compuPhysToInternal.compuDefaultValue` (if existing)
  - OR
  - `CompuMethod.compuInternalToPhys.compuScales`
  - `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
    - \* `CompuScale.upperLimit`
    - \* `CompuScale.lowerLimit`
    - \* `CompuScale.compuNumerator.vs {ordered}`
    - \* `CompuScale.compuDenominator.v`
- in case the `CompuMethod.category` is `RAT_FUNC` with 2 `compuNumerator` coefficients and 1 `compuDenominator` coefficient
  - this case is treated like a `CompuMethod` where the `category` is `LINEAR`
- in case the `CompuMethod.category` is `RAT_FUNC` not matching the `LINEAR` case
  - `CompuMethod.compuPhysToInternal.compuScale`
  - `CompuMethod.compuPhysToInternal.compuDefaultValue` (if existing)
  - AND
  - `CompuMethod.compuInternalToPhys.compuScale`
  - `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
    - \* `CompuScale.upperLimit`

- \* `CompuScale.lowerLimit`
- \* `CompuScale.compuInverseValue.vf` (if existing)
- \* `CompuScale.compuNumerator.vs` {ordered}
- \* `CompuScale.compuDenominator.v` {ordered}
- in case the `CompuMethod.category` is `SCALE_RAT_FUNC`
  - `CompuMethod.compuPhysToInternal.compuScales`
  - `CompuMethod.compuPhysToInternal.compuDefaultValue` (if existing)
  - AND
  - `CompuMethod.compuInternalToPhys.compuScales`
  - `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
    - \* `CompuScale.upperLimit`
    - \* `CompuScale.lowerLimit`
    - \* `CompuScale.compuInverseValue.vf` (if existing)
    - \* `CompuScale.compuNumerator.vs` {ordered}
    - \* `CompuScale.compuDenominator.v` {ordered}
- in case the `CompuMethod.category` is `TEXTTABLE`
  - `CompuMethod.compuInternalToPhys.compuScales`
  - `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
    - \* `CompuScale.upperLimit`
    - \* `CompuScale.lowerLimit`
    - \* `CompuScale.compuInverseValue.vf` (if existing)
    - \* `CompuScale.compuConst.vt`
- in case the `CompuMethod.category` is `BITFIELD_TEXTTABLE`
  - `CompuMethod.compuInternalToPhys.compuScales`
  - `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
    - \* `CompuScale.upperLimit`
    - \* `CompuScale.lowerLimit`

- \* `CompuScale.mask`
- \* `CompuScale.compuInverseValue.vf` (if existing)
- \* `CompuScale.compuConst.vt`
- in case the `CompuMethod.category` is `SCALE_LINEAR_AND_TEXTTABLE`
  - `CompuMethod.compuInternalToPhys.compuScales`
  - `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
  - \* `CompuScale.upperLimit`
  - \* `CompuScale.lowerLimit`
  - \* `CompuScale.mask`
  - \* `CompuScale.compuInverseValue.vf` (if existing)
  - \* `CompuScale.compuConst.vt` (if existing)
  - \* `CompuScale.compuNumerator.vs {ordered}` (if existing)
  - \* `CompuScale.compuDenominator.v` (if existing)
- in case the `CompuMethod.category` is `SCALE_RATIONAL_AND_TEXTTABLE`
  - `CompuMethod.compuPhysToInternal.compuScales`
  - `CompuMethod.compuPhysToInternal.compuDefaultValue` (if existing)AND
  - `CompuMethod.compuInternalToPhys.compuScales`
  - `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
  - \* `CompuScale.upperLimit`
  - \* `CompuScale.lowerLimit`
  - \* `CompuScale.mask`
  - \* `CompuScale.compuInverseValue.vf` (if existing)
  - \* `CompuScale.compuConst.vt` (if existing)
  - \* `CompuScale.compuNumerator.vs {ordered}` (if existing)
  - \* `CompuScale.compuDenominator.v {ordered}` (if existing)
- in case the `CompuMethod.category` is `TAB_NOINTP`
  - `CompuMethod.compuInternalToPhys.compuScales`

- `CompuMethod.compuInternalToPhys.compuDefaultValue` (if existing)
  - \* `CompuScale.upperLimit`
  - \* `CompuScale.lowerLimit`
  - \* `CompuScale.compuInverseValue.vf` (if existing)
  - \* `CompuScale.compuConst.vt` (if existing)

Additionally, the attributes of `Unit` according to [SWS\_SwCluC\_03038], [SWS\_SwCluC\_03039] apply.

](*SRS\_SwCluC\_00010*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00102*, *SRS\_SwCluC\_00103*, *SRS\_SwCluC\_00106*, *SRS\_SwCluC\_00205*)

**[SWS\_SwCluC\_03043]** [The Cross Cluster Communication shall use the following attributes for the given `DataConstr` for the `SwCluCManifResourceGuardValue` calculation:

- `DataConstr.dataConstrRule.physConstrs.upperLimit` (if existing)
- `DataConstr.dataConstrRule.physConstrs.lowerLimit` (if existing)
- `DataConstr.dataConstrRule.physConstrs.monotony` (if existing)
- `DataConstr.dataConstrRule.physConstrs.maxGradient` (if existing)
- `DataConstr.dataConstrRule.physConstrs.maxDiff` (if existing)
- `DataConstr.dataConstrRule.internalConstrs.upperLimit` (if existing, else based on `baseTypeEncoding` and `baseTypeSize` the technical upper limit is taken)
- `DataConstr.dataConstrRule.internalConstrs.lowerLimit` (if existing, else based on `baseTypeEncoding` and `baseTypeSize` the technical lower limit is taken)
- `DataConstr.dataConstrRule.internalConstrs.monotony` (if existing, else `noMonotony`)
- `DataConstr.dataConstrRule.internalConstrs.maxGradient` (if existing)
- `DataConstr.dataConstrRule.internalConstrs.maxDiff` (if existing)

](*SRS\_SwCluC\_00010*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00102*, *SRS\_SwCluC\_00103*, *SRS\_SwCluC\_00106*, *SRS\_SwCluC\_00205*)

**[SWS\_SwCluC\_03044]** [The Cross Cluster Communication shall use the following attributes for the given `SwBaseType` for the `SwCluCManifResourceGuardValue` calculation:

- `SwBaseType.baseTypeEncoding`

- `SwBaseType.baseTypeSize`
- `SwBaseType.byteOrder`
- `SwBaseType.nativeDeclaration`
- `SwBaseType.memAlignment` (if existing, else 0 applies)

](*SRS\_SwCluC\_00010*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00102*, *SRS\_SwCluC\_00103*, *SRS\_SwCluC\_00106*, *SRS\_SwCluC\_00205*)

### 7.3.2.3 Cross Cluster Communication Base Socket

In general, it is possible that the communication between `Application Software Clusters` needs some basic infrastructure from the `Host Software Cluster`. For instance, to pass an activity or event between `Application Software Clusters`. Usually, such event passing requires some knowledge about the overall environment, which is **NOT** available in an `Application Software Cluster`. For instance, in the `Application Software Cluster`, only a subset of the defined partitions (and related `EcucPartitions` plus `OsApplications`) are known.

**[SWS\_SwCluC\_03012]** [If the implementation of a `Cross Cluster Communication` requires some basic infrastructure from the `Host Software Cluster`, it shall use the means of the `SwCluCXccBaseSocket` configuration to link to the resource pool.](*SRS\_SwCluC\_00212*)

**[SWS\_SwCluC\_03013]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall put one `Resource Entry` for each associated `SwCluCXccBaseSocket` into the `Binary Manifest`.](*SRS\_SwCluC\_00212*)

### 7.3.2.4 Cross Cluster Communication and McSupport Data

**[SWS\_SwCluC\_03071]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall provide an `MC-Support` (Measurement and Calibration) description as part of its `Basic Software Module Description`.](*SRS\_SwCluC\_00300*)

**[SWS\_SwCluC\_03072]** [The `McSupportData` element begin part of **[SWS\_SwCluC\_03071]** and its sub-structure shall be self-contained, in the sense that there is no need to deliver the whole upstream descriptions of the ECU (including the `ECU Extract`, `Software Component` descriptions, `Basic Software Module` descriptions, `ECU Configuration Values` descriptions, etc.), in order to later generate the final "A2L"-file. This means that the `Cross Cluster Communication` generator has to copy the required information from the upstream descriptions into the `McSupportData` element.](*SRS\_SwCluC\_00300*)

**[SWS\_SwCluC\_03073]** [The `Cross Cluster Communication` generator shall export the effective `SwDataDefProps` (including all of the referenced and aggregated

sub-elements like e.g. `CompuMethod` or `SwRecordLayout`) in the role `resultingProperties`, for each `McDataInstance`, after resolving the precedence rules defined in the SW-Component Template [19] chapter *Properties of Data Definitions*. Thereby, the `ImplementationDataType` properties `compuMethod` and `dataConstr` are not taken in consideration for effective `SwDataDefProps` of the `McDataInstance`, due to their refinement nature of **C** and **AI**.] (*SRS\_SwCluC\_00300*)

**[SWS\_SwCluC\_03074]** [The `Cross Cluster Communication` generator shall export one entry in the `McSupportData`, describing the default data instance according to [SWS\_SwCluC\_03120], with the role `mcParameterInstance`, with the following attributes:

- `swCalibrationAccess` set to `readWrite`
- effective `SwDataDefProps` according to [SWS\_SwCluC\_03073]
- `McDataInstance.subElements` for array elements or structure elements, if applicable
- `symbol` set to the C-symbol name used for the default data instance

if

- the parameter `SwCluCXccSwCluCXccDefaultDataHandling` is set to `DEFAULTS_AS_CONSTANTS`,
- AND
- the effective `swCalibrationAccess` according to [SWS\_SwCluC\_03073] of the related `VariableDataPrototype` is set to `readOnly` or `readWrite`

] (*SRS\_SwCluC\_00300*)

**[SWS\_SwCluC\_03077]** [The `Cross Cluster Communication` generator shall export one entry in the `McSupportData`, describing the default data instance according to [SWS\_SwCluC\_03120], with the role `mcParameterInstance`, with the following attributes:

- `swCalibrationAccess` set to `readOnly`
- effective `SwDataDefProps` according to [SWS\_SwCluC\_03073]
- `McDataInstance.subElements` for array elements or structure elements, if applicable
- `symbol` set to the C-symbol name used for the default data instance

if

- the parameter `SwCluCXccSwCluCXccDefaultDataHandling` is set to `DEFAULTS_AS_CONSTANTS`

AND



- the `effectiveSwDataDefProps` according to [SWS\_SwCluC\_03073] of the related `VariableDataPrototype` is set to `readOnly` or `readWrite`

](SRS\_SwCluC\_00300)

[SWS\_SwCluC\_03075] [The `Cross Cluster Communication` generator shall export one entry in the `McSupportData`, describing the default parameter instance according to [SWS\_SwCluC\_03006], with the role `mcParameterInstance`, with the following attributes:

- `swCalibrationAccess` set to `readWrite`
- effective `SwDataDefProps` according to [SWS\_SwCluC\_03073]
- `McDataInstance.subElements` for array elements or structure elements, if applicable
- `symbol` set to the C-symbol name used for the default parameter instance

](SRS\_SwCluC\_00300)

[SWS\_SwCluC\_03076] [If the `swCalibrationAccess` of a `VariableDataPrototype` instance in the delegation `PPortPrototype` at the `CompositionSwComponentType` at the `CompositionSwComponentType` of the `rootSoftwareComposition` of the `Ecu Extract` is set to `readOnly` or `readWrite`, the `Cross Cluster Communication` generator shall export one entry in the `McSupportData`, describing the data instance according to [SWS\_SwCluC\_03101], with the role `mcVariableInstance`, with the following attributes:

- effective `SwDataDefProps` (inclusive `swCalibrationAccess`) according to [SWS\_SwCluC\_03073]
- `McDataInstance.subElements` for array elements or structure elements, if applicable
- `symbol` set to the C-symbol name used for the data instance
- if applicable, `flatMapEntry` referencing to the corresponding `FlatInstanceDescriptor` element of the `VariableDataPrototype`

](SRS\_SwCluC\_00300)

### 7.3.3 Sender Receiver Communication

#### 7.3.3.1 Restrictions on VFB communication features

[SWS\_SwCluC\_03064] [The `Cross Cluster Communication` of the `Software Cluster Connection` shall reject the configuration, if there is a “N:1” sender-receiver communication with last-is-the-best semantic.](SRS\_SwCluC\_00100, SRS\_SwCluC\_00101)

**[SWS\_SwCluC\_03065]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall reject the configuration, if there is a “1:N” sender-receiver communication with event semantic (queued communication).] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03068]** [The implementation of a [Cross Cluster Communication](#) shall support that [Data Communication Graphs](#) between [Application Software Clusters](#) can be added, without modification of the [Host Software Cluster](#).] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

### 7.3.3.2 Data Consistency

**[SWS\_SwCluC\_03084]** [If the attribute [DataComProps.dataConsistencyPolicy](#) is set to [consistencyMechanismRequired](#) for the [Data Communication Graph](#), the [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall use an appropriate mechanism to guarantee data consistency if data inconsistency could occur.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#), [SRS\\_SwCluC\\_00107](#))

Please note that such a consistency mechanism is implemented preferable with a lock free pattern, since in a clustered ECU software the optimization of semaphores is barely possible.

**[SWS\_SwCluC\_03085]** [If the attribute [DataComProps.dataConsistencyPolicy](#) is set to [noConsistencyMechanism](#) for the [Data Communication Graph](#), the [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall not use any mechanisms to guarantee data consistency.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#), [SRS\\_SwCluC\\_00107](#))

Rationale: If it is guaranteed on system level, that the data exchange on that [Data Communication Graph](#) will not cause any data inconsistencies, [noConsistencyMechanism](#) can be set. Thus, no extra data consistency mechanism is required to be used by the [Software Cluster Connection](#).

### 7.3.3.3 Transmission

**[SWS\_SwCluC\_03101]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall provide one data instance, for each assigned [Data Communication Graph](#)

- where the referenced [VariableDataPrototype](#) is owned by a delegation [PPortPrototype](#) at the [CompositionSwComponentType](#) of the [rootSoftwareComposition](#) of the [Ecu Extract](#) AND
- where implicit communication applies to that [VariableDataPrototype](#) OR

- where explicit unqueued communication applies to that `VariableDataPrototype`

](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03102]** [The data instance created according to [\[SWS\\_SwCluC\\_03101\]](#) shall be mapped to a VAR memory section, according to document [\[17\]](#).](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03103]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall make the data instance created according to [\[SWS\\_SwCluC\\_03101\]](#), accessible to other `Software Clusters` via a `Resource Entry` in the `Binary Manifest`.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03106]** [When implicit or explicit unqueued communication applies, the `Rte_Rips_Write` shall update the data instance created according to [\[SWS\\_SwCluC\\_03101\]](#)), and return `RTE_E_OK`.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03142]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall provide one `Resource Entry`, for each assigned `Data Communication Graph`

- where the referenced `VariableDataPrototype` is owned by a delegation `PPortPrototype` at the `CompositionSwComponentType` of the `rootSoftwareComposition` of the `Ecu Extract` AND
- where explicit queued communication applies to that `VariableDataPrototype`

This `Resource Entry` shall be used to link the access of the related `Rte_Rips_Write` service to the according queue instance on the receiving `Software Cluster`.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00212*)

**[SWS\_SwCluC\_03107]** [When explicit queued communication applies, and the `Resource Entry` created according to [\[SWS\\_SwCluC\\_03142\]](#) is not connected, the `Rte_Rips_Write` shall discard the write access, and return `RTE_E_OK`.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*, *SRS\_SwCluC\_00213*)

**[SWS\_SwCluC\_03108]** [When explicit queued communication applies, and the `Resource Entry` created according to [\[SWS\\_SwCluC\\_03142\]](#) is connected, the `Rte_Rips_Write` shall check the queue status (See [\[SWS\\_SwCluC\\_03135\]](#)), to determine whether or not the data can be enqueued.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03109]** [When explicit queued communication applies, and the `Resource Entry` created according to [\[SWS\\_SwCluC\\_03142\]](#) is connected, and the queue is not full, the `Rte_Rips_Write` shall enqueue the data and return `RTE_E_OK` (See [\[SWS\\_SwCluC\\_03135\]](#)).](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03110]** [When explicit queued communication applies, and the `Resource Entry` created according to [\[SWS\\_SwCluC\\_03142\]](#) is connected, but

the queue is full, the `Rte_Rips_Write` shall discard the write access and return `RTE_E_LIMIT` (See [SWS\_SwCluC\_03135]). (SRS\_SwCluC\_00100, SRS\_SwCluC\_00101)

**[SWS\_SwCluC\_03080]** [When implicit or explicit unqueued communication applies and the attribute `sendIndication` is set to `anySendOperation` for the `Data Communication Graph`, the call of the `Rte_Rips_Write` shall indicate the occurrence of a send operation for the related data instance.] (SRS\_SwCluC\_00100, SRS\_SwCluC\_00101)

This send operation indication can be used at the receiving `Software Clusters` to determine update flags or data receive event triggers.

Please note that the specification behavior supports a polling of those send indications and therefore an active passing of those events can be avoided.

The value of the `sendIndication` attribute is only relevant for unqueued communication (last-is-the best), since the implementation of a queue on the receiver side provides in any case the possibility to detect enqueue operations.

**[SWS\_SwCluC\_03111]** [The data instance created according to [SWS\_SwCluC\_03101] shall be initialized according to the `NonqueuedSenderComSpec.initValue` in the `PPortPrototype` at the `CompositionSwComponentType` of the `rootSoftwareComposition` of the `Ecu Extract`.] (SRS\_SwCluC\_00100, SRS\_SwCluC\_00101)

**[SWS\_SwCluC\_03112]** [If acknowledgment is enabled on a `Data Communication Graph` where explicit unqueued communication applies, and the resource created according to [SWS\_SwCluC\_03103] is not connected, the `Rte_Rips_Feedback` API shall return `RTE_E_UNCONNECTED`.] (SRS\_SwCluC\_00100, SRS\_SwCluC\_00101, SRS\_SwCluC\_00213)

**[SWS\_SwCluC\_03113]** [If acknowledgement is enabled on a `Data Communication Graph` where explicit unqueued communication applies, and the resource created according to [SWS\_SwCluC\_03103] is connected, the `Rte_Rips_Feedback` API shall return `RTE_E_TRANSMIT_ACK`.] (SRS\_SwCluC\_00100, SRS\_SwCluC\_00101)

**[SWS\_SwCluC\_03405]** [If acknowledgment is enabled on a `Data Communication Graph` where explicit queued communication applies, and the resource created according to [SWS\_SwCluC\_03142] is not connected, the `Rte_Rips_Feedback` API shall return `RTE_E_UNCONNECTED`.] (SRS\_SwCluC\_00100, SRS\_SwCluC\_00101, SRS\_SwCluC\_00213)

**[SWS\_SwCluC\_03406]** [If acknowledgement is enabled on a `Data Communication Graph` where explicit queued communication applies, and the resource created according to [SWS\_SwCluC\_03142] is connected and the data could be enqueued, the `Rte_Rips_Feedback` API shall return `RTE_E_TRANSMIT_ACK`.] (SRS\_SwCluC\_00100, SRS\_SwCluC\_00101)

### 7.3.3.4 Reception

**[SWS\_SwCluC\_03120]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall provide one default data instance, for each assigned [Data Communication Graph](#)

- where the referenced [VariableDataPrototype](#) is owned by a delegation [RPortPrototype](#) at the [CompositionSwComponentType](#) of the [rootSoftwareComposition](#) of the [Ecu Extract](#) AND
- where implicit communication applies to that [VariableDataPrototype](#) OR
- where explicit unqueued communication applies to that [VariableDataPrototype](#)

]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03133]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall provide a queue data instance (where the queue size corresponds to the specified queue length), for each assigned [Data Communication Graph](#)

- where the referenced [VariableDataPrototype](#) is owned by a delegation [RPortPrototype](#) at the [CompositionSwComponentType](#) of the [rootSoftwareComposition](#) of the [Ecu Extract](#) AND
- where explicit queued communication applies to that [VariableDataPrototype](#)

]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03134]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall determine the queue size according to the [queueLength](#) attribute of the [QueuedReceiverComSpec](#)]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03135]** [When [\[SWS\\_SwCluC\\_03133\]](#) applies, the [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall provide a data instance, representing the number of possible entries in the queue.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03122]** [If the parameter [SwCluCXccSwCluCXccDefaultDataHandling](#) is set to [DEFAULTS\\_AS\\_CONSTANTS](#), the default data instance created according to [\[SWS\\_SwCluC\\_03120\]](#) shall be mapped to a [CONST](#) memory section, according to document [\[17\]](#).]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03121]** [If the parameter [SwCluCXccSwCluCXccDefaultDataHandling](#) is set to [DEFAULTS\\_AS\\_CALPRMS](#), the default data instance created according to [\[SWS\\_SwCluC\\_03120\]](#) shall be mapped to a [CALPRM](#) memory section, according to document [\[17\]](#).]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

Please note as well that section 7.3.2.4 is relevant for calibration parameters instantiated by [Software Cluster Connection](#).

**[SWS\_SwCluC\_03123]** [The data instances created according to [\[SWS\\_SwCluC\\_03120\]](#), [\[SWS\\_SwCluC\\_03133\]](#) and [\[SWS\\_SwCluC\\_03135\]](#) shall be mapped to a VAR memory section, according to document [\[17\]](#).] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03124]** [The default data instance created according to [\[SWS\\_SwCluC\\_03120\]](#) shall be initialized according to the `NonqueuedReceiverComSpec.initValue` in the `RPortPrototype` at the `CompositionSwComponentType` of the `rootSoftwareComposition` of the `Ecu Extract`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03126]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall use the default data instance created according to [\[SWS\\_SwCluC\\_03120\]](#) as default handle in the corresponding [Resource Entry](#) in the [Binary Manifest](#).] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03136]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall make the data instance created according to [\[SWS\\_SwCluC\\_03133\]](#) accessible from other [Software Clusters](#), via a [Resource Entry](#) in the [Binary Manifest](#).] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03130]** [When explicit unqueued communication via [dataReceivePointByArguments](#) applies, and the [Resource Entry](#) created according to [\[SWS\\_SwCluC\\_03126\]](#) is not connected, the `Rte_Rips_Read` shall copy the value of default data instance created according to [\[SWS\\_SwCluC\\_03120\]](#) to the location of the OUT parameter `<data>`, and shall return `RTE_E_UNCONNECTED`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_03131]** [When explicit unqueued communication via [dataReceivePointByValues](#) applies, and the [Resource Entry](#) created according to [\[SWS\\_SwCluC\\_03126\]](#) is not connected, the `Rte_Rips_DRead` shall return the value of default data instance created according to [\[SWS\\_SwCluC\\_03120\]](#).] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_03132]** [When explicit unqueued communication via [dataReceivePointByArguments](#) applies, and the [Resource Entry](#) created according to [\[SWS\\_SwCluC\\_03126\]](#) is connected, the `Rte_Rips_Read` shall copy the value of the corresponding data instance of the provider to the location of the OUT parameter `<data>`, and shall return `RTE_E_OK`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03137]** [When explicit queued communication applies, and the resource created according to [\[SWS\\_SwCluC\\_03136\]](#) is not connected, the `Rte_Rips_Read` shall discard the read access, and return `RTE_E_UNCONNECTED`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#), [SRS\\_SwCluC\\_00213](#))



**[SWS\_SwCluC\_03138]** [When explicit queued communication applies, and the `Resource Entry` created according to [\[SWS\\_SwCluC\\_03136\]](#) is connected, but no entry is available in the queue, the `Rte_Rips_Read` shall discard the read access, and return `RTE_E_NO_DATA`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03139]** [When explicit queued communication applies, and the `Resource Entry` created according to [\[SWS\\_SwCluC\\_03136\]](#) is connected, the `Rte_Rips_Read` shall copy the value of the first available entry of the corresponding data instance to the location of the OUT parameter <data>, and return `RTE_E_OK`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03140]** [When [\[SWS\\_SwCluC\\_03139\]](#) applies, the `Rte_Rips_Read` shall dequeue the data from the corresponding queue.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03143]** [If explicit unqueued communication applies, and the `Resource Entry` in the `Binary Manifest` created according to [\[SWS\\_SwCluC\\_03126\]](#) is not connected, the `Rte_Rips_DataIsUpdated` shall return `FALSE`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_03144]** [If explicit unqueued communication applies, and the `Resource Entry` in the `Binary Manifest` created according to [\[SWS\\_SwCluC\\_03126\]](#) is connected, and the sender has updated the data since the previous execution of the corresponding `Rte_Rips_Read` service, the `Rte_Rips_DataIsUpdated` shall return `TRUE`.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03081]** [The `Rte_Rips_DataIsUpdated` shall return `TRUE` if

- explicit unqueued communication applies
- AND
- the `Resource Entry` in the `Binary Manifest` created according to [\[SWS\\_SwCluC\\_03126\]](#) is connected
- AND
- the occurrence of a send operation was indicated after previous calls of `Rte_Read` or `Rte_DRead` related to this reading software component.

] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00101](#))

**[SWS\_SwCluC\_03082]** [The `Rte_Rips_DataIsUpdated_EventActivation` shall return `TRUE` if

- the `Resource Entry` in the `Binary Manifest` created according to [\[SWS\\_SwCluC\\_03126\]](#) or [\[SWS\\_SwCluC\\_03136\]](#) is connected
- AND



- the occurrence of a send operation was indicated after previous calls of this instance of the `Rte_Rips_DataIsUpdated_EventActivation`

OR

- a enqueue operation occurred after previous calls of this instance of the `Rte_Rips_DataIsUpdated_EventActivation`

](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

### 7.3.4 NvData communication

#### 7.3.4.1 Restrictions on VFB communication features

Please note that the `Cross Cluster Communication` of the `Software Cluster Connection` does not support the NvData communication. This means its not possible that a communication graph involves a `NvBlockSwComponent` and additionally get mapped to the `Cross Software Cluster Communication Plug-In`.

This use case can be implemented by a software component copying the data of a `NvBlockSwComponent` to the `Software Cluster`'s interface using a regular sender receiver communication.

**[SWS\_SwCluC\_CONSTR\_03400] Data Communication Graph which involves a NvBlockSwComponent** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall not be configured such that, a `Data Communication Graph` which involves a `NvBlockSwComponent` is associated to the `Cross Cluster Communication` according to [SWS\_SwCluC\_03002].](*SRS\_SwCluC\_00100*, *SRS\_BSW\_00167*)

### 7.3.5 Client Server Communication

#### 7.3.5.1 General

**[SWS\_SwCluC\_03145]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall ensure that the result of a `ClientServerOperation` is dispatched to the correct client, if more than one client invokes the `ClientServerOperation`](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03146]** [The `Cross Cluster Communication` shall support multiple `Clients` invoking the same `ClientServerOperation` on a server ('N:1' Communication where  $N \geq 1$ ).](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

### 7.3.5.2 Timeout

**[SWS\_SwCluC\_03147]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall ensure that timeout monitoring is performed for client-server communication.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03087]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall implement the timeout monitoring of a `client` in the associated `SwCluC_Xcc_MainFunction`.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03088]** [When a timeout occurred, the `Cross Cluster Communication` of the `Software Cluster Connection` shall discard any subsequent responses to that request.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

Please note, in case a timeout occurs the related `Rte_Rips_ReturnResult` returns `RTE_E_TIMEOUT` (*[SWS\_SwCluC\_03169]*) and buffers for the `IN/OUT` and `OUT` parameters are not be modified (*[SWS\_Rte\_89023]*, *[SWS\_Rte\_01114]*).

**[SWS\_SwCluC\_03089]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall reject configurations where a `client` with a `ServerCallPoint.timeout` value  $> 0$  is associated to a `SwCluC_Xcc_MainFunction` where the `ServerCallPoint.timeout` value is not an integer multiple of the `SwCluC_Xcc_MainFunction.SwCluC_Xcc_MainTimeBase` value.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03090]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall associate all clients to a specific `SwCluC_Xcc_MainFunction` which are explicitly mapped via a `SwCluC_Xcc_ClientInstanceRef` of the related `SwCluC_Xcc_MainFunction` container.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03091]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall associate all `clients` which are not referenced explicitly by a `SwCluC_Xcc_ClientInstanceRef` with the default `SwCluC_Xcc_MainFunction` for the `EcucPartition` on which the `SwComponentPrototype` owning the `client` is mapped to.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03092]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall reject configurations where a `client` in an assigned `Client Server Communication Graph` with a `ServerCallPoint.timeout` value  $> 0$  exists, which is not associated a `SwCluC_Xcc_MainFunction`.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_CONSTR\_03093]** [`Clients` of a `SwComponentPrototype` shall only be associated to `SwCluC_Xcc_MainFunctions` belonging to the identical `EcucPartition` on which the `SwComponentPrototype` is mapped to.](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*, *SRS\_BSW\_00167*)

### 7.3.5.3 Scheduling of main functions

**[SWS\_SwCluC\_03094]** [In case `SwCluC_XccScheduleIntegration` is set to `SERVICE_SOFTWARE_COMPONENT`, the Cross Cluster Communication of the Software Cluster Connection shall create one partition specific Service Software Component per configured `EcucPartition` for the Xcc, with the name `SwCluC_Xcc_<EcucPartition shortName>`.] (*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03095]** [In case `SwCluC_XccScheduleIntegration` is set to `SERVICE_SOFTWARE_COMPONENT`, the Cross Cluster Communication of the Software Cluster Connection shall create one `RunnableEntity` per configured `SwCluC_XccMainFunction` container in the partition specific Service Software Component according **[SWS\_SwCluC\_03094]**.]

The `EcucPartition` is determined by the parameter `SwCluC_XccMainPartition-Ref`. The attributes of the `RunnableEntity` shall be set as following:

- `symbol` is set to the name of the `SwCluC_Xcc_MainFunction` according **[SWS\_SwCluC\_91002]**
- `canBeInvokedConcurrently` is set to `false`

] (*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03096]** [In case `SwCluC_XccScheduleIntegration` is set to `SERVICE_SOFTWARE_COMPONENT`, the Cross Cluster Communication of the Software Cluster Connection shall create one `TimingEvent` per configured `SwCluC_XccMainFunction` container in the partition specific Service Software Component according **[SWS\_SwCluC\_03094]**.]

The attributes of the `TimingEvent` shall be set as following:

- `startOnEvent` is set to the `RunnableEntity` according **[SWS\_SwCluC\_03095]**
- `period` value is set according the `SwCluC_XccMainTimeBase` parameter

] (*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

Note: `shortName` of `TimingEvent` is vendor specific.

Note: According **[SWS\_BSW\_00001]** the `SwCluC` module has to provide a BSW Module description containing a `BswModuleDescription`. This general requirement is not repeated in this specification, but it's the basis for further requirements on descriptive elements.

**[SWS\_SwCluC\_03097]** [In case `SwCluC_XccScheduleIntegration` is set to `BASIC_SW_MODULE`, the Cross Cluster Communication of the Software Cluster Connection shall create one `BswSchedulableEntity` per configured `SwCluC_XccMainFunction` container in its `BswModuleDescription`.]

The attributes of the `BswSchedulableEntity` shall be set as following:

- `shortName` is set to the name of the `SwCluC_Xcc_MainFunction` according [SWS\_SwCluC\_91002]
- `reentrancyLevel` is set to `false`

](SRS\_SwCluC\_00100, SRS\_SwCluC\_00103)

[SWS\_SwCluC\_03098] [In case `SwCluC_XccScheduleIntegration` is set to `BASIC_SW_MODULE`, the `Cross Cluster Communication` of the `Software Cluster Connection` shall create one `BswTimingEvent` per configured `SwCluC_XccMainFunction` container in its `BswModuleDescription`.

The attributes of the `BswTimingEvent` shall be set as following:

- `startsOnEvent` is set to the `BswSchedulableEntity` according [SWS\_SwCluC\_03097]
- `period` value is set according the `SwCluC_XccMainTimeBase` parameter

](SRS\_SwCluC\_00100, SRS\_SwCluC\_00103)

Note: `shortName` of `BswTimingEvent` is vendor specific.

#### 7.3.5.4 Buffering

[SWS\_SwCluC\_03150] [The `Cross Cluster Communication` on the client side of the `Software Cluster Connection` shall provide a request buffer for each client of the assigned `Client Server Communication Graph`.

Note: The structure of the request buffer is implementation specific, but the `Cross Cluster Communication` has to store at least the IN parameters and IN/OUT parameters, the transaction handle and the status code of the communication.](SRS\_SwCluC\_00100, SRS\_SwCluC\_00103)

[SWS\_SwCluC\_03152] [The `Cross Cluster Communication` on the server side of the `Software Cluster Connection` shall provide a request queue with the specified queue length (See [SWS\_SwCluC\_03154]), for each assigned `Client Server Communication Graph`, where the referenced `ClientServerOperation` is owned by a delegation `PPortPrototype` at the `CompositionSwComponentType` of the `rootSoftwareComposition` of the `Ecu Extract`.

Note: The structure of the queue is implementation specific, but the `Cross Cluster Communication` has to store at least the IN/OUT and OUT parameters, the transaction handle and the status code of the communication.](SRS\_SwCluC\_00100, SRS\_SwCluC\_00103)

[SWS\_SwCluC\_03153] [The `Cross Cluster Communication` on the server side of the `Software Cluster Connection` shall provide N response buffers (where N corresponds to the specified queue length according [SWS\_SwCluC\_03154]), for

each assigned `Client Server Communication Graph`, where the referenced `ClientServerOperation` is owned by a delegation `PPortPrototype` at the `CompositionSwComponentType` of the `rootSoftwareComposition` of the `Ecu Extract`.

Note: The structure of the response buffer is implementation specific, but the `Cross Cluster Communication` has to store at least the IN/OUT and OUT parameters, the transaction handle and the status code of the communication. ](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03154]** [The `Cross Cluster Communication` on the server side of the `Software Cluster Connection` shall determine the queue length according to the following priority rules (highest priority first):

1. value of the ECU-C parameter `RteServerQueueLength`
2. value of the `queueLength` attribute of the `ServerComSpec`

](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

Note: The queue length can be pre-defined at Software Cluster design time with the attribute `ClientServerOperationComProps.queueLength`. But it is in the responsibility of the integrator to consider this value for the cluster configuration.

**[SWS\_SwCluC\_03155]** [The `Cross Cluster Communication` on the server side of the `Software Cluster Connection` shall handle the requests in a first-in-first-out queue. ](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00103*)

**[SWS\_SwCluC\_03156]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall make the request buffer instance created according to **[SWS\_SwCluC\_03150]** accessible for the `Software Cluster` implementing the server, via a `Resource Entry` in the `Binary Manifest`. ](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03158]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall make each request queue instance created according to **[SWS\_SwCluC\_03152]** accessible to the `Software Cluster`, via a `Resource Entry` in the `Binary Manifest`. ](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

**[SWS\_SwCluC\_03159]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall make each response buffer instance created according to **[SWS\_SwCluC\_03153]** accessible to the `Software Clusters`, via a `Resource Entry` in the `Binary Manifest`. ](*SRS\_SwCluC\_00100*, *SRS\_SwCluC\_00101*)

### 7.3.5.5 Response to Request Mapping

The `Cross Cluster Communication` is responsible to map a response to the corresponding request. The problem of request to response mapping is split into:

- Mapping of a response to the correct client in the `Software Cluster`.

- Mapping of a response to the correct request within one client in the [Software Cluster](#).

The general approach for request response mapping is to use transaction handles.

**[SWS\_SwCluC\_03160]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall use a transaction handle that contains three parts, of unsigned integer type:

- Software Cluster Identifier
- Client Identifier
- Client Sequence Counter

]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03161]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall use the transaction handle for the identification of client server transactions, communicated between the clusters.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03162]** [The [Cross Cluster Communication](#) on the server side of the [Software Cluster Connection](#) shall return the transaction handle of the request, without modification, together with the response.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03163]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall allow only one request per client and server operation at any time.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

### 7.3.5.6 Client Side

**[SWS\_SwCluC\_03086]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall treat a client as connected

- if the corresponding resource in the [Binary Manifest](#) of the request queue (see [\[SWS\\_SwCluC\\_03158\]](#))

AND

- if the corresponding resource in the [Binary Manifest](#) of the response buffer (see [\[SWS\\_SwCluC\\_03159\]](#))

are connected.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

Note: This means that if only the request queue or the response buffer gets a connection to the server in the other [Software Cluster](#), the client is considered as unconnected.

**[SWS\_SwCluC\_03164]** [If the client is not connected according [\[SWS\\_SwCluC\\_03086\]](#), the [Rte\\_Rips\\_Invoke](#) shall return



RTE\_E\_UNCONNECTED immediately.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_03165]** [If the client is connected according [\[SWS\\_SwCluC\\_03086\]](#), the [Rte\\_Rips\\_Invoke](#) shall copy the IN and IN/OUT parameters, inform the server via a status flag, and return RTE\_E\_OK.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03166]** [If the client is connected according [\[SWS\\_SwCluC\\_03086\]](#), the [Rte\\_Rips\\_Invoke](#) shall return RTE\_E\_LIMIT, until the server's result has been successfully passed to the client, and no timeout occurred. The IN and IN/OUT parameters shall not be modified by [Rte\\_Rips\\_Invoke](#) .]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03167]** [If the client is not connected according [\[SWS\\_SwCluC\\_03086\]](#), the [Rte\\_Rips\\_ReturnResult](#) shall return RTE\_E\_UNCONNECTED immediately.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_03168]** [If the client is connected according [\[SWS\\_SwCluC\\_03086\]](#), the [Rte\\_Rips\\_ReturnResult](#) shall return RTE\_E\_NO\_DATA, until the server's result has been successfully passed to the client and no timeout occurred.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03169]** [If the client is connected according [\[SWS\\_SwCluC\\_03086\]](#), and the server's result was not available within the specified timeout, the [Rte\\_Rips\\_ReturnResult](#) shall return RTE\_E\_TIMEOUT.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03170]** [If the client is connected according [\[SWS\\_SwCluC\\_03086\]](#), and an [AsynchronousServerCallReturnsEvent](#) exists, the [Rte\\_Rips\\_InvocationHandler](#) shall poll the corresponding response queue status to determine whether or not the server's result is available.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#), [SRS\\_BSW\\_00172](#))

**[SWS\_SwCluC\_03171]** [If the client is connected according [\[SWS\\_SwCluC\\_03086\]](#), and an [AsynchronousServerCallReturnsEvent](#) exists, the [Rte\\_Rips\\_InvocationHandler](#) shall call the corresponding ACSR Runnable.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

### 7.3.5.7 Server Side

**[SWS\_SwCluC\_03173]** [If the corresponding resource in the [Binary Manifest](#) representing the request queue (See [\[SWS\\_SwCluC\\_03158\]](#)) is connected, the [Rte\\_Rips\\_InvocationHandler](#) shall poll the corresponding request queue status to determine whether or not there is a pending request.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#), [SRS\\_BSW\\_00172](#))



**[SWS\_SwCluC\_03401]** [One call of the `Rte_Rips_InvocationHandler` shall dequeue pending server call requests until

- either the request queue has no further pending requests

OR

- it has executed so many server calls as given by the configuration 'maximum number of server invocations' according [\[SWS\\_SwCluC\\_03402\]](#).

]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03402]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall determine the 'maximum number of server invocations' value for a `server runnable` from the parameter `RteServerNumberOfRequestProcessing` of the `RteEventToTaskMapping` applied to the `OperationInvokedEvent` of the `server runnable`.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03178]** [If the

- corresponding resource in the `Binary Manifest` representing the request queue (See [\[SWS\\_SwCluC\\_03158\]](#))

AND

- corresponding resource in the `Binary Manifest` representing the response buffer (See [\[SWS\\_SwCluC\\_03159\]](#))

are connected, the `Rte_Rips_InvocationHandler` shall invoke the corresponding `server runnable` with IN, IN/OUT and OUT parameters of request resp. response buffer.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03176]** [If the corresponding resource in the `Binary Manifest` representing the request queue (See [\[SWS\\_SwCluC\\_03158\]](#)) is connected, the `Rte_Rips_InvocationHandler` shall dequeue the server queue after successful invocation of the server queue.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03177]** [If the corresponding resource in the `Binary Manifest` representing the request queue (See [\[SWS\\_SwCluC\\_03158\]](#)) is connected (see [\[SWS\\_SwCluC\\_03086\]](#)), the `Rte_Rips_InvocationHandler` shall set the status of the response buffer (See [\[SWS\\_SwCluC\\_03159\]](#)) accordingly, to inform the client that the request has been processed.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

**[SWS\_SwCluC\_03083]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall ignore server responses with invalid transaction handles on the client side.]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

For instance the server responds with a transaction handle which does not match to any ongoing client request.

## 7.3.6 Modes Communication

### 7.3.6.1 General principles

The mode switch communication in AUTOSAR is a mixture between a data (the mode value) and an event semantic (the transition between modes). It also has some potential impact on the execution of `ExecutableEntity`s, via mode switch events and mode disabling dependencies. Additionally, the transitions between modes are following a strict sequence, as described in document [4].

Introducing this communication pattern to a clustered software architecture requires a technical solution that balances between the local view of software components inside a `Software Cluster`, and the ECU wide behavior cross several `Software Clusters`.

For the Software Cluster Communication, the following principles apply:

- The mode providing `Software Cluster` owns the leading mode machine instance, including the mode queue.
- The `Host Software Cluster` provides the mode switch tasks, which are used to execute the mode switch on each partition, where the mode is capable to execute runnables
- The `Host Software Cluster` coordinates the transfer of the mode switch notifications between the `Software Clusters`.
- The `Host Software Cluster` coordinates the conjunction of the `Software Cluster` individual completions of the mode switches, and notifies the mode providing `Software Cluster`
- Nevertheless, the mode switch itself is locally executed in each RTE in a `Software Cluster`. This has the consequence that the order between `on-exit ExecutableEntity`s, `on-transition ExecutableEntity`s, and `on-entry ExecutableEntity`s is only preserved locally inside a `Software Cluster`.
- The interfaces towards the RTE are only called in well-defined OS task contexts.

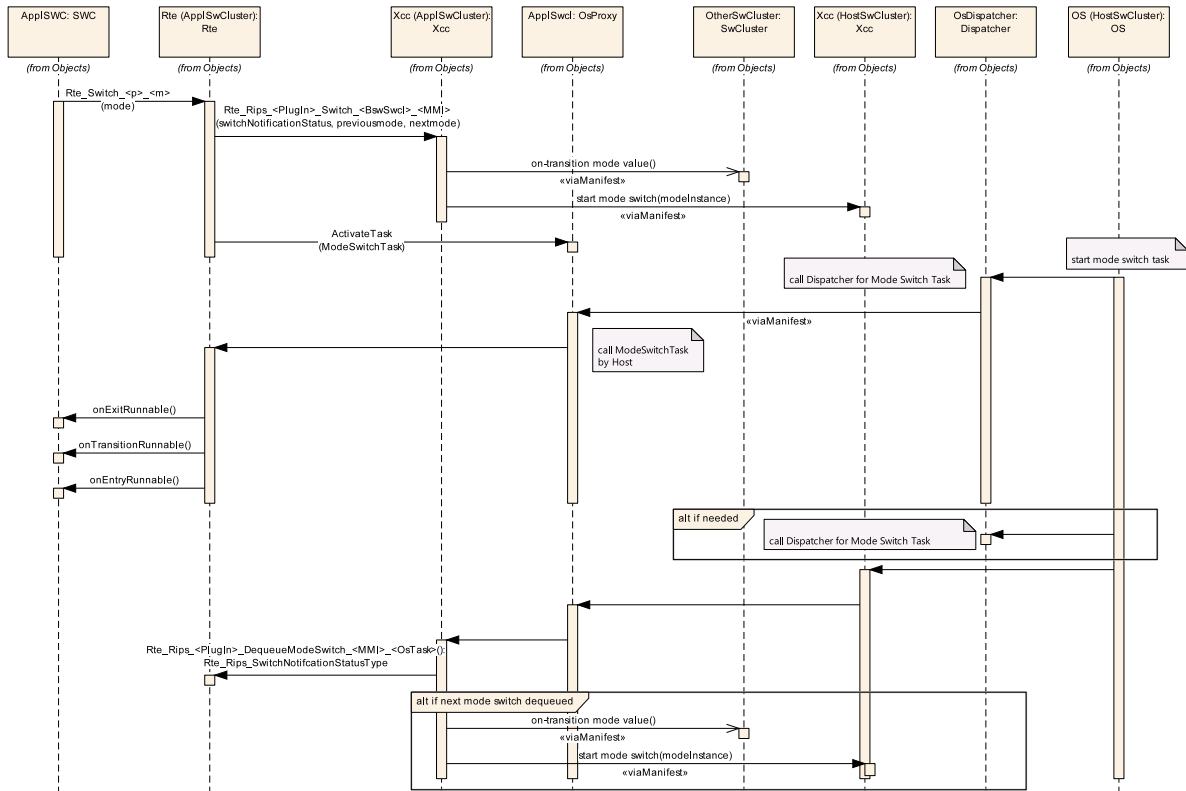
A sender-receiver communication can be implemented solely between `Application Software Clusters`, without impact to the `Host Software Cluster`. In contrast, the adding of a new mode switch communication between `Application Software Clusters`, additionally impacts the `Host Software Cluster`.

#### 7.3.6.2 Software Cluster providing a mode

The `Software Cluster` providing the mode owns the leading mode machine instance, including its mode queue. Hence, the information about the next mode, to

which the mode machine currently switches, is provided by this [Software Cluster](#). In this specification, this mode value is called 'current on-transition value'.

The figure 7.3 illustrates the principle sequence, when a mode switch is initiated by an [Application Software Cluster](#).

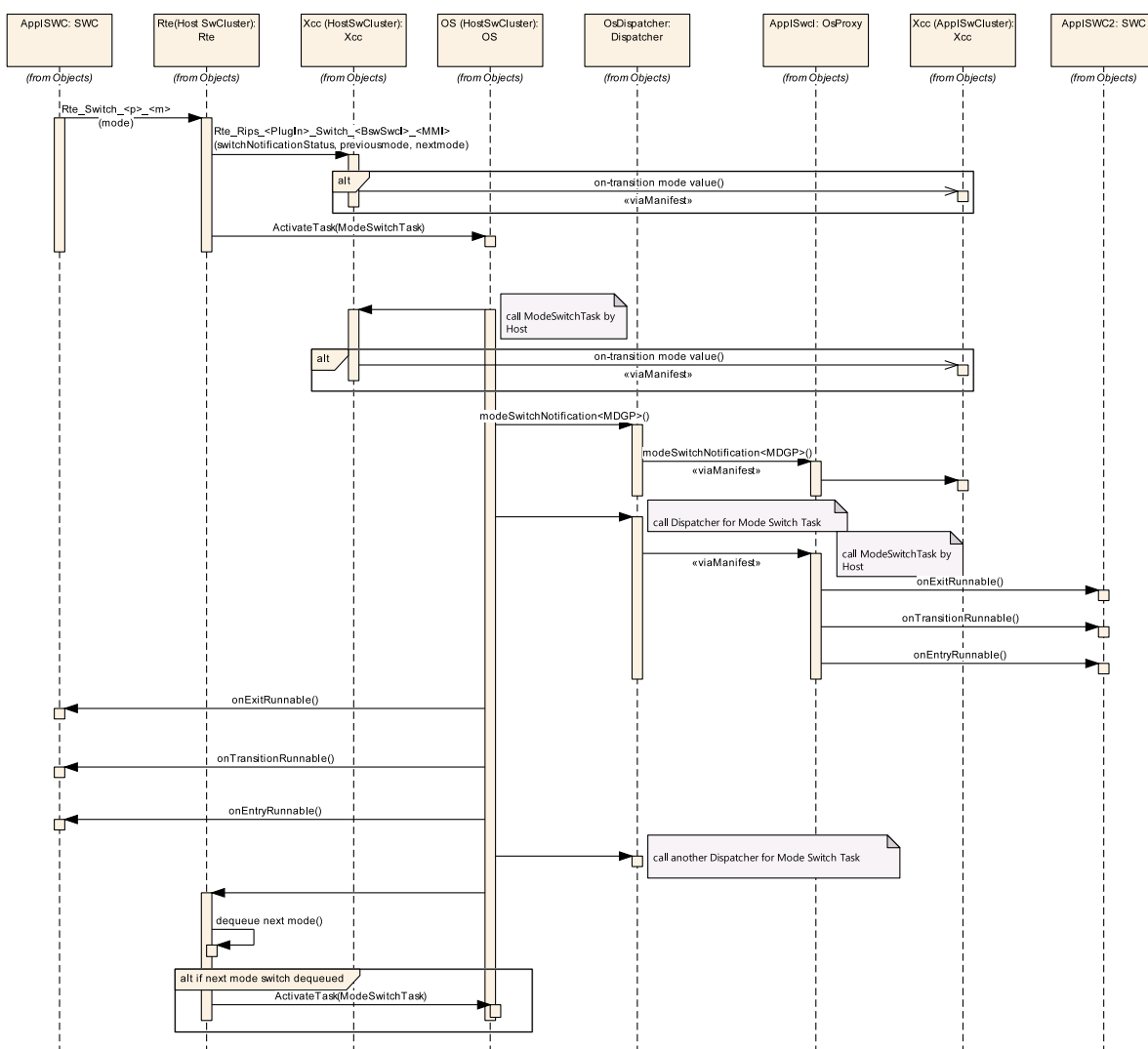


**Figure 7.3: Execution of a mode switch provided by an Application Software Cluster**

- The [mode manager](#) software component calls the [Rte\\_Switch](#) API to do the mode switch notification
- The [Cross Cluster Communication](#) gets notified via the call of the [Rte\\_Rips\\_Switch](#) Service.
- If the mode queue is empty, this [Rte\\_Rips\\_Switch](#) can be used to determine the first on-transition value.
- The [Cross Cluster Communication](#) in the [Application Software Cluster](#) informs the [Cross Cluster Communication](#) in the [Host Software Cluster](#) that a mode switch starts. This notification is a [Cross Cluster Communication](#) internal interface, which is not standardized.
- After the start of the mode switch on the host, the according mode switch tasks are scheduled (potentially on multiple partitions). This in turn, via [Dispatchers](#), schedules cluster local proxy mode switch tasks.

- Potentially, other proxy mode switch tasks are scheduled before and after. Hence, the RTE cannot dequeue the next mode already in the context of its mode switch tasks.
- After the **Cross Cluster Communication** in the **Host Software Cluster** has determined that a mode switch task has run to end, it uses **Cross Cluster Communication** to notify the RTE in the **Application Software Cluster** to dequeue the next mode.

The figure 7.4 illustrates the principle sequence, when a mode switch is initiated by a **Host Software Cluster**.



**Figure 7.4: Execution of a mode switch provided by an Host Software Cluster**

- The **mode manager** software component calls the **Rte\_Switch** API, to do the mode switch notification

- The `Cross Cluster Communication` gets notified via the call of the `Rte_Rips_Switch` Service.
- If the mode queue is empty, this `Rte_Rips_Switch` can be used to determine the first on-transition value. Alternatively, this is also possible in the mode switch task(s) before first `Dispatchers` are scheduled.
- After the start of the mode switch on the host, the according mode switch tasks are scheduled (potentially on multiple partitions). This in turn, via `Dispatchers`, schedules cluster local proxy mode switch tasks.
- In contrast to the scenario in figure 7.3, the RTE can dequeue the next mode already in the context of its mode switch tasks.

These two principle sequences lead to the following requirements on the `Cross Cluster Communication`, in case a `Software Cluster` provides a mode.

**[SWS\_SwCluC\_03022]** [The `Cross Cluster Communication` shall signal the current on-transition value to other `Software Clusters`, before the mode switch according to [SWS\_Rte\_02665] starts.] (*SRS\_SwCluC\_00104*)

Note: This functionality can be implemented inside the `Rte_Rips_Switch` service, in case the mode queue was empty. Otherwise, this can be done shortly before the last mode switch task terminates, or when the first mode switch task starts already for the next transition. The interface to signal the current on-transition is a `Cross Cluster Communication` internal interface, which is not standardized.

**[SWS\_SwCluC\_03057]** [The `Cross Cluster Communication` shall add at the `Software Cluster` providing the mode a `Provided Resource Entry`, and at any `Software Cluster` requiring the trigger an according `Require Resource Entry` in the `Binary Manifest`.] (*SRS\_SwCluC\_00104*)

[SWS\_SwCluC\_03057] ensures that a missing `mode manager` in a clustered ECU gets detected, even if the implementation may rely additionally on the according `Dispatchers`.

**[SWS\_SwCluC\_03023]** [The `Cross Cluster Communication` of the `Host Software Cluster` shall implement a `mode manager` for each mode which needs to be provided by an `Application Software Cluster`.] (*SRS\_SwCluC\_00104*)

With this `mode manager`, it is possible to schedule the according `Dispatchers` for mode switch notification, and `Dispatchers` for `Software Cluster` local proxy mode switch tasks.

To ease the realization of [SWS\_SwCluC\_03023], all modes provided by the `Application Software Clusters`, shall be consumed by the `Host Software Cluster`.

**[SWS\_SwCluC\_CONSTR\_03032]** [For each mode provided by an `Application Software Cluster`, the `Ecu Extract` of the `Host Software Cluster` shall own a required `mode switch port` at the `CompositionSwComponentType` of the `rootSoftwareComposition`.] (*SRS\_SwCluC\_00104*, *SRS\_BSW\_00167*)

**[SWS\_SwCluC\_03024]** [The [Cross Cluster Communication](#) of the [Host Software Cluster](#) shall enqueue the current on-transition values signaled by [Application Software Cluster](#), via the related [mode manager](#). ([\[SWS\\_SwCluC\\_03023\]](#))] ([SRS\\_SwCluC\\_00104](#))

Note: In case the [Host Software Cluster](#) provides the mode, the RTE implements already the leading [mode machine instance](#).

**[SWS\_SwCluC\_03025]** [The [Cross Cluster Communication](#) of the [Host Software Cluster](#) shall notify the [Application Software Cluster](#), when a [mode switch tasks](#) starts.] ([SRS\\_SwCluC\\_00104](#))

Note: This notification is used by the [Application Software Cluster](#) to schedule the [mode switch notification runnable](#), which enqueues the [mode switch notification](#) in the cluster local RTE.

**[SWS\_SwCluC\_03026]** [The [Cross Cluster Communication](#) of the [Host Software Cluster](#) shall notify the [Cross Cluster Communication](#) of the [Application Software Cluster](#), when all [mode switch tasks](#) run to end.] ([SRS\\_SwCluC\\_00104](#))

**[SWS\_SwCluC\_03027]** [In case the [Application Software Cluster](#) provides the mode, the [Cross Cluster Communication](#) of the [Host Software Cluster](#) shall notify the [Cross Cluster Communication](#) of the [Application Software Cluster](#), when [mode switch tasks](#) run to end.] ([SRS\\_SwCluC\\_00104](#))

**[SWS\_SwCluC\_03028]** [In case the [Application Software Cluster](#) provides the mode, the [Cross Cluster Communication](#) of the [Application Software Cluster](#) notifies the RTE via [Rte\\_Rips\\_DequeueModeSwitch](#), when a [mode switch task](#) known by this RTE runs to end. The [Cross Cluster Communication](#) has to guarantee that the last call of [Rte\\_Rips\\_DequeueModeSwitch](#) is not done before the last [on-entry ExecutableEntity](#) in the whole clustered system terminated.] ([SRS\\_SwCluC\\_00104](#))

Please note [\[SWS\\_Rte\\_70123\]](#), which guarantees a certain execution context for the RTE.

**[SWS\_SwCluC\_03029]** [The [Cross Cluster Communication](#) shall provide a [Complex Driver Software Component](#) on each [EcucPartition](#), where [mode switch task](#) are configured. This component is later called [mode proxy component](#).] ([SRS\\_SwCluC\\_00104](#))

**[SWS\_SwCluC\_03030]** [The [Cross Cluster Communication](#) shall provide [RunnableEntities](#) to detect the start and end of any [mode switch task](#), which is related to [mode communication cross Software Clusters](#).] ([SRS\\_SwCluC\\_00104](#))

Please note: the [RunnableEntities](#) [\[SWS\\_SwCluC\\_03030\]](#) may require additional [ModeAccessPoints](#), as well as suitable [RTEEvents](#). It is possible to use [OsTaskExecutionEvent](#) and a small runtime logic, to determine the ongoing [mode transition](#), or a set of [SwcModeSwitchEvents](#), which activate the [RunnableEntity](#) on any transition of a specific [mode machine instance](#).

### 7.3.6.3 Host Software Cluster requiring a mode

As explained in section 7.3.6.2, the [Host Software Cluster](#) is already aware about existing modes communicated cross [Software Clusters](#). Therefore, it technically receives already the modes provided by [Application Software Clusters](#). In case the [Host Software Cluster](#) owns software components, which require the the mode as well, it shall connect them to its already existing mode manager.

**[SWS\_SwCluC\_03031]** [The [Cross Cluster Communication](#) shall provide the [AssemblySwConnectors](#) between the provided [mode switch ports](#) of the [mode proxy component](#) and the required [mode switch ports](#) at the software components requiring the mode, if the mode is required by the [Host Software Cluster](#).] ([SRS\\_SwCluC\\_00104](#))

### 7.3.6.4 Application Software Cluster requiring a mode

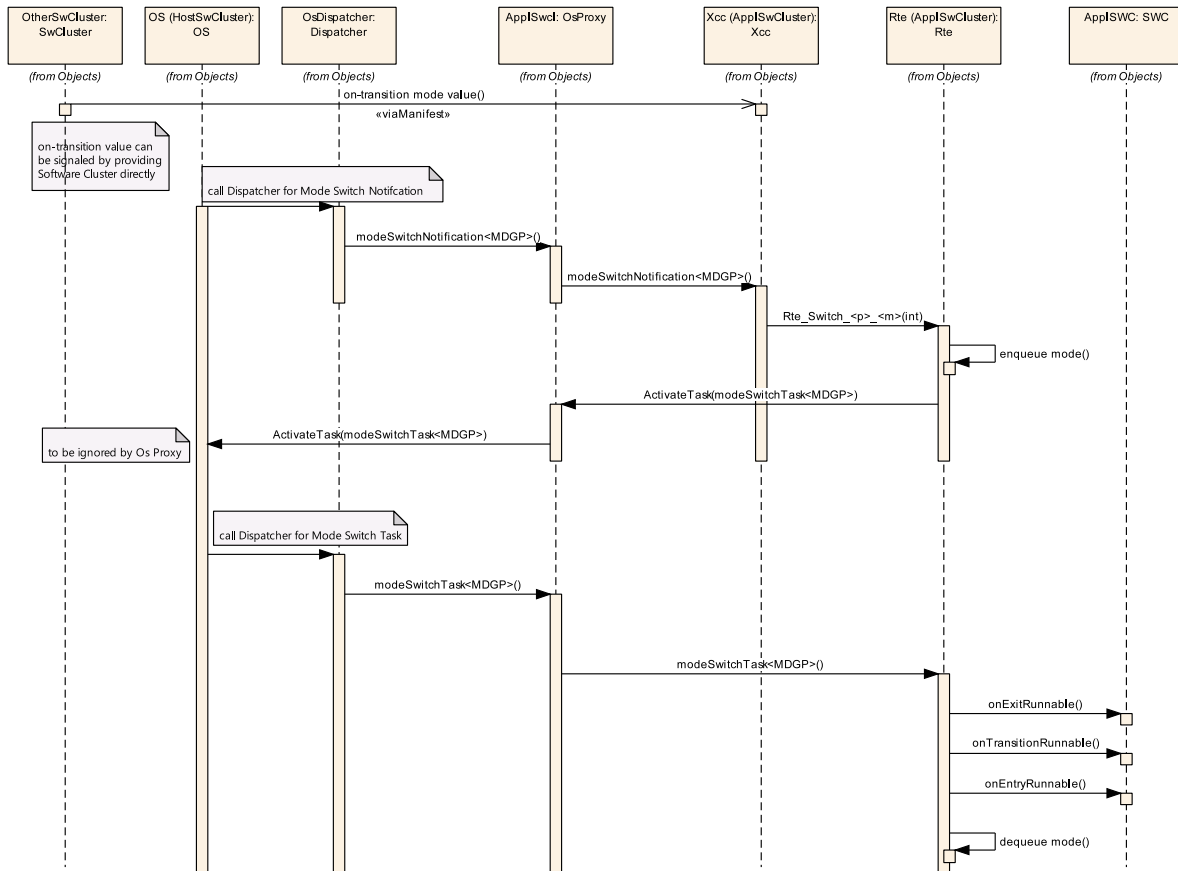
For each required mode, the [Application Software Cluster](#) defines [OsTask\(s\)](#) plus [dispatcher\(s\)](#), for the [mode switch notification](#).

When the mode switch gets notified by the [Host Software Cluster](#), the [Cross Cluster Communication](#) writes the actual on-transition mode value to the RTE of the [Application Software Cluster](#) with the regular [Rte\\_Switch](#) API related to a [mode switch port](#).

Note: The RTE in the [Application Software Cluster](#) shall still a call [ActivateTask\(s\)](#) to trigger the mode switch task(s). This call can still be used by the [Host Software Cluster](#) to trigger the mode switch task execution in the [Host Software Cluster](#), if needed.

For this purpose, the [Cross Cluster Communication](#) defines a [RunnableEntity](#) with an [OsTaskExecutionEvent](#) for each mode on each partition where a [mode switch notification](#) is configured. When the mode switch is executed, the [Host Software Cluster](#) schedules the mode switch task(s), which in turn schedule the 'proxy' mode switch task(s) in the [Application Software Cluster](#)





**Figure 7.5: Execution of a mode switch in an Application Software Cluster**

**[SWS\_SwCluC\_03015]** [The [Cross Cluster Communication](#) shall provide a [Complex Driver Software Component](#) on each [EcucPartition](#) where a [mode switch port](#) needs to be provided. This component is later called [mode proxy component](#).] ([SRS\\_SwCluC\\_00104](#))

**[SWS\_SwCluC\_03016]** [The [Cross Cluster Communication](#) shall provide a provided [mode switch port](#) on each [mode proxy component](#) where a [mode switch port](#) needs to be provided.] ([SRS\\_SwCluC\\_00104](#))

**[SWS\_SwCluC\_03017]** [The [Cross Cluster Communication](#) shall provide the [AssemblySwConnectors](#) between the provided [mode switch ports](#) and the required [mode switch ports](#) at the software components requiring the mode.] ([SRS\\_SwCluC\\_00104](#))

**[SWS\_SwCluC\_03018]** [The [Cross Cluster Communication](#) shall provide a [mode switch notification](#) runnable with an [OsTaskExecutionEvent](#), for each mode on each partition where a [mode switch notification](#) is configured. The [RunnableEntity](#) shall define a [ModeSwitchPoint](#).] ([SRS\\_SwCluC\\_00104](#))

**[SWS\_SwCluC\_03019]** [When the mode switch notification runnable is executed, it shall write the actual on-transition value via `Rte_Switch` to the RTE.] (*SRS\_SwCluC\_00104*)

**[SWS\_SwCluC\_CONSTR\_03020]** [For each `EcucPartition` on which the mode switch notification is configured for a `ModeDeclarationGroupPrototype` required by an `Application Software Cluster`, a `OsTask` with a related `SwCluCOsProxyOsTask` and `SwCluCOsProxyOsTaskDispatcher` shall be configured.] (*SRS\_SwCluC\_00104*, *SRS\_BSW\_00167*)

**[SWS\_SwCluC\_CONSTR\_03021]** [For each required `ModeDeclarationGroupPrototype` and `EcucPartition` on which the mode switch notification is configured, a `OsTask` with a related `SwCluCOsProxyOsTask` and `SwCluCOsProxyOsTaskDispatcher` shall be configured.] (*SRS\_SwCluC\_00104*, *SRS\_BSW\_00167*)

### 7.3.6.5 Initialization

The approach described in section 7.3.6.2 and 7.3.6.4 leads to local mode machine instances in each `Software Cluster` providing or requiring the mode.

But this also implies that the initialization of the mode machine instances is executed time shifted, without explicit synchronization by the `Cross Cluster Communication`.

When the clustered system starts, the following procedure needs to be preserved!

- Initialization of the `Cross Cluster Communications`
- Execute all `Rte_Init_<InitContainer>` functions in `Application Software Clusters` and `Host Software Cluster`. This step already leads to the execution of `on-entry ExecutableEntitys`, triggered by `initialMode` and mapped to `RteInitializationRunnableBatch` container.
- Execute all `Rte_Start` in `Application Software Clusters`. This step executes the remaining `on-entry ExecutableEntitys` triggered by `initialMode`. In case the RTE implementation triggers the mode switch task to proceed the transition to the `initialMode`, it will happen here as well.
- Execute `Rte_Start` in the `Host Software Cluster`. This step executes the remaining `on-entry ExecutableEntitys` triggered by `initialMode` in the `Host Software Cluster`. In case the RTE implementation triggers the mode switch task to proceed the transition to the `initialMode`, the mode switch task will now be executed.

## 7.3.7 Trigger Communication

### 7.3.7.1 General principles

The trigger communication in AUTOSAR is a pure event semantic, which is used to request the execution of `triggered ExecutableEntitys`.

Introducing this communication pattern to a clustered software architecture, the focus lies on the use case to implement `trigger sources` in `Application Software Clusters` and in the `Host Software Cluster`. Nevertheless, the control on the execution of the `triggered ExecutableEntitys` is implemented in the `Host Software Cluster`, to guarantee an ECU wide behavior cross several `Software Clusters`.

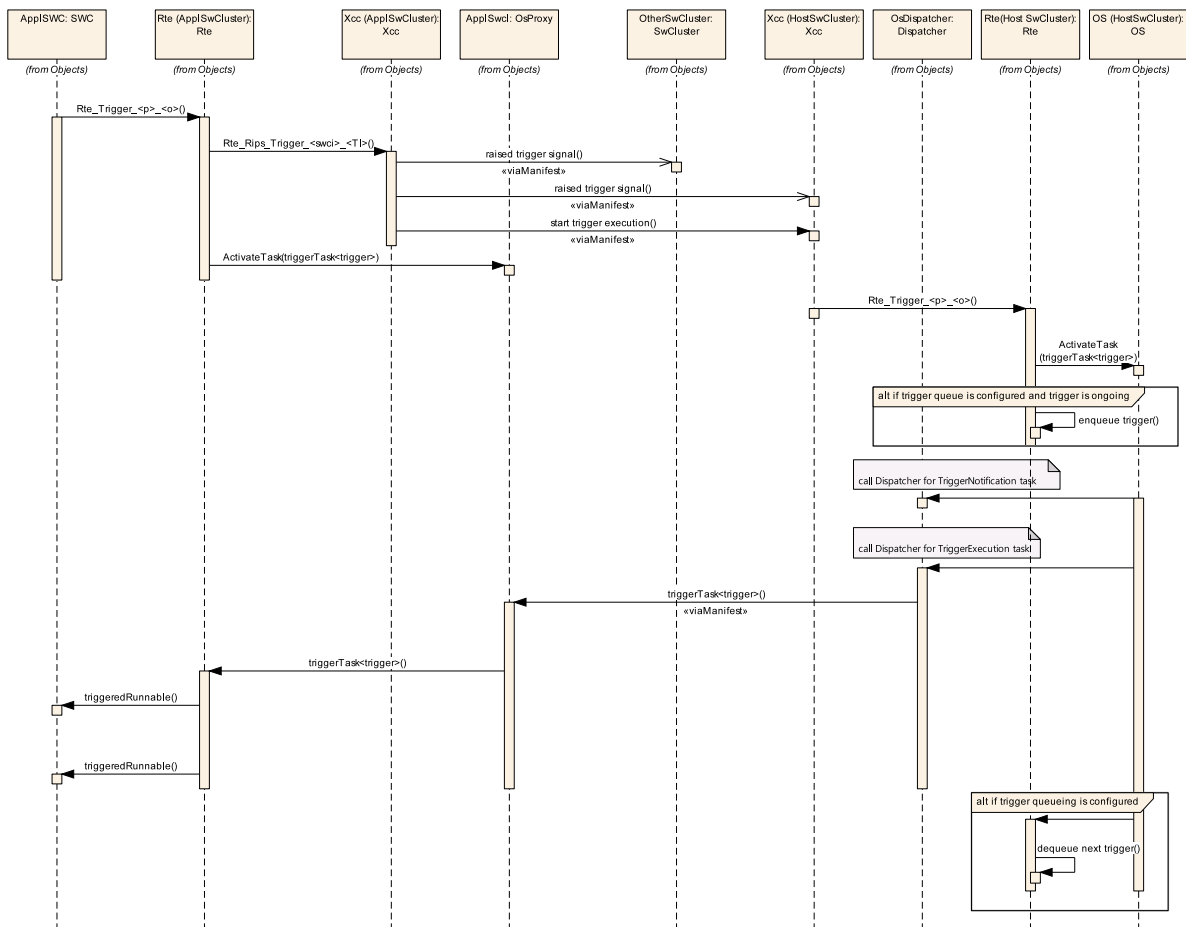
For the `Software Cluster Communication`, the following principles apply:

- The trigger providing `Application Software Cluster` transfers the occurrence of the trigger to the `Host Software Cluster`.
- The `Host Software Cluster` provides the tasks, which are used to execute the `triggered ExecutableEntitys` on each partition where needed.
- If queuing of triggers is required from a dynamic perspective, this is configured and implemented in the RTE of the `Host Software Cluster`
- Nevertheless, the triggering itself is locally executed in each RTE inside a `Software Cluster`. This has the consequence that the order between `triggered ExecutableEntitys` is only preserved locally inside a single proxy OS Task of an `Application Software Cluster`.
- The interfaces towards the RTE are only called in well-defined OS task contexts.

Adding of a new trigger communication between `Application Software Clusters`, additionally impacts the `Host Software Cluster`.

### 7.3.7.2 Software Cluster providing a trigger

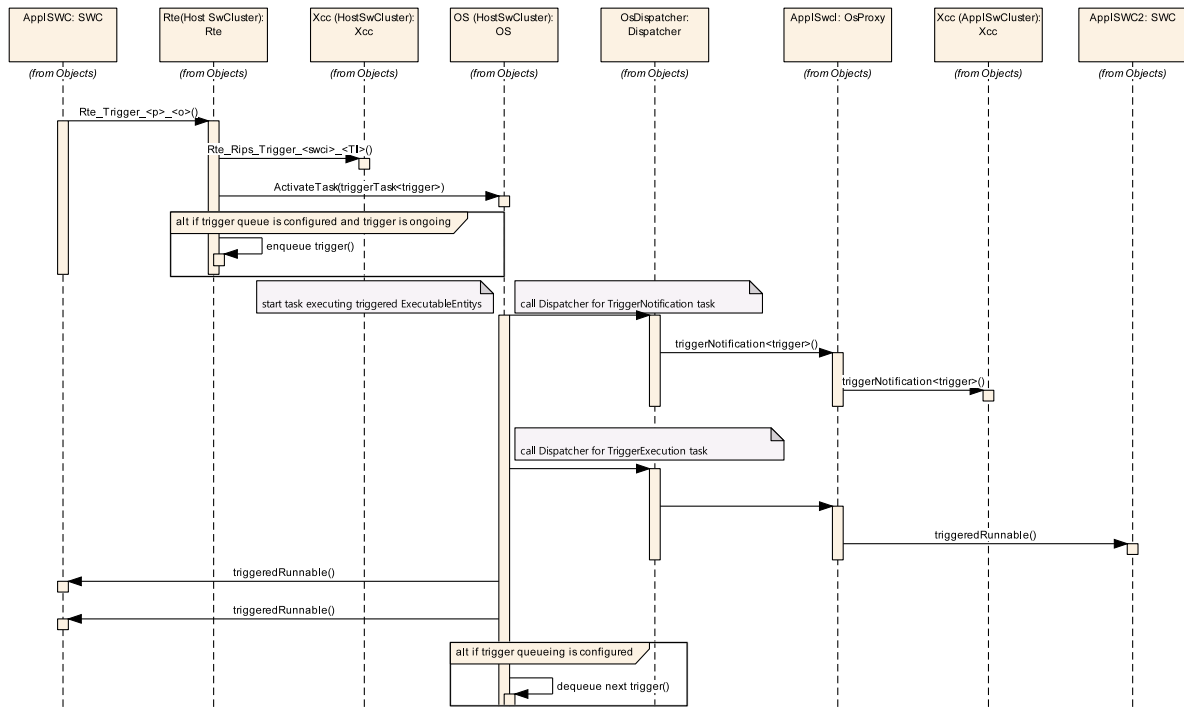
The figure 7.6 illustrates the principle sequence, when a trigger is raised by an `Application Software Cluster`.



**Figure 7.6: Execution of a trigger provided by an Application Software Cluster**

- The `trigger` source calls the `Rte_Trigger` API, to raise the trigger.
- The `Cross Cluster Communication` gets notified, via the call of the `Rte_Rips_Trigger` Service.
- The `Cross Cluster Communication` in the `Application Software Cluster` informs the `Cross Cluster Communication` in the `Host Software Cluster` that a trigger was raised. This notification is a `Cross Cluster Communication` internal interface, which is not standardized.
- In the `Host Software Cluster`, the `Cross Cluster Communication` raises the trigger in the RTE, via `Rte_Trigger` API. In case of a configured trigger queue, this would enqueue the trigger.
- After the start of the trigger execution on the `Host Software Cluster`, the according tasks are scheduled (potentially on multiple partitions). This in turn schedules, via `Dispatchers`, the `Application Software Cluster` local proxy tasks.
- In case of a configured trigger queue, the dequeue operation is executed after the last `triggered ExecutableEntity` terminated.

The figure 7.7 illustrates the principle sequence, when a trigger is raised by a [Host Software Cluster](#).



**Figure 7.7: Execution of a trigger provided by an Host Software Cluster**

- The [trigger source](#) calls the [Rte\\_Trigger](#) API, to raise the trigger.
- The [Cross Cluster Communication](#) gets notified, via the call of the [Rte\\_Rips\\_Trigger](#) Service.
- The RTE activates the tasks used for execution of [triggered ExecutableEntities](#). If a queue is configured, and a trigger execution is already ongoing, the RTE in the [Host Software Cluster](#) enqueues the trigger.
- After the start of the trigger execution on the [Host Software Cluster](#), the according tasks are scheduled (potentially on multiple partitions). This in turn, schedules, via [Dispatchers](#), the [Application Software Cluster](#) local proxy tasks.
- In case of a configured trigger queue, the dequeue operation is executed after the last [triggered ExecutableEntities](#) terminated.

These two principle sequences lead to the following requirements on the [Cross Cluster Communication](#), in case a [Software Cluster](#) provides a mode.

**[SWS\_SwCluC\_03055]** [The [Cross Cluster Communication](#) shall signal to other [Software Clusters](#) that a trigger was raised.] ([SRS\\_SwCluC\\_00105](#))

Note: This functionality can be implemented inside the `Rte_Rips_Trigger` service. Function wise, it is up to the implementation, if the `[SWS_SwCluC_03055]` is already fulfilled via the connection to the `Host Software Cluster`.

**[SWS\_SwCluC\_03056]** [The `Cross Cluster Communication` shall, at the `Software Cluster` providing the trigger, add a `Provided Resource Entry` and, at `Software Clusters` requiring the trigger, an according `Require Resource Entry` in the `Binary Manifest`.] (*SRS\_SwCluC\_00105*)

`[SWS_SwCluC_03056]` ensures that a missing `trigger source` in a clustered ECU gets detected, even if the implementation may rely on the according `Dispatchers`.

**[SWS\_SwCluC\_03058]** [The `Cross Cluster Communication` of the `Host Software Cluster` shall implement a `trigger source` for each trigger, which needs to be provided by an `Application Software Cluster`.] (*SRS\_SwCluC\_00105*)

With this `trigger source`, it is possible to schedule the according `Dispatchers` for trigger notification, and `Dispatchers` for `Software Cluster` local trigger execution tasks.

To ease the realization of `[SWS_SwCluC_03058]`, all triggers provided by `Application Software Clusters`, shall be consumed by the `Host Software Cluster`.

**[SWS\_SwCluC\_CONSTR\_03059]** [The `Ecu Extract` of the `Host Software Cluster` shall, for each trigger provided by an `Application Software Cluster`, own a required `trigger port` at the `CompositionSwComponentType` of the `rootSoftwareComposition`.] (*SRS\_SwCluC\_00105*, *SRS\_BSW\_00167*)

**[SWS\_SwCluC\_03060]** [The `Cross Cluster Communication` of the `Host Software Cluster` shall raise the triggers signaled by `Application Software Clusters`, via the related `trigger source`. (`[SWS_SwCluC_03058]`)] (*SRS\_SwCluC\_00105*)

Note: In case the `Host Software Cluster` provides the trigger, the `trigger source` is already part of the `Software Components` or `BSW Modules` belonging to the `Host Software Cluster`, which are directly interacting with the `RTE` or `SchM`.

**[SWS\_SwCluC\_03061]** [The `Cross Cluster Communication` of the `Host Software Cluster` shall notify the `Application Software Cluster`, when the execution of a trigger tasks starts.] (*SRS\_SwCluC\_00104*)

Note: This notification is used by the `Application Software Cluster` to schedule the `trigger notification runnable`, which raises the trigger at the cluster local `RTE`.

**[SWS\_SwCluC\_03062]** [The `Cross Cluster Communication` shall provide a `Complex Driver Software Component` on each `EcucPartition`, where a `trigger source` according to `[SWS_SwCluC_03058]` is configured. This component is later called `trigger proxy component`.] (*SRS\_SwCluC\_00104*)

### 7.3.7.3 Host Software Cluster requiring a trigger

As explained in section 7.3.7.2, the `Host Software Cluster` is already aware about an existing trigger communicated cross `Software Clusters`. Therefore, it technically already receives the triggers raised by `Application Software Clusters`. In case the `Host Software Cluster` owns software components that require the the trigger as well, it shall connect them to its already existing `trigger source`, according to [SWS\_SwCluC\_03058].

**[SWS\_SwCluC\_03063]** [The `Cross Cluster Communication` shall provide the `AssemblySwConnectors` between the provided `trigger ports` of the `trigger proxy component`, and the required `trigger ports` at the software components requiring the trigger, if the trigger is required by the `Host Software Cluster`.] (*SRS\_SwCluC\_00104*)

### 7.3.7.4 Application Software Cluster requiring a trigger

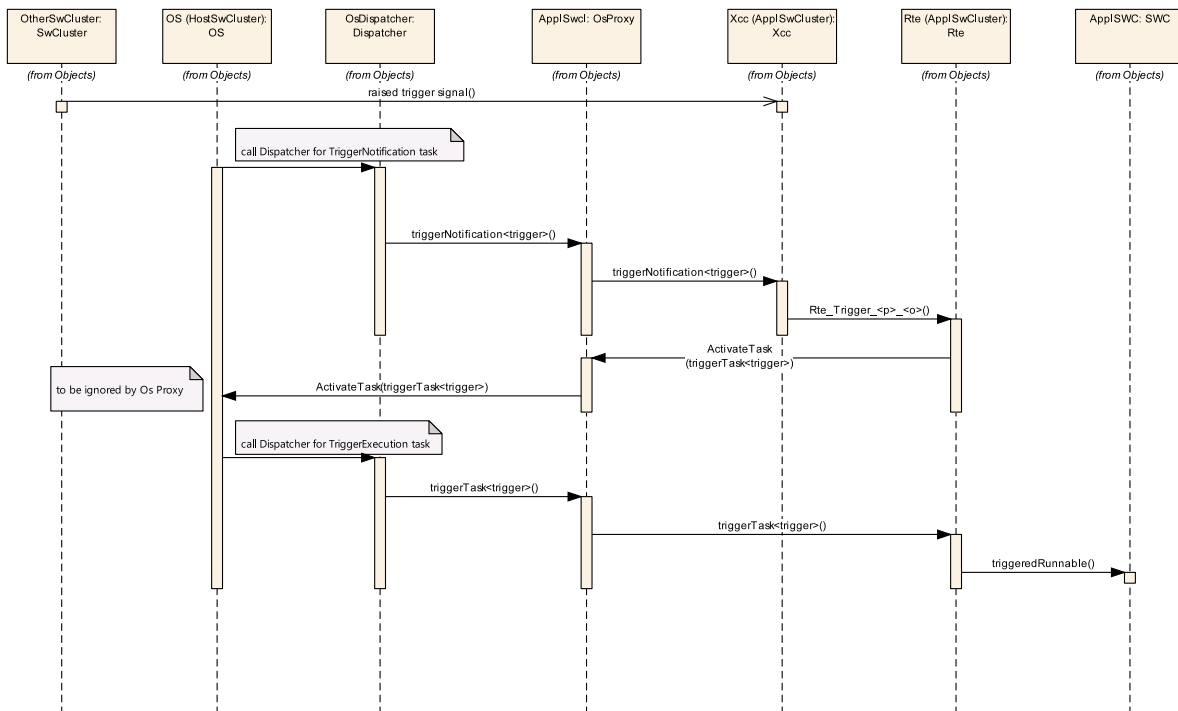
For each required `trigger`, the `Application Software Cluster` defines `OsTask(s)` plus `dispatcher(s)`, for the `trigger notification`.

When the trigger gets executed by the `Host Software Cluster`, the `Cross Cluster Communication` raises `trigger` at the RTE of the `Application Software Cluster`, with the regular `Rte_Trigger` API related to a `trigger port`.

**Note:** The RTE in the `Application Software Cluster` shall still call `ActivateTask(s)`, to trigger the task(s) used for the execution of `triggered ExecutableEntities`. This call can still be used by the `Host Software Cluster` to trigger the task executions in the `Host Software Cluster`, if needed.

For this purpose, the `Cross Cluster Communication` defines a `RunnableEntity` with an `OsTaskExecutionEvent`, for each trigger and on each partition, a `trigger notification` is configured. When the trigger is executed, the `Host Software Cluster` schedules the task(s), which in turn schedule the 'proxy' task(s) in the `Application Software Cluster`.





**Figure 7.8: Execution of a trigger in an Application Software Cluster**

**[SWS\_SwCluC\_03048]** [The [Cross Cluster Communication](#) shall provide a Complex Driver Software Component, on each [EcucPartition](#) where a [trigger port](#) needs to be provided. This component is later called [trigger proxy component](#).] ([SRS\\_SwCluC\\_00105](#))

**[SWS\_SwCluC\_03049]** [The [Cross Cluster Communication](#) shall provide a provided [trigger port](#), on each [trigger proxy component](#).] ([SRS\\_SwCluC\\_00105](#))

**[SWS\_SwCluC\_03050]** [The [Cross Cluster Communication](#) shall provide the [AssemblySwConnectors](#) between the provided [trigger ports](#) and the required [trigger ports](#), at the software components requiring the trigger.] ([SRS\\_SwCluC\\_00105](#))

**[SWS\_SwCluC\_03051]** [The [Cross Cluster Communication](#) shall provide a trigger notification runnable with an [OsTaskExecutionEvent](#), for each trigger on each partition a trigger notification is configured. The [RunnableEntity](#) shall define a [ExternalTriggeringPoint](#).] ([SRS\\_SwCluC\\_00105](#))

**[SWS\_SwCluC\_03052]** [When the trigger notification runnable is executed, it shall raise the trigger via [Rte\\_Trigger](#) to the RTE.] ([SRS\\_SwCluC\\_00105](#))

**[SWS\_SwCluC\_CONSTR\_03053]** [For each [EcucPartition](#) on which the trigger notification is configured for a [trigger](#) required by an [Application Software Cluster](#), a [OsTask](#), with a related [SwCluCOsProxyOsTask](#) and

SwCluCOsProxyOsTaskDispatcher, shall be configured.](SRS\_SwCluC\_00105, SRS\_BSW\_00167)

**[SWS\_SwCluC\_CONSTR\_03054]** [For each required `trigger` and `EcucPartition` on which `triggered ExecutableEntitys` needs to be executed, at least one `OsTask`, with a related `SwCluCOsProxyOsTask` and `SwCluCOsProxyOsTaskDispatcher`, shall be configured.](SRS\_SwCluC\_00105, SRS\_BSW\_00167)

### 7.3.8 Parameter Communication

**[SWS\_SwCluC\_03006]** [The `Cross Cluster Communication` of the `Software Cluster Connection` shall provide one constant default parameter instance for each assigned `Parameter Communication Graph`, which contains NO `PPortPrototype`.](SRS\_SwCluC\_00100, SRS\_SwCluC\_00106)

**[SWS\_SwCluC\_03007]** [The default value instance shall be mapped to a CALPRM memory section, according to document [17].](SRS\_SwCluC\_00100, SRS\_SwCluC\_00106)

Please note as well section 7.3.2.4, which is relevant for calibration parameters instantiated by `Software Cluster Connection`.

**[SWS\_SwCluC\_03008]** [The default value instance shall be initialized according to the `ParameterRequireComSpec.initValue`, in the `RPortPrototype` at the `CompositionSwComponentType` of the `rootSoftwareComposition` of the `Ecu Extract`.](SRS\_SwCluC\_00100, SRS\_SwCluC\_00106)

**[SWS\_SwCluC\_03009]** [If the corresponding resource in the `Binary Manifest` is connected, the `Rte_Rips_Prm` shall return the value of the connected parameter.](SRS\_SwCluC\_00100, SRS\_SwCluC\_00106)

**[SWS\_SwCluC\_03010]** [If the corresponding resource in the `Binary Manifest` is NOT connected, the `Rte_Rips_Prm` shall return the value of the default parameter instance of [SWS\_SwCluC\_03006].](SRS\_SwCluC\_00100, SRS\_SwCluC\_00106, SRS\_SwCluC\_00213)

Note: The behavior of `Rte_Rips_Prm` function, according to [SWS\_SwCluC\_03009] and [SWS\_SwCluC\_03010], can be implemented by referencing the default parameter instance as the default handle in the `Binary Manifest`.

**[SWS\_SwCluC\_03011]** [For each assigned `Parameter Communication Graph`, which contains the `PPortPrototype`, the `Cross Cluster Communication` of the `Software Cluster Connection` shall make the parameter instance, according to [SWS\_Rte\_80130], accessible for other `Software Clusters`, via a `Resource Entry` in the `Binary Manifest`.](SRS\_SwCluC\_00100, SRS\_SwCluC\_00106)

### 7.3.9 Error Classification

Together with the RTE, the [Cross Cluster Communication](#) of the [Software Cluster Connection](#) implements the Run-Time Environment of the [Software Cluster](#). The usual development errors checking API parameters are already covered by the development error detection of RTE. In addition, communication infrastructure errors are not reported as [Production Errors](#) nor as [Extended Production Errors](#). Therefore, the following sections do not define error codes, and are marked as not applicable.

#### 7.3.9.1 Development Errors

Development errors are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

#### 7.3.9.2 Runtime Errors

Runtime errors are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

#### 7.3.9.3 Transient Faults

Transient Faults are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

#### 7.3.9.4 Production Errors

Production Errors are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

#### 7.3.9.5 Extended Production Errors

Extended Production Errors are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

### 7.3.10 Initialization of Xcc

Please note, that the [Cross Cluster Communication](#) offers two initialization functions for each [Software Cluster](#). This enables that each [Software Cluster](#) can

first initialize its memories which are intended to be read by other [Software Clusters](#) before initializations are executed which depend on that to be read memories. To ensure proper initialization behavior all [SwCluC\\_Xcc\\_Init1](#) have to be called before the [SwCluC\\_Xcc\\_Init2](#) functions.

**[SWS\_SwCluC\_CONSTR\_03404] SwCluC Xcc initialization order** [All [SwCluC\\_Xcc\\_Init1](#) functions of any [Software Cluster](#) on the machine shall be called before the call of the [SwCluC\\_Xcc\\_Init2](#) functions of any [Software Cluster](#) on the same machine.] ([SRS\\_BSW\\_00407](#))

## 7.4 Proxy Modules

### 7.4.1 Overview

Since an [Application Software Cluster](#) does not contain all BSW modules (in extreme case no BSW modules), those missing APIs, as well as the EcuC configuration elements, need to be substituted.

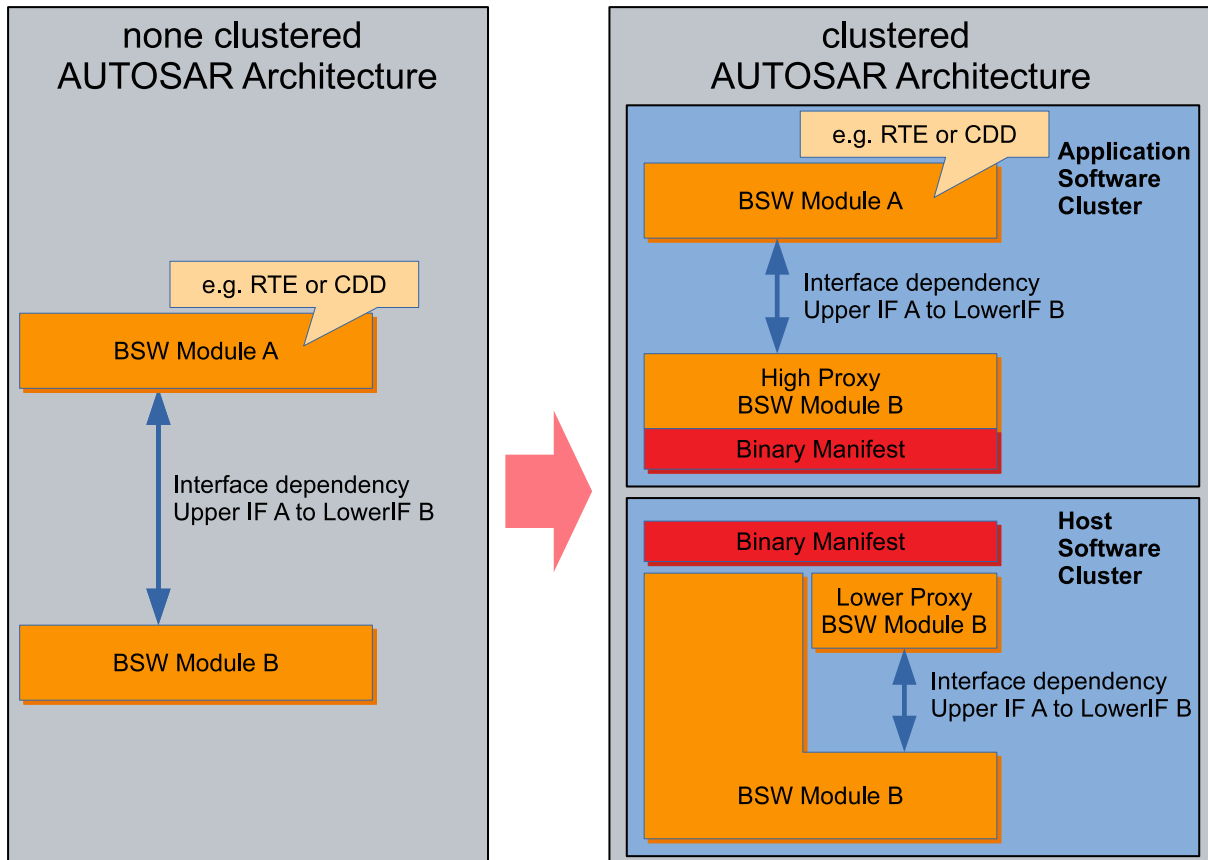
In the AUTOSAR Layered Software Architecture, the dependency between BSW modules can be generalized as follows:

A higher layer BSW module uses the APIs of a lower layer BSW module. In the opposite direction, the lower layer BSW module may call callback functions of the higher layer BSW module. In case of [AUTOSAR Interfaces](#), additional [Software Component Descriptions](#) are required to enable the RTE generation. If the interface between those BSW modules is configurable, the ECU configuration provides the information about Symbolic Name values and ID values.

Of course, the AUTOSAR Layered Software Architecture also has horizontal dependencies. In this case, rotate the previous paragraph by 90 degrees.

It is important to state that the different BSW Module are directly using the C-interfaces of each other, without abstraction (as the RTE provides between SWCs). This, in turn, causes strong implementation dependencies, like fixed names of include files and C-functions.

Since the actual implementation and integration of the Classic Platform architecture is now split into [Software Clusters](#), missing BSW Modules - those to which interfaces are existing - need to be substituted. The [Figure 7.9](#) illustrates the proxy module approach, for a horizontal interface dependency.



**Figure 7.9: Proxy module approach**

The C-interfaces of the lower layer BSW module (Module B), towards the higher layer BSW module (Module A), are provided by the High Proxy Module B, in the Software Cluster SWCL 1. The C-interfaces, ECU-C, and Component Descriptions of Module B are provided in the same name space / ARPackage structure as the original Module B. For the users of Module B (in this example Module A), the substitution of Module B by the High Proxy Module B is transparent. Usually, the offered API functions are almost without logic, and are just redirecting the calls towards the substituted module.

In the *Host Software Cluster*, the Low Proxy Module acts as a substitute for all 'user modules' in other Software Clusters. It implements the callback functions, which are normally configured in Module B.

The High Proxy Module and Low Proxy Module are connected via the means of the *Binary Manifest*. Therefore, the functions of the High and Low Proxy modules may contain functionality, which handles this *Binary Manifest* link and the situations if the link is missing. For instance, returning a reasonable error code or even providing some replacement value.

In addition, the High Proxy Module can implement functionality to localize configuration decisions. For instance, in order to support a SWCL local growing of the NV block over integration steps, it could be possible to adjust the locally used size of a NV block. Of course, this is only possible if the configured size in the real NvM is sufficiently large.

By this approach, the SWCs and BSW modules inside the [Application Software Clusters](#) call the common BSW inside the [Host Software Cluster](#) via proxies. When doing so, the partitioning of the ECU SW has to be considered, as described in section [7.4.2.2](#) Partitions.

This section specifies the general Proxy Module pattern. Additionally, requirements for specific Proxy Modules are in section [7.4.3](#). Additional Proxy Modules might be standardized by AUTOSAR in future releases.

## 7.4.2 Abstract Proxy Module Pattern

This section provides some generic design principles and common requirements, relevant for Proxy Module implementations.

Basically, a High Proxy Module provides a kind of facade, which hides the Software Cluster Connection specific mechanisms to access the real BSW Module. In the AUTOSAR Architecture, such a facade has to hide dependencies to

- Standardized Interfaces
- Standardized AUTOSAR Interfaces and the
- ECU Configuration

In addition to the essential need to provide the interfaces to the BSW Module user in the [Application Software Cluster](#), the [Proxy Module](#) should implement abstraction functionalities. Those abstraction functionalities decouple the needed configuration in the [High Proxy Module](#), from the configuration done in the BSW Module of the [Host Software Cluster](#). The introduction of abstraction functionalities is a case-by-case decision. On the one hand, they might need a functional support of the according BSW Module, or might lead to functional restrictions. On the other hand, such abstractions are beneficial, since in some cases they can be used to avoid a re-configuration of the [Host Software Cluster](#), after change in the [Application Software Cluster](#).

Please note that the following requirements only have limited applicability to an OS Proxy, since the OS APIs are already designed to be called from all the partitions.

### 7.4.2.1 General Proxy functionality

**[SWS\_SwCluC\_02000]** [The Proxy Module shall support that id values, required to access the BSW service API of the [Host Software Cluster](#), can change, without reconfiguration or rebuild of the [Application Software Cluster](#) using the BSW service.] ([SRS\\_SwCluC\\_00203](#))

### 7.4.2.2 Partitions

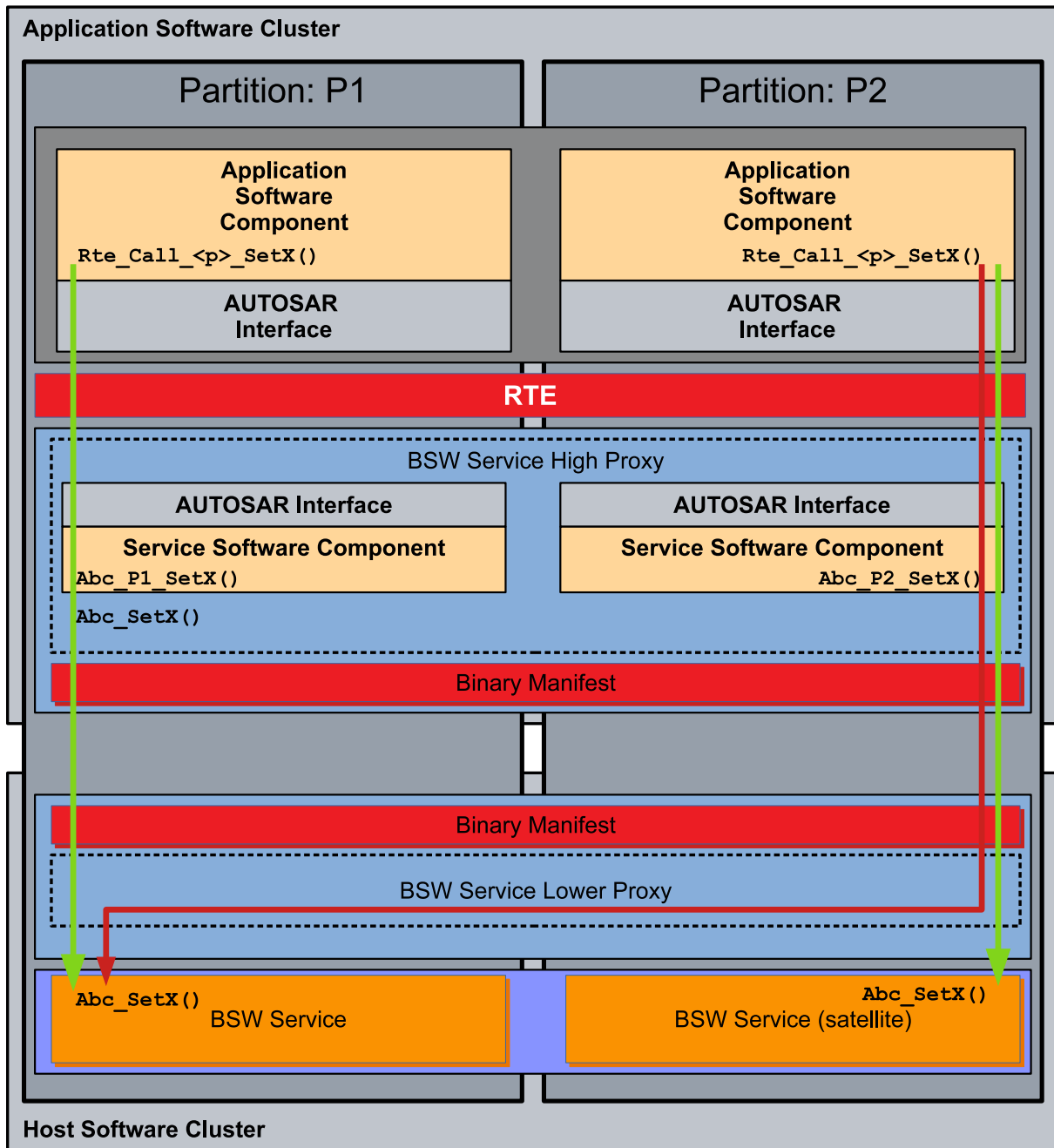
Partitions are shared between the [Host Software Cluster](#) and [Application Software Clusters](#). This also applies to the properties of the related [OsApplications](#) and [OsTasks](#). Consequently, [Application Software Clusters](#) are not strictly separated from the [Host Software Cluster](#). Due to performance reasons, it is possible to share the identical partition of the [Host Software Cluster](#) with many [Application Software Clusters](#). If [Application Software Clusters](#) share the same partition, they are also not strictly separated from each other. In contrast, if a [Software Cluster](#) has multiple partitions (e.g. on different safety levels), those partitions are separated from each other.

When a partition crossing function call is required, usually some close interaction with the Operating System is necessary - especially in case of different safety levels. However, the Operating System is not directly available inside an [Application Software Cluster](#). Additionally, it needs to be considered that passing synchronous function calls cross partitions, may have an impact on the scheduling behavior of the software. Therefore, it is preferable to do this in the [Host Software Cluster](#), or - even better - to avoid this by implementing the master satellite pattern in the related BSW modules.

As a consequence:

Inside a partition, such direct function calls to the BSW module in the [Host Software Cluster](#) are easily possible, with little overhead. If a BSW service is needed in a specific partition (including safety partition), the [Host Software Cluster](#) should offer the service interface in this partition. If this is not possible, the according transition shall be implemented in the [Host Software Cluster](#). To support this, the [Proxy Modules](#) have to grant a partition write access to their interfaces.





**Figure 7.10: Proxy Modules and Partitions**

Figure 7.10 illustrates this approach. The AUTOSAR Interfaces are offered in each partition, via a dedicated Service Software Component. The related Standardized AUTOSAR Interface is provided in exactly one Partition, in which the BSW module integration is supported.

A call from the Application Software Component is passed vertically through the partition, down to the BSW Module or its satellite (green arrow).

If such a satellite is not available, the Low Proxy Module can implement (e.g. via `SchM`) a cross partition call (red arrow).

**[SWS\_SwCluC\_02001]** [The High Proxy shall provide the applicable Standardized AUTOSAR Interfaces once per configured `EcucPartition`. In doing so, the APIs are provided with the original `Mip`, at the `EcucPartition` where the `SwCluCNativeBswApi` is set to `true`. For all the other BSW API instances, the `Mip` is replaced by `<Mip>_<shortName of EcucPartition>`.] ([SRS\\_SwCluC\\_00202](#))

**[SWS\_SwCluC\_02002]** [The High Proxy shall create one partition specific Service Software Component per configured `EcucPartition`, with the name `<Mip>_<EcucPartition shortName>`.] ([SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02003]** [The High Proxy shall provide the Ports belonging to a specific `CpSoftwareClusterServiceResource`, at the partition specific Service Software Component, to which the using `SwComponentPrototype` is mapped to.] ([SRS\\_SwCluC\\_00201](#))

#### 7.4.2.3 Unconnected Service Resources

**[SWS\_SwCluC\_02004]** [The High Proxy shall implement a 'reasonable' behavior for a service resource, if the connection to the resource provider does not exist. In any case, the OUT arguments of functions shall return a 'neutral' value, or the value which can be assumed after a reset. The functional behavior should be like the state directly after a reset, before further activity occurred.] ([SRS\\_SwCluC\\_00213](#))

Note: To decide what is 'reasonable', a functional understanding of the service resource is required. Therefore, [\[SWS\\_SwCluC\\_02004\]](#) can only give some rough expectations.

#### 7.4.2.4 Ecu Configuration Principles

**[SWS\_SwCluC\_02005]** [To resolve the ECU Configuration dependency, the Proxy Module implementation shall define a Vendor Specific Module Definition [18], where the ECU Configuration container and parameters are used to configure the interface towards the user of the substituted BSW Module.] ([SRS\\_BSW\\_00159](#))

Typically, those are the containers and parameters configuring the variation (e.g. existence) of Standardized AUTOSAR Interfaces, or parameters relevant for symbolic name values.

In addition, these containers need to have a relationship to the software cluster resource pool, in order to manage the configuration needs exchange between the different Software Cluster providers. Furthermore, the `CpSoftwareClusterServiceResource` element defines the `globalResourceId`, which is required for the resource entries in the Binary Manifest.

**[SWS\_SwCluC\_02006]** [The Proxy Module implementation shall define an `EcucContainerDef`, which defines a mapping between

- the `EcucContainerDef`(s) identifying the module user channel in the `StMD` of substituted BSW Module

AND

- the `CpSoftwareClusterServiceResource` representing the user channel in the software cluster resource pool. The `EcucForeignReferenceDef` shall be named `SwCluCResourceRef`.

]([SRS\\_BSW\\_00159](#))

Note that this `EcucContainerDef` of [[SWS\\_SwCluC\\_02006](#)] can also be used to add additional Parameters, to control the connection behavior between `High Proxy` and `Low Proxy`. For an example, see: [SwCluCNvMProxyNvBlock](#).

**[SWS\_SwCluC\_02007]** [The Proxy Module implementation shall define, for each different Proxy Module, an `EcucEnumerationParamDef` named `SwCluCProxyGeneration<Mip>`, with the literals

- `PROXY_DISABLED`, to disable the according Proxy Module code and AUTOSAR model generation
- `HIGH_PROXY`, to enable the according High Proxy Module code and AUTOSAR model generation
- `LOW_PROXY`, to enable the according Low Proxy Module code and AUTOSAR model generation

]([SRS\\_BSW\\_00159](#), [SRS\\_SwCluC\\_00204](#))

#### 7.4.2.5 Proxy Modules and Binary Manifest

It is the responsibility of the `Proxy Module` implementation to put its `Resource Entries` into the `Binary Manifest` of the respective `Software Cluster`. This includes service user specific channels (e.g. for a specific NV block), or some general links - typically named base socket - to link some generic infrastructure between `Low` and `High Proxy` (e.g. the set of BSW APIs).

**[SWS\_SwCluC\_02008]** [The `Proxy Module` implementation of the `Software Cluster Connection` shall put one `Resource Entry`, for each associated `CpSoftwareClusterServiceResource`, into the `Binary Manifest`.]([SRS\\_SwCluC\\_00212](#))

### 7.4.3 Specific Proxy Module Requirements

#### 7.4.3.1 OS Proxy

##### 7.4.3.1.1 Enable OS Proxy Generation

**[SWS\_SwCluC\_02200]** [The OS High Proxy code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter `SwCluCProxyGenerationOs` is set to `HIGH_PROXY`.] (*SRS\_SwCluC\_00204*)

**[SWS\_SwCluC\_02201]** [The OS LOW Proxy code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter `SwCluCProxyGenerationOs` is set to `LOW_PROXY`.] (*SRS\_SwCluC\_00204*)

##### 7.4.3.1.2 General OS Proxy functionality

##### 7.4.3.1.3 Overview

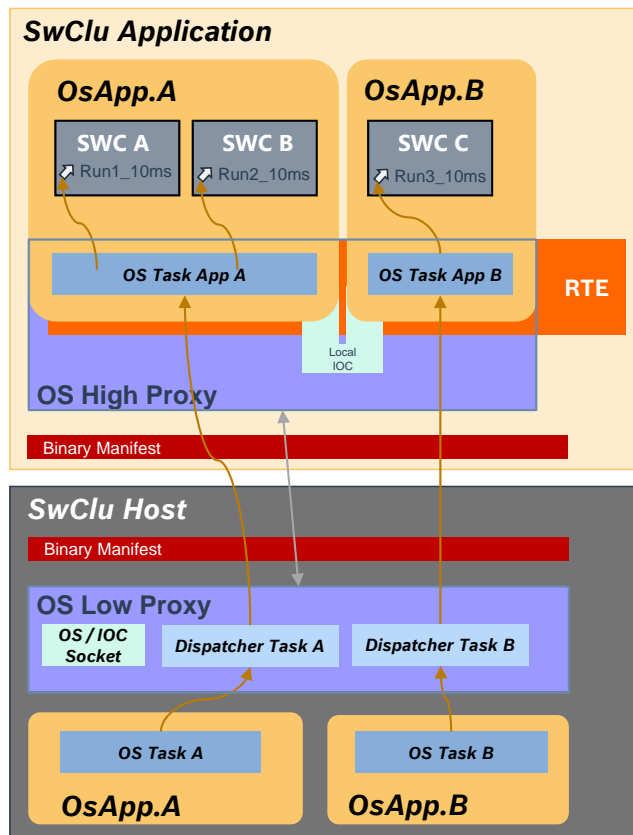


Figure 7.11: Overview of Os Proxy

As explained in chapter 7.1.1 and 7.4.1, the concept of [Software Clusters](#) also has to provide a way to divide some parts of an AUTOSAR [Os](#) into smaller units (see document [5] as reference for [Os](#)). Basically, [runnables](#) of a [Software Cluster](#) shall be executed on a target [machine](#). Since the system is divided into a machine dependent part ([Host Software Cluster](#)), and several [machine](#) independent parts ([Application Software Clusters](#)), an interface layer in between is required. This layer will be realized using the proxy concept.

The [Application Software Cluster](#) contains proxies for those parts of the OS implementation that are needed to complete the runtime environment (RTE). This is called [Os High Proxy](#).

The [Host Software Cluster](#) will implement the AUTOSAR [Os](#), as well as the overall configuration of the [machine](#). The [Os Low Proxy](#) makes this AUTOSAR [Os](#) accessible by the [Os High Proxy](#), via the [Binary Manifest](#). Both are linked together via the information held in the [Binary Manifest](#), which enables an API exchange between [Software Clusters](#).

The OS features (e.g. tasks, resources, spinlocks) supported by the [Os High Proxy](#) are configured with [EcucModuleConfigurationValues](#) for an [Os EcucModuleDef](#), with according [OsTask](#), [OsResource](#), [OsSpinlock](#), etc. containers. In the [Application Software Cluster](#) and in the [Host Software Cluster](#), the configuration of [SwCluCOsProxyOsTask](#), [SwCluCOsProxyOsResource](#), [SwCluCOsProxyOsSpinlock](#), etc. containers map the OS configuration containers to [CpSoftwareClusterServiceResources](#), defining each the [globalResourceId](#) and the [isMandatory](#) attribute, relevant for the corresponding [Resource Entry](#) in the [Binary Manifest](#).

The [Os Low Proxy](#) provides an [Os](#)- and [IOC](#)-socket for each [Application Software Cluster](#). It also provides a dispatcher, which is responsible for calling each [Os-Task](#) of an [Application Software Cluster](#). The [Os](#)- and [IOC](#)-socket provides basic hooks to the [Application Software Cluster](#). These are used, for example, to do basic initialization of local [Os](#) and [IOC](#) channels, to forward general APIs like [spinlock](#), or to do a context switch. The dispatcher controls and calls the [Os-Tasks](#) from the [Application Software Cluster](#). This could, for example, be implemented as [runnables](#), which are indirectly calling the [Os High Proxy Task](#), depending on the entry found in the [Binary Manifest](#).

The [Host Software Cluster](#) provides the implementation of [Os Applications](#), and an abstraction of them in the [Os Low Proxy](#). The [Os-Application](#) context inside an [Application Software Cluster](#) matches to the corresponding [Os Application](#) in the [Host Software Cluster](#). The [Os High Proxy](#) task is executed in the same context as the low proxy task, and has the same level of priority, trust and access.

As mentioned before, a connection between [Os Low Proxy](#) and [Os High Proxy](#) is required. It will be established with the mechanism described in chapter 7.1.5.2 (Connecting Resources). In this chapter, the metaclasses for [Os service resources](#)

are defined: `CpSoftwareClusterServiceResources`. Essential to run a `Application Software Cluster` are resources for the Os- and IOC-socket and the Os-ProxyTasks. These resources are part of the system's resource pool (`CpSoftwareClusterResourcePool`), which includes the description of their relevant attributes and a unique `ResourceID` (`CpSoftwareClusterResource.globalResourceId`). A valid connection can only be established, if all attributes configured for those resources match during the connection process.

To achieve a robust system, and to avoid erroneous behavior, it is recommended to mark Os service resources as mandatory.

Detailed requirements can be found below.

#### 7.4.3.1.4 General requirements

**[SWS\_SwCluC\_02202]** [The Os Proxy shall support the execution of `OsTasks` from an `Application Software Cluster`, in the context of the `Host Software Cluster`.] (*SRS\_SwCluC\_00214*)

**[SWS\_SwCluC\_CONSTR\_02203] Constraint for Interrupts** [Interrupts are not supported for an `Application Software Cluster`, since it does not have access to the hardware or peripherals.] (*SRS\_SwCluC\_00214*)

**[SWS\_SwCluC\_02204]** [The Os Proxy shall support a socket mechanism to hook several `Application Software Clusters` onto the `Host Software Cluster`.] (*SRS\_SwCluC\_00214*)

For example, this can be used to support `Application Software Cluster` local IOC communication paths.

**[SWS\_SwCluC\_02205]** [The Os High Proxy interfaces shall be described with the parameters, and according containers, as defined in `Os EcucModuleDef`.] (*SRS\_SwCluC\_00214*)

**[SWS\_SwCluC\_02206]** [The Os Proxy interfaces shall be configured as a service resource, with the parameters as defined in the `SwCluCOSProxy` container.] (*SRS\_SwCluC\_00214*)

#### 7.4.3.1.5 OS High Proxy

**[SWS\_SwCluC\_02210]** [The `Os High Proxy` shall provide the header file `Os.h` and `Os_Cfg.h`.] (*SRS\_SwCluC\_00214*)

**[SWS\_SwCluC\_02211]** [The `Os High Proxy` shall provide a proxy `OsTask`, to which events from the `Application Software Cluster` can be mapped, during the design of an `Application Software Cluster`.] (*SRS\_SwCluC\_00214*)

[SWS\_SwCluC\_02230] [The `Os High Proxy` shall support the implementation of a task body of the proxy `OsTask`, with the `TASK()` macro.] (SRS\_SwCluC\_00214)

[SWS\_SwCluC\_02212] [The `Os High Proxy` shall provide a set of OS APIs that are required by the `Application Software Cluster`:

- `ActivateTask`
- `ChainTask`
- `TerminateTask`
- `Schedule`

] (SRS\_SwCluC\_00202, SRS\_SwCluC\_00214)

[SWS\_SwCluC\_02213] [If `SwCluCOsProxyOsTask.SwCluCOsProxyTaskActivation.PASS_TASK_ACTIVATION` is set for a specific `OsTask`, the API `ActivateTask` called for this OS task shall trigger a task activation in the `Host Software Cluster`.] (SRS\_SwCluC\_00214)

[SWS\_SwCluC\_02229] [If `SwCluCOsProxyOsTask.SwCluCOsProxyTaskActivation.OMIT_TASK_ACTIVATION` is set for a specific `OsTask`, the API `ActivateTask` called for this OS task returns without effect.] (SRS\_SwCluC\_00214)

[SWS\_SwCluC\_02214] [In an `Application Software Cluster`, the `Os High Proxy` shall provide a 'ChainTask' API which is implemented as macro and must contain a return statement.] (SRS\_SwCluC\_00214)

Please note: The OS task chaining can only be handled in the OS implementation in the `Host Software Cluster`.

[SWS\_SwCluC\_CONSTR\_02282] **Constraint for ChainTask** [In an `Application Software Cluster`, the 'ChainTask' API shall only be called at the end of the function body of an 'OS Task'.] (SRS\_SwCluC\_00214)

[SWS\_SwCluC\_02215] [In an `Application Software Cluster`, the `Os High Proxy` shall provide a 'TerminateTask' API which is implemented as a macro and must contain a return statement.] (SRS\_SwCluC\_00214)

Please note: The real OS task termination can only be handled in the OS implementation in the `Host Software Cluster`.

[SWS\_SwCluC\_CONSTR\_02283] **Constraint for TerminateTask** [In an `Application Software Cluster`, the 'TerminateTask' API shall only be called at the end of the function body of an 'OS Task'.] (SRS\_SwCluC\_00214)

Rationale:

When developing an `Application Software Cluster`, the `Os High Proxy` has no ability to call to the 'real' Os to activate or terminate tasks based on calls to 'ChainTask', 'ActivateTask' or 'TerminateTask'. However, this does not mean that calls to these functions cannot exist within application cluster code. It simply means that a



SwCluC module implementation must contain 'stub' representations of these functions in an `Os High Proxy` which have no effect when called within an application cluster which has not been integrated in the final system which includes a `Host Software Cluster`.

However, given that application clusters will eventually be integrated together with a host cluster, code in an application cluster must follow some rules to ensure that their usage of task management APIs do not clash with the intended use case of cyclic execution in cluster based configurations.

Note: Where constraints [\[SWS\\_SwCluC\\_CONSTR\\_02282\]](#) and [\[SWS\\_SwCluC\\_CONSTR\\_02283\]](#) restrict the usage of `ChainTask` and `TerminateTask` in an `Application Software Cluster`, no such constraint exists to restrict the usage of `'ActivateTask'`.

In a clustered software architecture, the dynamic behavior of the ECU is controlled by the `Host Software Cluster`. Hence, the `Host Software Cluster` is in charge to control the activation of `OS Tasks`.

Nevertheless, use cases may exist to sporadically activate `OS Tasks` on demand of an `Application Software Cluster`. For this reason, the `ActivateTask` API is offered by the `Os High Proxy` which is fully functional in case of [\[SWS\\_SwCluC\\_02213\]](#). In opposite to `'TerminateTask'` and `'ChainTask'` the `'ActivateTask'` API usage is not bound to the task body. The usage of `'ActivateTask'` APIs in `Application Software Cluster` needs to be carefully aligned with the overall dynamic scheduling concept of the ECU!

**[SWS\_SwCluC\_02216]** [The `Os High Proxy` shall provide default handles for resources, in case a connection to the host system could not be established successfully between `Application Software Cluster` and the `Host Software Cluster`. The default implementation shall be a neutral behavior, with the return value `E_OK`, to support "standard status" from OS.] ([SRS\\_SwCluC\\_00214](#))

See the section [7.4.3.1.6 'Os Low Proxy'](#), for an explanation of how a missing connection is handled in the `Host Software Cluster`.

**[SWS\_SwCluC\_02217]** [The `Os High Proxy` shall have a service resource `SwCluCOsProxyOsTask`, for each `OsTask` required in the `Application Software Cluster`. For this resource, an entry in the `Binary Manifest` shall be created, to be able to link the task to its `OsLowProxy` implementation in the `Host Software Cluster`. Since the content of the `OsTask` is created by the RTE, this API shall be used and registered as service resource. It is recommended that this resource is marked with the mandatory flag (`SwCluCBManifIsMandatory`).] ([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02218]** [The `Os High Proxy` shall contain a required service resource `SwCluCOsProxyOsTaskDispatcher`. The `Proxy-OsTask` shall be called in that context. For this resource, an entry in the `Binary Manifest` shall be created, to be able to link it to the `OsLowProxy` dispatcher in the `Host Software Cluster`. It is recommended that this resource is marked with the mandatory flag (`SwCluCBManifIsMandatory`).] ([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02219]** [The `Os High Proxy` shall contain a required service resource `SwCluCOsProxyFunctionDispatcher`. This function dispatcher is used to call functions in context of the `Host Software Cluster`. For this resource, an entry in the `Binary Manifest` shall be created, to be able to link it to the `OsLowProxy` dispatcher in the `Host Software Cluster`.]([SRS\\_SwCluC\\_00214](#))

For example, to call an `Application Software Cluster` local `Bsw-Module Init` function, in dedicated context of the `Host Software Cluster`.

**[SWS\_SwCluC\_02220]** [The `Os High Proxy` shall contain a required service resource `SwCluCOsProxyOsBaseSocket`. This collects all hooks needed to be linked to the `Host Software Cluster`. It also contains `Application Software Cluster` local `Os` specific functions for `StartOs`, `initialize` and `shutdown`. It should also cover the local `IOC`, if present. It is recommended that this resource is marked with the mandatory flag ( `SwCluCBManifIsMandatory`).]([SRS\\_SwCluC\\_00214](#))

Please note: This is highly vendor specific.

**[SWS\_SwCluC\_02221]** [Since a `Application Software Cluster` can contain several `OS Applications`, the `Os High Proxy` shall be able to provide a local `IOC` implementation for the cluster internal communication paths between `OS Applications`. The link to the `Host Software Cluster` shall be established as part of the `SwCluCOsProxyOsBaseSocket` service resource.]([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02222]** [The `Os High Proxy` shall require a service resource `SwCluCOsProxyOsApplication`, which is used in the `Application Software Cluster`, and needs to be matched to the `Host Software Cluster`.]([SRS\\_SwCluC\\_00214](#))

This service resource represents the actual configuration of the `Application Software Cluster`'s local `OS Application`, with its parameters and linked local `OS` objects.

**[SWS\_SwCluC\_02223]** [The `Os High Proxy` shall require a service resource `SwCluCOsProxyOsResource`, which is used in the `Application Software Cluster`, and needs to be matched to the `Host Software Cluster`.]([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02224]** [The `Os High Proxy` shall require a service resource `SwCluCOsProxyOsSpinlock`, which is used in the `Application Software Cluster`, and needs to be matched to the `Host Software Cluster`.]([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02225]** [The `Os High Proxy` shall provide the following APIs for the `Application Software Cluster`:

- `GetResource`
- `ReleaseResource`
- `SuspendOSInterrupts`
- `ResumeOSInterrupts`

- [GetSpinlock](#)
- [ReleaseSpinlock](#)
- [GetApplicationID](#)
- [GetCoreID](#)
- [CallTrustedFunction](#)

Each of these APIs corresponds to a service resource in the [Os Low Proxy](#). There will be an entry in the [Binary Manifest](#), to require these service resources, which are described here: [SwCluCOsProxy](#).] ([SRS\\_SwCluC\\_00202](#), [SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02279]** [If the configuration parameter [SwCluCOsProxyIdTranslationEnabled](#) is enabled, the [Os High Proxy](#) shall support the translation of IDs (CoreId, OsApplicationId) configured in the [Host Software Cluster](#) into [Application Software Cluster](#) specific local IDs.] ([SRS\\_SwCluC\\_00214](#))

Rationale: This is to avoid larger look-up tables required to fetch the correct ID configured in the [Host Software Cluster](#) for the use case where only a subset of the [Host Software Cluster](#) OS configuration is provided to the [Application Software Clusters](#).

**[SWS\_SwCluC\_02280]** [If the configuration parameter [SwCluCOsProxyIdTranslationEnabled](#) is enabled, the ID reported by the following OS APIs for the [Application Software Clusters](#):

- [GetApplicationID](#)
- [GetCoreID](#)

shall correspond to the [Application Software Cluster](#) specific local IDs. (See [\[SWS\\_SwCluC\\_02279\]](#))] ([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_CONSTR\_02281]** **Consistent ID configuration between [Host Software Clusters](#) and [Application Software Clusters](#)** [In case the parameter [SwCluCOsProxyIdTranslationEnabled](#) is set to `false` the configuration of core ID and application ID values in the according [Application Software Cluster](#) shall be identically to the ID values configured in the [Host Software Cluster](#).] ([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02226]** [The [Os High Proxy](#) shall NOT support the following APIs for the [Application Software Cluster](#).

- [StartScheduleTable](#)
- [StopScheduleTable](#)
- [DisableAllInterrupts](#)
- [EnableAllInterrupts](#)
- [SuspendAllInterrupts](#)

- [ResumeAllInterrupts](#)

]([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02227]** [The configuration of the [Os High Proxy](#) for a complete [Application Software Cluster](#) shall be specified with a set of ECUC-parameters defined here: [SwCluCOsProxy](#).]([SRS\\_SwCluC\\_00214](#))

#### 7.4.3.1.6 OS Low Proxy

**[SWS\_SwCluC\_02250]** [The [Os Low Proxy](#) shall only be provided by the [Host Software Cluster](#).]([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02251]** [The configuration of the [Os Low Proxy](#) for a complete [Host Software Cluster](#) shall be specified with a set of ECUC-parameters defined here: [SwCluCOsProxy](#). The configuration of the [Os Low Proxy](#) shall be derived from the implemented configuration for the Os in the [Host Software Cluster](#).]([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02252]** [The [Os Low Proxy](#) shall provide a socket for the [Os High Proxys](#) of the [Application Software Clusters](#). For each [Application Software Cluster](#), a corresponding service resource [SwCluCOsProxyOsBaseSocket](#) and configuration shall be provided.]([SRS\\_SwCluC\\_00214](#))

**[SWS\_SwCluC\_02253]** [The [Os Low Proxy](#) shall provide for each [SwCluCOsProxyOsBaseSocket](#) a [SwCluC\\_OsProxy\\_Init](#) API, to initialize the [Os High Proxy](#) of an [Application Software Cluster](#). This shall be one element of the service resource [SwCluCOsProxyOsBaseSocket](#).]([SRS\\_SwCluC\\_00214](#))

For example, an Init-Callback could be provided for each [Application Software Cluster](#), and called from the [Os Low Proxy](#) during initialization phase of the [Host Software Cluster](#).

**[SWS\_SwCluC\_02254]** [The [Os Low Proxy](#) shall provide an API to start the [Os High Proxy](#) of an [Application Software Cluster](#). This shall be one element of the service resource [SwCluCOsProxyOsBaseSocket](#).]([SRS\\_SwCluC\\_00214](#))

For example, a Startup hook could be provided for each [Application Software Cluster](#).

**[SWS\_SwCluC\_02255]** [The [Os Low Proxy](#) shall provide an API to shutdown the [Os High Proxy](#) of an [Application Software Cluster](#). This shall be one element of the service resource [SwCluCOsProxyOsBaseSocket](#).]([SRS\\_SwCluC\\_00214](#))

For example, a shutdown hook could be provided for each [Application Software Cluster](#).

**[SWS\_SwCluC\_02256]** [The [Os Low Proxy](#) shall be able to provide an API to connect IOC from [Os High Proxy](#) of an [Application Software Cluster](#). This

shall be one element of the service resource `SwCluCOsProxyOsBaseSocket.`] (*SRS\_SwCluC\_00214*)

For example, an IOC-Init callback could be provided for each `Application Software Cluster`, and called from the `Os Low Proxy`, if a connection is established.

## Dispatchers

**[SWS\_SwCluC\_02270]** [The `Os Low Proxy` shall have a service resource `SwCluCOsProxyOsTaskDispatcher`, for each task dispatcher provided in the `Host Software Cluster`. For this resource, an entry in the `Binary Manifest` shall be created, to be able to link the task dispatcher to its `Os High Proxy` implementation in the `Application Software Cluster`.] (*SRS\_SwCluC\_00214*)

Please note section 'Overview of Os Proxy' 7.11.

Example: The `Host Software Cluster` has a full configuration of the `Os`, and is prepared to host several `Application Software Cluster`, with their local RTE, to be able to execute the runnables of the `Application Software Clusters Software` components. This preconfiguration will preserve positions in an `OsTask`, like for events of runnables. Instead of executing a runnable, a so called dispatcher will be executed. This dispatcher acts as a link to `Application Software Clusters` task container, which will then execute all mapped runnables for this specific part of the task.

A connection between `Software Clusters` is established, when `ResourceIDs` in the `Binary Manifests` matches. This is necessary for service resources of the task dispatcher and the task itself. It is advised to check the connection status of these, in the implementation of the task dispatcher.

**[SWS\_SwCluC\_02259]** [The `Os Low Proxy` shall provide a service resource `SwCluCOsProxyOsTask`, for each `Application Software Clusters` task configuration that the system shall be prepared for. For this resource, an entry in the `Binary Manifest` shall be created, to be able to link it to the `Os High Proxy` task in the `Host Software Cluster`.] (*SRS\_SwCluC\_00214*)

Please note that the `SwCluCOsProxyOsTask` container has a reference to a `OsTask` container. This reference shall be used in the `Host Software Cluster` and the `Application Software Cluster` to obtain the `OsTask` configuration relevant for the guard value calculation. Hence, it is ensured that `Host Software Cluster` and `Application Software Cluster`'s `OsTask` configuration is compatible. See as well [\[SWS\\_SwCluC\\_90004\]](#).

**[SWS\_SwCluC\_02271]** [The `Os Low Proxy` shall have a service resource `SwCluCOsProxyFunctionDispatcher`, for each function dispatcher provided in the `Host Software Cluster`. For this resource, an entry in the `Binary Manifest` shall be created, to be able to link the function dispatcher to its `Os High Proxy` implementation in the `Application Software Cluster`.] (*SRS\_SwCluC\_00214*)

Example: The `Host Software Cluster` has a full configuration of the BSW. To initialize all modules properly, a call to `Application Software Cluster` might be

necessary. For example, to initialize a local RAM area there. Since this function or runnable might not be known by the RTE as runnable of a `Software Component`, this function can be called via the `Os proxy function dispatcher`. This dispatcher can be configured in the `Host Software Cluster`, to be called from ECUM or an `Ini-Task`. Each dispatcher provides its own service resource in the `Binary Manifest`. If a successful link to another `Software Cluster` is established, the call can be executed from the `Host Software Cluster` into the `Application Software Cluster`.

### Scheduling of dispatchers in Host Software Cluster

**[SWS\_SwCluC\_02272]** [The `Os Low Proxy` shall create one partition specific `Service Software Component` per configured `EcucPartition` for the dispatcher, with the name `SwCluC_Dispatcher_<EcucPartition shortName>`.]  
(SRS\_SwCluC\_00214)

**[SWS\_SwCluC\_02273]** [The `Os Low Proxy` shall create one `RunnableEntity` per configured `SwCluCOsProxyOsTaskDispatcher` container in the partition specific `Service Software Component` according [SWS\_SwCluC\_02272].

The `EcucPartition` is determined by the parameter `SwCluCOsProxyEcucPartitionRef`, if configured or alternatively by the `EcucPartition` to which the related `OsTask` belongs. The attributes of the `RunnableEntity` shall be set as following:

- `minimumStartInterval` is set to the parameter value `SwCluCOsProxyMinimumStartInterval`
- `symbol` is set to the name of the task dispatcher's C-function used for implementation of [SWS\_SwCluC\_02270]
- `canBeInvokedConcurrently` is set to `false`

](SRS\_SwCluC\_00214)

**[SWS\_SwCluC\_02278]** [The `Os Low Proxy` shall create one `InitEvent` per configured `SwCluCOsProxyDispatcherInitEvent` container in the partition specific `Service Software Component` according [SWS\_SwCluC\_02272]. The attributes of the `InitEvent` shall be set as following:

- `shortName` is set according the container's `shortName`
- `startOnEvent` is set to the `RunnableEntity` according [SWS\_SwCluC\_02273] related to the owning `SwCluCOsProxyOsTaskDispatcher` container.

](SRS\_SwCluC\_00214)

**[SWS\_SwCluC\_02274]** [The `Os Low Proxy` shall create one `BackgroundEvent` per configured `SwCluCOsProxyDispatcherBackgroundEvent` container in the partition specific `Service Software Component` according [SWS\_SwCluC\_02272]. The attributes of the `BackgroundEvent` shall be set as following:



- `shortName` is set according the container's `shortName`
- `startOnEvent` is set to the `RunnableEntity` according [SWS\_SwCluC\_02273] related to the owning `SwCluCOsProxyOsTaskDispatcher` container.
- `disabledMode(s)` are created according the `SwCluCOsProxyDisabledModeInstanceRef(s)` where for each different `PPortPrototype` an `RPortPrototype` is created at the owing Service Software Component according [SWS\_SwCluC\_02272] and used as `contextPort`.

](SRS\_SwCluC\_00214)

[SWS\_SwCluC\_02275] [The `Os Low Proxy` shall create one `TimingEvent` per configured `SwCluCOsProxyDispatcherTimingEvent` container in the partition specific Service Software Component according [SWS\_SwCluC\_02272]. The attributes of the `TimingEvent` shall be set as following:

- `shortName` is set according the container's `shortName`
- `startOnEvent` is set to the `RunnableEntity` according [SWS\_SwCluC\_02273] related to the owning `SwCluCOsProxyOsTaskDispatcher` container
- `period` value is set according the `SwCluCOsProxyTimingEventPeriod` parameter
- `disabledMode(s)` are created according the `SwCluCOsProxyDisabledModeInstanceRef(s)` where for each different `PPortPrototype` an `RPortPrototype` is created at the owing Service Software Component according [SWS\_SwCluC\_02272] and used as `contextPort`.

](SRS\_SwCluC\_00214)

[SWS\_SwCluC\_02276] [The `Os Low Proxy` shall create one `SwcModeSwitchEvent` per configured `SwCluCOsProxyDispatcherModeSwitchEvent` container in the partition specific Service Software Component according [SWS\_SwCluC\_02272]. The attributes of the `SwcModeSwitchEvent` shall be set as following:

- `shortName` is set according the container's `shortName`
- `startOnEvent` is set to the `RunnableEntity` according [SWS\_SwCluC\_02273] related to the owning `SwCluCOsProxyOsTaskDispatcher` container
- `activation` value is set according the `SwCluCOsProxyDispatcherActivation` parameter
- `modes` are created according the `SwCluCOsProxyModeInstanceRef(s)` where for each different `PPortPrototype` an `RPortPrototype` is created at the



owing Service Software Component according [SWS\_SwCluC\_02272] and used as `contextPort`.

- `disabledMode(s)` are created according the `SwCluCOsProxyDisabledModeInstanceRef(s)` where for each different `PPortPrototype` an `RPortPrototype` is created at the owing Service Software Component according [SWS\_SwCluC\_02272] and used as `contextPort`.

](SRS\_SwCluC\_00214)

**[SWS\_SwCluC\_02277]** [The `Os Low Proxy` shall create one `ExternalTriggerOccurredEvent` per configured `SwCluCOsProxyDispatcherExternalTriggerOccurredEvent` container in the partition specific Service Software Component according [SWS\_SwCluC\_02272]. The attributes of the `ExternalTriggerOccurredEvent` shall be set as following:

- `shortName` is set according the container's `shortName`
- `startOnEvent` is set to the `RunnableEntity` according [SWS\_SwCluC\_02273] related to the owing `SwCluCOsProxyOsTaskDispatcher` container
- `trigger` is set according the `SwCluCOsProxyTriggerInstanceRef` where for each different `PPortPrototype` an `RPortPrototype` is created at the owing Service Software Component according [SWS\_SwCluC\_02272] and used as `contextRPort`.
- `disabledMode(s)` are created according the `SwCluCOsProxyDisabledModeInstanceRef(s)` where for each different `PPortPrototype` an `RPortPrototype` is created at the owing Service Software Component according [SWS\_SwCluC\_02272] and used as `contextPort`.

](SRS\_SwCluC\_00214)

## OsApplication

**[SWS\_SwCluC\_02262]** [The `Os Low Proxy` shall provide a service resource `SwCluCOsProxyOsApplication`, for each `OsApplication` that is configured in the `Host Software Cluster`, and prepared for use in `Application Software Clusters`.](SRS\_SwCluC\_00214)

## OsResource

**[SWS\_SwCluC\_02263]** [The `Os Low Proxy` shall provide a service resource `SwCluCOsProxyOsResource`, for each `OsResource` used in `Application Software Clusters`.](SRS\_SwCluC\_00214)

## OsSpinlock

**[SWS\_SwCluC\_02264]** [The `Os Low Proxy` shall provide a service resource `SwCluCOsProxyOsSpinlock`, for each `OsSpinlock` used in `Application Software Clusters`.](SRS\_SwCluC\_00214)

## OS APIs

[SWS\_SwCluC\_02265] [The *Os Low Proxy* shall provide a basic service implementation for the following APIs, to be used and connected with an *Application Software Cluster*:

- *GetResource*
- *ReleaseResource*
- *SuspendOSInterrupts*
- *ResumeOSInterrupts*
- *ReleaseResource*
- *GetSpinlock*
- *ReleaseSpinlock*
- *GetApplicationID*
- *Schedule*
- *CallTrustedFunction*
- *GetCoreID*

These APIs shall be provided with a corresponding service resource from *SwCluC-  
COsProxy*.) (*SRS\_SwCluC\_00214*)

### Unconnected Service Resources

[SWS\_SwCluC\_02266] [The *Os Low Proxy* shall provide default handles for resources, in case a connection could not be established successfully between *Application Software Cluster* and the *Host Software Cluster*.) (*SRS\_SwCluC\_00213*)

For example, if an *Application Software Cluster* is missing, the task-dispatcher in the host calls an empty function.

Please note: One property of a clustered system is that parts shall be independently buildable. Another property is that some parts can be absent. Therefore, "default stubs" are needed for non-local APIs. But in case of missing interfaces to *Os, Application Software Clusters* cannot run successfully. The usage of a suitable mechanism to detect this case is advised. To achieve a robust system, the *Host Software Cluster* is still running in such a state.

#### 7.4.3.2 NvM Proxy

The specified NvM Proxy has the following underlying design principle.

In the [Application Software Cluster](#), NV Blocks supported by the NvM High Proxy are configured with [EcucModuleConfigurationValues](#) for a NvM [EcucModuleDef](#), with according [NvMBlockDescriptors](#) containers. In the [Application Software Cluster](#) and in the [Host Software Cluster](#), the configuration of [SwCluCnvMProxyNvBlock](#) containers map the [NvMBlockDescriptors](#) to [CpSoftwareClusterServiceResources](#), defining each the [globalResourceId](#) and the [isMandatory](#) attribute, relevant for the corresponding [Resource Entry](#) in the [Binary Manifest](#).

The connection between the [NvM High Proxy](#) and the [NvM Low Proxy](#) utilizes the explicit synchronization, as specified in document [6]. The explicit synchronization has the advantage that the addresses of RAM Blocks and ROM blocks of [Application Software Cluster](#) do not have to be known by the NVRAM Manager in the [Host Software Cluster](#). In addition, the function interface can be used to introduce additional functionality, like the NV block length adjustment ([[SWS\\_SwCluC\\_02105](#)]). On the other hand, this design principle cannot support temporary RAM blocks, since the NvM configuration in the [Host Software Cluster](#) may hold a different size than the NvM configuration in the [Application Software Cluster](#).

**[SWS\_SwCluC\_CONSTR\_02134]** [The NvM High Proxy shall reject configurations of temporary RAM blocks.]([SRS\\_SwCluC\\_00206](#), [SRS\\_SwCluC\\_00213](#))

Note: this means only NVRAM blocks configured with a permanent RAM block or explicit synchronization callbacks are supported in the NvM High Proxy.

In addition, the [Host Software Cluster](#) should not have a functional dependency to the content stored in NV Blocks of the [Application Software Cluster](#). Furthermore, the NvM High Proxy shall be able to initialize the RAM Block, even if the related NV Block is not connected to a [Host Software Cluster](#). This requires the existence of ROM block default values.

**[SWS\_SwCluC\_CONSTR\_02135]** [The NvM High Proxy shall reject configurations, where no ROM block is configured via the parameter [NvMRomBlockDataAddress](#), or the parameter [NvMBlockDescriptor.NvMInitBlockCallback](#).]([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_CONSTR\_02141]** [The NvM High Proxy shall reject configurations, where the NV Block length given by [NvMNvBlockLength](#) is larger than the maximum size foreseen in the [Host Software Cluster](#), given by [SwCluCnvMProxyNvBlockMaxLength](#).]([SRS\\_SwCluC\\_00206](#))

Please note that [SwCluCnvMProxyNvBlockMaxLength](#) is also part of the guard value, and therefore protected from unilateral changes.

#### 7.4.3.2.1 Enable NvM Proxy Generation

**[SWS\_SwCluC\_02101]** [The NvM High Proxy code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter `SwCluCProxyGenerationNvM` is set to `HIGH_PROXY`.] ([SRS\\_SwCluC\\_00206](#), [SRS\\_SwCluC\\_00204](#))

**[SWS\_SwCluC\_02144]** [The NvM Low Proxy code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter `SwCluCProxyGenerationNvM` is set to `LOW_PROXY`.] ([SRS\\_SwCluC\\_00206](#), [SRS\\_SwCluC\\_00204](#))

#### 7.4.3.2.2 General NvM Proxy functionality

**[SWS\_SwCluC\_02104]** [The NvM Proxy shall support that the BlockIds of the NvM of `Host Software Cluster` can change, without reconfiguration or rebuild of the `Application Software Cluster` using these NV blocks.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02105]** [The NvM Proxy shall support that the NV block length used in the `Application Software Cluster` can be  $\leq$  the NV block length configured in the NvM of the `Host Software Cluster`. In case NV block length in `Application Software Cluster` is smaller, the NV block is filled with default values. The default fill value of a single byte is defined by the configuration parameter `SwCluCNvMProxyNvBlockFillValue`.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02106]** [The NvM Proxy shall support that the NV block length used in the `Application Software Cluster` can be changed (in the range  $0 \leq$  NV block length configured in NvM), without reconfiguration or rebuild of the `Host Software Cluster`.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02112]** [In case it is configured in the NvM High Proxy, the NvM Proxy shall invoke the `NvM_SingleBlockCallbackFunction` or `JobFinished` operation, when the according instance of the NvM Low Proxy is called.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02122]** [In case it is configured in the NvM High Proxy, the NvM Proxy shall invoke the `NvM_InitBlockCallbackFunction` or `InitBlock` operation, when the according instance of the NvM Low Proxy is called.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02123]** [In case it is configured in the NvM High Proxy, the NvM Proxy shall invoke the `NvM_ReadRamBlockFromNvm` function or `ReadRamBlockFromNvm` operation, when the according instance of the NvM Low Proxy is called.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02124]** [In case it is configured in the NvM High Proxy, the NvM Proxy shall invoke the `NvM_WriteRamBlockToNvm` function or `WriteRamBlockToNvm` operation, when the according instance of the NvM Low Proxy is called.] ([SRS\\_SwCluC\\_00206](#))

### 7.4.3.2.3 Configuration ID check

In case of a non-clustered AUTOSAR ECU the [configuration ID check](#) is centrally implemented in NVRAM Manager when it is enabled via [NvMDynamicConfiguration](#) is set to `TRUE`.

If a configuration ID mismatch is detected, for NVRAM blocks which are configured with [NvMResistantToChangedSw](#) == `FALSE`, default data are loaded independent of the validity of an assigned RAM or NV block. This feature ensures an initialization of NV blocks in case of a changed NVRAM memory layout, i.e., if a block is added or removed, or if its size or type is changed.

In case of a AUTOSAR ECU using independently reprogrammable [Software Clusters](#), a common configuration ID has the drawback of unintended reprogramming dependencies. In case of a NVRAM memory layout change caused by one [Software Cluster](#), the non-resistant-to-changed-SW NV blocks of all other [Software Clusters](#) needs to be set to default as well. In addition, such a configuration ID change can only be initiated via an update of the [Host Software Cluster](#).

To enable a check on changed NVRAM memory layout per [Application Software Cluster](#) the [NvM High Proxy](#) supports individual configuration IDs per [Application Software Cluster](#).

Since the [NvM High Proxy](#) cannot directly interfere with the [NvM\\_ReadAll](#) execution it has to implement its configuration ID checking in the execution of the [NvM\\_ReadRamBlockFromNvm](#) triggered by the execution of the multi block request triggered by [NvM\\_ReadAll](#). This [configuration ID check](#) is only active after the initialization of the [NvM Proxy](#) till the [NvM\\_ReadAll](#) multi block request is successfully finished.

The [NvM Proxy](#) gets informed about the successful finish of [NvM\\_ReadAll](#) by the call of [SwCluC\\_NvMProxy\\_MultiBlockReadAllJobFinished](#) from BswM via an appropriately configured action list.

The time span between [NvM Proxy](#) initialization and the call of [SwCluC\\_NvMProxy\\_MultiBlockReadAllJobFinished](#) is called [NvM startup phase](#).

To ensure a working behavior of the [NvM Proxy](#) in the [SwCluC](#), the NVRAM Manager of the [Host Software Cluster](#) has to treat all [NvBlocks](#) of an [Application Software Cluster](#) as [NvMResistantToChangedSw](#) == `TRUE`. This behavior can be ensured by the appropriate configuration of the NVRAM Manager.

**[SWS\_SwCluC\_CONSTR\_02145] [Application Software Cluster](#)'s [NvBlocks](#) are treated as 'resistant to changed SW' by [NvM](#) in [Host Software Cluster](#)** [For any NVRAM Block belonging to an [Application Software Cluster](#) ([NvM Low Proxy](#) of the [SwCluC](#) occurs as block user) the parameter [NvMResistantToChangedSw](#) shall be set to `TRUE` in the [Host Software Cluster](#).] ([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00167](#))

Note: This includes the NVRAM Blocks used to store the configuration ID of a specific [Application Software Cluster](#)

In addition, the NvBlocks in the [Host Software Cluster](#) have to be configured such, that the [Configuration ID block](#) of an [Application Software Cluster](#) is restored before the regular NvBlocks of that [Application Software Cluster](#). Since the NvM ensures the processing order of NvM Blocks during a [NvM\\_ReadAll](#) job by the Block Id ([SWS\_NvM\_00244]). This enables that the [NvM High Proxy](#) can process its Config Block ID handling before that recovery of the regular NvBlocks.

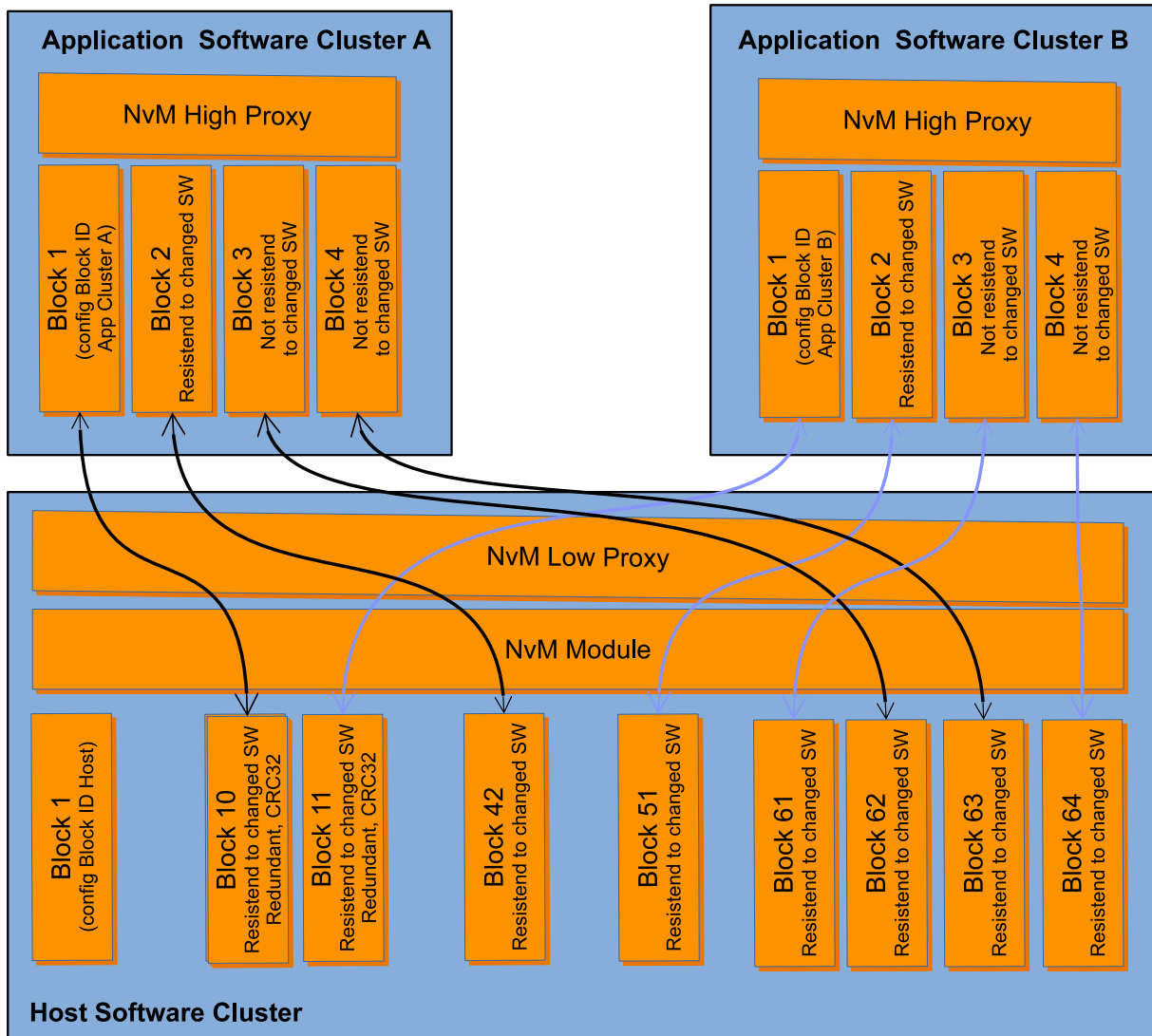
**[SWS\_SwCluC\_CONSTR\_02146] Block IDs of [Application Software Cluster's Configuration ID blocks in Host Software Cluster](#)** [In the NvM module of the [Host Software Cluster](#) the [Configuration ID block](#) of an [Application Software Cluster](#) shall be configured with a lower block ID than all the other NvBlocks of the identical [Application Software Cluster](#).] ([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00167](#))

Please note, that the configured Block IDs of an [Application Software Cluster's](#) NvBlock can differ in the configuration in the [NvM High Proxy](#) and the NvM of the [Host Software Cluster](#).

The Block ID numbers are translated during the API calls from [Application Software Cluster](#) to the [Host Software Cluster](#).

Hence, a valid configuration of Block IDs in the [Host Software Cluster](#) can look like following example as shown in figure [7.12](#).





**Figure 7.12: Example configuration of NvBlocks used by Application Software Clusters**

**[SWS\_SwCluC\_02147]** [The [NvM High Proxy](#) of a specific [Application Software Cluster](#) shall enable the [configuration ID check](#), if the parameter [NvM-DynamicConfiguration](#) is set to TRUE in this [Application Software Cluster](#).]([SRS\\_SwCluC\\_00206](#))

Note: The parameter [NvMDynamicConfiguration](#) is set in the [NvM module](#) configuration of the respective [Application Software Cluster](#).

Like in the configuration of the [NvM module](#) in the [Host Software Cluster](#), the block ID 1 is reserved for the [Configuration ID block](#) in each [Application Software Cluster](#). This [Configuration ID block](#) to contain the stored [NVRAM configuration ID](#).

**[SWS\_SwCluC\_CONSTR\_02148] Configuration ID block uses always block ID 1** [In the configuration of the [NvM High Proxy](#), the [NVRAM block](#) with the block ID 1 shall be reserved for the [Configuration ID block](#) to contain the stored [NVRAM configuration ID](#).]([SRS\\_SwCluC\\_00206](#))



**[SWS\_SwCluC\_02149]** [The `NvM_High_Proxy` of a specific `Application Software Cluster` shall implement the `Configuration ID block` as redundant type with CRC32.](*SRS\_SwCluC\_00206*)

**[SWS\_SwCluC\_CONSTR\_02160]** `NvBlock` configuration of `Application Software Cluster's Configuration ID blocks in Host Software Cluster` [In the `NvM` module of the `Host Software Cluster` the `Configuration ID block` of an `Application Software Cluster` shall be configured with `NvMBlockManagementType == NVM_BLOCK_REDUNDANT` and `NvMBlockCrcType == NVM_CRC32`.](*SRS\_SwCluC\_00206*)

**[SWS\_SwCluC\_02150]** [The job of the function `NvM_WriteBlock` for the `Configuration ID block` shall write the compiled NVRAM configuration ID to the stored NVRAM configuration ID (in the `Configuration ID blocks`) of this `Application Software Cluster`.](*SRS\_SwCluC\_00206*)

**[SWS\_SwCluC\_02151]** [The job of the function `NvM_WritePRAMBlock` for the `Configuration ID block` shall write the compiled NVRAM configuration ID to the stored NVRAM configuration ID (in the `Configuration ID blocks`) of this `Application Software Cluster`.](*SRS\_SwCluC\_00206*)

**[SWS\_SwCluC\_02152]** [The `NvM_ReadRamBlockFromNvm` call for the `Configuration ID block` shall validate the configuration ID by comparing the stored NVRAM configuration ID of this `Application Software Cluster` vs. the compiled NVRAM configuration ID of this `Application Software Cluster`.](*SRS\_SwCluC\_00206*)

In case the `NvM` module cannot read the `Configuration ID block` of an `Application Software Cluster` because the corresponding NV block is empty or invalidated the `NvM` Module will call the respective `NvM_InitBlockCallbackFunction` for the `Configuration ID block`.

**[SWS\_SwCluC\_02153]** [The `NvM_ReadRamBlockFromNvm` call for the `Configuration ID block` shall treat the result of the configuration ID check as a configuration ID mismatch.](*SRS\_SwCluC\_00206*)

Note: The later update and validation of the `Configuration ID block` is handled in **[SWS\_SwCluC\_02157]**.

**[SWS\_SwCluC\_02154]** [The job of the function `NvM_GetErrorStatus` reports for the `Configuration ID block` `NVM_REQ_NOT_OK` in case of configuration ID mismatch.](*SRS\_SwCluC\_00206*)

Note: this ensures a compatible behavior as **[SWS\_NvM\_00306]**

**[SWS\_SwCluC\_02155]** [The job of the function `NvM_GetErrorStatus` reports for the `Configuration ID block` `NVM_REQ_NV_INVALIDATED` till the `Configuration ID block` of this `Application Software Cluster` was restored valid from `NvRam`](*SRS\_SwCluC\_00206*)

Note: this ensures a compatible behavior as **[SWS\_NvM\_00672]**

**[SWS\_SwCluC\_02156]** [The function `NvM_ReadRamBlockFromNvm` shall get the ROM Block default values and copy them to application if

- `configuration ID check` is enabled (`NvMDynamicConfiguration` is set to `TRUE`)

AND

- a configuration ID mismatch was detected

AND

- for the related `NvBlock` in the `Application Software Cluster` the `NvMResistantToChangedSw` is set to `FALSE`

AND

- `NvM Proxy` is in `NvM startup phase`

In all other cases the function `NvM_ReadRamBlockFromNvm` shall process the normal data copy functionality from `NvM` to application] (*SRS\_SwCluC\_00206*)

**[SWS\_SwCluC\_02157]** [The function `SwCluC_NvMProxy_MultiBlock-ReadAllJobFinished` shall update the `Configuration ID block` according to the new (compiled) configuration ID and validate the according `NVRAM Block` if a configuration ID mismatch occurred and if the `NvMDynamicConfiguration == TRUE`.] (*SRS\_SwCluC\_00206*)

Note: The validation `NVRAM block` with config ID triggers a CRC recalculation and enables that it gets written during next `NvM_WriteAll`.

#### 7.4.3.2.4 NvM High Proxy

**[SWS\_SwCluC\_02102]** [The `NvM High Proxy` shall provide the header file `NvM.h`.] (*SRS\_SwCluC\_00206*)

**[SWS\_SwCluC\_02103]** [The `NvM High Proxy` shall provide the symbolic name values for `NvBlocks`, for `NvM users` in the `Application Software Cluster`.] (*SRS\_SwCluC\_00206*)

**[SWS\_SwCluC\_02125]** [The `NvM High Proxy` shall provide the functions for single block requests

- `NvM_SetDataIndex`
- `NvM_GetDataIndex`
- `NvM_SetBlockProtection`
- `NvM_GetErrorStatus`
- `NvM_SetRamBlockStatus`

- `NvM_SetBlockLockStatus`
- `NvM_CancelJobs`
- `NvM_ReadBlock`
- `NvM_WriteBlock`
- `NvM_RestoreBlockDefaults`
- `NvM_EraseNvBlock`
- `NvM_InvalidateNvBlock`
- `NvM_ReadPRAMBlock`
- `NvM_WritePRAMBlock`
- `NvM_RestorePRAMBlockDefaults`

for NvM users in the `Application Software Cluster`.] ([SRS\\_SwCluC\\_00206](#), [SRS\\_SwCluC\\_00202](#))

**[SWS\_SwCluC\_02126]** [The NvM High Proxy shall provide the functions for single block requests, according to [\[SWS\\_SwCluC\\_02103\]](#), once per configured `SwCluCnvMBaseSocket`. In doing so, the APIs are provided with the original `Mip NvM` at the `EcucPartition`, where the `SwCluCNativeBswApi` is set to `true`. For all the other `SwCluCnvMBaseSocket` instances, the `Mip NvM` is replaced by `NvM_<shortName of EcucPartition>`.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02136]** [The functions

- `NvM_ReadBlock`
- `NvM_WriteBlock`
- `NvM_RestoreBlockDefaults`

of the NvM High Proxy shall only accept single block requests, where the pointer to the RAM data block is set to `NULL_PTR`. Otherwise, `E_NOT_OK` is returned, and the request is discarded.] ([SRS\\_SwCluC\\_00206](#))

For example, the function `NvM_GetErrorStatus` can be provided as

```

1  /* EcucPartition "Core0_QM", SwCluCNativeBswApi == true */
2  Std_ReturnType NvM_GetErrorStatus (
3      NvM_BlockIdType BlockId,
4      NvM_RequestResultType * RequestResultPtr
5  )
6  ...
7
8  /* EcucPartition "Core1_QM", SwCluCNativeBswApi == false */
9  Std_ReturnType NvM_Core1_QM_GetErrorStatus (
10     NvM_BlockIdType BlockId,
11     NvM_RequestResultType * RequestResultPtr
12 )
13 ...

```

Note: `SwCluCNativeBswApi` can only be set to `true`, for at most one `SwCluCNvM-BaseSocket` container in an `Application Software Cluster` configuration.

## Callback Functions

**[SWS\_SwCluC\_02109]** [The NvM High Proxy shall support the optional configuration of a `NvM_SingleBlockCallbackFunction`, according to [\[ECUC\\_NvM\\_00562\]](#), [\[ECUC\\_NvM\\_00506\]](#) and [\[ECUC\\_NvM\\_00559\]](#).] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02110]** [The NvM High Proxy shall support the optional configuration of a `NvM_PNJF_{Block}` port for `NvMNotifyJobFinished` notification.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02115]** [The NvM High Proxy shall support the optional configuration of a `NvM_InitBlockCallbackFunction`, according to [\[ECUC\\_NvM\\_00561\]](#), [\[ECUC\\_NvM\\_00116\]](#) and [\[ECUC\\_NvM\\_00559\]](#).] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02116]** [The NvM High Proxy shall support the optional configuration of a `NvM_PNIB_{Block}` port for `NvMNotifyInitBlock` notification.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02117]** [The NvM High Proxy shall support the optional configuration of a `NvM_ReadRamBlockFromNvm`, according to [\[ECUC\\_NvM\\_00521\]](#).] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02118]** [The NvM High Proxy shall support the optional configuration of a `NvM_WriteRamBlockToNvm`, according to [\[ECUC\\_NvM\\_00520\]](#).] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02119]** [The NvM High Proxy shall support the optional configuration of a `NvM_PM_{Block}` port for `NvMMirror` notification.] ([SRS\\_SwCluC\\_00206](#))

## Multiple Partitions

**[SWS\_SwCluC\_02120]** [The NvM High Proxy shall create one partition specific Service Software Component per configured `EcucPartition`, with the name `NvM_<EcucPartition shortName>`.] ([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02121]** [The NvM High Proxy shall provide the Ports belonging to a specific Nv Block

- `NvM_PS_{Block}`
- `NvM_PAdmin_{Block}`
- `NvM_PNIB_{Block}`
- `NvM_PNJF_{Block}`
- `NvM_PM_{Block}`

at the partition specific Service Software Component, to which the using `SwComponentPrototype` is mapped.] ([SRS\\_SwCluC\\_00206](#), [SRS\\_SwCluC\\_00201](#))

## Handling of unconnected blocks

**[SWS\_SwCluC\_02107]** [In case a NV block configured in the NvM High Proxy is not connected to any NvM Low Proxy, the NvM High Proxy shall initialize the Nv RAM Block, with the default values given by `NvMRomBlockDataAddress` and / or `NvMInitBlockCallback`.] (*SRS\_SwCluC\_00206*, *SRS\_SwCluC\_00213*)

**[SWS\_SwCluC\_02113]** [In case a NV block configured in the NvM High Proxy is not connected to any NvM Low Proxy, the function `NvM_GetErrorStatus` of the NvM High Proxy shall still return `E_OK`, and the request result is set to `NVM_REQ_RESTORED_FROM_ROM`.] (*SRS\_SwCluC\_00206*, *SRS\_SwCluC\_00213*)

**[SWS\_SwCluC\_02114]** [In case a NV block configured in the NvM High Proxy is not connected to any NvM Low Proxy, the functions

- `NvM_SetDataIndex`
- `NvM_GetDataIndex`
- `NvM_SetBlockProtection`
- `NvM_SetRamBlockStatus`
- `NvM_SetBlockLockStatus`
- `NvM_CancelJobs`
- `NvM_ReadBlock`
- `NvM_WriteBlock`
- `NvM_RestoreBlockDefaults`
- `NvM_EraseNvBlock`
- `NvM_InvalidateNvBlock`
- `NvM_ReadPRAMBlock`
- `NvM_WritePRAMBlock`
- `NvM_RestorePRAMBlockDefaults`

of the NvM High Proxy shall return `E_NOT_OK`.] (*SRS\_SwCluC\_00206*, *SRS\_SwCluC\_00213*)

### 7.4.3.2.5 NvM Low Proxy

As shown in figure 7.10, the NvM Low Proxy shall be able to invoke APIs of the BSW modules in the `Host Software Cluster`, without a partition change in the `Application Software Clusters`. This partition change is only needed, if the BSW module does not offer a satellite on this partition. The availability of the BSW modules on dedicated `EcucPartitions` is a property of the `Host Software Cluster`.

**[SWS\_SwCluC\_02132]** [The NvM Low Proxy shall provide the entry functions for single block requests, according to [\[SWS\\_SwCluC\\_02103\]](#), once per configured `SwCluC-NvMBaseSocket` at the `EcucPartition` configured by `SwCluCnVMBaseSocket.SwCluCProxyEcucPartitionRef`.

In case the `SwCluCnVMProxyUsedSatelliteRef` is set, the `EcucPartition` shall be changed, before the NVM API is called.]([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02111]** [The NvM Low Proxy shall provide an instance of a `NvM-SingleBlockCallbackFunction` per configured NV block (`SwCluCnVMProxyNvBlock`) in the NvM Low Proxy.]([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02127]** [The NvM Low Proxy shall provide an instance of a `NvM-InitBlockCallbackFunction` per configured NV block (`SwCluCnVMProxyNvBlock`) in the NvM Low Proxy.]([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02128]** [The NvM Low Proxy shall provide an instance of a `NvM-ReadRamBlockFromNvm` per configured NV block (`SwCluCnVMProxyNvBlock`) in the NvM Low Proxy.]([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02129]** [The NvM Low Proxy shall provide an instance of a `NvM-WriteRamBlockToNvm` per configured NV block (`SwCluCnVMProxyNvBlock`) in the NvM Low Proxy.]([SRS\\_SwCluC\\_00206](#))

Contrary to the call of BSW module's APIs from an `Application Software Cluster`, the invoked callback notifications need to change the partition in the `Host Software Cluster`, before the calls are ending up in the `Application Software Cluster`, if the BSW module does not offer a satellite on this partition.

**[SWS\_SwCluC\_02133]** [The callback instances according to [\[SWS\\_SwCluC\\_02111\]](#), [\[SWS\\_SwCluC\\_02127\]](#), [\[SWS\\_SwCluC\\_02128\]](#), and [\[SWS\\_SwCluC\\_02129\]](#), are provided

- at the `EcucPartition` referenced by `SwCluCnVMProxyNvBlock.SwCluC-NvMProxyNvBlockEcucPartitionRef`, if a `SwCluCnVMBaseSocket` is directly available at this `EcucPartition`

OR

- at the `EcucPartition` of the `SwCluCnVMBaseSocket` referenced by the `SwCluCnVMBaseSocket` - via `SwCluCnVMProxyUsedSatelliteRef`, which is on the `EcucPartition` given by `SwCluCnVMProxyNvBlock.SwCluCnVM-ProxyNvBlockEcucPartitionRef`. In this case, the `EcucPartition` shall be changed, before the callback in the `High Proxy` is called.

]([SRS\\_SwCluC\\_00206](#))

**[SWS\_SwCluC\_02108]** [In case a NV block configured in the NvM Low Proxy is not connected to any NvM High Proxy, the NvM Low Proxy implementation shall ensure that the content of the NV block is not modified by the NvM Low Proxy.]([SRS\\_SwCluC\\_00206](#), [SRS\\_SwCluC\\_00213](#))

Note: An access by `Dcm` might still change the NV block content in this case.

**[SWS\_SwCluC\_02142]** [The NvM Low Proxy implementation shall describe the NV blocks provided to NvM High Proxies via `NvBlockNeeds`, derived from the `CpSoftwareClusterServiceResource.resourceNeeds`.] ([SRS\\_SwCluC\\_00206](#))

Note: **[SWS\_SwCluC\_02142]** ensures an automated configuration of the NVRAM Manager.

**[SWS\_SwCluC\_02143]** [The NvM Low Proxy shall provide, for each `SwCluCnVMBaseSocket`, a `SwCluC_NvMProxy_Init` API, to initialize the NvM High Proxy of an Application Software Cluster. This shall be one element of the service resource `SwCluCnVMBaseSocket`.] ([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00101](#))

#### 7.4.3.2.6 Error detection

**[SWS\_SwCluC\_02137]** [If development error detection is enabled for NvM High Proxy, the APIs

- `NvM_SetDataIndex`
- `NvM_GetDataIndex`
- `NvM_SetBlockProtection`
- `NvM_GetErrorStatus`
- `NvM_SetRamBlockStatus`
- `NvM_SetBlockLockStatus`
- `NvM_CancelJobs`
- `NvM_ReadBlock`
- `NvM_WriteBlock`
- `NvM_RestoreBlockDefaults`
- `NvM_EraseNvBlock`
- `NvM_InvalidateNvBlock`
- `NvM_ReadPRAMBlock`
- `NvM_WritePRAMBlock`
- `NvM_RestorePRAMBlockDefaults`

shall report the DET error `NVM_E_UNINIT`, when NVM High Proxy is not yet initialized.] ([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

**[SWS\_SwCluC\_02138]** [If development error detection is enabled for NvM High Proxy, the APIs

- `NvM_SetDataIndex`



- [NvM\\_GetDataIndex](#)
- [NvM\\_SetBlockProtection](#)
- [NvM\\_GetErrorStatus](#)
- [NvM\\_SetRamBlockStatus](#)
- [NvM\\_SetBlockLockStatus](#)
- [NvM\\_CancelJobs](#)
- [NvM\\_ReadBlock](#)
- [NvM\\_WriteBlock](#)
- [NvM\\_RestoreBlockDefaults](#)
- [NvM\\_EraseNvBlock](#)
- [NvM\\_InvalidateNvBlock](#)
- [NvM\\_ReadPRAMBlock](#)
- [NvM\\_WritePRAMBlock](#)
- [NvM\\_RestorePRAMBlockDefaults](#)

shall report the DET error `NVM_E_PARAM_BLOCK_ID`, when the passed `BlockId` is out of range of the `BlockIds` configured in the NvM High Proxy.]([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

**[SWS\_SwCluC\_02139]** [If development error detection is enabled for NvM High Proxy, the APIs

- [NvM\\_ReadBlock](#)
- [NvM\\_WriteBlock](#)
- [NvM\\_RestoreBlockDefaults](#)

shall report the DET error `NVM_E_PARAM_ADDRESS`, when a RAM block address different than `NULL_PTR` is passed.]([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

### 7.4.3.3 Com Proxy

#### 7.4.3.3.1 Enable Com Proxy Generation

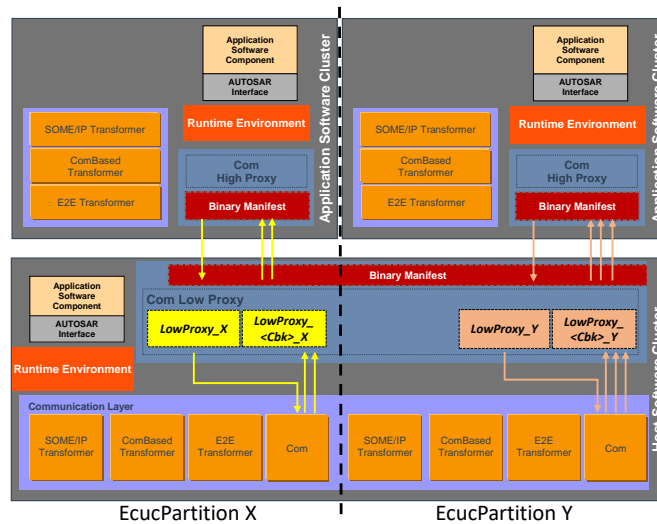
**[SWS\_SwCluC\_02600]{DRAFT}** [The `Com High Proxy` code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter `SwCluCProxyGenerationCom` is set to `HIGH_PROXY`.]([SRS\\_SwCluC\\_00211](#), [SRS\\_SwCluC\\_00204](#))

[SWS\_SwCluC\_02601]{DRAFT} [The `Com Low Proxy` code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter `SwCluCProxyGenerationCom` is set to `LOW_PROXY`.] (*SRS\_SwCluC\_00211*, *SRS\_SwCluC\_00204*)

### 7.4.3.3.2 General Com Proxy functionality

#### 7.4.3.3.3 Overview

The specified `Com Proxy` has the following underlying design principle.



**Figure 7.13: Overview of Com Proxy**

The `Application Software Cluster` provides proxies for those parts of the `Com` implementation that are required to complete its functionality. This is called `Com High Proxy`.

The `Host Software Cluster` contains the real implementation of the `Com` functionality and makes it available to the `Com High Proxy` via the respective `Com Low Proxy`. Both `Com High Proxy` and `Com Low Proxy` are linked together based on the information available in `Binary Manifest`, which enables the execution of `Com` (Callback) functions from `Application Software Cluster` to `Host Software Cluster` and vice-versa.

The `Com Proxy` as an `ComUserModule` is represented by one or several `ComUserModuleCnf`. A `ComUserModuleCnf` is required for each `EcucPartition`, in which the `Com Proxy`

- requires direct access to the Com APIs initiating transmission/reception requests of `ComSignals` and/or `ComSignalGroups`
- provides transmission/reception notification callbacks of `ComSignals` and/or `ComSignalGroups`

Effectively, a `ComUserModuleCnf` links a fixed set of notification callbacks in the Com to a specific `EcucPartition` in the `Com Proxy`. As consequence, the `Com Proxy` has to map each `ComUserSignal` / `ComUserSignalGroup` via `ComUserSystemTemplateSystemSignalRef` / `ComUserSystemTemplateSignalGroupRef` to an `ComSignal` resp. `ComSignalGroup`.

The Com module shall provide its APIs for transmission/reception requests of the relevant `ComSignals` and/or `ComSignalGroups` on the `EcucPartition` configured in the `Com Proxy`.

The `Com Proxy` as `ComUserModule` shall provide a compatible configuration structure and content for the RTE in the `Application Software Cluster`. It derives its configuration of `ComSignals` and/or `ComSignalGroups` from the Com. For the `EcucPartition` assignment, the `Com Proxy` creates virtual main functions (Rx/Tx) and maps the respective `ComIPdus` to them. These main functions exist only in the configuration but do not have an implementation.

Even if the concept of Com user provides a lot of flexibility to support access by multiple users including their notifications, some limitations have to be considered.

In general, multiple writers can cause race conditions, if the writers are not coordinated. In addition, the required sequence of `Com_SendSignal` (of group signals) and `Com_SendSignalGroup` calls cause the risk of data inconsistency in case of preemption by multiple writers.

Since such a coordination across different Software Clusters is hardly achievable, the following restriction applies:

**[SWS\_SwCluC\_CONSTR\_02653]{DRAFT}** [Sent signals or signal groups shall be provided to at most one `Application Software Cluster`.] (*SRS\_SwCluC\_00211*)

Nevertheless, reading a signal or signal group by several `Application Software Clusters` is possible.

#### 7.4.3.3.4 General requirements

**[SWS\_SwCluC\_02602]{DRAFT}** [The `Com Proxy` shall support that the `ComHandleId` of `ComSignals` configured in Com of the `Host Software Cluster` can change, without reconfiguration or rebuild of the `Application Software Cluster` using these `ComSignals`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02603]{DRAFT}** [The `Com Proxy` shall support that the `ComHandleId` of `ComSignalGroups` resp. `ComGroupSignals` configured in the `Com` of the `Host Software Cluster` can change, without reconfiguration or rebuild of the `Application Software Cluster` using these `ComSignalGroups`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02652]{DRAFT}** [The `Com Proxy` shall support that the `ComUserCbchandleId` of `ComUserSignals` resp. `ComUserSignalGroups` configured in `Com` users of the `Application Software Cluster` can change, without reconfiguration or rebuild of the `Host Software Cluster`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02604]{DRAFT}** [The `Com Proxy` shall support the invocation of `Com APIs` from an `Application Software Cluster` in context of the `Host Software Cluster`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02605]{DRAFT}** [The `Com Proxy` shall support the invocation of `Com callbacks` from the `Host Software Cluster` in context of the `Application Software Cluster`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02639]{DRAFT}** [If the `<ComUser_CbkRxAck>` notification callback is configured in the `Com High Proxy` (via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), where the respective `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_ACK`) the configured `<ComUser_CbkRxAck>` callback shall be invoked when the associated `SwCluC_ComProxy_CbkRxAck` instance of the `Com Low Proxy` is called.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02640]{DRAFT}** [If the invalid `<ComUser_CbkInv>` notification callback is configured in the `Com High Proxy` (via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), where the respective `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_INV`) the configured `<ComUser_CbkInv>` callback shall be invoked when the associated `SwCluC_ComProxy_CbkInv` instance of the `Com Low Proxy` is called.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02642]{DRAFT}** [If the `<ComUser_CbkRxTOut>` notification callback is configured in the `Com High Proxy` (via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), where the respective `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_TOUT`) the configured `<ComUser_CbkRxTOut>` callback shall be invoked when the associated `SwCluC_ComProxy_CbkRxTOut` instance of the `Com Low Proxy` is called.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02643]{DRAFT}** [If the `<ComUser_CbkTxAck>` notification callback is configured in the `Com High Proxy` (via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), where the respective `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_TX_ACK`) the configured `<ComUser_CbkTxAck>` callback shall be invoked when the associated instance of the `Com Low Proxy` is called.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02644]{DRAFT}** [If the `<ComUser_CbkTxErr>` notification callback is configured in the `Com High Proxy` (via the `ComUserCallbackName` (See

[[ECUC\\_Com\\_10036](#)]), where the respective `ComUserCallbackType` (See [[ECUC\\_Com\\_10034](#)]) is set to `COM_TX_ERR`) the configured `<ComUser_CbkTxErr>` callback shall be invoked when the associated `SwCluC_ComProxy_CbkTxErr` instance of the `Com Low Proxy` is called.]([SRS\\_SwCluC\\_00211](#))

[[SWS\\_SwCluC\\_02645](#)]{DRAFT} [If the `<ComUser_CbkTxTOut>` timeout notification callback is configured in the `Com High Proxy` (via the `ComUserCallbackName` (See [[ECUC\\_Com\\_10036](#)]), where the respective `ComUserCallbackType` (See [[ECUC\\_Com\\_10034](#)]) is set to `COM_TX_TOUT`) the configured `<ComUser_CbkTxTOut>` callback shall be invoked when the associated `SwCluC_ComProxy_CbkTxTOut` instance of the `Com Low Proxy` is called.]([SRS\\_SwCluC\\_00211](#))

#### 7.4.3.3.5 Com High Proxy

[[SWS\\_SwCluC\\_02606](#)]{DRAFT} [The `Com High Proxy` shall provide the header file `Com.h`.]([SRS\\_SwCluC\\_00211](#))

[[SWS\\_SwCluC\\_02607](#)]{DRAFT} [The `Com High Proxy` shall provide the symbolic name values for the `ComSignals`, for Com users in the `Application Software Cluster`.]([SRS\\_SwCluC\\_00211](#))

[[SWS\\_SwCluC\\_02608](#)]{DRAFT} [The `Com High Proxy` shall provide the symbolic name values for the `ComSignalGroups` resp. `ComGroupSignals`, for Com users in the `Application Software Cluster`.]([SRS\\_SwCluC\\_00211](#))

[[SWS\\_SwCluC\\_02609](#)]{DRAFT} [The `Com High Proxy` shall provide the functions for transmission requests of `ComSignals` and `ComSignalGroups`

- `Com_SendSignal`
- `Com_SendDynSignal`
- `Com_SendSignalGroup`
- `Com_SendSignalGroupArray`
- `Com_SendSignalWithMetaData`
- `Com_SendDynSignalWithMetaData`
- `Com_SendSignalGroupWithMetaData`
- `Com_SendSignalGroupArrayWithMetaData`

required by the Com users in the `Application Software Cluster`.

]([SRS\\_SwCluC\\_00211](#), [SRS\\_SwCluC\\_00202](#))

[[SWS\\_SwCluC\\_02610](#)]{DRAFT} [The `Com High Proxy` shall provide the functions for reception requests of a `ComSignal` and `ComSignalGroup`

- `Com_ReceiveSignal`

- [Com\\_ReceiveDynSignal](#)
- [Com\\_ReceiveSignalGroup](#)
- [Com\\_ReceiveSignalGroupArray](#)
- [Com\\_ReceiveSignalWithMetaData](#)
- [Com\\_ReceiveDynSignalWithMetaData](#)
- [Com\\_ReceiveSignalGroupWithMetaData](#)
- [Com\\_ReceiveSignalGroupArrayWithMetaData](#)

required by the Com users in the [Application Software Cluster](#)

]([SRS\\_SwCluC\\_00211](#), [SRS\\_SwCluC\\_00202](#))

**[SWS\_SwCluC\_02648]{DRAFT}** [The function [Com\\_ReceiveSignalGroup](#) provided by the [Com High Proxy](#) shall

- invoke the [Com\\_ReceiveSignalGroupArray](#) API to fetch the data as uint8 array representation, AND
- perform a transformation on the uint8 array to output the original data which will be passed to the RTE in the [Application Software Cluster](#).

]([SRS\\_SwCluC\\_00211](#))

**[SWS\_SwCluC\_02649]{DRAFT}** [The function [Com\\_ReceiveSignalGroupWithMetaData](#) provided by the [Com High Proxy](#) shall

- invoke the [Com\\_ReceiveSignalGroupArrayWithMetaData](#) API to fetch the data as uint8 array representation, AND
- perform a transformation on the uint8 array to output the original data which will be passed to the RTE in the [Application Software Cluster](#).

]([SRS\\_SwCluC\\_00211](#))

**[SWS\_SwCluC\_02611]{DRAFT}** [The [Com High Proxy](#) shall provide the functions for invalidation requests of a [ComSignal](#) and [ComSignalGroup](#)

- [Com\\_InvalidateSignal](#)
- [Com\\_InvalidateSignalGroup](#)

required by the Com users in the [Application Software Cluster](#)

]([SRS\\_SwCluC\\_00211](#), [SRS\\_SwCluC\\_00202](#))

**[SWS\_SwCluC\_02612]{DRAFT}** [If the [Com High Proxy](#) is not connected to the [Com Low Proxy](#), the functions w.r.t transmission requests of [ComSignals](#) and [ComSignalGroups](#)

- [Com\\_SendSignal](#)

- Com\_SendDynSignal
- Com\_SendSignalGroup
- Com\_SendSignalGroupArray
- Com\_SendSignalWithMetaData
- Com\_SendDynSignalWithMetaData
- Com\_SendSignalGroupWithMetaData
- Com\_SendSignalGroupArrayWithMetaData

of the Com High Proxy shall return COM\_SERVICE\_NOT\_AVAILABLE.

](SRS\_SwCluC\_00211, SRS\_SwCluC\_00202, SRS\_SwCluC\_00213)

**[SWS\_SwCluC\_02613]{DRAFT}** [If the Com High Proxy is not connected to the Com Low Proxy, the functions w.r.t reception requests of ComSignals and ComSignalGroups

- Com\_ReceiveSignal
- Com\_ReceiveDynSignal
- Com\_ReceiveSignalGroup
- Com\_ReceiveSignalGroupArray
- Com\_ReceiveSignalWithMetaData
- Com\_ReceiveDynSignalWithMetaData
- Com\_ReceiveSignalGroupWithMetaData
- Com\_ReceiveSignalGroupArrayWithMetaData
- Com\_ReceiveSignalWithMetaData
- Com\_ReceiveDynSignalWithMetaData

of the Com High Proxy shall return COM\_SERVICE\_NOT\_AVAILABLE.

](SRS\_SwCluC\_00211, SRS\_SwCluC\_00213)

**[SWS\_SwCluC\_02614]{DRAFT}** [If the Com High Proxy is not connected to the Com Low Proxy, the functions w.r.t invalidation requests of ComSignals and ComSignalGroups

- Com\_InvalidateSignal
- Com\_InvalidateSignalGroup

of the Com High Proxy shall return COM\_SERVICE\_NOT\_AVAILABLE.

](SRS\_SwCluC\_00211, SRS\_SwCluC\_00213)



[SWS\_SwCluC\_02615]{DRAFT} [The `Com High Proxy` shall provide the functions for transmission request of a signal(group)s, according to [SWS\_SwCluC\_02609], once per configured `SwCluCComProxyBaseSocket`. At the `EcucPartition` where the `SwCluCNativeBswApi` is set to `true`, For all other `SwCluCComProxyBaseSocket` instances, the `Mip Com` is replaced by `Com_<EcucPartition.ShortName>`.](SRS\_SwCluC\_00211)

[SWS\_SwCluC\_02616]{DRAFT} [The `Com High Proxy` shall provide the functions for reception request of a signal(group)s, according to [SWS\_SwCluC\_02610], once per configured `SwCluCComProxyBaseSocket`. At the `EcucPartition` where the `SwCluCNativeBswApi` is set to `true`, the API is provided with the original `Mip Com`. For all the other `SwCluCComProxyBaseSocket` instances, the `Mip Com` is replaced by `Com_<EcucPartition.ShortName>`.](SRS\_SwCluC\_00211)

[SWS\_SwCluC\_02617]{DRAFT} [The `Com High Proxy` shall provide the functions for invalidation request of a signal(group)s, according to [SWS\_SwCluC\_02611], once per configured `SwCluCComProxyBaseSocket`. At the `EcucPartition` where the `SwCluCNativeBswApi` is set to `true`, the API is provided with the original `Mip Com`. For all the other `SwCluCComProxyBaseSocket` instances, the `Mip Com` is replaced by `Com_<EcucPartition.ShortName>`.](SRS\_SwCluC\_00211)

## Callback Functions

[SWS\_SwCluC\_02618]{DRAFT} [The `Com High Proxy` shall support the optional `<ComUser_CbkRxAck>` notification callback configured via the `ComUserCallbackName` (See [ECUC\_Com\_10036]) parameter where the `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_ACK`.](SRS\_SwCluC\_00211, SRS\_SwCluC\_00202)

[SWS\_SwCluC\_02619]{DRAFT} [The `Com High Proxy` shall support the optional invalid `<ComUser_CbkInv>` notification callback configured via the `ComUserCallbackName` (See [ECUC\_Com\_10036]) where the `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_INV`.](SRS\_SwCluC\_00211, SRS\_SwCluC\_00202)

[SWS\_SwCluC\_02620]{DRAFT} [The `Com High Proxy` shall support the optional `<ComUser_CbkRxTOut>` timeout notification callback configured via the `ComUserCallbackName` (See [ECUC\_Com\_10036]) where the `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_TOUT`.](SRS\_SwCluC\_00211, SRS\_SwCluC\_00202)

[SWS\_SwCluC\_02621]{DRAFT} [The `Com High Proxy` shall support the optional `<ComUser_CbkTxAck>` notification callback configured via the `ComUserCallbackName` (See [ECUC\_Com\_10036]) where the `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_TX_ACK`.](SRS\_SwCluC\_00211, SRS\_SwCluC\_00202)

[SWS\_SwCluC\_02622]{DRAFT} [The `Com High Proxy` shall support the optional `<ComUser_CbkTxErr>` error notification callback configured via the `ComUserCallbackName` (See [ECUC\_Com\_10036]) where the `ComUserCallbackType` (See

[ECUC\_Com\_10034]) is set to `COM_TX_ERR`.] (*SRS\_SwCluC\_00211*, *SRS\_SwCluC\_00202*)

[SWS\_SwCluC\_02623]{DRAFT} [The `Com High Proxy` shall support the optional `<ComUser_CbkTxTOut>` timeout notification callback configured via the `ComUser_CallbackName` (See [ECUC\_Com\_10036]) where the `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_TX_TOUT`.] (*SRS\_SwCluC\_00211*, *SRS\_SwCluC\_00202*)

[SWS\_SwCluC\_02647]{DRAFT} [The `Com High Proxy` shall create for each `SwCluCComProxyBaseSocket` a required resource entry in the `Binary Manifest`.] (*SRS\_SwCluC\_00211*, *SRS\_SwCluC\_00212*)

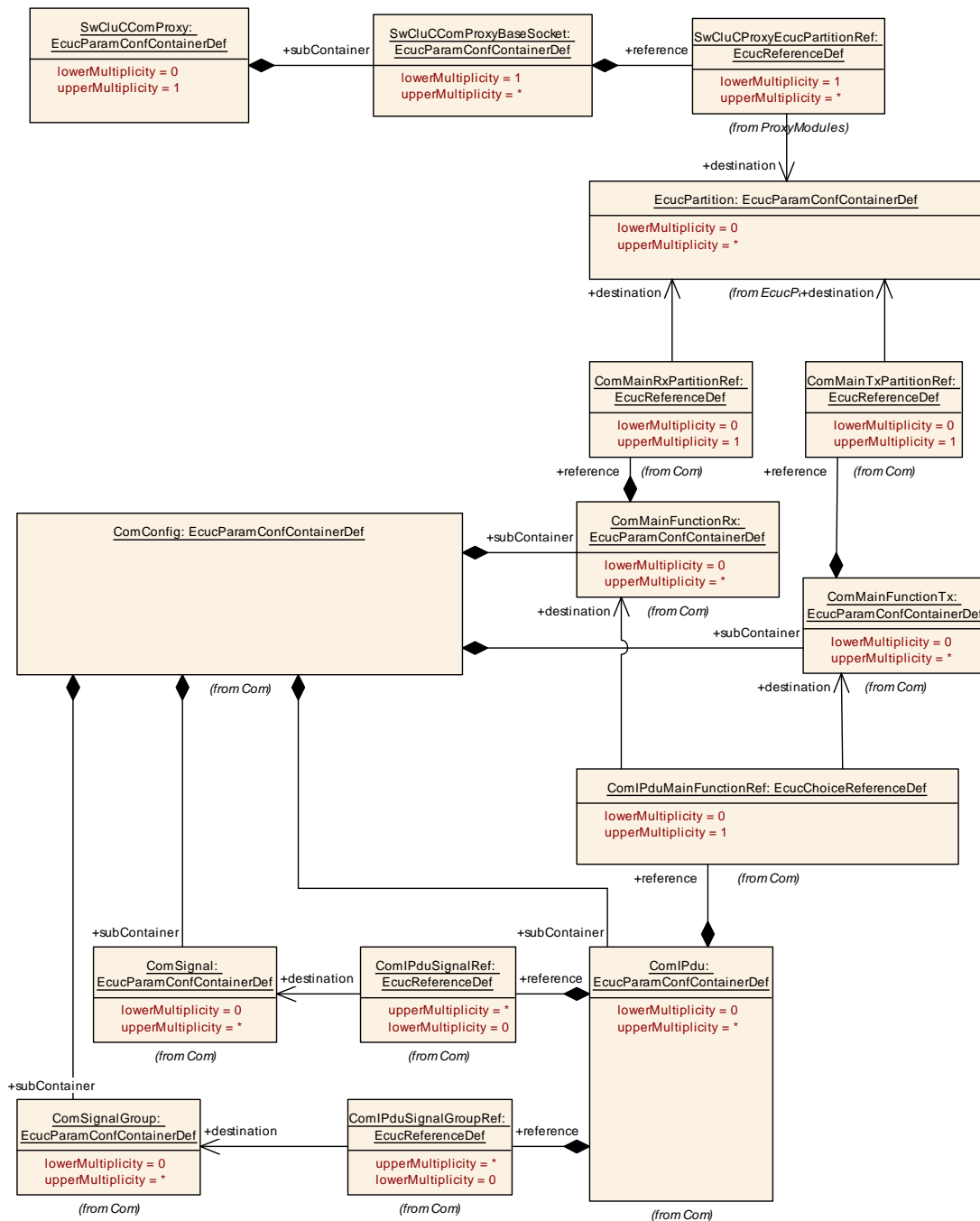
Please note that the callbacks of the `Application Software Cluster`

- `<ComUser_CbkRxAck>`
- `<ComUser_CbkInv>`
- `<ComUser_CbkRxTOut>`
- `<ComUser_CbkTxAck>`
- `<ComUser_CbkTxErr>`
- `<ComUser_CbkTxTOut>`

are connected to the `Host Software Cluster` via the `Com base socket`. See [SWS\_SwCluC\_02661]

In the `Application Software Cluster`, the relationship between a `Signal` or a `Signal Group` in `Com` and the related `Com base socket` is given indirectly, via the common `EcucPartition(s)` of the `SwCluCComProxyBaseSocket.SwCluCProxyEcucPartitionRef` and the `ComMainFunctionRx.ComMainRxPartitionRef` and `ComMainFunctionTx.ComMainTxPartitionRef` respectively. Those relationships are illustrated in figure 7.14.

The reason not to define a dedicated `EcuC` configuration structure for this purpose, is the assumption that the same tools are used to derive the `Com` configuration for an `Application Software Cluster` and a `Host Software Cluster`.



**Figure 7.14: Signal or a Signal Group and their relationships to Com base sockets via EcucPartition**

[SWS\_SwCluC\_02662]{DRAFT} [The Com High Proxy shall create for each Com-Signal and ComSignalGroup configured in Com a required resource entry in the Binary Manifest. Where the ComMainFunctionRx.ComMainRxPartitionRef and ComMainFunctionTx.ComMainTxPartitionRef are relevant to denote the EcucPartition.](SRS\_SwCluC\_00211, SRS\_SwCluC\_00212)

#### 7.4.3.3.6 Com Low Proxy

[SWS\_SwCluC\_02624]{DRAFT} [The `Com Low Proxy` shall provide the header file `SwCluC_ComProxy_Cbk.h`.] ([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_CONSTR\_02654]{DRAFT} [The `ComUserHeaderInclude` parameter shall be configured as `SwCluC_ComProxy_Cbk.h`.] ([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_02651]{DRAFT} [The `Com Low Proxy` shall provide in its `ComUserModuleCnf` containers the `ComUserCbkJd` values for the configured `ComUserSignals` and `ComUserSignalGroups`, according to its internal implementation requirements (e.g. to address the `Com Low Proxy`'s data structures).] ([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_02625]{DRAFT} [The `Com Low Proxy` shall provide the entry function for transmission, reception and invalidation requests of `ComSignal(Group)s`, according to [[SWS\\_SwCluC\\_02609](#)], [[SWS\\_SwCluC\\_02610](#)] and [[SWS\\_SwCluC\\_02611](#)], once per configured `SwCluCComProxyBaseSocket`, at the `EcucPartition` configured by `SwCluCComProxyBaseSocket.SwCluCProxyEcucPartitionRef`.

In case the `SwCluCComProxyUsedSatelliteRef` is set, the `EcucPartition` shall be changed, before the Com API is called.] ([SRS\\_SwCluC\\_00211](#))

The implementation of the `Com Low Proxy` may provide some basic infrastructure for the `Com High Proxy` in order to be operational. Such generic infrastructure services (including the access to COM APIs or the callbacks) can be linked between `Application Software Cluster` and `Host Software Clusters` by means of a Com base socket.

[SWS\_SwCluC\_02626]{DRAFT} [The `Com Low Proxy` shall provide for each `SwCluCComProxyBaseSocket` a `SwCluC_ComProxy_Init` API, to initialize the `Com High Proxy` of an `Application Software Cluster`.] ([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_02627]{DRAFT} [The `Com Low Proxy` shall provide an instance of all `SwCluC_ComProxy_CbkRxAck` notification callbacks, configured via the `ComUserCallbackName` (See [[ECUC\\_Com\\_10036](#)]) parameter, with the `ComUserCallbackType` (See [[ECUC\\_Com\\_10034](#)]) set to `COM_RX_ACK`.] ([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_CONSTR\_02655]{DRAFT} [Each notification callback, where the parameter `ComUserCallbackType` (See [[ECUC\\_Com\\_10034](#)]) is set to `COM_RX_ACK`, shall be configured as `SwCluC_ComProxy_<BS>_CbkJdRxAck`, where `<BS>` is the `shortName` of the `SwCluCComProxyBaseSocket` container.] ([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_02628]{DRAFT} [The `Com Low Proxy` shall provide an instance of all `SwCluC_ComProxy_CbkInv` notification callbacks, configured on each `ComSignal(Group)` via the `ComUserCallbackName` (See [[ECUC\\_Com\\_10036](#)]) parameter, with the `ComUserCallbackType` (See [[ECUC\\_Com\\_10034](#)]) set to `COM_RX_INV`.] ([SRS\\_SwCluC\\_00211](#))

**[SWS\_SwCluC\_CONSTR\_02656]{DRAFT}** [Each notification callback, where the parameter `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_INV`, shall be configured as `SwCluC_ComProxy_<BS>_CbkJnv`, where `<BS>` is the `shortName` of the `SwCluCComProxyBaseSocket` container.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02629]{DRAFT}** [The `Com Low Proxy` shall provide an instance of all `SwCluC_ComProxy_CbkRxTOut` timeout notification callbacks configured on each `ComSignal(Group)`, via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), with the `ComUserCallbackType` (See [ECUC\_Com\_10034]) set to `COM_RX_TOUT`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_CONSTR\_02657]{DRAFT}** [Each notification callback where the parameter `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_RX_TOUT` shall be configured as `SwCluC_ComProxy_<BS>_CbkJRxTOut` where `<BS>` is the `shortName` of the `SwCluCComProxyBaseSocket` container.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02630]{DRAFT}** [The `Com Low Proxy` shall provide an instance of all `SwCluC_ComProxy_CbkTxAck` notification callbacks configured on each `ComSignal(Group)`, via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), with the `ComUserCallbackType` (See [ECUC\_Com\_10034]) set to `COM_TX_ACK`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_CONSTR\_02658]{DRAFT}** [Each notification callback, where the parameter `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_TX_ACK`, shall be configured as `SwCluC_ComProxy_<BS>_CbkJTxAck`, where `<BS>` is the `shortName` of the `SwCluCComProxyBaseSocket` container.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02631]{DRAFT}** [The `Com Low Proxy` shall provide an instance of all `SwCluC_ComProxy_CbkTxErr` notification callbacks configured on each `ComSignal(Group)`, via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), with the `ComUserCallbackType` (See [ECUC\_Com\_10034]) set to `COM_TX_ERR`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_CONSTR\_02659]{DRAFT}** [Each notification callback, where the parameter `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_TX_ERR`, shall be configured as `SwCluC_ComProxy_<BS>_CbkJTxErr`, where `<BS>` is the `shortName` of the `SwCluCComProxyBaseSocket` container.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02632]{DRAFT}** [The `Com Low Proxy` shall provide an instance of all `SwCluC_ComProxy_CbkTxTOut` notification callbacks configured on each `ComSignal(Group)`, via the `ComUserCallbackName` (See [ECUC\_Com\_10036]), with the `ComUserCallbackType` (See [ECUC\_Com\_10034]) set to `COM_TX_TOUT`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_CONSTR\_02660]{DRAFT}** [Each notification callback, where the parameter `ComUserCallbackType` (See [ECUC\_Com\_10034]) is set to `COM_TX_TOUT`, shall be configured as `SwCluC_ComProxy_<BS>_CbkJTxTOut`, where `<BS>` is the `shortName` of the `SwCluCComProxyBaseSocket` container.] (*SRS\_SwCluC\_00211*)

[SWS\_SwCluC\_02633]{DRAFT} [The notification callback instances according to [SWS\_SwCluC\_02626], [SWS\_SwCluC\_02627], [SWS\_SwCluC\_02628], [SWS\_SwCluC\_02629], [SWS\_SwCluC\_02630], [SWS\_SwCluC\_02631] and [SWS\_SwCluC\_02632] are provided

- at the `EcucPartition` of the `SwCluCComProxyBaseSocket` referenced by the `SwCluCComProxyBaseSocket` - via `SwCluCComProxyUsedSatelliteRef`. In this case, the `EcucPartition` shall be changed, before the callback in the `High Proxy` is called.

]([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_02646]{DRAFT} [The `Com Low Proxy` shall create for each `SwCluCComProxyBaseSocket` a provided resource entry in the `Binary Manifest`.

]([SRS\\_SwCluC\\_00211](#), [SRS\\_SwCluC\\_00212](#))

[SWS\_SwCluC\_02661]{DRAFT} [The `Com base socket` shall implement the connection of the related callback functions

- `SwCluC_ComProxy_CbkRxAck`
- `SwCluC_ComProxy_CbkInv`
- `SwCluC_ComProxy_CbkRxTOut`
- `SwCluC_ComProxy_CbkTxAck`
- `SwCluC_ComProxy_CbkTxErr`
- `SwCluC_ComProxy_CbkTxTOut`

]([SRS\\_SwCluC\\_00211](#))

[SWS\_SwCluC\_02634]{DRAFT} [If the `Com Low Proxy` is not connected to the `Com High Proxy`, the callback functions

- `SwCluC_ComProxy_CbkRxAck`
- `SwCluC_ComProxy_CbkInv`
- `SwCluC_ComProxy_CbkRxTOut`
- `SwCluC_ComProxy_CbkTxAck`
- `SwCluC_ComProxy_CbkTxErr`
- `SwCluC_ComProxy_CbkTxTOut`

of the `Com Low Proxy` shall return shall return without effect.]([SRS\\_SwCluC\\_00211](#), [SRS\\_SwCluC\\_00213](#))

Conceptually, the `Com Proxy` provides Signals and Signal Groups with their corresponding notifications for a set of specific `EcucPartitions`. In the simplest case, this is a single `EcucPartition`, where also the `Com` module handles the underlying



ComIPdu. In case the Com users as well as the Com API are unspecific to the `EcucPartition`, the `Com Proxy` can provide the same Signals and Signal Groups with their corresponding notifications for more than one `EcucPartition`. Nevertheless, it's possible that the `Com Proxy` changes the partition for Com API access and notifications. But be aware that this may have a severe performance impact, if this is used for a larger number of Signals or Signal Groups.

In the `Host Software Cluster`, the set of Signals and Signal Groups, with their corresponding notifications, is configured by means of the `SwCluCComProxyBaseSocket.ComUserModuleCnf`. For those Signals and Signal Groups, the related entries in the `Binary Manifest` are created by the `Com Low Proxy`.

**[SWS\_SwCluC\_02663]{DRAFT}** [The `Com Low Proxy` shall create for each `ComUserSignal` and `ComUserSignalGroup` configured in a `SwCluCComProxyBaseSocket.ComUserModuleCnf` a provided resource entry in the `Binary Manifest`.] (*SRS\_SwCluC\_00211*, *SRS\_SwCluC\_00212*)

#### 7.4.3.3.7 Error Detection

**[SWS\_SwCluC\_02636]{DRAFT}** [If the development error detection is enabled for the `Com High Proxy`, the APIs

- `Com_SendSignal`
- `Com_SendDynSignal`
- `Com_SendSignalGroup`
- `Com_SendSignalGroupArray`
- `Com_SendSignalWithMetaData`
- `Com_SendDynSignalWithMetaData`
- `Com_SendSignalGroupWithMetaData`
- `Com_SendSignalGroupArrayWithMetaData`
- `Com_ReceiveSignal`
- `Com_ReceiveDynSignal`
- `Com_ReceiveSignalGroup`
- `Com_ReceiveSignalGroupArray`
- `Com_ReceiveSignalWithMetaData`
- `Com_ReceiveDynSignalWithMetaData`
- `Com_ReceiveSignalGroupWithMetaData`



- `Com_ReceiveSignalGroupArrayWithMetaData`
- `Com_ReceiveSignalWithMetaData`
- `Com_ReceiveDynSignalWithMetaData`
- `Com_InvalidateSignal`
- `Com_InvalidateSignalGroup`

shall report the DET error `COM_E_UNINIT`, in case the `Com High Proxy` is not initialized.]([SRS\\_SwCluC\\_00211](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

**[SWS\_SwCluC\_02637]{DRAFT}** [If the development error detection is enabled for the `Com High Proxy`, the APIs

- `Com_SendSignal`
- `Com_SendDynSignal`
- `Com_SendSignalGroup`
- `Com_SendSignalGroupArray`
- `Com_SendSignalWithMetaData`
- `Com_SendDynSignalWithMetaData`
- `Com_SendSignalGroupWithMetaData`
- `Com_SendSignalGroupArrayWithMetaData`
- `Com_ReceiveSignal`
- `Com_ReceiveDynSignal`
- `Com_ReceiveSignalGroup`
- `Com_ReceiveSignalGroupArray`
- `Com_ReceiveSignalWithMetaData`
- `Com_ReceiveDynSignalWithMetaData`
- `Com_ReceiveSignalGroupWithMetaData`
- `Com_ReceiveSignalGroupArrayWithMetaData`
- `Com_ReceiveSignalWithMetaData`
- `Com_ReceiveDynSignalWithMetaData`
- `Com_InvalidateSignal`
- `Com_InvalidateSignalGroup`

shall, when invoked with a `NULL_PTR`, report the DET error `COM_E_PARAM_POINTER.`] (*SRS\_SwCluC\_00211*, *SRS\_BSW\_00369*, *SRS\_BSW\_00323*, *SRS\_BSW\_00350*)

**[SWS\_SwCluC\_02638]{DRAFT}** [If the development error detection is enabled for the `Com High Proxy`, the APIs

- `Com_SendSignal`
- `Com_SendDynSignal`
- `Com_SendSignalGroup`
- `Com_SendSignalGroupArray`
- `Com_SendSignalWithMetaData`
- `Com_SendDynSignalWithMetaData`
- `Com_SendSignalGroupWithMetaData`
- `Com_SendSignalGroupArrayWithMetaData`
- `Com_ReceiveSignal`
- `Com_ReceiveDynSignal`
- `Com_ReceiveSignalGroup`
- `Com_ReceiveSignalGroupArray`
- `Com_ReceiveSignalWithMetaData`
- `Com_ReceiveDynSignalWithMetaData`
- `Com_ReceiveSignalGroupWithMetaData`
- `Com_ReceiveSignalGroupArrayWithMetaData`
- `Com_ReceiveSignalWithMetaData`
- `Com_ReceiveDynSignalWithMetaData`
- `Com_InvalidateSignal`
- `Com_InvalidateSignalGroup`

shall, when invoked with a wrong parameter, report the DET error `COM_E_PARAM.`] (*SRS\_SwCluC\_00211*, *SRS\_BSW\_00369*, *SRS\_BSW\_00323*, *SRS\_BSW\_00350*)

### 7.4.3.4 LdCom Proxy

#### 7.4.3.4.1 Enable LdCom Proxy Generation

[SWS\_SwCluC\_02500]{DRAFT} [The [LdCom High Proxy](#) code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter [SwCluCProxyGenerationLdCom](#) is set to `HIGH_PROXY`.] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00204](#))

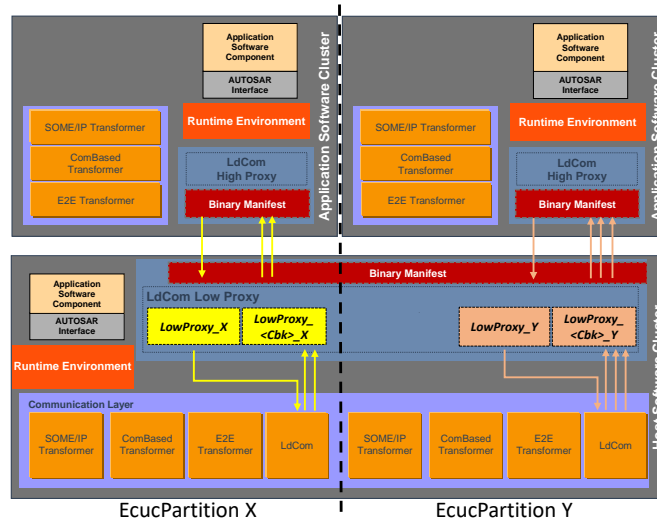
[SWS\_SwCluC\_02501]{DRAFT} [The [LdCom Low Proxy](#) code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter [SwCluCProxyGenerationLdCom](#) is set to `LOW_PROXY`.] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00204](#))

#### 7.4.3.4.2 General LdCom Proxy functionality

##### 7.4.3.4.3 Overview

With the concept of Software Clusters, which enables the splitting of the software of an AUTOSAR Classic Platform Architecture into smaller units, the [Application Software Cluster](#) provides proxies for those parts of the `LdCom` implementation that are required to complete its functionality. This is called [LdCom High Proxy](#).

The [Host Software Cluster](#) contains the real implementation of the `LdCom` functionality and makes it available to the [LdCom High Proxy](#) via the respective [LdCom Low Proxy](#). Both [LdCom High Proxy](#) and [LdCom Low Proxy](#) are linked together based on the information available in [Binary Manifest](#), which enables the execution of `LdCom` (Callback) functions from [Application Software Cluster](#) to [Host Software Cluster](#) and vice-versa.



**Figure 7.15: Overview of LdCom Proxy**

The `LdCom` module can now have an arbitrary of users with the `LdCom Low Proxy` being one of those. It therefore relies on the usage of URI References (See [18], Section URI Reference) to be linked with its respective users in the model.

To guarantee the compatibility between configurations of the `LdCom` module and the `LdCom Proxy`, required parameters and containers are defined by the `LdComUserUriDefSet`. This means that the `LdCom Proxy` as a `LdCom` user shall configure `LdComUserModuleCnf` container (including its sub-containers), which holds the configuration of the `LdComIPdus` it transmits and receives (via dedicated notification callbacks).

There are two alternatives, how the `LdCom Proxy` can be configured:

### ECUC Partition specific `LdCom Proxy` Callbacks

Here, the `LdCom Proxy` as an `LdComUserModule` provides dedicated instances for each configured partition, on which `LdCom` (notification callback) invocations take place. This, however, mandates that it provides multiple main functions, each one bound to the relevant `EcucPartition`. The configured notification callbacks are invoked in the context of one `EcucPartition` only.

### ECUC Partition agnostic `LdCom Proxy` Callbacks

Here, the `LdCom Proxy` provides partition independent notification callback instances, and therefore has to provide one common set of notification callbacks, which are invoked in the context of different `EcucPartitions`. Furthermore, it shall ensure a re-entrant implementation of the notification callbacks for different `LdComIPdus` on different `EcucPartition`.

The `LdCom Proxy` as an `LdComUserModule` is represented by one or several `SwCluCLdComProxyBaseSockets`, configured via a dedicated `LdComUserModuleCnf`. A `SwCluCLdComProxyBaseSocket` is required for each `EcucPartition`, in which the `LdCom Proxy`

- requires direct access to the `LdCom` APIs initiating transmission requests
- provides notification callbacks w.r.t transmission and reception

Effectively, a `SwCluCLdComProxyBaseSocket` links a fixed set of notification callbacks in the `LdCom` to a specific `EcucPartition` in the `LdCom Proxy`. As a consequence, the `LdCom Proxy` has to map each `LdComUserIPdu` via `LdComUserSystemTemplateSignalRef` to an `LdComIPdu`.

The `LdCom` shall provide its APIs for transmission requests of the relevant `LdComIPdus` on the `EcucPartition` configured in the `LdCom Proxy`. Even if the concept of `LdCom` user provides a lot of flexibility to support access by multiple users, including their notifications, some limitations need to be considered. In general, multiple writers can cause race conditions, if the writers are not coordinated. In addition, the behavior of `<LdComUser_LdComCbkJTriggerTransmit>` does not support multiple notified users for the same `LdComIPdu`. Since such a coordination across different Software Clusters is hardly achievable, the following restriction applies:

**[SWS\_SwCluC\_CONSTR\_02546]{DRAFT}** [Sent `LdComIPdu` shall be provided to at most one `Application Software Cluster`.] (*SRS\_SwCluC\_00207*)

In addition, the `LdCom Proxy` does not support a fan out of `LdComIPdus` sent or received via transport protocol API.

**[SWS\_SwCluC\_CONSTR\_02547]{DRAFT}** [`LdComIPdus` sent or received via transport protocol API shall be provided to at most one `Application Software Cluster`.] (*SRS\_SwCluC\_00207*)

Please note that the `PduR` supports a fan-out of TP-connections to upper layers.

#### 7.4.3.4.4 General requirements

**[SWS\_SwCluC\_02502]{DRAFT}** [The `LdCom Proxy` shall support that the `LdComIPdu` Ids of the `LdCom` of the `Host Software Cluster` can change, without reconfiguration or rebuild of the `Application Software Cluster` using these `LdComIPdus`.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02548]{DRAFT}** [The `LdCom Proxy` shall support that the `LdComUserCbkJHandleId` of `LdComUserIPdus` configured in `LdCom` users of the `Application Software Cluster` can change, without reconfiguration or rebuild of the `Host Software Cluster`.] (*SRS\_SwCluC\_00211*)

**[SWS\_SwCluC\_02503]{DRAFT}** [The `LdCom Proxy` shall support the invocation of `LdCom API` from an `Application Software Cluster` in context of the `Host Software Cluster`.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02504]{DRAFT}** [The `LdCom Proxy` shall support the invocation of `LdCom Callback APIs` from the `Host Software Cluster` in context of the `Application Software Cluster`.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02535]{DRAFT}** [If the `<LdComUser_LdComCbkJRxIndication>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUser_CallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUser_CallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_RX_INDICATION`), all the configured `<LdComUser_LdComCbkJRxIndication>` callbacks shall be invoked, when the associated instance of the `SwCluC_LdComProxy_LdComCbkJRxIndication` from the `LdCom Low Proxy` is called.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02536]{DRAFT}** [If the `<LdComUser_LdComCbkJTxConfirmation>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUser_CallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUser_CallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TX_CONFIRMATION`), the configured `<LdComUser_LdComCbkJTxConfirmation>` callback shall be invoked. when the associated instance of the `SwCluC_LdComProxy_LdComCbkJTxConfirmation` from the `LdCom Low Proxy` is called.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02537]{DRAFT}** [If the `<LdComUser_LdComCbkJTriggerTransmit>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUser_CallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUser_CallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TX_TRIGGER_TRANSMIT`), the configured `<LdComUser_LdComCbkJTriggerTransmit>` callback shall be invoked, when the associated instance of the `SwCluC_LdComProxy_LdComCbkJTriggerTransmit` from the `LdCom Low Proxy` is called.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02538]{DRAFT}** [If the `<LdComUser_LdComCbkJCopyRxData>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUser_CallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUser_CallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TP_COPY_RX_DATA`), the configured `<LdComUser_LdComCbkJCopyRxData>` callback shall be invoked, when the associated instance of the `SwCluC_LdComProxy_LdComCbkJCopyRxData` from the `LdCom Low Proxy` is called.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02539]{DRAFT}** [If the `<LdComUser_LdComCbkJStartOfReception>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUser_CallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUser_CallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_RX_START_OF_RECEPTION`), the configured `<LdComUser_LdComCbkJStartOfReception>` callback shall be invoked, when the associated instance of the `SwCluC_LdComProxy_LdComCbkJStartOfReception` from the `LdCom Low Proxy` is called.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02540]{DRAFT}** [If the `<LdComUser_LdComCbkJpRxIndication>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, where the `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_RX_INDICATION`), the configured `<LdComUser_LdComCbkJpRxIndication>` callback shall be invoked, when the associated instance of the `SwCluC_LdComProxy_LdComCbkJpRxIndication` from the `LdCom Low Proxy` is called.](SRS\_SwCluC\_00207)

**[SWS\_SwCluC\_02541]{DRAFT}** [If the `<LdComUser_LdComCbkJpTxConfirmation>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, where the `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_TX_CONFIRMATION`), the configured `<LdComUser_LdComCbkJpTxConfirmation>` callback shall be invoked, when the associated instance of the `SwCluC_LdComProxy_LdComCbkJpTxConfirmation` from the `LdCom Low Proxy` is called.](SRS\_SwCluC\_00207)

**[SWS\_SwCluC\_02542]{DRAFT}** [If the `<LdComUser_LdComCbkJCopyTxData>` notification callback is configured in the `LdCom High Proxy` (via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, where the `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_COPY_TX_DATA`), the configured `<LdComUser_LdComCbkJCopyTxData>` callback shall be invoked, when the associated instance of the `SwCluC_LdComProxy_LdComCbkJCopyTxData` from the `LdCom Low Proxy` is called.](SRS\_SwCluC\_00207)

#### 7.4.3.4.5 LdCom High Proxy

**[SWS\_SwCluC\_02505]{DRAFT}** [The `LdCom High Proxy` shall provide the header file `LdCom.h`.](SRS\_SwCluC\_00207)

**[SWS\_SwCluC\_02506]{DRAFT}** [The `LdCom High Proxy` shall provide the symbolic name values for the `LdComIPdu` IDs, for `LdCom` users in the `Application Software Cluster`.](SRS\_SwCluC\_00207)

**[SWS\_SwCluC\_02507]{DRAFT}** [The `LdCom High Proxy` shall provide the function w.r.t transmission request of a `LdComIPdu`

- `LdCom_Transmit`

required by the `Application Software Cluster`

](SRS\_SwCluC\_00207, SRS\_SwCluC\_00202)

**[SWS\_SwCluC\_02508]{DRAFT}** [If the `LdCom High Proxy` is not connected to the `LdCom Low Proxy`, the function

- `LdCom_Transmit`



of the `LdCom High Proxy` shall return `E_NOT_OK`.] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02509]{DRAFT}** [The `LdCom High Proxy` shall provide the function for transmission request of a signal, according to [\[SWS\\_SwCluC\\_02506\]](#), once per configured `SwCluCLdComProxyBaseSocket`. At the `EcucPartition`, where the `SwCluCNativeBswApi` is set to `true`, the API is provided with the original `Mip LdCom`. For all other `SwCluCLdComProxyBaseSocket` instances, the `Mip LdCom` is replaced by `LdCom_<EcucPartition.ShortName>`.] ([SRS\\_SwCluC\\_00207](#))

### Callback Functions

**[SWS\_SwCluC\_02510]{DRAFT}** [The `LdCom High Proxy` shall support the `<LdComUser_LdComCbkJRxIndication>` notification callback, configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_RX_INDICATION`] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00202](#))

**[SWS\_SwCluC\_02511]{DRAFT}** [The `LdCom High Proxy` shall support the optional `<LdComUser_LdComCbkJTxConfirmation>` notification callback, configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TX_CONFIRMATION`] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00202](#))

Please note that only a single `LdCom` user can be notified with `<LdComUser_LdComCbkJTxConfirmation>`.

**[SWS\_SwCluC\_02512]{DRAFT}** [The `LdCom High Proxy` shall support the optional `<LdComUser_LdComCbkJTriggerTransmit>` notification callback, configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TX_TRIGGER_TRANSMIT`] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00202](#))

Please note that only a single `LdCom` user can be notified with `<LdComUser_LdComCbkJTriggerTransmit>`.

**[SWS\_SwCluC\_02513]{DRAFT}** [The `LdCom High Proxy` shall support the `<LdComUser_LdComCbkJCopyRxData>` notification callback, configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, where the `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TP_COPY_RX_DATA`] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00202](#))

Please note that only a single `LdCom` user can be notified with `<LdComUser_LdComCbkJCopyRxData>`.

**[SWS\_SwCluC\_02514]{DRAFT}** [The `LdCom High Proxy` shall support the `<LdComUser_LdComCbkJStartOfReception>` notification callback configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter where the `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_RX_START_OF_RECEPTION`] ([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00202](#))

Please note that only a single LdCom user can be notified with `<LdComUser_LdComCbkJStartOfReception>`.

**[SWS\_SwCluC\_02515]{DRAFT}** [The `LdCom High Proxy` shall support the `<LdComUser_LdComCbkJTpRxIndication>` notification callback, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, where the `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_RX_INDICATION`] (*SRS\_SwCluC\_00207, SRS\_SwCluC\_00202*)

Please note that only a single LdCom user can be notified with `<LdComUser_LdComCbkJTpRxIndication>`.

**[SWS\_SwCluC\_02516]{DRAFT}** [The `LdCom High Proxy` shall support the `<LdComUser_LdComCbkJTpTxConfirmation>` notification callback, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, where the `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_TX_CONFIRMATION`] (*SRS\_SwCluC\_00207, SRS\_SwCluC\_00202*)

Please note that only a single LdCom user can be notified with `<LdComUser_LdComCbkJTpTxConfirmation>`.

**[SWS\_SwCluC\_02517]{DRAFT}** [The `LdCom High Proxy` shall support the `<LdComUser_LdComCbkJCopyTxData>` notification callback, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, where the `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_COPY_TX_DATA`] (*SRS\_SwCluC\_00207, SRS\_SwCluC\_00202*)

Please note that only a single LdCom user can be notified with `<LdComUser_LdComCbkJCopyTxData>`.

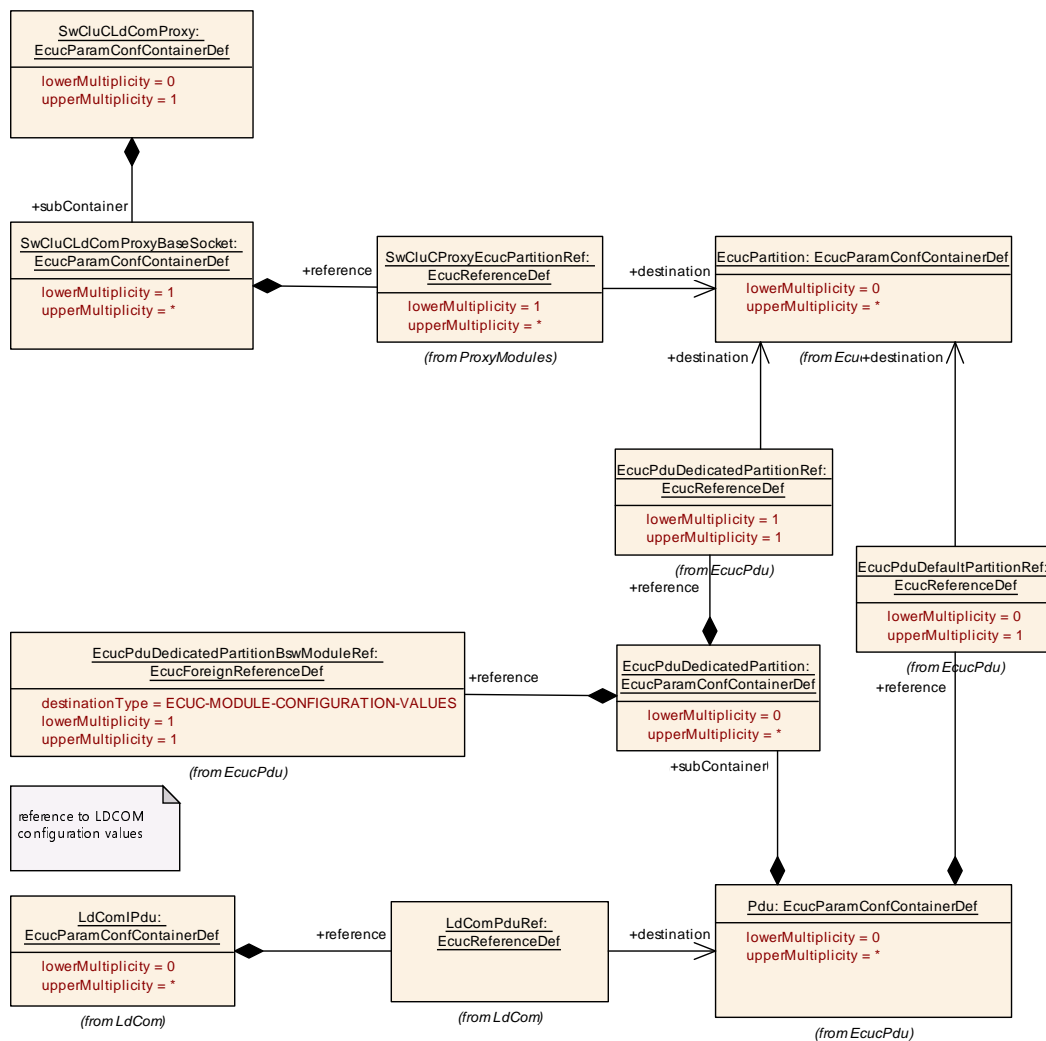
**[SWS\_SwCluC\_02543]{DRAFT}** [The `LdCom High Proxy` shall create, for each `SwCluC_LdComProxyBaseSocket`, a required resource entry in the `Binary Manifest`.] (*SRS\_SwCluC\_00207*)

Please note that the callbacks of the `Application Software Cluster`

- `<LdComUser_LdComCbkJStartOfReception>`
- `<LdComUser_LdComCbkJCopyRxData>`
- `<LdComUser_LdComCbkJCopyTxData>`
- `<LdComUser_LdComCbkJTriggerTransmit>`
- `<LdComUser_LdComCbkJRxIndication>`
- `<LdComUser_LdComCbkJTpRxIndication>`
- `<LdComUser_LdComCbkJTxConfirmation>`
- `<LdComUser_LdComCbkJTpTxConfirmation>`

are connected to the `Host Software Cluster` via the `LdCom` base socket. See [SWS\_SwCluC\_02550]

In the [Application Software Cluster](#), the relationship between a `LdComUserIPdu` and the related `Base Socket` is given indirectly, via the common `EcucPartition(s)` of the `SwCluCLdComProxyBaseSocket.SwCluCProxyEcucPartitionRef` and the `EcucPartition` of the `LdComIPdu`'s referenced `Pdu`. Where the `EcucPartition` of the `Pdu` is given via `Pdu.EcucPduDefaultPartitionRef` or `Pdu.EcucPduDedicatedPartition.EcucPduDedicatedPartitionRef`, where `EcucPduDedicatedPartition` applies for `LdCom` configuration. Those relationships are illustrated in figure 7.16. The reason not to define a dedicated `EcuC` configuration structure for this purpose, is the assumption that the same tools are used to derive the `LdCom` configuration for an [Application Software Cluster](#) and a [Host Software Cluster](#).



**Figure 7.16: LdComIPdus and their relationships to LdCom base sockets via EcucPartition**

[SWS\_SwCluC\_02551]{DRAFT} [The `LdCom High Proxy` shall create for each `LdComIPdu` configured in `LdCom` a required resource entry in the `Binary Manifest`.

Where the `EcucPartition` of the `LdComIPdu`'s `Pdu` given via `Pdu.EcucPduDefaultPartitionRef` or `Pdu.EcucPduDedicatedPartition.EcucPduDedicatedPartitionRef` are relevant to denote the `EcucPartition`.|(SRS\_SwCluC\_00207, SRS\_SwCluC\_00212)

#### 7.4.3.4.6 LdCom Low Proxy

[SWS\_SwCluC\_02518]{DRAFT} [The `LdCom Low Proxy` shall provide the header file `SwCluC_LdComProxy_Cbk.h`.|(SRS\_SwCluC\_00207)

[SWS\_SwCluC\_CONSTR\_02554]{DRAFT} [The `LdComUserHeaderInclude` parameter shall be configured as `SwCluC_LdComProxy_Cbk.h`.|(SRS\_SwCluC\_00211)

[SWS\_SwCluC\_02549]{DRAFT} [The `LdCom Low Proxy` shall provide in its `LdComUserModuleCnf` containers the `LdComUserCbkJdHandleId` values for the configured `LdComUserIPdus`, according to its internal implementation requirements (e.g. to address the `LdCom Low Proxy`'s data structures).|(SRS\_SwCluC\_00211)

The implementation of the `LdCom Low Proxy` may provide some basic infrastructure for the `LdCom High Proxy` in order to be operational. Such generic infrastructure services (including the access to `LdCom APIs` or the callbacks) can be linked between `Application Software Cluster` and `Host Software Clusters` by means of a `LdCom base socket`.

[SWS\_SwCluC\_02519]{DRAFT} [The `LdCom Low Proxy` shall provide the entry function for transmission requests, according to [SWS\_SwCluC\_02506], once per configured `SwCluCLdComProxyBaseSocket` at the `EcucPartition` configured by `SwCluCLdComProxyBaseSocket.SwCluCProxyEcucPartitionRef`.|(SRS\_SwCluC\_00207)

[SWS\_SwCluC\_02520]{DRAFT} [The `LdCom Low Proxy` shall provide for each `SwCluCLdComProxyBaseSocket` a `SwCluC_LdComProxy_Init` API, to initialize the `LdCom High Proxy` of an `Application Software Cluster`.|(SRS\_SwCluC\_00207)

[SWS\_SwCluC\_02521]{DRAFT} [The `LdCom Low Proxy` shall provide an instance of all `SwCluC_LdComProxy_LdComCbkJdRxIndication` notification callbacks, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, with `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) set to `LDCOM_RX_INDICATION`.|(SRS\_SwCluC\_00207)

[SWS\_SwCluC\_CONSTR\_02555]{DRAFT} [Each `SwCluC_LdComProxy_LdComCbkJdRxIndication` notification callback, where the parameter `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_RX_INDICATION`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJdRxIndication`, where `<BS>` is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.|(SRS\_SwCluC\_00207)

**[SWS\_SwCluC\_02522]{DRAFT}** [The `LdCom Low Proxy` shall provide an instance of all `LdComCbkJtxConfirmation` notification callbacks, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, with `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) set to `LDCOM_TX_CONFIRMATION`.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_CONSTR\_02556]{DRAFT}** [Each `SwCluC_LdComProxy_LdComCbkJtxConfirmation` notification callback, where the parameter `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TX_CONFIRMATION`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJtxConfirmation`, where `<BS>` is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02523]{DRAFT}** [The `LdCom Low Proxy` shall provide an instance of all `LdComCbkJtriggerTransmit` notification callbacks, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, with `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) set to `LDCOM_TX_TRIGGER_TRANSMIT`.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_CONSTR\_02557]{DRAFT}** [Each `SwCluC_LdComProxy_LdComCbkJtriggerTransmit` notification callback, where the parameter `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TX_TRIGGER_TRANSMIT`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJtriggerTransmit`, where `<BS>` is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02524]{DRAFT}** [The `LdCom Low Proxy` shall provide an instance of all `LdComCbkJcopyRxData` notification callbacks, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, with `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) set to `LDCOM_TP_COPY_RX_DATA`.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_CONSTR\_02558]{DRAFT}** [Each `SwCluC_LdComProxy_LdComCbkJcopyRxData` notification callback, where the parameter `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_COPY_RX_DATA`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJcopyRxData`, where `<BS>` is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_02525]{DRAFT}** [The `LdCom Low Proxy` shall provide an instance of all `LdComCbkJstartOfReception` notification callbacks, configured via the `LdComUserCallbackName` (See [ECUC\_LdCom\_00023]) parameter, with `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) set to `LDCOM_RX_START_OF_RECEPTION`.] (*SRS\_SwCluC\_00207*)

**[SWS\_SwCluC\_CONSTR\_02559]{DRAFT}** [Each `SwCluC_LdComProxy_LdComCbkJstartOfReception` notification callback, where the parameter `LdComUserCallbackType` (See [ECUC\_LdCom\_00025]) is set to `LDCOM_TP_COPY_RX_DATA`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJcopyRxData`, where



<BS> is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_02526]{DRAFT}** [The `LdCom Low Proxy` shall provide an instance of all `LdComCbkJpRxIndication` notification callbacks, configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, with `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) set to `LDCOM_TP_RX_INDICATION`.]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_CONSTR\_02560]{DRAFT}** [Each `SwCluC_LdComProxy_LdComCbkJpRxIndication` notification callback, where the parameter `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TP_RX_INDICATION`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJpRxIndication`, where <BS> is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_02527]{DRAFT}** [The `LdCom Low Proxy` shall provide an instance of all `LdComCbkJpTxConfirmation` notification callbacks, configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, with the `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) set to `LDCOM_TP_TX_CONFIRMATION`.]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_CONSTR\_02561]{DRAFT}** [Each `SwCluC_LdComProxy_LdComCbkJpTxConfirmation` notification callback, where the parameter `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TP_TX_CONFIRMATION`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJpTxConfirmation`, where <BS> is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_02528]{DRAFT}** [The `LdCom Low Proxy` shall provide an instance of all `SwCluC_LdComProxy_LdComCbkJCopyTxData` notification callbacks, configured via the `LdComUserCallbackName` (See [\[ECUC\\_LdCom\\_00023\]](#)) parameter, with the `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) set to `LDCOM_TP_COPY_TX_DATA`.]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_CONSTR\_02562]{DRAFT}** [Each `SwCluC_LdComProxy_LdComCbkJCopyTxData` notification callback, where the parameter `LdComUserCallbackType` (See [\[ECUC\\_LdCom\\_00025\]](#)) is set to `LDCOM_TP_COPY_TX_DATA`, shall be configured as `SwCluC_LdComProxy_<BS>_LdComCbkJCopyTxData`, where <BS> is the `shortName` of the `SwCluCLdComProxyBaseSocket` container.]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_02529]{DRAFT}** [The notification callback instances according to [\[SWS\\_SwCluC\\_02520\]](#), [\[SWS\\_SwCluC\\_02521\]](#), [\[SWS\\_SwCluC\\_02522\]](#), [\[SWS\\_SwCluC\\_02523\]](#), [\[SWS\\_SwCluC\\_02524\]](#), [\[SWS\\_SwCluC\\_02525\]](#), [\[SWS\\_SwCluC\\_02526\]](#), [\[SWS\\_SwCluC\\_02527\]](#) and [\[SWS\\_SwCluC\\_02528\]](#) are provided

- at the `EcucPartition` of the `SwCluCLdComProxyBaseSocket`, referenced by the `SwCluCLdComProxyBaseSocket` - via `SwCluCLdComProxyUsedSatelliteRef`.

]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_02544]{DRAFT}** [The `LdCom Low Proxy` shall create for each `SwCluCLdComProxyBaseSocket` a provided resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00212](#))

**[SWS\_SwCluC\_02550]{DRAFT}** [The `LdCom base socket` shall implement the connection of the related callback functions

- `SwCluC_LdComProxy_LdComCbkStartOfReception`
- `SwCluC_LdComProxy_LdComCbkCopyRxData`
- `SwCluC_LdComProxy_LdComCbkCopyTxData`
- `SwCluC_LdComProxy_LdComCbkTriggerTransmit`
- `SwCluC_LdComProxy_LdComCbkRxIndication`
- `SwCluC_LdComProxy_LdComCbkTpRxIndication`
- `SwCluC_LdComProxy_LdComCbkTxConfirmation`
- `SwCluC_LdComProxy_LdComCbkTpTxConfirmation`

]([SRS\\_SwCluC\\_00207](#))

**[SWS\_SwCluC\_02530]{DRAFT}** [If the `LdCom Low Proxy` is not connected to the `LdCom High Proxy`, the notification callback functions

- `SwCluC_LdComProxy_LdComCbkStartOfReception`
- `SwCluC_LdComProxy_LdComCbkCopyRxData`
- `SwCluC_LdComProxy_LdComCbkCopyTxData`

of the `LdCom Low Proxy` shall return `BUFREQ_E_NOT_OK`.]([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02531]{DRAFT}** [If the `LdCom Low Proxy` is not connected to the `LdCom High Proxy`, the notification callback function

- `SwCluC_LdComProxy_LdComCbkTriggerTransmit`

of the `LdCom Low Proxy` shall return `E_NOT_OK`.]([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02532]{DRAFT}** [If the `LdCom Low Proxy` is not connected to the `LdCom High Proxy`, the notification callback functions

- `SwCluC_LdComProxy_LdComCbkRxIndication`



- `SwCluC_LdComProxy_LdComCbkJpRxIndication`
- `SwCluC_LdComProxy_LdComCbkJpTxConfirmation`
- `SwCluC_LdComProxy_LdComCbkJpTxConfirmation`

of the `LdCom Low Proxy` shall return without effect.]([SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00213](#))

Conceptually, the `LdCom Proxy` provides `LdComIPdus` with their corresponding notifications for a set of specific `EcucPartitions`. In the simplest case, this is a single `EcucPartition`, where also the `LdCom` module handles the underlying `LdComIPdu`. In case the `LdCom` users as well as the `LdCom` API are unspecific to the `EcucPartitions`, the `LdCom Proxy` provides the same `LdComIPdu` on multiple `EcucPartitions`. Nevertheless, it is possible that the `LdCom Proxy` changes the partition. But be aware that this may have a severe performance impact, if this is used for a larger number of `LdComIPdus`.

In the `Host Software Cluster`, the set of `LdComIPdus` with their corresponding notifications is configured by means of the `SwCluC_LdComProxyBaseSocket.LdComUserModuleCnf`. For those `LdComIPdus`, the related entries in the `Binary Manifest` are created by the `LdCom Low Proxy`.

**[SWS\_SwCluC\_02552]{DRAFT}** [The `LdCom Low Proxy` shall create, for each `LdComUserIPdu` configured in a `SwCluC_LdComProxyBaseSocket.LdComUserModuleCnf`, a provided resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00207](#))

#### 7.4.3.4.7 Error Detection

**[SWS\_SwCluC\_02533]{DRAFT}** [If the development error detection is enabled for the `LdCom High Proxy`, the API

- `LdCom_Transmit`

shall report the DET error `LDCOM_E_UNINIT`, in case the `LdCom High Proxy` is not initialized.]([SRS\\_SwCluC\\_00207](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

**[SWS\_SwCluC\_02534]{DRAFT}** [If the development error detection is enabled for the `LdCom High Proxy`, the API

- `LdCom_Transmit`

shall, when invoked with a `NULL_PTR`, report the DET error `LDCOM_E_PARAM_POINTER`.

]([SRS\\_SwCluC\\_00207](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

### 7.4.3.5 Dcm Proxy

The specified Dcm Proxy has the following underlying design principle:

For diagnostic services accessing data of the ECU's applications, the Dcm requires interfaces to the Software Components, to read or write data values or to control specific functionality. Those interfaces need to be provided by the Software Components that are implementing the regular functionality of the ECU. Therefore, the Dcm Proxy provides the functionality to route these interfaces into the [Application Software Cluster](#). The protocol, session and authentication handling stay in the Dcm of the [Host Software Cluster](#). The configuration whether a sub-service is available at all, including its properties (e.g. a data size or the required diagnostic session), is still located in the Dcm.

For some diagnostic services, the Dcm offers a wide configurability with regard to how the interface to the software components is exactly implemented. E.g., the access to a diagnostic data can be done either with a client server interface for synchronous access, or a client server interface for asynchronous access, or a sender receiver interface. Furthermore, additional sub-options are possible.

To avoid configuration dependencies from the [Host Software Cluster](#) to detailed interface decisions in the [Application Software Clusters](#), the Dcm Proxy uses a more generic interface to connect to the Dcm. The configuration of interface specialization is done in the [Application Software Clusters](#).

In general, this specification refers to the [Standardized AUTOSAR Interfaces of the Dcm](#)

#### 7.4.3.5.1 Enable Dcm Proxy Generation

**[SWS\_SwCluC\_02338]{DRAFT}** [The [Dcm High Proxy](#) code, and related AUTOSAR model descriptions, shall only be created if the configuration parameter [SwCluCProxyGenerationDcm](#) is set to [HIGH\\_PROXY](#).] ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00204](#))

**[SWS\_SwCluC\_02339]{DRAFT}** [The [Dcm Low Proxy](#) code, and related AUTOSAR model descriptions, shall only be created if the configuration parameter [SwCluCProxyGenerationDcm](#) is set to [LOW\\_PROXY](#).] ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00204](#))

#### 7.4.3.5.2 Dcm High Proxy

**[SWS\_SwCluC\_02300]{DRAFT}** [The [Dcm High Proxy](#) shall provide the header file [Dcm.h](#).] ([SRS\\_SwCluC\\_00208](#))

### Multiple Partitions

**[SWS\_SwCluC\_02341]{DRAFT}** [The `Dcm High Proxy` shall create one partition specific Service Software Component per configured `EcucPartition`, with the name `Dcm_<EcucPartition shortName>`.] (*SRS\_SwCluC\_00208*)

**[SWS\_SwCluC\_02342]{DRAFT}** [The `Dcm High Proxy` shall provide the Ports belonging to a specific interface connection at the partition specific Service Software Component, at the given `EcucPartition` of the proxy channel, configured via

- `SwCluCdcmProxyDiagnosticData.SwCluCProxyEcucPartitionRef`
- OR
- `SwCluCdcmProxyRoutineControl.SwCluCProxyEcucPartitionRef`
- OR
- `SwCluCdcmProxyServiceRequestNotification.SwCluCProxyEcucPartitionRef`

] (*SRS\_SwCluC\_00208*)

### Binary Manifest

The implementation of the `Dcm High Proxy` may require some basic infrastructure from the `Dcm Low Proxy` in order to be operational. Such generic infrastructure services can be linked between `Application Software Cluster` and `Host Software Cluster` by means of a `Dcm` base socket.

**[SWS\_SwCluC\_02390]{DRAFT}** [The `Dcm High Proxy` shall create for each `SwCluCdcmProxyBaseSocket` a required resource entry in the `Binary Manifest`.] (*SRS\_SwCluC\_00212*)

#### 7.4.3.5.2.1 Diagnostic Data proxy

The `diagnostic data proxy` provides access to diagnostic data in `Application Software Clusters`, which can be accessed by diagnostic services via the `Dcm` in the `Host Software Cluster`.

Service ID	Service name
UDS 0x22	ReadDataByIdentifier
UDS 0x24	ReadScalingDataByIdentifier
UDS 0x2E	WriteDataByIdentifier
UDS 0x2F	InputOutputControlByIdentifier
OBD \$01	Request Current Powertrain Diagnostic Data
OBD \$09	Request Vehicle Information

**Table 7.3: Diagnostic Services for diagnostic data proxy**

In addition, the `diagnostic data proxy` is also used by the `Dem` to access diagnostic data for freeze frame capturing.

## DataServices\_{Data} ports

The `DataServices_{Data}` ports are used to access single diagnostic data elements.

**[SWS\_SwCluC\_02301]{DRAFT}** [The `Dcm High Proxy` shall support the configuration of `DataServices_{Data}` `RPortPrototypes` for synchronous `ClientServerInterface` `DataServices_{Data}` for a `SwCluCdcmProxyDiagnosticData` referencing via `SwCluCdcmProxyDataRef` a `DcmDspData` or a `DcmDspPidService01`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00201*)

Note: In the corresponding `Dcm` configuration, `DcmDspDataUsePort` will usually be set to `USE_DATA_SYNCH_CLIENT_SERVER`.

**[SWS\_SwCluC\_02302]{DRAFT}** [The `Dcm High Proxy` shall support the configuration of `DataServices_{Data}` `RPortPrototypes` for asynchronous `ClientServerInterface` `DataServices_{Data}` without parameter `ErrorCode`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00201*)

Note: In the corresponding `Dcm` configuration, `DcmDspDataUsePort` will usually be set to `USE_DATA_ASYNC_CLIENT_SERVER`.

**[SWS\_SwCluC\_02303]{DRAFT}** [The `Dcm High Proxy` shall support the configuration of `DataServices_{Data}` `RPortPrototypes` for asynchronous `ClientServerInterface` `DataServices_{Data}` with parameter `ErrorCode`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00201*)

Note: In the corresponding `Dcm` configuration, `DcmDspDataUsePort` will usually be set to `USE_DATA_ASYNC_CLIENT_SERVER_ERROR`.

**[SWS\_SwCluC\_02304]{DRAFT}** [In case the `SwCluCdcmProxyDiagnosticData` channel related to a `DataServices_{Data}` `PortPrototypes` is connected, the `Dcm Proxy` shall invoke the

- `ReadData` operation, when the corresponding `Xxx_ReadData` API is called in the `Dcm Low Proxy`,
- OR
- `WriteData` operation, when the corresponding `Xxx_WriteData` API is called in the `Dcm Low Proxy`,
- OR
- `ReadDataLength` operation, when the corresponding `Xxx_ReadDataLength` API is called in the `Dcm Low Proxy`,
- OR
- `ConditionCheckRead` operation, when the corresponding `Xxx_ConditionCheckRead` API is called in the `Dcm Low Proxy`,
- OR

- `GetScalingInformation` operation, when the corresponding `Xxx_GetScalingInformation` API is called in the `Dcm Low Proxy`,  
OR
- `ReturnControlToECU` operation, when the corresponding `Xxx_ReturnControlToECU` API is called in the `Dcm Low Proxy`,  
OR
- `ResetToDefault` operation, when the corresponding `Xxx_ResetToDefault` API is called in the `Dcm Low Proxy`,  
OR
- `FreezeCurrentState` operation, when the corresponding `Xxx_FreezeCurrentState` API is called in the `Dcm Low Proxy`,  
OR
- `ShortTermAdjustment` operation, when the corresponding `Xxx_ShortTermAdjustment` API is called in the `Dcm Low Proxy`.

In that case, IN arguments (`Data` (if applicable), `OpStatus` (if applicable), `controlMask` (if applicable) and `ControlStateInfo` (if applicable)) are passed to the client, and OUT arguments (`Data` (if applicable), `ScalingInfo` (if applicable), `ErrorCode` (if applicable)) and application errors are transferred back to the caller of the `Dcm Low Proxy`.] (*SRS\_SwCluC\_00208*)

**[SWS\_SwCluC\_02305]{DRAFT}** [In case the operations in the `DataServices_{Data} ClientServerInterface` do not have a `controlMask` argument configured, the value is discarded without checking the passed `controlMaskLength`.] (*SRS\_SwCluC\_00208*)

**[SWS\_SwCluC\_02306]{DRAFT}** [In case the operations in the `DataServices_{Data} ClientServerInterface` do not have an `ErrorCode` argument configured, the default value `DCM_POS_RESP` is transferred back to the caller of the `Dcm Low Proxy` in case the caller returned `E_OK`.] (*SRS\_SwCluC\_00208*)

**[SWS\_SwCluC\_02307]{DRAFT}** [In case the `DataServices_{Data} RPortPrototype` is unconnected, the application error `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE` is transferred back to the caller of the `Dcm Low Proxy`.] (*SRS\_SwCluC\_00208*)

**[SWS\_SwCluC\_02308]{DRAFT}** [In case the passed `DataLength`, `ScalingInfoLength`, or `controlMaskLength` (if applicable, see [\[SWS\\_SwCluC\\_02305\]](#)) of the caller of the `Dcm Low Proxy` do not match the configured data size in the `Dcm` configuration in the `Application Software Cluster`, the application error `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE` is transferred back to the caller of the `Dcm Low Proxy`. No data, `scalingInfo` or `controlMask` values shall be transferred in this case.] (*SRS\_SwCluC\_00208*)

Please note: In case the data has dynamic length configured in the [Application Software Cluster](#) for this diagnostic data element, the `DataLength` cannot be checked.

### DataServices\_{Data} via sender-receiver / nv-data interfaces

[SWS\_SwCluC\_02309]{DRAFT} [The `Dcm High Proxy` shall support the configuration of `DataServices_{Data} RPortPrototypes` for `SenderReceiverInterface/NvDataInterface DataServices_{Data}`]. ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00201](#))

Note: In the corresponding `Dcm` configuration, `DcmDspDataUsePort` will usually be set to `USE_DATA_SENDER_RECEIVER` or `USE_DATA_SENDER_RECEIVER_AS_SERVICE` AND the related parameters `DcmDspDidRead` will not exist AND `DcmDspDidWrite` will not exist.

[SWS\_SwCluC\_02310]{DRAFT} [The `Dcm High Proxy` shall support the configuration of `DataServices_{Data} PPortPrototypes` for `SenderReceiverInterface/NvDataInterface DataServices_{Data}`]. ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00201](#))

Note: In the corresponding `Dcm` configuration, `DcmDspDataUsePort` will usually be set to `USE_DATA_SENDER_RECEIVER` or `USE_DATA_SENDER_RECEIVER_AS_SERVICE` AND the related parameters `DcmDspDidRead` will not exist AND `DcmDspDidWrite` will exist.

[SWS\_SwCluC\_02311]{DRAFT} [The `Dcm High Proxy` shall support the configuration of `DataServices_{Data} PRPortPrototypes` for `SenderReceiverInterface/NvDataInterface DataServices_{Data}`]. ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00201](#))

Note: In the corresponding `Dcm` configuration, `DcmDspDataUsePort` will usually be set to `USE_DATA_SENDER_RECEIVER` or `USE_DATA_SENDER_RECEIVER_AS_SERVICE` AND the related parameters `DcmDspDidRead` will exist AND `DcmDspDidWrite` will not exist.

[SWS\_SwCluC\_02312]{DRAFT} [In case the `SwCluCdcmProxyDiagnosticData` channel related to a `DataServices_{Data} PortPrototypes` is connected, the `Dcm Proxy` shall

- read the `dataElement/nvData`, when the corresponding `Xxx_ReadData` API is called in the `Dcm Low Proxy`,
- OR
- write the `dataElement/nvData`, when the corresponding `Xxx_WriteData` API is called in the `Dcm Low Proxy`.

In that case `IN` argument `Data` (if applicable) is sent to the receiver, and `OUT` argument `Data` (if applicable) is transferred back to the caller of the `Dcm Low Proxy`. ([SRS\\_SwCluC\\_00208](#))



**[SWS\_SwCluC\_02313]{DRAFT}** [In case the `DataServices_{Data} SenderReceiverInterface/NvDataInterface` is configured, the default value `DCM_POS_RESP` as `ErrorCode` is transferred back to the caller of the `Dcm Low Proxy` for any connected `RPortPrototype` and any connected or unconnected `PPortPrototype` or `PRPortPrototype`.] (*SRS\_SwCluC\_00208*)

**[SWS\_SwCluC\_02314]{DRAFT}** [In case the `DataServices_{Data} RPortPrototype`, `PPortPrototype` or `PRPortPrototype` is unconnected, the return value `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE` is transferred back to the caller of the `Dcm Low Proxy`.] (*SRS\_SwCluC\_00208*)

**[SWS\_SwCluC\_02315]{DRAFT}** [In case the passed `DataLength` of the caller of the `Dcm Low Proxy` does not match the configured data size in the `Dcm` configuration in the `Application Software Cluster`, the return value `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE` is transferred back to the caller of the `Dcm Low Proxy`. No data shall be transferred in this case.] (*SRS\_SwCluC\_00208*)

### DataServices\_{DID} ports

The `DataServices_{DID}` ports are used to access entire data belonging to a DID.

**[SWS\_SwCluC\_02316]{DRAFT}** [The `Dcm High Proxy` shall support the configuration of `DataServices_{DID} RPortPrototypes` for `SenderReceiverInterface DataServices_{DID}`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00201*)

Note: In the corresponding `Dcm` configuration, `DcmDspDidUsePort` will usually be set to `USE_ATOMIC_SENDER_RECEIVER_INTERFACE` or `USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE` AND the related parameters `DcmDspDidRead` will exist AND `DcmDspDidWrite` will not exist OR `DcmDspDidControl` will exist.

**[SWS\_SwCluC\_02317]{DRAFT}** [The `Dcm High Proxy` shall support the configuration of `DataServices_{DID} PPortPrototypes` for `SenderReceiverInterface DataServices_{DID}`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00201*)

Note: In the corresponding `Dcm` configuration, `DcmDspDidUsePort` will usually be set to `USE_ATOMIC_SENDER_RECEIVER_INTERFACE` or `USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE` AND the related parameters `DcmDspDidRead` will not exist AND `DcmDspDidWrite` will exist OR `DcmDspDidControl` will exist.

**[SWS\_SwCluC\_02318]{DRAFT}** [The `Dcm High Proxy` shall support the configuration of `DataServices_{DID} PRPortPrototypes` for `SenderReceiverInterface DataServices_{DID}`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00201*)

Note: In the corresponding `Dcm` configuration, `DcmDspDidUsePort` will usually be set to `USE_ATOMIC_SENDER_RECEIVER_INTERFACE`, `USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE`, or `USE_ATOMIC_NV_DATA_INTERFACE` AND the related parameters `DcmDspDidRead` will exist AND `DcmDspDidWrite` will exist OR `DcmDspDidControl` will exist.



**[SWS\_SwCluC\_02319]{DRAFT}** [In case the [SwCluCcmProxyDiagnosticData](#) channel related to a [DataServices\\_{DID}](#) [PortPrototypes](#) is connected, the Dcm Proxy shall

- read the [dataElement](#), when the corresponding [Xxx\\_ReadData](#) API is called in the [Dcm Low Proxy](#),
- OR
- write the [dataElement](#), when the corresponding [Xxx\\_WriteData](#) API is called in the [Dcm Low Proxy](#),

In that case, IN argument [Data](#) (if applicable) is sent to the receiver and OUT argument [Data](#) (if applicable) is transferred back to the caller of the [Dcm Low Proxy](#).] ([SRS\\_SwCluC\\_00208](#))

**[SWS\_SwCluC\_02320]{DRAFT}** [In case the [DataServices\\_{DID}](#) [SenderReceiverInterface](#) is configured, the default value [DCM\\_POS\\_RESP](#) as [Error-Code](#) is transferred back to the caller of the [Dcm Low Proxy](#) for any connected [RPortPrototype](#) and any connected or unconnected [PPortPrototype](#) or [PR-PortPrototype](#).] ([SRS\\_SwCluC\\_00208](#))

**[SWS\_SwCluC\_02321]{DRAFT}** [In case the [DataServices\\_{DID}](#) [RPortPrototype](#) is unconnected, the return value [E\\_NOT\\_OK](#) and the [ErrorCode](#) [DCM\\_E\\_REQUESTOUTOFRANGE](#) is transferred back to the caller of the [Dcm Low Proxy](#).] ([SRS\\_SwCluC\\_00208](#))

**[SWS\_SwCluC\_02322]{DRAFT}** [In case the passed [DataLength](#) of the caller of the [Dcm Low Proxy](#) does not match the configured data size in the [Dcm](#) configuration in the [Application Software Cluster](#), the return value [E\\_NOT\\_OK](#) and the [ErrorCode](#) [DCM\\_E\\_REQUESTOUTOFRANGE](#) is transferred back to the caller of the [Dcm Low Proxy](#). No data shall be transferred in this case.] ([SRS\\_SwCluC\\_00208](#))

### **IOControlRequest\_{DID} and IOControlResponse\_{DID} ports**

The [IOControlRequest\\_{DID}](#) and [IOControlResponse\\_{DID}](#) sender-receiver ports are used for the Service [0x2F](#) - [InputOutputControlByIdentifier](#) as an alternative to the [DataServices\\_{Data}](#) client-server ports

**[SWS\_SwCluC\_02323]{DRAFT}** [The [Dcm High Proxy](#) shall support the configuration of [IOControlRequest\\_{DID}](#) [RPortPrototypes](#) for [SenderReceiverInterface](#) [IOControlRequest\\_{DID}](#).] ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02324]{DRAFT}** [The [Dcm High Proxy](#) shall support the configuration of [IOControlResponse\\_{DID}](#) [RPortPrototypes](#) for [SenderReceiverInterface](#) [IOControlResponse\\_{DID}](#).] ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00201](#))

Note: In the corresponding Dcm configuration, `DcmDspDidUsePort` will usually be set to `USE_ATOMIC_SENDER_RECEIVER_INTERFACE` or `USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE` and the related container `DcmDspDid` will exist.

[SWS\_SwCluC\_02325]{DRAFT} [In case the `SwCluCcmProxyDiagnosticData` channel, related to a `IOControlRequest_{DID}` and `IOControlResponse_{DID}` sender-receiver port, is connected, the Dcm Proxy shall:

- calculate the `underControl`, `IOOperationRequest` and `controlState` data elements, according to [SWS\_Dcm\_01435], [SWS\_Dcm\_00682], [SWS\_Dcm\_01436], [SWS\_Dcm\_01437], [SWS\_Dcm\_01438], [SWS\_Dcm\_01275], [SWS\_Dcm\_01277] AND
- return the `IOOperationResponse`, according to [SWS\_Dcm\_01439], [SWS\_Dcm\_01440], and [SWS\_Dcm\_01441], when the corresponding `Xxx_ReadData`, `Xxx_WriteData`, `Xxx_ReturnControlToECU`, `Xxx_ResetToDefault`, `Xxx FreezeCurrentState`, or `Xxx_ShortTermAdjustment` API is called in the `Dcm Low Proxy`.

](SRS\_SwCluC\_00208)

## Binary Manifest

[SWS\_SwCluC\_02391]{DRAFT} [The `Dcm High Proxy` shall create for each `diagnostic data proxy` - configured via `SwCluCcmProxyDiagnosticData` container - a provided resource entry in the `Binary Manifest`.](SRS\_SwCluC\_00212)

### 7.4.3.5.2.2 Routine Control proxy

The `routine control proxy` provides access to routine control services in `Application Software Clusters`, which can be accessed by UDS diagnostic services `0x31 RoutineControl` via the `Dcm` in the `Host Software Cluster`.

#### RoutineServices\_{RoutineName} ports

[SWS\_SwCluC\_02330]{DRAFT} [The `Dcm High Proxy` shall support the configuration of `RoutineServices_{RoutineName}` `RPortPrototypes` for `ClientServerInterface` `RoutineServices_{RoutineName}`.](SRS\_SwCluC\_00208, SRS\_SwCluC\_00201)

[SWS\_SwCluC\_02331]{DRAFT} [In case the `SwCluCcmProxyRoutineControl` channel related to a `RoutineServices_{RoutineName}` `RPortPrototypes` is connected, the Dcm Proxy shall invoke the

- Start `operation`, when the corresponding `Xxx_Start` API is called in the `Dcm Low Proxy`,

OR

- StartConfirmation operation, when the corresponding Xxx\_StartConfirmation API is called in the Dcm Low Proxy,  
OR
- Stop operation, when the corresponding Xxx\_Stop API is called in the Dcm Low Proxy,  
OR
- StopConfirmation operation, when the corresponding Xxx\_StopConfirmation API is called in the Dcm Low Proxy,  
OR
- RequestResults operation, when the corresponding Xxx\_RequestResults API is called in the Dcm Low Proxy,  
OR
- RequestResultsConfirmation operation, when the corresponding Xxx\_RequestResultsConfirmation API is called in the Dcm Low Proxy,

In this case, INOUT arguments (dataInOut (if applicable)) are used to transfer the individual dataIn signals to the client, and to transfer back the individual dataOut signals as joint array to the caller of the Dcm Low Proxy. The configuration of the operations in the ClientServerInterfaces is according to the Dcm configuration of the Application Software Cluster. Additionally, IN arguments OpStatus (if applicable) and ConfirmationStatus (if applicable) are passed to the client, and OUT arguments ErrorCode (if applicable) and application errors are transferred back to the caller of the Dcm Low Proxy.](SRS\_SwCluC\_00208)

**[SWS\_SwCluC\_02332]{DRAFT}** [In case the RoutineServices\_{RoutineName} RPortPrototype is unconnected, the return value E\_NOT\_OK and the ErrorCode DCM\_E\_REQUESTOUTOFRANGE (if applicable) is transferred back to the caller of the Dcm Low Proxy.](SRS\_SwCluC\_00208)

**[SWS\_SwCluC\_02333]{DRAFT}** [In case the passed DataLength of the caller of the Dcm Low Proxy does not match the configured data size in the Dcm configuration in the Application Software Cluster, the return value E\_NOT\_OK and the ErrorCode DCM\_E\_REQUESTOUTOFRANGE is transferred back to the caller of the Dcm Low Proxy. No data shall be transferred in this case.](SRS\_SwCluC\_00208)

Please note: In case dynamic length signals are configured in the Application Software Cluster for this routine control, the DataLength cannot be checked.

## Binary Manifest

**[SWS\_SwCluC\_02392]{DRAFT}** [The Dcm High Proxy shall create for each routine control proxy - configured via SwCluCdmProxyRoutineControl container - a provided resource entry in the Binary Manifest.](SRS\_SwCluC\_00212)

### 7.4.3.5.2.3 Service Request Notification proxy

The service request notification proxy provides access to the service request manufacturer notification and service request supplier notification

#### ServiceRequestManufacturerNotification\_{Name} ports

[SWS\_SwCluC\_02334]{DRAFT} [The [Dcm High Proxy](#) shall support the configuration of [ServiceRequestManufacturerNotification\\_{Name} RPortPrototypes](#) for [ClientServerInterface ServiceRequestManufacturerNotification\\_{Name}](#).] ([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00201](#))

#### ServiceRequestSupplierNotification\_{Name} ports

[SWS\_SwCluC\_02335]{DRAFT} [The [Dcm High Proxy](#) shall support the configuration of [ServiceRequestSupplierNotification\\_{Name} RPortPrototypes](#) for [ClientServerInterface ServiceRequestSupplierNotification\\_{Name}](#).] ([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02336]{DRAFT} [In case the [SwCluCdcmProxyServiceRequestNotification](#) channel related to a [ServiceRequestManufacturerNotification\\_{Name}](#) or [ServiceRequestSupplierNotification\\_{Name}](#) [RPortPrototypes](#) is connected, the Dcm Proxy shall invoke the

- Confirmation operation, when the corresponding [Xxx\\_Confirmation](#) API is called in the [Dcm Low Proxy](#),
- OR
- Indication operation, when the corresponding [Xxx\\_Indication](#) API is called in the [Dcm Low Proxy](#).

In this case, IN arguments [[SID](#) (if applicable), [ReqType](#) (if applicable), [ConnectionId](#) (if applicable), [ConfirmationStatus](#) (if applicable), [ProtocolType](#) (if applicable), [TesterSourceAddress](#) (if applicable), [RequestData](#) (if applicable), [DataSize](#) (if applicable)] are passed to the client and OUT arguments [[ErrorCode](#) (if applicable)] and application errors are transferred back to the caller of the [Dcm Low Proxy](#).] ([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02337]{DRAFT} [In case the [ServiceRequestManufacturerNotification\\_{Name}](#) or [ServiceRequestSupplierNotification\\_{Name}](#) [RPortPrototype](#) is unconnected, the return value [E\\_NOT\\_OK](#) and the [ErrorCode](#) [DCM\\_E\\_REQUESTOUTOFRANGE](#) (if applicable) is transferred back to the caller of the [Dcm Low Proxy](#).] ([SRS\\_SwCluC\\_00208](#))

#### Binary Manifest

[SWS\_SwCluC\_02393]{DRAFT} [The [Dcm High Proxy](#) shall create for each [service request notification proxy](#) - configured via [SwCluCdcmProxyServiceRequestNotification](#) container - a provided resource entry in the [Binary Manifest](#).] ([SRS\\_SwCluC\\_00212](#))

### 7.4.3.5.3 Dcm Low Proxy

#### 7.4.3.5.3.1 Diagnostic Data proxy

##### ReadData

[SWS\_SwCluC\_02350]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_ReadData` function per configured `SwCluCdcmProxyDiagnosticData` container in the `Dcm Low Proxy`, if the `diagnostic data element read access` is enabled.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02351]{DRAFT} [The `Xxx_ReadData` function shall be named `SwCluC_DcmProxy_ReadData_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02352]{DRAFT} [The `diagnostic data element read access` for a `SwCluCdcmProxyDiagnosticData` is enabled, if:

- `SwCluCdcmProxyDataRef` references a `DcmDspData` AND the corresponding `DcmDspDid` has a `DcmDspDidRead` configured in its related `DcmDspDidInfo`
- OR
- `SwCluCdcmProxyDataRef` references a `DcmDspDid`, which has a `DcmDspDidRead` configured in its related `DcmDspDidInfo`
- OR
- `SwCluCdcmProxyDataRef` references a `DcmDspPidService01`
- OR
- `SwCluCdcmProxyDataRef` references a `DemDataElementClass`

](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02380]{DRAFT} [The `Xxx_ReadData` function of `Dcm Low Proxy` shall return `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE`, if the corresponding `diagnostic data proxy` is not connected to an instance in the `Dcm High Proxy`. No data is returned in this case.](SRS\_SwCluC\_00208, SRS\_SwCluC\_00213)

##### WriteData

[SWS\_SwCluC\_02353]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_WriteData` function per configured `SwCluCdcmProxyDiagnosticData` container in the `Dcm Low Proxy`, if the `diagnostic data element write access` is enabled.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02354]{DRAFT} [The `Xxx_WriteData` function shall be named `SwCluC_DcmProxy_WriteData_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02355]{DRAFT} [The diagnostic data element write access for a `SwCluCdcMProxyDiagnosticData` is enabled, if:

- `SwCluCdcMProxyDataRef` references a `DcmDspData` AND the corresponding `DcmDspDid` has a `DcmDspDidWrite` configured in its related `DcmDspDidInfo`
- OR
- `SwCluCdcMProxyDataRef` references a `DcmDspDid`, which has a `DcmDspDidWrite` configured in its related `DcmDspDidInfo`

]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02381]{DRAFT} [The `Xxx_WriteData` function of `Dcm Low Proxy` shall return `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE`, if the corresponding `diagnostic data proxy` is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### ReadDataLength

[SWS\_SwCluC\_02356]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_ReadDataLength` function per configured `SwCluCdcMProxyDiagnosticData` container in the `Dcm Low Proxy`, if the `diagnostic data element read data length access` is enabled.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02357]{DRAFT} [The `Xxx_ReadDataLength` function shall be named `SwCluC_DcmProxy_ReadDataLength_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCdcMProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02358]{DRAFT} [The diagnostic data element read data length access for a `SwCluCdcMProxyDiagnosticData` is enabled, if:

- `SwCluCdcMProxyDataRef` references a `DcmDspData` AND the corresponding `DcmDspDid` has a `DcmDspDidRead` configured in its related `DcmDspDidInfo`
- AND
- the `DcmDspDataType` is set to `UINT8_DYN`.

]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02382]{DRAFT} [The `Xxx_ReadDataLength` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding `diagnostic data proxy` is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### ConditionCheckRead

[SWS\_SwCluC\_02359]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_ConditionCheckRead` function per configured `SwCluCdcMProxyDiagnosticData` container in the `Dcm Low Proxy`, if the `diagnostic data element condition check read access` is enabled.]([SRS\\_SwCluC\\_00208](#))



[SWS\_SwCluC\_02360]{DRAFT} [The `Xxx_ConditionCheckRead` function shall be named `SwCluC_DcmProxy_ConditionCheckRead_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCDcmProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02361]{DRAFT} [The diagnostic data element condition check read access for a `SwCluCDcmProxyDiagnosticData` is enabled, if:

- `SwCluCDcmProxyDataRef` references a `DcmDspData` AND the corresponding `DcmDspDid` has a `DcmDspDidRead` configured in its related `DcmDspDidInfo`  
AND
- the parameter `DcmDspDataConditionCheckReadFncUsed` is set to `true`.

]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02383]{DRAFT} [The `Xxx_ConditionCheckRead` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding diagnostic data proxy is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### GetScalingInformation

[SWS\_SwCluC\_02362]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_GetScalingInformation` function per configured `SwCluCDcmProxyDiagnosticData` container in the `Dcm Low Proxy`, if the diagnostic data element scaling information access is enabled.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02363]{DRAFT} [The `Xxx_GetScalingInformation` function shall be named `SwCluC_DcmProxy_GetScalingInformation_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCDcmProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02364]{DRAFT} [The diagnostic data element scaling information access for a `SwCluCDcmProxyDiagnosticData` is enabled, if:

- `SwCluCDcmProxyDataRef` references a `DcmDspData`  
AND
- the corresponding `DcmDspDataScalingInfoSize` is configured in its related `DcmDspDataInfo`.

]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02384]{DRAFT} [The `Xxx_GetScalingInformation` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding diagnostic data proxy is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### ReturnControlToECU



[SWS\_SwCluC\_02365]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_ReturnControlToECU` function per configured `SwCluCdcmProxyDiagnosticData` container in the `Dcm Low Proxy`, if the diagnostic data element `return control to ECU` is enabled.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02366]{DRAFT} [The `Xxx_ReturnControlToECU` function shall be named `SwCluC_DcmProxy_ReturnControlToECU_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02367]{DRAFT} [The diagnostic data element `return control to ECU` for a `SwCluCdcmProxyDiagnosticData` is enabled, if:

- `SwCluCdcmProxyDataRef` references a `DcmDspData`
- AND
- the corresponding `DcmDspDid` has a `DcmDspDidControl` configured in its related `DcmDspDidInfo`
- AND
- the parameter `DcmDspDidFreezeCurrentState` is set to `true`.

](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02385]{DRAFT} [The `Xxx_ReturnControlToECU` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding diagnostic data proxy is not connected to an instance in the `Dcm High Proxy`.](SRS\_SwCluC\_00208, SRS\_SwCluC\_00213)

### ResetToDefault

[SWS\_SwCluC\_02368]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_ResetToDefault` function per configured `SwCluCdcmProxyDiagnosticData` container in the `Dcm Low Proxy`, if the diagnostic data element `reset to default` is enabled.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02369]{DRAFT} [The `Xxx_ResetToDefault` function shall be named `SwCluC_DcmProxy_ResetToDefault_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02370]{DRAFT} [The diagnostic data element `reset to default` for a `SwCluCdcmProxyDiagnosticData` is enabled, if:

- `SwCluCdcmProxyDataRef` references a `DcmDspData`
- AND
- the corresponding `DcmDspDid` has a `DcmDspDidControl` configured in its related `DcmDspDidInfo`
- AND

- the parameter `DcmDspDidResetToDefault` is set to `true`.

](SRS\_SwCluC\_00208)

**[SWS\_SwCluC\_02386]{DRAFT}** [The `Xxx_ResetToDefault` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding diagnostic data proxy is not connected to an instance in the `Dcm High Proxy`.](SRS\_SwCluC\_00208, SRS\_SwCluC\_00213)

### FreezeCurrentState

**[SWS\_SwCluC\_02371]{DRAFT}** [The `Dcm Low Proxy` shall provide an instance of a `Xxx_FreezeCurrentState` function per configured `SwCluCdcmProxyDiagnosticData` container in the `Dcm Low Proxy`, if the diagnostic data element `freeze current state` is enabled.](SRS\_SwCluC\_00208)

**[SWS\_SwCluC\_02372]{DRAFT}** [The `Xxx_FreezeCurrentState` function shall be named `SwCluC_DcmProxy_FreezeCurrentState_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.](SRS\_SwCluC\_00208)

**[SWS\_SwCluC\_02373]{DRAFT}** [The diagnostic data element `freeze current state` for a `SwCluCdcmProxyDiagnosticData` is enabled, if

- `SwCluCdcmProxyDataRef` references a `DcmDspData`

AND

- the corresponding `DcmDspDid` has a `DcmDspDidControl` configured in its related `DcmDspDidInfo`

AND

- the parameter `DcmDspDidFreezeCurrentState` is set to `true`.

](SRS\_SwCluC\_00208)

**[SWS\_SwCluC\_02387]{DRAFT}** [The `Xxx_FreezeCurrentState` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding diagnostic data proxy is not connected to an instance in the `Dcm High Proxy`.](SRS\_SwCluC\_00208, SRS\_SwCluC\_00213)

### ShortTermAdjustment

**[SWS\_SwCluC\_02374]{DRAFT}** [The `Dcm Low Proxy` shall provide an instance of a `Xxx_ShortTermAdjustment` function per configured `SwCluCdcmProxyDiagnosticData` container in the `Dcm Low Proxy`, if the diagnostic data element `short term adjustment` is enabled.](SRS\_SwCluC\_00208)

**[SWS\_SwCluC\_02375]{DRAFT}** [The `Xxx_ShortTermAdjustment` function shall be named `SwCluC_DcmProxy_ShortTermAdjustment_<DDSN>`, where `<DDSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.](SRS\_SwCluC\_00208)

[SWS\_SwCluC\_02376]{DRAFT} [The diagnostic data element short term adjustment for a `SwCluCdmProxyDiagnosticData` is enabled, if

- `SwCluCdmProxyDataRef` references a `DcmDspData`

AND

- the corresponding `DcmDspDid` has a `DcmDspDidControl` configured in its related `DcmDspDidInfo`

AND

- the parameter `DcmDspDidShortTermAdjustment` is set to `true`.

]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02388]{DRAFT} [The `Xxx_ShortTermAdjustment` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding diagnostic data proxy is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### Binary Manifest

[SWS\_SwCluC\_02394]{DRAFT} [The `Dcm Low Proxy` shall create for each diagnostic data proxy - configured via `SwCluCdmProxyDiagnosticData` container - a required resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00212](#))

### 7.4.3.5.3.2 Routine Control proxy

#### Start Operation

[SWS\_SwCluC\_02400]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_Start` function per configured `SwCluCdmProxyRoutineControl` container in the `Dcm Low Proxy`.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02401]{DRAFT} [The `Xxx_Start` function shall be named `SwCluC_DcmProxy_Start_<RCSN>`, where `<RCSN>` is the `shortName` of the `SwCluCdmProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02402]{DRAFT} [The `Xxx_Start` function of `Dcm Low Proxy` shall return `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE`, if the corresponding routine control proxy is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

#### StartConfirmation Operation

[SWS\_SwCluC\_02403]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_StartConfirmation` function per configured `SwCluCdmProxyRoutineControl` container in the `Dcm Low Proxy`.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02404]{DRAFT} [The `Xxx_StartConfirmation` function shall be named `SwCluC_DcmProxy_StartConfirmation_<RCSN>`, where `<RCSN>` is the

`shortName` of the `SwCluCdcmProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02405]{DRAFT} [The `Xxx_StartConfirmation` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding `routine control proxy` is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### Stop Operation

[SWS\_SwCluC\_02406]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_Stop` function per configured `SwCluCdcmProxyRoutineControl` container in the `Dcm Low Proxy`.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02407]{DRAFT} [The `Xxx_Stop` function shall be named `SwCluC_DcmProxy_Stop_<RCSN>`, where `<RCSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02408]{DRAFT} [The `Xxx_Stop` function of `Dcm Low Proxy` shall return `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE`, if the corresponding `routine control proxy` is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### StopConfirmation Operation

[SWS\_SwCluC\_02409]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_StopConfirmation` function per configured `SwCluCdcmProxyRoutineControl` container in the `Dcm Low Proxy`.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02410]{DRAFT} [The `Xxx_StopConfirmation` function shall be named `SwCluC_DcmProxy_StopConfirmation_<RCSN>`, where `<RCSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02411]{DRAFT} [The `Xxx_StopConfirmation` function of `Dcm Low Proxy` shall return `E_NOT_OK` if the corresponding `routine control proxy` is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

### RequestResults Operation

[SWS\_SwCluC\_02412]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_RequestResults` function per configured `SwCluCdcmProxyRoutineControl` container in the `Dcm Low Proxy`.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02413]{DRAFT} [The `Xxx_RequestResults` function shall be named `SwCluC_DcmProxy_RequestResults_<RCSN>`, where `<RCSN>` is the `shortName` of the `SwCluCdcmProxyRoutineControl` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02414]{DRAFT} [The `Xxx_RequestResults` function of `Dcm Low Proxy` shall return `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE`, if the corresponding `routine control proxy` is not connected to an instance in the `Dcm High Proxy`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00213*)

### RequestResultsConfirmation Operation

[SWS\_SwCluC\_02415]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_RequestResultsConfirmation` function per configured `SwCluC_DcmProxyRoutineControl` container in the `Dcm Low Proxy`.] (*SRS\_SwCluC\_00208*)

[SWS\_SwCluC\_02416]{DRAFT} [The `Xxx_RequestResultsConfirmation` function shall be named `SwCluC_DcmProxy_RequestResultsConfirmation_<RCSN>`, where `<RCSN>` is the `shortName` of the `SwCluC_DcmProxyRoutineControl` container.] (*SRS\_SwCluC\_00208*)

[SWS\_SwCluC\_02417]{DRAFT} [The `Xxx_RequestResultsConfirmation` function of `Dcm Low Proxy` shall return `E_NOT_OK`, if the corresponding `routine control proxy` is not connected to an instance in the `Dcm High Proxy`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00213*)

### Binary Manifest

[SWS\_SwCluC\_02395]{DRAFT} [The `Dcm Low Proxy` shall create for each `routine control proxy` - configured via `SwCluC_DcmProxyRoutineControl` container - a required resource entry in the `Binary Manifest`.] (*SRS\_SwCluC\_00212*)

## 7.4.3.5.3.3 Service Request Notification proxy

### Indication Operation

[SWS\_SwCluC\_02418]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_Indication` function per configured `SwCluC_DcmProxyServiceRequestNotification` container in the `Dcm Low Proxy`.] (*SRS\_SwCluC\_00208*)

[SWS\_SwCluC\_02419]{DRAFT} [The `Xxx_Indication` function shall be named `SwCluC_DcmProxy_Indication_<SRNSN>`, where `<SRNSN>` is the `shortName` of the `SwCluC_DcmProxyServiceRequestNotification` container.] (*SRS\_SwCluC\_00208*)

[SWS\_SwCluC\_02420]{DRAFT} [The `Xxx_Indication` function of `Dcm Low Proxy` shall return `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE`, if the corresponding `routine control proxy` is not connected to an instance in the `Dcm High Proxy`.] (*SRS\_SwCluC\_00208*, *SRS\_SwCluC\_00213*)

### Confirmation Operation

[SWS\_SwCluC\_02421]{DRAFT} [The `Dcm Low Proxy` shall provide an instance of a `Xxx_Confirmation` function per configured `SwCluC_DcmProxyServiceRequestNotification` container in the `Dcm Low Proxy`.] (*SRS\_SwCluC\_00208*)

[SWS\_SwCluC\_02422]{DRAFT} [The `Xxx_Confirmation` function shall be named `SwCluC_DcmProxy_Confirmation_<SRNSN>`, where `<SRNSN>` is the `short-Name` of the `SwCluCDcmProxyServiceRequestNotification` container.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02423]{DRAFT} [The `Xxx_Confirmation` function of `Dcm Low Proxy` shall return `E_NOT_OK` and the `ErrorCode` `DCM_E_REQUESTOUTOFRANGE`, if the corresponding `routine control proxy` is not connected to an instance in the `Dcm High Proxy`.]([SRS\\_SwCluC\\_00208](#), [SRS\\_SwCluC\\_00213](#))

## Binary Manifest

[SWS\_SwCluC\_02396]{DRAFT} [The `Dcm Low Proxy` shall create for each `service request notification proxy` - configured via `SwCluCDcmProxyServiceRequestNotification` container - a required resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00212](#))

### 7.4.3.5.3.4 Multiple Partitions

The invoked interface functions need to change the partition in the `Host Software Cluster`, before the calls are ending up in the `Application Software Cluster`, if the `Dcm` module does not offer a satellite on this partition. This partition change can be implemented in the `Low Proxy`, by means of the `SchM` or with platform proprietary callouts.

[SWS\_SwCluC\_02425]{DRAFT} [The `Dcm Low Proxy` shall provide, for each `SwCluCDcmProxyBaseSocket`, a `SwCluC_DcmProxy_Init` API, to initialize the `Dcm High Proxy` of an `Application Software Cluster`. This shall be one element of the service resource `SwCluCDcmProxyBaseSocket`.]([SRS\\_SwCluC\\_00208](#))

[SWS\_SwCluC\_02424]{DRAFT} [The interface function instance for the `diagnostic data proxy`, `routine control proxy` and `service request notification proxy`, according to [[SWS\\_SwCluC\\_02350](#)], [[SWS\\_SwCluC\\_02353](#)], [[SWS\\_SwCluC\\_02356](#)], [[SWS\\_SwCluC\\_02359](#)], [[SWS\\_SwCluC\\_02362](#)], [[SWS\\_SwCluC\\_02365](#)], [[SWS\\_SwCluC\\_02368](#)], [[SWS\\_SwCluC\\_02371](#)], [[SWS\\_SwCluC\\_02374](#)], [[SWS\\_SwCluC\\_02400](#)], [[SWS\\_SwCluC\\_02403](#)], [[SWS\\_SwCluC\\_02406](#)], [[SWS\\_SwCluC\\_02409](#)], [[SWS\\_SwCluC\\_02412](#)], [[SWS\\_SwCluC\\_02415](#)], are provided either:

- at the `EcucPartition`, referenced by
  - `SwCluCDcmProxyDiagnosticData.SwCluCProxyEcucPartitionRef`
  - OR
  - `SwCluCDcmProxyRoutineControl.SwCluCProxyEcucPartitionRef`
  - OR



- `SwCluCdcProxyServiceRequestNotification.SwCluCProxyEcucPartitionRef`

OR

- if a `SwCluCdcProxyBaseSocket` is directly available, at its `EcucPartition`

OR

- at the `EcucPartition` of the `SwCluCdcProxyBaseSocket`, referenced by the `SwCluCdcProxyBaseSocket` - via `SwCluCdcProxyUsedSatelliteRef`, applicable for the `EcucPartition` requested above. In this case, the `EcucPartition` shall be changed, before the callback in the High Proxy is called.

]([SRS\\_SwCluC\\_00208](#))

### Binary Manifest

The implementation of the `Dcm Low Proxy` may provide some basic infrastructure for the `Dcm High Proxy` in order to be operational. Such generic infrastructure services can be linked between `Application Software Cluster` and `Host Software Cluster` by means of a `Dcm base socket`.

[[SWS\\_SwCluC\\_02397](#)]{DRAFT} [The `Dcm Low Proxy` shall create for each `SwCluCdcProxyBaseSocket` a provided resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00212](#))

#### 7.4.3.6 Dem Proxy

The specified `Dem Proxy` has the following underlying design principle:

In brief, the core business of `Dem` is the management of `Diagnostic Events` and the event memory, used to store failures and to capture related freeze frames with environmental data. This requires mainly interfaces to report and query status `Diagnostic Events`, as well as interfaces to read environmental data for the freeze frames. The `Dem Proxy` provides the ability implement so called `diagnostic event proxies`, enabling that `Diagnostic Monitors` - reporting diagnostic events - in the `Application Software Clusters` can access the `Dem` in the `Host Software Cluster`. APIs and AUTOSAR Service Interfaces that are not related to `Diagnostic Monitors` may not be supported by the `Dem Proxy`. Data relevant for freeze frames are (according diagnostic standards) are also accessible via `Dcm` by DID. Hence, the `diagnostic data proxy` functionality of the `Dcm Proxy` has to be used.



#### 7.4.3.6.1 Enable Dem Proxy Generation

[SWS\_SwCluC\_02748]{DRAFT} [The [Dem High Proxy](#) code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter [SwCluCProxyGenerationDem](#) is set to [HIGH\\_PROXY](#).] ([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00204](#))

[SWS\_SwCluC\_02749]{DRAFT} [The [Dem Low Proxy](#) code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter [SwCluCProxyGenerationDem](#) is set to [LOW\\_PROXY](#).] ([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00204](#))

#### 7.4.3.6.2 Dem High Proxy

##### 7.4.3.6.2.1 Dem High Proxy C-API

[SWS\_SwCluC\_02700]{DRAFT} [The [Dem High Proxy](#) shall provide the header file [Dem.h](#).] ([SRS\\_SwCluC\\_00209](#))

[SWS\_SwCluC\_02701]{DRAFT} [The [Dem High Proxy](#) shall provide the symbolic name values of [DemEventIds](#) for [Diagnostic Monitors](#) in the [Application Software Cluster](#).] ([SRS\\_SwCluC\\_00209](#))

[SWS\_SwCluC\_02702]{DRAFT} [The [Dem High Proxy](#) shall provide the functions for [Diagnostic Monitors](#) reporting [Diagnostic Events](#)

- [Dem\\_ClearPrestoredFreezeFrame](#)
- [Dem\\_PrestoreFreezeFrame](#)
- [Dem\\_ResetEventDebounceStatus](#)
- [Dem\\_ResetEventStatus](#)
- [Dem\\_SetEventDisabled](#)
- [Dem\\_SetEventStatus](#)

in the [Application Software Cluster](#).] ([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

[SWS\_SwCluC\_02736]{DRAFT} [The [Dem High Proxy](#) shall provide the function [Dem\\_SetEventStatusWithMonitorData](#), for [Diagnostic Monitors](#) reporting [Diagnostic Events](#) with monitor data in the [Application Software Cluster](#).] ([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

[SWS\_SwCluC\_02739]{DRAFT} [The [Dem High Proxy](#) shall provide the function [Dem\\_SetWIRStatus](#), for [Diagnostic Monitors](#) reporting [Diagnostic Events](#) in the [Application Software Cluster](#).] ([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

**[SWS\_SwCluC\_02703]{DRAFT}** [The *Dem High Proxy* shall provide the functions for Diagnostic Info of Diagnostic Events

- *Dem\_GetDTCOfEvent*
- *Dem\_GetDebouncingOfEvent*
- *Dem\_GetEventAvailable*
- *Dem\_GetEventExtendedDataRecordEx*
- *Dem\_GetEventFreezeFrameDataEx*
- *Dem\_GetEventUdsStatus*
- *Dem\_GetFaultDetectionCounter*
- *Dem\_GetMonitorStatus*

in the *Application Software Cluster*.] (*SRS\_SwCluC\_00209*, *SRS\_SwCluC\_00201*, *SRS\_SwCluC\_00202*)

**[SWS\_SwCluC\_02751]{DRAFT}** [If development error detection is enabled for *Dem High Proxy*, the APIs

- *Dem\_ClearPrestoredFreezeFrame*
- *Dem\_PrestoreFreezeFrame*
- *Dem\_ResetEventDebounceStatus*
- *Dem\_ResetEventStatus*
- *Dem\_SetEventDisabled*
- *Dem\_SetEventStatus*
- *Dem\_GetDTCOfEvent*
- *Dem\_GetDebouncingOfEvent*
- *Dem\_GetEventAvailable*
- *Dem\_GetEventExtendedDataRecordEx*
- *Dem\_GetEventFreezeFrameDataEx*
- *Dem\_GetEventUdsStatus*
- *Dem\_GetFaultDetectionCounter*
- *Dem\_GetMonitorStatus*
- *Dem\_SetEventStatusWithMonitorData*
- *Dem\_SetWIRStatus*

shall report the DET error `DEM_E_UNINIT`, when `Dem High Proxy` is not yet initialized.]([SRS\\_SwCluC\\_00209](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

#### 7.4.3.6.2.2 Callback Functions

[[SWS\\_SwCluC\\_02704](#)]{DRAFT} [The `Dem High Proxy` shall support the optional configuration of a `<Module>_DemGetFaultDetectionCounter<ForEvent>` callback, according to [[ECUC\\_Dem\\_00630](#)] and [[ECUC\\_Dem\\_00631](#)].]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

[[SWS\\_SwCluC\\_02705](#)]{DRAFT} [The `Dem High Proxy` shall support the optional configuration of a `<Module>_DemInitMonitorFor<EventName>` callback, according to [[ECUC\\_Dem\\_00632](#)] and [[ECUC\\_Dem\\_00601](#)].]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

[[SWS\\_SwCluC\\_02706](#)]{DRAFT} [The `Dem High Proxy` shall support the optional configuration of a `<Module>_DemTriggerOnMonitorStatus` callback, according to [[ECUC\\_Dem\\_00936](#)] and [[ECUC\\_Dem\\_00937](#)].]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

[[SWS\\_SwCluC\\_02707](#)]{DRAFT} [The `Dem High Proxy` shall support the optional configuration of a `<Module>_DemClearEventAllowed<ForCondition>` callback, according to [[ECUC\\_Dem\\_00607](#)] and [[ECUC\\_Dem\\_00609](#)].]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

[[SWS\\_SwCluC\\_02737](#)]{DRAFT} [The `Dem High Proxy` shall support the optional configuration of a `<Module>_DemTriggerOnEventData` callback, according to [[ECUC\\_Dem\\_00606](#)] and [[ECUC\\_Dem\\_00608](#)].]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

[[SWS\\_SwCluC\\_02738](#)]{DRAFT} [The `Dem High Proxy` shall support the optional configuration of a `<Module>_DemTriggerOnEventUdsStatus` callback, according to [[ECUC\\_Dem\\_00628](#)] and [[ECUC\\_Dem\\_00629](#)].]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00202](#))

#### 7.4.3.6.2.3 Service Ports

[[SWS\\_SwCluC\\_02723](#)]{DRAFT} [The `Dem High Proxy` shall provide the ports belonging to a specific `Diagnostic Event`

- `Event_{Name}`
- `EventStatus_{Name}`

at the partition specific Service Software Component, to which the using `SwComponentPrototype` is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02724]{DRAFT}** [The [Dem High Proxy](#) shall provide the `DiagnosticMonitor_MonitorData_{Name}` port for each specific Diagnostic Event, where `DemEventReportingType` is set to `STANDARD_REPORTING_WITH_MONITOR_DATA` at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02740]{DRAFT}** [The [Dem High Proxy](#) shall provide the `EventStatus_{Name}` port for each specific Diagnostic Event at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02725]{DRAFT}** [The [Dem High Proxy](#) shall provide the `CBClrEvt_{Name}` port for each specific Diagnostic Event, where `DemCallbackClearEventAllowed` is configured at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02726]{DRAFT}** [The [Dem High Proxy](#) shall provide the `CBFaultDetectCtr_{Name}` port for each specific Diagnostic Event, where `DemCallbackGetFDC` is configured at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

Note: this applies only if `DemDebounceAlgorithmClass` is set to `DebounceMonitorInternal`

**[SWS\_SwCluC\_02727]{DRAFT}** [The [Dem High Proxy](#) shall provide the `CBInitEvt_{Name}` port for each specific Diagnostic Event, where `DemCallbackInitMForE` is configured at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02741]{DRAFT}** [The [Dem High Proxy](#) shall provide the `CBDataEvt_{Name}` port for each specific Diagnostic Event, where `DemCallbackEventDataChanged` is configured at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02742]{DRAFT}** [The [Dem High Proxy](#) shall provide the `CBEventUdsStatusChanged_{EventName}_{CallbackName}` port for each specific Diagnostic Event, where `DemCallbackEventUdsStatusChanged` is configured at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

**[SWS\_SwCluC\_02743]{DRAFT}** [The [Dem High Proxy](#) shall provide the `CBMonitorStatusChanged_{EventName}_{CallbackName}` port for each specific Diagnostic Event, where `DemCallbackMonitorStatusChanged` is configured at the partition specific Service Software Component, to which the using [SwComponentPrototype](#) is mapped.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00201](#))

## Multiple Partitions

[SWS\_SwCluC\_02708]{DRAFT} [The Dem High Proxy shall create one partition specific Service Software Component per configured `EcucPartition`, with the name `Dem_<EcucPartition shortName>`.]([SRS\\_SwCluC\\_00209](#))

[SWS\_SwCluC\_02709]{DRAFT} [The Dem High Proxy shall provide the ports belonging to a specific interface connection at the partition specific Service Software Component, to which the using `SwComponentPrototype` is mapped.]([SRS\\_SwCluC\\_00209](#))

### 7.4.3.6.2.4 Binary Manifest

The implementation of the `Dem High Proxy` may require some basic infrastructure from the `Dem Low Proxy` in order to be operational. Such generic infrastructure services can be linked between `Application Software Cluster` and `Host Software Cluster` by means of a `Dem base socket`.

[SWS\_SwCluC\_02744]{DRAFT} [The Dem High Proxy shall create for each `SwCluCDemProxyBaseSocket` a required resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00212](#))

[SWS\_SwCluC\_02745]{DRAFT} [The Dem High Proxy shall create for each `diagnostic event proxy` - configured via `SwCluCDemProxyDiagnosticEvent` container - a required resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00212](#))

### 7.4.3.6.2.5 Handling of unconnected Diagnostic Events

[SWS\_SwCluC\_02710]{DRAFT} [In case a `Diagnostic Event` configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the functions / operations

- `Dem_ClearPrestoredFreezeFrame` / `ClearPrestoredFreezeFrame`
- `Dem_PrestoreFreezeFrame` / `PrestoreFreezeFrame`
- `Dem_ResetEventDebounceStatus` / `ResetEventDebounceStatus`
- `Dem_ResetEventStatus` / `ResetEventStatus`
- `Dem_SetEventDisabled` / `SetEventDisabled`
- `Dem_SetEventStatus` / `SetEventStatus`
- `Dem_SetEventStatusWithMonitorData` / `SetEventStatusWithMonitorData`
- `Dem_SetWIRStatus` / `SetWIRStatus`

of the `Dem High Proxy` shall return `E_NOT_OK`.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02711]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `DEM_E_NO_DTC_AVAILABLE` and the value 0 for the `DTCOfEvent` argument, when `Dem_GetDTCOfEvent` / `GetDTCOfEvent` is called.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02712]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `E_NOT_OK` and the value 0 for the `DebouncingState` argument, when `Dem_GetDebouncingOfEvent` / `GetDebouncingOfEvent` is called.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02713]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `E_NOT_OK` and the value `FALSE` for the `AvailableStatus` argument, when `Dem_GetEventAvailable` / `GetEventAvailable` is called.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02714]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `E_NOT_OK` and the value 0 for the `Bufsize` argument, when `Dem_GetEventExtendedDataRecordEx` / `GetEventExtendedDataRecordEx` is called. The `Bufsize` argument stays unmodified.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02715]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `E_NOT_OK` and the value 0 for the `Bufsize` argument, when `Dem_GetEventFreezeFrameDataEx` / `GetEventFreezeFrameDataEx` is called. The `Bufsize` argument stays unmodified.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02716]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `E_NOT_OK` and the value 0 for the `UDSStatusByte` argument, when `Dem_GetEventUdsStatus` / `GetEventUdsStatus` is called.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02717]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `E_NOT_OK` and the value 0 for the `FaultDetectionCounter` argument, when `Dem_GetFaultDetectionCounter` / `GetFaultDetectionCounter` is called.]([SRS\\_SwCluC\\_00209](#), [SRS\\_SwCluC\\_00213](#))

**[SWS\_SwCluC\_02718]{DRAFT}** [In case a Diagnostic Event configured in the `Dem High Proxy` is not connected to any `Dem Low Proxy`, the `Dem High Proxy` shall return `E_NOT_OK` and the value 0 for the `MonitorStatus` argument, when



Dem\_GetMonitorStatus / GetMonitorStatus is called.](SRS\_SwCluC\_00209, SRS\_SwCluC\_00213)

### 7.4.3.6.3 Dem Low Proxy

As shown in figure 7.10, the Dem Low Proxy shall be able to invoke APIs of the BSW modules in the Host Software Cluster, without a partition change in the Application Software Clusters. This partition change is only needed, if the BSW module does not offer a satellite on this partition. The availability of the BSW modules on dedicated EcucPartitions is a property of the Host Software Cluster.

**[SWS\_SwCluC\_02719]{DRAFT}** [The Dem Low Proxy shall provide the entry functions for Diagnostic Event reporting and info, according to [SWS\_SwCluC\_02702] and [SWS\_SwCluC\_02702], once per configured SwCluCDemProxyBaseSocket at the EcucPartition configured by SwCluCDemProxyBaseSocket.SwCluCProxyEcucPartitionRef.

In case the SwCluCDemProxyUsedSatelliteRef is set, the EcucPartition shall be changed, before the Dem API is called.](SRS\_SwCluC\_00209)

**[SWS\_SwCluC\_02728]{DRAFT}** [The Dem Low Proxy shall provide, for each SwCluCDemProxyBaseSocket, a SwCluC\_DemProxy\_Init API, to initialize the Dem High Proxy of an Application Software Cluster. This shall be one element of the service resource SwCluCDemProxyBaseSocket.](SRS\_SwCluC\_00209)

**[SWS\_SwCluC\_02729]{DRAFT}** [The Dem Low Proxy shall provide an instance of a <Module>\_DemGetFaultDetectionCounter<ForEvent> per configured Diagnostic Event (SwCluCDemProxyDiagnosticEvent), in the Dem Low Proxy, if DemDebounceAlgorithmClass is set to DebounceMonitorInternal.](SRS\_SwCluC\_00209)

**[SWS\_SwCluC\_02730]{DRAFT}** [The Dem Low Proxy shall provide an instance of a <Module>\_DemInitMonitorFor<EventName> per configured Diagnostic Event (SwCluCDemProxyDiagnosticEvent), in the Dem Low Proxy.](SRS\_SwCluC\_00209)

**[SWS\_SwCluC\_02731]{DRAFT}** [The Dem Low Proxy shall provide an instance of a <Module>\_DemTriggerOnMonitorStatus per configured Diagnostic Event (SwCluCDemProxyDiagnosticEvent), in the Dem Low Proxy.](SRS\_SwCluC\_00209)

**[SWS\_SwCluC\_02732]{DRAFT}** [The Dem Low Proxy shall provide an instance of a <Module>\_DemClearEventAllowed<ForCondition> per configured Diagnostic Event (SwCluCDemProxyDiagnosticEvent), in the Dem Low Proxy.](SRS\_SwCluC\_00209)



[SWS\_SwCluC\_02733]{DRAFT} [The `Dem Low Proxy` implementation shall describe the `Diagnostic Events` provided to `Dem High Proxys` via `DiagnosticEventNeeds` and `DiagnosticEventInfoNeeds`, derived from the `CpSoftwareClusterServiceResource.resourceNeeds`.] (*SRS\_SwCluC\_00209*)

Note: [SWS\_SwCluC\_02733] ensures a partly automated configuration of the `Diagnostic Event Manager`.

#### 7.4.3.6.3.1 Binary Manifest

The implementation of the `Dem Low Proxy` may provide some basic infrastructure for the `Dem High Proxy` in order to be operational. Such generic infrastructure services can be linked between `Application Software Cluster` and `Host Software Cluster` by means of a `Dem base socket`.

[SWS\_SwCluC\_02746]{DRAFT} [The `Dem Low Proxy` shall create, for each `SwCluCDemProxyBaseSocket`, a provided resource entry in the `Binary Manifest`.] (*SRS\_SwCluC\_00209*, *SRS\_SwCluC\_00212*)

[SWS\_SwCluC\_02747]{DRAFT} [The `Dem Low Proxy` shall create for, each `diagnostic event proxy` - configured via `SwCluCDemProxyDiagnosticEvent` container -, a provided resource entry in the `Binary Manifest`.] (*SRS\_SwCluC\_00209*, *SRS\_SwCluC\_00212*)

#### 7.4.3.6.3.2 Handling of unconnected Diagnostic Events

[SWS\_SwCluC\_02734]{DRAFT} [In case a `Diagnostic Event` configured in the `Dem Low Proxy` is not connected to any `Dem High Proxy`, the callback functions

- `<Module>_DemGetFaultDetectionCounter<ForEvent>`
- `<Module>_DemClearEventAllowed<ForCondition>`

of the `Dem High Proxy` shall return `E_NOT_OK`.] (*SRS\_SwCluC\_00209*, *SRS\_SwCluC\_00213*)

Note: The callback functions in [SWS\_SwCluC\_02734] indicate that the call to the `diagnostic monitor` has failed, in case the `Diagnostic Event` is not connected.

[SWS\_SwCluC\_02735]{DRAFT} [In case a `Diagnostic Event` configured in the `Dem Low Proxy` is not connected to any `Dem High Proxy`, the callback functions

- `<Module>_DemInitMonitorFor<EventName>`
- `<Module>_DemTriggerOnMonitorStatus`

of the `Dem High Proxy` shall return `E_OK`.] (*SRS\_SwCluC\_00209*, *SRS\_SwCluC\_00213*)

Note: The callback functions in [SWS\_SwCluC\_02735] do not support an error code different than E\_OK.

### 7.4.3.7 FiM Proxy

The FiM Proxy provides the ability implement so called diagnostic function inhibition proxies, enabling that software in the Application Software Clusters can access the FiM in the Host Software Cluster, to get function permissions or to set the function availability.

The specified FiM Proxy has the following underlying design principle:

In the Application Software Cluster, Function Inhibitions supported by the FiM High Proxy are configured with EcucModuleConfigurationValues for a FiM EcucModuleDef, with according FiMFIDs containers. In the Application Software Cluster and in the Host Software Cluster, the configuration of SwCluCfiMProxyFID containers map the FiMFIDs to CpSoftwareClusterServiceResources, defining each the globalResourceId and the isMandatory attribute, relevant for the corresponding Resource Entry in the Binary Manifest.

The connection between the FiM High Proxy and the FiM Low Proxy utilizes the Binary Manifest. Finally, the FiM Low Proxy invokes the FiM APIs in the Host Software Cluster in the partitions the FiM module is supporting.

The configuration of the Function Inhibition with the relationships between diagnostic events and FIDs resides in the Host Software Cluster. To adjust the intended inhibition without rebuild of the Host Software Cluster, the FiM module provides post-build configurability to large extend.

#### 7.4.3.7.1 Enable FiM Proxy Generation

[SWS\_SwCluC\_03214]{DRAFT} [The FiM High Proxy code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter SwCluCProxyGenerationFiM is set to HIGH\_PROXY.](SRS\_SwCluC\_00210, SRS\_SwCluC\_00204)

[SWS\_SwCluC\_03215]{DRAFT} [The FiM Low Proxy code, and related AUTOSAR model descriptions, shall only be created, if the configuration parameter SwCluCProxyGenerationFiM is set to LOW\_PROXY.](SRS\_SwCluC\_00210, SRS\_SwCluC\_00204)

### 7.4.3.7.2 FiM High Proxy

#### 7.4.3.7.2.1 FiM High Proxy C-API

[SWS\_SwCluC\_03200]{DRAFT} [The *FiM High Proxy* shall provide the header file *FiM.h*.] ([SRS\\_SwCluC\\_00210](#))

[SWS\_SwCluC\_03201]{DRAFT} [The *FiM High Proxy* shall provide the symbolic name values for *FiMFIDs*, for *FiM* users in the *Application Software Cluster*.] ([SRS\\_SwCluC\\_00210](#))

[SWS\_SwCluC\_03202]{DRAFT} [The *FiM High Proxy* shall provide the functions for *Function Inhibitions*

- [FiM\\_GetFunctionPermission](#)
- [FiM\\_SetFunctionAvailable](#)

for *FiM* users in the *Application Software Cluster*.] ([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00202](#))

[SWS\_SwCluC\_03217]{DRAFT} [If development error detection is enabled for *FiM High Proxy*, the APIs

- [FiM\\_GetFunctionPermission](#)
- [FiM\\_SetFunctionAvailable](#)

shall report the DET error *FIM\_E\_UNINIT*, when *FiM High Proxy* is not yet initialized.] ([SRS\\_SwCluC\\_00210](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

[SWS\_SwCluC\_03218]{DRAFT} [If development error detection is enabled for *FiM High Proxy*, the APIs

- [FiM\\_GetFunctionPermission](#)
- [FiM\\_SetFunctionAvailable](#)

shall report the DET error *FIM\_E\_FID\_OUT\_OF\_RANGE*, if the functions are called with wrong *FID* value] ([SRS\\_SwCluC\\_00210](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#), [SRS\\_BSW\\_00350](#))

#### 7.4.3.7.2.2 Service Ports

[SWS\_SwCluC\_03204]{DRAFT} [The *FiM High Proxy* shall provide the ports belonging to a specific *Function Inhibition*

- `Func_{Name}`
- `Control_{Name}`

at the partition specific Service Software Component, to which the using `SwComponentPrototype` is mapped.]([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00201](#))

### Multiple Partitions

[SWS\_SwCluC\_03203]{DRAFT} [The `FiM High Proxy` shall create one partition specific Service Software Component per configured `EcucPartition`, with the name `FiM_<EcucPartition shortName>`.]([SRS\\_SwCluC\\_00210](#))

#### 7.4.3.7.2.3 Handling of unconnected Function Inhibition

[SWS\_SwCluC\_03205]{DRAFT} [In case a Function Inhibition configured in the `FiM High Proxy` is not connected to any `FiM Low Proxy`, the `FiM High Proxy` shall return `E_NOT_OK` and the value `FALSE` for the Permission, when `FiM_GetFunctionPermission / GetFunctionPermission` is called.]([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00213](#))

[SWS\_SwCluC\_03206]{DRAFT} [In case a Function Inhibition configured in the `FiM High Proxy` is not connected to any `FiM Low Proxy`, the `FiM High Proxy` shall return `E_NOT_OK`, when `FiM_SetFunctionAvailable / SetFunctionAvailable` is called.]([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00213](#))

#### 7.4.3.7.2.4 Binary Manifest

The implementation of the `FiM High Proxy` may require some basic infrastructure from the `FiM Low Proxy` in order to be operational. Such generic infrastructure services can be linked between `Application Software Cluster` and `Host Software Cluster` by means of a `FiM base socket`.

[SWS\_SwCluC\_03210]{DRAFT} [The `FiM High Proxy` shall create for each `SwCluCfiMProxyBaseSocket` a required resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00212](#))

[SWS\_SwCluC\_03211]{DRAFT} [The `FiM High Proxy` shall create for each `diagnostic function inhibition proxy - configured via SwCluCfiMProxyFID` container - a required resource entry in the `Binary Manifest`.]([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00212](#))

#### 7.4.3.7.3 FiM Low Proxy

As shown in figure 7.10, the `FiM Low Proxy` shall be able to invoke APIs of the BSW modules in the `Host Software Cluster`, without a partition change in the `Application Software Clusters`. This partition change is only needed, if the BSW module does not offer a satellite on this partition. The availability of the BSW modules on dedicated `EcucPartitions` is a property of the `Host Software Cluster`.

[SWS\_SwCluC\_03207]{DRAFT} [The [FiM Low Proxy](#) implementation shall describe the [Function Inhibitions provided to FiM High Proxys via FunctionInhibitionNeeds](#), derived from the [CpSoftwareClusterServiceResource.resourceNeeds](#).] ([SRS\\_SwCluC\\_00210](#))

[SWS\_SwCluC\_03208]{DRAFT} [The [FiM Low Proxy](#) implementation shall describe the control functions for [Function Inhibitions provided to FiM High Proxies via FunctionInhibitionAvailabilityNeeds](#), derived from the [CpSoftwareClusterServiceResource.resourceNeeds](#).] ([SRS\\_SwCluC\\_00210](#))

Note: [[SWS\\_SwCluC\\_03205](#)] and [[SWS\\_SwCluC\\_03206](#)] ensures a partly automated configuration of the [FiM Manager](#).

[SWS\_SwCluC\_03209]{DRAFT} [The [FiM Low Proxy](#) shall provide, for each [SwCluC\\_FiMProxyBaseSocket](#), a [SwCluC\\_FiMProxy\\_Init](#) API, to initialize the [FiM High Proxy](#) of an [Application Software Cluster](#). This shall be one element of the service resource [SwCluC\\_FiMProxyBaseSocket](#).] ([SRS\\_SwCluC\\_00210](#))

#### 7.4.3.7.3.1 Binary Manifest

The implementation of the [FiM Low Proxy](#) may provide some basic infrastructure for the [FiM High Proxy](#) in order to be operational. Such generic infrastructure services can be linked between [Application Software Cluster](#) and [Host Software Cluster](#) by means of a [FiM base socket](#).

[SWS\_SwCluC\_03212]{DRAFT} [The [FiM Low Proxy](#) shall create for each [SwCluC\\_FiMProxyBaseSocket](#) a provided resource entry in the [Binary Manifest](#).] ([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00212](#))

[SWS\_SwCluC\_03213]{DRAFT} [The [FiM Low Proxy](#) shall create for each [diagnostic function inhibition proxy - configured via SwCluC\\_FiMProxyFID container](#) - a provided resource entry in the [Binary Manifest](#).] ([SRS\\_SwCluC\\_00210](#), [SRS\\_SwCluC\\_00212](#))

### 7.4.4 Error Classification

#### 7.4.4.1 Development Errors

The development error types defined for the [SwCluC NvM Proxy](#) are listed in [[SWS\\_SwCluC\\_02140](#)].

**[SWS\_SwCluC\_02140] Development Error Types of SwCluC NvM Proxy [**

<i>Type of error</i>	<i>Related error code</i>	<i>Value [hex]</i>
API service called with wrong parameter	NVM_E_PARAM_BLOCK_ID	0x0A
API is called with wrong parameter pointer	NVM_E_PARAM_POINTER	0x0F
API is called when NvM Proxy is not initialized yet	NVM_E_UNINIT	0x14

**Table 7.4: Development Error Types for SwCluC NvM Proxy**

|(SRS\_BSW\_00337, SRS\_BSW\_00385, SRS\_BSW\_00327, SRS\_BSW\_00480, SRS\_BSW\_00487)

The development error types defined for the SwCluC Com Proxy are listed in [SWS\_SwCluC\_02650].

**[SWS\_SwCluC\_02650]{DRAFT} Development Error Types of SwCluC Com Proxy [**

<i>Type of error</i>	<i>Related error code</i>	<i>Value [hex]</i>
API service called with wrong parameter	COM_E_PARAM	0x01
API service called with a NULL pointer.	COM_E_PARAM_POINTER	0x03
Error code if any API service is called before the <a href="#">Com High Proxy</a> module was initialized by the <a href="#">Com Low Proxy</a>	COM_E_UNINIT	0x02

**Table 7.5: Development Error Types for SwCluC Com Proxy**

|(SRS\_BSW\_00337, SRS\_BSW\_00385, SRS\_BSW\_00327, SRS\_BSW\_00480, SRS\_BSW\_00487)

The development error types defined for the SwCluC LdCom Proxy are listed in [SWS\_SwCluC\_02545].

**[SWS\_SwCluC\_02545]{DRAFT} Development Error Types of SwCluC LdCom Proxy [**

<i>Type of error</i>	<i>Related error code</i>	<i>Value [hex]</i>
Error code, if any API service is called before the <a href="#">LdCom High Proxy</a> module was initialized by the <a href="#">LdCom Low Proxy</a>	LDCOM_E_UNINIT	0x02





API service called with a NULL pointer. In case of this error, the API service shall return immediately without any further action, except for reporting this development error.	LDCOM_E_PARAM_POINTER	0x03
API service called with wrong Signal-ID (LdCom IPdu ID)	LDCOM_E_INVALID_SIGNAL_ID	0x05

**Table 7.6: Development Error Types for SwCluC LdCom Proxy**

|(SRS\_BSW\_00337, SRS\_BSW\_00385, SRS\_BSW\_00327, SRS\_BSW\_00480, SRS\_BSW\_00487)

The development error types defined for the SwCluC Dcm Proxy are listed in [SWS\_SwCluC\_02426].

**[SWS\_SwCluC\_02426]{DRAFT} Development Error Types of SwCluC Dcm Proxy**

[

Type of error	Related error code	Value [hex]
Error code, if any API service is called before the Dcm High Proxy module was initialized by the Dcm Low Proxy	DCM_E_UNINIT	0x05

**Table 7.7: Development Error Types for SwCluC Dcm Proxy**

|(SRS\_BSW\_00337, SRS\_BSW\_00385, SRS\_BSW\_00327, SRS\_BSW\_00480, SRS\_BSW\_00487)

The development error types defined for the SwCluC Dem Proxy are listed in [SWS\_SwCluC\_02750].

**[SWS\_SwCluC\_02750]{DRAFT} Development Error Types of SwCluC Dem Proxy**

[

Type of error	Related error code	Value [hex]
API function called with a NULL pointer.	DEM_E_PARAM_POINTER	0x11
API function called with wrong parameter value	DEM_E_PARAM_DATA	0x12
API function called with wrong length parameter value	DEM_E_PARAM_LENGTH	0x13





△

Error code, if any API service is called before the <a href="#">Dem High Proxy</a> module was initialized by the <a href="#">Dem Low Proxy</a>	DEM_E_UNINIT	0x20
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**Table 7.8: Development Error Types for SwCluC Dem Proxy**

|(SRS\_BSW\_00337, SRS\_BSW\_00385, SRS\_BSW\_00327, SRS\_BSW\_00480, SRS\_BSW\_00487)

The development error types defined for the SwCluC FiM Proxy are listed in [SWS\_SwCluC\_03216].

[SWS\_SwCluC\_03216]{DRAFT} **Development Error Types of SwCluC FiM Proxy** [

Type of error	Related error code	Value [hex]
Error code, if any API service is called before the <a href="#">FiM High Proxy</a> module was initialized by the <a href="#">FiM Low Proxy</a>	FIM_E_UNINIT	0x01
<a href="#">FiM_GetFunctionPermission</a> or <a href="#">FiM_SetFunctionAvailable</a> called with wrong FID	FIM_E_FID_OUT_OF_RANGE	0x02

**Table 7.9: Development Error Types for SwCluC FiM Proxy**

|(SRS\_BSW\_00337, SRS\_BSW\_00385, SRS\_BSW\_00327, SRS\_BSW\_00480, SRS\_BSW\_00487)

#### 7.4.4.2 Runtime Errors

Runtime errors are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

#### 7.4.4.3 Transient Faults

Transient Faults are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

#### 7.4.4.4 Production Errors

Production Errors are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

### 7.4.4.5 Extended Production Errors

Extended Production Errors are not applicable for the [Cross Cluster Communication](#) of the [Software Cluster Connection](#).

## 7.5 Standardized Service Resources

This section list the standardized definitions of [CpSoftwareClusterServiceResource](#) with the defined [categorys](#) and the applicable [resourceNeeds](#).

Table 7.10 defines the meaning of the tables for [CpSoftwareClusterServiceResource](#) in this section.

<b>Column</b>	<b>Description</b>	
<b>Category</b>	<a href="#">category</a> of the <a href="#">CpSoftwareClusterServiceResource</a> referencing the related <a href="#">EcucContainerValues</a> via the <a href="#">resourceNeeds</a> reference.	
<b>Context</b> and <b>Container / Parameter</b>	path to the standardized definition	
<b>Mult.</b>	Describes the multiplicity, which applies for the Container, Parameter, or Reference when it is used for the description of a <a href="#">CpSoftwareClusterServiceResource</a> . <a href="#">resourceNeeds</a> . This multicity can deviate from the multiplicity defind for the Standardized Module Defintion	
<b>Description / Restrictions</b>	Describes the multiplicity, which applies for the Container, Parameter, or Reference when it is used for the description of a <a href="#">CpSoftwareClusterServiceResource</a> . <a href="#">resourceNeeds</a>	
<b>Guard Value relevant</b>	Defines whether and how the Container, Parameter, or Reference is treated for the calculation of the Guard Value of a <a href="#">Resource Entry</a> . Following list of standard definitions apply:	
	<b>No</b>	The Container, Parameter, or Reference is only used for information or to express a configuration request which is optionally to be fulfilled and does not impact the calculated Guard Value
	<b>Value</b>	The value of the Parameter is considered for the Guard Value calculation





	<b>Choice</b>	Applicable in case the mentioned Container is child of a choice container. The selected kind chosen Container is part of the Guard Value calculation
	<b>from ref</b>	Take the attributes from the referenced Container. The related Container, Parameter, or Reference will be given additionally in this table

**Table 7.10: How to read Standardized Service Resource tables**

### 7.5.1 Software Cluster Base Configuration Check

For a [CpSoftwareClusterServiceResource](#), defined for a [Software Cluster Base Configuration Check](#), [\[SWS\\_SwCluC\\_90000\]](#) applies.

#### [\[SWS\\_SwCluC\\_90000\]](#) SWCLUSTER\_RES\_BASE\_CNF [

Category	SWCLUSTER_RES_BASE_CNF			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.11: SWCLUSTER\_RES\_BASE\_CNF**

]()

### 7.5.2 Cross Cluster Communication

For a [CpSoftwareClusterServiceResource](#), defined for a [Cross Cluster Communication Base Socket](#) (see section [7.3.2.3](#)), [\[SWS\\_SwCluC\\_90008\]](#) applies.

#### [\[SWS\\_SwCluC\\_90008\]](#) SWCLUSTER\_RES\_XCC\_BASE\_SOCKET [

Category	SWCLUSTER_RES_XCC_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.12: SWCLUSTER\_RES\_XCC\_BASE\_SOCKET**

]()

### 7.5.3 OS Proxy

For a [CpSoftwareClusterServiceResource](#), defined for a `Os Base Socket` (see section 7.4.3.1.3), [\[SWS\\_SwCluC\\_90002\]](#) applies.

#### [\[SWS\\_SwCluC\\_90002\]](#) SWCLUSTER\_RES\_OS\_BASE\_SOCKET [

Category	SWCLUSTER_RES_OS_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.13: SWCLUSTER\_RES\_OS\_BASE\_SOCKET**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a `OsApplication` (see section 7.4.3.1.5), [\[SWS\\_SwCluC\\_90003\]](#) applies.

#### [\[SWS\\_SwCluC\\_90003\]](#) SWCLUSTER\_RES\_OS\_APPLICATION [

Category	SWCLUSTER_RES_OS_APPLICATION			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.14: SWCLUSTER\_RES\_OS\_APPLICATION**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a `OsTask` (see section 7.4.3.1.5), [\[SWS\\_SwCluC\\_90004\]](#) applies.

#### [\[SWS\\_SwCluC\\_90004\]](#) SWCLUSTER\_RES\_OS\_TASK [

Category	SWCLUSTER_RES_OS_TASK			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
Os/OsTask	OsTaskActivation	1		Value
Os/OsTask	OsTaskPriority	1		Value
Os/OsTask	OsTaskSchedule	1		Value

**Table 7.15: SWCLUSTER\_RES\_OS\_TASK**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a `OsResource` (see section 7.4.3.1.5), [\[SWS\\_SwCluC\\_90005\]](#) applies.

**[SWS\_SwCluC\_90005] SWCLUSTER\_RES\_OS\_RESOURCE [**

Category	SWCLUSTER_RES_OS_RESOURCE			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.16: SWCLUSTER\_RES\_OS\_RESOURCE**

}]()

For a [CpSoftwareClusterServiceResource](#), defined for a [OsSpinlock](#) (see section 7.4.3.1.5), [\[SWS\\_SwCluC\\_90006\]](#) applies.

**[SWS\_SwCluC\_90006] SWCLUSTER\_RES\_OS\_SPINLOCK [**

Category	SWCLUSTER_RES_OS_SPINLOCK			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.17: SWCLUSTER\_RES\_OS\_SPINLOCK**

}]()

For a [CpSoftwareClusterServiceResource](#), defined for a task dispatcher (see section 7.4.3.1.5), [\[SWS\\_SwCluC\\_90007\]](#) applies.

**[SWS\_SwCluC\_90007] SWCLUSTER\_RES\_OS\_TASK\_DISPATCHER [**

Category	SWCLUSTER_RES_OS_TASK_DISPATCHER			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
Os/OsTask	OsTaskPriority	1		Value
Os/OsTask	OsTaskSchedule	1		Value

**Table 7.18: SWCLUSTER\_RES\_OS\_TASK\_DISPATCHER**

}]()

For a [CpSoftwareClusterServiceResource](#), defined for a function dispatcher (see section 7.4.3.1.5), [\[SWS\\_SwCluC\\_90008\]](#) applies.

**[SWS\_SwCluC\_90009] SWCLUSTER\_RES\_OS\_FNC\_DISPATCHER [**

Category	SWCLUSTER_RES_OS_FNC_DISPATCHER			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.19: SWCLUSTER\_RES\_OS\_FNC\_DISPATCHER**

]()

**7.5.4 NvM Proxy**

For a [CpSoftwareClusterServiceResource](#), defined for a NvM Base Socket (see section 7.4.3.2.5), [\[SWS\\_SwCluC\\_90010\]](#) applies.

**[SWS\_SwCluC\_90010] SWCLUSTER\_RES\_NVM\_BASE\_SOCKET [**

Category	SWCLUSTER_RES_NVM_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.20: SWCLUSTER\_RES\_NVM\_BASE\_SOCKET**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a Nv Block (see section 7.4.3.2), [\[SWS\\_SwCluC\\_90001\]](#) applies.

**[SWS\_SwCluC\_90001] SWCLUSTER\_RES\_NV\_BLOCK [**

Category	SWCLUSTER_RES_NV_BLOCK			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
NvM/NvMBlockDescriptor	NvMBlockManagementType	1		Value
NvM/NvMBlockDescriptor	NvMBlockUseAutoValidation	1		Value
NvM/NvMBlockDescriptor	NvMBlockUseCrc	1		Value
NvM/NvMBlockDescriptor	NvMBlockUseSetRamBlock Status	1		Value
NvM/NvMBlockDescriptor	NvMBlockWriteProt	1		Value
NvM/NvMBlockDescriptor	NvMCalcRamBlockCrc	1		Value
NvM/NvMBlockDescriptor	NvMResistantToChangedSw	1		Value
NvM/NvMBlockDescriptor	NvMRomBlockNum	1		Value
NvM/NvMBlockDescriptor	NvMSelectBlockForReadAll	1		Value





Category	SWCLUSTER_RES_NV_BLOCK			
NvM/NvMBlockDescriptor	NvMSelectBlockForWriteAll	1		Value
NvM/NvMBlockDescriptor	NvMWriteBlockOnce	1		Value
NvM/NvMCommon	NvMSetRamBlockStatusApi	1		Value
SwCluC/SwCluCProxies/SwCluCNvMProxy/SwCluCNvMProxyNvBlock	SwCluCNvMProxyNvBlockMaxLength	1		Value

**Table 7.21: SWCLUSTER\_RES\_NV\_BLOCK**

}]()

### 7.5.5 Com Proxy

For a [CpSoftwareClusterServiceResource](#), defined for a [Com base socket](#), [[SWS\\_SwCluC\\_90011](#)] applies.

**[SWS\_SwCluC\_90011]{DRAFT} SWCLUSTER\_RES\_COM\_BASE\_SOCKET [**

Category	SWCLUSTER_RES_COM_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.22: SWCLUSTER\_RES\_COM\_BASE\_SOCKET**

}]()

### 7.5.6 LdCom Proxy

For a [CpSoftwareClusterServiceResource](#), defined for a [LdCom base socket](#), [[SWS\\_SwCluC\\_90012](#)] applies.

**[SWS\_SwCluC\_90012]{DRAFT} SWCLUSTER\_RES\_LDCOM\_BASE\_SOCKET [**

Category	SWCLUSTER_RES_LDCOM_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.23: SWCLUSTER\_RES\_LDCOM\_BASE\_SOCKET**

}]()



### 7.5.7 Dcm Proxy

For a [CpSoftwareClusterServiceResource](#), defined for a [Dcm base socket](#), [[SWS\\_SwCluC\\_90013](#)] applies.

#### [[SWS\\_SwCluC\\_90013](#)]{DRAFT} SWCLUSTER\_RES\_DCM\_BASE\_SOCKET [

Category	SWCLUSTER_RES_DCM_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.24: SWCLUSTER\_RES\_DCM\_BASE\_SOCKET**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a [diagnostic data proxy](#), [[SWS\\_SwCluC\\_90014](#)] applies.

#### [[SWS\\_SwCluC\\_90014](#)]{DRAFT} SWCLUSTER\_RES\_DCM\_DIAGNOSTIC\_DATA [

Category	SWCLUSTER_RES_DCM_DIAGNOSTIC_DATA			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.25: SWCLUSTER\_RES\_DCM\_DIAGNOSTIC\_DATA**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a [routine control proxy](#), [[SWS\\_SwCluC\\_90015](#)] applies.

#### [[SWS\\_SwCluC\\_90015](#)]{DRAFT} SWCLUSTER\_RES\_DCM\_ROUTINE\_CONTROL [

Category	SWCLUSTER_RES_DCM_ROUTINE_CONTROL			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.26: SWCLUSTER\_RES\_DCM\_ROUTINE\_CONTROL**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a [service request notification proxy](#), [[SWS\\_SwCluC\\_90016](#)] applies.

**[SWS\_SwCluC\_90016]{DRAFT} SWCLUSTER\_RES\_DCM\_SERVICE\_REQUEST\_NOTIFICATION** [

Category	SWCLUSTER_RES_DCM_SERVICE_REQUEST_NOTIFICATION			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.27: SWCLUSTER\_RES\_DCM\_SERVICE\_REQUEST\_NOTIFICATION**

]()

### 7.5.8 Dem Proxy

For a [CpSoftwareClusterServiceResource](#), defined for a [Dem base socket](#), [\[SWS\\_SwCluC\\_90017\]](#) applies.

**[SWS\_SwCluC\_90017]{DRAFT} SWCLUSTER\_RES\_DEM\_BASE\_SOCKET** [

Category	SWCLUSTER_RES_DEM_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.28: SWCLUSTER\_RES\_DEM\_BASE\_SOCKET**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a [diagnostic event proxy](#), [\[SWS\\_SwCluC\\_90018\]](#) applies.

**[SWS\_SwCluC\_90018]{DRAFT} SWCLUSTER\_RES\_DEM\_DIAGNOSTIC\_EVENT** [

Category	SWCLUSTER_RES_DEM_DIAGNOSTIC_EVENT			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
Dem/DemConfigSet/Dem EventParameter	DemDebounceAlgorithmClass	1	choice of debouncing without contained parameters	Choice
Dem/DemConfigSet/Dem EventParameter	DemEventReportingType	1		Value

**Table 7.29: SWCLUSTER\_RES\_DEM\_DIAGNOSTIC\_EVENT**

]()

### 7.5.9 FiM Proxy

For a [CpSoftwareClusterServiceResource](#), defined for a [FiM base socket](#) [[SWS\\_SwCluC\\_90019](#)], applies.

#### [SWS\_SwCluC\_90019]{DRAFT} SWCLUSTER\_RES\_FIM\_BASE\_SOCKET [

Category	SWCLUSTER_RES_FIM_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.30: SWCLUSTER\_RES\_FIM\_BASE\_SOCKET**

]()

For a [CpSoftwareClusterServiceResource](#), defined for a [diagnostic function inhibition proxy](#), [[SWS\\_SwCluC\\_90020](#)] applies.

#### [SWS\_SwCluC\_90020]{DRAFT} SWCLUSTER\_RES\_FIM\_FID [

Category	SWCLUSTER_RES_FIM_FID			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.31: SWCLUSTER\_RES\_FIM\_FID**

]()

### 7.5.10 WdgM

For a [CpSoftwareClusterServiceResource](#) defined for a [WdgM base socket](#) [[SWS\\_SwCluC\\_90021](#)] applies.

#### [SWS\_SwCluC\_90021]{DRAFT} SWCLUSTER\_RES\_WDGM\_BASE\_SOCKET [

Category	SWCLUSTER_RES_WDGM_BASE_SOCKET			
Context	Container / Parameter	Mult.	Description / Restrictions	Guard Value relevant
no standardized resourceNeeds				

**Table 7.32: SWCLUSTER\_RES\_WDGM\_BASE\_SOCKET**

]()

Please note the definition of [WdgMBaseSocket](#) in document [20]

For a [CpSoftwareClusterServiceResource](#) defined for a cross cluster transition proxy [[SWS\\_SwCluC\\_90022](#)] applies.

**[SWS\_SwCluC\_90022]{DRAFT} SWCLUSTER\_RES\_WDGM\_TRANSITION [**

<b>Category</b>	SWCLUSTER_RES_WDGM_TRANSITION			
<b>Context</b>	<b>Container / Parameter</b>	<b>Mult.</b>	<b>Description / Restrictions</b>	<b>Guard Value relevant</b>
no standardized resourceNeeds				

**Table 7.33: SWCLUSTER\_RES\_WDGM\_TRANSITION**

]

Please note the definition of [WdgMTransitionProxy](#) in document [[20](#)]

## 7.6 Common Functions

This section describes common functionality of the [SwCluC](#) module.

### 7.6.1 Version Info

**[SWS\_SwCluC\_09000]** [If a NULL pointer is passed via the parameter `versioninfo` to the function [SwCluC\\_GetVersionInfo](#) and development error detection is enabled for [SwCluC](#) module, the function shall report the DET error `SWCLUC_E_PARAM_POINTER`.] ([SRS\\_BSW\\_00482](#), [SRS\\_BSW\\_00373](#), [SRS\\_BSW\\_00369](#), [SRS\\_BSW\\_00323](#))

### 7.6.2 Error Classification

#### 7.6.2.1 Development Errors

The general development error types defined for the [SwCluC](#) module are listed in [[SWS\\_SwCluC\\_09001](#)].

**[SWS\_SwCluC\_09001] Definiton of development errors in module SwCluC [**

<b>Type of error</b>	<b>Related error code</b>	<b>Error value</b>
Error code, if API is called with wrong parameter pointer	SWCLUC_E_PARAM_POINTER	0x01

]

([SRS\\_BSW\\_00337](#), [SRS\\_BSW\\_00385](#), [SRS\\_BSW\\_00327](#), [SRS\\_BSW\\_00480](#), [SRS\\_BSW\\_00487](#))

## 8 API specification

### 8.1 Imported types

In this chapter all types included from the following files are listed.

**[SWS\_SwCluC\_10012] Definition of imported datatypes of module SwCluC** [

<i>Module</i>	<i>Header File</i>	<i>Imported Type</i>
ComStack_Types	ComStack_Types.h	BufReq_ReturnType
	ComStack_Types.h	CbkHandleIdType (draft)
	ComStack_Types.h	PduInfoType
	ComStack_Types.h	PduLengthType
	ComStack_Types.h	RetryInfoType
	ComStack_Types.h	TpDataStateType
Std	Std_Types.h	Std_ReturnType
	Std_Types.h	Std_VersionInfoType

]([SRS\\_SwCluC\\_00202](#), [SRS\\_SwCluC\\_00207](#), [SRS\\_SwCluC\\_00211](#))

Please note that the [Software Cluster Connection](#) additionally utilizes the Platform Types (as defined in document [21]) and Standard Types (as defined in document [22]).

### 8.2 Type definitions

#### 8.2.1 Binary Manifest

##### 8.2.1.1 SwCluC\_BManif\_SwClusterIdType

**[SWS\_SwCluC\_10000] Definition of datatype SwCluC\_BManif\_SwClusterIdType** [

[

<b>Name</b>	SwCluC_BManif_SwClusterIdType
<b>Kind</b>	Type
<b>Derived from</b>	uint8
<b>Description</b>	Type of the Software Cluster's ID value
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.2 SwCluC\_BManif\_MachineldType

[SWS\_SwCluC\_10001] Definition of datatype SwCluC\_BManif\_MachineldType [

<b>Name</b>	SwCluC_BManif_MachineldType
<b>Kind</b>	Type
<b>Derived from</b>	uint8
<b>Description</b>	Type for the global ID value of a resource
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.3 SwCluC\_BManif\_ConCtrlType

[SWS\_SwCluC\_10002] Definition of datatype SwCluC\_BManif\_ConCtrlType [

<b>Name</b>	SwCluC_BManif_ConCtrlType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint16		
<b>Range</b>	SWCLUC_BMANIF_DISABLE_ON_ECU_CONNECTION	0x8000	The connection of Software Clusters on ECU is disabled for this machine.
<b>Description</b>	Type to code control flags for the connection process. Bit 0..14 are reserved.		
<b>Available via</b>	SwCluC_BManif.h		

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.4 SwCluC\_BManif\_ResourcePropertiesType

[SWS\_SwCluC\_10003] Definition of datatype SwCluC\_BManif\_ResourcePropertiesType [

<b>Name</b>	SwCluC_BManif_ResourcePropertiesType			
<b>Kind</b>	Bitfield			
<b>Derived from</b>	uint8			
<b>Elements</b>	<b>Kind</b>	<b>Name</b>	<b>Mask</b>	<b>Description</b>
	bit	SWCLUC_BMANIF_PROVIDED_RESOURCE	0x80	the resource is provided by the Software Cluster
	bit	SWCLUC_BMANIF_MANDATORY_RESOURCE	0x40	the required resource is mandatory
<b>Description</b>	Type to code the properties of a resource. Bit 0..5 are reserved. In case none of the bits are set the value 0 is valid.			
<b>Available via</b>	SwCluC_BManif.h			

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.5 SwCluC\_BManif\_ResourceTypeIdType

[SWS\_SwCluC\_10004] Definition of datatype SwCluC\_BManif\_ResourceTypeIdType

<b>Name</b>	SwCluC_BManif_ResourceTypeIdType
<b>Kind</b>	Type
<b>Derived from</b>	uint8
<b>Description</b>	Type to code the type of a resource
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.6 SwCluC\_BManif\_GlobalResourceIdType

[SWS\_SwCluC\_10005] Definition of datatype SwCluC\_BManif\_GlobalResourceIdType

<b>Name</b>	SwCluC_BManif_GlobalResourceIdType
<b>Kind</b>	Type
<b>Derived from</b>	uint32
<b>Description</b>	Type for the global ID value of a resource
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.7 SwCluC\_BManif\_ResourceGuardValueType

[SWS\_SwCluC\_10006] Definition of datatype SwCluC\_BManif\_ResourceGuardValueType

<b>Name</b>	SwCluC_BManif_ResourceGuardValueType
<b>Kind</b>	Type
<b>Derived from</b>	uint32
<b>Description</b>	Type for the guard value of a resource
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))



### 8.2.1.8 SwCluC\_BManif\_TableIndexType

[SWS\_SwCluC\_10007] Definition of datatype SwCluC\_BManif\_TableIndexType [

<b>Name</b>	SwCluC_BManif_TableIndexType
<b>Kind</b>	Type
<b>Derived from</b>	uint16
<b>Description</b>	Index type to address the immutable and modifiable interface table
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.9 SwCluC\_BManif\_HandleIndexType

[SWS\_SwCluC\_10008] Definition of datatype SwCluC\_BManif\_HandleIndexType [

<b>Name</b>	SwCluC_BManif_HandleIndexType
<b>Kind</b>	Type
<b>Derived from</b>	uint8
<b>Description</b>	Index type to address a set of handles in the immutable and modifiable interface table
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.2.1.10 SwCluC\_BManif\_VoidFncPtrType

[SWS\_SwCluC\_10009] Definition of datatype SwCluC\_BManif\_VoidFncPtrType [

<b>Name</b>	SwCluC_BManif_VoidFncPtrType
<b>Kind</b>	Function Pointer
<b>Syntax</b>	<code>int (*SwCluC_BManif_VoidFncPtrType) ( void )</code>
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	int   -
<b>Description</b>	Generic function pointer type according C default type for functions
<b>Available via</b>	SwCluC_BManif.h

]([SRS\\_SwCluC\\_00006](#))

### 8.2.1.11 SwCluC\_BManif\_HandleType

[SWS\_SwCluC\_10010] Definition of datatype SwCluC\_BManif\_HandleType [

<b>Name</b>	SwCluC_BManif_HandleType	
<b>Kind</b>	Union	
<b>Elements</b>	dptr	
	<b>Type</b>	void*
	<b>Comment</b>	Handle as pointer to variable
	val	
	<b>Type</b>	uint32
	<b>Comment</b>	Handle as value
	fptr	
	<b>Type</b>	<a href="#">SwCluC_BManif_VoidFncPtrType</a>
	<b>Comment</b>	Handle as pointer to function
<b>Description</b>	Type of a handle in the interface table.	
<b>Available via</b>	SwCluC_BManif.h	

]([SRS\\_SwCluC\\_00006](#))

### 8.2.1.12 SwCluC\_BManif\_HeaderType

[SWS\_SwCluC\_10011] Definition of datatype SwCluC\_BManif\_HeaderType [

<b>Name</b>	SwCluC_BManif_HeaderType	
<b>Kind</b>	Structure	
<b>Elements</b>	Preamble	
	<b>Type</b>	uint64
	<b>Comment</b>	magic pattern of Manifest Header begin
	ManifestMajorVersion	
	<b>Type</b>	uint8
	<b>Comment</b>	version of the Binary Manifest Layout
	ManifestMinorVersion	
	<b>Type</b>	uint8
	<b>Comment</b>	version of the Binary Manifest Layout
	SwClusterId	
	<b>Type</b>	<a href="#">SwCluC_BManif_SwClusterIdType</a>
	<b>Comment</b>	Software Cluster Id
	MachineId	
	<b>Type</b>	<a href="#">SwCluC_BManif_MachineIdType</a>
	<b>Comment</b>	Machine Id
	SwClusterType	
	<b>Type</b>	uint8
	<b>Comment</b>	kind of Software Cluster
Reserved1		





<b>Type</b>	uint8
<b>Comment</b>	reserved
Reserved2	
<b>Type</b>	uint8
<b>Comment</b>	reserved
Reserved3	
<b>Type</b>	uint8
<b>Comment</b>	reserved
ConnectorControlFlags	
<b>Type</b>	<a href="#">SwCluC_BManif_ConCtrlType</a>
<b>Comment</b>	Control flags for Software Cluster connector
NoOfInterfaceDescriptors	
<b>Type</b>	uint16
<b>Comment</b>	Number of Interface Descriptors
NoOfOfferedInterfaceHandles	
<b>Type</b>	uint16
<b>Comment</b>	Number of Handles in the Offered Interface
NoOfSubscribedInterfaceHandles	
<b>Type</b>	uint16
<b>Comment</b>	Number of Handles in the Subscribed Interface
ImmutableTablesChecksumPtr	
<b>Type</b>	const uint32*
<b>Comment</b>	Pointer to checksum about immutable descriptor and interface tables
SubscribedInterfaceValidityMarkerPtr	
<b>Type</b>	const uint32*
<b>Comment</b>	Pointer to validity marker indicating whether all subscribed tables are written
ResourcePropertiesDescriptorColumnPtr	
<b>Type</b>	<a href="#">const SwCluC_BManif_ResourcePropertiesType*</a>
<b>Comment</b>	Pointer to descriptor column for resource properties
ResourceTypeDescriptorColumnPtr	
<b>Type</b>	<a href="#">const SwCluC_BManif_ResourceTypeIdType*</a>
<b>Comment</b>	Pointer to descriptor column for resource type Ids
GlobalResourceIdDescriptorColumnPtr	
<b>Type</b>	<a href="#">const SwCluC_BManif_GlobalResourceIdType*</a>
<b>Comment</b>	Pointer to descriptor column for global resource Ids
ResourceGuardValueDescriptorColumnPtr	
<b>Type</b>	<a href="#">const SwCluC_BManif_ResourceGuardValueType*</a>
<b>Comment</b>	Pointer to descriptor column for guard values
OfferedInterfaceIndexDescriptorColumnPtr	
<b>Type</b>	<a href="#">const SwCluC_BManif_TableIndexType*</a>
<b>Comment</b>	Pointer to descriptor column for offered interface column index
OfferedInterfaceNoOfHandlesDescriptorColumnPtr	
<b>Type</b>	<a href="#">const SwCluC_BManif_HandleIndexType*</a>
<b>Comment</b>	Pointer to descriptor column for number of handles in offered interface column





	SubscribedInterfaceIndexDescriptorColumnPtr	
	<b>Type</b>	<a href="#">const SwCluC_BManif_TableIndexType*</a>
	<b>Comment</b>	Pointer to descriptor column for subscribed interface column index
	SubscribedInterfaceNoOfHandlesDescriptorColumnPtr	
	<b>Type</b>	<a href="#">const SwCluC_BManif_HandleIndexType*</a>
	<b>Comment</b>	Pointer to descriptor column for number of handles in subscribed interface column
	SubscribedInterfaceNoOfHandleSetsDescriptorColumnPtr	
	<b>Type</b>	<a href="#">const SwCluC_BManif_HandleIndexType*</a>
	<b>Comment</b>	Pointer to descriptor column for number of handle sets in subscribed interface column
	OfferedInterfaceHandleColumnPtr	
	<b>Type</b>	<a href="#">const SwCluC_BManif_HandleType*</a>
	<b>Comment</b>	Pointer to interface column for offered handles
	SubscribedInterfaceDefaultHandleColumnPtr	
	<b>Type</b>	<a href="#">const SwCluC_BManif_HandleType*</a>
	<b>Comment</b>	Pointer to default interface column for subscribed handles
	SubscribedInterfaceHandleColumnPtr	
	<b>Type</b>	<a href="#">const SwCluC_BManif_HandleType*</a>
	<b>Comment</b>	Pointer to interface column for subscribed handles
	SubscribedInterfaceConnectedSwClusterIdColumnPtr	
	<b>Type</b>	<a href="#">const SwCluC_BManif_SwClusterIdType*</a>
	<b>Comment</b>	Pointer to interface column for connected cluster Id values
<b>Description</b>	-	
<b>Available via</b>	SwCluC_BManif.h	

|(SRS\_SwCluC\_00006, SRS\_BSW\_00310)

## 8.2.2 Cross Cluster Communication

The [Cross Cluster Communication](#) implements the types of a [Cross Software Cluster Communication Plug-In](#) as specified in document [4].

## 8.2.3 ProxyModules

The [Proxy Modules](#) partly implement the types of the according AUTOSAR BSW modules. Those are listed in appendix D.

## 8.3 Function definitions

### 8.3.1 BinaryManifest

#### 8.3.1.1 API Principles

None of the functions defined for the `Binary Manifest` access are utilizing the `Std_ReturnType` to provide runtime errors. Since the `Binary Manifest` itself is implemented by a set of const variables, which need to be located to Flash ROM, all the failure situations caused by a temporary unavailability of the `Binary Manifest` can be excluded. Instead, it needs to be considered that the `Binary Manifest` is involved very frequently, since it is needed to access any resource from other `Software Clusters`, including the `Host Software Cluster`.

##### 8.3.1.1.1 Named versus indexed handle access

The APIs for the `Binary Manifest` offer basically two different kinds of access.

The functions `[SWS_SwCluC_10020]`, `[SWS_SwCluC_10021]`, and `[SWS_SwCluC_10032]` provide an entire named access to the handle of a `Resource Entry` in a `Resource Entry Group`. This kind of access is useful, if the using implementation requires a named access on a specific channel. For instance the callbacks of NvM are implemented `NvBlock` specific. In such a `NvBlock` specific callback the related handles to call the `High Proxy` could be easily accessed via name.

In opposite the functions `[SWS_SwCluC_10022]`, `[SWS_SwCluC_10023]`, and `[SWS_SwCluC_10033]` provide an access to a handle of a `Resource Entry` in a `Resource Entry Group`, where the `Resource Entry` is addressed by index. This kind of access is useful, if the using implementation requires indexed based access on channels. Usually service APIs of the `High Proxies` select the channel by an ID value. E.g. the `NvBlock` gets selected by a `BlockId` parameter. Since the order of `Resource Entries` in a `Resource Entry Group` is configurable, the proxy implementation can ensure that the 'channel id' matches to the `resIndex` values. Hence, the passed 'channel id' values can be used without further conversion to get the relevant handles in the `Binary Manifest`.

##### 8.3.1.1.2 Implementation aspects

When an implementation of the Software Cluster Connection or a CDD utilizes the `Binary Manifest`, it is not expected that the usage of the `SwCluC_BManif_GetHandle`, `SwCluC_BManif_GetConSwClusterId`, and `SwCluC_BManif_GetNoOfHandleSets` APIs result in real function calls. From the implementation perspective of the `Binary Manifest`, this should never be required, since accesses to handles or Software Cluster Ids are accesses to primitive constant variables.

**[SWS\_SwCluC\_00057]** [The functions `SwCluC_BManif_GetHandle`, `SwCluC_BManif_GetConSwClusterId`, and `SwCluC_BManif_GetNoOfHandleSets`, according to [\[SWS\\_SwCluC\\_10020\]](#), [\[SWS\\_SwCluC\\_10021\]](#), [\[SWS\\_SwCluC\\_10022\]](#), [\[SWS\\_SwCluC\\_10023\]](#), [\[SWS\\_SwCluC\\_10032\]](#), and [\[SWS\\_SwCluC\\_10033\]](#), shall each be implemented as a C-function-like macro.]([SRS\\_SwCluC\\_00012](#))

**[SWS\_SwCluC\_00058]** [`<Resource Entry Group>` is the `shortName` of either the `SwCluCBManifProvideResourceEntryGroup` or `SwCluCBManifRequireResourceEntryGroup`.]([SRS\\_SwCluC\\_00012](#))

**[SWS\_SwCluC\_00059]** [`<Resource Entry>` is the `shortName` of either the `SwCluCBManifProvideResourceEntry` or `SwCluCBManifRequireResourceEntry`.]([SRS\\_SwCluC\\_00012](#))

**[SWS\_SwCluC\_00060]** [`<Handle>` is the `shortName` of either the `SwCluCBManifProvideHandle` or `SwCluCBManifNotifierHandle` of the `SwCluCBManifResourceType`, referenced by `SwCluCBManifProvideResourceEntryGroup` or `SwCluCBManifRequireResourceEntryGroup`.]([SRS\\_SwCluC\\_00012](#))

**[SWS\_SwCluC\_00061]** [`<handleType>` is either

- the referenced `ImplementationDataType`, if the `SwCluCBManifHandleImpleTypeRef` is defined for a `Provide Handle` or `Notifier Handle`. OR
- `uint32`, if the `SwCluCBManifHandleImpleTypeRef` is not defined, and `SwCluCBManifNativeHandleType` is set to `VALUE` OR
- `void *`, if the `SwCluCBManifHandleImpleTypeRef` is not defined, and `SwCluCBManifNativeHandleType` is set to `DATA_REFERENCE` OR
- `SwCluC_BManif_VoidFncPtrType`, if the `SwCluCBManifHandleImpleTypeRef` is not defined, and `SwCluCBManifNativeHandleType` is set to `FUNCTION_REFERENCE`

]([SRS\\_SwCluC\\_00012](#))

**[SWS\_SwCluC\_CONSTR\_00091]** [In a set of `SwCluCBManifProvideHandle` in a `SwCluCBManifResourceType` it is not permitted to set `SwCluCBManifIsOptional` to `false`, if any preceding `SwCluCBManifProvideHandle` has already set `SwCluCBManifIsOptional` to `true`.]([SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_CONSTR\_00092]** [In a set of `SwCluCBManifNotifierHandle` in a `SwCluCBManifResourceType` it is not permitted to set `SwCluCBManifIsOptional` to `false`, if any preceding `SwCluCBManifNotifierHandle` has already set `SwCluCBManifIsOptional` to `true`.]([SRS\\_SwCluC\\_00014](#))

Rationale: A `Resource Type` with optional handles has to define the optional ones after the non-optional ones.

**[SWS\_SwCluC\_CONSTR\_00093]** [In a set of `SwCluCBManifProvideHandle` in a `SwCluCBManifResourceType` at most one optional handle shall exist.]([SRS\\_SwCluC\\_00014](#))

**[SWS\_SwCluC\_CONSTR\_00094]** [In a set of [SwCluCManifestNotifierHandle](#) in a [SwCluCManifestResourceType](#) at most one optional handle shall exist.]([SRS\\_SwCluC\\_00014](#))

Rationale: If more than one optional handle exist, the mapping between the filled handles and the declared handles in the resource type becomes ambiguous. If an implementation requires to vary the number of exchanged handles on a more fine grained level, those can be put into implementation specific structure behind the optional handle. But the minor configuration with the typical highest optimization need can still work without double indirection.

### 8.3.1.2 SwCluC\_BManif\_GetHandle

**[SWS\_SwCluC\_10020]** Definition of API function [SwCluC\\_BManif\\_GetHandle\\_<ResourceEntryGroup>\\_<ResourceEntry>\\_<Handle>](#) [

<b>Service Name</b>	SwCluC_BManif_GetHandle_<ResourceEntryGroup>_<ResourceEntry>_<Handle>	
<b>Syntax</b>	<pre>&lt;handleType&gt; SwCluC_BManif_GetHandle_&lt;ResourceEntryGroup&gt;_&lt;ResourceEntry&gt;_&lt;Handle&gt; (     SwCluC_BManif_HandleIndexType notifierSetIndex )</pre>	
<b>Service ID [hex]</b>	0x10	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	notifierSetIndex	Optional parameter for the notifier set index in the range 0.. SWCLUC_BMANIF_MAX_NO_OF_NOTIFIER_SETS_<Resource Entry Group>_<Resource Entry> -1  It exists if for a notifier handle of a provided resource multiple notifier sets are supported
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	<handleType>	Pointer or value stored in Binary Manifest for this handle
<b>Description</b>	Returns a handle of a Resource Entry in a Resource Entry Group	
<b>Available via</b>	SwCluC_BManif.h	

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

**[SWS\_SwCluC\_00062]** [The function [SwCluC\\_BManif\\_GetHandle](#) according to [\[SWS\\_SwCluC\\_10020\]](#) shall exist for each [SwCluCManifestProvideHandle](#) and [SwCluCManifestNotifierHandle](#) defined for each [SwCluCManifestProvideResourceEntry](#) and [SwCluCManifestRequireResourceEntry](#) in a [SwCluCManifestProvideResourceEntryGroup](#) and [SwCluCManifestRequireResourceEntryGroup](#).]([SRS\\_SwCluC\\_00006](#))



### 8.3.1.3 SwCluC\_BManif\_GetHandle

[SWS\_SwCluC\_10022] Definition of API function SwCluC\_BManif\_GetHandle\_<ResourceEntryGroup>\_<Handle> [

<b>Service Name</b>	SwCluC_BManif_GetHandle_<ResourceEntryGroup>_<Handle>	
<b>Syntax</b>	<pre>&lt;handleType&gt; SwCluC_BManif_GetHandle_&lt;ResourceEntryGroup&gt;_&lt;Handle&gt; (     SwCluC_BManif_TableIndexType resIndex,     SwCluC_BManif_HandleIndexType notifierSetIndex )</pre>	
<b>Service ID [hex]</b>	0x11	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	resIndex	Index of the resource entry in a Resource Entry Group in the range 0.. SWCLUC_BMANIF_NO_OF_ENTRIES_<Resource Entry Group> -1.
	notifierSetIndex	Optional parameter for the notifier set index in the range 0.. SWCLUC_BMANIF_MAX_NO_OF_NOTIFIER_SETS_<Resource Entry Group>_<Resource Entry> -1 It exists if for a notifier handle of a provided resource multiple notifier sets are supported
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	<handleType>	Id of the connected Software Cluster
<b>Description</b>	Returns a handle of a Resource Entry in a Resource Entry Group	
<b>Available via</b>	SwCluC_BManif.h	

] ([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

[SWS\_SwCluC\_00064] [The function [SwCluC\\_BManif\\_GetHandle](#) according to [\[SWS\\_SwCluC\\_10022\]](#) shall exist for each [SwCluCBManifProvideHandle](#) and [SwCluCBManifNotifierHandle](#) defined for each [SwCluCBManifProvideResourceEntryGroup](#) and [SwCluCBManifRequireResourceEntryGroup](#).] ([SRS\\_SwCluC\\_00006](#))

### 8.3.1.4 SwCluC\_BManif\_GetConSwClusterId

[SWS\_SwCluC\_10021] Definition of API function SwCluC\_BManif\_GetConSwClusterId\_<ResourceEntryGroup>\_<ResourceEntry>\_<Handle> [

<b>Service Name</b>	SwCluC_BManif_GetConSwClusterId_<ResourceEntryGroup>_<ResourceEntry>_<Handle>	
<b>Syntax</b>	<pre>SwCluC_BManif_SwClusterIdType SwCluC_BManif_GetConSwCluster Id_&lt;ResourceEntryGroup&gt;_&lt;ResourceEntry&gt;_&lt;Handle&gt; (     SwCluC_BManif_HandleIndexType notifierSetIndex )</pre>	
<b>Service ID [hex]</b>	0x12	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	





<b>Parameters (in)</b>	notifierSetIndex	Optional parameter for the notifier set index in the range 0.. SWCLUC_BMANIF_MAX_NO_OF_NOTIFIER_SETS_<Resource Entry Group>_<Resource Entry> -1  It exists if for a notifier handle of a provided resource multiple notifier sets are supported
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	SwCluC_BManif_SwClusterIdType	Id of the connected Software Cluster
<b>Description</b>	Returns the Id of the connected Software Cluster for a Notifier Handle of a Provide Resource Entry or a Provide Handle of a Require Resource Entry	
<b>Available via</b>	SwCluC_BManif.h	

](SRS\_SwCluC\_00006, SRS\_BSW\_00310, SRS\_SwCluC\_00008)

**[SWS\_SwCluC\_00063]** [The function `SwCluC_BManif_GetConSwClusterId` according to **[SWS\_SwCluC\_10021]** shall exist

- for each `SwCluC_BManifNotifierHandle` defined for each `SwCluC_BManifProvideResourceEntry` in a `SwCluC_BManifProvideResourceEntryGroup`

AND

- for each `SwCluC_BManifProvideHandle` defined for each `SwCluC_BManifRequireResourceEntry` in a `SwCluC_BManifRequireResourceEntryGroup`.

](SRS\_SwCluC\_00006)

### 8.3.1.5 SwCluC\_BManif\_GetConSwClusterId

**[SWS\_SwCluC\_10023]** Definition of API function `SwCluC_BManif_GetConSwClusterId_<ResourceEntryGroup>_<Handle>` [

<b>Service Name</b>	SwCluC_BManif_GetConSwClusterId_<ResourceEntryGroup>_<Handle>	
<b>Syntax</b>	SwCluC_BManif_SwClusterIdType SwCluC_BManif_GetConSwClusterId_<ResourceEntryGroup>_<Handle> ( SwCluC_BManif_TableIndexType resIndex, SwCluC_BManif_HandleIndexType notifierSetIndex )	
<b>Service ID [hex]</b>	0x13	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	resIndex	Index of the resource entry in a Resource Entry Group in the range 0.. SWCLUC_BMANIF_NO_OF_ENTRIES_<Resource Entry Group> -1.



△

	notifierSetIndex	Optional parameter for the notifier set index in the range 0.. SWCLUC_BMANIF_MAX_NO_OF_NOTIFIER_SETS_<Resource Entry Group>_<Resource Entry> -1  It exists if for a notifier handle of a provided resource multiple notifier sets are supported.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	SwCluC_BManif_SwClusterIdType	Id of the connected Software Cluster
<b>Description</b>	Returns the Id of the connected Software Cluster for a Notifier Handle of a Provide Resource Entry or a Provide Handle of a Require Resource Entry	
<b>Available via</b>	SwCluC_BManif.h	

](SRS\_SwCluC\_00006, SRS\_BSW\_00310, SRS\_SwCluC\_00008)

**[SWS\_SwCluC\_00065]** [The function `SwCluC_BManif_GetConSwClusterId` according to **[SWS\_SwCluC\_10023]** shall exist

- for each `SwCluCBManifNotifierHandle` defined for a `SwCluCBManifProvideResourceEntryGroup`

AND

- for each `SwCluCBManifProvideHandle` defined for a `SwCluCBManifRequireResourceEntryGroup`.

](SRS\_SwCluC\_00006)

### 8.3.1.6 SwCluC\_BManif\_GetNoOfHandleSets

**[SWS\_SwCluC\_10032]** Definition of API function `SwCluC_BManif_GetNoOfHandleSets_<Resource Entry Group>_<Resource Entry>` [

<b>Service Name</b>	SwCluC_BManif_GetNoOfHandleSets_<Resource Entry Group>_<Resource Entry>	
<b>Syntax</b>	<code>SwCluC_BManif_HandleIndexType SwCluC_BManif_GetNoOfHandleSets_&lt;Resource Entry Group&gt;_&lt;Resource Entry&gt; ( void )</code>	
<b>Service ID [hex]</b>	0x14	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	SwCluC_BManif_HandleIndexType	Number of actually used - and thereby connected - handle sets
<b>Description</b>	Returns the number of actually used - and thereby connected - handle sets	
<b>Available via</b>	SwCluC_BManif.h	

](SRS\_SwCluC\_00006, SRS\_BSW\_00310)

[SWS\_SwCluC\_00066] [The function `SwCluC_BManif_GetNoOfHandleSets` according to [SWS\_SwCluC\_10032] shall exist for each `SwCluCBManifProvideResourceEntry` in a `SwCluCBManifProvideResourceEntryGroup` where the parameter `SwCluCBManifMultipleNotifierSupport` is set to `MULTIPLE_NOTIFIER_SETS`.] (SRS\_SwCluC\_00006)

### 8.3.1.7 SwCluC\_BManif\_GetNoOfHandleSets

[SWS\_SwCluC\_10033] Definition of API function `SwCluC_BManif_GetNoOfHandleSets_<Resource Entry Group>` [

<b>Service Name</b>	SwCluC_BManif_GetNoOfHandleSets_<Resource Entry Group>	
<b>Syntax</b>	<pre>SwCluC_BManif_HandleIndexType SwCluC_BManif_GetNoOfHandleSets_&lt;Resource Entry Group&gt; (     SwCluC_BManif_TableIndexType resIndex )</pre>	
<b>Service ID [hex]</b>	0x15	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	resIndex	Index of the resource entry in a Resource Entry Group in the range 0.. SWCLUC_BMANIF_NO_OF_ENTRIES_<Resource Entry Group> -1.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	SwCluC_BManif_HandleIndexType	Number of actually used - and thereby connected - handle sets
<b>Description</b>	Returns the number of actually used - and thereby connected - handle sets.	
<b>Available via</b>	SwCluC_BManif.h	

] (SRS\_SwCluC\_00006, SRS\_BSW\_00310)

[SWS\_SwCluC\_00067] [The function `SwCluC_BManif_GetNoOfHandleSets` according to [SWS\_SwCluC\_10033] shall exist for each `SwCluCBManifProvideResourceEntryGroup` where the parameter `SwCluCBManifMultipleNotifierSupport` is set to `MULTIPLE_NOTIFIER_SETS`.] (SRS\_SwCluC\_00006)

### 8.3.1.8 SwCluC\_BManif\_GetValidityMarker

[SWS\_SwCluC\_10034] Definition of API function `SwCluC_BManif_GetValidityMarker` [

<b>Service Name</b>	SwCluC_BManif_GetValidityMarker
<b>Syntax</b>	<pre>uint32 SwCluC_BManif_GetValidityMarker (     void )</pre>
<b>Service ID [hex]</b>	0x16





<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint32	Value of the Subscribed Interface Validity Marker
<b>Description</b>	Returns the value of the Subscribed Interface Validity Marker.	
<b>Available via</b>	SwCluC_BManif.h	

]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00310](#))

### 8.3.1.9 SWCLUC\_BMANIF\_NO\_OF\_ENTRIES

[[SWS\\_SwCluC\\_01000](#)] [

**Symbolic name:** SWCLUC\_BMANIF\_NO\_OF\_ENTRIES\_<Resource Entry Group>

**Value:** Number of [Resource Entries](#) in the according [Resource Entry Group](#)

**Comments:** n.a.]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00441](#))

[[SWS\\_SwCluC\\_00068](#)] [The definition SWCLUC\_BMANIF\_NO\_OF\_ENTRIES according to [[SWS\\_SwCluC\\_01000](#)] shall exist for each [SwCluCManifProvideResourceEntryGroup](#).]([SRS\\_SwCluC\\_00006](#))

### 8.3.1.10 SWCLUC\_BMANIF\_NO\_OF\_NOTIFIER\_SETS

[[SWS\\_SwCluC\\_01002](#)] [

**Symbolic name:** SWCLUC\_BMANIF\_MAX\_NO\_OF\_NOTIFIER\_SETS\_<Resource Entry Group>\_<Resource Entry>

**Value:** Maximum number of notifier sets for the according [Provide Resource Entry](#)

**Comments:** n.a.]([SRS\\_SwCluC\\_00006](#), [SRS\\_BSW\\_00441](#))

[[SWS\\_SwCluC\\_00069](#)] [The definition SWCLUC\_BMANIF\_NO\_OF\_NOTIFIER\_SETS according to [[SWS\\_SwCluC\\_01002](#)] shall exist for each [SwCluCManifProvideResourceEntry](#) in a [SwCluCManifProvideResourceEntryGroup](#) where the parameter [SwCluCManifMultipleNotifierSupport](#) is set to MULTIPLE\_NOTIFIER\_SETS.]([SRS\\_SwCluC\\_00006](#))

## 8.3.2 Cross Cluster Communication

In addition to the interfaces listed in this section, the [Cross Cluster Communication](#) implements the interfaces of a [Cross Software Cluster Communication Plug-In](#) as specified in document [4].

### 8.3.2.1 SwCluC\_Xcc\_Init1

#### [SWS\_SwCluC\_11000] Definition of API function SwCluC\_Xcc\_Init1 [

<b>Service Name</b>	SwCluC_Xcc_Init1
<b>Syntax</b>	void SwCluC_Xcc_Init1 ( void )
<b>Service ID [hex]</b>	0x20
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_Xcc_Init is intended to allocate and initialize system resources used by the Software Cluster Connection. It initializes interface memory which might be needed to be read by other Software Clusters but it is not allowed to do any read access to memory of any another Software Cluster.
<b>Available via</b>	SwCluC.h

]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00108](#), [SRS\\_BSW\\_00101](#), [SRS\\_BSW\\_-00358](#), [SRS\\_BSW\\_00310](#))

### 8.3.2.2 SwCluC\_Xcc\_Init2

#### [SWS\_SwCluC\_11001] Definition of API function SwCluC\_Xcc\_Init2 [

<b>Service Name</b>	SwCluC_Xcc_Init2
<b>Syntax</b>	void SwCluC_Xcc_Init2 ( void )
<b>Service ID [hex]</b>	0x21
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_Xcc_Init2 is intended to allocate and initialize system resources used by the Software Cluster Connection. It can execute initializations which require a read access to interface memory of another Software Clusters.
<b>Available via</b>	SwCluC.h

]([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00108](#), [SRS\\_BSW\\_00101](#), [SRS\\_BSW\\_-00358](#), [SRS\\_BSW\\_00310](#))

### 8.3.3 Proxy Modules

The [Proxy Modules](#) partly implement the interfaces of the according AUTOSAR BSW modules. Those are listed in appendix [D](#).

Following functions are provided in addition:

#### 8.3.3.1 SwCluC\_OsProxy\_Init

**[SWS\_SwCluC\_12000] Definition of API function SwCluC\_OsProxy\_Init\_<SwCluC\_OsProxyOsBaseSocket>** [

<b>Service Name</b>	SwCluC_OsProxy_Init_<SwCluC_OsProxyOsBaseSocket>
<b>Syntax</b>	void SwCluC_OsProxy_Init_<SwCluC_OsProxyOsBaseSocket> ( void )
<b>Service ID [hex]</b>	0x30
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_OsProxy_Init is intended to allocate and initialize system resources used by the Os Proxy linked to this specific socket
<b>Available via</b>	SwCluC.h

] ([SRS\\_BSW\\_00101](#), [SRS\\_BSW\\_00358](#), [SRS\\_BSW\\_00310](#))

The name part <SwCluC\_OsProxyOsBaseSocket> is the [shortName](#) of the [SwCluC\\_OsProxyOsBaseSocket](#).

#### 8.3.3.2 SwCluC\_NvMProxy\_Init

**[SWS\_SwCluC\_12100] Definition of API function SwCluC\_NvMProxy\_Init\_<SwCluC\_NvMBaseSocket>** [

<b>Service Name</b>	SwCluC_NvMProxy_Init_<SwCluC_NvMBaseSocket>
<b>Syntax</b>	void SwCluC_NvMProxy_Init_<SwCluC_NvMBaseSocket> ( void )
<b>Service ID [hex]</b>	0x31
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None







<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_NvMProxy_Init is intended to allocate and initialize system resources used by the NvMProxy linked to this specific socket.
<b>Available via</b>	SwCluC.h

]([SRS\\_BSW\\_00101](#), [SRS\\_BSW\\_00358](#), [SRS\\_BSW\\_00310](#))

The name part <SwCluCnVmBaseSocket> is the `shortName` of the `SwCluCnVmBaseSocket`.

### 8.3.3.3 SwCluC\_NvMProxy\_MultiBlockReadAllJobFinished

[SWS\_SwCluC\_91003] Definition of API function SwCluC\_NvMProxy\_MultiBlockReadAllJobFinished [

<b>Service Name</b>	SwCluC_NvMProxy_MultiBlockReadAllJobFinished
<b>Syntax</b>	<pre>void SwCluC_NvMProxy_MultiBlockReadAllJobFinished (     void )</pre>
<b>Service ID [hex]</b>	0x47
<b>Sync/Async</b>	Asynchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	This function informs the NvM proxy of the SwCluC about the end of the NvM_ReadAll job.
<b>Available via</b>	SwCluC.h

]()

### 8.3.3.4 SwCluC\_LdComProxy\_Init

[SWS\_SwCluC\_13000]{DRAFT} Definition of API function SwCluC\_LdComProxy\_Init\_<SwCluCLdComBaseSocket> [

<b>Service Name</b>	SwCluC_LdComProxy_Init_<SwCluCLdComBaseSocket> (draft)
<b>Syntax</b>	<pre>void SwCluC_LdComProxy_Init_&lt;SwCluCLdComBaseSocket&gt; (     void )</pre>
<b>Service ID [hex]</b>	0x32
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None





<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_LdComProxy_Init is intended to allocate and initialize system resources used by the LdComProxy linked to this specific socked. <b>Tags:</b> atp.Status=draft
<b>Available via</b>	SwCluC.h

|(SRS\_BSW\_00101, SRS\_BSW\_00358, SRS\_BSW\_00310)

The name part <SwCluCLdComProxyBaseSocket> is the [shortName](#) of the [SwCluCLdComProxyBaseSocket](#).

### 8.3.3.5 SwCluC\_ComProxy\_Init

[SWS\_SwCluC\_13001]{DRAFT} Definition of API function SwCluC\_ComProxy\_Init\_<SwCluCComBaseSocket> [

<b>Service Name</b>	SwCluC_ComProxy_Init_<SwCluCComBaseSocket> (draft)
<b>Syntax</b>	void SwCluC_ComProxy_Init_<SwCluCComBaseSocket> ( void )
<b>Service ID [hex]</b>	0x33
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_ComProxy_Init is intended to allocate and initialize system resources used by the ComProxy linked to this specific socked. <b>Tags:</b> atp.Status=draft
<b>Available via</b>	SwCluC.h

|(SRS\_BSW\_00101, SRS\_BSW\_00358, SRS\_BSW\_00310)

The name part <SwCluCComProxyBaseSocket> is the [shortName](#) of the [SwCluC-ComProxyBaseSocket](#).

### 8.3.3.6 SwCluC\_DcmProxy\_Init

[SWS\_SwCluC\_12200]{DRAFT} Definition of API function SwCluC\_DcmProxy\_Init\_<SwCluCDcmBaseSocket> [

<b>Service Name</b>	SwCluC_DcmProxy_Init_<SwCluCDcmBaseSocket> (draft)
<b>Syntax</b>	void SwCluC_DcmProxy_Init_<SwCluCDcmBaseSocket> ( void )
<b>Service ID [hex]</b>	0x34
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_DcmProxy_Init is intended to allocate and initialize system resources used by the Dcm Proxy linked to this specific socket. <b>Tags:</b> atp.Status=draft
<b>Available via</b>	SwCluC.h

]([SRS\\_BSW\\_00101](#), [SRS\\_BSW\\_00358](#), [SRS\\_BSW\\_00310](#))

The name part <SwCluCDcmProxyBaseSocket> is the [shortName](#) of the [SwCluCDcmProxyBaseSocket](#).

### 8.3.3.7 SwCluC\_DemProxy\_Init

[SWS\_SwCluC\_12300]{DRAFT} Definition of API function SwCluC\_DemProxy\_Init\_<SwCluCDemBaseSocket> [

<b>Service Name</b>	SwCluC_DemProxy_Init_<SwCluCDemBaseSocket> (draft)
<b>Syntax</b>	void SwCluC_DemProxy_Init_<SwCluCDemBaseSocket> ( void )
<b>Service ID [hex]</b>	0x35
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_DemProxy_Init is intended to allocate and initialize system resources used by the Dem Proxy linked to this specific socket. <b>Tags:</b> atp.Status=draft
<b>Available via</b>	SwCluC.h

]([SRS\\_BSW\\_00101](#), [SRS\\_BSW\\_00358](#), [SRS\\_BSW\\_00310](#))

The name part <SwCluCDemProxyBaseSocket> is the [shortName](#) of the [SwCluCDemProxyBaseSocket](#).

### 8.3.3.8 SwCluC\_FiMProxy\_Init

**[SWS\_SwCluC\_12400]{DRAFT} Definition of API function SwCluC\_FiMProxy\_Init\_<SwCluCFiMBaseSocket>** [

<b>Service Name</b>	SwCluC_FiMProxy_Init_<SwCluCFiMBaseSocket> (draft)
<b>Syntax</b>	void SwCluC_FiMProxy_Init_<SwCluCFiMBaseSocket> ( void )
<b>Service ID [hex]</b>	0x36
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	SwCluC_FiMProxy_Init is intended to allocate and initialize system resources used by the FiM Proxy linked to this specific socket. <b>Tags:</b> atp.Status=draft
<b>Available via</b>	SwCluC.h

] ([SRS\\_BSW\\_00101](#), [SRS\\_BSW\\_00358](#), [SRS\\_BSW\\_00310](#))

The name part <SwCluCFiMProxyBaseSocket> is the [shortName](#) of the [SwCluC-FiMProxyBaseSocket](#).

## 8.3.4 Common Functions

This section describes the interfaces which are common for the whole [SwCluC](#) module.

### 8.3.4.1 SwCluC\_GetVersionInfo

**[SWS\_SwCluC\_91001] Definition of API function SwCluC\_GetVersionInfo** [

<b>Service Name</b>	SwCluC_GetVersionInfo
<b>Syntax</b>	void SwCluC_GetVersionInfo ( Std_VersionInfoType* versioninfo )
<b>Service ID [hex]</b>	0x45
<b>Sync/Async</b>	Asynchronous
<b>Reentrancy</b>	Non Reentrant





<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	versioninfo	Pointer to where to store the version information of this module.
<b>Return value</b>	None	
<b>Description</b>	Service to get the version information of the SwCluC module.	
<b>Available via</b>		

|(SRS\_BSW\_00482, SRS\_BSW\_00373, SRS\_BSW\_00407)

## 8.4 Callback notifications

This is a list of functions provided for other modules.

### 8.4.1 Binary Manifest

The [Binary Manifest](#) has no callback notifications.

### 8.4.2 Cross Cluster Communication

The [Cross Cluster Communication](#) implements the interfaces of a [Cross Software Cluster Communication Plug-In](#) as specified in document [4].

### 8.4.3 Proxy Modules

The [Proxy Modules](#) partly implement the callback notifications of the according AUTOSAR BSW modules. Those are listed in appendix [D](#).

#### 8.4.3.0.1 Com Proxy

##### 8.4.3.0.1.1 SwCluC\_ComProxy\_CbkRxAck

[SWS\_SwCluC\_13002]{DRAFT} **Definition of callback function SwCluC\_Com Proxy\_<BS>\_CbkRxAck** [

<b>Service Name</b>	SwCluC_ComProxy_<BS>_CbkRxAck (draft)
<b>Syntax</b>	void SwCluC_ComProxy_<BS>_CbkRxAck ( CbchandleIdType ComUserCbchandleId )
<b>Service ID [hex]</b>	0x37



△

<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ComUserCbkJandleId	Com user callback handle Id
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	This callback function indicates that the signal of the primitive data item/event is ready for reception. It is an implementation of a <ComUser_CbkRxAck> callback. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	SwCluC_ComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00211](#))

#### 8.4.3.0.1.2 SwCluC\_ComProxy\_CbkInv

**[SWS\_SwCluC\_13003]{DRAFT} Definition of callback function SwCluC\_ComProxy\_<BS>\_CbkInv** [

<b>Service Name</b>	SwCluC_ComProxy_<BS>_CbkInv (draft)	
<b>Syntax</b>	void SwCluC_ComProxy_<BS>_CbkInv ( CbkJandleIdType ComUserCbkJandleId )	
<b>Service ID [hex]</b>	0x38	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ComUserCbkJandleId	Com user callback handle Id
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	This callback function indicates that COM has received a signal and parsed it as "invalid". It is an implementation of a <ComUser_CbkInv> callback. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	SwCluC_ComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00211](#))

### 8.4.3.0.1.3 SwCluC\_ComProxy\_CbkRxTOut

[SWS\_SwCluC\_13004]{DRAFT} Definition of callback function SwCluC\_ComProxy\_<BS>\_CbkRxTOut [

<b>Service Name</b>	SwCluC_ComProxy_<BS>_CbkRxTOut (draft)	
<b>Syntax</b>	<pre>void SwCluC_ComProxy_&lt;BS&gt;_CbkRxTOut (     CbkHandleIdType ComUserCbkHandleId )</pre>	
<b>Service ID [hex]</b>	0x39	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ComUserCbkHandleId	Com user callback handle Id
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>This callback function indicates that the aliveTimeout after the last successful reception of the signal of the data item/event has expired (data element outdated). It is an implementation of a &lt;ComUser_CbkRxTOut&gt; callback.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	SwCluC_ComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00211](#))

### 8.4.3.0.1.4 SwCluC\_ComProxy\_CbkTxAck

[SWS\_SwCluC\_13005]{DRAFT} Definition of callback function SwCluC\_ComProxy\_<BS>\_CbkTxAck [

<b>Service Name</b>	SwCluC_ComProxy_<BS>_CbkTxAck (draft)	
<b>Syntax</b>	<pre>void SwCluC_ComProxy_&lt;BS&gt;_CbkTxAck (     CbkHandleIdType ComUserCbkHandleId )</pre>	
<b>Service ID [hex]</b>	0x3a	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ComUserCbkHandleId	Com user callback handle Id
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>This callback function indicates that the signal of the data item/event is already handed over by COM to the PDU router. It is an implementation of a &lt;ComUser_CbkTxAck&gt; callback.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	SwCluC_ComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00211](#))



#### 8.4.3.0.1.5 SwCluC\_ComProxy\_CbkTxErr

[SWS\_SwCluC\_13006]{DRAFT} Definition of callback function SwCluC\_ComProxy\_<BS>\_CbkTxErr [

<b>Service Name</b>	SwCluC_ComProxy_<BS>_CbkTxErr (draft)	
<b>Syntax</b>	<pre>void SwCluC_ComProxy_&lt;BS&gt;_CbkTxErr (     CbkHandleIdType ComUserCbkJHandleId )</pre>	
<b>Service ID [hex]</b>	0x3b	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ComUserCbkJHandleId	Com user callback handle Id
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>This callback function indicates that an error occurred when the signal of the data item/event was handed over by COM to the PDU router. It is an implementation of a &lt;ComUser_CbkTxErr&gt; callback.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	SwCluC_ComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00211](#))

#### 8.4.3.0.1.6 SwCluC\_ComProxy\_CbkTxTOut

[SWS\_SwCluC\_13007]{DRAFT} Definition of callback function SwCluC\_ComProxy\_<BS>\_CbkTxTOut [

<b>Service Name</b>	SwCluC_ComProxy_<BS>_CbkTxTOut (draft)	
<b>Syntax</b>	<pre>void SwCluC_ComProxy_&lt;BS&gt;_CbkTxTOut (     CbkHandleIdType ComUserCbkJHandleId )</pre>	
<b>Service ID [hex]</b>	0x3c	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ComUserCbkJHandleId	Com user callback handle Id
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>This callback function indicates that the timeout of TransmissionAcknowledgementRequest for sending the signal of the data item/event has expired. It is an implementation of a &lt;ComUser_CbkTxTOut&gt; callback.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	SwCluC_ComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00211](#))

### 8.4.3.0.2 LdCom Proxy

#### 8.4.3.0.2.1 SwCluC\_LdComProxy\_LdComCbkJCopyRxData

[SWS\_SwCluC\_13008]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJCopyRxData [

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJCopyRxData (draft)	
<b>Syntax</b>	<pre>BufReq_ReturnType SwCluC_LdComProxy_&lt;BS&gt;_LdComCbkJCopyRxData (     CbkHandleIdType LdComUserCbkJHandleId,     const PduInfoType* info,     PduLengthType* bufferSizePtr )</pre>	
<b>Service ID [hex]</b>	0x3d	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJHandleId	LdCom user callback handle Id corresponding to the received I-PDU
	info	Provides the source buffer (SduDataPtr) and the number of bytes to be copied (SduLength). An SduLength of 0 can be used to query the current amount of available buffer in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	bufferSizePtr	Available receive buffer after data has been copied.
<b>Return value</b>	BufReq_ReturnType	BUFREQ_OK: Data copied successfully BUFREQ_E_NOT_OK: Data was not copied because an error occurred.
<b>Description</b>	This function is called to provide the received data of an I-PDU segment (N-PDU) to the upper layer. Each call to this function provides the next part of the I-PDU data. The size of the remaining data is written to the position indicated by bufferSizePtr. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h	

] ([SRS\\_SwCluC\\_00207](#))

#### 8.4.3.0.2.2 SwCluC\_LdComProxy\_LdComCbkJCopyTxData

[SWS\_SwCluC\_13009]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJCopyTxData [

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJCopyTxData (draft)	
<b>Syntax</b>	<pre>BufReq_ReturnType SwCluC_LdComProxy_&lt;BS&gt;_LdComCbkJCopyTxData (     CbkHandleIdType LdComUserCbkJHandleId,     const PduInfoType* info,     const RetryInfoType* retry,     PduLengthType* availableDataPtr )</pre>	
<b>Service ID [hex]</b>	0x3e	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJHandleId, otherwise Reentrant	





<b>Parameters (in)</b>	LdComUserCbkJdHandleId	LdCom user callback handle Id corresponding to the transmitted I-PDU.
	info	Provides the destination buffer (SduDataPtr) and the number of bytes to be copied (SduLength). If not enough transmit data is available, no data is copied by the upper layer module and BUFREQ_E_BUSY is returned. The lower layer module may retry the call. An SduLength of 0 can be used to indicate state changes in the retry parameter or to query the current amount of available data in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
	retry	Will not be handled by LdCom and its upper layer.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	availableDataPtr	Indicates the remaining number of bytes that are available in the upper layer module's Tx buffer. availableDataPtr can be used by TP modules that support dynamic payload lengths (e.g. FrlsoTp) to determine the size of the following CFS.
<b>Return value</b>	BufReq_ReturnType	<p>BUFREQ_OK: Data has been copied to the transmit buffer completely as requested.</p> <p>BUFREQ_E_BUSY: Request could not be fulfilled, because the required amount of Tx data is not available. The lower layer module may retry this call later on. No data has been copied.</p> <p>BUFREQ_E_NOT_OK: Data has not been copied. Request failed.</p>
<b>Description</b>	<p>This function is called to acquire the transmit data of an I-PDU segment (N-PDU). Each call to this function provides the next part of the I-PDU data unless retry-&gt;TpDataState is TP_DATARETRY. In this case the function restarts to copy the data beginning at the offset from the current position indicated by retry-&gt;TxTpDataCnt. The size of the remaining data is written to the position indicated by availableDataPtr</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h	

](SRS\_SwCluC\_00207)

### 8.4.3.0.2.3 SwCluC\_LdComProxy\_LdComCbkJdRxIndication

[SWS\_SwCluC\_13010]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJdRxIndication [

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJdRxIndication (draft)	
<b>Syntax</b>	<pre>void SwCluC_LdComProxy_&lt;BS&gt;_LdComCbkJdRxIndication (     CbkHandleIdType LdComUserCbkJdHandleId,     const PduInfoType* PduInfoPtr )</pre>	
<b>Service ID [hex]</b>	0x3f	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJdHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJdHandleId	LdCom user callback handle Id corresponding to the received PDU
	PduInfoPtr	Contains the length (SduLength) of the received PDU, a pointer to a buffer (SduDataPtr) containing the PDU, and the MetaData related to this PDU.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	





<b>Return value</b>	None
<b>Description</b>	Indication of a received PDU from a lower layer communication interface module. <b>Tags:</b> atp.Status=draft
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h

|(SRS\_SwCluC\_00207)

#### 8.4.3.0.2.4 SwCluC\_LdComProxy\_LdComCbkJStartOfReception

#### [SWS\_SwCluC\_13015]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJStartOfReception [

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJStartOfReception (draft)	
<b>Syntax</b>	BufReq_ReturnType SwCluC_LdComProxy_<BS>_LdComCbkJStartOfReception ( CbkHandleIdType LdComUserCbkJHandleId, const PduInfoType* info, PduLengthType TpSduLength, PduLengthType* bufferSizePtr )	
<b>Service ID [hex]</b>	0x40	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJHandleId	LdCom user callback handle Id corresponding to the I-PDU.
	info	Pointer to a PduInfoType structure containing the payload data (without protocol information) and payload length of the first frame or single frame of a transport protocol I-PDU reception, and the MetaData related to this PDU. If neither first/single frame data nor MetaData are available, this parameter is set to NULL_PTR.
	TpSduLength	Total length of the N-SDU to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	bufferSizePtr	Available receive buffer in the receiving module. This parameter will be used to compute the Block Size (BS) in the transport protocol module.
<b>Return value</b>	BufReq_ReturnType	BUFREQ_OK: Connection has been accepted. bufferSizePtr indicates the available receive buffer; reception is continued. If no buffer of the requested size is available, a receive buffer size of 0 shall be indicated by bufferSizePtr. BUFREQ_E_NOT_OK: Connection has been rejected; reception is aborted. bufferSizePtr remains unchanged. BUFREQ_E_OVFL: No buffer of the required length can be provided; reception is aborted. bufferSizePtr remains unchanged.
<b>Description</b>	This function is called at the start of receiving an N-SDU. The N-SDU might be fragmented into multiple N-PDUs (FF with one or more following CFs) or might consist of a single N-PDU (SF). The service shall provide the currently available maximum buffer size when invoked with TpSduLength equal to 0. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h	

|(SRS\_SwCluC\_00207)

### 8.4.3.0.2.5 SwCluC\_LdComProxy\_LdComCbkJpRxIndication

[SWS\_SwCluC\_13011]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJpRxIndication [

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJpRxIndication (draft)	
<b>Syntax</b>	<pre>void SwCluC_LdComProxy_&lt;BS&gt;_LdComCbkJpRxIndication (     CbkHandleIdType LdComUserCbkJpHandleId,     Std_ReturnType result )</pre>	
<b>Service ID [hex]</b>	0x41	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same sn, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJpHandleId	LdCom user callback handle Id corresponding to the received I-PDU
	result	Result of the reception.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>Called after an I-PDU has been received via the TP API, the result indicates whether the transmission was successful or not.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00207](#))

### 8.4.3.0.2.6 SwCluC\_LdComProxy\_LdComCbkJriggerTransmit

[SWS\_SwCluC\_13012]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJriggerTransmit [

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJriggerTransmit (draft)	
<b>Syntax</b>	<pre>Std_ReturnType SwCluC_LdComProxy_&lt;BS&gt;_LdComCbkJriggerTransmit (     CbkHandleIdType LdComUserCbkJpHandleId,     PduInfoType* PduInfoPtr )</pre>	
<b>Service ID [hex]</b>	0x42	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJpHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJpHandleId	LdCom user callback handle Id corresponding to the ID of the SDU that is requested to be transmitted
	PduInfoPtr	Contains a pointer to a buffer (SduDataPtr) to where the SDU data shall be copied, and the available buffer size in SduLengh. On return, the service will indicate the length of the copied SDU data in SduLengh.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	





<b>Return value</b>	Std_ReturnType	E_OK: SDU has been copied and SduLength indicates the number of copied bytes. E_NOT_OK: No SDU data has been copied. PduInfoPtr must not be used since it may contain a NULL pointer or point to invalid data.
<b>Description</b>	Within this API, the upper layer module (called module) shall check whether the available data fits into the buffer size reported by PduInfoPtr->SduLength. If it fits, it shall copy its data into the buffer provided by PduInfoPtr->SduDataPtr and update the length of the actual copied data in PduInfoPtr->SduLength. If not, it returns E_NOT_OK without changing PduInfoPtr. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h	

](SRS\_SwCluC\_00207)

#### 8.4.3.0.2.7 SwCluC\_LdComProxy\_LdComCbkJxConfirmation

**[SWS\_SwCluC\_13013]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJxConfirmation [**

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJxConfirmation (draft)	
<b>Syntax</b>	void SwCluC_LdComProxy_<BS>_LdComCbkJxConfirmation ( CbkHandleIdType LdComUserCbkJxHandleId, Std_ReturnType result )	
<b>Service ID [hex]</b>	0x43	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJxHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJxHandleId	LdCom user callback handle Id corresponding to the PDU that has been transmitted
	result	E_OK: The PDU was transmitted. E_NOT_OK: Transmission of the PDU failed.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	The lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h	

](SRS\_SwCluC\_00207)

### 8.4.3.0.2.8 SwCluC\_LdComProxy\_LdComCbkJpTxConfirmation

[SWS\_SwCluC\_13014]{DRAFT} Definition of callback function SwCluC\_LdComProxy\_<BS>\_LdComCbkJpTxConfirmation [

<b>Service Name</b>	SwCluC_LdComProxy_<BS>_LdComCbkJpTxConfirmation (draft)	
<b>Syntax</b>	<pre>void SwCluC_LdComProxy_&lt;BS&gt;_LdComCbkJpTxConfirmation (     CbkHandleIdType LdComUserCbkJpHandleId,     Std_ReturnType result )</pre>	
<b>Service ID [hex]</b>	0x44	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJpHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJpHandleId	LdCom user callback handle Id corresponding to the transmitted I-PDU
	result	E_OK - transmission successful E_NOT_OK - transmission not successful
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>This function is called after a Signal has been transmitted via the TP-API on its network.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	SwCluC_LdComProxy_Cbk.h	

]([SRS\\_SwCluC\\_00207](#))

## 8.5 Scheduled functions

These functions are directly called by Basic Software Scheduler. The following functions shall have no return value and no parameter. All functions shall be non reentrant.

### 8.5.1 Binary Manifest

The [Binary Manifest](#) has no scheduled functions.

### 8.5.2 Cross Cluster Communication Scheduled functions

#### 8.5.2.1 SwCluC\_Xcc\_MainFunction



**[SWS\_SwCluC\_91002] Definition of scheduled function SwCluC\_Xcc\_MainFunction\_<suffix>** [

<b>Service Name</b>	SwCluC_Xcc_MainFunction_<suffix>
<b>Syntax</b>	void SwCluC_Xcc_MainFunction_<suffix> ( void )
<b>Service ID [hex]</b>	0x46
<b>Description</b>	This function shall perform timeout monitoring of SwCluC Xcc
<b>Available via</b>	SwCluC.h

] ([SRS\\_BSW\\_00373](#), [SRS\\_BSW\\_00172](#))

**[SWS\_SwCluC\_03099]** [The [Cross Cluster Communication](#) of the [Software Cluster Connection](#) shall provide a [SwCluC\\_Xcc\\_MainFunction](#) per [SwCluC\\_Xcc\\_MainFunction](#) container where suffix is set to the [shortName](#) of the [SwCluC\\_Xcc\\_MainFunction](#) container.] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#))

Please note, beside the standardized scheduled functions, the [Cross Cluster Communications](#) is free to implement additional vendor specific ones if needed.

### 8.5.3 Proxy Modules Scheduled functions

The [Proxy Modules](#) have no standardized scheduled functions but are free to implement some if functionally needed.

## 8.6 Expected interfaces

In this chapter, all interfaces required from other modules are listed.

### 8.6.1 Mandatory interfaces

Note: This section defines all interfaces, which are required to fulfill the core functionality of the module.

#### 8.6.1.1 Binary Manifest

The [Binary Manifest](#) has no mandatory interfaces.

#### 8.6.1.2 Cross Cluster Communication

The [Cross Cluster Communication](#) has no mandatory interfaces.

### 8.6.1.3 Proxy Modules

The [Proxy Modules](#) partly implement the mandatory interfaces of the according AUTOSAR BSW modules. Those are listed in appendix [D](#).

## 8.6.2 Optional interfaces

This section defines all interfaces, which are required to fulfill an optional functionality of the module.

### 8.6.2.1 Binary Manifest

The [Binary Manifest](#) has no optional interfaces.

### 8.6.2.2 Cross Cluster Communication

The [Cross Cluster Communication](#) has no optional interfaces.

### 8.6.2.3 Proxy Modules

The [Proxy Modules](#) partly implement the optional interfaces of the according AUTOSAR BSW modules. Those are listed in appendix [D](#).

## 8.6.3 Configurable interfaces

In this section, all interfaces are listed where the target function could be configured. The target function is usually a callback function. The names of this kind of interfaces are not fixed because they are configurable.

### 8.6.3.1 Binary Manifest

The [Binary Manifest](#) has no configurable interfaces.

### 8.6.3.2 Cross Cluster Communication

The [Cross Cluster Communication](#) implements the interfaces of a [Cross Software Cluster Communication Plug-In](#) as specified in document [\[4\]](#).

### 8.6.3.3 Proxy Modules

The [Proxy Modules](#) partly implement the configurable interfaces of the according AUTOSAR BSW modules. Those are listed in appendix [D](#).

## 8.7 Service Interfaces

### 8.7.1 Binary Manifest

The [Binary Manifest](#) has no Service Interfaces.

### 8.7.2 Cross Cluster Communication

The [Cross Cluster Communication](#) has no Service Interfaces.

### 8.7.3 Proxy Modules

The [Proxy Modules](#) only implement Service Interfaces, which are already defined by the original AUTOSAR Service. Those are listed in appendix [E](#).

## 9 Sequence diagrams

No sequence diagrams are contained in this section.

## 10 Configuration specification

In general, this chapter defines configuration parameters and their clustering into containers. In order to support the specification Chapter 10.1 describes fundamentals. It also specifies a template (table) you shall use for the parameter specification. We intend to leave Chapter 10.1 in the specification to guarantee comprehension.

Chapter 10.2 specifies the structure (containers) and the parameters of the module `SwCluC`.

Chapter 10.3 specifies published information of the module `SwCluC`.

### 10.1 How to read this chapter

For details, refer to the chapter 10.1 “Introduction to configuration specification” in `SWS_BSWGeneral`.

### 10.2 Containers and configuration parameters

The following chapters summarize all configuration parameters. The detailed meanings of the parameters describe Chapter 7 and Chapter 8.

### 10.2.1 Module Configuration

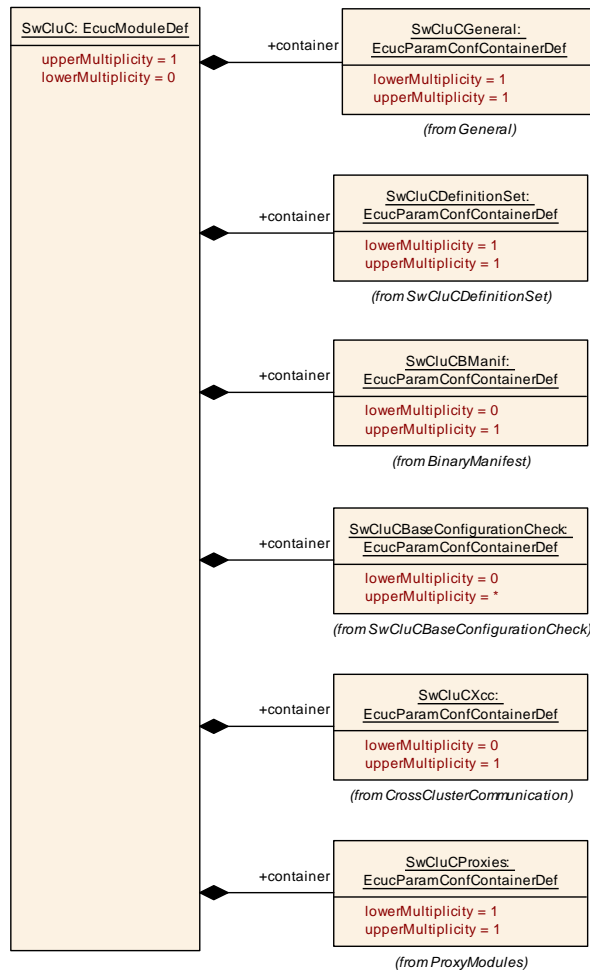


Figure 10.1: SwCluC configuration overview

<b>SWS Item</b>	[ECUC_SwCluC_00001]
<b>Module Name</b>	SwCluC
<b>Description</b>	Module to collect Software Cluster Connection specific configuration information.
<b>Post-Build Variant Support</b>	true
<b>Supported Config Variants</b>	VARIANT-POST-BUILD, VARIANT-PRE-COMPILE

Included Containers		
Container Name	Multiplicity	Scope / Dependency
SwCluCBManif	0..1	Configuration of the Binary Manifest of the Software Cluster Connection
SwCluCBBaseConfigurationCheck	0..*	Configuration of the base configuration check of Software Cluster Connection. This configuration places a mandatory entry in the Binary Manifest where the guard value is used to proof if the general setup of the Application Software Cluster is compatible to the general setup of the Host Software Cluster. For each Application Software Cluster an individual base configuration check should be defined.





Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCDefinitionSet</a>	1	Definition of a set of Software Clusters
<a href="#">SwCluCGeneral</a>	1	General configuration of the Software Cluster Connection
<a href="#">SwCluCProxies</a>	1	General configuration of the Proxy Modules of Software Cluster Connection
<a href="#">SwCluCXcc</a>	0..1	Configuration of the Binary Manifest of the Software Cluster Connection

### 10.2.2 General configuration parameters

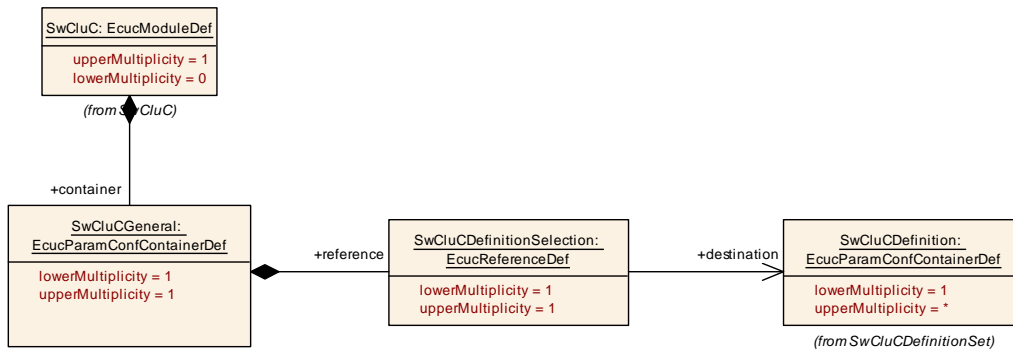


Figure 10.2: SwCluC General configuration parameters

<b>SWS Item</b>	[ECUC_SwCluC_00002]		
<b>Container Name</b>	SwCluCGeneral		
<b>Parent Container</b>	<a href="#">SwCluC</a>		
<b>Description</b>	General configuration of the Software Cluster Connection		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00005]		
<b>Parameter Name</b>	SwCluCDefinitionSelection		
<b>Parent Container</b>	<a href="#">SwCluCGeneral</a>		
<b>Description</b>	This reference selects the Software Cluster Definition which is applied for this Software Cluster.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">SwCluCDefinition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	



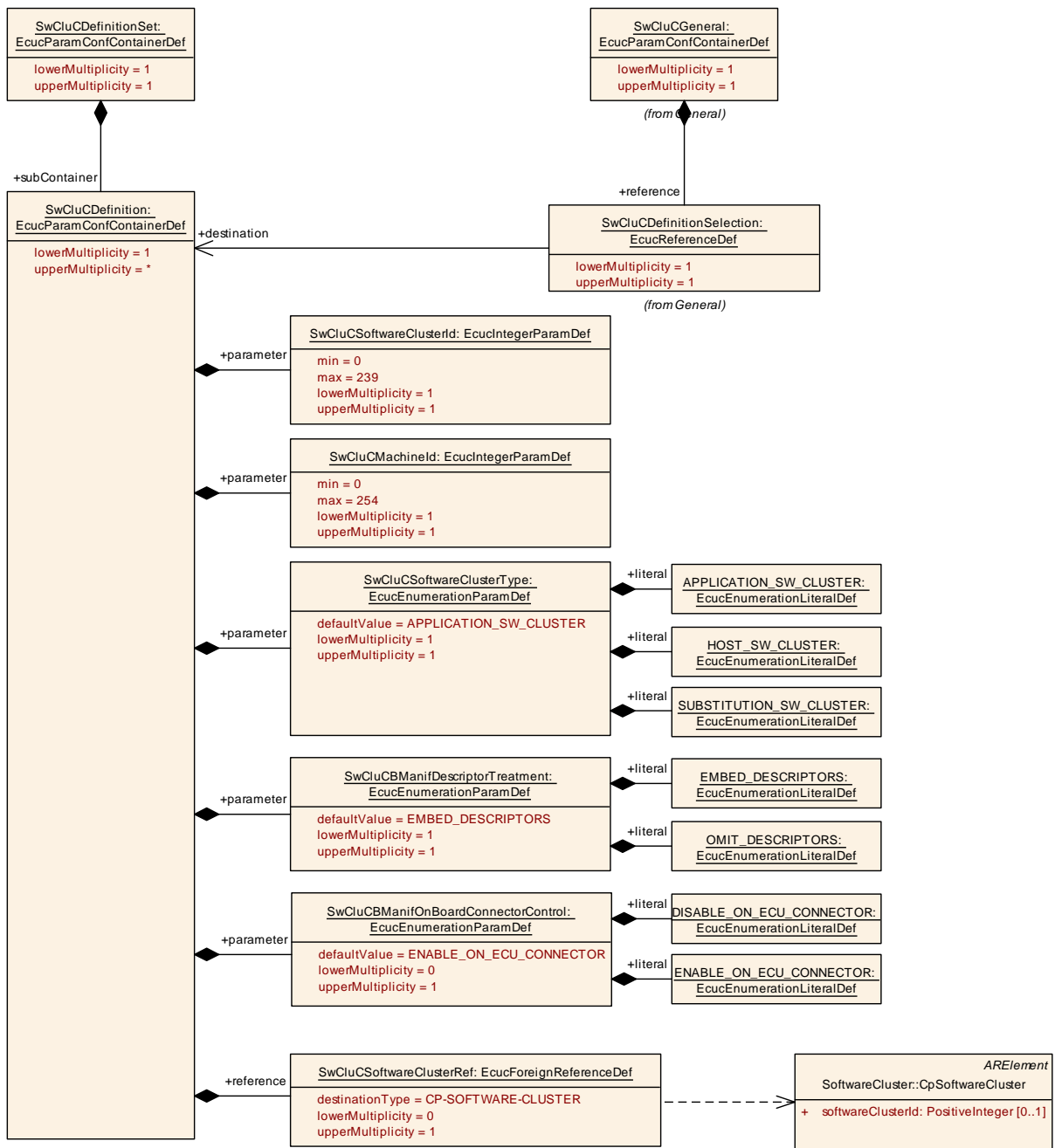




<b>Scope / Dependency</b>	scope: local
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<b>No Included Containers</b>
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### 10.2.3 Software Cluster Definition



**Figure 10.3: SwCluC Software Cluster Definition**

<b>SWS Item</b>	[ECUC_SwCluC_00004]
<b>Container Name</b>	SwCluCDefinitionSet
<b>Parent Container</b>	<a href="#">SwCluC</a>
<b>Description</b>	Definition of a set of Software Clusters
<b>Configuration Parameters</b>	

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCDefinition</a>	1..*	Definition of the general properties of the Software Cluster. The definitions are separated in a set of definitions in order to enable an holistic view about all existing Software Cluster Definitions.

<b>SWS Item</b>	[ECUC_SwCluC_00006]		
<b>Container Name</b>	SwCluCDefinition		
<b>Parent Container</b>	<a href="#">SwCluCDefinitionSet</a>		
<b>Description</b>	Definition of the general properties of the Software Cluster. The definitions are separated in a set of definitions in order to enable an holistic view about all existing Software Cluster Definitions.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00010]		
<b>Parameter Name</b>	SwCluCBManifDescriptorTreatment		
<b>Parent Container</b>	<a href="#">SwCluCDefinition</a>		
<b>Description</b>	Configures the existence of the Interface Descriptor Table in the Binary Object of the Software Cluster.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	EMBED_DESCRIPTOR	The Interface Descriptor Table of the Binary Manifest is embed into the Binary Object.	
	OMIT_DESCRIPTOR	The Interface Descriptor Table of the Binary Manifest is omitted from the Binary Object. The information needs to be delivered as CpSoftwareClusterBinaryManifestDescriptor.	
<b>Default value</b>	<a href="#">EMBED_DESCRIPTOR</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00011]
<b>Parameter Name</b>	SwCluCBManifOnBoardConnectorControl
<b>Parent Container</b>	<a href="#">SwCluCDefinition</a>





<b>Description</b>	SwCluCManifOnBoardConnectorControl enables or disables the onECU execution of the Software Cluster Connector. This setting is only applicable for the Host Software Cluster.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DISABLE_ON_ECU_CONNECTOR	The connection of Software Clusters OnECU is disabled for this machine.	
	ENABLE_ON_ECU_CONNECTOR	The connection of Software Clusters OnECU is enabled for this machine.	
<b>Default value</b>	<a href="#">ENABLE_ON_ECU_CONNECTOR</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00008]</b>		
<b>Parameter Name</b>	SwCluCMachineId		
<b>Parent Container</b>	<a href="#">SwCluCDefinition</a>		
<b>Description</b>	Unique number of the (virtual or physical) machine to which the Software Cluster belongs.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 254		
<b>Default value</b>	–		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00007]</b>		
<b>Parameter Name</b>	SwCluCSoftwareClusterId		
<b>Parent Container</b>	<a href="#">SwCluCDefinition</a>		
<b>Description</b>	Unique number of the Software Cluster Numbers >= 0xFE are reserved to indicate special values or the unconnected state.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 239		
<b>Default value</b>	–		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants





	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00009]</b>		
<b>Parameter Name</b>	SwCluCSoftwareClusterType		
<b>Parent Container</b>	<a href="#">SwCluCDefinition</a>		
<b>Description</b>	The type of the Software Cluster		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	APPLICATION_SW_CLUSTER	This Software Cluster is an Application Software Cluster.	
	HOST_SW_CLUSTER	This Software Cluster is a Host Software Cluster.	
	SUBSTITUTION_SW_CLUSTER	This Software Cluster is a Substitution Software Cluster.	
<b>Default value</b>	<a href="#">APPLICATION_SW_CLUSTER</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00034]</b>		
<b>Parameter Name</b>	SwCluCSoftwareClusterRef		
<b>Parent Container</b>	<a href="#">SwCluCDefinition</a>		
<b>Description</b>	Reference to the CpSoftwareCluster to define the link to the Software Cluster description in the System.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
-------------------------------

**[SWS\_SwCluC\_CONSTR\_00096]** [SwCluCSoftwareClusterId](#) shall be set according [CpSoftwareCluster.softwareClusterId](#) [For a specific [SwCluCDefinition](#), the value of [SwCluCDefinition.SwCluCSoftwareClusterId](#) shall be identical to the value of the [softwareClusterId](#) of the [CpSoftwareCluster](#) referenced via [SwCluCDefinition.SwCluCSoftwareClusterRef](#).] ([SRS\\_SwCluC\\_00212](#), [SRS\\_BSW\\_00167](#))

Rationale: The `SwCluCSoftwareClusterId` cannot be chosen by the ECU integrator, if the `softwareClusterId` is already given by a system description. For integration specific software clusters, the ECU integrator has to choose a free number for the `SwCluCSoftwareClusterId`.

### 10.2.4 Software Cluster Base Configuration Check

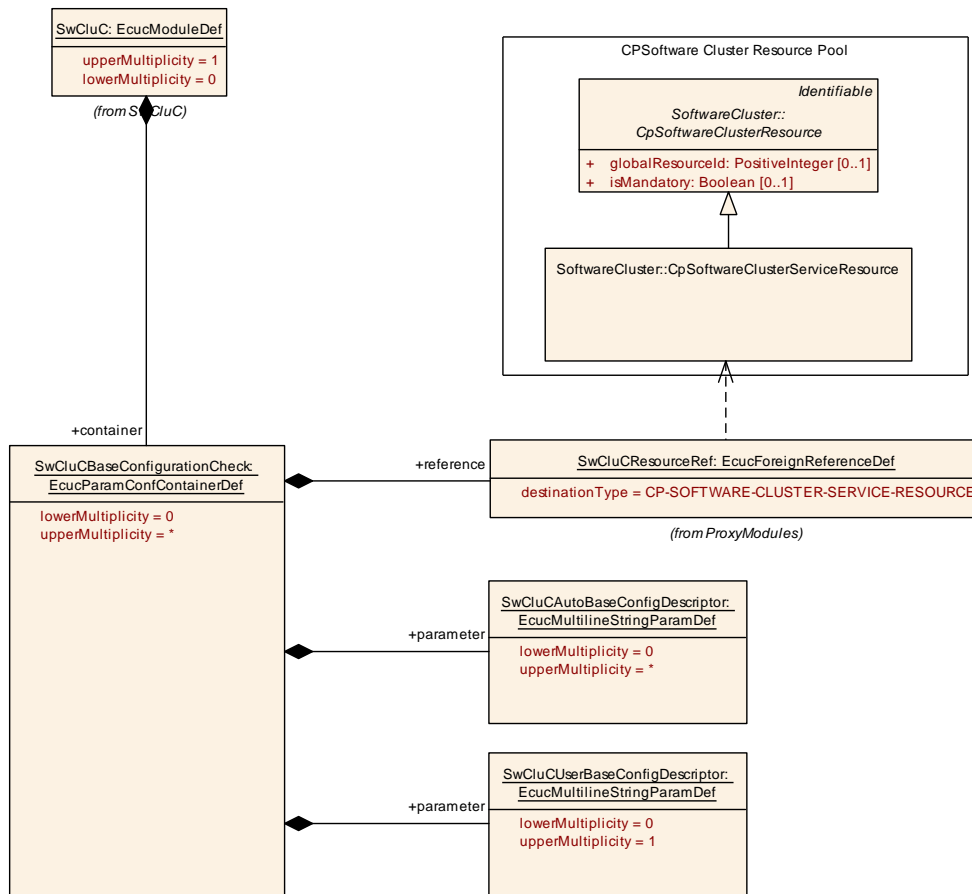


Figure 10.4: Software Cluster Base Configuration Check

<b>SWS Item</b>	[ECUC_SwCluC_00079]		
<b>Container Name</b>	SwCluCBBaseConfigurationCheck		
<b>Parent Container</b>	SwCluC		
<b>Description</b>	Configuration of the base configuration check of Software Cluster Connection. This configuration places a mandatory entry in the Binary Manifest where the guard value is used to proof if the general setup of the Application Software Cluster is compatible to the general setup of the Host Software Cluster. For each Application Software Cluster an individual base configuration check should be defined.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00080]</b>		
<b>Parameter Name</b>	SwCluCAutoBaseConfigDescriptor		
<b>Parent Container</b>	<a href="#">SwCluCBaseConfigurationCheck</a>		
<b>Description</b>	A machine determined string which represent the basic configuration assumption. Multiple SwCluCAutoBaseConfigDescriptor values can be added to support that different tools contribute to the checksum. For instance Software Cluster Connection Tool, Compiler, Link, or Locate tooling. isAuto shall be set to true since tool chain adds its collected values automatically.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	EcucMultilineStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00081]</b>		
<b>Parameter Name</b>	SwCluCUserBaseConfigDescriptor		
<b>Parent Container</b>	<a href="#">SwCluCBaseConfigurationCheck</a>		
<b>Description</b>	A user determined string which represent the basic configuration assumption.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucMultilineStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

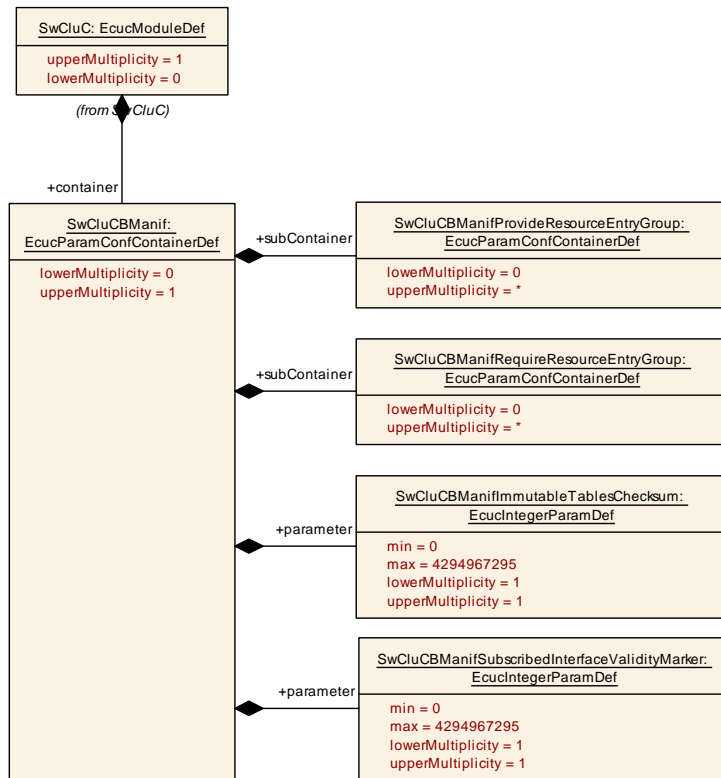
<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCBaseConfigurationCheck</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

**[SWS\_SwCluC\_CONSTR\_00078]** [SwCluCBaseConfigurationCheck](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_BASE\\_CNF](#) [The [SwCluCBaseConfigurationCheck.SwCluCResourceRef](#)

shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_BASE\\_CNF.](#)] ([SRS\\_SwCluC\\_00212](#), [SRS\\_BSW\\_00167](#))

### 10.2.5 Binary Manifest



**Figure 10.5: SwCluC Binary Manifest**

<b>SWS Item</b>	[ECUC_SwCluC_00003]
<b>Container Name</b>	SwCluCBManif
<b>Parent Container</b>	SwCluC
<b>Description</b>	Configuration of the Binary Manifest of the Software Cluster Connection
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00020]
<b>Parameter Name</b>	SwCluCBManifImmutableTablesChecksum
<b>Parent Container</b>	SwCluCBManif
<b>Description</b>	This parameter defines the initialization value of the Immutable Tables Checksum. If the Binary Manifest code generator already calculates the checksum, the value can be stored here (withAuto == true).
<b>Multiplicity</b>	1
<b>Type</b>	EcucIntegerParamDef
<b>Range</b>	0 .. 4294967295
<b>Default value</b>	-
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b> X All Variants





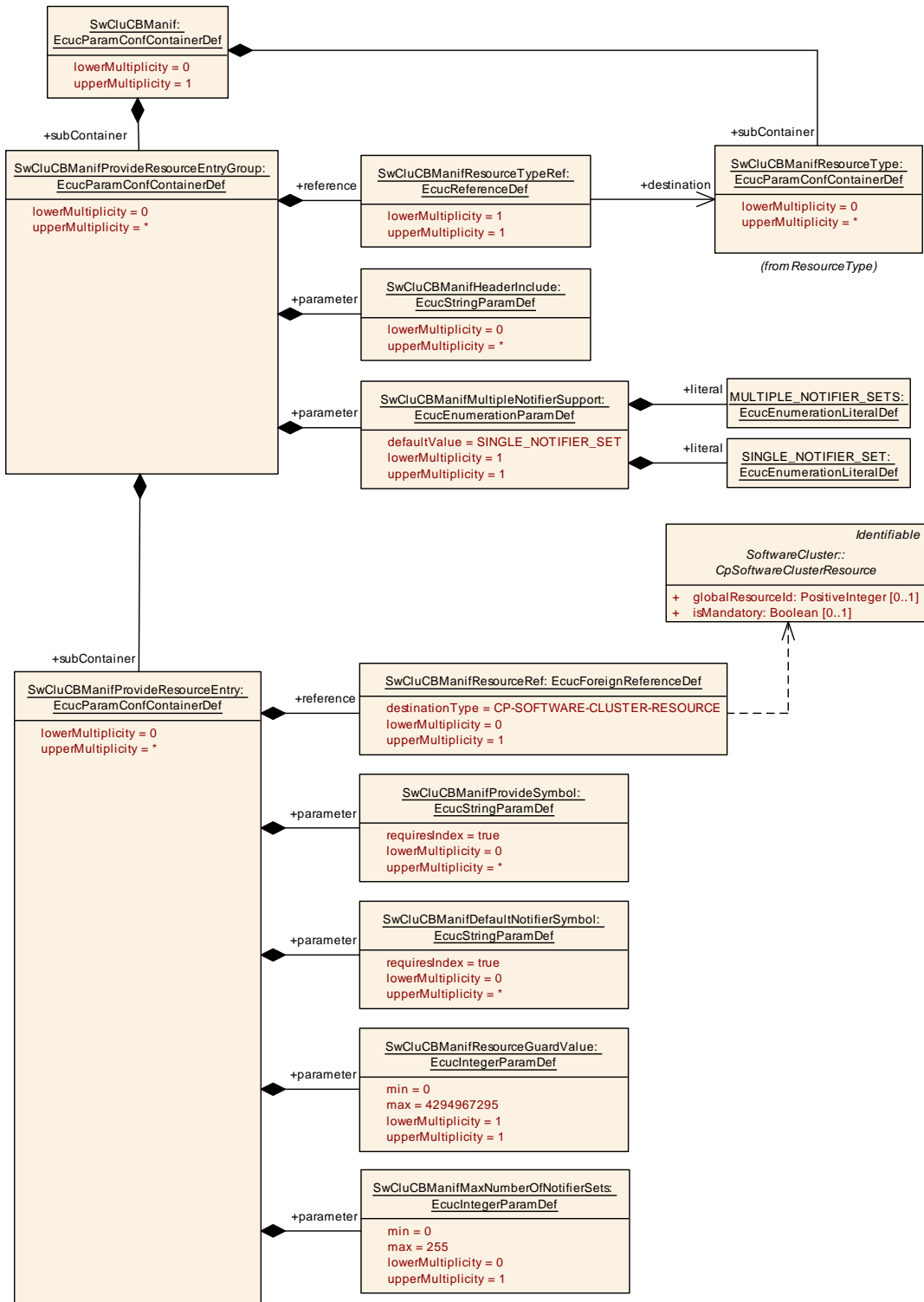


	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00022]</b>		
<b>Parameter Name</b>	SwCluCBManifSubscribedInterfaceValidityMarker		
<b>Parent Container</b>	<a href="#">SwCluCBManif</a>		
<b>Description</b>	This parameter defines the initialization value of the Subscribed Interface Validity Marker. The init value should be set to the erased value of the flash memory.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	–		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">SwCluCBManifProvideResourceEntryGroup</a>	0..*	Describes a group of provided resources in the Binary Manifest. The belonging handles are put into the Binary Manifest's tables into an consecutive order which supports an array based access.
<a href="#">SwCluCBManifRequireResourceEntryGroup</a>	0..*	Describes a group of required resources in the Binary Manifest. The belonging handles are put into the Binary Manifest's tables into an consecutive order which supports an array based access.
<a href="#">SwCluCBManifResourceType</a>	0..*	This container defines the structure of a resource type in the Binary Manifest.

**10.2.5.1 Provide Resource Entry Group**



**Figure 10.6: SwCluC Provide Resource Entry Group**

<b>SWS Item</b>	[ECUC_SwCluC_00018]
<b>Container Name</b>	SwCluCManifestProvideResourceEntryGroup
<b>Parent Container</b>	<a href="#">SwCluCManifest</a>
<b>Description</b>	Describes a group of provided resources in the Binary Manifest. The belonging handles are put into the Binary Manifest's tables into an consecutive order which supports an array based access.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00024]		
<b>Parameter Name</b>	SwCluCManifestHeaderInclude		
<b>Parent Container</b>	<a href="#">SwCluCManifestProvideResourceEntryGroup</a>		
<b>Description</b>	Defines the header file(s) where the owner of the SwCluCManifestProvideResourceEntryGroup / SwCluCManifestRequireResourceEntryGroup has the declarations of the symbols for the handle initialization.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_SwCluC_00016]		
<b>Parameter Name</b>	SwCluCManifestMultipleNotifierSupport		
<b>Parent Container</b>	<a href="#">SwCluCManifestProvideResourceEntryGroup</a>		
<b>Description</b>	SwCluCManifestMultipleNotifierSupport defines whether multiple Software Cluster can register on the notifier handles. For each possible connection a set of notifier handles is allocated.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	MULTIPLE_NOTIFIER_SETS	The provided resource supports the co-resident notifier connections to multiple required resources.	
	SINGLE_NOTIFIER_SET	The provided resource supports at most one connection of notifiers to a required resource.	
<b>Default value</b>	<a href="#">SINGLE_NOTIFIER_SET</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_SwCluC_00023]
<b>Parameter Name</b>	SwCluCBManifResourceTypeRef
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideResourceEntryGroup</a>
<b>Description</b>	Defines the resource type for all SwCluCBManifProvideResourceEntry / SwCluCBManifRequireResourceEntry
<b>Multiplicity</b>	1
<b>Type</b>	Reference to <a href="#">SwCluCBManifResourceType</a>
<b>Scope / Dependency</b>	

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCBManifProvideResourceEntry</a>	0..*	Describes a single entry for a provided resource in the Binary Manifest.

### 10.2.5.2 Provided Resource Entry

<b>SWS Item</b>	[ECUC_SwCluC_00009]
<b>Container Name</b>	SwCluCBManifProvideResourceEntry
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideResourceEntryGroup</a>
<b>Description</b>	Describes a single entry for a provided resource in the Binary Manifest.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00027]
<b>Parameter Name</b>	SwCluCBManifDefaultNotifierSymbol
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideResourceEntry</a>
<b>Description</b>	<p>SwCluCBManifDefaultNotifierSymbol set the default value of a Notifier Handle put into the Modifiable Interface. The number and order of SwCluCBManifDefaultNotifierSymbol needs to match the number and order of SwCluCBManifNotifierHandle in the referenced SwCluCBManifResourceType.</p> <p>The parameter is defined as string in order to support the usage of symbols as initialize. Values have to be set as string in a C supported number format, e.g. 0x C001CAFE. In case the provide handle holds a pointer the address operator is part of the string, e.g. &amp;myExampleFunction</p> <p><b>Attributes:</b> requiresIndex=true</p>
<b>Multiplicity</b>	0..*
<b>Type</b>	EcucStringParamDef
<b>Default value</b>	–
<b>Regular Expression</b>	–
<b>Scope / Dependency</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00029]
<b>Parameter Name</b>	SwCluCBManifMaxNumberOfNotifierSets
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideResourceEntry</a>
<b>Description</b>	SwCluCBManifMaxNumberOfNotifierSets defines the maximum number of possible required resources using notifier handles. It is required in case SwCluCBManifMultipleNotifierSupport is set to MULTIPLE_NOTIFIER_SETS.





<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 255		
<b>Default value</b>	-		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00026]</b>		
<b>Parameter Name</b>	SwCluCBManifProvideSymbol		
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideResourceEntry</a>		
<b>Description</b>	<p>SwCluCBManifProvideSymbol set the value of a Provide Handle put into the Immutable Interface. The number and order of SwCluCBManifProvideSymbols needs to match the number and order of SwCluCBManifProvideHandle in the referenced SwCluCBManif Resource Type.</p> <p>The parameter is defined as string in order to support the usage of symbols as initialize. Values have to be set as string in a C supported number format, e.g. 0x C001CAFE. In case the provide handle holds a pointer the address operator is part of the string, e.g. &amp;myExampleFunction</p> <p><b>Attributes:</b> requiresIndex=true</p>		
<b>Multiplicity</b>	0..*		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00028]</b>		
<b>Parameter Name</b>	SwCluCBManifResourceGuardValue		
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideResourceEntry</a>		
<b>Description</b>	SwCluCBManifResourceGuardValue provides guarding information checked by the Software Cluster connector. A provided resources and required resources of Software Clusters can only be connected, if the resource guarding values of provider and requester are equal.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	-		
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00025]</b>		
<b>Parameter Name</b>	SwCluCBManifResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideResourceEntry</a>		
<b>Description</b>	Reference to the CpSoftwareClusterResource determining the global resource Id. If the reference is not set, the global resource Id in the Binary Manifest will be set to 0 for this resource entry in order to indicate an invalid resource.		

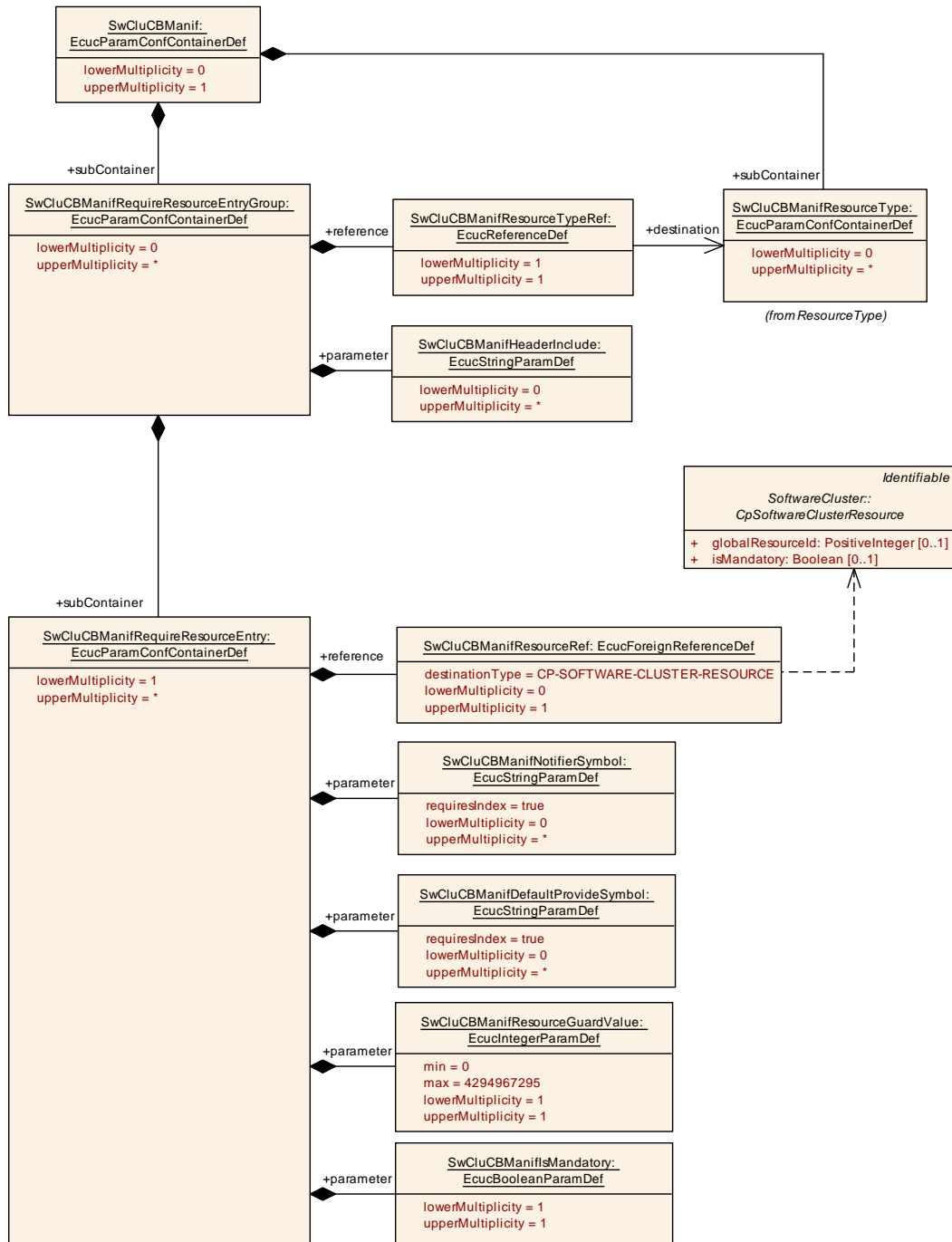




<b>Multiplicity</b>	0..1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-RESOURCE
<b>Scope / Dependency</b>	

**No Included Containers**

**10.2.5.3 Require Resource Entry Group**



**Figure 10.7: SwCluC Require Resource Entry Group**

<b>SWS Item</b>	[ECUC_SwCluC_00019]
<b>Container Name</b>	SwCluCManifRequireResourceEntryGroup
<b>Parent Container</b>	SwCluCManif







<b>Description</b>	Describes a group of required resources in the Binary Manifest. The belonging handles are put into the Binary Manifest's tables into an consecutive order which supports an array based access.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00024]		
<b>Parameter Name</b>	SwCluCBManifHeaderInclude		
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntryGroup</a>		
<b>Description</b>	Defines the header file(s) where the owner of the SwCluCBManifProvideResourceEntryGroup / SwCluCBManifRequireResourceEntryGroup has the declarations of the symbols for the handle initialization.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_SwCluC_00023]		
<b>Parameter Name</b>	SwCluCBManifResourceTypeRef		
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntryGroup</a>		
<b>Description</b>	Defines the resource type for all SwCluCBManifProvideResourceEntry / SwCluCBManifRequireResourceEntry		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">SwCluCBManifResourceType</a>		
<b>Scope / Dependency</b>			

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCBManifRequireResourceEntry</a>	1..*	Describes a single entry for a required resource in the Binary Manifest.

### 10.2.5.4 Require Resource Entry

<b>SWS Item</b>	[ECUC_SwclC_00021]
<b>Container Name</b>	SwCluCBManifRequireResourceEntry
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntryGroup</a>
<b>Description</b>	Describes a single entry for a required resource in the Binary Manifest.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00031]
<b>Parameter Name</b>	SwCluCBManifDefaultProvideSymbol
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntry</a>
<b>Description</b>	<p>SwCluCBManifDefaultProvideSymbol set the default value of a Provide Handle put into the Modifiable Interface. The number and order of SwCluCBManifDefaultProvide Symbols needs to match the number and order of SwCluCBManifProvideHandles in the referenced SwCluCBManifResourceType.</p> <p>The parameter is defined as string in order to support the usage of symbols as initialize. Values have to be set as string in a C supported number format, e.g. 0x C001CAFE. In case the provide handle holds a pointer the address operator is part of the string, e.g. &amp;myExampleFunction</p> <p><b>Attributes:</b> requiresIndex=true</p>
<b>Multiplicity</b>	0..*
<b>Type</b>	EcucStringParamDef
<b>Default value</b>	–
<b>Regular Expression</b>	–
<b>Scope / Dependency</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00032]
<b>Parameter Name</b>	SwCluCBManifIsMandatory
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntry</a>
<b>Description</b>	SwCluCBManifIsMandatory indicates, that the resource is mandatory to operate this Software Cluster. If the resource is not provided on the machine the connection process for this Software Cluster requiring this resource gets aborted.
<b>Multiplicity</b>	1
<b>Type</b>	EcucBooleanParamDef
<b>Default value</b>	–
<b>Scope / Dependency</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00030]
<b>Parameter Name</b>	SwCluCBManifNotifierSymbol
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntry</a>
<b>Description</b>	<p>SwCluCBManifNotifierSymbol set the value of a Notifier Handle put into the Immutable Interface. The number and order of SwCluCBManifNotifierSymbol needs to match the number and order of SwCluCBManifNotifierHandles in the referenced SwCluCBManifResourceType.</p> <p>The parameter is defined as string in order to support the usage of symbols as initialize. Values have to be set as string in a C supported number format, e.g. 0x C001CAFE. In case the provide handle holds a pointer the address operator is part of the string, e.g. &amp;myExampleFunction</p> <p><b>Attributes:</b> requiresIndex=true</p>
<b>Multiplicity</b>	0..*
<b>Type</b>	EcucStringParamDef
<b>Default value</b>	–
<b>Regular Expression</b>	–
<b>Scope / Dependency</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00028]
<b>Parameter Name</b>	SwCluCBManifResourceGuardValue
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntry</a>



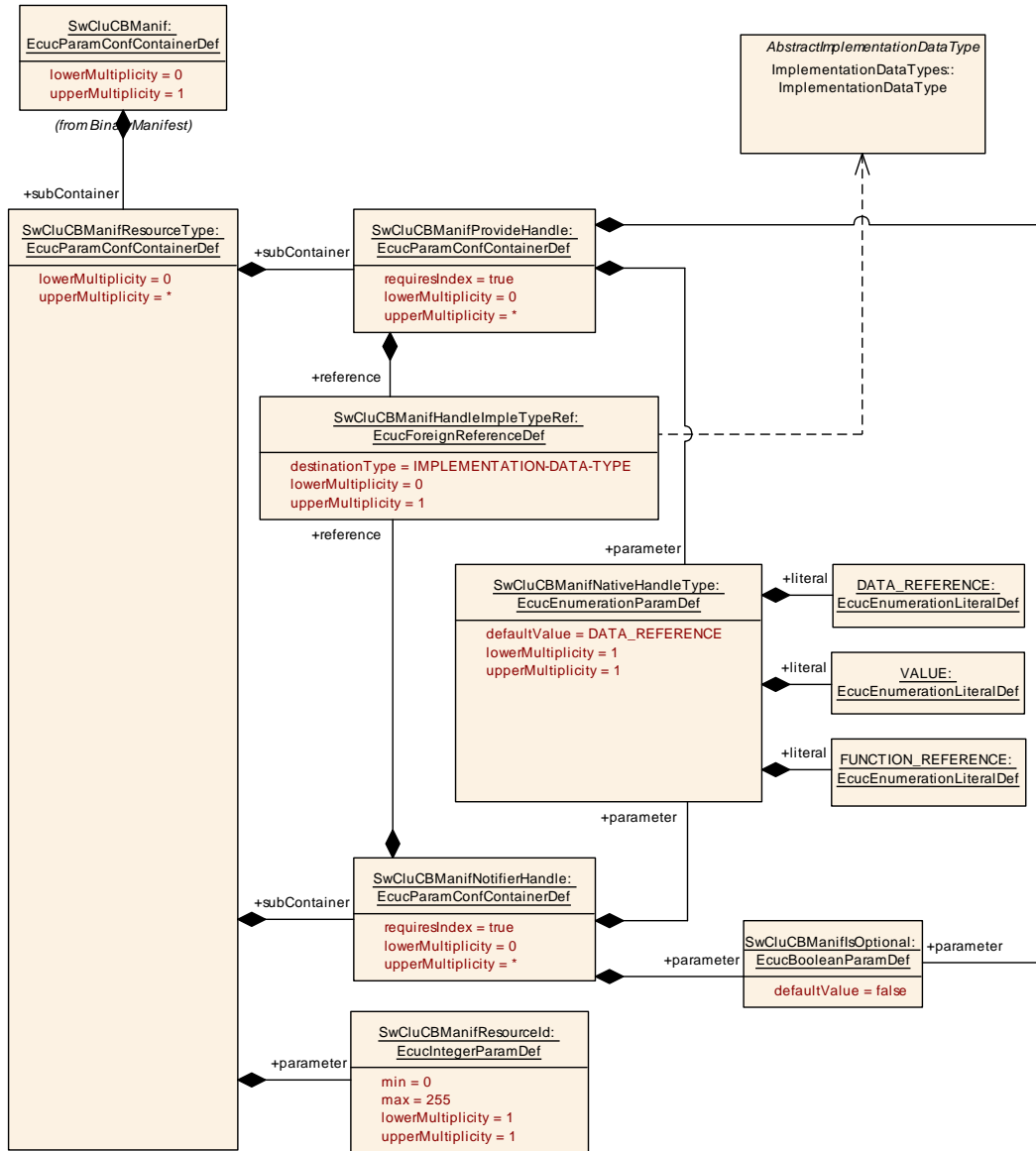


<b>Description</b>	SwCluCBManifResourceGuardValue provides guarding information checked by the Software Cluster connector. A provided resources and required resources of Software Clusters can only be connected, if the resource guarding values of provider and requester are equal.	
<b>Multiplicity</b>	1	
<b>Type</b>	EcucIntegerParamDef	
<b>Range</b>	0 .. 4294967295	
<b>Default value</b>	-	
<b>Scope / Dependency</b>		

<b>SWS Item</b>	[ECUC_SwCluC_00025]	
<b>Parameter Name</b>	SwCluCBManifResourceRef	
<b>Parent Container</b>	<a href="#">SwCluCBManifRequireResourceEntry</a>	
<b>Description</b>	Reference to the CpSoftwareClusterResource determining the global resource Id. If the reference is not set, the global resource Id in the Binary Manifest will be set to 0 for this resource entry in order to indicate an invalid resource.	
<b>Multiplicity</b>	0..1	
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-RESOURCE	
<b>Scope / Dependency</b>		

<b>No Included Containers</b>
-------------------------------

**10.2.5.5 Resource Type**



**Figure 10.8: SwCluC resource type**

<b>SWS Item</b>	[ECUC_SwCluC_00012]		
<b>Container Name</b>	SwCluCManifestResourceType		
<b>Parent Container</b>	SwCluCManifest		
<b>Description</b>	This container defines the structure of a resource type in the Binary Manifest.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00017]		
<b>Parameter Name</b>	SwCluCManifResourceId		
<b>Parent Container</b>	<a href="#">SwCluCManifResourceType</a>		
<b>Description</b>	Unique number of the resource type.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 255		
<b>Default value</b>	-		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCManifNotifierHandle</a>	0..*	Defines a Notifier Handle and its properties for this resource type.
<a href="#">SwCluCManifProvideHandle</a>	0..*	Defines a Provide Handle and its properties for this resource type.

<b>SWS Item</b>	[ECUC_SwCluC_00013]		
<b>Container Name</b>	SwCluCManifProvideHandle		
<b>Parent Container</b>	<a href="#">SwCluCManifResourceType</a>		
<b>Description</b>	Defines a Provide Handle and its properties for this resource type. <b>Attributes:</b> requiresIndex=true		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00099]		
<b>Parameter Name</b>	SwCluCManifIsOptional		
<b>Parent Container</b>	<a href="#">SwCluCManifProvideHandle</a>		
<b>Description</b>	Indicates that this handle is optional and may not always exist for each Provide Resource Entry or Require Resource Entry.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00033]		
<b>Parameter Name</b>	SwCluCManifNativeHandleType		
<b>Parent Container</b>	<a href="#">SwCluCManifProvideHandle</a>		





<b>Description</b>	<p>This parameter determines the underlying native type of the handle which can be</p> <ul style="list-style-type: none"> <li>• pointer to variable</li> <li>• value</li> <li>• pointer to function</li> </ul> <p>This information is required to correctly initialize the handle in the Immutable Interface or Modifiable Interface.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DATA_REFERENCE	Handle is pointer to variable	
	FUNCTION_REFERENCE	Handle is pointer to function	
	VALUE	Handle is a value	
<b>Default value</b>	<a href="#">DATA_REFERENCE</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00015]</b>		
<b>Parameter Name</b>	SwCluCBManifHandleImpleTypeRef		
<b>Parent Container</b>	<a href="#">SwCluCBManifProvideHandle</a>		
<b>Description</b>	Reference to the ImplementationDataType of the handle. This type can be additionally configured to get a correct casting of the native handle type to the returned handle type.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to IMPLEMENTATION-DATA-TYPE		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

**No Included Containers**

<b>SWS Item</b>	<b>[ECUC_SwCluC_00014]</b>		
<b>Container Name</b>	SwCluCBManifNotifierHandle		
<b>Parent Container</b>	<a href="#">SwCluCBManifResourceType</a>		
<b>Description</b>	<p>Defines a Notifier Handle and its properties for this resource type.</p> <p><b>Attributes:</b> requiresIndex=true</p>		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00099]</b>		
<b>Parameter Name</b>	SwCluCBManifIsOptional		
<b>Parent Container</b>	<a href="#">SwCluCBManifNotifierHandle</a>		
<b>Description</b>	Indicates that this handle is optional and may not always exist for each Provide Resource Entry or Require Resource Entry.		





<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

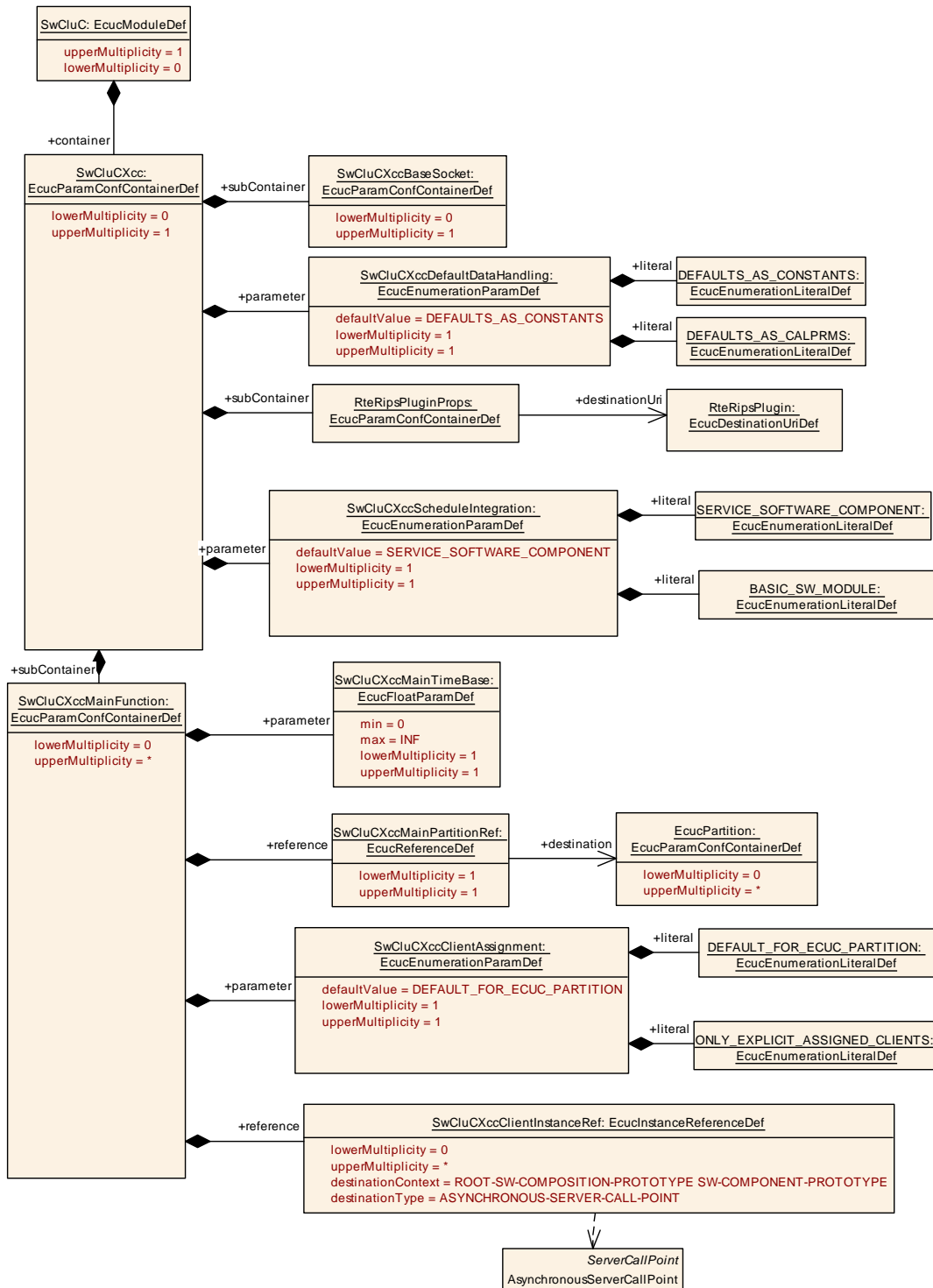
<b>SWS Item</b>	[ECUC_SwCluC_00033]		
<b>Parameter Name</b>	SwCluCBManifNativeHandleType		
<b>Parent Container</b>	<a href="#">SwCluCBManifNotifierHandle</a>		
<b>Description</b>	<p>This paramter determines the underlying native type of the handle which can be</p> <ul style="list-style-type: none"> <li>• pointer to variable</li> <li>• value</li> <li>• pointer to function</li> </ul> <p>This information is required to correctly initialize the handle in the Immutable Interface or Modifiable Interface.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DATA_REFERENCE	Handle is pointer to variable	
	FUNCTION_REFERENCE	Handle is pointer to function	
	VALUE	Handle is a value	
<b>Default value</b>	<a href="#">DATA_REFERENCE</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_SwCluC_00015]		
<b>Parameter Name</b>	SwCluCBManifHandleImpleTypeRef		
<b>Parent Container</b>	<a href="#">SwCluCBManifNotifierHandle</a>		
<b>Description</b>	Reference to the ImplementationDataType of the handle. This type can be additionally configured to get a correct casting of the native handle type to the returned handel type.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to IMPLEMENTATION-DATA-TYPE		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>No Included Containers</b>
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**10.2.6 Cross Cluster Communication**



**Figure 10.9: General Cross Cluster Communication Parameters**

<b>SWS Item</b>	[ECUC_SwCluC_00075]
<b>Container Name</b>	SwCluCXcc
<b>Parent Container</b>	SwCluC
<b>Description</b>	Configuration of the Binary Manifest of the Software Cluster Connection
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_SwCluC_00084]		
<b>Parameter Name</b>	SwCluCXccDefaultDataHandling		
<b>Parent Container</b>	SwCluCXcc		
<b>Description</b>	SwCluCXccDefaultDataHandling defines whether the default data for unconnected RPortPrototypes of a Software Cluster are instantiated as fixed constants or as calibration parameter.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DEFAULTS_AS_CALPRMS	Default data are implemented as calibration parameter.	
	DEFAULTS_AS_CONSTANTS	Default data are implemented as fixed constants.	
<b>Default value</b>	DEFAULTS_AS_CONSTANTS		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_SwCluC_00156]		
<b>Parameter Name</b>	SwCluCXccScheduleIntegration		
<b>Parent Container</b>	SwCluCXcc		
<b>Description</b>	Defines whether the SwCluC_Xcc_MainFunction is integrated via a Service Software Component with RunnableEntity or a Basic Software Module Description with SchedulableEntity.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	BASIC_SW_MODULE	SwCluC_Xcc_MainFunctions are integrated via a Basic Software Module Description with SchedulableEntity(s)	
	SERVICE_SOFTWARE_COMPONENT	SwCluC_Xcc_MainFunctions are integrated via a Service Software Component with Runnable Entity(s)	
<b>Default value</b>	SERVICE_SOFTWARE_COMPONENT		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">RteRipsPluginProps</a>	1	This container defines the identity of the Rte Implementation Plug-in and provides the RTE relevant parameters of the Rte Implementation Plug-in. The shortName of the container defines the name of the Rte Implementation Plug-in used for the API infixes.
<a href="#">SwCluCXccBaseSocket</a>	0..1	Maps a XccBaseSocket to the CpSoftwareClusterService Resource describing the XccBaseSocket resource in the clustered system. Maps a XccBaseSocket to a specific Ecuc Partition on which the XccBaseSocket is working.
<a href="#">SwCluCXccMainFunction</a>	0..*	Defines the existence and properties of a SwCluC_Xcc_Main Function.

### 10.2.6.1 Cross Cluster Communication Base Socket

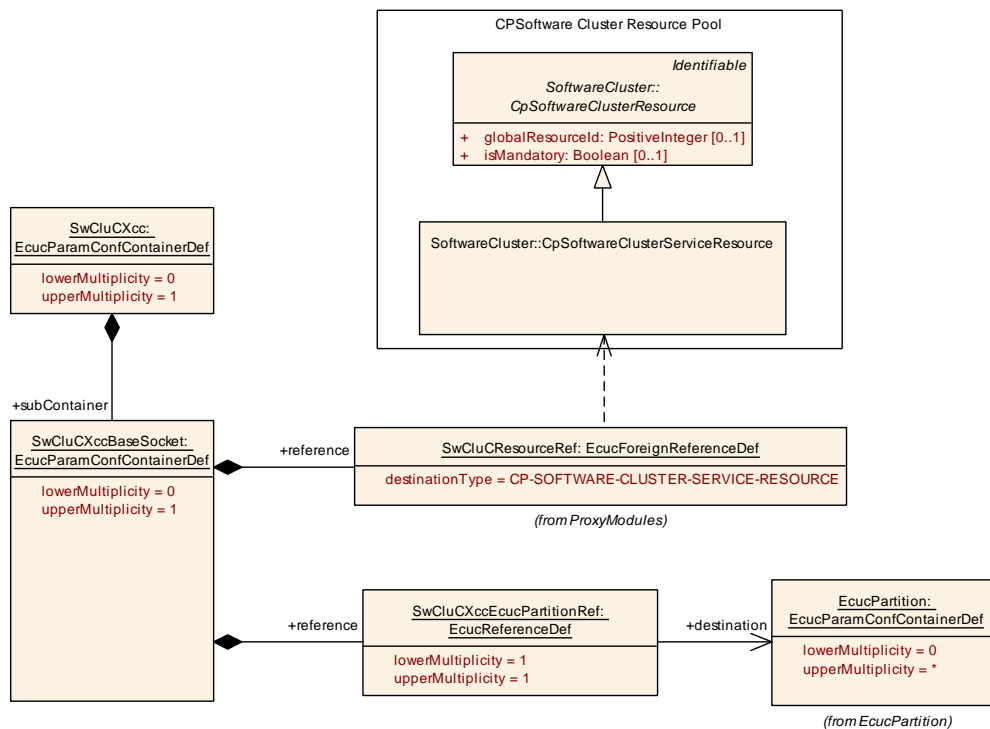


Figure 10.10: Cross Cluster Communication Base Socket

SWS Item	[ECUC_SwCluC_00076]
Container Name	SwCluCXccBaseSocket
Parent Container	<a href="#">SwCluCXcc</a>
Description	Maps a XccBaseSocket to the CpSoftwareClusterServiceResource describing the Xcc BaseSocket resource in the clustered system. Maps a XccBaseSocket to a specific EcucPartition on which the XccBaseSocket is working.
Configuration Parameters	

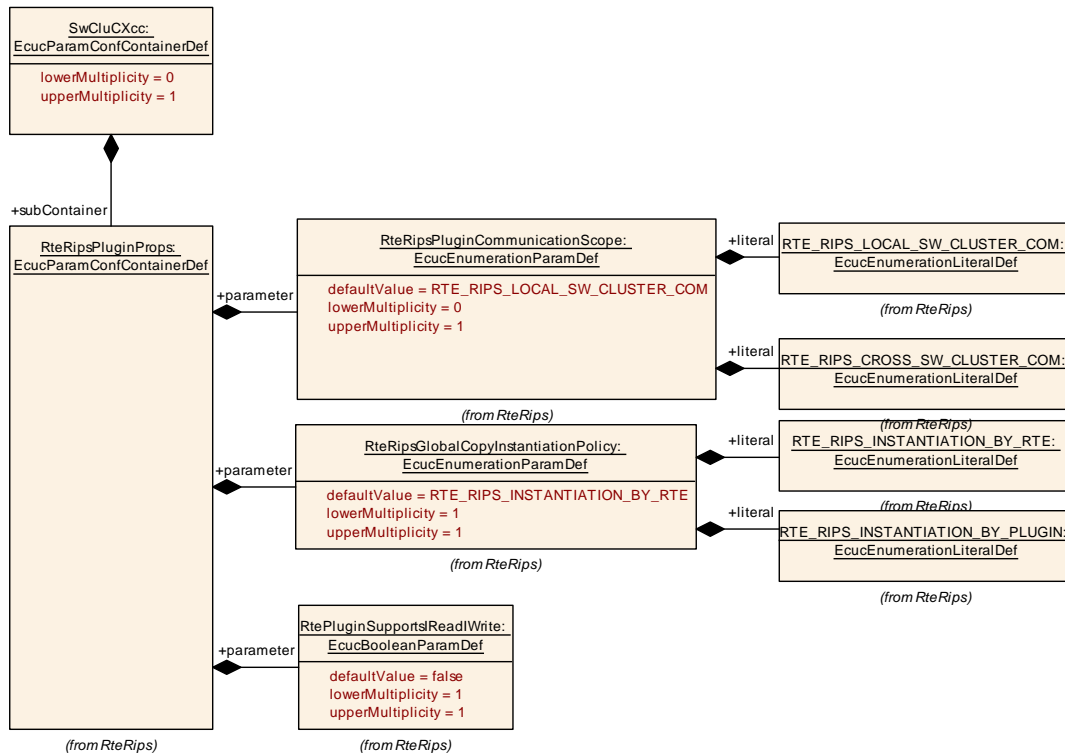
<b>SWS Item</b>	[ECUC_SwCluC_00087]
<b>Parameter Name</b>	SwCluCResourceRef
<b>Parent Container</b>	<a href="#">SwCluCXccBaseSocket</a>
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

<b>SWS Item</b>	[ECUC_SwCluC_00077]		
<b>Parameter Name</b>	SwCluCXccEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCXccBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition on which the XccBaseSocket is available.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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**[SWS\_SwCluC\_CONSTR\_03063]** [SwCluCXccBaseSocket](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_XCC\\_BASE\\_SOCKET](#) [The [SwCluCXccBaseSocket.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_XCC\\_BASE\\_SOCKET](#).] ([SRS\\_SwCluC\\_00212](#), [SRS\\_BSW\\_00167](#))

**10.2.6.2 Cross Cluster Communication Rte Plug-in Props**



**Figure 10.11: Cross Cluster Communication RTE Plug-In Properties**

<b>SWS Item</b>	[ECUC_Rte_09173]
<b>Container Name</b>	RteRipsPluginProps
<b>Parent Container</b>	SwCluCXcc
<b>Destination Uri Definition</b>	RteRipsPlugin
<b>Description</b>	This container defines the identity of the Rte Implementation Plug-in and provides the RTE relevant parameters of the Rte Implementation Plug-in. The shortName of the container defines the name of the Rte Implementation Plug-in used for the API infixes.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Rte_09169]									
<b>Parameter Name</b>	RtePluginSupportsIReadIWrite									
<b>Parent Container</b>	RteRipsPluginProps									
<b>Description</b>	Denotes if or not the plug-in supports the Rte_Rips_IRead/IWrite macros for primitive data.									
<b>Multiplicity</b>	1									
<b>Type</b>	EcucBooleanParamDef									
<b>Default value</b>	false									
<b>Post-Build Variant Value</b>	false									
<b>Value Configuration Class</b>	<table border="1"> <tr> <td><b>Pre-compile time</b></td> <td>X</td> <td>All Variants</td> </tr> <tr> <td><b>Link time</b></td> <td>-</td> <td></td> </tr> <tr> <td><b>Post-build time</b></td> <td>-</td> <td></td> </tr> </table>	<b>Pre-compile time</b>	X	All Variants	<b>Link time</b>	-		<b>Post-build time</b>	-	
<b>Pre-compile time</b>	X	All Variants								
<b>Link time</b>	-									
<b>Post-build time</b>	-									
<b>Scope / Dependency</b>	scope: local									

<b>SWS Item</b>	<b>[ECUC_Rte_09170]</b>		
<b>Parameter Name</b>	RteRipsGlobalCopyInstantiationPolicy		
<b>Parent Container</b>	<a href="#">RteRipsPluginProps</a>		
<b>Description</b>	Select whether for the relevant communication graph a RIPS plugin should instantiate the associated global copies itself or use global copies which have been instantiated by the RTE.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	RTE_RIPS_INSTANTIATION_BY_PLUGIN	For the relevant communication graphs, the RIPS plugin must provide the global copies of the associated data.	
	RTE_RIPS_INSTANTIATION_BY_RTE	For the relevant communication graphs, the RTE must provide the global copies of the associated data.	
<b>Default value</b>	<a href="#">RTE_RIPS_INSTANTIATION_BY_RTE</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09171]</b>		
<b>Parameter Name</b>	RteRipsPluginCommunicationScope		
<b>Parent Container</b>	<a href="#">RteRipsPluginProps</a>		
<b>Description</b>	Defines the communication scope for which the Rte Implementation Plug-Ins (RIPS) serves. If this parameter is not set, the default behavior RTE_RIPS_LOCAL_SW_CLUSTER_COM applies.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	RTE_RIPS_CROSS_SW_CLUSTER_COM	The Rte Implementation Plug-In handles the Cross Software Cluster Communication.	
	RTE_RIPS_LOCAL_SW_CLUSTER_COM	The Rte Implementation Plug-In handles the Local Software Cluster Communication.	
<b>Default value</b>	<a href="#">RTE_RIPS_LOCAL_SW_CLUSTER_COM</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
RteRipsPluginCommunicationType Support	0..1	This container defines the different elements of communication graphs that the plugin is responsible for. <b>Tags:</b> atp.Status=draft

### 10.2.6.3 Cross Cluster Communication Main Function

<b>SWS Item</b>	[ECUC_SwCluC_00157]		
<b>Container Name</b>	SwCluCXccMainFunction		
<b>Parent Container</b>	<a href="#">SwCluCXcc</a>		
<b>Description</b>	Defines the existence and properties of a SwCluC_Xcc_MainFunction.		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00160]		
<b>Parameter Name</b>	SwCluCXccClientAssignment		
<b>Parent Container</b>	<a href="#">SwCluCXccMainFunction</a>		
<b>Description</b>	Defines if the SwCluC_Xcc_MainFunction is used as default main function for all clients which are not referenced explicitly by a SwCluCXccClientInstanceRef on this Ecuc Partition		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DEFAULT_FOR_ECUC_PARTITION	The related SwCluC_Xcc_MainFunction is used as default main function to handle timeout for all clients which are not referenced explicitly by a SwCluCXccClientInstanceRef on this EcucPartition.	
	ONLY_EXPLICIT_ASSIGNED_CLIENTS	The related SwCluC_Xcc_MainFunction only handles timeout for clients which are explicitly referenced by a SwCluCXccClientInstanceRef by this SwCluCXccMainFunction.	
<b>Default value</b>	<a href="#">DEFAULT_FOR_ECUC_PARTITION</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_SwCluC_00158]		
<b>Parameter Name</b>	SwCluCXccMainTimeBase		
<b>Parent Container</b>	<a href="#">SwCluCXccMainFunction</a>		
<b>Description</b>	The period between successive calls to according instance of SwCluC_Xcc_Main Function in seconds. This parameter may be used by the SwCluC generator to transform the given timeout values to internal implementation specific counter or tick values.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. INF]		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		



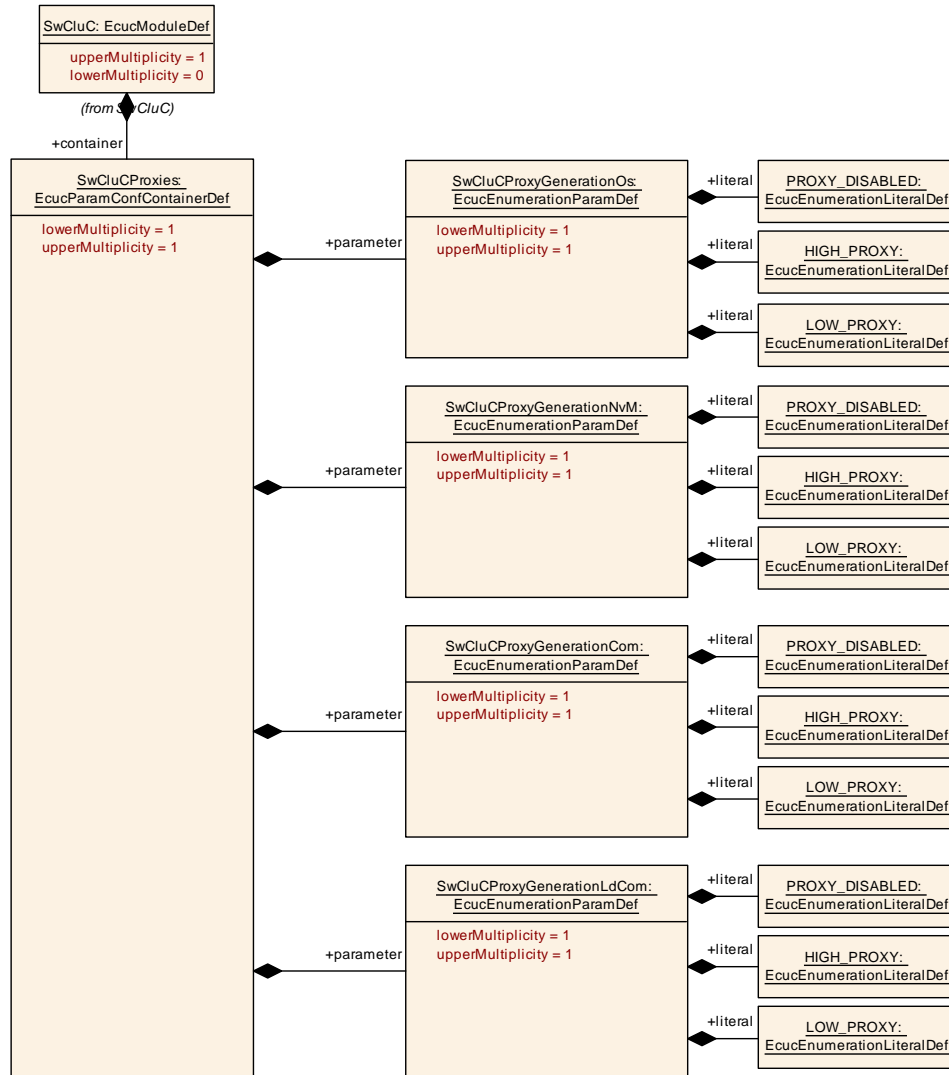
<b>SWS Item</b>	<b>[ECUC_SwCluC_00161]</b>		
<b>Parameter Name</b>	SwCluCXccClientInstanceRef		
<b>Parent Container</b>	<a href="#">SwCluCXccMainFunction</a>		
<b>Description</b>	Reference to an AsynchronousServerCallPoint		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Instance reference to ASYNCHRONOUS-SERVER-CALL-POINT context: ROOT-SW-COMPOSITION-PROTOTYPE SW-COMPONENT-PROTOTYPE		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00159]</b>		
<b>Parameter Name</b>	SwCluCXccMainPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCXccMainFunction</a>		
<b>Description</b>	Reference to EcucPartition, where the according SwCluC_Xcc_MainFunction instance is assigned to.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

**No Included Containers**

**[SWS\_SwCluC\_CONSTR\_03403]** [It is only allowed to configure at most one [SwCluCXccMainFunction](#) where [SwCluCXccClientAssignment](#) is set to [DEFAULT\\_FOR\\_ECUC\\_PARTITION](#) per [EcucPartition](#).] ([SRS\\_SwCluC\\_00100](#), [SRS\\_SwCluC\\_00103](#), [SRS\\_BSW\\_00167](#))

**10.2.7 Proxy Modules**



**Figure 10.12: General Proxies Parameters**

<b>SWS Item</b>	[ECUC_SwCluC_00036]		
<b>Container Name</b>	SwCluCProxies		
<b>Parent Container</b>	SwCluC		
<b>Description</b>	General configuration of the Proxy Modules of Software Cluster Connection		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00100]		
<b>Parameter Name</b>	SwCluCProxyGenerationCom		
<b>Parent Container</b>	SwCluCProxies		





<b>Description</b>	Defines whether the Com Proxy code and models are generated.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	HIGH_PROXY	Enables the according High Proxy Module code and AUTOSAR model generation.	
	LOW_PROXY	Enables the according Low Proxy Module code and AUTOSAR model generation.	
	PROXY_DISABLED	Disables the Proxy Module code and AUTOSAR model generation.	
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00102]</b>		
<b>Parameter Name</b>	SwCluCProxyGenerationDcm		
<b>Parent Container</b>	<a href="#">SwCluCProxies</a>		
<b>Description</b>	Defines whether the Dcm Proxy code and models are generated.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	HIGH_PROXY	Enables the according High Proxy Module code and AUTOSAR model generation.	
	LOW_PROXY	Enables the according Low Proxy Module code and AUTOSAR model generation.	
	PROXY_DISABLED	Disables the Proxy Module code and AUTOSAR model generation.	
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00103]</b>		
<b>Parameter Name</b>	SwCluCProxyGenerationDem		
<b>Parent Container</b>	<a href="#">SwCluCProxies</a>		
<b>Description</b>	Defines whether the Dem Proxy code and models are generated.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	HIGH_PROXY	Enables the according High Proxy Module code and AUTOSAR model generation.	
	LOW_PROXY	Enables the according Low Proxy Module code and AUTOSAR model generation.	





	PROXY_DISABLED	Disables the Proxy Module code and AUTOSAR model generation.	
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_SwCluC_00104]		
Parameter Name	SwCluCProxyGenerationFiM		
Parent Container	<a href="#">SwCluCProxies</a>		
Description	Defines whether the FiM Proxy code and models are generated.		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	HIGH_PROXY	Enables the according High Proxy Module code and AUTOSAR model generation.	
	LOW_PROXY	Enables the according Low Proxy Module code and AUTOSAR model generation.	
	PROXY_DISABLED	Disables the Proxy Module code and AUTOSAR model generation.	
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_SwCluC_00101]		
Parameter Name	SwCluCProxyGenerationLdCom		
Parent Container	<a href="#">SwCluCProxies</a>		
Description	Defines whether the LdCom Proxy code and models are generated.		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	HIGH_PROXY	Enables the according High Proxy Module code and AUTOSAR model generation.	
	LOW_PROXY	Enables the according Low Proxy Module code and AUTOSAR model generation.	
	PROXY_DISABLED	Disables the Proxy Module code and AUTOSAR model generation.	
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	





<b>Scope / Dependency</b>	scope: ECU		
<b>SWS Item</b>	[ECUC_SwCluC_00038]		
<b>Parameter Name</b>	SwCluCProxyGenerationNvM		
<b>Parent Container</b>	<a href="#">SwCluCProxies</a>		
<b>Description</b>	Defines whether the NvM Proxy code and models are generated.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	HIGH_PROXY	Enables the according High Proxy Module code and AUTOSAR model generation.	
	LOW_PROXY	Enables the according Low Proxy Module code and AUTOSAR model generation.	
	PROXY_DISABLED	Disables the Proxy Module code and AUTOSAR model generation.	
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00037]		
<b>Parameter Name</b>	SwCluCProxyGenerationOs		
<b>Parent Container</b>	<a href="#">SwCluCProxies</a>		
<b>Description</b>	Defines whether the Os Proxy code and models are generated.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	HIGH_PROXY	Enables the according High Proxy Module code and AUTOSAR model generation.	
	LOW_PROXY	Enables the according Low Proxy Module code and AUTOSAR model generation.	
	PROXY_DISABLED	Disables the Proxy Module code and AUTOSAR model generation.	
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

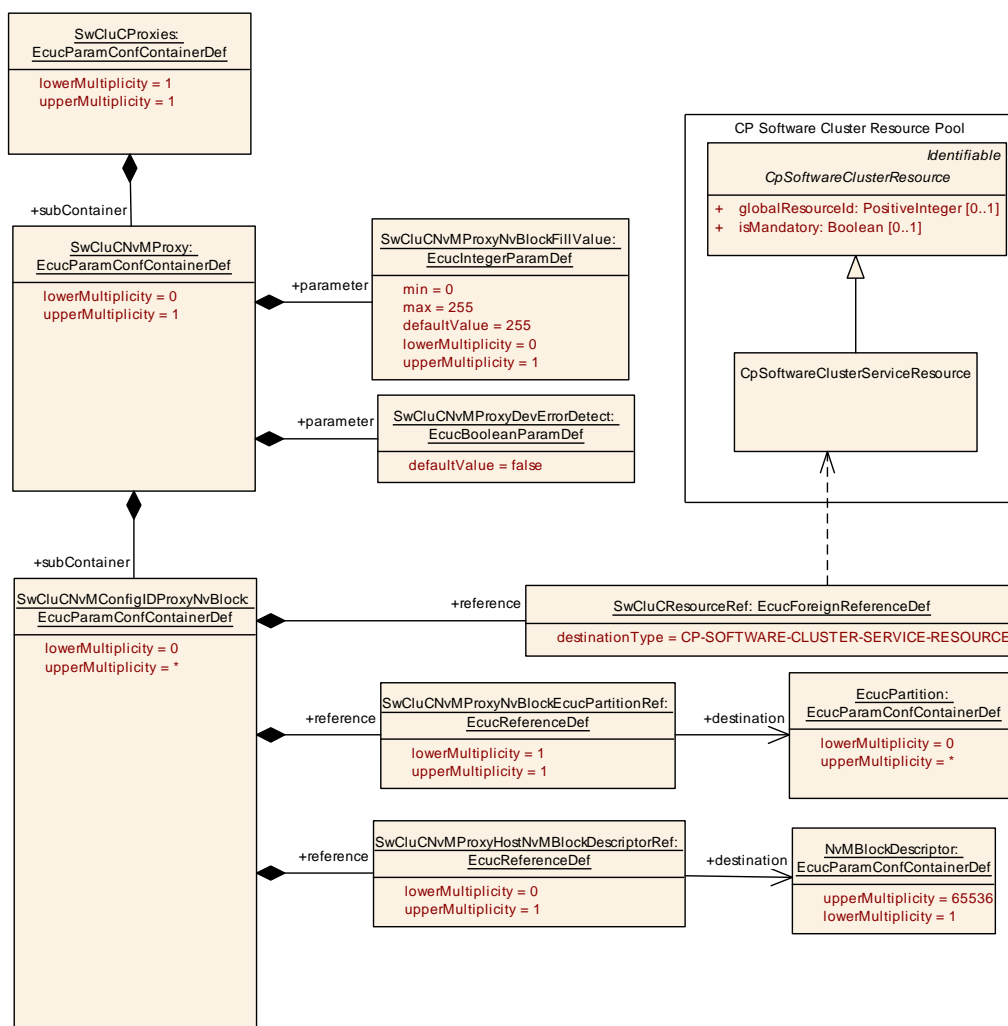
Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCComProxy</a>	0..1	LdCom Proxy specific parameters.
<a href="#">SwCluCDcmProxy</a>	0..1	Dcm Proxy specific parameters.
<a href="#">SwCluCDemProxy</a>	0..1	DemProxy specific parameters.





Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCFiMProxy</a>	0..1	FiM Proxy specific parameters.
<a href="#">SwCluCLdComProxy</a>	0..1	LdCom Proxy specific parameters.
<a href="#">SwCluCNvMProxy</a>	0..1	NvM Proxy specific parameters.
<a href="#">SwCluCOsProxy</a>	0..1	Os Proxy specific parameters.

### 10.2.7.1 NvM Proxy



**Figure 10.13: NvM Proxy Parameter**

SWS Item	[ECUC_SwCluC_00039]
Container Name	SwCluCNvMProxy
Parent Container	<a href="#">SwCluCProxies</a>





<b>Description</b>	NvM Proxy specific parameters.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

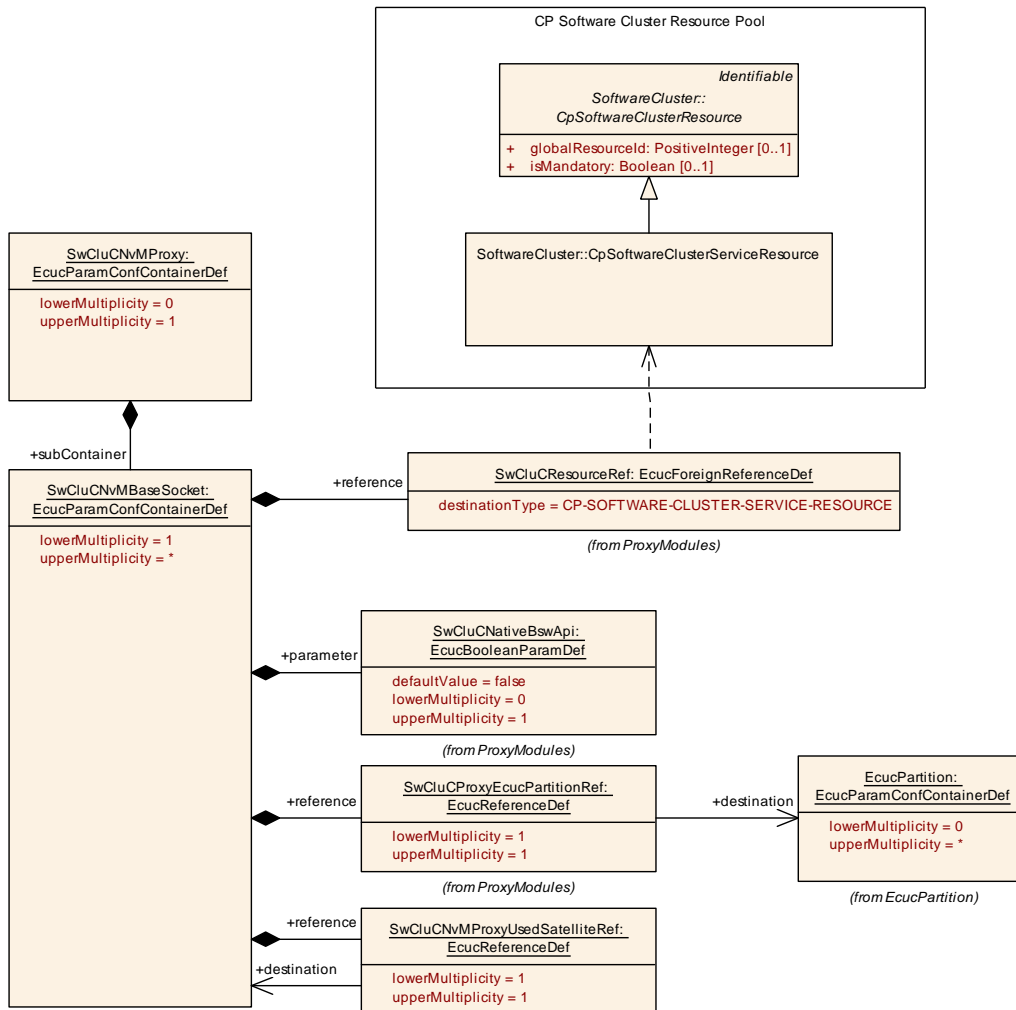
<b>SWS Item</b>	<b>[ECUC_SwCluC_00083]</b>		
<b>Parameter Name</b>	SwCluCnVMPProxyDevErrorDetect		
<b>Parent Container</b>	<a href="#">SwCluCnVMPProxy</a>		
<b>Description</b>	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00055]</b>		
<b>Parameter Name</b>	SwCluCnVMPProxyNvBlockFillValue		
<b>Parent Container</b>	<a href="#">SwCluCnVMPProxy</a>		
<b>Description</b>	Defines the default value used to fill unused bytes in NvBlock space in case NvBlock length in Application Software Cluster < NvBlock length configured in NvM of Host Software Cluster.  Dependent on NvM Proxy implementation this parameter is only relevant for NvM Low Proxy or NvM High Proxy		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 255		
<b>Default value</b>	255		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCNvMBaseSocket</a>	1..*	<p>This container configures how many EcucPartitions specific API links are required for the NvM Proxy and to which cluster resource the API set belongs.</p> <p>In the NvM Low Proxy all offered API sets needs to be configured. In the NvM High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the Ecuc Partition on which the API set is provided.</p>
<a href="#">SwCluCNvMConfigIDProxyNvBlock</a>	0..*	<p>Describes a Configuration ID block of an Application Software Cluster and maps it to</p> <ul style="list-style-type: none"> <li>• a CpSoftwareClusterServiceResource describing the NvBlock resource in the clustered system</li> <li>• a EcucPartition</li> <li>• a NvMBlockDescriptor (only in the context of the Host Software Cluster)</li> </ul> <p>In the scope of an Application Software Cluster at most one Sw CluCNvMConfigIDProxyNvBlock container can exist. In the scope of a Host Software Cluster multiple SwCluCNvMConfigIDProxyNvBlock container can exist, one for each Configuration ID block of Application Software Clusters.</p>
<a href="#">SwCluCNvMProxyNvBlock</a>	1..*	<p>Maps a NvMBlockDescriptor to the CpSoftwareClusterService Resource describing the NvBlock resource in the clustered system.</p>



**10.2.7.1.1 NvM Base Socket**



**Figure 10.14: NvM Proxy Base Socket**

<b>SWS Item</b>	[ECUC_SwCluC_00056]		
<b>Container Name</b>	SwCluCNvMBaseSocket		
<b>Parent Container</b>	SwCluCNvMProxy		
<b>Description</b>	<p>This container configures how many EcucPartitions specific API links are required for the NvM Proxy and to which cluster resource the API set belongs.</p> <p>In the NvM Low Proxy all offered API sets needs to be configured. In the NvM High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the EcucPartition on which the API set is provided.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00058]</b>		
<b>Parameter Name</b>	SwCluCNativeBswApi		
<b>Parent Container</b>	<a href="#">SwCluCNvMBaseSocket</a>		
<b>Description</b>	Defines if the native C-API without pre or suffixes is offered in the Application Software Cluster on this EcucPartition.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00082]</b>		
<b>Parameter Name</b>	SwCluCNvMProxyUsedSatelliteRef		
<b>Parent Container</b>	<a href="#">SwCluCNvMBaseSocket</a>		
<b>Description</b>	Reference to the SwCluCNvMBaseSocket which has access to a satellite of the NvM. The owning SwCluCNvMBaseSocket uses the NvM satellite of the referenced SwCluCNvMBaseSocket.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">SwCluCNvMBaseSocket</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00059]</b>		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCNvMBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00087]
<b>Parameter Name</b>	SwCluCResourceRef
<b>Parent Container</b>	SwCluCNvMBaseSocket
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

No Included Containers

[SWS\_SwCluC\_CONSTR\_02130] **SwCluCNvMBaseSocket** relates only to a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_NVM\_BASE\_SOCKET** [The **SwCluCNvMBaseSocket.SwCluCResourceRef** shall only reference a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_NVM\_BASE\_SOCKET**.] (*SRS\_SwCluC\_00206, SRS\_BSW\_00167*)

### 10.2.7.1.2 NvM Proxy NvBlock configuration

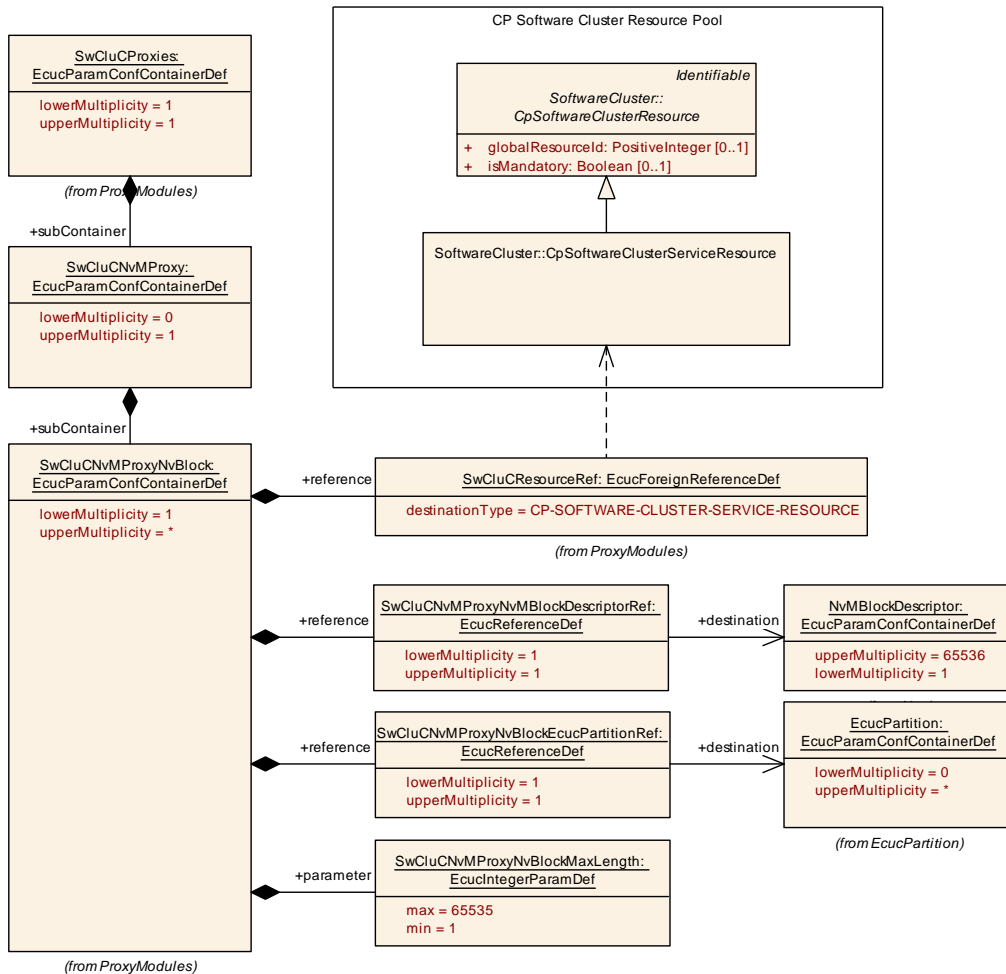


Figure 10.15: NvM Proxy NvBlock

<b>SWS Item</b>	<b>[ECUC_SwCluC_00040]</b>		
<b>Container Name</b>	SwCluCnVmProxyNvBlock		
<b>Parent Container</b>	<a href="#">SwCluCnVmProxy</a>		
<b>Description</b>	Maps a NvMBlockDescriptor to the CpSoftwareClusterServiceResource describing the NvBlock resource in the clustered system.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00043]</b>		
<b>Parameter Name</b>	SwCluCnVmProxyNvBlockMaxLength		
<b>Parent Container</b>	<a href="#">SwCluCnVmProxyNvBlock</a>		
<b>Description</b>	Defines the maximum NV block data length in bytes.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00060]</b>		
<b>Parameter Name</b>	SwCluCnVmProxyNvBlockEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCnVmProxyNvBlock</a>		
<b>Description</b>	Reference to the EcucPartition on which the NvM Proxy offers the NvBlock access (call of APIfunctions, callback functions and Ports on the Service Software Component)		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00042]</b>		
<b>Parameter Name</b>	SwCluCnVmProxyNvMBlockDescriptorRef		
<b>Parent Container</b>	<a href="#">SwCluCnVmProxyNvBlock</a>		
<b>Description</b>	Reference to the NvMBlockDescriptor		
<b>Multiplicity</b>	1		





Type	Reference to <a href="#">NvMBlockDescriptor</a>
Scope / Dependency	scope: ECU

SWS Item	[ECUC_SwCluC_00087]
Parameter Name	SwCluCResourceRef
Parent Container	<a href="#">SwCluCNvMProxyNvBlock</a>
Description	Reference to the CpSoftwareClusterServiceResource.
Multiplicity	1
Type	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
Scope / Dependency	scope: ECU

No Included Containers
------------------------

**[SWS\_SwCluC\_CONSTR\_02131]** [SwCluCNvMProxyNvBlock](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_NV\\_BLOCK](#) [The [SwCluCNvMProxyNvBlock.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_NV\\_BLOCK](#).] ([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00167](#))

### 10.2.7.1.2.1 NvM Proxy Configuration ID Block configuration

SWS Item	[ECUC_SwCluC_00162]		
Container Name	SwCluCNvMConfigIDProxyNvBlock		
Parent Container	<a href="#">SwCluCNvMProxy</a>		
Description	<p>Describes a Configuration ID block of an Application Software Cluster and maps it to</p> <ul style="list-style-type: none"> <li>• a CpSoftwareClusterServiceResource describing the NvBlock resource in the clustered system</li> <li>• a EcucPartition</li> <li>• a NvMBlockDescriptor (only in the context of the Host Software Cluster)</li> </ul> <p>In the scope of an Application Software Cluster at most one SwCluCNvMConfigIDProxyNvBlock container can exist. In the scope of a Host Software Cluster multiple SwCluCNvMConfigIDProxyNvBlock container can exist, one for each Configuration ID block of Application Software Clusters.</p>		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

SWS Item	[ECUC_SwCluC_00163]		
Parameter Name	SwCluCNvMProxyHostNvMBlockDescriptorRef		
Parent Container	<a href="#">SwCluCNvMConfigIDProxyNvBlock</a>		
Description	Reference to the NvMBlockDescriptor of the NvM module in Host Software Cluster. This reference is only applicable in the context of a Host Software Cluster.		
Multiplicity	0..1		





<b>Type</b>	Reference to <a href="#">NvMBlockDescriptor</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00060]</b>		
<b>Parameter Name</b>	SwCluCNvMProxyNvBlockEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCNvMConfigIDProxyNvBlock</a>		
<b>Description</b>	Reference to the EcucPartition on which the NvM Proxy offers the NvBlock access (call of APIfunctions, callback functions and Ports on the Service Software Component)		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

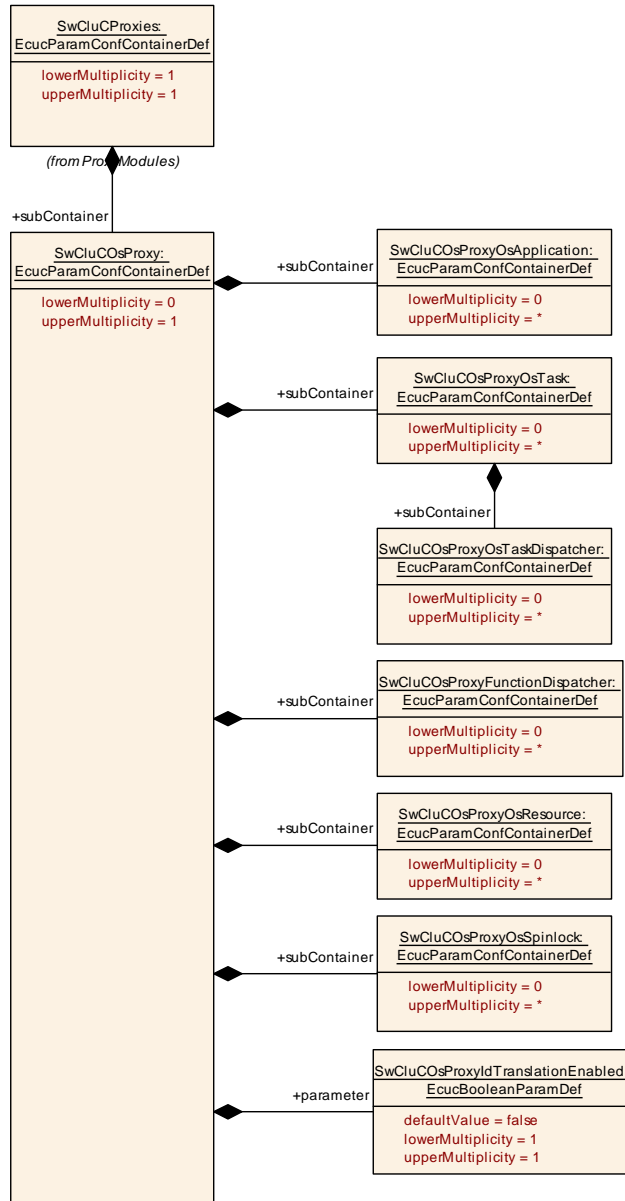
<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCNvMConfigIDProxyNvBlock</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
-------------------------------

**[SWS\_SwCluC\_CONSTR\_02158]** [In case the parameter [NvMDynamicConfiguration](#) is set to `true` in the NvM module configuration of the [Application Software Cluster](#), exactly one container [SwCluCNvMConfigIDProxyNvBlock](#) shall exist in the scope of the same [Application Software Cluster](#).] ([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00167](#))

**[SWS\_SwCluC\_CONSTR\_02159]** [In the scope of an [Application Software Cluster](#) at most one [SwCluCNvMConfigIDProxyNvBlock](#) container shall exist.] ([SRS\\_SwCluC\\_00206](#), [SRS\\_BSW\\_00167](#))

**10.2.7.2 Os Proxy**



**Figure 10.16: Os Proxy Parameter**

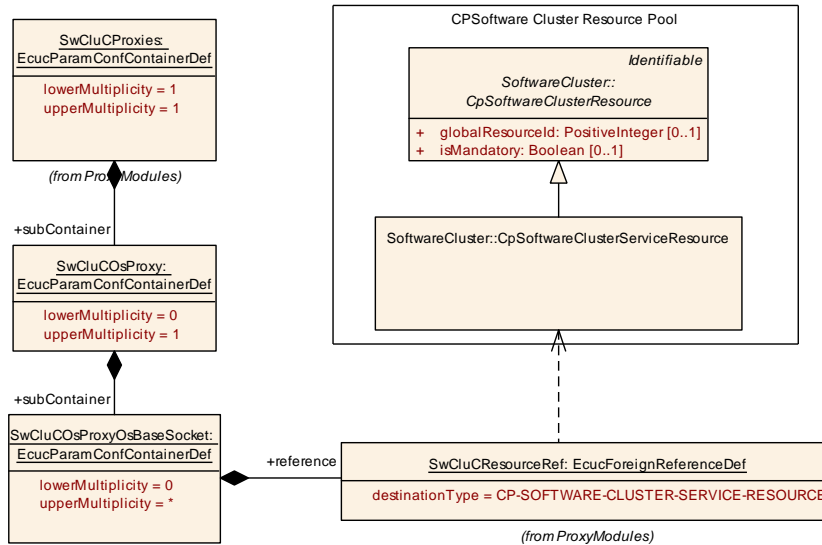
<b>SWS Item</b>	[ECUC_SwCluC_00085]		
<b>Container Name</b>	SwCluCOsProxy		
<b>Parent Container</b>	<a href="#">SwCluCProxies</a>		
<b>Description</b>	Os Proxy specific parameters.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00155]</b>		
<b>Parameter Name</b>	SwCluCOsProxyIdTranslationEnabled		
<b>Parent Container</b>	<a href="#">SwCluCOsProxy</a>		
<b>Description</b>	Enables the translation of core IDs and application IDs between Host SW Cluster and Application SW Cluster - true: IDs translation from HOST into Application SW Cluster specific ones is enabled. - false: IDs translation from HOST into Application SW Cluster specific ones is disabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">SwCluCOsProxyFunctionDispatcher</a>	0..*	This container configures a function dispatcher. In the Os High Proxy this configuration puts a function as a Dispatch Entry Point in the Binary Manifest which can be called by the Os Low Proxy. In the Os Low Proxy this configuration provides the Dispatcher Function (and according resource Entry in the Binary Manifest) which is able to call the MaxNumberOfCallee Dispatch Entry Points of Os High Proxies.
<a href="#">SwCluCOsProxyOsApplication</a>	0..*	Maps a OsApplication to the CpSoftwareClusterService Resource describing the OsApplication resource in the clustered system.
<a href="#">SwCluCOsProxyOsBaseSocket</a>	0..*	Maps a OsBaseSocket to the CpSoftwareClusterService Resource describing the OsBaseSocket resource in the clustered system.
<a href="#">SwCluCOsProxyOsResource</a>	0..*	Maps a OsResource to the CpSoftwareClusterServiceResource describing the OsResource resource in the clustered system.
<a href="#">SwCluCOsProxyOsSpinlock</a>	0..*	Maps a OsSpinlock to the CpSoftwareClusterServiceResource describing the OsSpinlock resource in the clustered system.
<a href="#">SwCluCOsProxyOsTask</a>	0..*	Maps a OsTask to the CpSoftwareClusterServiceResource describing the OsTask resource in the clustered system.



**10.2.7.2.1 Os Proxy Base Socket configuration**



**Figure 10.17: Os Proxy Base Socket Parameter**

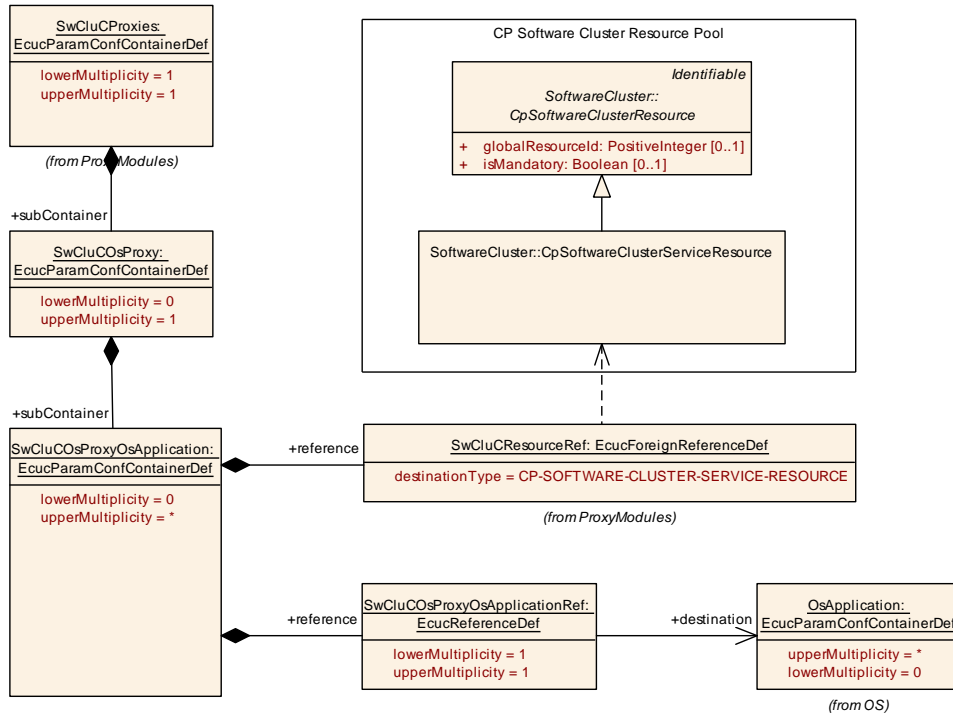
<b>SWS Item</b>	[ECUC_SwCluC_00053]		
<b>Container Name</b>	SwCluCOsProxyOsBaseSocket		
<b>Parent Container</b>	SwCluCOsProxy		
<b>Description</b>	Maps a OsBaseSocket to the CpSoftwareClusterServiceResource describing the Os BaseSocket resource in the clustered system.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00087]		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	SwCluCOsProxyOsBaseSocket		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

**No Included Containers**

[SWS\_SwCluC\_CONSTR\_02231] **SwCluCOsProxyOsBaseSocket** relates only to a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_BASE\_SOCKET** [The **SwCluCOsProxyOsBaseSocket.SwCluCResourceRef** shall only reference a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_BASE\_SOCKET**.] (*SRS\_SwCluC\_00214, SRS\_BSW\_00167*)

**10.2.7.2.2 Os Proxy OsApplication configuration**



**Figure 10.18: Os Proxy OsApplication Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00046]		
<b>Container Name</b>	SwCluCOsProxyOsApplication		
<b>Parent Container</b>	SwCluCOsProxy		
<b>Description</b>	Maps a OsApplication to the CpSoftwareClusterServiceResource describing the Os Application resource in the clustered system.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00050]		
<b>Parameter Name</b>	SwCluCOsProxyOsApplicationRef		
<b>Parent Container</b>	SwCluCOsProxyOsApplication		
<b>Description</b>	Reference to the OsApplication		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to OsApplication		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00087]		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	SwCluCOsProxyOsApplication		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		





<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

No Included Containers

**[SWS\_SwCluC\_CONSTR\_02232]** **SwCluCOsProxyOsApplication** relates only to a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_APPLICATION** [The **SwCluCOsProxyOsApplication.SwCluCResourceRef** shall only reference a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_APPLICATION**.] (*SRS\_SwCluC\_00214, SRS\_BSW\_00167*)

### 10.2.7.2.3 Os Proxy OsTask configuration

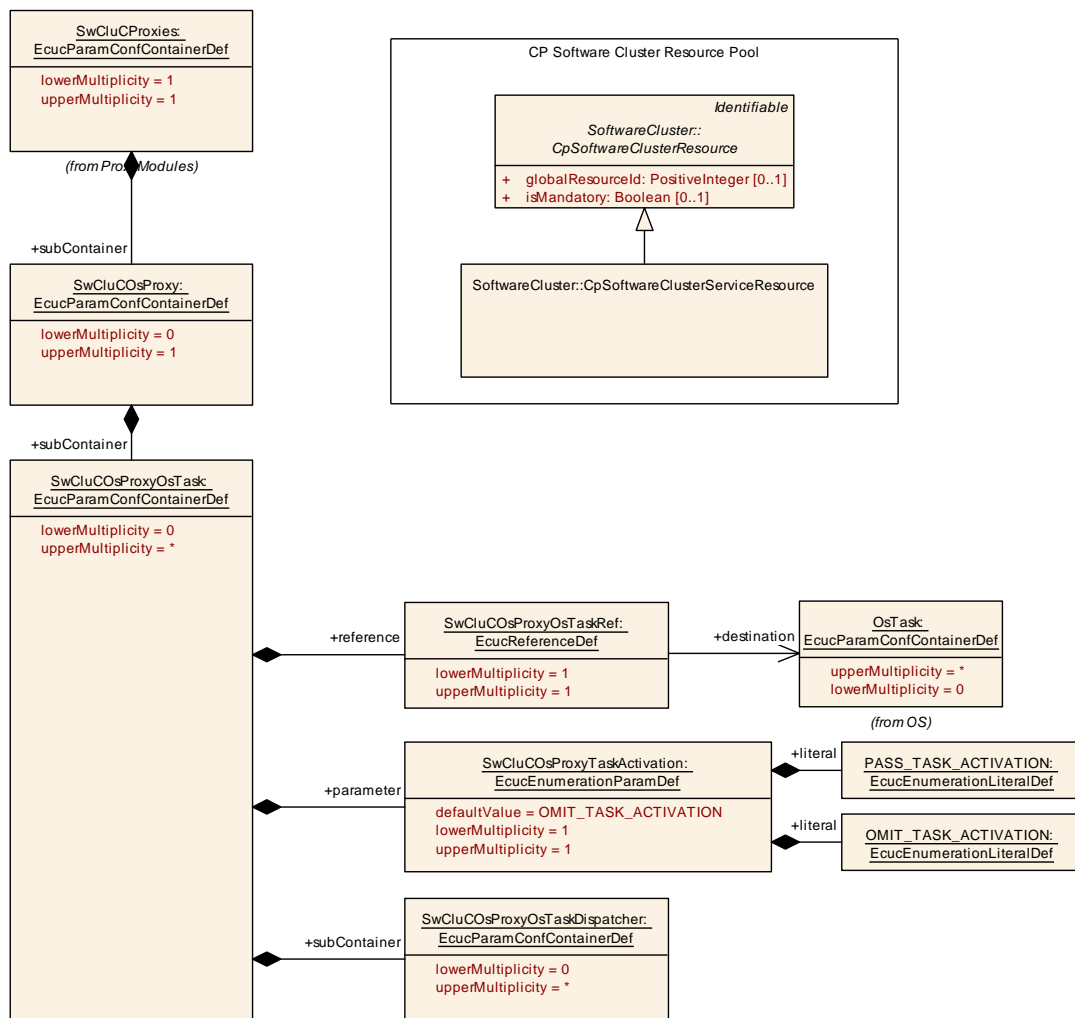


Figure 10.19: Os Proxy OsTask Parameter

<b>SWS Item</b>	<b>[ECUC_SwCluC_00044]</b>		
<b>Container Name</b>	SwCluCOsProxyOsTask		
<b>Parent Container</b>	<a href="#">SwCluCOsProxy</a>		
<b>Description</b>	Maps a OsTask to the CpSoftwareClusterServiceResource describing the OsTask resource in the clustered system.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00048]</b>		
<b>Parameter Name</b>	SwCluCOsProxyTaskActivation		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTask</a>		
<b>Description</b>	Configures for this particular OsTask whether ActivateTask is passed to the Host Software Cluster or not.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	OMIT_TASK_ACTIVATION	ActivateTask is NOT passed to the Host Software Cluster.	
	PASS_TASK_ACTIVATION	ActivateTask is passed to the Host Software Cluster.	
<b>Default value</b>	<a href="#">OMIT_TASK_ACTIVATION</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

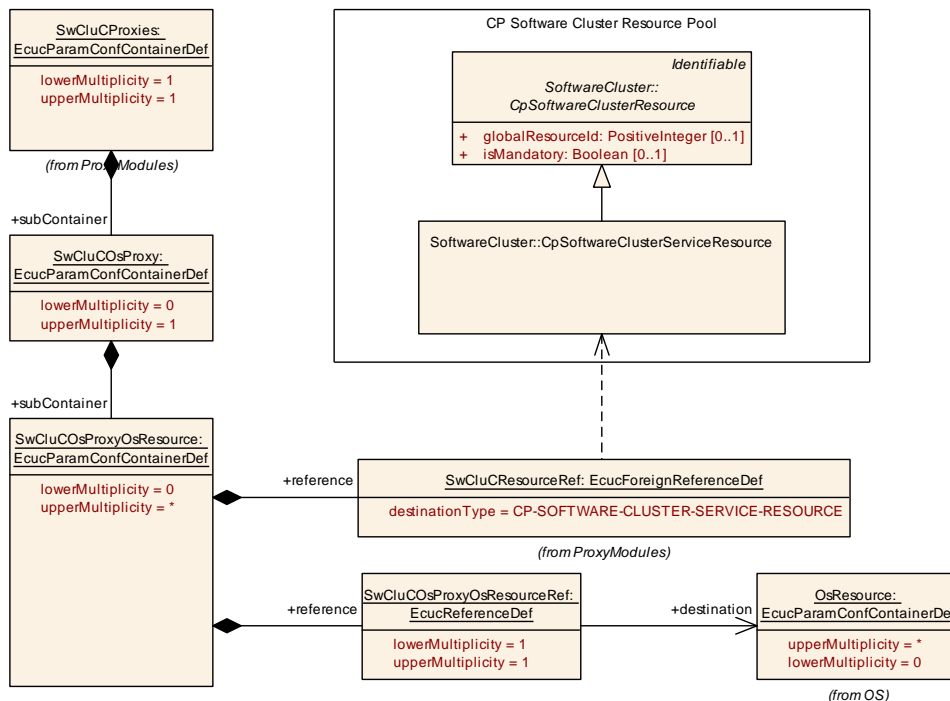
<b>SWS Item</b>	<b>[ECUC_SwCluC_00045]</b>		
<b>Parameter Name</b>	SwCluCOsProxyOsTaskRef		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTask</a>		
<b>Description</b>	Reference to the OsTask		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">OsTask</a>		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTask</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
SwCluCOsProxyOsTaskDispatcher	0..*	<p>This container defines a task dispatcher for the owning proxy task. In the Os High Proxy this configuration provides the OS Task body function as a Dispatch Entry Point in the Binary manifest which can be called by the Os Low Proxy. In the HIGH_PROXY configuration at most one SwCluCOsProxyOsTask Dispatcher can be owned by a SwCluCOsProxyOsTask In the Os Low Proxy this configuration provides the Dispatcher Runnable (and according resource Entry in the Binary Manifest) which is able to call the MaxNumberOfCallee Dispatch Entry Points of Os High Proxies. In the LOW_PROXY configuration multiple SwCluCOsProxyOsTaskDispatcher can be owned by a SwCluCOsProxyOsTask.</p> <p>If none of the SwCluCOsProxyDispatcher&lt;xxx&gt;Event containers is configured it's up to the integrator to model the appropriate RTEEvent.</p>

[SWS\_SwCluC\_CONSTR\_02233] **SwCluCOsProxyOsTask** relates only to a **Cp-SoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_TASK** [The **SwCluCOsProxyOsTask.SwCluCResourceRef** shall only reference a **Cp-SoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_TASK**.] (*SRS\_SwCluC\_00214, SRS\_BSW\_00167*)

### 10.2.7.2.4 Os Proxy OsResource configuration



**Figure 10.20: Os Proxy OsResource Parameter**

<b>SWS Item</b>	<b>[ECUC_SwCluC_00049]</b>		
<b>Container Name</b>	SwCluCOsProxyOsResource		
<b>Parent Container</b>	<a href="#">SwCluCOsProxy</a>		
<b>Description</b>	Maps a OsResource to the CpSoftwareClusterServiceResource describing the Os Resource resource in the clustered system.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

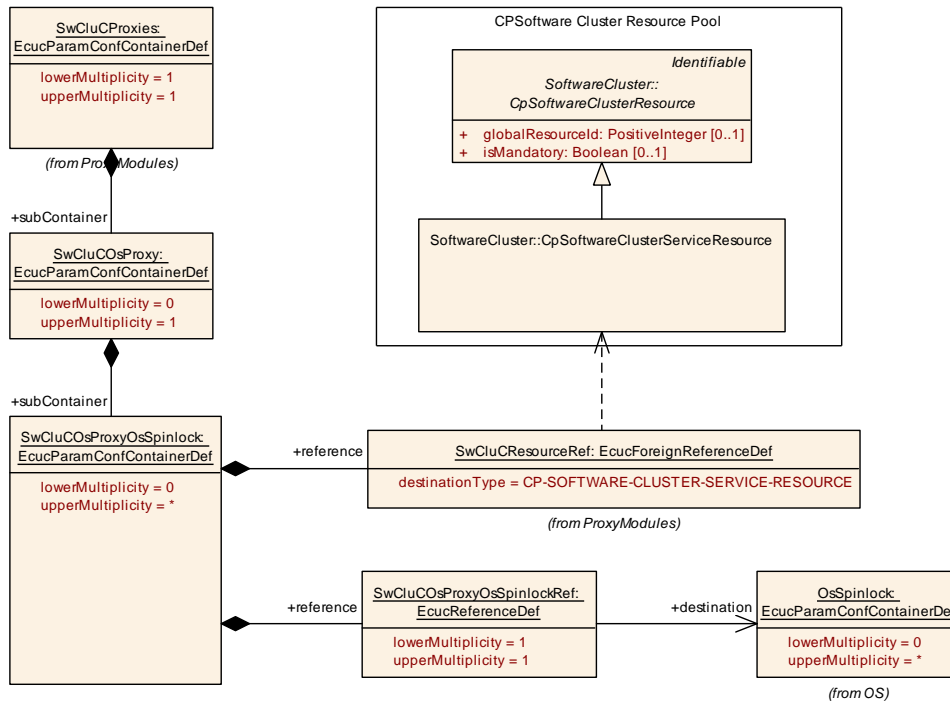
<b>SWS Item</b>	<b>[ECUC_SwCluC_00047]</b>		
<b>Parameter Name</b>	SwCluCOsProxyOsResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsResource</a>		
<b>Description</b>	Reference to the OsResource		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">OsResource</a>		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsResource</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

**No Included Containers**

**[SWS\_SwCluC\_CONSTR\_02234]** [SwCluCOsProxyOsResource](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_OS\\_RESOURCE](#) [The [SwCluCOsProxyOsResource.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_OS\\_RESOURCE](#).] ([SRS\\_SwCluC\\_00214](#), [SRS\\_BSW\\_00167](#))

**10.2.7.2.5 Os Proxy OsSpinlock configuration**



**Figure 10.21: Os Proxy OsSpinlock Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00051]		
<b>Container Name</b>	SwCluCOsProxyOsSpinlock		
<b>Parent Container</b>	SwCluCOsProxy		
<b>Description</b>	Maps a OsSpinlock to the CpSoftwareClusterServiceResource describing the Os Spinlock resource in the clustered system.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00052]		
<b>Parameter Name</b>	SwCluCOsProxyOsSpinlockRef		
<b>Parent Container</b>	SwCluCOsProxyOsSpinlock		
<b>Description</b>	Reference to the OsSpinlock		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">OsSpinlock</a>		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00087]		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	SwCluCOsProxyOsSpinlock		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		





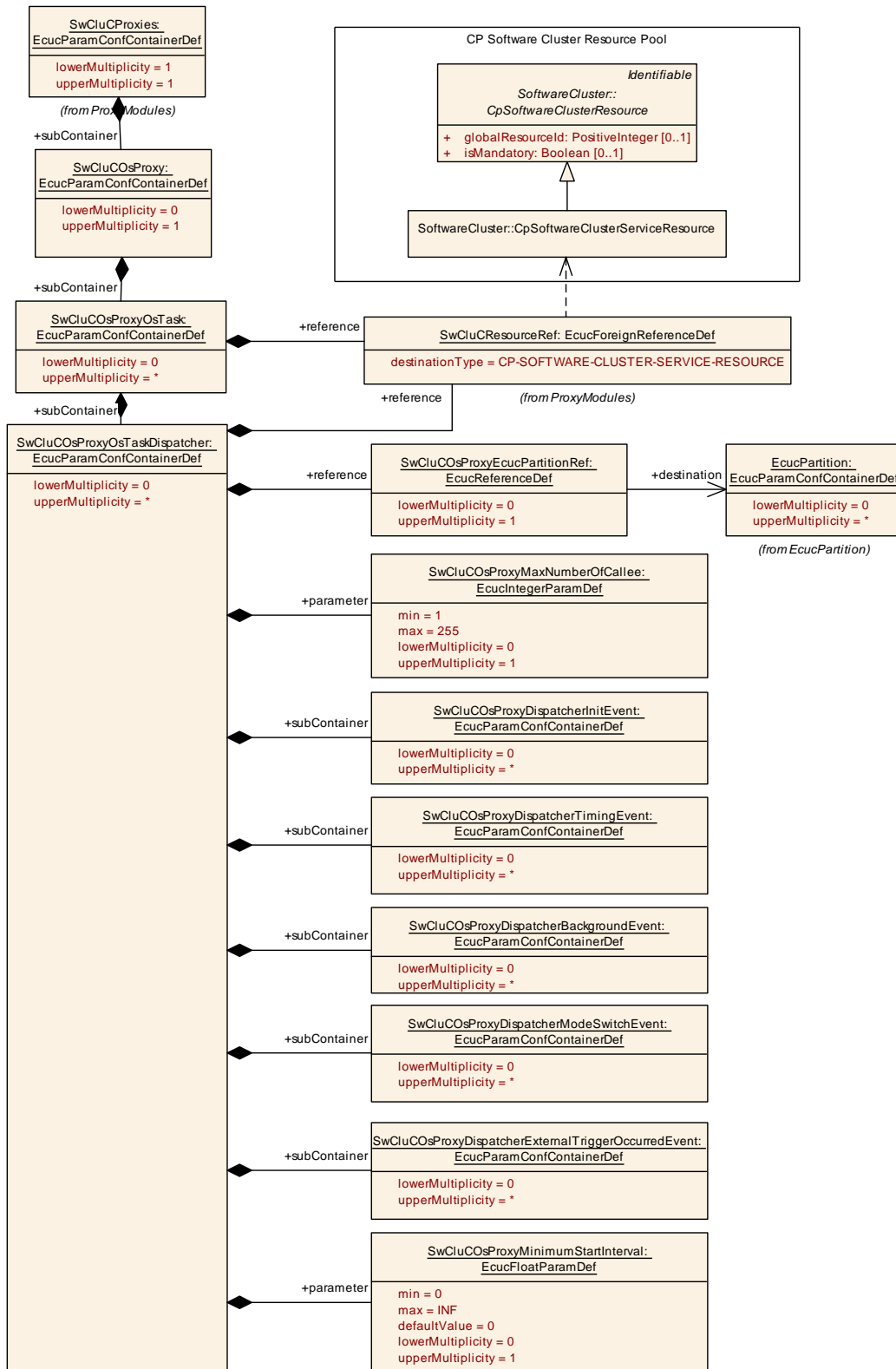
Type	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
Scope / Dependency	scope: ECU

No Included Containers

**[SWS\_SwCluC\_CONSTR\_02235]** **SwCluCOsProxyOsSpinlock** relates only to a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_SPINLOCK** [The **SwCluCOsProxyOsSpinlock.SwCluCResourceRef** shall only reference a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_OS\_SPINLOCK**.] (*SRS\_SwCluC\_00214, SRS\_BSW\_00167*)



**10.2.7.2.6 Os Proxy Task Dispatcher configuration**



**Figure 10.22: Os Proxy Task Dispatcher Parameter**

<b>SWS Item</b>	<b>[ECUC_SwCluC_00061]</b>		
<b>Container Name</b>	SwCluCOsProxyOsTaskDispatcher		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTask</a>		
<b>Description</b>	<p>This container defines a task dispatcher for the owning proxy task. In the Os High Proxy this configuration provides the OS Task body function as a Dispatch Entry Point in the Binary manifest which can be called by the Os Low Proxy. In the HIGH_PROXY configuration at most one SwCluCOsProxyOsTaskDispatcher can be owned by a Sw CluCOsProxyOsTask In the Os Low Proxy this configuration provides the Dispatcher Runnable (and according resource Entry in the Binary Manifest) which is able to call the MaxNumberOfCallee Dispatch Entry Points of Os High Proxies. In the LOW_PROXY configuration multiple SwCluCOsProxyOsTaskDispatcher can be owned by a SwCluCOsProxyOsTask.</p> <p>If none of the SwCluCOsProxyDispatcher&lt;xxx&gt;Event containers is configured it's up to the integrator to model the appropriate RTEEvent.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00062]</b>		
<b>Parameter Name</b>	SwCluCOsProxyMaxNumberOfCallee		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTaskDispatcher</a>		
<b>Description</b>	Defines how many Dispatch Entry Points the dispatcher of the Os Low Proxy is able to call at most. In the Os Low Proxy this configuration parameter is mandatory.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 255		
<b>Default value</b>	–		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00070]</b>		
<b>Parameter Name</b>	SwCluCOsProxyMinimumStartInterval		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTaskDispatcher</a>		
<b>Description</b>	Specifies the time in seconds by which two consecutive starts of an dispatcher Runnable are guaranteed to be separated.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. INF]		
<b>Default value</b>	0		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00078]</b>		
<b>Parameter Name</b>	SwCluCOsProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTaskDispatcher</a>		





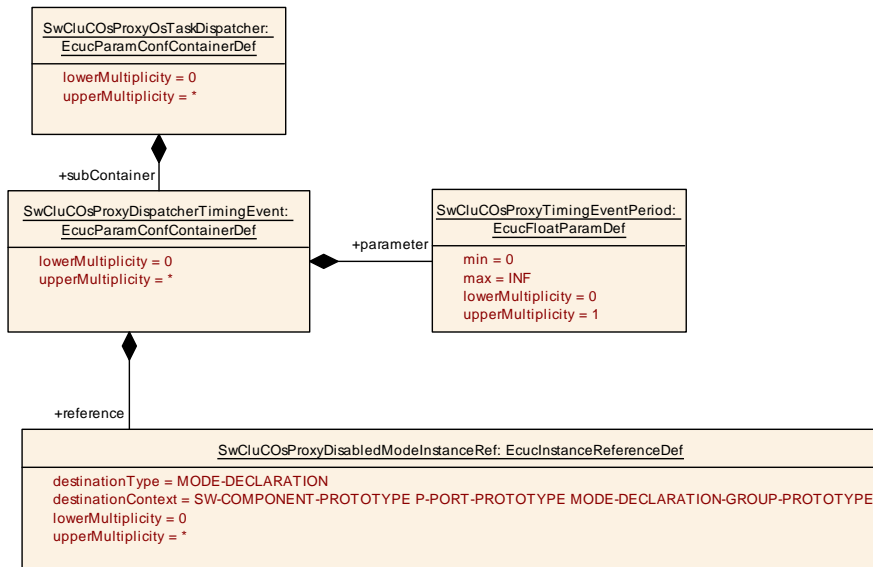
<b>Description</b>	<p>If the reference is not provided, the task dispatcher is provided on the EcuPartition to which the OsApplication of the OsTask related to the owning SwCluCOsProxyOsTask belongs.</p> <p>If the reference is provided, the task dispatcher is provided on the referenced Ecu Partition. In this case the task dispatcher is scheduled in the OsTask related to the owning SwCluCOsProxyOsTask but is changing its partition before the task dispatcher schedules proxy tasks in the Application Software Cluster.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ <a href="#">ECUC_SwCluC_00087</a> ]
<b>Parameter Name</b>	SwCluCResourceRef
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTaskDispatcher</a>
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCOsProxyDispatcherBackgroundEvent</a>	0..*	Configures a BackgroundEvent starting the owing Dispatcher Runnable.
<a href="#">SwCluCOsProxyDispatcherExternalTriggerOccurredEvent</a>	0..*	Configures a ExternalTriggerOccurredEvent starting the owing Dispatcher Runnable.
<a href="#">SwCluCOsProxyDispatcherInitEvent</a>	0..*	Configures an InitEvent starting the owing Dispatcher Runnable.
<a href="#">SwCluCOsProxyDispatcherModeSwitchEvent</a>	0..*	Configures a ModeSwitchEvent starting the owing Dispatcher Runnable.
<a href="#">SwCluCOsProxyDispatcherTimingEvent</a>	0..*	Configures a TimingEvent starting the owing Dispatcher Runnable.

[[SWS\\_SwCluC\\_CONSTR\\_02236](#)] [SwCluCOsProxyOsTaskDispatcher](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_OS\\_TASK\\_DISPATCHER](#) [The [SwCluCOsProxyOsTaskDispatcher.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_OS\\_TASK\\_DISPATCHER](#).] ([SRS\\_SwCluC\\_00214](#), [SRS\\_BSW\\_00167](#))

**10.2.7.2.6.1 Os Proxy Task Dispatcher Timing Event configuration**



**Figure 10.23: Os Proxy Task Dispatcher Timing Event Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00066]		
<b>Container Name</b>	SwCluCOsProxyDispatcherTimingEvent		
<b>Parent Container</b>	SwCluCOsProxyOsTaskDispatcher		
<b>Description</b>	Configures a TimingEvent starting the owing Dispatcher Runnable.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00065]		
<b>Parameter Name</b>	SwCluCOsProxyTimingEventPeriod		
<b>Parent Container</b>	SwCluCOsProxyDispatcherTimingEvent		
<b>Description</b>	Period of timing event in seconds. The value of this attribute shall be greater than zero.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. INF]		
<b>Default value</b>	–		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00071]		
<b>Parameter Name</b>	SwCluCOsProxyDisabledModeInstanceRef		
<b>Parent Container</b>	SwCluCOsProxyDispatcherTimingEvent		
<b>Description</b>	Reference to the Mode instance in a PPortPrototype that disable the Event.		
<b>Multiplicity</b>	0..*		





<b>Type</b>	Instance reference to MODE-DECLARATION context: SW-COMPONENT-PROTOTYPE P-PORT-PROTOTYPE MODE-DECLARATION-GROUP-PROTOTYPE
<b>Scope / Dependency</b>	scope: ECU

No Included Containers

### 10.2.7.2.6.2 Os Proxy Task Dispatcher Background Event configuration

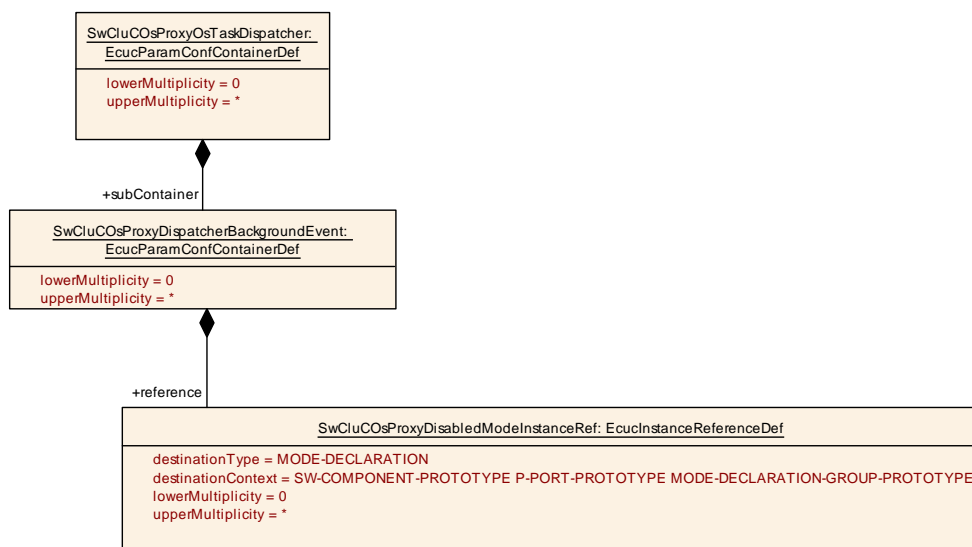


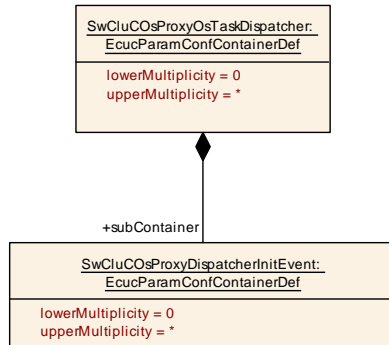
Figure 10.24: Os Proxy Task Dispatcher Background Event Parameter

<b>SWS Item</b>	[ECUC_SwCluC_00067]		
<b>Container Name</b>	SwCluCOsProxyDispatcherBackgroundEvent		
<b>Parent Container</b>	SwCluCOsProxyOsTaskDispatcher		
<b>Description</b>	Configures a BackgroundEvent starting the owing Dispatcher Runnable.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00071]
<b>Parameter Name</b>	SwCluCOsProxyDisabledModelInstanceRef
<b>Parent Container</b>	SwCluCOsProxyDispatcherBackgroundEvent
<b>Description</b>	Reference to the Mode instance in a PPortPrototype that disable the Event.
<b>Multiplicity</b>	0..*
<b>Type</b>	Instance reference to MODE-DECLARATION context: SW-COMPONENT-PROTOTYPE P-PORT-PROTOTYPE MODE-DECLARATION-GROUP-PROTOTYPE
<b>Scope / Dependency</b>	scope: ECU

No Included Containers

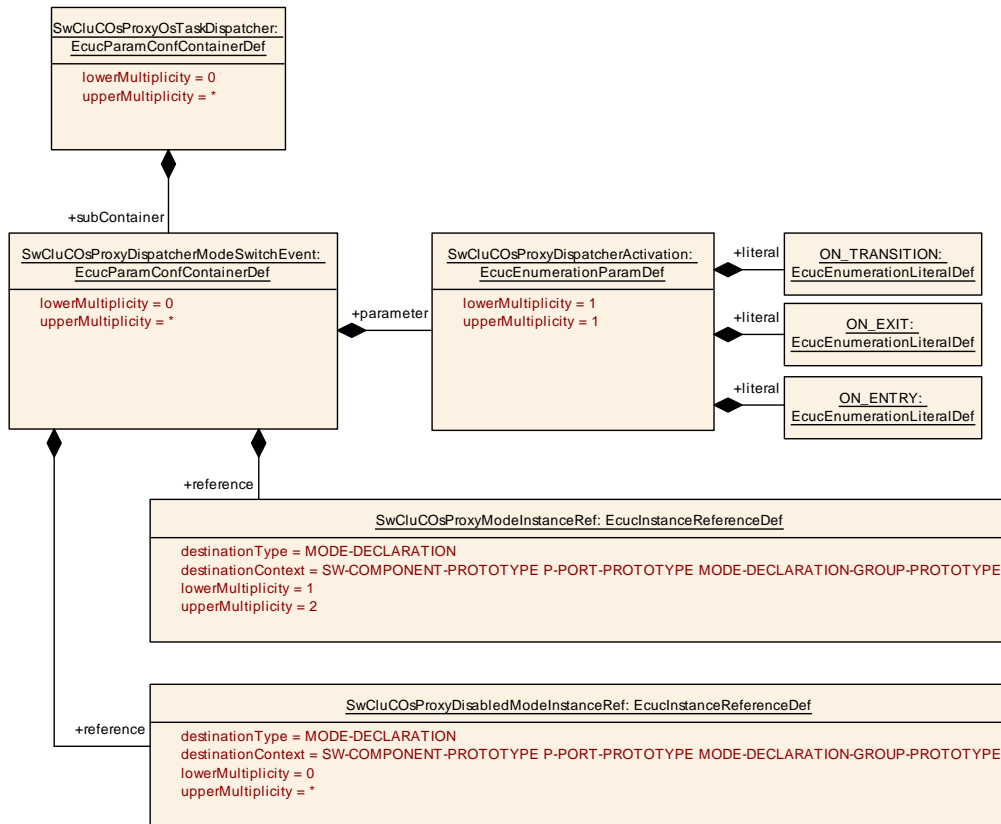
**10.2.7.2.6.3 Os Proxy Task Dispatcher Init Event configuration**



**Figure 10.25: Os Proxy Task Dispatcher Init Event Parameter**

<b>SWS Item</b>	<b>[ECUC_SwCluC_00153]</b>		
<b>Container Name</b>	SwCluCOsProxyDispatcherInitEvent		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyOsTaskDispatcher</a>		
<b>Description</b>	Configures an InitEvent starting the owing Dispatcher Runnable.		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			
<b>No Included Containers</b>			

**10.2.7.2.6.4 Os Proxy Task Dispatcher Mode Switch Event configuration**



**Figure 10.26: Os Proxy Task Dispatcher Mode Switch Event Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00068]		
<b>Container Name</b>	SwCluCOsProxyDispatcherModeSwitchEvent		
<b>Parent Container</b>	SwCluCOsProxyOsTaskDispatcher		
<b>Description</b>	Configures a ModeSwitchEvent starting the owing Dispatcher Runnable.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00072]	
<b>Parameter Name</b>	SwCluCOsProxyDispatcherActivation	
<b>Parent Container</b>	SwCluCOsProxyDispatcherModeSwitchEvent	
<b>Description</b>	Specifies if the event is activated on entering or exiting the referenced Mode instance.	
<b>Multiplicity</b>	1	
<b>Type</b>	EcucEnumerationParamDef	
<b>Range</b>	ON_ENTRY	On entering the referred mode.
	ON_EXIT	On exiting the referred mode.
	ON_TRANSITION	On transition of the 1st referred mode to the 2nd referred mode.





<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

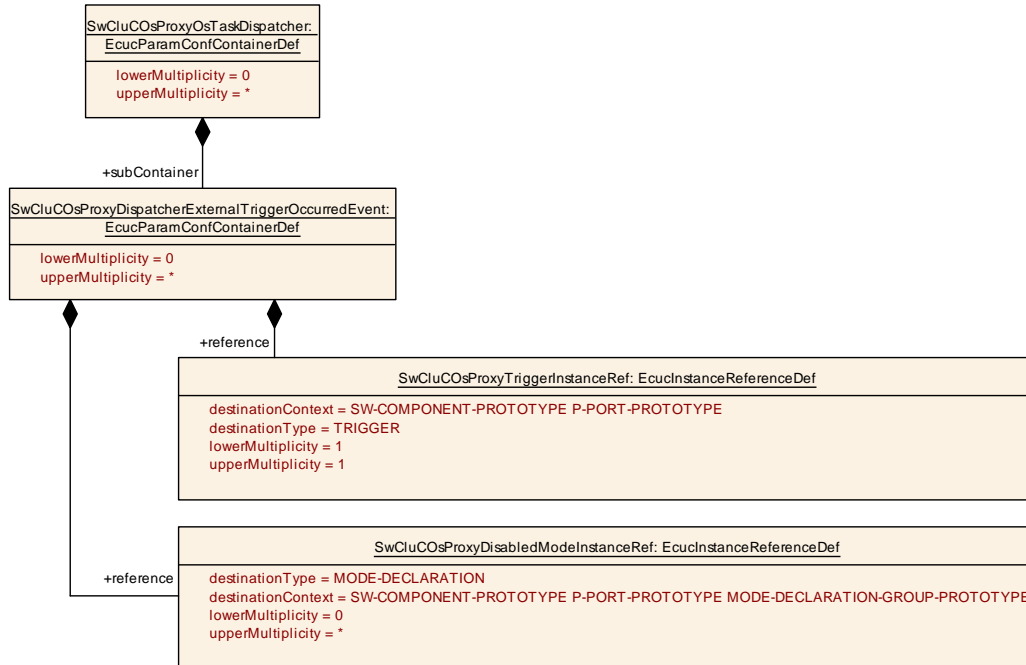
<b>SWS Item</b>	[ECUC_SwCluC_00071]
<b>Parameter Name</b>	SwCluCOsProxyDisabledModeInstanceRef
<b>Parent Container</b>	<a href="#">SwCluCOsProxyDispatcherModeSwitchEvent</a>
<b>Description</b>	Reference to the Mode instance in a PPortPrototype that disable the Event.
<b>Multiplicity</b>	0..*
<b>Type</b>	Instance reference to MODE-DECLARATION context: SW-COMPONENT-PROTOTYPE P-PORT-PROTOTYPE MODE-DECLARATION-GROUP-PROTOTYPE
<b>Scope / Dependency</b>	scope: ECU

<b>SWS Item</b>	[ECUC_SwCluC_00073]
<b>Parameter Name</b>	SwCluCOsProxyModeInstanceRef
<b>Parent Container</b>	<a href="#">SwCluCOsProxyDispatcherModeSwitchEvent</a>
<b>Description</b>	Reference to one or two Mode instances in a PPortPrototype that that initiate the mode switch.
<b>Multiplicity</b>	1..2
<b>Type</b>	Instance reference to MODE-DECLARATION context: SW-COMPONENT-PROTOTYPE P-PORT-PROTOTYPE MODE-DECLARATION-GROUP-PROTOTYPE
<b>Scope / Dependency</b>	scope: ECU

<b>No Included Containers</b>
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**10.2.7.2.6.5 Os Proxy Task Dispatcher External Trigger Occurred Event configuration**



**Figure 10.27: Os Proxy Task Dispatcher External Trigger Occurred Event Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00069]		
<b>Container Name</b>	SwCluCOsProxyDispatcherExternalTriggerOccurredEvent		
<b>Parent Container</b>	SwCluCOsProxyOsTaskDispatcher		
<b>Description</b>	Configures a ExternalTriggerOccurredEvent starting the owing Dispatcher Runnable.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00071]		
<b>Parameter Name</b>	SwCluCOsProxyDisabledModelInstanceRef		
<b>Parent Container</b>	SwCluCOsProxyDispatcherExternalTriggerOccurredEvent		
<b>Description</b>	Reference to the Mode instance in a PPortPrototype that disable the Event.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Instance reference to MODE-DECLARATION context: SW-COMPONENT-PROTOTYPE P-PORT-PROTOTYPE MODE-DECLARATION-GROUP-PROTOTYPE		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00074]		
<b>Parameter Name</b>	SwCluCOsProxyTriggerInstanceRef		
<b>Parent Container</b>	SwCluCOsProxyDispatcherExternalTriggerOccurredEvent		
<b>Description</b>	Reference to the Trigger instances in a PPortPrototype that raise the trigger.		

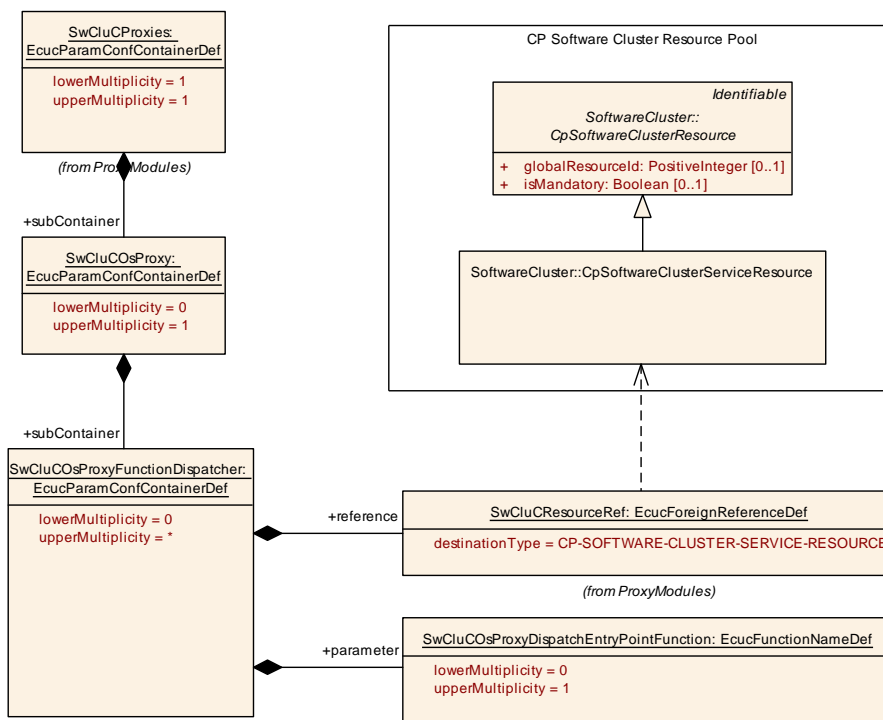




<b>Multiplicity</b>	1
<b>Type</b>	Instance reference to TRIGGER context: SW-COMPONENT-PROTOTYPE P-PORT-PROTOTYPE
<b>Scope / Dependency</b>	scope: ECU

<b>No Included Containers</b>
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### 10.2.7.2.7 Os Proxy Function Dispatcher configuration



**Figure 10.28: Os Proxy Function Dispatcher Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00063]		
<b>Container Name</b>	SwCluCOsProxyFunctionDispatcher		
<b>Parent Container</b>	SwCluCOsProxy		
<b>Description</b>	This container configures a function dispatcher. In the Os High Proxy this configuration puts a function as a Dispatch Entry Point in the Binary Manifest which can be called by the Os Low Proxy. In the Os Low Proxy this configuration provides the Dispatcher Function (and according resource Entry in the Binary Manifest) which is able to call the MaxNumberOfCallee Dispatch Entry Points of Os High Proxies.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

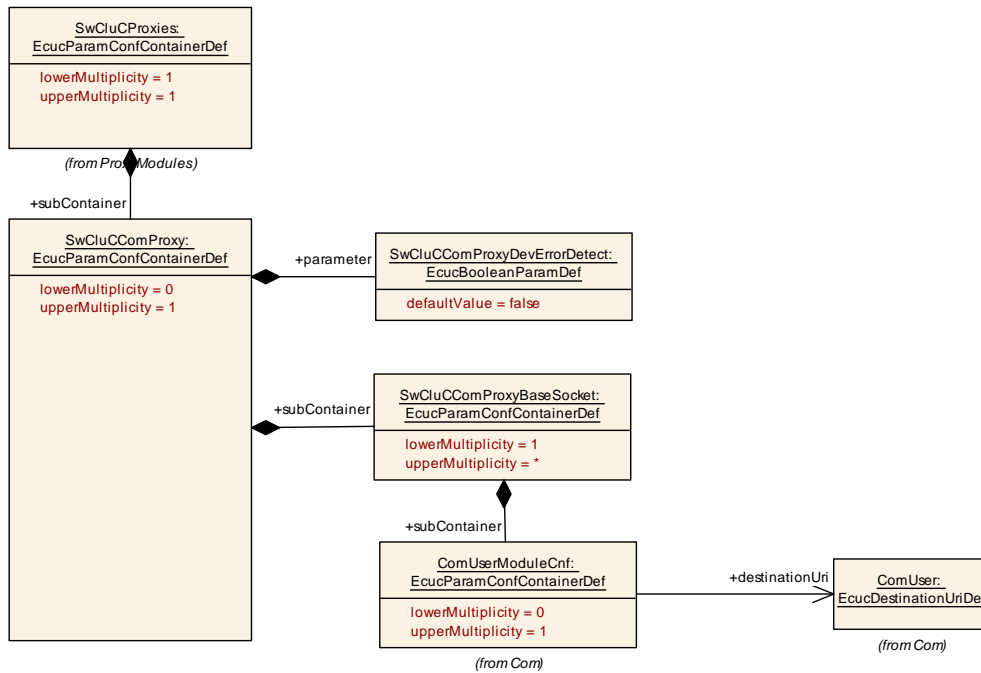
<b>SWS Item</b>	<b>[ECUC_SwCluC_00064]</b>		
<b>Parameter Name</b>	SwCluCOsProxyDispatchEntryPointFunction		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyFunctionDispatcher</a>		
<b>Description</b>	Name of the function which is put into the Binary Manifest as Dispatch Entry Point. In the Os High Proxy this configuration parameter is mandatory		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCOsProxyFunctionDispatcher</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

**[SWS\_SwCluC\_CONSTR\_02237]** [SwCluCOsProxyFunctionDispatcher](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_OS\\_FNC\\_DISPATCHER](#) [The [SwCluCOsProxyFunctionDispatcher.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_OS\\_FNC\\_DISPATCHER](#).] ([SRS\\_SwCluC\\_00214](#), [SRS\\_BSW\\_00167](#))

**10.2.7.3 Com Proxy**



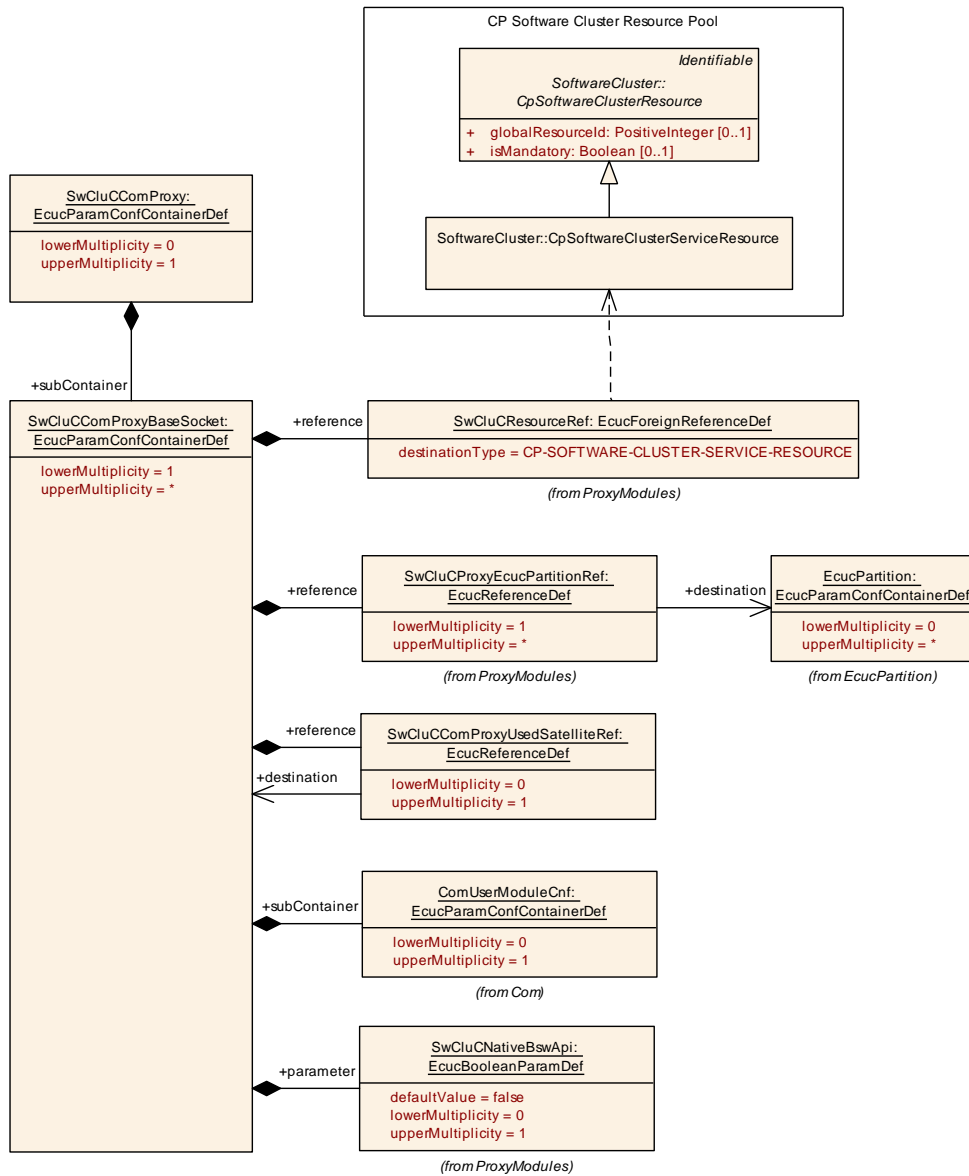
**Figure 10.29: Com Proxy Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00127]		
<b>Container Name</b>	SwCluCComProxy		
<b>Parent Container</b>	SwCluCProxies		
<b>Description</b>	LdCom Proxy specific parameters.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00128]		
<b>Parameter Name</b>	SwCluCComProxyDevErrorDetect		
<b>Parent Container</b>	SwCluCComProxy		
<b>Description</b>	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">SwCluCComProxyBaseSocket</a>	1..*	<p>This container configures how many EcucPartitions specific API links are required for the Com Proxy and to which cluster resource the API set belongs.</p> <p>In the Com Low Proxy all offered API sets (incl callbacks) needs to be configured. In the Com High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the Ecuc Partition on which the API set is provided.</p> <p>The ComUserModuleCnf is only applicable in the Host Software Cluster and shall not be configured in the scope of a Application Software Cluster. One ComUserModuleCnf instance can either server for ComSignals and ComSignalGroups on multiple Ecuc Partitions or exactly one EcucPartition. How many ComUser instances an Rte in an related Application Software Cluster requires is vendor specific.</p>

**10.2.7.3.1 Com Proxy Base Socket**



**Figure 10.30: Com Proxy Base Socket**

<b>SWS Item</b>	[ECUC_SwCluC_00131]
<b>Container Name</b>	SwCluCComProxyBaseSocket
<b>Parent Container</b>	SwCluCComProxy





<b>Description</b>	<p>This container configures how many EcucPartitions specific API links are required for the Com Proxy and to which cluster resource the API set belongs.</p> <p>In the Com Low Proxy all offered API sets (incl callbacks) needs to be configured. In the Com High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the EcucPartition on which the API set is provided.</p> <p>The ComUserModuleCnf is only applicable in the Host Software Cluster and shall not be configured in the scope of a Application Software Cluster. One ComUserModuleCnf instance can either server for ComSignals and ComSignalGroups on multiple Ecuc Partitions or exactly one EcucPartition. How many ComUser instances an Rte in an related Application Software Cluster requires is vendor specific.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00058]</b>		
<b>Parameter Name</b>	SwCluCNativeBswApi		
<b>Parent Container</b>	<a href="#">SwCluCComProxyBaseSocket</a>		
<b>Description</b>	Defines if the native C-API without pre or suffixes is offered in the Application Software Cluster on this EcucPartition.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00132]</b>		
<b>Parameter Name</b>	SwCluCComProxyUsedSatelliteRef		
<b>Parent Container</b>	<a href="#">SwCluCComProxyBaseSocket</a>		
<b>Description</b>	Reference to the SwCluCComBaseSocket which has access to a satellite of the Com. The owning SwCluCComBaseSocket uses the Com satellite of the referenced SwCluCComBaseSocket.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">SwCluCComProxyBaseSocket</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00147]</b>		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCComProxyBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1..*		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

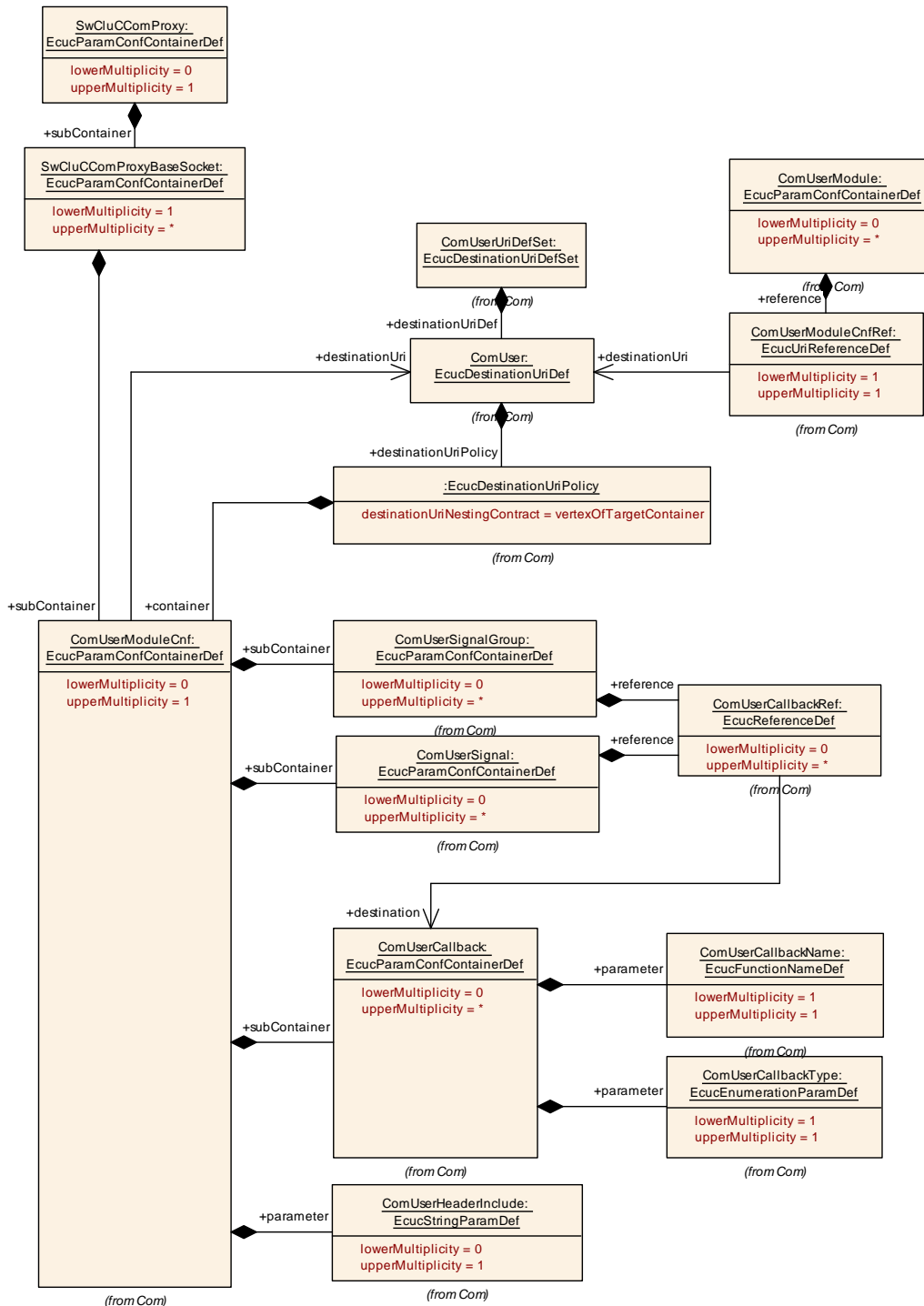
<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCComProxyBaseSocket</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">ComUserModuleCnf</a>	0..1	Contains the configuration parameters of the Com user module.

**[SWS\_SwCluC\_CONSTR\_02664]{DRAFT} [SwCluCComProxyBaseSocket](#) relates only to a [CpSoftwareClusterServiceResource](#) of category **SWCLUSTER\_RES\_COM\_BASE\_SOCKET** [The [SwCluCComProxyBaseSocket.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category **SWCLUSTER\_RES\_COM\_BASE\_SOCKET**.] (*SRS\_SwCluC\_00211*, *SRS\_BSW\_00167*)**



**10.2.7.3.2 Com User Module Configuration**



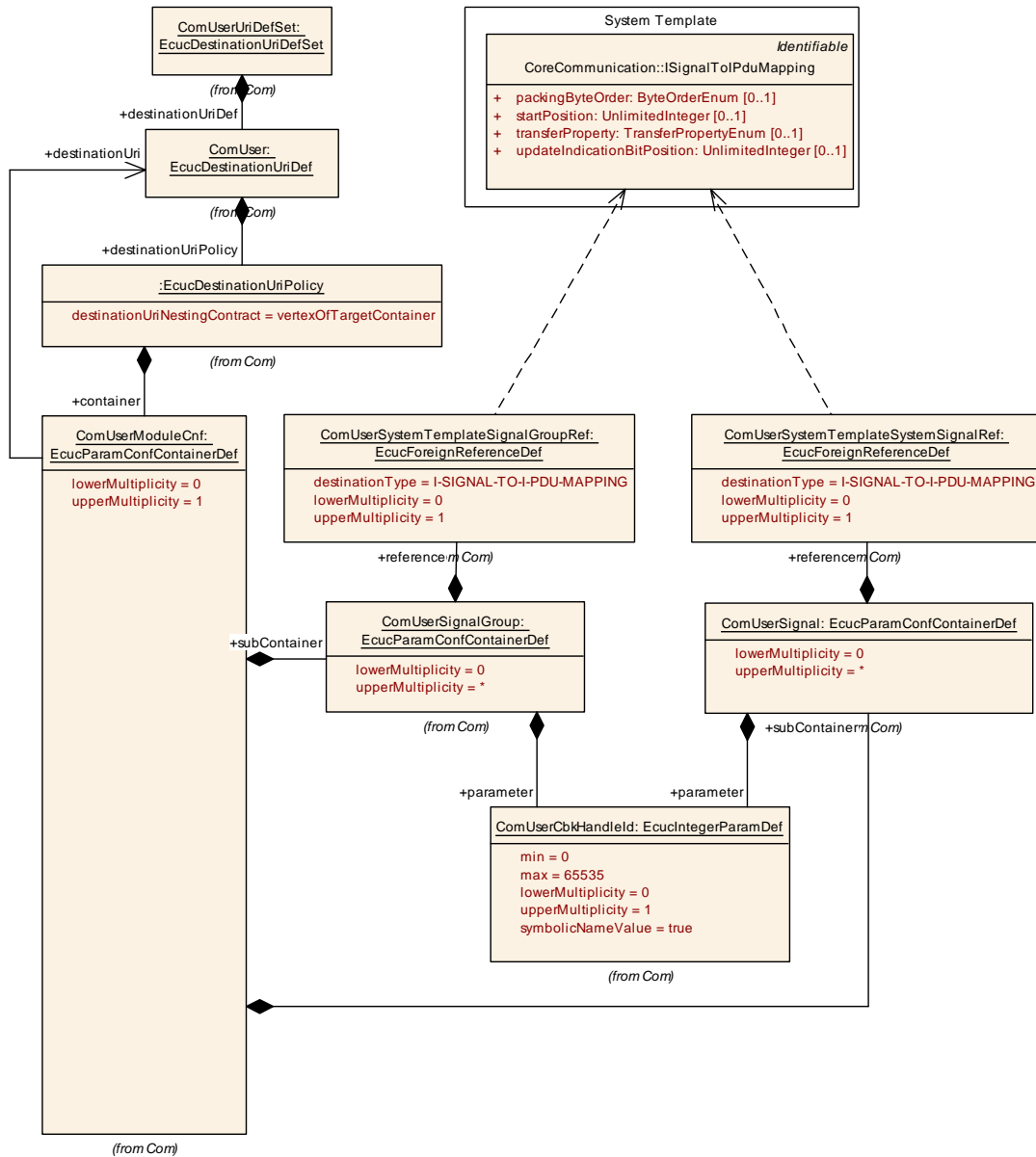
**Figure 10.31: Com user module configuration**

<b>SWS Item</b>	<b>[ECUC_Com_10030]</b>		
<b>Container Name</b>	ComUserModuleCnf		
<b>Parent Container</b>	RteComUser, <a href="#">SwCluCComProxyBaseSocket</a>		
<b>Destination Uri Definition</b>	<a href="#">ComUser</a>		
<b>Description</b>	Contains the configuration parameters of the Com user module.		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Com_10032]</b>		
<b>Parameter Name</b>	ComUserHeaderInclude		
<b>Parent Container</b>	<a href="#">ComUserModuleCnf</a>		
<b>Description</b>	Defines the header file where the Com user provides the function declarations for configured callbacks.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">ComUserCallback</a>	0..*	This container defines a Com callback function for signals and signal groups.
<a href="#">ComUserSignal</a>	0..*	Contains the configuration parameters of a signal inside a Com user module. Please note that it is valid to define ComUserSignal without any callback function.
<a href="#">ComUserSignalGroup</a>	0..*	Contains the configuration parameters of a signal group inside a Com user module. Please note that it is valid to define ComUserSignalGroup without any callback function.

**10.2.7.3.3 Com User Signals and Signal Groups**



**Figure 10.32: Com user signals and signal groups**

**10.2.7.3.3.1 Com User Signals**

<b>SWS Item</b>	[ECUC_Com_10028]
<b>Container Name</b>	ComUserSignal
<b>Parent Container</b>	ComUserModuleCnf
<b>Description</b>	Contains the configuration parameters of a signal inside a Com user module. Please note that it is valid to define ComUserSignal without any callback function.





<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Com_10033]</b>		
<b>Parameter Name</b>	ComUserCbkJandleId		
<b>Parent Container</b>	<a href="#">ComUserSignal</a>		
<b>Description</b>	The numerical value used as the Com user callback handle Id. This ID identifies signals and signal groups in the COM callbacks using ComUserCbkJandleId parameter respectively.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Com_10035]</b>		
<b>Parameter Name</b>	ComUserCallbackRef		
<b>Parent Container</b>	<a href="#">ComUserSignal</a>		
<b>Description</b>	Reference(s) to all callback(s) of this signal or signal group.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">ComUserCallback</a>		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Com_10025]</b>		
<b>Parameter Name</b>	ComUserSystemTemplateSystemSignalRef		
<b>Parent Container</b>	<a href="#">ComUserSignal</a>		





<b>Description</b>	Reference to the ISignalToIPduMapping that contains a reference to the ISignal (System Template) which this ComUserSignal (or ComUserGroupSignal) represents.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to I-SIGNAL-TO-I-PDU-MAPPING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

### 10.2.7.3.3.2 Com User Signal Groups

<b>SWS Item</b>	[ECUC_Com_10027]		
<b>Container Name</b>	ComUserSignalGroup		
<b>Parent Container</b>	<a href="#">ComUserModuleCnf</a>		
<b>Description</b>	Contains the configuration parameters of a signal group inside a Com user module. Please note that it is valid to define ComUserSignalGroup without any callback function.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_Com_10033]		
<b>Parameter Name</b>	ComUserCbkJHandleId		
<b>Parent Container</b>	<a href="#">ComUserSignalGroup</a>		
<b>Description</b>	The numerical value used as the Com user callback handle Id. This ID identifies signals and signal groups in the COM callbacks using ComUserCbkJHandleId parameter respectively.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants





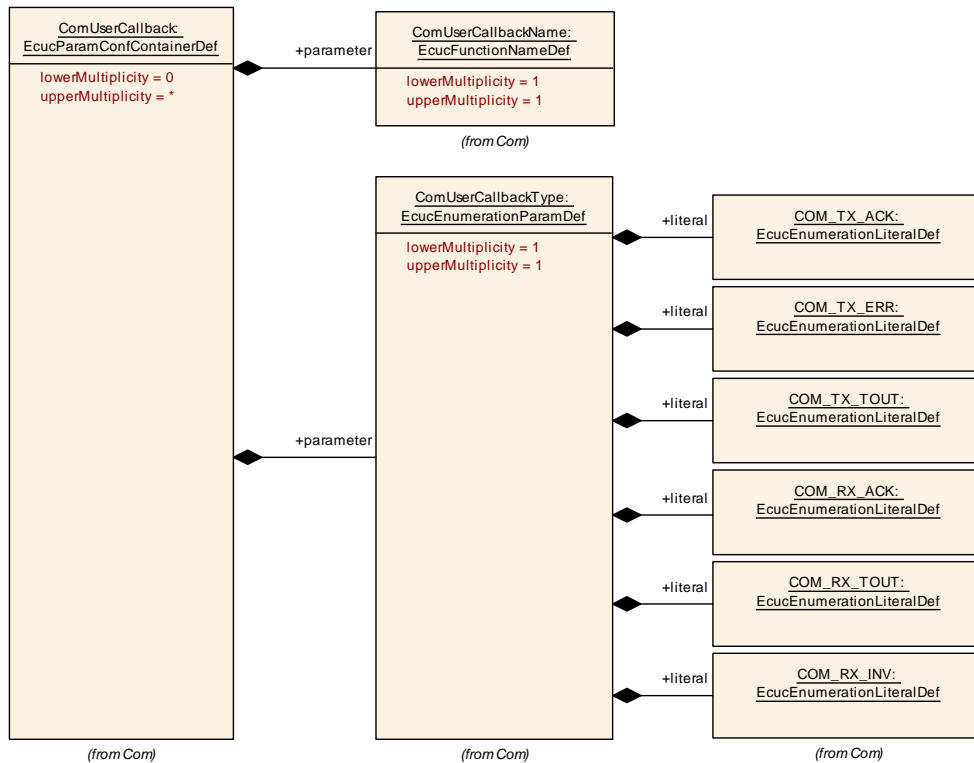
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Com_10035]</b>		
<b>Parameter Name</b>	ComUserCallbackRef		
<b>Parent Container</b>	<a href="#">ComUserSignalGroup</a>		
<b>Description</b>	Reference(s) to all callback(s) of this signal or signal group.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">ComUserCallback</a>		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Com_10026]</b>		
<b>Parameter Name</b>	ComUserSystemTemplateSignalGroupRef		
<b>Parent Container</b>	<a href="#">ComUserSignalGroup</a>		
<b>Description</b>	Reference to the ISignalToIPduMapping that contains a reference to the ISignalGroup (SystemTemplate) which this ComUserSignalGroup represents.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to I-SIGNAL-TO-I-PDU-MAPPING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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**10.2.7.3.4 Com User callbacks**



**Figure 10.33: Com User callbacks**

<b>SWS Item</b>	<b>[ECUC_Com_10038]</b>		
<b>Container Name</b>	ComUserCallback		
<b>Parent Container</b>	<a href="#">ComUserModuleCnf</a>		
<b>Description</b>	This container defines a Com callback function for signals and signal groups.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Com_10036]</b>		
<b>Parameter Name</b>	ComUserCallbackName		
<b>Parent Container</b>	<a href="#">ComUserCallback</a>		
<b>Description</b>	The name of the callback function to be called.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE



△

<b>Value Configuration Class</b>	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Com_10034]</b>		
<b>Parameter Name</b>	ComUserCallbackType		
<b>Parent Container</b>	<a href="#">ComUserCallback</a>		
<b>Description</b>	The type of the Com callback		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	COM_RX_ACK	Com_CbkRxAck callback which is called immediately after the message has been stored in the receiving message object. This type of callback represents a ComNotification.	
	COM_RX_INV	Com_CbkInv callback which is called after reception of an invalid signal or signal group respectively. This type of callback represents a ComInvalidNotification.	
	COM_RX_TOUT	Com_CbkRxTOUt callback which is called immediately after a message reception error has been detected by the deadline monitoring mechanism. This type of callback represents a ComTimeoutNotification.	
	COM_TX_ACK	Com_CbkTxAck callback which is called immediately after successful transmission of the I-PDU containing the message. This type of callback represents a ComNotification.	
	COM_TX_ERR	Com_CbkTxErr callback which is called in case the transmission is not possible because the corresponding I-PDU group is stopped. This type of callback represents a ComErrorNotification.	
	COM_TX_TOUT	Com_CbkTxTOUt callback which is called immediately after a message transmission error has been detected by the deadline monitoring mechanism. This type of callback represents a ComTimeoutNotification.	
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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**10.2.7.4 LdCom Proxy**



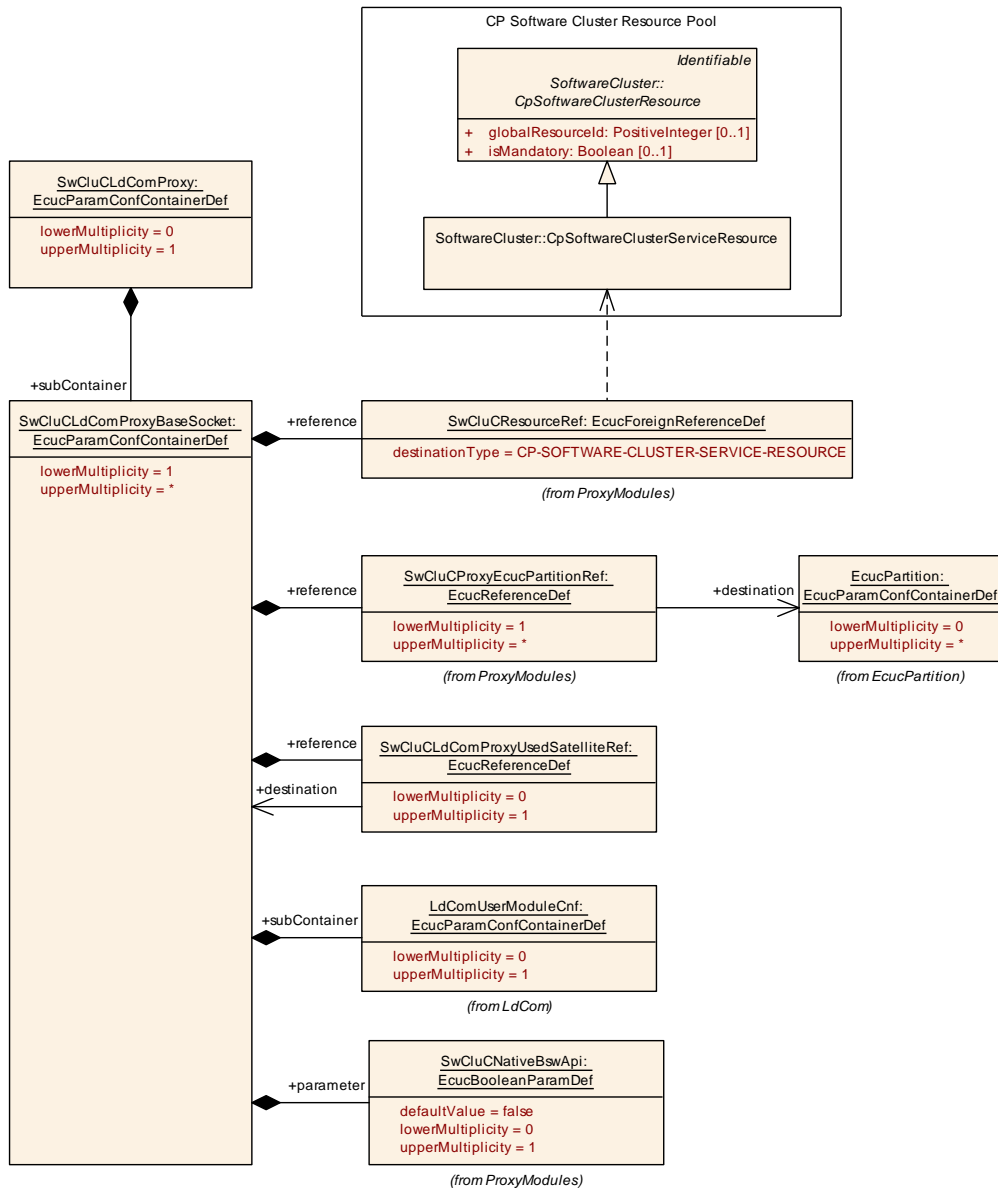
**Figure 10.34: LdCom Proxy Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00125]		
<b>Container Name</b>	SwCluCLdComProxy		
<b>Parent Container</b>	SwCluCProxies		
<b>Description</b>	LdCom Proxy specific parameters.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00126]		
<b>Parameter Name</b>	SwCluCLdComProxyDevErrorDetect		
<b>Parent Container</b>	SwCluCLdComProxy		
<b>Description</b>	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
SwCluCLdComProxyBaseSocket	1..*	<p>This container configures how many EcucPartitions specific API links are required for the LdCom Proxy and to which cluster resource the API set belongs.</p> <p>In the LdCom Low Proxy all offered API sets (incl. callbacks) needs to be configured. In the LdCom High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the Ecuc Partition on which the API set is provided.</p> <p>The LdComUserModuleCnf is only applicable in the Host Software Cluster and shall not be configured in the scope of a Application Software Cluster. One LdComUserModuleCnf instance can either server for LdComIPdus on multiple Ecuc Partitons or exactly one EcucPartiton. How many LdComUser instances an Rte in an related Application Software Cluster requires is vendor specific.</p>

**10.2.7.4.1 LdCom Base Socket**



**Figure 10.35: LdCom Proxy Base Socket**

<b>SWS Item</b>	[ECUC_SwCluC_00129]
<b>Container Name</b>	SwCluCLdComProxyBaseSocket
<b>Parent Container</b>	SwCluCLdComProxy





<b>Description</b>	<p>This container configures how many EcucPartitions specific API links are required for the LdCom Proxy and to which cluster resource the API set belongs.</p> <p>In the LdCom Low Proxy all offered API sets (incl. callbacks) needs to be configured. In the LdCom High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the EcucPartition on which the API set is provided.</p> <p>The LdComUserModuleCnf is only applicable in the Host Software Cluster and shall not be configured in the scope of a Application Software Cluster. One LdComUserModuleCnf instance can either server for LdComIPdus on multiple EcucPartitons or exactly one EcucPartiton. How many LdComUser instances an Rte in an related Application Software Cluster requires is vendor specific.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00058]</b>		
<b>Parameter Name</b>	SwCluCNativeBswApi		
<b>Parent Container</b>	<a href="#">SwCluCLdComProxyBaseSocket</a>		
<b>Description</b>	Defines if the native C-API without pre or suffixes is offered in the Application Software Cluster on this EcucPartition.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00130]</b>		
<b>Parameter Name</b>	SwCluCLdComProxyUsedSatelliteRef		
<b>Parent Container</b>	<a href="#">SwCluCLdComProxyBaseSocket</a>		
<b>Description</b>	Reference to the SwCluCLdComBaseSocket which has access to a satellite of the Ld Com. The owning SwCluCLdComBaseSocket uses the LdCom satellite of the referenced SwCluCLdComBaseSocket.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">SwCluCLdComProxyBaseSocket</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00147]		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCLdComProxyBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1..*		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00087]		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCLdComProxyBaseSocket</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">LdComUserModuleCnf</a>	0..1	Contains the configuration parameters of the LdCom user module.

**[SWS\_SwCluC\_CONSTR\_02553]{DRAFT}** [SwCluCLdComProxyBaseSocket](#) relates only to a [CpSoftwareClusterServiceResource](#) of category **SWCLUSTER\_RES\_LDCOM\_BASE\_SOCKET** [The [SwCluCLdComProxyBaseSocket.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category **SWCLUSTER\_RES\_LDCOM\_BASE\_SOCKET**.] ([SRS\\_SwCluC\\_00207](#), [SRS\\_BSW\\_00167](#))

#### 10.2.7.4.2 LdCom User module configuration

<b>SWS Item</b>	[ECUC_LdCom_00030]		
<b>Container Name</b>	<a href="#">LdComUserModuleCnf</a>		
<b>Parent Container</b>	<a href="#">RteLdComUser</a> , <a href="#">SwCluCLdComProxyBaseSocket</a>		
<b>Destination Uri Definition</b>	<a href="#">LdComUser</a>		
<b>Description</b>	Contains the configuration parameters of the LdCom user module.		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	





	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_LdCom_00027]</b>		
<b>Parameter Name</b>	LdComUserHeaderInclude		
<b>Parent Container</b>	<a href="#">LdComUserModuleCnf</a>		
<b>Description</b>	Defines the header file where the LdCom user provides the function declarations for configured callbacks.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">LdComUserCallback</a>	0..*	This container defines a LdCom callback function for a LdCom IPdu.
<a href="#">LdComUserIPdu</a>	0..*	Contains the configuration parameters for the LdCom's signal (LdComIPdu) inside a LdCom user module.

10.2.7.4.3 LdCom User IPdus

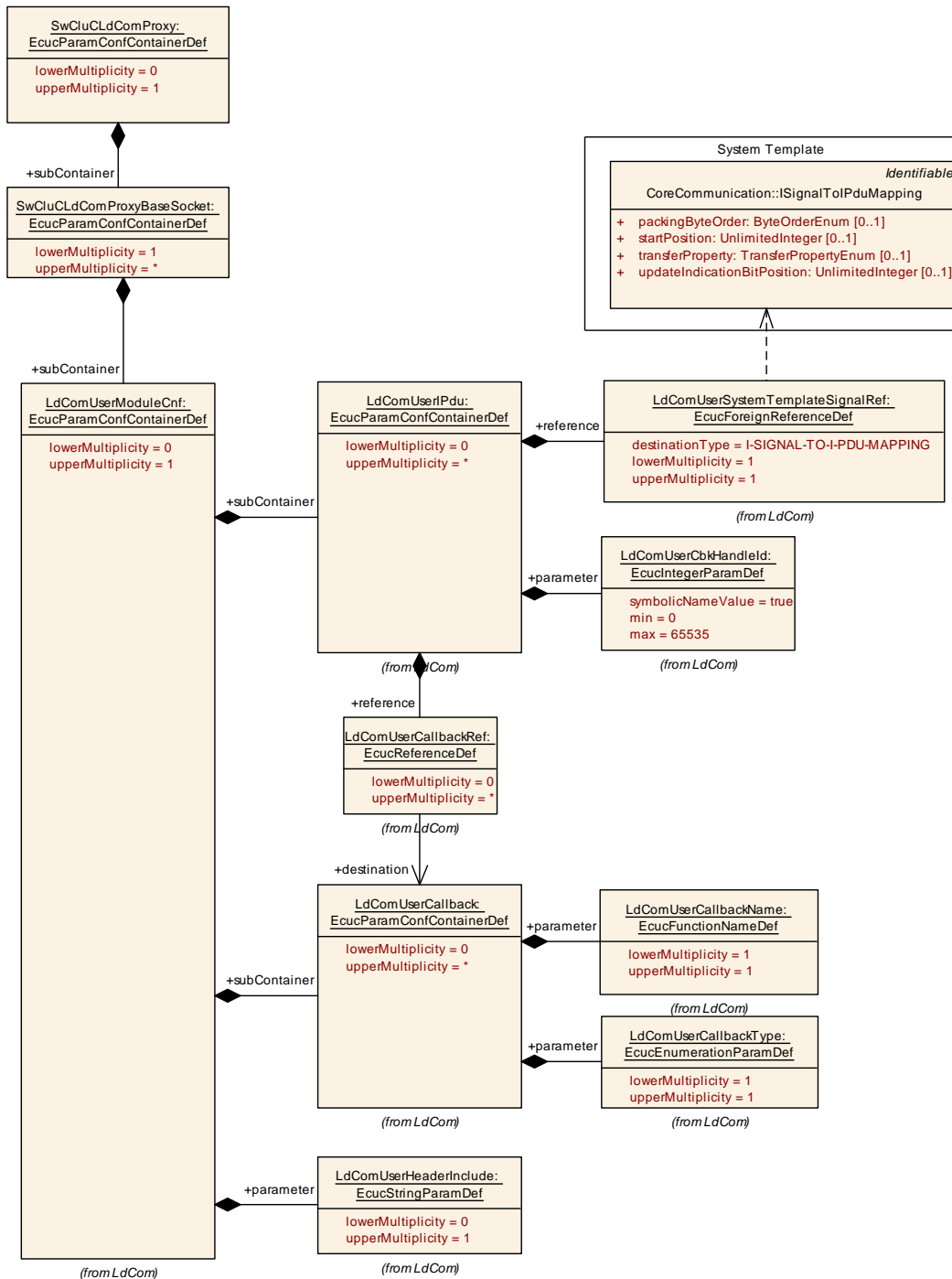


Figure 10.36: LdCom User module configuration

SWS Item	[ECUC_LdCom_00028]
Container Name	LdComUserIPdu
Parent Container	LdComUserModuleCnf





<b>Description</b>	Contains the configuration parameters for the LdCom's signal (LdComIPdu) inside a LdCom user module.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_LdCom_00026]</b>		
<b>Parameter Name</b>	LdComUserCbkJHandleId		
<b>Parent Container</b>	<a href="#">LdComUserIPdu</a>		
<b>Description</b>	<p>The numerical value used as the LdCom user callback handle Id.</p> <p>This is the ID used by LdCom to invoke callbacks of a LdCom user (Rte, ScCluC LdCom Low Proxy or CDDs) using LdComUserCbkJHandleId parameter respectively.</p> <p>A corresponding symbolic name reference is created, which may be used for the invocations of the user.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_LdCom_00024]</b>		
<b>Parameter Name</b>	LdComUserCallbackRef		
<b>Parent Container</b>	<a href="#">LdComUserIPdu</a>		
<b>Description</b>	Reference(s) to all callback(s) of this LdComIPdu.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">LdComUserCallback</a>		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_LdCom_00033]</b>		
<b>Parameter Name</b>	LdComUserSystemTemplateSignalRef		
<b>Parent Container</b>	<a href="#">LdComUserIPdu</a>		
<b>Description</b>	Reference to the ISignalToIPduMapping that contains a reference to the ISignal (System Template).		
<b>Multiplicity</b>	1		



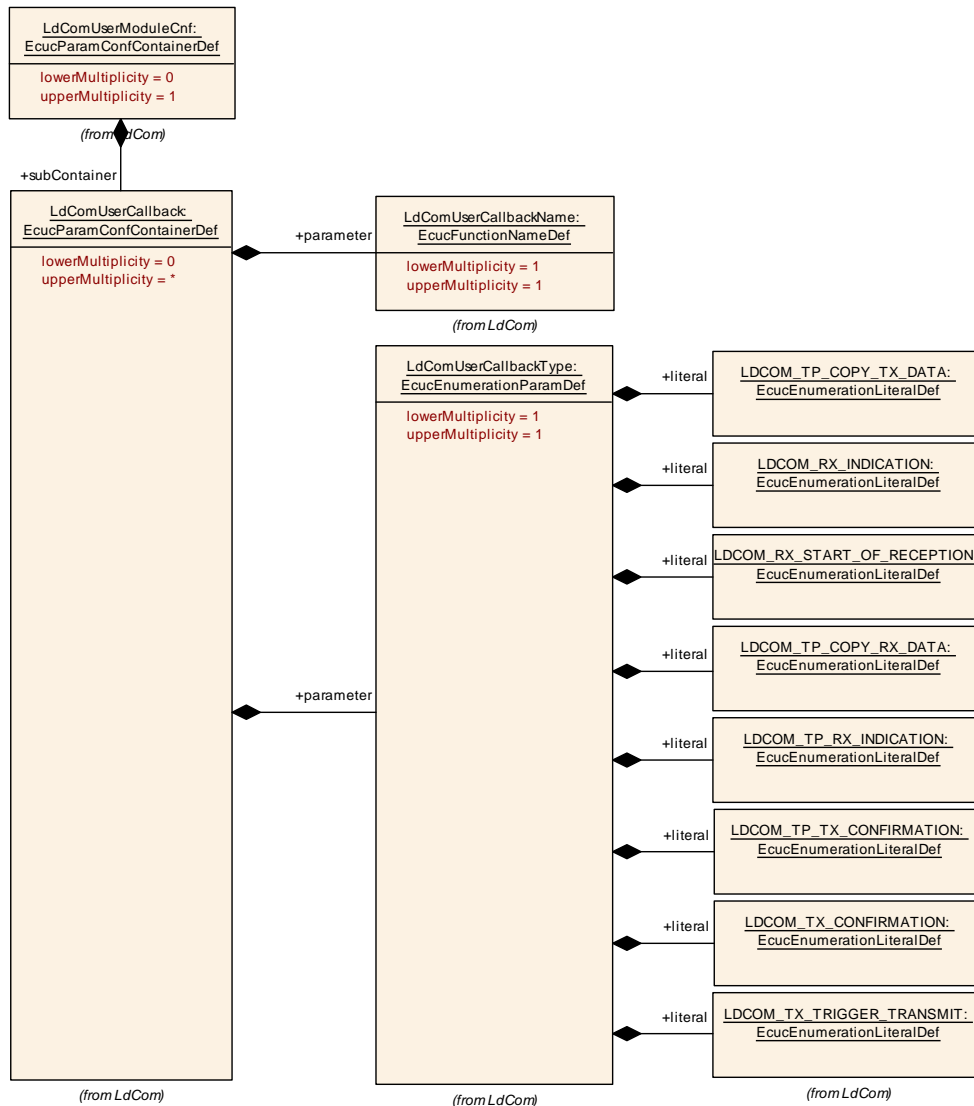




<b>Type</b>	Foreign reference to I-SIGNAL-TO-I-PDU-MAPPING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
-------------------------------

**10.2.7.4.4 LdCom User callbacks**



**Figure 10.37: LdCom User callbacks**

<b>SWS Item</b>	[ECUC_LdCom_00022]		
<b>Container Name</b>	LdComUserCallback		
<b>Parent Container</b>	<a href="#">LdComUserModuleCnf</a>		
<b>Description</b>	This container defines a LdCom callback function for a LdComIPdu.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_LdCom_00023]</b>		
<b>Parameter Name</b>	LdComUserCallbackName		
<b>Parent Container</b>	<a href="#">LdComUserCallback</a>		
<b>Description</b>	The name of the callback function to be called.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_LdCom_00025]</b>		
<b>Parameter Name</b>	LdComUserCallbackType		
<b>Parent Container</b>	<a href="#">LdComUserCallback</a>		
<b>Description</b>	The type of the LdCom callback		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	LDCOM_RX_INDICATION	LdComCbkJxIndication callback indicates a received PDU from a lower layer communication interface module.	
	LDCOM_RX_START_OF_RECEPTION	LdComCbkJxStartOfReception callback called at the start of receiving an N-SDU.	
	LDCOM_TP_COPY_RX_DATA	LdComCbkJxCopyRxData callback to provide the received data of an I-PDU segment (N-PDU) to the upper layer.	
	LDCOM_TP_COPY_TX_DATA	LdComCbkJxCopyTxData callback to acquire the transmit data of an I-PDU segment.	
	LDCOM_TP_RX_INDICATION	LdComCbkJxTpRxIndication callback called after an I-PDU has been received via the TP API	
	LDCOM_TP_TX_CONFIRMATION	LdComCbkJxTpTxConfirmation callback called after a Signal has been transmitted via the TP-API on its network.	
	LDCOM_TX_CONFIRMATION	LdComCbkJxTxConfirmation callback which is called when the lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU.	
	LDCOM_TX_TRIGGER_TRANSMIT	LdComCbkJxTxConfirmation callback which is called when the lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU.	
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD





	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

### 10.2.7.5 Dcm Proxy

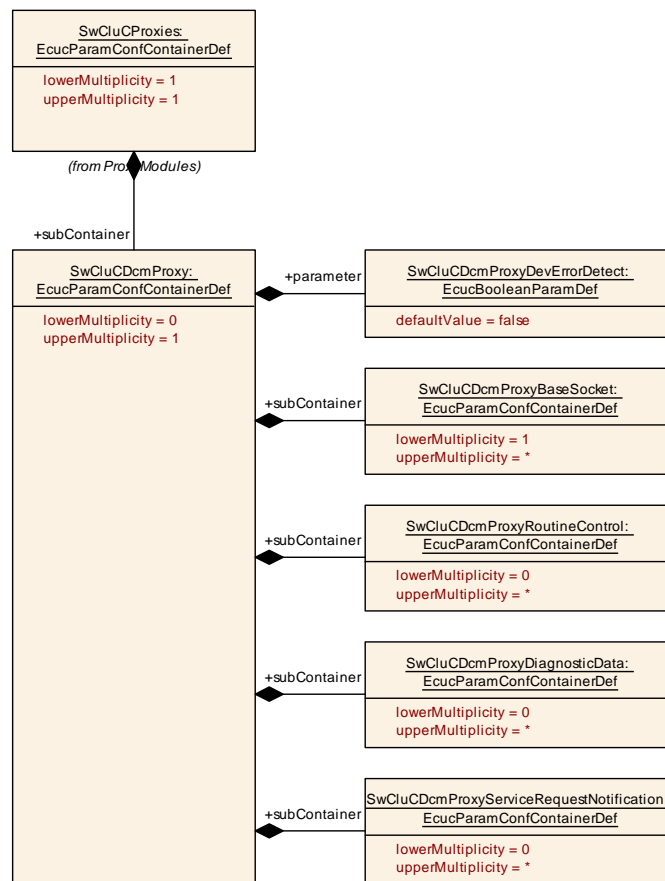


Figure 10.38: Dcm Proxy Parameter

<b>SWS Item</b>	[ECUC_SwCluC_00118]		
<b>Container Name</b>	SwCluCDcmProxy		
<b>Parent Container</b>	SwCluCProxies		
<b>Description</b>	Dcm Proxy specific parameters.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	



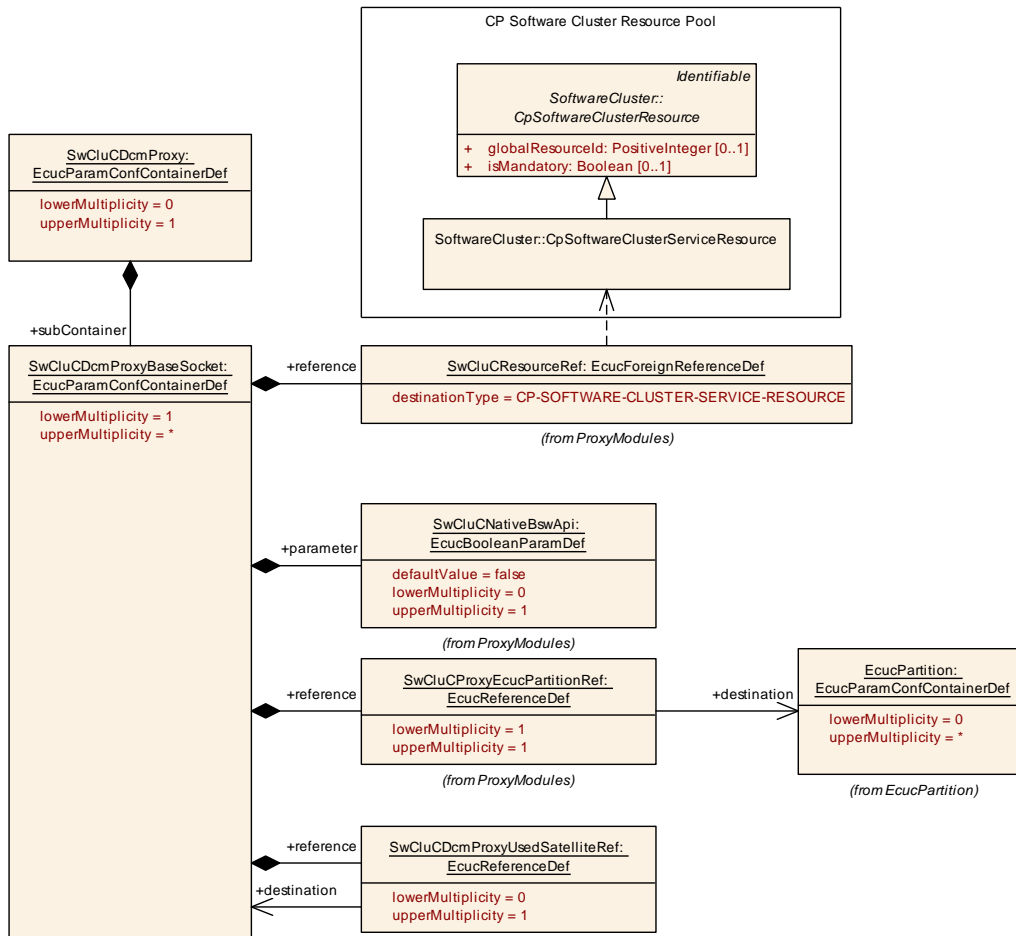


**Configuration Parameters**

<b>SWS Item</b>	<b>[ECUC_SwCluC_00137]</b>		
<b>Parameter Name</b>	SwCluCDcmProxyDevErrorDetect		
<b>Parent Container</b>	<a href="#">SwCluCDcmProxy</a>		
<b>Description</b>	<p>Switches the development error detection and notification on or off.</p> <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">SwCluCDcmProxyBaseSocket</a>	1..*	<p>This container configures how many EcucPartitions specific API links are required for the Dcm Proxy and to which cluster resource the API set belongs.</p> <p>In the Dcm Low Proxy all offered API sets needs to be configured. In the Dcm High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the Ecuc Partition on which the API set is provided.</p>
<a href="#">SwCluCDcmProxyDiagnosticData</a>	0..*	Configures a Diagnostic Data proxy for a DID or PID or IOControl.
<a href="#">SwCluCDcmProxyRoutineControl</a>	0..*	Configures a Routine Control proxy.
<a href="#">SwCluCDcmProxyServiceRequest Notification</a>	0..*	Configures a Service Request Notification proxy.

**10.2.7.5.1 Dcm Base Socket**



**Figure 10.39: Dcm Proxy Base Socket**

<b>SWS Item</b>	[ECUC_SwCluC_00120]		
<b>Container Name</b>	SwCluCdcmProxyBaseSocket		
<b>Parent Container</b>	SwCluCDcmProxy		
<b>Description</b>	<p>This container configures how many EcucPartitions specific API links are required for the Dcm Proxy and to which cluster resource the API set belongs.</p> <p>In the Dcm Low Proxy all offered API sets needs to be configured. In the Dcm High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the EcucPartition on which the API set is provided.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00058]</b>		
<b>Parameter Name</b>	SwCluCNativeBswApi		
<b>Parent Container</b>	<a href="#">SwCluCDcmProxyBaseSocket</a>		
<b>Description</b>	Defines if the native C-API without pre or suffixes is offered in the Application Software Cluster on this EcucPartition.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00121]</b>		
<b>Parameter Name</b>	SwCluCDcmProxyUsedSatelliteRef		
<b>Parent Container</b>	<a href="#">SwCluCDcmProxyBaseSocket</a>		
<b>Description</b>	Reference to the SwCluCDemBaseSocket which has access to a satellite of the Dcm. The owning SwCluCDemBaseSocket uses the Dcm satellite of the referenced SwCluCDemBaseSocket.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">SwCluCDcmProxyBaseSocket</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00059]</b>		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCDcmProxyBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

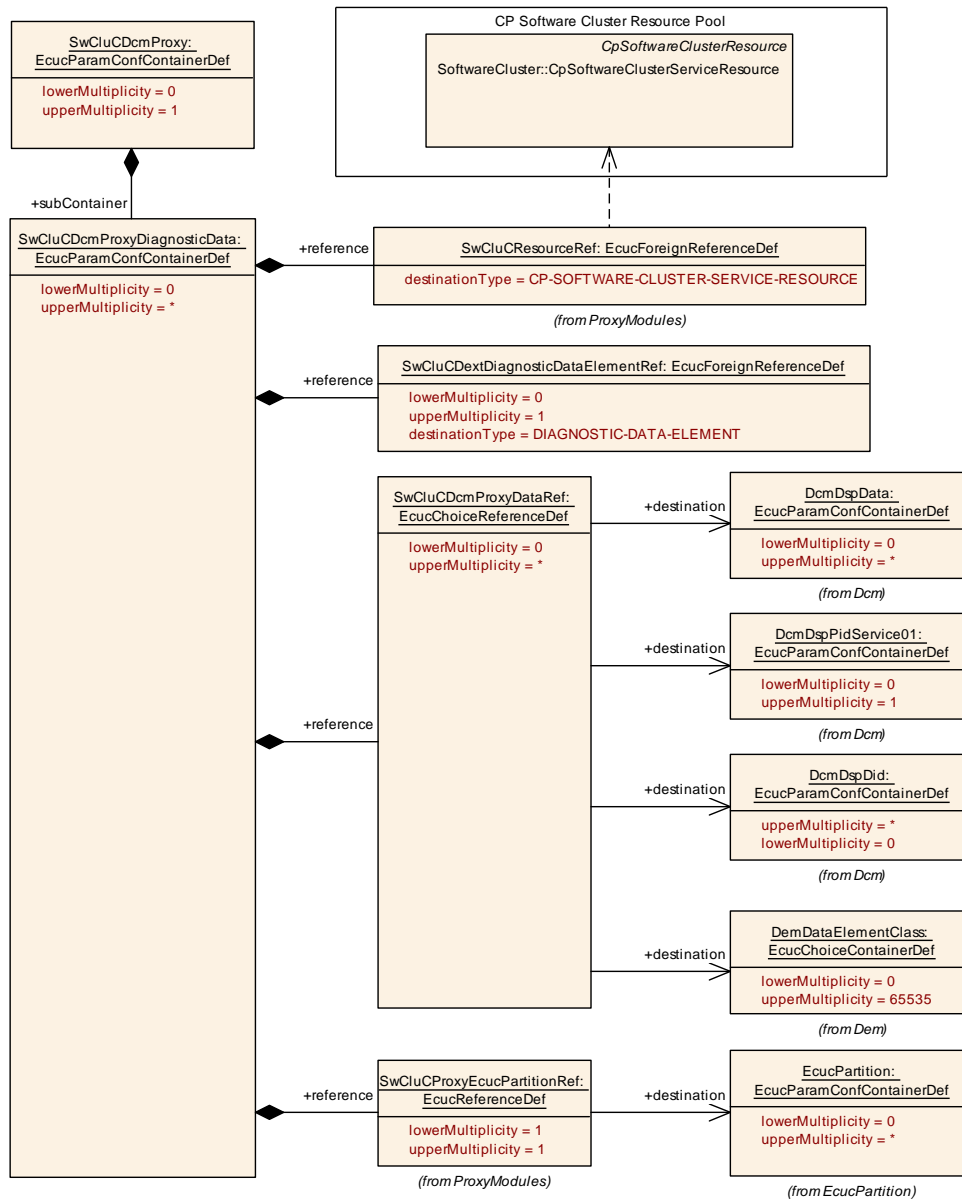
<b>SWS Item</b>	[ECUC_SwCluC_00087]
<b>Parameter Name</b>	SwCluCResourceRef
<b>Parent Container</b>	SwCluCDCmProxyBaseSocket
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

No Included Containers

[SWS\_SwCluC\_CONSTR\_02752]{DRAFT} **SwCluCDCmProxyBaseSocket** relates only to a **CpSoftwareClusterServiceResource** of category **SWCLUSTER\_RES\_DCM\_BASE\_SOCKET** [The `SwCluCDCmProxyBaseSocket.SwCluCResourceRef` shall only reference a `CpSoftwareClusterServiceResource` of category `SWCLUSTER_RES_DCM_BASE_SOCKET`.] (*SRS\_SwCluC\_00208*, *SRS\_BSW\_00167*)



**10.2.7.5.2 Dcm Proxy Diagnostic Data**



**Figure 10.40: Dcm Proxy Diagnostic Data**

<b>SWS Item</b>	[ECUC_SwCluC_00122]		
<b>Container Name</b>	SwCluCDcmProxyDiagnosticData		
<b>Parent Container</b>	<a href="#">SwCluCDcmProxy</a>		
<b>Description</b>	Configures a Diagnostic Data proxy for a DID or PID or IOControl.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00123]
<b>Parameter Name</b>	SwCluCDCmProxyDataRef
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyDiagnosticData</a>
<b>Description</b>	Reference to the diagnostic data of Dcm which can either be a DcmDspData, or a DcmDspPidService01, or a DcmDspDid.  The DcmDspDid reference is only applicable in the Application Software Cluster if the DID has exactly one Diagnostic Data Element requiring the DID based interface.  The reference is mandatory in the Application Software Cluster and can be used in the Host Software Cluster to identify the related diagnostic data in the Dcm configuration.
<b>Multiplicity</b>	0..*
<b>Type</b>	Choice reference to [ <a href="#">DcmDspData</a> , <a href="#">DcmDspDid</a> , <a href="#">DcmDspPidService01</a> , <a href="#">DemDataElementClass</a> ]
<b>Scope / Dependency</b>	scope: ECU

<b>SWS Item</b>	[ECUC_SwCluC_00138]
<b>Parameter Name</b>	SwCluCDExtDiagnosticDataElementRef
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyDiagnosticData</a>
<b>Description</b>	Reference to the DiagnosticDataElement in DEXT for back-tracing in case of DEXT based configuration approaches
<b>Multiplicity</b>	0..1
<b>Type</b>	Foreign reference to DIAGNOSTIC-DATA-ELEMENT
<b>Scope / Dependency</b>	scope: ECU

<b>SWS Item</b>	[ECUC_SwCluC_00059]		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyDiagnosticData</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

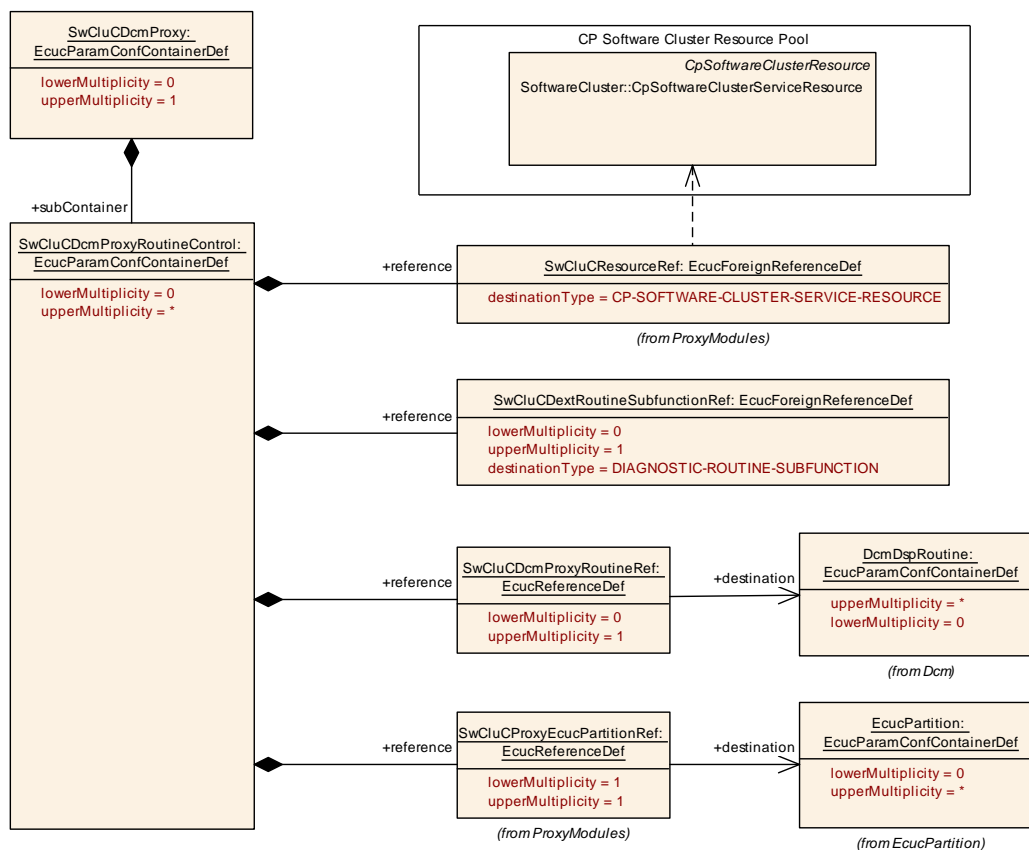
<b>SWS Item</b>	[ECUC_SwCluC_00087]
<b>Parameter Name</b>	SwCluCResourceRef
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyDiagnosticData</a>
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

No Included Containers

**[SWS\_SwCluC\_CONSTR\_02427]{DRAFT}**     [SwCluCDCmProxyDiagnosticData](#)  
relates only to a [CpSoftwareClusterServiceResource](#) of category

**SWCLUSTER\_RES\_DCM\_DIAGNOSTIC\_DATA** [The `SwCluCDcmProxyDiagnosticData.SwCluCResourceRef` shall only reference a `CpSoftwareClusterServiceResource` of category `SWCLUSTER_RES_DCM_DIAGNOSTIC_DATA`.] ([SRS\\_SwCluC\\_00208](#), [SRS\\_BSW\\_00167](#))

### 10.2.7.5.3 Dcm Proxy Routine Control



**Figure 10.41: Dcm Proxy Routine Control**

<b>SWS Item</b>	<b>[ECUC_SwCluC_00133]</b>		
<b>Container Name</b>	SwCluCDcmProxyRoutineControl		
<b>Parent Container</b>	SwCluCDcmProxy		
<b>Description</b>	Configures a Routine Control proxy.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00136]</b>		
<b>Parameter Name</b>	SwCluCDCmProxyRoutineRef		
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyRoutineControl</a>		
<b>Description</b>	Reference to the routine configuration of Dcm. The reference is mandatory in the Application Software Cluster and can be used in the Host Software Cluster to identify the related routine control in the Dcm configuration.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">DcmDspRoutine</a>		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00135]</b>		
<b>Parameter Name</b>	SwCluCDEXTRoutineSubfunctionRef		
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyRoutineControl</a>		
<b>Description</b>	Reference to the Routine Subfunction in DEXT for back-tracing in case of DEXT based configuration approaches		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to DIAGNOSTIC-ROUTINE-SUBFUNCTION		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00059]</b>		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyRoutineControl</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

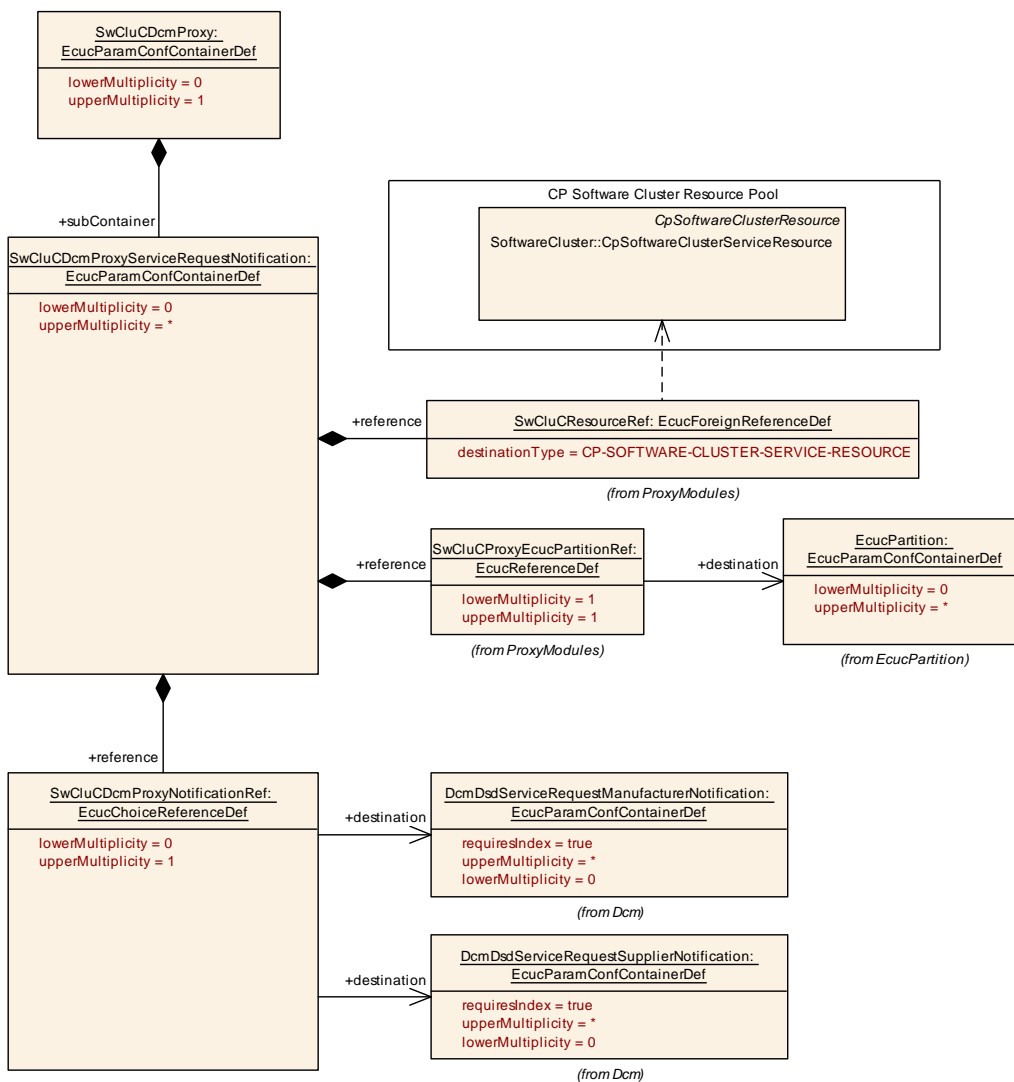
<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCDCmProxyRoutineControl</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers
------------------------

**[SWS\_SwCluC\_CONSTR\_02428]{DRAFT}**    [SwCluCDCmProxyRoutineControl](#)  
relates only to a [CpSoftwareClusterServiceResource](#) of category

**SWCLUSTER\_RES\_DCM\_ROUTINE\_CONTROL** [The `SwCluCDcmProxyRoutineControl.SwCluCResourceRef` shall only reference a `CpSoftwareClusterServiceResource` of category `SWCLUSTER_RES_DCM_ROUTINE_CONTROL`.] (*SRS\_SwCluC\_00208, SRS\_BSW\_00167*)

### 10.2.7.5.4 Dcm Proxy Service Request Notification



**Figure 10.42: Dcm Proxy Service Request Notification**

<b>SWS Item</b>	[ECUC_SwCluC_00145]
<b>Container Name</b>	SwCluCDcmProxyServiceRequestNotification
<b>Parent Container</b>	SwCluCDcmProxy
<b>Description</b>	Configures a Service Request Notification proxy.





<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00146]
<b>Parameter Name</b>	SwCluCDcmProxyNotificationRef
<b>Parent Container</b>	<a href="#">SwCluCDcmProxyServiceRequestNotification</a>
<b>Description</b>	Reference to the Service Request Notification configuration of Dcm which can either be a DcmDsdServiceRequestSupplierNotification or DcmDsdServiceRequestManufacturerNotification  The reference is mandatory in the Application Software Cluster and can be used in the Host Software Cluster to identify the related notification in the Dcm configuration.
<b>Multiplicity</b>	0..1
<b>Type</b>	Choice reference to [ DcmDsdServiceRequestManufacturerNotification, DcmDsdServiceRequestSupplierNotification ]
<b>Scope / Dependency</b>	scope: ECU

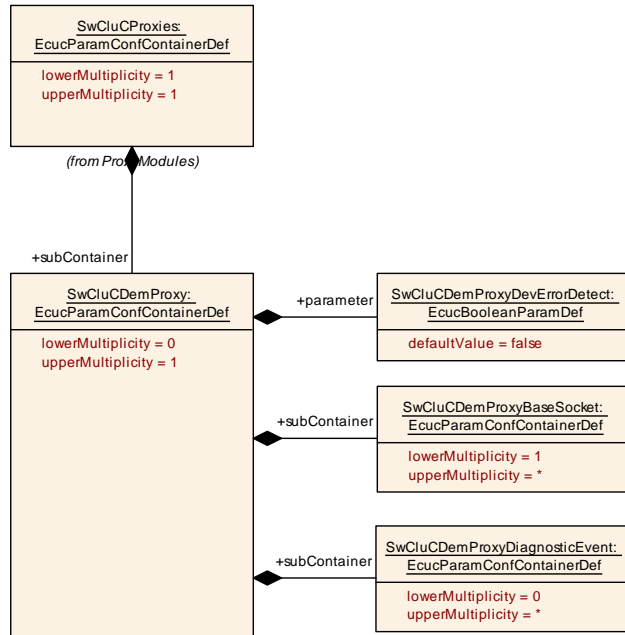
<b>SWS Item</b>	[ECUC_SwCluC_00059]		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCDcmProxyServiceRequestNotification</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00087]
<b>Parameter Name</b>	SwCluCResourceRef
<b>Parent Container</b>	<a href="#">SwCluCDcmProxyServiceRequestNotification</a>
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

<b>No Included Containers</b>
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**[SWS\_SwCluC\_CONSTR\_02429]{DRAFT} [SwCluCDcmProxyServiceRequestNotification](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_DCM\\_SERVICE\\_REQUEST\\_NOTIFICATION](#) [The [SwCluCDcmProxyServiceRequestNotification.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_DCM\\_SERVICE\\_REQUEST\\_NOTIFICATION](#).] ([SRS\\_SwCluC\\_00208](#), [SRS\\_BSW\\_00167](#))**

**10.2.7.6 Dem Proxy**



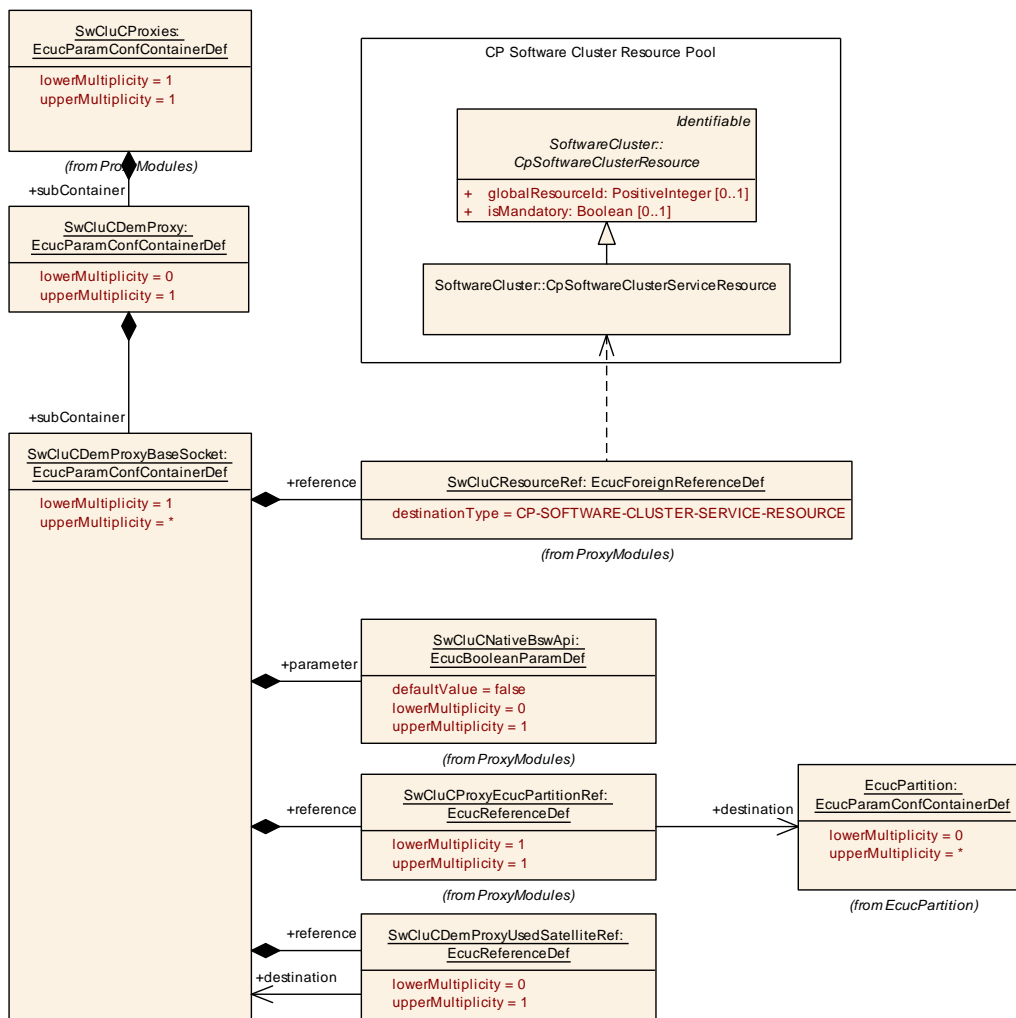
**Figure 10.43: Dem Proxy Parameter**

<b>SWS Item</b>	[ECUC_SwCluC_00112]		
<b>Container Name</b>	SwCluCDemProxy		
<b>Parent Container</b>	SwCluCProxies		
<b>Description</b>	DemProxy specific parameters.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00113]		
<b>Parameter Name</b>	SwCluCDemProxyDevErrorDetect		
<b>Parent Container</b>	SwCluCDemProxy		
<b>Description</b>	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
SwCluCDemProxyBaseSocket	1..*	This container configures how many EcucPartitions specific API links are required for the Dem Proxy and to which cluster resource the API set belongs.  In the Dem Low Proxy all offered API sets needs to be configured. In the Dem High Proxy only the ones are configured which are offered inside this Application Software Cluster.  The reference SwCluCProxyEcucPartitionRef denotes the Ecuc Partition on which the API set is provided.
SwCluCDemProxyDiagnosticEvent	0..*	Configures a Diagnostic Event proxy.

### 10.2.7.6.1 Dem Base Socket



**Figure 10.44: Dem Proxy Base Socket**



<b>SWS Item</b>	<b>[ECUC_SwCluC_00114]</b>		
<b>Container Name</b>	SwCluCDemProxyBaseSocket		
<b>Parent Container</b>	<a href="#">SwCluCDemProxy</a>		
<b>Description</b>	<p>This container configures how many EcucPartitions specific API links are required for the Dem Proxy and to which cluster resource the API set belongs.</p> <p>In the Dem Low Proxy all offered API sets needs to be configured. In the Dem High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the EcucPartition on which the API set is provided.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00058]</b>		
<b>Parameter Name</b>	SwCluCNativeBswApi		
<b>Parent Container</b>	<a href="#">SwCluCDemProxyBaseSocket</a>		
<b>Description</b>	Defines if the native C-API without pre or suffixes is offered in the Application Software Cluster on this EcucPartition.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00115]</b>		
<b>Parameter Name</b>	SwCluCDemProxyUsedSatelliteRef		
<b>Parent Container</b>	<a href="#">SwCluCDemProxyBaseSocket</a>		
<b>Description</b>	Reference to the SwCluCDemBaseSocket which has access to a satellite of the Dem. The owning SwCluCDemBaseSocket uses the Dem satellite of the referenced SwCluCDemBaseSocket.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">SwCluCDemProxyBaseSocket</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

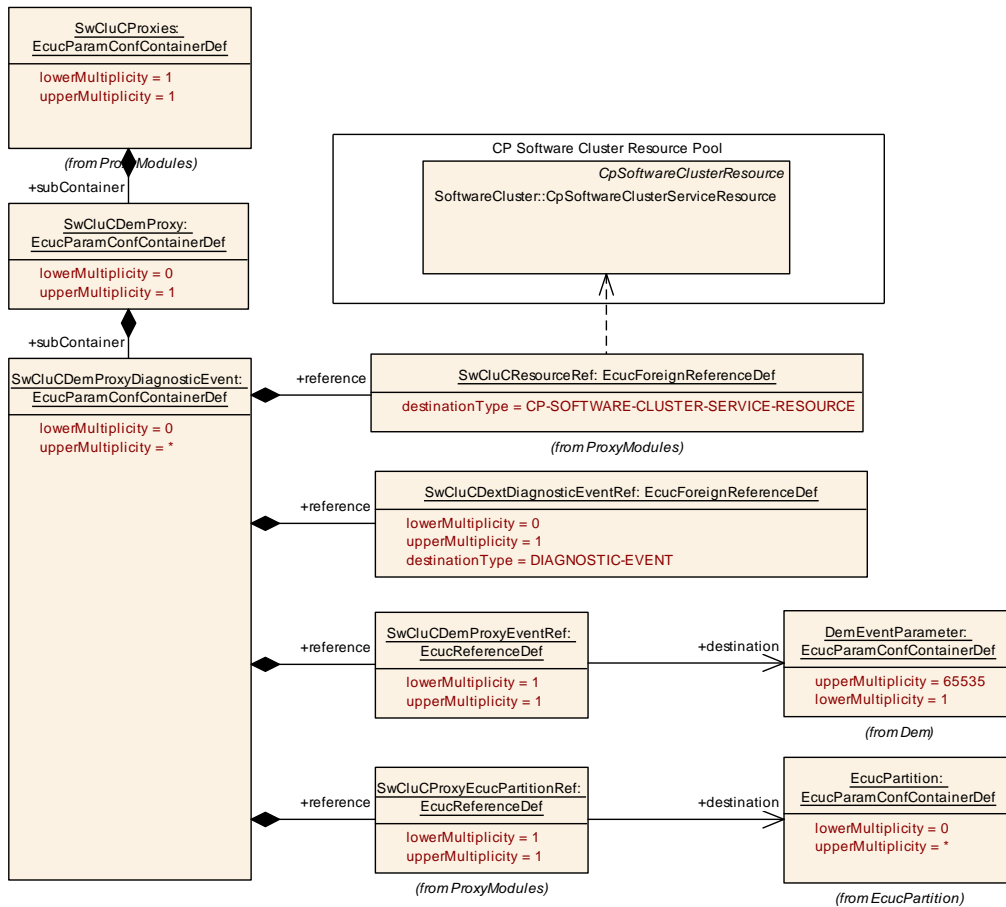
<b>SWS Item</b>	<b>[ECUC_SwCluC_00059]</b>		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCDemProxyBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCDemProxyBaseSocket</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

**[SWS\_SwCluC\_CONSTR\_02720]{DRAFT} [SwCluCDemProxyBaseSocket](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_DEM\\_BASE\\_SOCKET](#) [The [SwCluCDemProxyBaseSocket.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_DEM\\_BASE\\_SOCKET](#).] ([SRS\\_SwCluC\\_00209](#), [SRS\\_BSW\\_00167](#))**

**10.2.7.6.2 Dem Proxy Diagnostic Event**



**Figure 10.45: Dem Proxy Diagnostic Event**

<b>SWS Item</b>	[ECUC_SwCluC_00116]		
<b>Container Name</b>	SwCluCDemProxyDiagnosticEvent		
<b>Parent Container</b>	SwCluCDemProxy		
<b>Description</b>	Configures a Diagnostic Event proxy.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00117]		
<b>Parameter Name</b>	SwCluCDemProxyEventRef		
<b>Parent Container</b>	SwCluCDemProxyDiagnosticEvent		
<b>Description</b>	Reference to the diagnostic event of Dem		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to DemEventParameter		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00140]		
<b>Parameter Name</b>	SwCluCDExtDiagnosticEventRef		
<b>Parent Container</b>	<a href="#">SwCluCDemProxyDiagnosticEvent</a>		
<b>Description</b>	Reference to the Diagnostic Event in DEXT for back-tracing in case of DEXT based configuration approaches		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to DIAGNOSTIC-EVENT		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00059]		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCDemProxyDiagnosticEvent</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_SwCluC_00087]		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCDemProxyDiagnosticEvent</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

[SWS\_SwCluC\_CONSTR\_02721]{DRAFT} [SwCluCDemProxyDiagnosticEvent](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_DEM\\_DIAGNOSTIC\\_EVENT](#) [The [SwCluCDemProxyDiagnosticEvent.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_DEM\\_DIAGNOSTIC\\_EVENT](#).] ([SRS\\_SwCluC\\_00209](#), [SRS\\_BSW\\_00167](#))

### 10.2.7.7 FiM Proxy

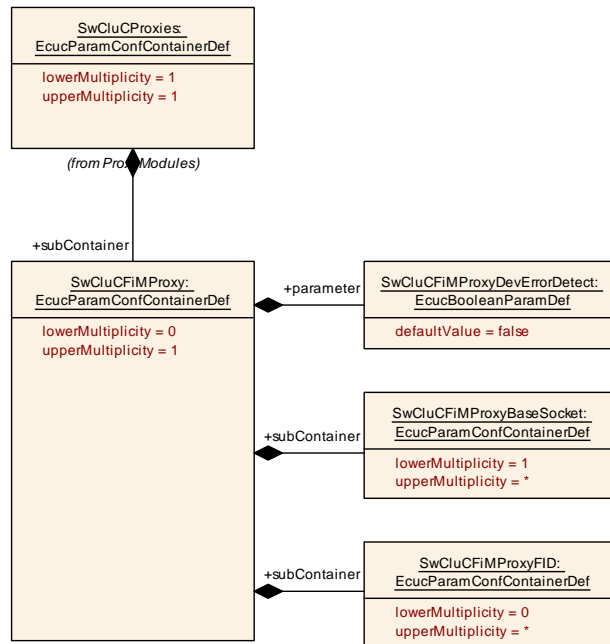


Figure 10.46: FiM Proxy Parameter

<b>SWS Item</b>	[ECUC_SwCluC_00105]		
<b>Container Name</b>	SwCluCFiMProxy		
<b>Parent Container</b>	SwCluCProxies		
<b>Description</b>	FiM Proxy specific parameters.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00106]		
<b>Parameter Name</b>	SwCluCFiMProxyDevErrorDetect		
<b>Parent Container</b>	SwCluCFiMProxy		
<b>Description</b>	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
SwCluCFiMProxyBaseSocket	1..*	This container configures how many EcucPartitions specific API links are required for the FiM Proxy and to which cluster resource the API set belongs.  In the FiM Low Proxy all offered API sets needs to be configured. In the FiM High Proxy only the ones are configured which are offered inside this Application Software Cluster.  The reference SwCluCProxyEcucPartitionRef denotes the Ecuc Partition on which the API set is provided.
SwCluCFiMProxyFID	0..*	Configures a Function Inhibition proxy.

### 10.2.7.7.1 FiM Base Socket

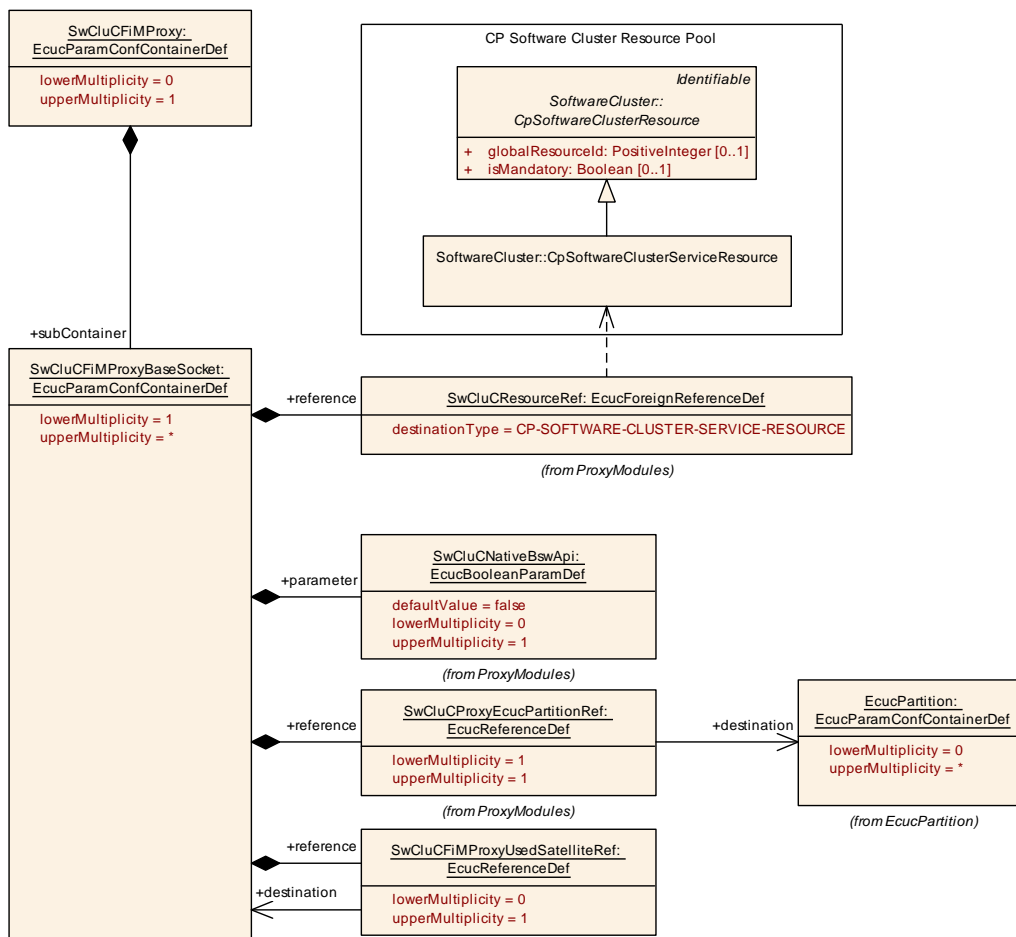


Figure 10.47: FiM Proxy Base Socket

SWS Item	[ECUC_SwCluC_00107]
Container Name	SwCluCFiMProxyBaseSocket
Parent Container	SwCluCFiMProxy





<b>Description</b>	<p>This container configures how many EcucPartitions specific API links are required for the FiM Proxy and to which cluster resource the API set belongs.</p> <p>In the FiM Low Proxy all offered API sets needs to be configured. In the FiM High Proxy only the ones are configured which are offered inside this Application Software Cluster.</p> <p>The reference SwCluCProxyEcucPartitionRef denotes the EcucPartition on which the API set is provided.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_SwCluC_00058]</b>		
<b>Parameter Name</b>	SwCluCNativeBswApi		
<b>Parent Container</b>	<a href="#">SwCluCFiMProxyBaseSocket</a>		
<b>Description</b>	Defines if the native C-API without pre or suffixes is offered in the Application Software Cluster on this EcucPartition.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00108]</b>		
<b>Parameter Name</b>	SwCluCFiMProxyUsedSatelliteRef		
<b>Parent Container</b>	<a href="#">SwCluCFiMProxyBaseSocket</a>		
<b>Description</b>	Reference to the SwCluCFiMBaseSocket which has access to a satellite of the FiM. The owning SwCluCFiMBaseSocket uses the FiM satellite of the referenced SwCluCFiMBaseSocket.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">SwCluCFiMProxyBaseSocket</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00059]</b>		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCFiMProxyBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition.		





<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

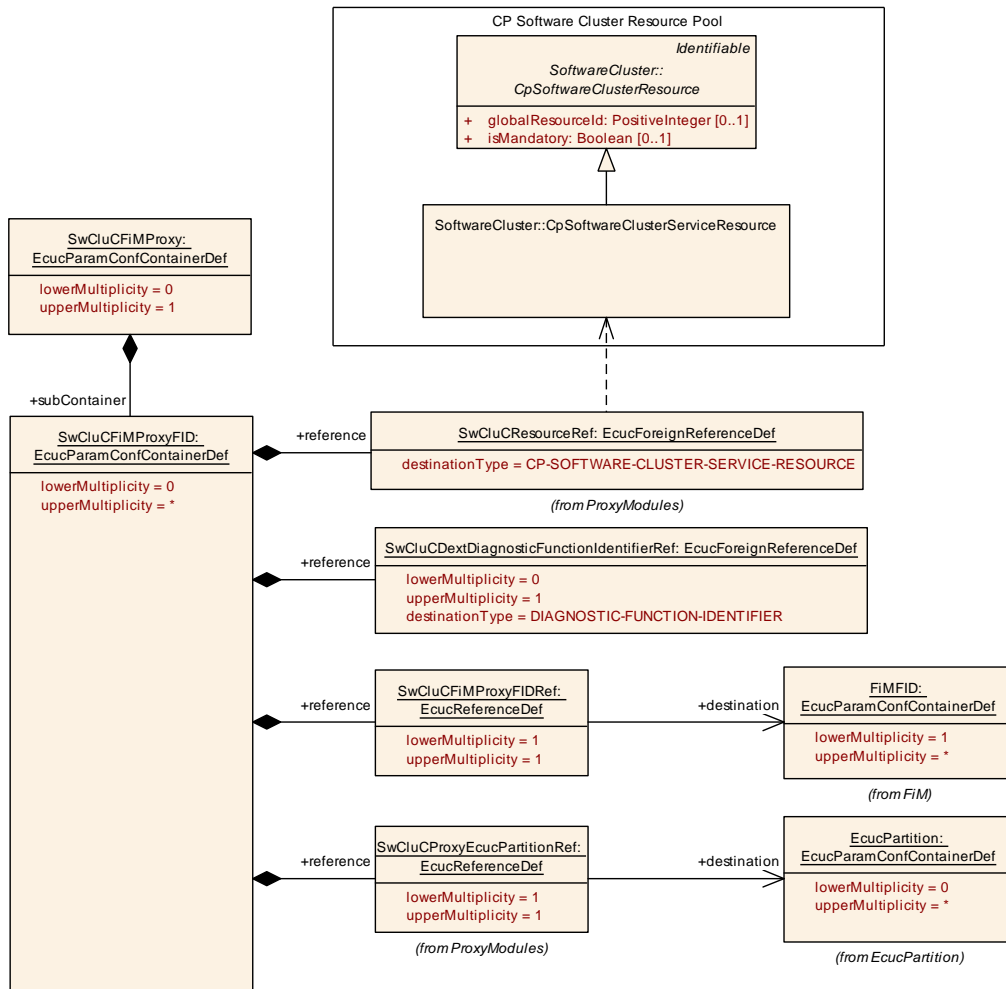
<b>SWS Item</b>	[ECUC_SwCluC_00087]
<b>Parameter Name</b>	SwCluCResourceRef
<b>Parent Container</b>	<a href="#">SwCluCFiMProxyBaseSocket</a>
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

No Included Containers
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[SWS\_SwCluC\_CONSTR\_03210]{DRAFT} [SwCluCFiMProxyBaseSocket](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_FIM\\_BASE\\_SOCKET](#) [The [SwCluCFiMProxyBaseSocket.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_FIM\\_BASE\\_SOCKET](#).] ([SRS\\_SwCluC\\_00210](#), [SRS\\_BSW\\_00167](#))



**10.2.7.7.2 FiM Proxy FID**



**Figure 10.48: FiM Proxy FID**

<b>SWS Item</b>	[ECUC_SwCluC_00109]		
<b>Container Name</b>	SwCluCFiMProxyFID		
<b>Parent Container</b>	SwCluCFiMProxy		
<b>Description</b>	Configures a Function Inhibition proxy.		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_SwCluC_00142]		
<b>Parameter Name</b>	SwCluCxDextDiagnosticFunctionIdentifierRef		
<b>Parent Container</b>	SwCluCFiMProxyFID		
<b>Description</b>	Reference to the DiagnosticFunctionIdentifier in DEXT for back-tracing in case of DEXT based configuration approaches		





<b>Multiplicity</b>	0..1
<b>Type</b>	Foreign reference to DIAGNOSTIC-FUNCTION-IDENTIFIER
<b>Scope / Dependency</b>	scope: ECU

<b>SWS Item</b>	<b>[ECUC_SwCluC_00110]</b>		
<b>Parameter Name</b>	SwCluCFiMProxyFIDRef		
<b>Parent Container</b>	<a href="#">SwCluCFiMProxyFID</a>		
<b>Description</b>	Reference to the FIMFID		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">FIMFID</a>		
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00059]</b>		
<b>Parameter Name</b>	SwCluCProxyEcucPartitionRef		
<b>Parent Container</b>	<a href="#">SwCluCFiMProxyFID</a>		
<b>Description</b>	Reference to the EcucPartition.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_SwCluC_00087]</b>		
<b>Parameter Name</b>	SwCluCResourceRef		
<b>Parent Container</b>	<a href="#">SwCluCFiMProxyFID</a>		
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE		
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers
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**[SWS\_SwCluC\_CONSTR\_03211]{DRAFT} [SwCluCFiMProxyFID](#) relates only to a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_FIM\\_FID](#) [The [SwCluCFiMProxyFID.SwCluCResourceRef](#) shall only reference a [CpSoftwareClusterServiceResource](#) of category [SWCLUSTER\\_RES\\_FIM\\_FID](#).] ([SRS\\_SwCluC\\_00210](#), [SRS\\_BSW\\_00167](#))**

## 10.3 Published Information

For details refer to the chapter 10.3 “Published Information” in SWS\_BSWGeneral.

## A Not applicable requirements

**[SWS\_SwCluC\_NA\_00999]** [These requirements are not applicable to this specification.] (*SRS\_BSW\_00344, SRS\_BSW\_00404, SRS\_BSW\_00405, SRS\_BSW\_00170, SRS\_BSW\_00380, SRS\_BSW\_00419, SRS\_BSW\_00438, SRS\_BSW\_00375, SRS\_BSW\_00416, SRS\_BSW\_00406, SRS\_BSW\_00467, SRS\_BSW\_00437, SRS\_BSW\_00168, SRS\_BSW\_00423, SRS\_BSW\_00424, SRS\_BSW\_00425, SRS\_BSW\_00426, SRS\_BSW\_00427, SRS\_BSW\_00432, SRS\_BSW\_00433, SRS\_BSW\_00450, SRS\_BSW\_00461, SRS\_BSW\_00451, SRS\_BSW\_00478, SRS\_BSW\_00339, SRS\_BSW\_00422, SRS\_BSW\_00417, SRS\_BSW\_00409, SRS\_BSW\_00452, SRS\_BSW\_00458, SRS\_BSW\_00466, SRS\_BSW\_00488, SRS\_BSW\_00469, SRS\_BSW\_00470, SRS\_BSW\_00471, SRS\_BSW\_00472, SRS\_BSW\_00473, SRS\_BSW\_00161, SRS\_BSW\_00162, SRS\_BSW\_00005, SRS\_BSW\_00415, SRS\_BSW\_00164, SRS\_BSW\_00325, SRS\_BSW\_00342, SRS\_BSW\_00343, SRS\_BSW\_00160, SRS\_BSW\_00453, SRS\_BSW\_00456, SRS\_BSW\_00457, SRS\_BSW\_00479, SRS\_BSW\_00483, SRS\_BSW\_00007, SRS\_BSW\_00413, SRS\_BSW\_00347, SRS\_BSW\_00307, SRS\_BSW\_00335, SRS\_BSW\_00410, SRS\_BSW\_00411, SRS\_BSW\_00463, SRS\_BSW\_00481, SRS\_BSW\_00346, SRS\_BSW\_00314, SRS\_BSW\_00447, SRS\_BSW\_00348, SRS\_BSW\_00353, SRS\_BSW\_00301, SRS\_BSW\_00302, SRS\_BSW\_00328, SRS\_BSW\_00312, SRS\_BSW\_00006, SRS\_BSW\_00439, SRS\_BSW\_00448, SRS\_BSW\_00449, SRS\_BSW\_00357, SRS\_BSW\_00377, SRS\_BSW\_00304, SRS\_BSW\_00378, SRS\_BSW\_00306, SRS\_BSW\_00308, SRS\_BSW\_00309, SRS\_BSW\_00484, SRS\_BSW\_00485, SRS\_BSW\_00486, SRS\_BSW\_00414, SRS\_BSW\_00359, SRS\_BSW\_00360, SRS\_BSW\_00440, SRS\_BSW\_00330, SRS\_BSW\_00331, SRS\_BSW\_00454, SRS\_BSW\_00477, SRS\_BSW\_00459, SRS\_BSW\_00460, SRS\_BSW\_00336, SRS\_BSW\_00351, SRS\_BSW\_00383, SRS\_BSW\_00384, SRS\_BSW\_00386, SRS\_BSW\_00388, SRS\_BSW\_00389, SRS\_BSW\_00345, SRS\_BSW\_00390, SRS\_BSW\_00392, SRS\_BSW\_00393, SRS\_BSW\_00394, SRS\_BSW\_00395, SRS\_BSW\_00396, SRS\_BSW\_00399, SRS\_BSW\_00401, SRS\_BSW\_00403, SRS\_BSW\_00462, SRS\_BSW\_00490, SRS\_BSW\_00492, SRS\_BSW\_00494, SRS\_BSW\_00493, SRS\_BSW\_00491, SRS\_BSW\_00489, SRS\_BSW\_00465, SRS\_BSW\_00464, SRS\_BSW\_00429, SRS\_BSW\_00408, SRS\_BSW\_00402, SRS\_BSW\_00400, SRS\_BSW\_00398, SRS\_BSW\_00397, SRS\_BSW\_00379, SRS\_BSW\_00374, SRS\_BSW\_00341, SRS\_BSW\_00318, SRS\_BSW\_00321, SRS\_BSW\_00300, SRS\_BSW\_00171, SRS\_BSW\_00010, SRS\_BSW\_00009, SRS\_BSW\_00004, SRS\_BSW\_00003*)

## B Referenced Meta Classes

<b>Class</b>	<b>AbstractAccessPoint</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::AccessCount			
<b>Note</b>	Abstract class indicating an access point from an ExecutableEntity.			
<b>Base</b>	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	AsynchronousServerCallResultPoint, ExternalTriggeringPointIdent, InternalTriggeringPoint, ModeAccessPointIdent, <a href="#">ModeSwitchPoint</a> , <a href="#">ParameterAccess</a> , <a href="#">ServerCallPoint</a> , <a href="#">VariableAccess</a>			
<b>Aggregated by</b>	AtpClassifier.atpFeature			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
returnValue Provision	RteApiReturnValue ProvisionEnum	0..1	attr	This attribute controls the provision of return values for RTE APIs that correspond to the enclosing access point.

**Table B.1: AbstractAccessPoint**

<b>Class</b>	<b>ApplicationArrayType</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
<b>Note</b>	An application data type which is an array, each element is of the same application data type. <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>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dynamicArray SizeProfile	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 B.2: ApplicationArrayType**

<b>Class</b>	<b>ApplicationArrayElement</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
<b>Note</b>	Describes the properties of the elements of an application array 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="#">ApplicationArrayType.element</a> , <a href="#">AtpClassifier.atpFeature</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
arraySize Handling	ArraySizeHandling Enum	0..1	attr	The way how the size of the array is handled.
arraySize Semantics	<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 CompuMethod 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.





<b>Class</b>	<b>ApplicationArrayElement</b>			
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 B.3: ApplicationArrayElement**

<b>Class</b>	<b>ApplicationCompositeElementDataPrototype</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
<b>Note</b>	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.			
<b>Base</b>	ARObject, AtpFeature, AtpPrototype, <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	<a href="#">ApplicationArrayElement</a> , <a href="#">ApplicationRecordElement</a>			
<b>Aggregated by</b>	AtpClassifier.atpFeature			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
type	<a href="#">ApplicationDataType</a>	0..1	tref	This represents the corresponding data type. <b>Stereotypes:</b> isOfType

**Table B.4: ApplicationCompositeElementDataPrototype**

<b>Class</b>	<b>ApplicationDataType</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
<b>Note</b>	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.			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, <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="#">ApplicationCompositeDataType</a> , <a href="#">ApplicationPrimitiveDataType</a>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table B.5: ApplicationDataType**

<b>Class</b>	<b>ApplicationError</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	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.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ClientServerInterface.possibleError</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





<b>Class</b>	<b>ApplicationError</b>			
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 B.6: ApplicationError**

<b>Class</b>	<b>ApplicationPrimitiveDataType</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
<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> , AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, <a href="#">AutosarDataType</a> , CollectableElement, <a href="#">Identifiable</a> , MultilanguageReferrable, PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table B.7: ApplicationPrimitiveDataType**

<b>Class</b>	<b>ApplicationRecordDataType</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
<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, ApplicationCompositeDataType, <a href="#">ApplicationDataType</a> , AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, <a href="#">AutosarDataType</a> , CollectableElement, <a href="#">Identifiable</a> , MultilanguageReferrable, PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	ARPackage.element			
<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 ApplicationRecordElement is subject to variability with the purpose to support the conditional existence of elements inside a ApplicationrecordDataType. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=element.shortName, element.variation Point.shortLabel vh.latestBindingTime=preCompileTime

**Table B.8: ApplicationRecordDataType**

<b>Class</b>	<b>ApplicationRecordElement</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
<b>Note</b>	Describes the properties of one particular element of an application record data type.			
<b>Base</b>	ARObject, <a href="#">ApplicationCompositeElementDataPrototype</a> , AtpFeature, AtpPrototype, <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , MultilanguageReferrable, <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">ApplicationRecordDataType.element</a> , AtpClassifier.atpFeature			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	ApplicationRecordElement			
isOptional	Boolean	0..1	attr	<p>This attribute represents the ability to declare the enclosing ApplicationRecordElement as optional. This means the that, at runtime, the ApplicationRecordElement may or may not have a valid value and shall therefore be ignored.</p> <p>The underlying runtime software provides means to set the ApplicationRecordElement as not valid at the sending end of a communication and determine its validity at the receiving end.</p>

**Table B.9: ApplicationRecordElement**

Class	ArgumentDataPrototype			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	An argument of an operation, much like a data element, but also carries direction information and is owned by a particular ClientServerOperation.			
Base	ARObject, AtpFeature, AtpPrototype, AutosarDataPrototype, DataPrototype, Identifiable, Multilanguage Referrable, Referrable			
Aggregated by	AtpClassifier.atpFeature, ClientServerOperation.argument			
Attribute	Type	Mult.	Kind	Note
direction	ArgumentDirection Enum	0..1	attr	This attribute specifies the direction of the argument prototype.
serverArgument ImplPolicy	ServerArgumentImpl PolicyEnum	0..1	attr	<p>This defines how the argument type of the servers RunnableEntity is implemented.</p> <p>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.</p>

**Table B.10: ArgumentDataPrototype**

Enumeration	ArraySizeSemanticsEnum
Package	M2::AUTOSARTemplates::CommonStructure::ImplementationDataTypes
Note	This type controls how the information about the number of elements in an ApplicationArrayDataType is to be interpreted.
Aggregated by	ApplicationArrayElement.arraySizeSemantics, DiagnosticDataElement.arraySizeSemantics, ImplementationDataTypeElement.arraySizeSemantics, SwTextProps.arraySizeSemantics
Literal	Description
fixedSize	<p>This means that the ApplicationArrayDataType will always have a fixed number of elements.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=0</p>
variableSize	<p>This implies that the actual number of elements in the ApplicationArrayDataType might vary at run-time. The value of arraySize represents the maximum number of elements in the array.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=1</p>

**Table B.11: ArraySizeSemanticsEnum**

Class	AssemblySwConnector
Package	M2::AUTOSARTemplates::SWComponentTemplate::Composition
Note	AssemblySwConnectors are exclusively used to connect SwComponentPrototypes in the context of a CompositionSwComponentType.





<b>Class</b>	<b>AssemblySwConnector</b>			
<b>Base</b>	<i>ARObject</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i> , <i>SwConnector</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <a href="#">CompositionSwComponentType.connector</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
provider	AbstractProvidedPort Prototype	0..1	iref	Instance of providing port. <b>InstanceRef implemented by:</b> PPortInComposition InstanceRef
requester	AbstractRequiredPort Prototype	0..1	iref	Instance of requiring port. <b>InstanceRef implemented by:</b> RPortInComposition InstanceRef

**Table B.12: AssemblySwConnector**

<b>Class</b>	<b>AsynchronousServerCallReturnsEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This event is raised when an asynchronous server call is finished.			
<b>Base</b>	<i>ARObject</i> , <i>AbstractEvent</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>RTEEvent</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <i>SwcInternalBehavior.event</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
eventSource	AsynchronousServer CallResultPoint	0..1	ref	The referenced <i>AsynchronousServerCallResultPoint</i> raises this <i>AsynchronousServerCallReturnsEvent</i> when the asynchronous server call returns.

**Table B.13: AsynchronousServerCallReturnsEvent**

<b>Class</b>	<b>AutosarDataPrototype</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
<b>Note</b>	Base class for prototypical roles of an <i>AutosarDataType</i> .			
<b>Base</b>	<i>ARObject</i> , <i>AtpFeature</i> , <i>AtpPrototype</i> , <i>DataPrototype</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Subclasses</b>	<a href="#">ArgumentDataPrototype</a> , <a href="#">ParameterDataPrototype</a> , <a href="#">VariableDataPrototype</a>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i>			
<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 B.14: AutosarDataPrototype**

<b>Class</b>	<b>AutosarDataType</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
<b>Note</b>	Abstract base class for user defined AUTOSAR data types for software.			
<b>Base</b>	<i>ARElement</i> , <i>ARObject</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>	<i>AbstractImplementationDataType</i> , <a href="#">ApplicationDataType</a>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>







<b>Class</b>	<b>AutosarDataType</b> (abstract)			
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 B.15: AutosarDataType**

<b>Class</b>	<b>BackgroundEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This event is used to start RunnableEntities that are supposed to be executed in the background.			
<b>Base</b>	ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwcInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table B.16: BackgroundEvent**

<b>Class</b>	<b>BaseType</b> (abstract)			
<b>Package</b>	M2::MSR::AsamHdo::BaseTypes			
<b>Note</b>	This abstract meta-class represents the ability to specify a platform dependent base type.			
<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="#">SwBaseType</a>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
baseType Definition	BaseTypeDefinition	1	aggr	This is the actual definition of the base type. <b>Tags:</b> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false

**Table B.17: BaseType**

<b>Class</b>	<b>BaseTypeDirectDefinition</b>			
<b>Package</b>	M2::MSR::AsamHdo::BaseTypes			
<b>Note</b>	This BaseType is defined directly (as opposite to a derived BaseType)			
<b>Base</b>	ARObject, <a href="#">BaseTypeDefinition</a>			
<b>Aggregated by</b>	<a href="#">BaseType.baseTypeDefinition</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
baseType Encoding	BaseTypeEncoding String	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





<b>Class</b>	<b>BaseTypeDirectDefinition</b>			
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
native Declaration	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 baseType Size.  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 B.18: BaseTypeDirectDefinition**

<b>Class</b>	<b>BswEvent</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<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, AbstractEvent, Identifiable, MultilanguageReferrable, Referrable			
<b>Subclasses</b>	BswInterruptEvent, BswOperationInvokedEvent, BswScheduleEvent			
<b>Aggregated by</b>	BswInternalBehavior.event			
<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 usage of the event is limited to the context of the referred Bsw DistinguishedPartitions.
disabledInMode	ModeDeclaration	*	iref	The modes, in which this event is disabled.  <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=disabledInMode.contextMode DeclarationGroup, disabledInMode.targetMode <b>InstanceRef implemented by:</b> ModeInBswModule DescriptionInstanceRef
startsOnEvent	BswModuleEntity	0..1	ref	The entity which is started by the event.

**Table B.19: BswEvent**

<b>Class</b>	<b>BswExternalTriggerOccurredEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<b>Note</b>	A BswEvent resulting from a trigger released by another module or cluster.			
<b>Base</b>	ARObject, AbstractEvent, <a href="#">BswEvent</a> , BswScheduleEvent, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	BswInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
trigger	<a href="#">Trigger</a>	0..1	ref	The trigger associated with this event. The trigger is external to this module.

**Table B.20: BswExternalTriggerOccurredEvent**

<b>Class</b>	<b>BswInternalTriggerOccurredEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<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>	ARObject, AbstractEvent, <a href="#">BswEvent</a> , BswScheduleEvent, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	BswInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
eventSource	BswInternalTriggering Point	0..1	ref	The activation point is the source of this event.

**Table B.21: BswInternalTriggerOccurredEvent**

<b>Class</b>	<b>BswModeSwitchEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<b>Note</b>	A BswEvent resulting from a mode switch.			
<b>Base</b>	ARObject, AbstractEvent, <a href="#">BswEvent</a> , BswScheduleEvent, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<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)	<a href="#">ModeDeclaration</a>	0..2	iref	Reference to one or two Modes that initiate the Mode Switch Event. <b>InstanceRef implemented by:</b> ModeInBswModule DescriptionInstanceRef

**Table B.22: BswModeSwitchEvent**

<b>Class</b>	<b>BswModuleDescription</b>			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswOverview			
<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			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpFeature, AtpStructureElement, CollectableElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PackageableElement</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ARPackage.element, AtpClassifier.atpFeature			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	BswModuleDescription			
bswModule Dependency	BswModuleDependency	*	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	BswModuleEntry	*	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	BswModuleEntry	*	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	BswInternalBehavior	*	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	BswModuleClientServer Entry	*	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  <b>Tags:</b>            atp.Splitkey=providedData.shortName, providedData.variationPoint.shortLabel            vh.latestBindingTime=preCompileTime            xml.sequenceOffset=55</p>
providedMode Group	<a href="#">ModeDeclarationGroup Prototype</a>	*	aggr	<p>A set of modes which is owned and provided by this module or cluster. It can be connected to the required ModeGroups 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, EcuAbstraction SwComponentType or ComplexDeviceDriverSw ComponentType.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation  <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, Ecu AbstractionSwComponentType or ComplexDeviceDriver SwComponentType.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation  <b>Tags:</b>            atp.Splitkey=releasedTrigger.shortName, releasedTrigger.variationPoint.shortLabel            vh.latestBindingTime=preCompileTime            xml.sequenceOffset=35</p>
requiredClient ServerEntry	BswModuleClientServer Entry	*	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  <b>Tags:</b>            atp.Splitkey=requiredClientServerEntry.shortName, requiredClientServerEntry.variationPoint.shortLabel            vh.latestBindingTime=preCompileTime            xml.sequenceOffset=50</p>





Class	BswModuleDescription			
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 required Data 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 <b>Tags:</b> atp.Splitkey=requiredData.shortName, requiredData.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=60</p>
requiredMode Group	<a href="#">ModeDeclarationGroup Prototype</a>	*	aggr	<p>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.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=requiredModeGroup.shortName, requiredModeGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=30</p>
requiredTrigger	<a href="#">Trigger</a>	*	aggr	<p>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.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=requiredTrigger.shortName, requiredTrigger.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=40</p>

**Table B.23: BswModuleDescription**

<b>Class</b>	<i>BswModuleEntity</i> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<b>Note</b>	Specifies the smallest code fragment which can be described for a BSW module or cluster within AUTOSAR.			
<b>Base</b>	<i>ARObject</i> , <a href="#">ExecutableEntity</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	BswCalledEntity, BswInterruptEntity, <a href="#">BswSchedulableEntity</a>			
<b>Aggregated by</b>	BswInternalBehavior.entity			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessedMode Group	<a href="#">ModeDeclarationGroup Prototype</a>	*	ref	<p>A mode group which is accessed via API call by this entity. It shall be a ModeDeclarationGroupPrototype required by this module or cluster.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=accessedModeGroup.modeDeclarationGroupPrototype, accessedModeGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>





Class	BswModuleEntity (abstract)			
activationPoint	BswInternalTriggeringPoint	*	ref	<p>Activation point used by the module entity to activate one or more internal triggers.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation  <b>Tags:</b>            atp.Splitkey=activationPoint.bswInternalTriggeringPoint, activationPoint.variationPoint.shortLabel            vh.latestBindingTime=preCompileTime</p>
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  <b>Tags:</b>            atp.Splitkey=callPoint.shortName, callPoint.variationPoint.shortLabel            vh.latestBindingTime=preCompileTime</p>
dataReceivePoint	<a href="#">BswVariableAccess</a>	*	aggr	<p>The data is received via the BSW Scheduler.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation  <b>Tags:</b>            atp.Splitkey=dataReceivePoint.shortName, dataReceivePoint.variationPoint.shortLabel            vh.latestBindingTime=preCompileTime</p>
dataSendPoint	<a href="#">BswVariableAccess</a>	*	aggr	<p>The data is sent via the BSW Scheduler.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation  <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>
issuedTrigger	<a href="#">Trigger</a>	*	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  <b>Tags:</b>            atp.Splitkey=issuedTrigger.trigger, issuedTrigger.variationPoint.shortLabel            vh.latestBindingTime=preCompileTime</p>
managedModeGroup	<a href="#">ModeDeclarationGroupPrototype</a>	*	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  <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 B.24: BswModuleEntity**

<b>Class</b>	<b>BswSchedulableEntity</b>			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<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>	<i>ARObject</i> , <i>BswModuleEntity</i> , <i>ExecutableEntity</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	BswInternalBehavior.entity			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table B.25: BswSchedulableEntity**

<b>Class</b>	<b>BswTimingEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<b>Note</b>	A recurring BswEvent driven by a time period.			
<b>Base</b>	<i>ARObject</i> , <i>AbstractEvent</i> , <i>BswEvent</i> , <i>BswScheduleEvent</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	BswInternalBehavior.event			
<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 B.26: BswTimingEvent**

<b>Class</b>	<b>BswVariableAccess</b>			
<b>Package</b>	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
<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>	<i>ARObject</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<i>BswModuleEntity.dataReceivePoint</i> , <i>BswModuleEntity.dataSendPoint</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessed Variable	<i>VariableDataPrototype</i>	0..1	ref	The data accessed via the BSW Scheduler.
context Limitation	BswDistinguished Partition	*	ref	The existence of this reference indicates that the variable is received resp. sent only in the context of the referred BswDistinguishedPartitions.

**Table B.27: BswVariableAccess**

<b>Class</b>	<b>ClientServerApplicationErrorMapping</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	This meta-class represents the ability to map ApplicationErrors onto each other.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	ClientServerInterfaceMapping.errorMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
firstApplication Error	<i>ApplicationError</i>	0..1	ref	This represents the first ApplicationError in the context of the ClientServerApplicationErrorMapping.
second ApplicationError	<i>ApplicationError</i>	0..1	ref	This represents the second ApplicationError in the context of the ClientServerApplicationErrorMapping.

**Table B.28: ClientServerApplicationErrorMapping**



<b>Class</b>	<b>ClientServerInterface</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<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>	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, PortInterface, Referrable</i>			
<b>Aggregated by</b>	ARPackage.element			
<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> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=operation.shortName, operation.variation Point.shortLabel vh.latestBindingTime=blueprintDerivationTime
possibleError	<a href="#">ApplicationError</a>	*	aggr	Application errors that are defined as part of this interface.

**Table B.29: ClientServerInterface**

<b>Class</b>	<b>ClientServerOperation</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	An operation declared within the scope of a client/server interface.			
<b>Base</b>	<i>ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable</i>			
<b>Aggregated by</b>	ApplicationInterface.command, <i>AtpClassifier.atpFeature</i> , <a href="#">ClientServerInterface.operation</a> , DiagnosticDataElementInterface.read, DiagnosticDataIdentifierInterface.read, DiagnosticDataIdentifierInterface.write, DiagnosticRoutineInterface.requestResult, DiagnosticRoutineInterface.start, DiagnosticRoutineInterface.stop, PhmRecoveryActionInterface.recovery, ServiceInterface.method			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
argument (ordered)	<a href="#">ArgumentDataPrototype</a>	*	aggr	An argument of this ClientServerOperation <b>Stereotypes:</b> atp.Splittable; atp.Variation <b>Tags:</b> atp.Splitkey=argument.shortName, argument.variation Point.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 ClientServerOperation 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 Client ServerOperation does not have to consider the usage of a shared buffer.
possibleError	<a href="#">ApplicationError</a>	*	ref	Possible errors that may be raised by the referring operation.

**Table B.30: ClientServerOperation**

<b>Class</b>	<b>ClientServerOperationComProps</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	Defines additional attributes for the implementation of Client Server communication between software clusters			
<b>Base</b>	ARObject, CpSoftwareClusterCommunicationResourceProps			
<b>Aggregated by</b>	CpSoftwareClusterCommunicationResource.communicationResourceProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
queueLength	PositiveInteger	0..1	attr	Length of call request queue on the server side. The queue is implemented by the SwCluC. 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 B.31: ClientServerOperationComProps**

<b>Class</b>	<b>ClientServerOperationMapping</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	Defines the mapping of two particular ClientServerOperations in context of two different ClientServer Interfaces.			
<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> atpSplitable <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 B.32: ClientServerOperationMapping**

<b>Class</b>	<b>CompositionSwComponentType</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Composition			
<b>Note</b>	A CompositionSwComponentType aggregates SwComponentPrototypes (that in turn are typed by SwComponentTypes) 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			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable, SwComponentType			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	CompositionSwComponentType			
component	SwComponent Prototype	*	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 <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 <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 <b>Tags:</b> atp.Splitkey=constantValueMapping</p>





Class	CompositionSwComponentType			
dataTypeMapping	DataTypeMappingSet	*	ref	<p>Reference to the <code>DataTypeMappingSet</code> to be applied for the used <code>ApplicationDataTypes</code> in <code>PortInterfaces</code>.</p> <p>Background: when developing subsystems it may happen that <code>ApplicationDataTypes</code> are used on the surface of <code>CompositionSwComponentTypes</code>. In this case it would be reasonable to be able to also provide the intended mapping to the <code>ImplementationDataTypes</code>. However, this mapping shall be informal and not technically binding for the implementors mainly because the RTE generator is not concerned about the <code>CompositionSwComponentTypes</code>.</p> <p>Rationale: if the mapping of <code>ApplicationDataTypes</code> on the delegated and inner <code>PortPrototype</code> matches then the mapping to <code>ImplementationDataTypes</code> is not impacting compatibility.</p> <p><b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=dataTypeMapping</p>
instantiationRTEEventProps	InstantiationRTEEventProps	*	aggr	<p>This allows to define instantiation specific properties for RTE Events, in particular for instance specific scheduling.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=instantiationRTEEventProps.shortLabel, instantiationRTEEventProps.variationPoint.shortLabel, vh.latestBindingTime=codeGenerationTime</p>
physicalDimensionMapping	PhysicalDimensionMappingSet	0..1	ref	<p>This reference identifies the <code>PhysicalDimensionMappingSet</code> that is applicable in the context of the enclosing <code>CompositionSwComponentType</code>. The <code>PhysicalDimensionMappings</code> contained in the <code>PhysicalDimensionMappingSet</code> shall be taken into account for the assessment of the compatibility of <code>PhysicalDimensions</code> in the context of creation of a <code>PortInterfaceMapping</code> in the scope of the <code>CompositionSwComponentType</code>.</p>

**Table B.33: CompositionSwComponentType**

<b>Class</b>	<b>Compu</b>			
<b>Package</b>	M2::MSR::AsamHdo::ComputationMethod			
<b>Note</b>	This meta-class represents the ability to express one particular computation.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">CompuMethod.compuInternalToPhys</a> , <a href="#">CompuMethod.compuPhysToInternal</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
compuContent	CompuContent	0..1	aggr	<p>This specifies the details of the computation.</p> <p><b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=compuContent, xml.roleElement=false, xml.roleWrapperElement=false, xml.sequenceOffset=20, xml.typeElement=false, xml.typeWrapperElement=false</p>





Class	Compu			
compuDefault Value	CompuConst	0..1	aggr	<p>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.</p> <p><b>Tags:</b> xml.sequenceOffset=70</p>

**Table B.34: Compu**

Class	CompuConstFormulaContent			
<b>Package</b>	M2::MSR::AsamHdo::ComputationMethod			
<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, CompuConstContent</i>			
<b>Aggregated by</b>	CompuConst.compuConstContentType			
Attribute	Type	Mult.	Kind	Note
vf	Numerical	1	attr	<p>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!).</p> <p>Thus for example, the influence of the cylinder number on conversion formulae can be introduced in a repeatable manner.</p> <p><b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=codeGenerationTime xml.sequenceOffset=30</p>

**Table B.35: CompuConstFormulaContent**

Class	CompuConstTextContent			
<b>Package</b>	M2::MSR::AsamHdo::ComputationMethod			
<b>Note</b>	This meta-class represents the textual content of a scale.			
<b>Base</b>	<i>ARObject, CompuConstContent</i>			
<b>Aggregated by</b>	CompuConst.compuConstContentType			
Attribute	Type	Mult.	Kind	Note
vt	VerbatimString	0..1	attr	This represents a textual constant in the computation method.

**Table B.36: CompuConstTextContent**

Class	CompuMethod			
<b>Package</b>	M2::MSR::AsamHdo::ComputationMethod			
<b>Note</b>	<p>This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.</p> <p>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.</p> <p><b>Tags:</b> atp.recommendedPackage=CompuMethods</p>			





<b>Class</b>	<b>CompuMethod</b>			
<b>Base</b>	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
compuInternalToPhys	Compu	0..1	aggr	This specifies the computation from internal values to physical values. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=compuInternalToPhys xml.sequenceOffset=80
compuPhysToInternal	Compu	0..1	aggr	This represents the computation from physical values to the internal values. <b>Stereotypes:</b> atpSplitable <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	Unit	0..1	ref	This is the physical unit of the Physical values for which the CompuMethod applies. <b>Tags:</b> xml.sequenceOffset=30

**Table B.37: CompuMethod**

<b>Class</b>	<b>CompuNominatorDenominator</b>			
<b>Package</b>	M2::MSR::AsamHdo::ComputationMethod			
<b>Note</b>	This class represents the ability to express a polynomial either as Nominator or as Denominator.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">CompuRationalCoeffs.compuDenominator</a> , <a href="#">CompuRationalCoeffs.compuNumerator</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
v (ordered)	Numerical	*	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 B.38: CompuNominatorDenominator**

<b>Class</b>	<b>CompuRationalCoeffs</b>			
<b>Package</b>	M2::MSR::AsamHdo::ComputationMethod			
<b>Note</b>	This meta-class represents the ability to express a rational function by specifying the coefficients of nominator and denominator.			
<b>Base</b>	<i>ARObject</i>			





<b>Class</b>	<b>CompuRationalCoeffs</b>			
<b>Aggregated by</b>	CompuScaleRationalFormula.compuRationalCoeffs			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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 B.39: CompuRationalCoeffs**

<b>Class</b>	<b>CompuScale</b>			
<b>Package</b>	M2::MSR::AsamHdo::ComputationMethod			
<b>Note</b>	This meta-class represents the ability to specify one segment of a segmented computation method.			
<b>Base</b>	<i>ARObject</i>			
<b>Aggregated by</b>	<a href="#">CompuScales.compuScale</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
a2lDisplayText	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	CompuConst	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	Limit	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	PositiveUnlimitedInteger	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	Identifier	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





Class		CompuScale		
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
upperLimit	Limit	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 B.40: CompuScale**

Class		CompuScaleConstantContents		
<b>Package</b>		M2::MSR::AsamHdo::ComputationMethod		
<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	CompuConst	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 B.41: CompuScaleConstantContents**

Class		CompuScales		
<b>Package</b>		M2::MSR::AsamHdo::ComputationMethod		
<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 B.42: CompuScales**



<b>Class</b>	<b>CpSoftwareCluster</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	<p>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.</p> <p><b>Tags:</b> atp.recommendedPackage=CpSoftwareClusters</p>			
<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>
softwareClusterId	PositiveInteger	0..1	attr	This attribute represents the value of the id of the corresponding CP software cluster.
swComponentAssignment	SwComponentPrototypeAssignment	*	aggr	<p>This is the collection of SwComponentPrototype Assignments</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=swComponentAssignment, swComponentAssignment.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
swComposition	<a href="#">CompositionSwComponentType</a>	*	ref	<p>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.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=swComposition.compositionSwComponentType, swComposition.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime</p>

**Table B.43: CpSoftwareCluster**

<b>Class</b>	<b>CpSoftwareClusterBinaryManifestDescriptor</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster::BinaryManifest			
<b>Note</b>	<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</p>			
<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>
cpSoftwareCluster	<a href="#">CpSoftwareCluster</a>	0..1	ref	<p>This reference identifies the CpSoftwareCluster to which the enclosing CpSoftwareClusterBinaryManifestDescriptor belongs,</p> <p>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.</p>
metaDataField	BinaryManifestMeta DataField	*	aggr	This aggregation identifies the collection of meta-data contained in the enclosing binary manifest.
provideResource	BinaryManifestProvide Resource	*	aggr	This aggregation represents the collection of provided resources in the enclosing binary manifest.





<b>Class</b>		<b>CpSoftwareClusterBinaryManifestDescriptor</b>		
require Resource	BinaryManifestRequire Resource	*	aggr	This aggregation represents the collection of required resources in the enclosing binary manifest.
resource Definition	BinaryManifest ResourceDefinition	*	aggr	This aggregation represents the collection of binary manifest resource definitions that belong to the enclosing CpSoftwareClusterBinaryManifestDescriptor.
softwareCluster Id	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 B.44: CpSoftwareClusterBinaryManifestDescriptor**

<b>Class</b>		<b>CpSoftwareClusterCommunicationResource</b>		
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	Represents a single resource required or provided by a CP Software Cluster which relates to the port based communication on VFB level.			
<b>Base</b>	ARObject, CpSoftwareClusterResource, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	CpSoftwareClusterResourcePool.resource			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
communication ResourceProps	CpSoftwareCluster Communication ResourceProps	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 B.45: CpSoftwareClusterCommunicationResource**

<b>Class</b>		<b>CpSoftwareClusterResource</b> (abstract)		
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	Represents a single resource required or provided by a CP Software Cluster. <b>Tags:</b> atp.recommendedPackage=Resources			
<b>Base</b>	ARObject, Identifiable, MultilanguageReferrable, Referrable			
<b>Subclasses</b>	CpSoftwareClusterCommunicationResource, CpSoftwareClusterServiceResource			
<b>Aggregated by</b>	CpSoftwareClusterResourcePool.resource			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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 B.46: CpSoftwareClusterResource**

<b>Class</b>	<b>CpSoftwareClusterResourcePool</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	Represents the pool of resources which can be provided or required by CP Software Clusters. <b>Tags:</b> atp.recommendedPackage=CpSoftwareClusterResourcePools			
<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>
ecuScope	<a href="#">EcuInstance</a>	*	ref	This reference identifies the EcuInstance in which the resource pool is defined. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=ecuScope
resource	<a href="#">CpSoftwareClusterResource</a>	*	aggr	This aggregation represents the collection of resources in the enclosing resource pool. <b>Stereotypes:</b> atp.Splittable <b>Tags:</b> atp.Splitkey=resource.shortName

**Table B.47: CpSoftwareClusterResourcePool**

<b>Class</b>	<b>CpSoftwareClusterServiceResource</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	Represents a single resource required or provided by a CP Software Cluster which relates to the BSW.			
<b>Base</b>	ARObject, CpSoftwareClusterResource, Identifiable, MultilanguageReferrable, Referrable			
<b>Aggregated by</b>	<a href="#">CpSoftwareClusterResourcePool.resource</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
resourceNeeds	<a href="#">EcucContainerValue</a>	*	ref	Reference(s) to one or multiple EcucContainerValue(s) qualifying the characteristics of the resource.

**Table B.48: CpSoftwareClusterServiceResource**

<b>Class</b>	<b>DataComProps</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	Represents a single resource required or provided by a CP Software Cluster which relates to the port based communication on VFB level.			
<b>Base</b>	ARObject, CpSoftwareClusterCommunicationResourceProps			
<b>Aggregated by</b>	<a href="#">CpSoftwareClusterCommunicationResource.communicationResourceProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataConsistencyPolicy	<a href="#">DataConsistencyPolicyEnum</a>	0..1	attr	This attribute defines requirements on the data consistency mechanism in the cross cluster communication. If the attribute is not set, the default value consistencyMechanismRequired applies.
sendIndication	<a href="#">SendIndicationEnum</a>	0..1	attr	Send indication behavior for last-is-the best data communication.

**Table B.49: DataComProps**

<b>Enumeration</b>	<b>DataConsistencyPolicyEnum</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster			
<b>Note</b>	Defines how data consistency is ensured in the cross cluster communication.			
<b>Aggregated by</b>	<a href="#">DataComProps.dataConsistencyPolicy</a>			





<b>Enumeration</b>	<b>DataConsistencyPolicyEnum</b>
<b>Literal</b>	<b>Description</b>
consistency Mechanism Required	In this case the data consistency is ensured by the implementation of the SwClucC module. <b>Tags:</b> atp.EnumerationLiteralIndex=0
noConsistency Mechanism	In this case the data consistency is not ensured by the SwClucC module. In this case it has to be ensured by scheduling. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table B.50: DataConsistencyPolicyEnum**

<b>Class</b>	<b>DataConstr</b>			
<b>Package</b>	M2::MSR::AsamHdo::Constraints::GlobalConstraints			
<b>Note</b>	This meta-class represents the ability to specify constraints on data. <b>Tags:</b> atp.recommendedPackage=DataConstrs			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, Identifiable, Multilanguage Referrable, PackageableElement, Referrable			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataConstrRule	DataConstrRule	*	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 B.51: DataConstr**

<b>Class</b>	<b>DataConstrRule</b>			
<b>Package</b>	M2::MSR::AsamHdo::Constraints::GlobalConstraints			
<b>Note</b>	This meta-class represents the ability to express one specific data constraint rule.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	DataConstr.dataConstrRule			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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	PhysConstrs	0..1	aggr	Describes the limitations applicable on the physical domain (as opposed to the internal domain). <b>Tags:</b> xml.sequenceOffset=30

**Table B.52: DataConstrRule**

<b>Class</b>	<b>DataMapping</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::DataMapping			
<b>Note</b>	Mapping of port elements (data elements and parameters) to frames and signals.			
<b>Base</b>	ARObject			
<b>Subclasses</b>	ClientServerToSignalMapping, SenderReceiverCompositeElementToSignalMapping, SenderReceiverToSignalGroupMapping, SenderReceiverToSignalMapping, TriggerToSignalMapping			
<b>Aggregated by</b>	SystemMapping.dataMapping			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
introduction	DocumentationBlock	0..1	aggr	This represents introductory documentation about the data mapping.

**Table B.53: DataMapping**

<b>Class</b>	<b>DataPrototype</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
<b>Note</b>	Base class for prototypical roles of any data type.			
<b>Base</b>	ARObject, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, Referrable			
<b>Subclasses</b>	ApplicationCompositeElementDataPrototype, AutosarDataPrototype			
<b>Aggregated by</b>	AtpClassifier.atpFeature			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
swDataDef Props	SwDataDefProps	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 B.54: DataPrototype**

<b>Class</b>	<b>DataReceivedEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This event is raised when the referenced data element is received.			
<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>
data	VariableDataPrototype	0..1	iref	The referenced VariableDataPrototype raises this Data ReceivedEvent when the data has been received.  <b>InstanceRef implemented by:</b> RVariableInAtomicSwc InstanceRef

**Table B.55: DataReceivedEvent**

<b>Class</b>	<b>DiagnosticEventInfoNeeds</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
<b>Note</b>	This meta-class represents the needs of a software-component interested to get information regarding specific DTCs.			
<b>Base</b>	ARObject, DiagnosticCapabilityElement, Identifiable, MultilanguageReferrable, Referrable, ServiceNeeds			
<b>Aggregated by</b>	BswServiceDependency.serviceNeeds, SwcServiceDependency.serviceNeeds			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>





Class	DiagnosticEventInfoNeeds			
obdDtcNumber	PositiveInteger	0..1	attr	This represents a reasonable Diagnostic Trouble Code. This allows to predefine the Diagnostic Trouble Code, e.g. if the function developer has received a particular requirement from the OEM or from a standardization body. This attribute applies for the OBD diagnostics use case.
udsDtcNumber	PositiveInteger	0..1	attr	This represents a reasonable Diagnostic Trouble Code. This allows to predefine the Diagnostic Trouble Code, e.g. if the function developer has received a particular requirement from the OEM or from a standardization body. This attribute applies for the UDS diagnostics use case.

**Table B.56: DiagnosticEventInfoNeeds**

Class	DiagnosticEventNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
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, Identifiable, MultilanguageReferrable, Referrable, ServiceNeeds			
Aggregated by	BswServiceDependency.serviceNeeds, SwcServiceDependency.serviceNeeds			
Attribute	Type	Mult.	Kind	Note
deferringFid	FunctionInhibitionNeeds	*	ref	This reference contains the link to a function identifier within the FiM which is used by the monitor before delivering a result.
diagEventDebounceAlgorithm	DiagEventDebounceAlgorithm	0..1	aggr	Specifies the abstract need on the Debounce Algorithm applied by the Diagnostic Event Manager.
inhibitingFid	FunctionInhibitionNeeds	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	FunctionInhibitionNeeds	*	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 B.57: DiagnosticEventNeeds**

<b>Class</b>	<b>EcuInstance</b>			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreTopology			
<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			
<b>Base</b>	ARObject, CollectableElement, FibexElement, <a href="#">Identifiable</a> , MultilanguageReferrable, PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
associatedComIPduGroup	ISignalPduGroup	*	ref	With this reference it is possible to identify which ISignalPduGroups are applicable for which Communication Connector/ ECU.  Only top level ISignalPduGroups shall be referenced by an EcuInstance. If an ISignalPduGroup contains other ISignalPduGroups than these contained ISignalPduGroups shall not be referenced by the EcuInstance. Contained ISignalPduGroups are associated to an Ecu Instance via the top level ISignalPduGroup.
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.
comConfigurationRxTimeBase	TimeValue	0..1	attr	The period between successive calls to Com_MainFunctionRx of the AUTOSAR COM module in seconds.
comConfigurationTxTimeBase	TimeValue	0..1	attr	The period between successive calls to Com_MainFunctionTx of the AUTOSAR COM module in seconds.
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 cyclicTiming assigned or eventControlledTiming with numberOfRepetitions > 0).
commController	CommunicationController	*	aggr	CommunicationControllers of the ECU. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=commController.shortName, commController.variationPoint.shortLabel vh.latestBindingTime=postBuild







Class	EcuInstance			
connector	Communication Connector	*	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	DltConfig	0..1	aggr	Describes the Dlt configuration on this EcuInstance.
dolpConfig	DolpConfig	0..1	aggr	Dolp configuration on this EcuInstance. <b>Tags:</b> atp.Status=draft
ecuTaskProxy	OsTaskProxy	*	ref	Reference to OsTaskProxies assigned to the Ecu Instance. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=ecuTaskProxy
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.
firewallRule	StateDependentFirewall	*	ref	Firewall rules defined in the context of an EcuInstance. <b>Tags:</b> atp.Status=candidate
partition	EcuPartition	*	aggr	Optional definition of Partitions within an Ecu.
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.
sleepMode Supported	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.
tcplplcmpProps	EthTcplplcmpProps	0..1	ref	EcuInstance specific ICMP (Internet Control Message Protocol) attributes
tcplpProps	EthTcplpProps	0..1	ref	EcuInstance specific Tcplp Stack attributes.
v2xSupported	V2xSupportEnum	0..1	attr	This attribute is used to control the existence of the V2X stack on the given EcuInstance.
wakeUpOver BusSupported	Boolean	0..1	attr	Driver support for wakeup over Bus.

**Table B.58: EcuInstance**



<b>Class</b>	<b>EcucContainerDef</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::ECUCParameterDefTemplate			
<b>Note</b>	Base class used to gather common attributes of configuration container definitions.			
<b>Base</b>	ARObject, AtpDefinition, EcucDefinitionElement, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Subclasses</b>	EcucChoiceContainerDef, <a href="#">EcucParamConfContainerDef</a>			
<b>Aggregated by</b>	EcucDestinationUriPolicy.container, <a href="#">EcucModuleDef.container</a> , <a href="#">EcucParamConfContainerDef.sub Container</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
destinationUri	EcucDestinationUriDef	*	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
multiplicity ConfigClass	EcucMultiplicity ConfigurationClass	*	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 EcucModule Def 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.
postBuildVariant Multiplicity	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 B.59: EcucContainerDef**

<b>Class</b>	<b>EcucContainerValue</b>			
<b>Package</b>	M2::AUTOSARTemplates::ECUCDescriptionTemplate			
<b>Note</b>	Represents a Container definition in the ECU Configuration Description.			
<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	EcucParameterValue	*	aggr	Aggregates all ECU Configuration Values within this Container.  atpVariation: [RS_ECUC_00079]  <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=parameterValue, parameterValue.variation Point.shortLabel vh.latestBindingTime=postBuild





Class	EcucContainerValue			
referenceValue	EcucAbstractReferenceValue	*	aggr	Aggregates all References with this container. atpVariation: [RS_ECUC_00079] <b>Stereotypes:</b> atpSplittable; 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. atpVariation: [RS_ECUC_00078] <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=subContainer.shortName, subContainer.variationPoint.shortLabel vh.latestBindingTime=postBuild

**Table B.60: EcucContainerValue**

Class	EcucEnumerationParamDef			
<b>Package</b>	M2::AUTOSARTemplates::ECUCParameterDefTemplate			
<b>Note</b>	Configuration parameter type for Enumeration.			
<b>Base</b>	<a href="#">ARObject</a> , <a href="#">AtpDefinition</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>	EcucDestinationUriPolicy.parameter, <a href="#">EcucParamConfContainerDef.parameter</a>			
Attribute	Type	Mult.	Kind	Note
defaultValue	Identifier	0..1	attr	Default value of the enumeration configuration parameter. This string needs to be one of the literals specified for this enumeration.
literal	EcucEnumerationLiteralDef	*	aggr	Aggregation on the literals used to define this enumeration parameter. 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>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=literal.shortName

**Table B.61: EcucEnumerationParamDef**

Class	EcucForeignReferenceDef			
<b>Package</b>	M2::AUTOSARTemplates::ECUCParameterDefTemplate			
<b>Note</b>	Specify a reference to an XML description of an entity described in another AUTOSAR template.			
<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>	EcucDestinationUriPolicy.reference, <a href="#">EcucParamConfContainerDef.reference</a>			
Attribute	Type	Mult.	Kind	Note
destinationType	String	0..1	attr	The type in the AUTOSAR Metamodel to which instance this reference is allowed to point to.

**Table B.62: EcucForeignReferenceDef**

<b>Class</b>	<b>EcucModuleConfigurationValues</b>			
<b>Package</b>	M2::AUTOSARTemplates::ECUCDescriptionTemplate			
<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.</p> <p>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>			
<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>
container	EcucContainerValue	*	aggr	<p>Aggregates all containers that belong to this module configuration.</p> <p>atpVariation: [RS_ECUC_00078]</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=container.shortName, container.variation Point.shortLabel vh.latestBindingTime=postBuild xml.sequenceOffset=10</p>
definition	EcucModuleDef	0..1	ref	<p>Reference to the definition of this EcucModule ConfigurationValues element. Typically, this is a vendor specific module configuration.</p> <p><b>Tags:</b> xml.sequenceOffset=-10</p>
ecucDefEdition	RevisionLabelString	0..1	attr	<p>This is the version info of the ModuleDef ECUC Parameter definition to which this values conform to / are based on.</p> <p>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.</p>
implementation ConfigVariant	EcucConfiguration VariantEnum	0..1	attr	<p>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.</p>
module Description	BswImplementation	0..1	ref	<p>Referencing the BSW module description, which this EcucModuleConfigurationValues element is configuring. This is optional because the EcucModuleConfiguration Values 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.</p>
postBuildVariant Used	Boolean	0..1	attr	<p>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.</p>

**Table B.63: EcucModuleConfigurationValues**

<b>Class</b>	<b>EcucModuleDef</b>			
<b>Package</b>	M2::AUTOSARTemplates::ECUCParameterDefTemplate			
<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=EcucModuleDefs			
<b>Base</b>	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpDefinition, CollectableElement, EcucDefinitionElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
<b>Aggregated by</b>	ARPackage.element			
<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
postBuildVariant Support	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.
refinedModule Def	<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
supported ConfigVariant	EcucConfiguration VariantEnum	*	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 B.64: EcucModuleDef**

<b>Class</b>	<b>EcucParamConfContainerDef</b>			
<b>Package</b>	M2::AUTOSARTemplates::ECUCParameterDefTemplate			
<b>Note</b>	Used to define configuration containers that can hierarchically contain other containers and/or parameter definitions.			
<b>Base</b>	<i>ARObject, AtpDefinition, EcucContainerDef, EcucDefinitionElement, Identifiable, MultilanguageReferrable, Referrable</i>			
<b>Aggregated by</b>	EcucChoiceContainerDef.choice, EcucDestinationUriPolicy.container, <a href="#">EcucModuleDef.container</a> , <a href="#">EcucParamConfContainerDef.subContainer</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
parameter	EcucParameterDef	*	aggr	The parameters defined within the EcucParamConfContainerDef. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=parameter.shortName





Class	EcucParamConfContainerDef			
reference	EcucAbstractReferenceDef	*	aggr	The references defined within the EcucParamConf ContainerDef. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=reference.shortName
subContainer	<a href="#">EcucContainerDef</a>	*	aggr	The containers defined within the EcucParamConf ContainerDef. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=subContainer.shortName

**Table B.65: EcucParamConfContainerDef**

Class	<i>ExecutableEntity</i> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::InternalBehavior			
<b>Note</b>	Abstraction of executable code.			
<b>Base</b>	<i>AObject</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Subclasses</b>	<i>BswModuleEntity</i> , <i>RunnableEntity</i>			
Attribute	Type	Mult.	Kind	Note
activationReason	ExecutableEntityActivationReason	*	aggr	If the ExecutableEntity provides at least one activationReason element the RTE resp. BSW Scheduler shall provide means to read the activation vector of this executable entity execution.  If no activationReason element is provided the feature of being able to determine the activating RTEEvent is disabled for this ExecutableEntity.
canEnter	ExclusiveArea	*	ref	This means that the executable entity can enter/leave the referenced exclusive area through explicit API calls. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=canEnter.exclusiveArea, canEnter.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
exclusiveAreaNestingOrder	ExclusiveAreaNestingOrder	*	ref	This represents the set of ExclusiveAreaNestingOrders recognized by this ExecutableEntity.
minimumStartInterval	TimeValue	0..1	attr	Specifies the time in seconds by which two consecutive starts of an ExecutableEntity are guaranteed to be separated.
reentrancyLevel	ReentrancyLevelEnum	0..1	attr	The reentrancy level of this ExecutableEntity. See the documentation of the enumeration type ReentrancyLevelEnum for details.  Please note that nonReentrant interfaces can have also reentrant or multicoreReentrant implementations, and reentrant interfaces can also have multicoreReentrant implementations.
runsInside	ExclusiveArea	*	ref	The executable entity runs completely inside the referenced exclusive area. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=runsInside.exclusiveArea, runsInside.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	ExecutableEntity (abstract)			
swAddrMethod	SwAddrMethod	0..1	ref	Addressing method related to this code entity. Via an association to the same SwAddrMethod, 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 B.66: ExecutableEntity**

Class	ExternalTriggerOccurredEvent			
Package	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
Note	This event is raised when the referenced Trigger has occurred.			
Base	ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, Multilanguage Referrable, RTEEvent, Referrable			
Aggregated by	AtpClassifier.atpFeature, SwcInternalBehavior.event			
Attribute	Type	Mult.	Kind	Note
trigger	Trigger	0..1	iref	The referenced Trigger raises this ExternalTrigger OccurredEvent. <b>InstanceRef implemented by:</b> RTriggerInAtomicSwc InstanceRef

**Table B.67: ExternalTriggerOccurredEvent**

Class	ExternalTriggeringPoint			
Package	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::Trigger			
Note	If a RunnableEntity owns an ExternalTriggeringPoint it is entitled to raise an ExternalTriggerOccurred Event.			
Base	ARObject			
Aggregated by	RunnableEntity.externalTriggeringPoint			
Attribute	Type	Mult.	Kind	Note
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 ExternalTriggering Point 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	Trigger	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 B.68: ExternalTriggeringPoint**

<b>Class</b>	<b>FlatInstanceDescriptor</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::FlatMap			
<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>			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	FlatMap.instance			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
ecuExtract Reference	AtpFeature	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 <b>InstanceRef implemented by:</b> AnyInstanceRef</p>
role	Identifier	0..1	attr	<p>The role denotes the particular role of the downstream memory location described by this FlatInstanceDescriptor.</p> <p>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.</p>
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 <b>Tags:</b> atp.Splitkey=rtePluginProps</p>
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	<p>The properties of this FlatInstanceDescriptor.</p> <p><b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=swDataDefProps</p>





Class	FlatInstanceDescriptor			
upstream Reference	AtpFeature	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 Swc Internal 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 Swc InternalBehavior.</p> <p><b>Tags:</b> xml.sequenceOffset=20 <b>InstanceRef implemented by:</b> AnyInstanceRef</p>

**Table B.69: FlatInstanceDescriptor**

Class	FunctionInhibitionAvailabilityNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the abstract needs on the configuration of the Function Inhibition Manager to provide the control function for one Function Identifier (FID).			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
Aggregated by	BswServiceDependency.serviceNeeds, SwcServiceDependency.serviceNeeds			
Attribute	Type	Mult.	Kind	Note
controlledFid	<a href="#">FunctionInhibitionNeeds</a>	0..1	ref	This reference represents the controlled FID

**Table B.70: FunctionInhibitionAvailabilityNeeds**

Class	FunctionInhibitionNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	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.			
Base	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a> , <a href="#">ServiceNeeds</a>			
Aggregated by	BswServiceDependency.serviceNeeds, SwcServiceDependency.serviceNeeds			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table B.71: FunctionInhibitionNeeds**

Enumeration	HandleInvalidEnum			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Communication			
Note	Strategies of handling the reception of invalidValue.			
Aggregated by	<a href="#">InvalidationPolicy.handleInvalid</a> , <a href="#">ISignalPort.handleInvalid</a>			







<i>Enumeration</i>	<b>HandleInvalidEnum</b>
<i>Literal</i>	<i>Description</i>
dontInvalidate	Invalidation is switched off. <b>Tags:</b> atp.EnumerationLiteralIndex=0
external Replacement	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 B.72: HandleInvalidEnum**

<b>Class</b>	<i>Identifiable</i> (abstract)
<b>Package</b>	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::Identifiable
<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>	<i>ARObject</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>
<b>Subclasses</b>	<p>ARPackage, <i>AbstractDolpLogicAddressProps</i>, <i>AbstractEvent</i>, <i>AbstractImplementationDataTypeElement</i>, <i>AbstractSecurityEventFilter</i>, <i>AbstractSecurityIdsmInstanceFilter</i>, <i>AbstractServiceInstance</i>, AppOsTask ProxyToEcuTaskProxyMapping, ApplicationEndpoint, <a href="#">ApplicationError</a>, ApplicationPartitionToEcuPartition Mapping, AppliedStandard, AsynchronousServerCallResultPoint, <i>AtpBlueprint</i>, <i>AtpBlueprintable</i>, <i>Atp Classifier</i>, <i>AtpFeature</i>, AutosarOperationArgumentInstance, AutosarVariableInstance, <i>BinaryManifest AddressableObject</i>, BinaryManifestItemDefinition, <i>BinaryManifestResource</i>, BinaryManifestResource Definition, BlockState, BswInternalTriggeringPoint, BswModuleDependency, <i>BuildActionEntity</i>, Build ActionEnvironment, CanTpAddress, CanTpChannel, CanTpNode, Chapter, ClassContentConditional, ClientIdDefinition, <a href="#">ClientServerOperation</a>, Code, <i>CollectableElement</i>, ComManagementMapping, <i>Comm ConnectorPort</i>, <i>CommunicationConnector</i>, <i>CommunicationController</i>, Compiler, ConsistencyNeeds, ConsumedEventGroup, <i>CouplingElementAbstractDetails</i>, CouplingPort, <i>CouplingPortAbstractShaper</i>, <i>CouplingPortStructuralElement</i>, <a href="#">CpSoftwareClusterResource</a>, CpSoftwareClusterResourceToApplication PartitionMapping, CpSoftwareClusterToApplicationPartitionMapping, CpSoftwareClusterToEcuInstance Mapping, CpSoftwareClusterToResourceMapping, <i>CryptoServiceMapping</i>, DataPrototypeGroup, Data Transformation, DdsCpDomain, DdsCpPartition, DdsCpQosProfile, DdsCpTopic, DependencyOnArtifact, <i>DiagEventDebounceAlgorithm</i>, DiagnosticAuthTransmitCertificateEvaluation, DiagnosticConnected Indicator, DiagnosticDataElement, DiagnosticDebounceAlgorithmProps, DiagnosticFunctionInhibit Source, DiagnosticParameterElement, <i>DiagnosticRoutineSubfunction</i>, DltApplication, DltArgument, Dlt LogChannel, DltMessage, DolpInterface, DolpLogicAddress, DolpRoutingActivation, ECUMapping, <i>EOC ExecutableEntityRefAbstract</i>, EcuPartition, <a href="#">EcucContainerValue</a>, <i>EcucDefinitionElement</i>, Ecu DestinationUriDef, EcucEnumerationLiteralDef, EcucQuery, EcucValidationCondition, EndToEnd Protection, EthernetWakeupSleepOnDataLineConfig, EventHandler, ExclusiveArea, <a href="#">ExecutableEntity</a>, <i>ExecutionTime</i>, FMAttributeDef, FMFeatureMapAssertion, FMFeatureMapCondition, FMFeatureMap Element, FMFeatureRelation, FMFeatureRestriction, FMFeatureSelection, <a href="#">FlatInstanceDescriptor</a>, FlexrayArTpNode, FlexrayTpConnectionControl, FlexrayTpNode, FlexrayTpPduPool, <i>FrameTriggering</i>, GeneralParameter, GlobalTimeGateway, <i>GlobalTimeMaster</i>, <i>GlobalTimeSlave</i>, <i>HeapUsage</i>, HwAttribute Def, HwAttributeLiteralDef, HwPin, HwPinGroup, <i>IEEE1722TpActBus</i>, <i>IEEE1722TpActBusPart</i>, IPsec Rule, IPv6ExtHeaderFilterList, ISignalToPduMapping, ISignalTriggering, <i>IdentCaption</i>, ImpositionTime, InternalTriggeringPoint, J1939SharedAddressCluster, J1939TpNode, Keyword, LifeCycleState, Lin ScheduleTable, LinTpNode, Linker, MacMulticastGroup, MacSecKayParticipant, <a href="#">McDataInstance</a>, MemorySection, <a href="#">ModeDeclaration</a>, ModeDeclarationMapping, <a href="#">ModeSwitchPoint</a>, NetworkEndpoint, <i>Nm Cluster</i>, NmEcu, <i>NmNode</i>, NvBlockDescriptor, <i>PackageableElement</i>, <a href="#">ParameterAccess</a>, PduActivation RoutingGroup, PduToFrameMapping, PduTriggering, PerInstanceMemory, <i>PhysicalChannel</i>, <a href="#">Port ElementToCommunicationResourceMapping</a>, PortGroup, <a href="#">PortInterfaceMapping</a>, PossibleErrorReaction, ResourceConsumption, RootSwCompositionPrototype, RptComponent, RptContainer, RptExecutable</p>





<b>Class</b>	<b>Identifiable</b> (abstract)			
	<p style="text-align: center;">△</p> <p>Entity, RptExecutableEntityEvent, RptExecutionContext, RptProfile, RptServicePoint, RteEventInCompositionSeparation, RteEventInCompositionToOsTaskProxyMapping, RteEventInSystemSeparation, RteEventInSystemToOsTaskProxyMapping, RunnableEntityGroup, <i>SdgAttribute</i>, SdgClass, SecureCommunicationAuthenticationProps, SecureCommunicationFreshnessProps, SecurityEventContextProps, <i>ServerCallPoint</i>, <i>ServiceNeeds</i>, SignalServiceTranslationElementProps, SignalServiceTranslationEventProps, SignalServiceTranslationProps, SocketAddress, SomeIpTpChannel, <i>SpecElementReference</i>, <i>StackUsage</i>, StaticSocketConnection, StructuredReq, SwGenericAxisParamType, SwServiceArg, SwcServiceDependency, SwcToApplicationPartitionMapping, SwcToEcuMapping, SwcToImplMapping, SwitchAsynchronousTrafficShaperGroupEntry, SwitchFlowMeteringEntry, SwitchStreamFilterActionDestPortModification, SwitchStreamFilterEntry, SwitchStreamFilterRule, SwitchStreamGateEntry, SwitchStreamIdentification, SystemMapping, SystemSignalGroupToCommunicationResourceMapping, SystemSignalToCommunicationResourceMapping, TDCpSoftwareClusterMapping, TDCpSoftwareClusterResourceMapping, TcpOptionFilterList, <i>TimingClock</i>, TimingClockSyncAccuracy, TimingCondition, <i>TimingConstraint</i>, <i>TimingDescription</i>, TimingExtensionResource, TimingModelInstance, TlsCryptoCipherSuite, TlsCryptoCipherSuiteProps, Topic1, TpAddress, TraceableTable, TraceableText, <i>TracedFailure</i>, <i>TransformationProps</i>, TransformationTechnology, <i>Trigger</i>, <i>VariableAccess</i>, VariationPointProxy, ViewMap, VlanConfig, WaitPoint</p>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
adminData	AdminData	0..1	aggr	<p>This represents the administrative data for the identifiable object.</p> <p><b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=adminData xml.sequenceOffset=-40</p>
annotation	Annotation	*	aggr	<p>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.</p> <p><b>Tags:</b> xml.sequenceOffset=-25</p>
category	CategoryString	0..1	attr	<p>The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.</p> <p><b>Tags:</b> xml.sequenceOffset=-50</p>
desc	MultiLanguageOverviewParagraph	0..1	aggr	<p>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.</p> <p>More elaborate documentation, (in particular how the object is built or used) should go to "introduction".</p> <p><b>Tags:</b> xml.sequenceOffset=-60</p>
introduction	DocumentationBlock	0..1	aggr	<p>This represents more information about how the object in question is built or is used. Therefore it is a DocumentationBlock.</p> <p><b>Tags:</b> xml.sequenceOffset=-30</p>





<b>Class</b>	<b>Identifiable</b> (abstract)			
uuid	String	0..1	attr	<p>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.</p> <p><b>Tags:</b> xml.attribute=true</p>

**Table B.73: Identifiable**

<b>Class</b>	<b>ImplementationDataType</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ImplementationDataTypes			
<b>Note</b>	<p>Describes a reusable data type on the implementation level. This will typically correspond to a typedef in C-code.</p> <p><b>Tags:</b> atp.recommendedPackage=ImplementationDataTypes</p>			
<b>Base</b>	<p><i>ARElement</i>, <i>ARObject</i>, <i>AbstractImplementationDataType</i>, <i>AtpBlueprint</i>, <i>AtpBlueprintable</i>, <i>AtpClassifier</i>, <i>AtpType</i>, <i>AutosarDataType</i>, <i>CollectableElement</i>, <i>Identifiable</i>, <i>MultilanguageReferrable</i>, <i>PackageableElement</i>, <i>Referrable</i></p>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dynamicArraySizeProfile	String	0..1	attr	Specifies the profile which the array will follow in case this data type is a variable size array.
isStructWithOptionalElement	Boolean	0..1	attr	<p>This attribute is only valid if the attribute category is set to STRUCTURE.</p> <p>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.</p>
subElement (ordered)	<a href="#">ImplementationDataTypeElement</a>	*	aggr	<p>Specifies an element of an array, struct, or union data type.</p> <p>The aggregation of ImplementationDataTypeElement is subject to variability with the purpose to support the conditional existence of elements inside a ImplementationDataType representing a structure.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation</p> <p><b>Tags:</b> atp.Splitkey=subElement.shortName, subElement.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>





Class	ImplementationDataType			
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 B.74: ImplementationDataType**

Class	ImplementationDataTypeElement			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ImplementationDataTypes			
<b>Note</b>	<p>Declares a data object which is locally aggregated. Such an element can only be used within the scope where it is aggregated.</p> <p>This element either consists of further subElements or it is further defined via its swDataDefProps.</p> <p>There are several use cases within the system of ImplementationDataTypes for such a local declaration:</p> <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>	<i>ARObject</i> , <i>AbstractImplementationDataTypeElement</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <a href="#">ImplementationDataType.subElement</a> , <a href="#">ImplementationDataTypeElement.subElement</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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	<a href="#">ArraySizeSemanticsEnum</a>	0..1	attr	This attribute controls the meaning of the value of the array size.
isOptional	Boolean	0..1	attr	<p>This attribute represents the ability to declare the enclosing ImplementationDataTypeElement as optional. This means that, at runtime, the ImplementationDataTypeElement may or may not have a valid value and shall therefore be ignored.</p> <p>The underlying runtime software provides means to set the CppImplementationDataTypeElement as not valid at the sending end of a communication and determine its validity at the receiving end.</p>





Class	ImplementationDataTypeElement			
subElement (ordered)	<a href="#">ImplementationDataTypeElement</a>	*	aggr	<p>Element of an array, struct, or union in case of a nested declaration (i.e. without using "typedefs").</p> <p>The aggregation of ImplementationDataTypeElement is subject to variability with the purpose to support the conditional existence of elements inside a ImplementationDataType representing a structure.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=subElement.shortName, subElement.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	<p>The properties of this ImplementationDataTypeElement.</p> <p><b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=swDataDefProps</p>

**Table B.75: ImplementationDataTypeElement**

Class	InitEvent			
Package	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
Note	This RTEEvent is supposed to be used for initialization purposes, i.e. for starting and restarting a partition. It is not guaranteed that all RunnableEntities referenced by this InitEvent are executed before the 'regular' RunnableEntities are executed for the first time. The execution order depends on the task mapping.			
Base	ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a> , MultilanguageReferrable, <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
Aggregated by	AtpClassifier.atpFeature, SwcInternalBehavior.event			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

**Table B.76: InitEvent**

Class	<i>InternalBehavior</i> (abstract)			
Package	M2::AUTOSARTemplates::CommonStructure::InternalBehavior			
Note	Common base class (abstract) for the internal behavior of both software components and basic software modules/clusters.			
Base	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a> , MultilanguageReferrable, <a href="#">Referrable</a>			
Subclasses	BswInternalBehavior, SwcInternalBehavior			
Aggregated by	AtpClassifier.atpFeature			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-





<b>Class</b>	<b>InternalBehavior</b> (abstract)			
constantMemory	ParameterDataPrototype	*	aggr	<p>Describes a read only memory object containing characteristic value(s) implemented by this InternalBehavior.</p> <p>The shortName of ParameterDataPrototype has to be equal to the 'C' identifier of the described constant.</p> <p>The characteristic value(s) might be shared between SwComponentPrototypes of the same SwComponentType.</p> <p>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.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=constantMemory.shortName, constantMemory.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
constantValueMapping	ConstantSpecificationMappingSet	*	ref	<p>Reference to the ConstantSpecificationMapping to be applied for the particular InternalBehavior</p> <p><b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=constantValueMapping</p>
dataTypeMapping	DataTypeMappingSet	*	ref	<p>Reference to the DataTypeMapping to be applied for the particular InternalBehavior</p> <p><b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=dataTypeMapping</p>
exclusiveArea	ExclusiveArea	*	aggr	<p>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.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=exclusiveArea.shortName, exclusiveArea.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
exclusiveAreaNestingOrder	ExclusiveAreaNestingOrder	*	aggr	<p>This represents the set of ExclusiveAreaNestingOrder owned by the InternalBehavior.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=exclusiveAreaNestingOrder.shortName, exclusiveAreaNestingOrder.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>





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.</p> <p>The shortName of the VariableDataPrototype has to be equal with the "C" identifier of the described variable.</p> <p>The aggregation of staticMemory is subject to variability with the purpose to support variability in the software component's implementations.</p> <p>Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=staticMemory.shortName, staticMemory.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>

**Table B.77: InternalBehavior**

Class	InternalConstrs			
Package	M2::MSR::AsamHdo::Constraints::GlobalConstraints			
Note	This meta-class represents the ability to express internal constraints.			
Base	ARObject			
Aggregated by	<a href="#">DataConstrRule.internalConstrs</a>			
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 <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 maps and curves.</p> <p><b>Tags:</b> xml.sequenceOffset=50</p>
monotony	<a href="#">MonotonyEnum</a>	0..1	attr	<p>This element specifies the monotony characteristics of the current internal or physical limits. The following table shows the monotony characteristics which are to be filled through the corresponding values.</p> <p>If the element has no contents or if it is omitted, "no Monotony" is the default content.</p> <p><b>Tags:</b> xml.sequenceOffset=70</p>





Class	InternalConstrs			
scaleConstr (ordered)	ScaleConstr	*	aggr	This is one particular scale which contributes to the data constraints. <b>Tags:</b> atp.Status=obsolete xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=40 xml.typeElement=false xml.typeWrapperElement=false
upperLimit	Limit	0..1	attr	This specifies the upper limit defined by the constraint. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=30

**Table B.78: InternalConstrs**

Class	InternalTriggerOccurredEvent			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This event is raised when the referenced InternalTriggeringPoint has occurred.			
<b>Base</b>	ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a> , <a href="#">Multilanguage Referrable</a> , <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwcInternalBehavior.event			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
eventSource	InternalTriggeringPoint	0..1	ref	The referenced InternalTriggeringPoint raises this InternalTriggerOccurredEvent.

**Table B.79: InternalTriggerOccurredEvent**

Class	InvalidationPolicy			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	Specifies whether the component can actively invalidate a particular dataElement. If no invalidationPolicy points to a dataElement this is considered to yield the identical result as if the handleInvalid attribute was set to dontInvalidate.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">SenderReceiverInterface.invalidationPolicy</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
dataElement	<a href="#">VariableDataPrototype</a>	0..1	ref	Reference to the dataElement for which the InvalidationPolicy applies.
handleInvalid	<a href="#">HandleInvalidEnum</a>	0..1	attr	This attribute controls how invalidation is applied to the dataElement.

**Table B.80: InvalidationPolicy**



<b>Class</b>	<b>McDataInstance</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::MeasurementCalibrationSupport			
<b>Note</b>	<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>			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<a href="#">McDataInstance.subElement</a> , <a href="#">McSupportData.mcParameterInstance</a> , <a href="#">McSupportData.mcVariableInstance</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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	McIdentifier	0..1	attr	An optional attribute to be used to set the ASAM ASAP2 DISPLAY_IDENTIFIER attribute.
flatMapEntry	<a href="#">FlatInstanceDescriptor</a>	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.</p> <p>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>
instanceInMemory	ImplementationElementInParameterInstanceRef	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	McDataAccessDetails	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	<p>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.</p> <p><b>Stereotypes:</b> atpSplittable <b>Tags:</b> atp.Splitkey=resultingProperties</p>
resultingRptSwPrototypingAccess	RptSwPrototypingAccess	0..1	aggr	Describes the implemented accessibility of data and modes by the rapid prototyping tooling.





<b>Class</b>	<b>McDataInstance</b>			
role	Identifier	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	RptImplPolicy	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> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=subElement.shortName, subElement.variationPoint.shortLabel 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>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=symbol

**Table B.81: McDataInstance**

<b>Class</b>	<b>McSupportData</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::MeasurementCalibrationSupport			
<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>
emulation Support	McSwEmulationMethod Support	*	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





Class	McSupportData			
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	SwSystemconstant ValueSet	*	ref	Sets of system constant values to be transferred to the MCD system, because the system constants have been specified with "swCalibrationAccess" = readonly.
rptSupportData	RptSupportData	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 B.82: McSupportData**

Class	ModeAccessPoint			
Package	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::ModeDeclarationGroup			
Note	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.			
Base	<i>ARObject</i>			
Aggregated by	<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> atpIdentifyContributor <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 B.83: ModeAccessPoint**

<b>Class</b>	<b>ModeDeclaration</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::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, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	AtpClassifier.atpFeature, <a href="#">ModeDeclarationGroup.modeDeclaration</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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 B.84: ModeDeclaration**

<b>Class</b>	<b>ModeDeclarationGroup</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ModeDeclaration			
<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, <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>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initialMode	<a href="#">ModeDeclaration</a>	0..1	ref	The initial mode of the ModeDeclarationGroup. This mode is active before any mode switches occurred.
mode Declaration	<a href="#">ModeDeclaration</a>	*	aggr	The ModeDeclarations collected in this ModeDeclaration Group. <b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=modeDeclaration.shortName, mode Declaration.variationPoint.shortLabel vh.latestBindingTime=blueprintDerivationTime
modeManager ErrorBehavior	<a href="#">ModeErrorBehavior</a>	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).
modeTransition	<a href="#">ModeTransition</a>	*	aggr	This represents the available ModeTransitions of the ModeDeclarationGroup
modeUserError Behavior	<a href="#">ModeErrorBehavior</a>	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).
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.

**Table B.85: ModeDeclarationGroup**

<b>Class</b>	<b>ModeDeclarationGroupPrototype</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ModeDeclaration			
<b>Note</b>	The ModeDeclarationGroupPrototype specifies a set of Modes (ModeDeclarationGroup) which is provided or required in the given context.			
<b>Base</b>	ARObject, AtpFeature, AtpPrototype, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			





<b>Class</b>	<b>ModeDeclarationGroupPrototype</b>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <a href="#">BswModuleDescription.providedModeGroup</a> , <a href="#">BswModuleDescription.requiredModeGroup</a> , <i>FirewallStateSwitchInterface.firewallStateMachine</i> , <i>FunctionGroupSet.functionGroup</i> , <a href="#">ModeSwitchInterface.modeGroup</a> , <i>Process.processStateMachine</i> , <i>StateManagementStateNotification.stateMachine</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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.
type	<a href="#">ModeDeclarationGroup</a>	0..1	tref	The "collection of ModeDeclarations" (= ModeDeclaration Group) supported by a component <b>Stereotypes:</b> isOfType

**Table B.86: ModeDeclarationGroupPrototype**

<b>Class</b>	<b>ModeDeclarationMappingSet</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	This meta-class implements a container for ModeDeclarationGroupMappings <b>Tags:</b> atp.recommendedPackage=PortInterfaceMappingSets			
<b>Base</b>	<i>ARElement</i> , <i>AObject</i> , <i>AtpClassifier</i> , <i>AtpType</i> , <i>CollectableElement</i> , <a href="#">Identifiable</a> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
mode Declaration Mapping	ModeDeclaration Mapping	*	aggr	This represents the collection of ModeDeclaration Mappings owned by the enclosing ModeDeclaration MappingSet.

**Table B.87: ModeDeclarationMappingSet**

<b>Class</b>	<b>ModeErrorBehavior</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ModeDeclaration			
<b>Note</b>	This represents the ability to define the error behavior in the context of mode handling.			
<b>Base</b>	<i>AObject</i>			
<b>Aggregated by</b>	<a href="#">ModeDeclarationGroup.modeManagerErrorBehavior</a> , <a href="#">ModeDeclarationGroup.modeUserErrorBehavior</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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	ModeErrorReaction PolicyEnum	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 B.88: ModeErrorBehavior**

<b>Class</b>	<b>ModeSwitchInterface</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	A mode switch interface declares a ModeDeclarationGroupPrototype to be sent and received. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
<b>Base</b>	<i>ARElement</i> , <i>AObject</i> , <i>AtpBlueprint</i> , <i>AtpBlueprintable</i> , <i>AtpClassifier</i> , <i>AtpType</i> , <i>CollectableElement</i> , <a href="#">Identifiable</a> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <a href="#">PortInterface</a> , <a href="#">Referrable</a>			





<b>Class</b>	<b>ModeSwitchInterface</b>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	aggr	The ModeDeclarationGroupPrototype of this mode interface.

**Table B.89: ModeSwitchInterface**

<b>Class</b>	<b>ModeSwitchPoint</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::ModeDeclarationGroup			
<b>Note</b>	A ModeSwitchPoint is required by a RunnableEntity owned a Mode Manager. Its semantics implies the ability to initiate a mode switch.			
<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.modeSwitchPoint</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
modeGroup	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	iref	The mode declaration group that is switched by this runnable.  <b>InstanceRef implemented by:</b> PModeGroupInAtomic SwcInstanceRef

**Table B.90: ModeSwitchPoint**

<b>Class</b>	<b>ModeTransition</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ModeDeclaration			
<b>Note</b>	This meta-class represents the ability to describe possible ModeTransitions in the context of a Mode DeclarationGroup.			
<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="#">ModeDeclarationGroup.modeTransition</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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 B.91: ModeTransition**

<b>Enumeration</b>	<b>MonotonyEnum</b>			
<b>Package</b>	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::PrimitiveTypes			
<b>Note</b>	This enumerator denotes the values for specification of monotony for e.g. curves.			
<b>Aggregated by</b>	<a href="#">InternalConstrs.monotony</a> , <a href="#">PhysConstrs.monotony</a> , <a href="#">SwCalprmAxisTypeProps.monotony</a>			
<b>Literal</b>	<b>Description</b>			
decreasing	This indicates that the related curve needs to be monotony decreasing. <b>Tags:</b> atp.EnumerationLiteralIndex=0			
increasing	This indicates that the related curve needs to be monotony increasing. <b>Tags:</b> atp.EnumerationLiteralIndex=1			





<b>Enumeration</b>	<b>MonotonyEnum</b>
monotonous	This indicates that the values shall be monotonously decreasing or increasing, depending on the trend set by the first values of the series. <b>Tags:</b> atp.EnumerationLiteralIndex=2
noMonotony	This indicates that the related curve needs not to be monotony. <b>Tags:</b> atp.EnumerationLiteralIndex=3
strictlyDecreasing	This indicates that the related curve needs to be strictly monotony decreasing. <b>Tags:</b> atp.EnumerationLiteralIndex=4
strictlyIncreasing	This indicates that the related curve needs to be strictly monotony increasing. <b>Tags:</b> atp.EnumerationLiteralIndex=5
strictMonotonous	This indicates that the values shall be strict monotonously decreasing or increasing, depending on the trend set by the first values of the series. <b>Tags:</b> atp.EnumerationLiteralIndex=6

**Table B.92: MonotonyEnum**

<b>Class</b>	<b>NonqueuedReceiverComSpec</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Communication			
<b>Note</b>	Communication attributes specific to non-queued receiving.			
<b>Base</b>	<i>ARObject, RPortComSpec, ReceiverComSpec</i>			
<b>Aggregated by</b>	<i>AbstractRequiredPortPrototype.requiredComSpec, PortPrototypeBlueprint.requiredComSpec</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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.
enableUpdate	Boolean	0..1	attr	This attribute controls whether application code is entitled to check whether the value of the corresponding VariableDataPrototype has been updated.
filter	DataFilter	0..1	aggr	The applicable filter algorithm for filtering the value of the corresponding dataElement.
handleData Status	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.
handleNever Received	Boolean	0..1	attr	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.  <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>
handleTimeout Type	HandleTimeoutEnum	0..1	attr	This attribute controls the behavior with respect to the handling of timeouts.







<b>Class</b>	<b>NonqueuedReceiverComSpec</b>			
initValue	ValueSpecification	0..1	aggr	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.
timeout Substitution Value	ValueSpecification	0..1	aggr	This attribute represents the substitution value applicable in the case of a timeout.

**Table B.93: NonqueuedReceiverComSpec**

<b>Class</b>	<b>NonqueuedSenderComSpec</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Communication			
<b>Note</b>	Communication attributes for non-queued sender/receiver communication (sender side)			
<b>Base</b>	ARObject, PPortComSpec, SenderComSpec			
<b>Aggregated by</b>	AbstractProvidedPortPrototype.providedComSpec, PortPrototypeBlueprint.providedComSpec			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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 B.94: NonqueuedSenderComSpec**

<b>Class</b>	<b>NvBlockNeeds</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
<b>Note</b>	Specifies the abstract needs on the configuration of a single NVRAM Block.			
<b>Base</b>	ARObject, Identifiable, MultilanguageReferrable, Referrable, ServiceNeeds			
<b>Aggregated by</b>	BswServiceDependency.serviceNeeds, NvBlockDescriptor.nvBlockNeeds, SwcServiceDependency.serviceNeeds			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
calcRamBlock Crc	Boolean	0..1	attr	Defines if CRC (re)calculation for the permanent RAM Block is required.
checkStatic BlockId	Boolean	0..1	attr	Defines if the Static Block Id check shall be enabled.
cyclicWriting Period	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.
ramBlockStatus Control	RamBlockStatusControl Enum	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	NvBlockNeeds ReliabilityEnum	0..1	attr	Reliability against data loss on the non-volatile medium.







<b>Class</b>	<b>NvBlockNeeds</b>			
resistantTo ChangedSw	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.
selectBlockFor FirstInitAll	Boolean	0..1	attr	If this attribute is set to true the NvM shall process this block in the NvM_FirstInitAll() function.
storeAt Shutdown	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.
store Emergency	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 store Emergency 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.
useAuto ValidationAt ShutDown	Boolean	0..1	attr	If set to true the RAM Block shall be auto validated during shutdown phase.
useCRCComp Mechanism	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.
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.
writing Frequency	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	NvBlockNeedsWriting PriorityEnum	0..1	attr	Requires the priority of writing this block in case of concurrent requests to write other blocks.

**Table B.95: NvBlockNeeds**

<b>Class</b>	<b>NvDataInterface</b>
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface
<b>Note</b>	A non volatile data interface declares a number of VariableDataPrototypes to be exchanged between non volatile block components and atomic software components. <b>Tags:</b> atp.recommendedPackage=PortInterfaces





<b>Class</b>	<b>NvDataInterface</b>			
<b>Base</b>	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, DataInterface, Identifiable, MultilanguageReferrable, PackageableElement, PortInterface, Referrable</i>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
nvData	<a href="#">VariableDataPrototype</a>	*	aggr	The VariableDataPrototype of this nv data interface.

**Table B.96: NvDataInterface**

<b>Class</b>	<b>OperationInvokedEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This event is raised when the ClientServerOperation referenced in OperationInvokedEvent.operation shall be invoked.			
<b>Base</b>	<i>ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, RTEEvent, Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature, SwcInternalBehavior.event</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
operation	<a href="#">ClientServerOperation</a>	0..1	iref	This represents the ClientServerOperation which shall be invoked. <b>InstanceRef implemented by:</b> POperationInAtomicSwc InstanceRef

**Table B.97: OperationInvokedEvent**

<b>Class</b>	<b>OsTaskExecutionEvent</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This RTEEvent is supposed to execute RunnableEntities 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 Runnables of Complex Drivers which have to react on task executions.			
<b>Base</b>	<i>ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, RTEEvent, Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature, SwcInternalBehavior.event</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
–	–	–	–	–

**Table B.98: OsTaskExecutionEvent**

<b>Class</b>	<b>PPortPrototype</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Components			
<b>Note</b>	Component port providing a certain port interface.			
<b>Base</b>	<i>ARObject, AbstractProvidedPortPrototype, AtpBlueprintable, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, PortPrototype, Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature, SwComponentType.port</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
provided Interface	<a href="#">PortInterface</a>	0..1	tref	The interface that this port provides. <b>Stereotypes:</b> isOfType

**Table B.99: PPortPrototype**

<b>Class</b>	<b>PRPortPrototype</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Components			
<b>Note</b>	This kind of PortPrototype can take the role of both a required and a provided PortPrototype.			
<b>Base</b>	<i>ARObject</i> , <i>AbstractProvidedPortPrototype</i> , <i>AbstractRequiredPortPrototype</i> , <i>AtpBlueprintable</i> , <i>AtpFeature</i> , <i>AtpPrototype</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PortPrototype</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <i>SwComponentType.port</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
provided Required Interface	<a href="#">PortInterface</a>	0..1	tref	This represents the PortInterface used to type the PRPort Prototype <b>Stereotypes:</b> isOfType

**Table B.100: PRPortPrototype**

<b>Class</b>	<b>ParameterAccess</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::DataElements			
<b>Note</b>	The presence of a ParameterAccess implies that a RunnableEntity needs access to a ParameterData Prototype.			
<b>Base</b>	<i>ARObject</i> , <i>AbstractAccessPoint</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <a href="#">RunnableEntity.parameterAccess</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessed Parameter	<a href="#">AutosarParameterRef</a>	0..1	aggr	Reference to the accessed calibration parameter.
swDataDef Props	<a href="#">SwDataDefProps</a>	0..1	aggr	This allows denote instance and access specific properties, mainly input values and common axis. <b>Stereotypes:</b> atpSplitable <b>Tags:</b> atp.Splitkey=swDataDefProps

**Table B.101: ParameterAccess**

<b>Class</b>	<b>ParameterDataPrototype</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
<b>Note</b>	A ParameterDataPrototype represents a formalized generic piece of information that is typically immutable by the application software layer, but mutable by measurement and calibration tools. ParameterDataPrototype is used in various contexts and the specific context gives the otherwise generic ParameterDataPrototype a dedicated semantics.			
<b>Base</b>	<i>ARObject</i> , <i>AtpFeature</i> , <i>AtpPrototype</i> , <i>AutosarDataPrototype</i> , <i>DataPrototype</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <i>BswInternalBehavior.perInstanceParameter</i> , <i>InternalBehavior.constantMemory</i> , <i>NvBlockDescriptor.romBlock</i> , <i>ParameterInterface.parameter</i> , <i>SwcInternalBehavior.perInstanceParameter</i> , <i>SwcInternalBehavior.sharedParameter</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initValue	<a href="#">ValueSpecification</a>	0..1	aggr	Specifies initial value(s) of the ParameterDataPrototype

**Table B.102: ParameterDataPrototype**

<b>Class</b>	<b>ParameterInterface</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<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>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, DataInterface, Identifiable, MultilanguageReferrable, PackageableElement, PortInterface, Referrable			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
parameter	ParameterData Prototype	*	aggr	The ParameterDataPrototype of this ParameterInterface.

**Table B.103: ParameterInterface**

<b>Class</b>	<b>ParameterRequireComSpec</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Communication			
<b>Note</b>	"Communication" specification that applies to parameters on the required side of a connection.			
<b>Base</b>	ARObject, RPortComSpec			
<b>Aggregated by</b>	AbstractRequiredPortPrototype.requiredComSpec, PortPrototypeBlueprint.requiredComSpec			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initValue	ValueSpecification	0..1	aggr	The initial value applicable for the corresponding ParameterDataPrototype.
parameter	ParameterData Prototype	0..1	ref	The ParameterDataPrototype to which the Parameter RequireComSpec applies.

**Table B.104: ParameterRequireComSpec**

<b>Class</b>	<b>PhysConstrs</b>			
<b>Package</b>	M2::MSR::AsamHdo::Constraints::GlobalConstraints			
<b>Note</b>	This meta-class represents the ability to express physical constraints. Therefore it has (in opposite to InternalConstrs) a reference to a Unit.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	DataConstrRule.physConstrs			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
lowerLimit	Limit	0..1	attr	This specifies the lower limit of the constraint. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=20
maxDiff	Numerical	0..1	attr	Maximum difference that is permitted between two consecutive values if the constraint is applied to an axis. <b>Tags:</b> xml.sequenceOffset=60
maxGradient	Numerical	0..1	attr	This element specifies the maximum slope that may be used in curves and maps. <b>Tags:</b> xml.sequenceOffset=50
monotony	MonotonyEnum	0..1	attr	This specifies the monotony constraints on the data object. Note that this applies only to curves and maps. <b>Tags:</b> xml.sequenceOffset=70





Class	PhysConstrs			
scaleConstr (ordered)	ScaleConstr	*	aggr	This is one particular scale which contributes to the data constraints. <b>Tags:</b> atp.Status=obsolete xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=40 xml.typeElement=false xml.typeWrapperElement=false
unit	<a href="#">Unit</a>	0..1	ref	This is the unit to which the physical constraints relate to. In particular, it is the physical unit of the specified limits. <b>Tags:</b> xml.sequenceOffset=80
upperLimit	Limit	0..1	attr	This specifies the upper limit of the constraint. <b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=30

**Table B.105: PhysConstrs**

Class	PhysicalDimension			
<b>Package</b>	M2::MSR::AsamHdo::Units			
<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, ARObjekt, CollectableElement, <a href="#">Identifiable</a>, MultilanguageReferrable, PackageableElement, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
currentExp	Numerical	0..1	attr	This attribute represents the exponent of the physical dimension "electric current". <b>Tags:</b> xml.sequenceOffset=50
lengthExp	Numerical	0..1	attr	The exponent of the physical dimension "length". <b>Tags:</b> xml.sequenceOffset=20
luminous IntensityExp	Numerical	0..1	attr	The exponent of the physical dimension "luminous intensity". <b>Tags:</b> xml.sequenceOffset=80
massExp	Numerical	0..1	attr	The exponent of the physical dimension "mass". <b>Tags:</b> xml.sequenceOffset=30
molarAmount Exp	Numerical	0..1	attr	The exponent of the physical dimension "quantity of substance". <b>Tags:</b> xml.sequenceOffset=70





Class	PhysicalDimension			
temperatureExp	Numerical	0..1	attr	The exponent of the physical dimension "temperature". <b>Tags:</b> xml.sequenceOffset=60
timeExp	Numerical	0..1	attr	The exponent of the physical dimension "time". <b>Tags:</b> xml.sequenceOffset=40

**Table B.106: PhysicalDimension**

Class	PortElementToCommunicationResourceMapping			
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate			
<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.			
<b>Base</b>	ARObject, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	CpSoftwareClusterMappingSet.portElementToComResourceMapping, SystemMapping.portElementToComResourceMapping			
Attribute	Type	Mult.	Kind	Note
clientServerOperation	<a href="#">ClientServerOperation</a>	0..1	iref	ClientServerOperation instance qualifying the communication resource <b>InstanceRef implemented by:</b> OperationInSystemInstanceRef
communicationResource	<a href="#">CpSoftwareClusterCommunicationResource</a>	0..1	ref	Communication resource for which the mapping applies.
modeDeclarationGroupPrototype	<a href="#">ModeDeclarationGroupPrototype</a>	0..1	iref	ModeDeclarationGroupPrototype instance qualifying the communication resource <b>InstanceRef implemented by:</b> ModeDeclarationGroupPrototypeInSystemInstanceRef
parameterDataPrototype	<a href="#">ParameterDataPrototype</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
variableDataPrototype	<a href="#">VariableDataPrototype</a>	0..1	iref	VariableDataPrototype instance qualifying the communication resource <b>InstanceRef implemented by:</b> VariableDataPrototypeInSystemInstanceRef

**Table B.107: PortElementToCommunicationResourceMapping**

Class	PortInterface (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<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>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, <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>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note





Class	PortInterface (abstract)			
isService	Boolean	0..1	attr	<p>This flag is set if the PortInterface is to be used for communication between an</p> <ul style="list-style-type: none"> <li>• ApplicationSwComponentType or</li> <li>• ServiceProxySwComponentType or</li> <li>• SensorActuatorSwComponentType or</li> <li>• ComplexDeviceDriverSwComponentType</li> <li>• ServiceSwComponentType</li> <li>• EcuAbstractionSwComponentType</li> </ul> <p>and a ServiceSwComponentType (namely an AUTOSAR Service) located on the same ECU. Otherwise the flag is not set.</p> <p><b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=blueprintDerivationTime</p>
serviceKind	ServiceProviderEnum	0..1	attr	<p>This attribute provides further details about the nature of the applied service.</p>

**Table B.108: PortInterface**

Class	PortInterfaceMapping (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	Specifies one PortInterfaceMapping to support the connection of Ports typed by two different Port Interfaces with PortInterface elements having unequal names and/or unequal semantic (resolution or range).			
Base	ARObject, AtpBlueprint, AtpBlueprintable, Identifiable, MultilanguageReferrable, Referrable			
Subclasses	ClientServerInterfaceMapping, ModelInterfaceMapping, TriggerInterfaceMapping, VariableAndParameterInterfaceMapping			
Aggregated by	PortInterfaceMappingSet.portInterfaceMapping			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table B.109: PortInterfaceMapping**

Class	PortPrototype (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Components			
Note	<p>Base class for the ports of an AUTOSAR software component.</p> <p>The aggregation of PortPrototypes is subject to variability with the purpose to support the conditional existence of ports.</p>			
Base	ARObject, AtpBlueprintable, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, Referrable			
Subclasses	AbstractProvidedPortPrototype, AbstractRequiredPortPrototype			
Aggregated by	AtpClassifier.atpFeature, SwComponentType.port			
Attribute	Type	Mult.	Kind	Note
clientServerAnnotation	ClientServerAnnotation	*	aggr	Annotation of this PortPrototype with respect to client/server communication.
delegatedPortAnnotation	DelegatedPortAnnotation	0..1	aggr	Annotations on this delegated port.
ioHwAbstractionServerAnnotation	IoHwAbstractionServerAnnotation	*	aggr	Annotations on this IO Hardware Abstraction port.





<b>Class</b>	<b>PortPrototype</b> (abstract)			
modePort Annotation	ModePortAnnotation	*	aggr	Annotations on this mode port.
nvDataPort Annotation	NvDataPortAnnotation	*	aggr	Annotations on this non volatile data port.
parameterPort Annotation	ParameterPort Annotation	*	aggr	Annotations on this parameter port.
senderReceiver Annotation	SenderReceiver Annotation	*	aggr	Collection of annotations of this ports sender/receiver communication.
triggerPort Annotation	TriggerPortAnnotation	*	aggr	Annotations on this trigger port.

**Table B.110: PortPrototype**

<b>Class</b>	<b>QueuedReceiverComSpec</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Communication			
<b>Note</b>	Communication attributes specific to queued receiving.			
<b>Base</b>	ARObject, RPortComSpec, ReceiverComSpec			
<b>Aggregated by</b>	AbstractRequiredPortPrototype.requiredComSpec, PortPrototypeBlueprint.requiredComSpec			
<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 B.111: QueuedReceiverComSpec**

<b>Class</b>	<b>RModelInAtomicSwcInstanceRef</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Components::InstanceRefs			
<b>Note</b>				
<b>Base</b>	ARObject, AtpInstanceRef			
<b>Aggregated by</b>	RTEEvent.disabledMode, SwcModeSwitchEvent.mode			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
base	AtomicSwcComponent Type	0..1	ref	<b>Stereotypes:</b> atpDerived <b>Tags:</b> xml.sequenceOffset=10
contextMode Declaration GroupPrototype	<a href="#">ModeDeclarationGroup Prototype</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=30
contextPort	AbstractRequiredPort Prototype	0..1	ref	<b>Tags:</b> xml.sequenceOffset=20
targetMode Declaration	<a href="#">ModeDeclaration</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=40

**Table B.112: RModelInAtomicSwcInstanceRef**

<b>Class</b>	<b>RPortPrototype</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Components			
<b>Note</b>	Component port requiring a certain port interface.			
<b>Base</b>	ARObject, AbstractRequiredPortPrototype, AtpBlueprintable, AtpFeature, AtpPrototype, <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">PortPrototype</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwComponentType.port			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>







Class	RPortPrototype			
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.
requiredInterface	<a href="#">PortInterface</a>	0..1	tref	The interface that this port requires. <b>Stereotypes:</b> isOfType

**Table B.113: RPortPrototype**

Class	RTEEvent (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
Note	Abstract base class for all RTE-related events			
Base	<i>ARObject</i> , <i>AbstractEvent</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Subclasses	<a href="#">AsynchronousServerCallReturnsEvent</a> , <a href="#">BackgroundEvent</a> , <a href="#">DataReceiveErrorEvent</a> , <a href="#">DataReceivedEvent</a> , <a href="#">DataSendCompletedEvent</a> , <a href="#">DataWriteCompletedEvent</a> , <a href="#">ExternalTriggerOccurredEvent</a> , <a href="#">InitEvent</a> , <a href="#">InternalTriggerOccurredEvent</a> , <a href="#">ModeSwitchedAckEvent</a> , <a href="#">OperationInvokedEvent</a> , <a href="#">OsTaskExecutionEvent</a> , <a href="#">SwcModeManagerErrorEvent</a> , <a href="#">SwcModeSwitchEvent</a> , <a href="#">TimingEvent</a> , <a href="#">TransformerHardErrorEvent</a>			
Aggregated by	<a href="#">AtpClassifier.atpFeature</a> , <a href="#">SwcInternalBehavior.event</a>			
Attribute	Type	Mult.	Kind	Note
disabledMode	<a href="#">ModeDeclaration</a>	*	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> <a href="#">RModeInAtomicSwcInstanceRef</a>
startOnEvent	<a href="#">RunnableEntity</a>	0..1	ref	The referenced RunnableEntity starts when the corresponding RTEEvent is raised.

**Table B.114: RTEEvent**

Class	RTriggerInAtomicSwcInstanceRef			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Components::InstanceRefs			
Note				
Base	<i>ARObject</i> , <i>AtpInstanceRef</i> , <i>TriggerInAtomicSwcInstanceRef</i>			
Aggregated by	<a href="#">ExternalTriggerOccurredEvent.trigger</a> , <a href="#">TransformerHardErrorEvent.requiredTrigger</a>			
Attribute	Type	Mult.	Kind	Note
contextRPort	AbstractRequiredPort Prototype	0..1	ref	<b>Tags:</b> xml.sequenceOffset=20
targetTrigger	<a href="#">Trigger</a>	0..1	ref	<b>Tags:</b> xml.sequenceOffset=30

**Table B.115: RTriggerInAtomicSwcInstanceRef**

Class	Referrable (abstract)			
Package	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::Identifiable			
Note	Instances of this class can be referred to by their identifier (while adhering to namespace borders).			
Base	<i>ARObject</i>			





<b>Class</b>	<b>Referrable</b> (abstract)			
<b>Subclasses</b>	<i>AtpDefinition</i> , <i>BswDistinguishedPartition</i> , <i>BswModuleCallPoint</i> , <i>BswModuleClientServerEntry</i> , <a href="#">BswVariableAccess</a> , <i>CouplingPortTrafficClassAssignment</i> , <i>DiagnosticEnvModeElement</i> , <i>EthernetPriorityRegeneration</i> , <i>ExclusiveAreaNestingOrder</i> , <i>HwDescriptionEntity</i> , <i>ImplementationProps</i> , <i>LinSlaveConfigIdent</i> , <a href="#">ModeTransition</a> , <i>MultilanguageReferrable</i> , <i>PncMappingIdent</i> , <i>SingleLanguageReferrable</i> , <i>SoConflPduIdentifier</i> , <i>SocketConnectionBundle</i> , <i>TimeSyncServerConfiguration</i> , <i>TpConnectionIdent</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
shortName	Identifier	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 B.116: Referrable**

<b>Class</b>	<b>RtePluginProps</b>			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::FlatMap			
<b>Note</b>	The properties of a communication graph with respect to the utilization of RTE Implementation Plug-in.			
<b>Base</b>	<i>AObject</i>			
<b>Aggregated by</b>	<a href="#">FlatInstanceDescriptor.rtePluginProps</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
associated CrossSwCluster ComRtePlugin	<a href="#">EcucContainerValue</a>	0..1	ref	This associates a communication graph to a specific RTE Implementation Plug-in handling cross Software Cluster communication.
associatedRte Plugin	<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 B.117: RtePluginProps**

<b>Class</b>	<b>RunnableEntity</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior			
<b>Note</b>	A RunnableEntity represents the smallest code-fragment that is provided by an AtomicSwComponent Type and are executed under control of the RTE. RunnableEntities are for instance set up to respond to data reception or operation invocation on a server.			
<b>Base</b>	<i>AObject</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <a href="#">ExecutableEntity</a> , <a href="#">Identifiable</a> , <i>MultilanguageReferrable</i> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <i>SwcInternalBehavior.runnable</i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
argument (ordered)	RunnableEntity Argument	*	aggr	This represents the formal definition of a an argument to a RunnableEntity.





Class	RunnableEntity			
asynchronous ServerCall ResultPoint	AsynchronousServer CallResultPoint	*	aggr	<p>The server call result point admits a runnable to fetch the result of an asynchronous server call.</p> <p>The aggregation of AsynchronousServerCallResultPoint 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.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=asynchronousServerCallResultPoint.shortName, asynchronousServerCallResultPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
canBelvoked Concurrently	Boolean	0..1	attr	<p>If the value of this attribute is set to "true" the enclosing RunnableEntity can be invoked concurrently (even for one instance of the corresponding AtomicSwComponent Type). This implies that it is the responsibility of the implementation of the RunnableEntity to take care of this form of concurrency.</p>
dataRead Access	<a href="#">VariableAccess</a>	*	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 <b>Tags:</b> atp.Splitkey=dataReadAccess.shortName, dataReadAccess.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
dataReceive PointBy Argument	<a href="#">VariableAccess</a>	*	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 <b>Tags:</b> atp.Splitkey=dataReceivePointByArgument.shortName, dataReceivePointByArgument.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>





Class	RunnableEntity			
dataReceivePointByValue	<a href="#">VariableAccess</a>	*	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 <b>Tags:</b> atp.Splitkey=dataReceivePointByValue.shortName, dataReceivePointByValue.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
dataSendPoint	<a href="#">VariableAccess</a>	*	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 <b>Tags:</b> atp.Splitkey=dataSendPoint.shortName, dataSendPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
dataWriteAccess	<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 <b>Tags:</b> atp.Splitkey=dataWriteAccess.shortName, dataWriteAccess.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
externalTriggeringPoint	<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 <b>Tags:</b> atp.Splitkey=externalTriggeringPoint.ident.shortName, externalTriggeringPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
internalTriggeringPoint	InternalTriggeringPoint	*	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 <b>Tags:</b> atp.Splitkey=internalTriggeringPoint.shortName, internalTriggeringPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>





Class	RunnableEntity			
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 <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 <b>Tags:</b> atp.Splitkey=modeSwitchPoint.shortName, modeSwitchPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
parameter Access	<a href="#">ParameterAccess</a>	*	aggr	<p>The presence of a ParameterAccess implies that a RunnableEntity needs read only access to a ParameterDataPrototype which may either be local or within a PortPrototype.</p> <p>The aggregation of ParameterAccess 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 ParameterAccess (points) in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=parameterAccess.shortName, parameterAccess.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
readLocal Variable	<a href="#">VariableAccess</a>	*	aggr	<p>The presence of a readLocalVariable implies that a RunnableEntity needs read access to a VariableDataPrototype in the role of implicitInterRunnableVariable or explicitInterRunnableVariable.</p> <p>The aggregation of readLocalVariable is subject to variability with the purpose to support the conditional existence of implicitInterRunnableVariable and explicitInterRunnableVariable or the variant existence of readLocalVariable (points) in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=readLocalVariable.shortName, readLocalVariable.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
serverCallPoint	<a href="#">ServerCallPoint</a>	*	aggr	<p>The RunnableEntity has a ServerCallPoint. The aggregation of ServerCallPoint is subject to variability with the purpose to support the conditional existence of client server PortPrototypes or the variant existence of server call points in the implementation.</p> <p><b>Stereotypes:</b> atpSplitable; atpVariation <b>Tags:</b> atp.Splitkey=serverCallPoint.shortName, serverCallPoint.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>





Class	RunnableEntity			
symbol	CIdentifier	0..1	attr	The symbol describing this RunnableEntity's entry point. This is considered the API of the RunnableEntity and is required during the RTE contract phase.
waitPoint	WaitPoint	*	aggr	The WaitPoint associated with the RunnableEntity.
writtenLocal Variable	<a href="#">VariableAccess</a>	*	aggr	<p>The presence of a writtenLocalVariable implies that a RunnableEntity needs write access to a VariableData Prototype in the role of implicitInterRunnableVariable or explicitInterRunnableVariable.</p> <p>The aggregation of writtenLocalVariable is subject to variability with the purpose to support the conditional existence of implicitInterRunnableVariable and explicitInterRunnableVariable or the variant existence of writtenLocalVariable (points) in the implementation.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=writtenLocalVariable.shortName, writtenLocalVariable.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>

**Table B.118: RunnableEntity**

Enumeration	SendIndicationEnum
Package	M2::AUTOSARTemplates::SystemTemplate::SoftwareCluster
Note	This meta-class provides a way to specify in which way redundancy shall be applied on collection level.
Aggregated by	<a href="#">DataComProps.sendIndication</a>
Literal	<b>Description</b>
anySendOperation	This value represents the requirement that any send operation of the Software Cluster is indicated. <b>Tags:</b> atp.EnumerationLiteralIndex=2
none	This value represents the requirement that send operations of the Software Cluster are not indicated. <b>Tags:</b> atp.EnumerationLiteralIndex=1

**Table B.119: SendIndicationEnum**

Class	SenderReceiverInterface			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	A sender/receiver interface declares a number of data elements to be sent and received. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
Base	<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>			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
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	MetaDataItemSet	*	aggr	This aggregation defines fixed sets of meta-data items associated with dataElements of the enclosing Sender ReceiverInterface

**Table B.120: SenderReceiverInterface**

<b>Class</b>	<b>ServerCallPoint</b> (abstract)			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::ServerCall			
<b>Note</b>	If a RunnableEntity owns a ServerCallPoint it is entitled to invoke a particular ClientServerOperation of a specific RPortPrototype of the corresponding AtomicSwComponentType			
<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>Subclasses</b>	AsynchronousServerCallPoint, <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> ROperationInAtomicSwc InstanceRef
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 B.121: ServerCallPoint**

<b>Class</b>	<b>ServerComSpec</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Communication			
<b>Note</b>	Communication attributes for a server port (PPortPrototype and ClientServerInterface).			
<b>Base</b>	ARObject, <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.
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.
transformation ComSpecProps	TransformationCom SpecProps	*	aggr	This references the TransformationComSpecProps which define port-specific configuration for data transformation.

**Table B.122: ServerComSpec**

<b>Class</b>	<b>SubElementMapping</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	This meta-class allows for the definition of mappings of elements of a composite data type.			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">DataPrototypeMapping.subElementMapping</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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> <a href="#">atp.Splitkey=firstElement</a> , <a href="#">firstElement.variation</a> <a href="#">Point.shortLabel</a> <a href="#">vh.latestBindingTime=preCompileTime</a>





Class	SubElementMapping			
secondElement	SubElementRef	0..1	aggr	This represents the second element referenced in the scope of the mapping. <b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=secondElement, secondElement.variation Point.shortLabel vh.latestBindingTime=preCompileTime
textTableMapping	TextTableMapping	0..2	aggr	This allows for the text-table translation of individual elements of a composite data type.

**Table B.123: SubElementMapping**

Class	SwBaseType			
Package	M2::MSR::AsamHdo::BaseTypes			
Note	This meta-class represents a base type used within ECU software. <b>Tags:</b> atp.recommendedPackage=BaseTypes			
Base	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, Base Type, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Aggregated by	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

**Table B.124: SwBaseType**

Enumeration	SwCalibrationAccessEnum			
Package	M2::MSR::DataDictionary::DataDefProperties			
Note	Determines the access rights to a data object w.r.t. measurement and calibration.			
Aggregated by	<a href="#">ModeDeclarationGroupPrototype.swCalibrationAccess</a> , SwCalprmAxis.swCalibrationAccess, <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 B.125: SwCalibrationAccessEnum**

Class	SwComponentPrototype			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Composition			
Note	Role of a software component within a composition.			
Base	ARObject, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, Referrable			
Aggregated by	AtpClassifier.atpFeature, <a href="#">CompositionSwComponentType.component</a>			
Attribute	Type	Mult.	Kind	Note
type	SwComponentType	0..1	tref	Type of the instance. <b>Stereotypes:</b> isOfType

**Table B.126: SwComponentPrototype**



<b>Class</b>	<<atpVariation>> <b>SwDataDefProps</b>			
<b>Package</b>	M2::MSR::DataDictionary::DataDefProperties			
<b>Note</b>	<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 SwDataDefProps 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>SwDataDefProps 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 recordLayouts which specify how such elements are mapped/converted to the DataTypes in the programming language (or in AUTOSAR). This is mainly expressed by properties like swRecordLayout and swCalprmAxisSet</li> <li>• Implementation aspects, mainly expressed by swImplPolicy, swVariableAccessImplPolicy, swAddr Method, swPointerTargetProps, baseType, implementationDataType and additionalNativeTypeQualifier</li> <li>• Access policy for the MCD system, mainly expressed by swCalibrationAccess</li> <li>• Semantics of the data element, mainly expressed by compuMethod and/or unit, dataConstr, invalid Value</li> <li>• Code generation policy provided by swRecordLayout</li> </ul> <p><b>Tags:</b> vh.latestBindingTime=codeGenerationTime</p>			
<b>Base</b>	ARObject			
<b>Aggregated by</b>	<a href="#">AutosarDataType.swDataDefProps</a> , CompositeNetworkRepresentation.networkRepresentation, <a href="#">Data Prototype.swDataDefProps</a> , DataPrototypeTransformationProps.networkRepresentationProps, DiagnosticDataElement.swDataDefProps, DiagnosticEnvDataElementCondition.swDataDefProps, Dlt Argument.networkRepresentation, <a href="#">FlatInstanceDescriptor.swDataDefProps</a> , <a href="#">ImplementationDataType Element.swDataDefProps</a> , InstantiationDataDefProps.swDataDefProps, ISignal.networkRepresentation Props, <a href="#">McDataInstance.resultingProperties</a> , <a href="#">ParameterAccess.swDataDefProps</a> , PerInstanceMemory.sw DataDefProps, <a href="#">ReceiverComSpec.networkRepresentation</a> , <a href="#">SenderComSpec.networkRepresentation</a> , SomeipDataPrototypeTransformationProps.networkRepresentation, SwPointerTargetProps.swDataDef Props, SwServiceArg.swDataDefProps, SwSystemconst.swDataDefProps, SystemSignal.physicalProps			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
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>





Class	<<atpVariation>> SwDataDefProps			
displayFormat	DisplayFormatString	0..1	attr	This property describes how a number is to be rendered e.g. in documents or in a measurement and calibration system. <b>Tags:</b> xml.sequenceOffset=210
displayPresentation	DisplayPresentationEnum	0..1	attr	This attribute controls the presentation of the related data for measurement and calibration tools.
implementationDataType	AbstractImplementationDataType	0..1	ref	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 <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> <b>Tags:</b> xml.sequenceOffset=215
invalidValue	ValueSpecification	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	SwAddrMethod	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
swBitRepresentation	SwBitRepresentation	0..1	aggr	Description of the binary representation in case of a bit variable. <b>Tags:</b> xml.sequenceOffset=60
swCalibrationAccess	<a href="#">SwCalibrationAccessEnum</a>	0..1	attr	Specifies the read or write access by MCD tools for this data object. <b>Tags:</b> xml.sequenceOffset=70
swCalprmAxisSet	SwCalprmAxisSet	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
swComparisonVariable	SwVariableRefProxy	*	aggr	Variables used for comparison in an MCD process. <b>Tags:</b> xml.sequenceOffset=170 xml.typeElement=false





<b>Class</b>	<b>&lt;&lt;atpVariation&gt;&gt; SwDataDefProps</b>			
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	SwVariableRefProxy	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	Numerical	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
swInterpolation Method	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
swPointerTarget Props	SwPointerTargetProps	0..1	aggr	Specifies that the containing data object is a pointer to another data object.  Note: This atpSplitable property has no atp.Splitkey due to atpVariation (PropertySetPattern). <b>Stereotypes:</b> atpSplitable <b>Tags:</b> xml.sequenceOffset=280
swRecord Layout	<a href="#">SwRecordLayout</a>	0..1	ref	Record layout for this data object. <b>Tags:</b> xml.sequenceOffset=290





<b>Class</b>	<b>&lt;&lt;atpVariation&gt;&gt; SwDataDefProps</b>			
swRefresh Timing	MultidimensionalTime	0..1	aggr	<p>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.</p> <p>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.</p> <p><b>Tags:</b> xml.sequenceOffset=300</p>
swTextProps	SwTextProps	0..1	aggr	<p>the specific properties if the data object is a text object.</p> <p><b>Tags:</b> xml.sequenceOffset=120</p>
swValueBlock Size	Numerical	0..1	attr	<p>This represents the size of a Value Block</p> <p><b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime xml.sequenceOffset=80</p>
swValueBlock SizeMult (ordered)	Numerical	*	attr	<p>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.</p> <p>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.</p> <p>For one-dimensional value blocks the attribute swValueBlockSize shall be used and this attribute shall not exist.</p> <p><b>Stereotypes:</b> atpVariation <b>Tags:</b> vh.latestBindingTime=preCompileTime</p>
unit	<a href="#">Unit</a>	0..1	ref	<p>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.</p> <p><b>Tags:</b> xml.sequenceOffset=350</p>
valueAxisData Type	<a href="#">ApplicationPrimitive DataType</a>	0..1	ref	<p>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.</p> <p><b>Tags:</b> xml.sequenceOffset=355</p>

**Table B.127: SwDataDefProps**

<b>Enumeration</b>	<b>SwImplPolicyEnum</b>
<b>Package</b>	M2::MSR::DataDictionary::DataDefProperties
<b>Note</b>	Specifies the implementation strategy with respect to consistency mechanisms of variables.
<b>Aggregated by</b>	BswInternalTriggeringPoint.swImplPolicy, InternalTriggeringPoint.swImplPolicy, <a href="#">SwDataDefProps.swImplPolicy</a> , <a href="#">Trigger.swImplPolicy</a>
<b>Literal</b>	<b>Description</b>
const	<p>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.</p> <p><b>Tags:</b> atp.EnumerationLiteralIndex=0</p>





Enumeration	SwImplPolicyEnum
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
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 B.128: SwImplPolicyEnum**

Class	SwRecordLayout			
<b>Package</b>	M2::MSR::DataDictionary::RecordLayout			
<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> , MultilanguageReferrable, PackageableElement, <a href="#">Referrable</a>			
<b>Aggregated by</b>	ARPackage.element			
Attribute	Type	Mult.	Kind	Note
swRecordLayoutGroup	SwRecordLayoutGroup	0..1	aggr	This is the top level record layout group. <b>Tags:</b> xml.roleElement=true xml.roleWrapperElement=false xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false

**Table B.129: SwRecordLayout**

Class	SwcModeSwitchEvent			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This event is raised when the specified mode change occurs.			
<b>Base</b>	ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a> , MultilanguageReferrable, <a href="#">RTEEvent</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	AtpClassifier.atpFeature, SwcInternalBehavior.event			
Attribute	Type	Mult.	Kind	Note
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.





Class		SwcModeSwitchEvent		
mode (ordered)	<a href="#">ModeDeclaration</a>	0..2	iref	The referenced mode or the transition between two modes raises this SwcModeSwitchEvent.  <b>InstanceRef implemented by:</b> <a href="#">RModeInAtomicSwcInstanceRef</a>

**Table B.130: SwcModeSwitchEvent**

Class		SynchronousServerCallPoint		
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::ServerCall			
<b>Note</b>	This means that the RunnableEntity is supposed to perform a blocking wait for a response from the server.			
<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> , <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>
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 B.131: SynchronousServerCallPoint**

Class		System		
<b>Package</b>	M2::AUTOSARTemplates::SystemTemplate			
<b>Note</b>	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			
<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> , <a href="#">UploadableDesignElement</a> , <a href="#">UploadablePackageElement</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>
clientId DefinitionSet	ClientIdDefinitionSet	*	ref	Set of Client Identifiers that are used for inter-ECU client-server communication in the System.
containerIPdu HeaderByte Order	ByteOrderEnum	0..1	attr	Defines the byteOrder of the header in ContainerIPdus.
ecuExtract Version	RevisionLabelString	0..1	attr	Version number of the Ecu Extract.





Class	System			
fibexElement	FibexElement	*	ref	<p>Reference to ASAM FIBEX elements specifying Communication and Topology.</p> <p>All Fibex Elements used within a System Description shall be referenced from the System Element.</p> <p>atpVariation: In order to describe a product-line, all Fibex Elements can be optional.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=fibexElement.fibexElement, fibexElement.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
interpolationRoutineMappingSet	InterpolationRoutineMappingSet	*	ref	<p>This reference identifies the InterpolationRoutineMapping Sets that are relevant in the context of the enclosing System.</p>
j1939SharedAddressCluster	J1939SharedAddressCluster	*	aggr	<p>Collection of J1939Clusters that share a common address space for the routing of messages.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=j1939SharedAddressCluster.shortName, j1939SharedAddressCluster.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
mapping	SystemMapping	*	aggr	<p>Aggregation of all mapping aspects (mapping of SW components to ECUs, mapping of data elements to signals, and mapping constraints).</p> <p>In order to support OEM / Tier 1 interaction and shared development for one common System this aggregation is atpSplittable and atpVariation. The content of System Mapping can be provided by several parties using different names for the SystemMapping.</p> <p>This element is not required when the System description is used for a network-only use-case.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=mapping.shortName, mapping.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
pncVectorLength	PositiveInteger	0..1	attr	<p>Length of the partial networking request release information vector (in bytes).</p>
pncVectorOffset	PositiveInteger	0..1	attr	<p>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.</p>
rootSoftwareComposition	RootSwCompositionPrototype	0..1	aggr	<p>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.</p> <p>atpVariation: The RootSwCompositionPrototype can vary.</p> <p><b>Stereotypes:</b> atpSplittable; atpVariation <b>Tags:</b> atp.Splitkey=rootSoftwareComposition.shortName, rootSoftwareComposition.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime</p>





Class	System			
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
systemDocumentation	Chapter	*	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
systemVersion	RevisionLabelString	0..1	attr	Version number of the System Description.

**Table B.132: System**

Class	TimingEvent			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::RTEEvents			
<b>Note</b>	This event is used to start RunnableEntities that shall be executed periodically.			
<b>Base</b>	<i>ARObject, AbstractEvent, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a>, MultilanguageReferrable, <a href="#">RTEEvent</a>, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature, SwcInternalBehavior.event</i>			
<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 RunnableEntity triggered by the mapped TimingEvent relative to the periodic activation of the time base of this TimingEvent. Unit: second.
period	TimeValue	0..1	attr	Period of timing event in seconds. The value of this attribute shall be greater than zero.

**Table B.133: TimingEvent**

Class	Trigger			
<b>Package</b>	M2::AUTOSARTemplates::CommonStructure::TriggerDeclaration			
<b>Note</b>	A trigger which is provided (i.e. released) or required (i.e. used to activate something) in the given context.			
<b>Base</b>	<i>ARObject, AtpClassifier, AtpFeature, AtpStructureElement, <a href="#">Identifiable</a>, MultilanguageReferrable, <a href="#">Referrable</a></i>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature, BswModuleDescription.releasedTrigger, BswModuleDescription.requiredTrigger, ServiceInterface.trigger, <a href="#">TriggerInterface.trigger</a></i>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
swImplPolicy	<a href="#">SwImplPolicyEnum</a>	0..1	attr	This attribute, when set to value queued, allows for a queued processing of Triggers.
triggerPeriod	MultidimensionalTime	0..1	aggr	Optional definition of a period in case of a periodically (time or angle) driven external trigger.

**Table B.134: Trigger**



<b>Class</b>	<b>TriggerInterface</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
<b>Note</b>	A trigger interface declares a number of triggers that can be sent by an trigger source. <b>Tags:</b> atp.recommendedPackage=PortInterfaces			
<b>Base</b>	ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, PortInterface, Referrable			
<b>Aggregated by</b>	ARPackage.element			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
trigger	Trigger	*	aggr	The Trigger of this trigger interface.

**Table B.135: TriggerInterface**

<b>Class</b>	<b>Unit</b>			
<b>Package</b>	M2::MSR::AsamHdo::Units			
<b>Note</b>	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. For the calculation from SI-unit to the defined unit the factor (factorSiToUnit ) and the offset (offsetSiToUnit ) are applied as follows: $x \{unit\} := y * \{siUnit\} * factorSiToUnit \{unit\} / \{siUnit\} + offsetSiToUnit \{unit\}$ For the calculation from a unit to SI-unit the reciprocal of the factor (factorSiToUnit ) and the negation of the offset (offsetSiToUnit ) are applied. $y \{siUnit\} := (x * \{unit\} - offsetSiToUnit \{unit\}) / (factorSiToUnit \{unit\} / \{siUnit\})$ <b>Tags:</b> atp.recommendedPackage=Units			
<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>
displayName	SingleLanguageUnit Names	0..1	aggr	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. <b>Tags:</b> xml.sequenceOffset=20
factorSiToUnit	Float	0..1	attr	This is the factor for the conversion from SI Units to units. The inverse is used for conversion from units to SI Units. <b>Tags:</b> xml.sequenceOffset=30
offsetSiToUnit	Float	0..1	attr	This is the offset for the conversion from and to siUnits. <b>Tags:</b> xml.sequenceOffset=40
physical Dimension	PhysicalDimension	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 B.136: Unit**

<b>Class</b>	<b>VariableAccess</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::DataElements			
<b>Note</b>	The presence of a VariableAccess implies that a RunnableEntity needs access to a VariableData Prototype. The kind of access is specified by the role in which the class is used.			





<b>Class</b>	<b>VariableAccess</b>			
<b>Base</b>	<i>ARObject</i> , <a href="#">AbstractAccessPoint</a> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	<i>AtpClassifier.atpFeature</i> , <i>ReceiverComSpec.replaceWith</i> , <a href="#">RunnableEntity.dataReadAccess</a> , <a href="#">RunnableEntity.dataReceivePointByArgument</a> , <a href="#">RunnableEntity.dataReceivePointByValue</a> , <a href="#">RunnableEntity.dataSendPoint</a> , <a href="#">RunnableEntity.dataWriteAccess</a> , <a href="#">RunnableEntity.readLocalVariable</a> , <a href="#">RunnableEntity.writtenLocalVariable</a>			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
accessed Variable	AutosarVariableRef	0..1	aggr	This denotes the accessed variable.
scope	VariableAccessScope Enum	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 B.137: VariableAccess**

<b>Class</b>	<b>VariableDataPrototype</b>			
<b>Package</b>	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
<b>Note</b>	A VariableDataPrototype represents a formalized generic piece of information that is typically mutable by the application software layer. VariableDataPrototype is used in various contexts and the specific context gives the otherwise generic VariableDataPrototype a dedicated semantics.			
<b>Base</b>	<i>ARObject</i> , <i>AtpFeature</i> , <i>AtpPrototype</i> , <a href="#">AutosarDataPrototype</a> , <a href="#">DataPrototype</a> , <a href="#">Identifiable</a> , <a href="#">MultilanguageReferrable</a> , <a href="#">Referrable</a>			
<b>Aggregated by</b>	ApplicationInterface.indication, <i>AtpClassifier.atpFeature</i> , BswInternalBehavior.arTypedPerInstanceMemory, <a href="#">BswModuleDescription.providedData</a> , <a href="#">BswModuleDescription.requiredData</a> , BulkNvDataDescriptor.bulkNvBlock, <a href="#">InternalBehavior.staticMemory</a> , NvBlockDescriptor.ramBlock, <a href="#">NvDataInterface.nvData</a> , <a href="#">SenderReceiverInterface.dataElement</a> , ServiceInterface.event, SwcInternalBehavior.arTypedPerInstanceMemory, SwcInternalBehavior.explicitInterRunnableVariable, SwcInternalBehavior.implicitInterRunnableVariable			
<b>Attribute</b>	<b>Type</b>	<b>Mult.</b>	<b>Kind</b>	<b>Note</b>
initValue	ValueSpecification	0..1	aggr	Specifies initial value(s) of the VariableDataPrototype

**Table B.138: VariableDataPrototype**

## C Referenced ECUC Configuration Parameters

### C.1 EcuC

#### C.1.1 EcucPartition

<b>SWS Item</b>	[ECUC_EcuC_00005]		
<b>Container Name</b>	EcucPartition		
<b>Parent Container</b>	EcucPartitionCollection		
<b>Description</b>	Definition of one Partition on this ECU. One Partition will be implemented using one Os-Application.		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_EcuC_00037]		
<b>Parameter Name</b>	EcucDefaultBswPartition		
<b>Parent Container</b>	<a href="#">EcucPartition</a>		
<b>Description</b>	Denotes the default BSW partition. This partition will host all BSW Modules, which are not explicitly mapped to a different partition.  For partitions other than the default BSW partition this parameter can be omitted.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	[ECUC_EcuC_00085]		
<b>Parameter Name</b>	EcucPartitionId		
<b>Parent Container</b>	<a href="#">EcucPartition</a>		
<b>Description</b>	ID of the partition.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	





	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_EcuC_00006]</b>		
<b>Parameter Name</b>	PartitionCanBeRestarted		
<b>Parent Container</b>	<a href="#">EcuPartition</a>		
<b>Description</b>	Specifies the requirement whether the Partition can be restarted. If set to true all software executing in this partition shall be capable of handling a restart.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcuBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_EcuC_00083]</b>		
<b>Parameter Name</b>	EcuEcuPartitionRef		
<b>Parent Container</b>	<a href="#">EcuPartition</a>		
<b>Description</b>	Reference to the EcuPartition to define the link to the partition described in the System description. <b>Tags:</b> atp.Status=draft		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to ECU-PARTITION		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_EcuC_00068]</b>		
<b>Parameter Name</b>	EcuPartitionBswModuleDistinguishedPartition		
<b>Parent Container</b>	<a href="#">EcuPartition</a>		
<b>Description</b>	This maps the abstract partition of the Bsw Module to a concrete Partition existing in the ECU.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Foreign reference to BSW-DISTINGUISHED-PARTITION		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	





<b>Scope / Dependency</b>			
<b>SWS Item</b>	[ECUC_EcuC_00086]		
<b>Parameter Name</b>	EcucPartitionCoreRef		
<b>Parent Container</b>	<a href="#">EcucPartition</a>		
<b>Description</b>	Reference to the core definition. This reference is used to describe to which core the EcucPartition is bound.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to EcucCoreDefinition		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_EcuC_00036]		
<b>Parameter Name</b>	EcucPartitionSoftwareComponentInstanceRef		
<b>Parent Container</b>	<a href="#">EcucPartition</a>		
<b>Description</b>	References the SW Component instances from the Ecu Extract that shall be executed in this partition.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Instance reference to SW-COMPONENT-PROTOTYPE context: ROOT-SW-COMPOSITION-PROTOTYPE		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

No Included Containers

## C.1.2 Pdu

<b>SWS Item</b>	[ECUC_EcuC_00001]
<b>Container Name</b>	Pdu
<b>Parent Container</b>	EcucPduCollection
<b>Description</b>	One Pdu flowing through the COM-Stack. This Pdu is used by all Com-Stack modules to agree on referencing the same Pdu.





<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_EcuC_00078]</b>		
<b>Parameter Name</b>	DynamicLength		
<b>Parent Container</b>	<a href="#">Pdu</a>		
<b>Description</b>	This parameter defines whether the Pdu has dynamic length (true) or not (false). Please note that the usage of this attribute is restricted by [constr_3448].		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_EcuC_00072]</b>		
<b>Parameter Name</b>	J1939Requestable		
<b>Parent Container</b>	<a href="#">Pdu</a>		
<b>Description</b>	Pdu can be triggered by the J1939 request message.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_EcuC_00087]</b>		
<b>Parameter Name</b>	KeepLocalPduBuffer		
<b>Parent Container</b>	<a href="#">Pdu</a>		





<b>Description</b>	<p>This parameter defines whether a module that handles the PDU would keep a temporary local buffer</p> <ul style="list-style-type: none"> <li>• until a confirmation or release-rx-buffer function call arrives (KeepLocalPduBuffer = TRUE) or</li> <li>• if a temporary local buffer is released after transmission or rx indication return (KeepLocalPduBuffer = FALSE).</li> </ul> <p><b>Tags:</b> atp.Status=draft</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	[ECUC_EcuC_00003]		
<b>Parameter Name</b>	PduLength		
<b>Parent Container</b>	<a href="#">Pdu</a>		
<b>Description</b>	Length of the Pdu in bytes. 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.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>			

<b>SWS Item</b>	[ECUC_EcuC_00082]		
<b>Parameter Name</b>	EcucPduDefaultPartitionRef		
<b>Parent Container</b>	<a href="#">Pdu</a>		
<b>Description</b>	Reference to EcucPartition, where the according Pdu is assigned to.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	





<b>Scope / Dependency</b>	scope: local
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<b>SWS Item</b>	<b>[ECUC_EcuC_00077]</b>		
<b>Parameter Name</b>	MetaDataTypeRef		
<b>Parent Container</b>	Pdu		
<b>Description</b>	Reference to meta data that is transported in the Pdu through the AUTOSAR layers.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to MetaDataType		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_EcuC_00052]</b>		
<b>Parameter Name</b>	SysTPduToFrameTriggeringRef		
<b>Parent Container</b>	Pdu		
<b>Description</b>	Reference to the FrameTriggering from the SystemTemplate which this Pdu belongs to. SysTPduToFrameTriggeringRef shall be used for UserDefinedPdu, NmPdu and NPdus which are not going through the Pdu Router. This reference shall not be used if SysTPduToPduTriggeringRef exists.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to FRAME-TRIGGERING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	dependency: SysTPduToFrameTriggeringRef shall be used for UserDefinedPdu, Nm Pdu and NPdus which are not going through the Pdu Router. This reference shall not be used if SysTPduToPduTriggeringRef exists.		

<b>SWS Item</b>	<b>[ECUC_EcuC_00054]</b>		
<b>Parameter Name</b>	SysTPduToPduTriggeringRef		
<b>Parent Container</b>	Pdu		
<b>Description</b>	Reference to the PduTriggering from the SystemTemplate which this Pdu represents. SysTPduToPduTriggeringRef shall be used for all Pdus except UserDefinedPdu, Nm Pdu and NPdus which are not going through the Pdu Router. For these Pdus, Sys TPduToFrameTriggeringRef shall be used.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to PDU-TRIGGERING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	







	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	dependency: SysTPduToPduTriggeringRef shall be used for all Pdus except User DefinedPdus, NmPdus and NPdus which are not going through the Pdu Router. This reference shall not be used if SysTPduToFrameTriggeringRef exists.		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">EcucPduDedicatedPartition</a>	0..*	Module specific container for Pdu to partition assignment.

### C.1.3 EcucPduDedicatedPartition

<b>SWS Item</b>	[ECUC_EcuC_00079]		
<b>Container Name</b>	EcucPduDedicatedPartition		
<b>Parent Container</b>	<a href="#">Pdu</a>		
<b>Description</b>	Module specific container for Pdu to partition assignment.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_EcuC_00080]		
<b>Parameter Name</b>	EcucPduDedicatedPartitionBswModuleRef		
<b>Parent Container</b>	<a href="#">EcucPduDedicatedPartition</a>		
<b>Description</b>	Reference to BSW module, for which the according dedicated Pdu assignment is valid.		
<b>Multiplicity</b>	1		
<b>Type</b>	Foreign reference to ECUC-MODULE-CONFIGURATION-VALUES		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_EcuC_00081]		
<b>Parameter Name</b>	EcucPduDedicatedPartitionRef		
<b>Parent Container</b>	<a href="#">EcucPduDedicatedPartition</a>		
<b>Description</b>	Module specific reference to EcucPartition, where the according Pdu is assigned to. The dedicated partition reference shall overrule the default partition reference for the respective module.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Post-Build Variant Value</b>	false		





Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers
------------------------

## C.2 RTE

### C.2.1 RteEventToTaskMapping

SWS Item	[ECUC_Rte_09020]
Container Name	RteEventToTaskMapping
Parent Container	RteSwComponentInstance
Description	Maps an instance of a RunnableEntity onto one OsTask based on the activating RTEEvent. In the case of a RunnableEntity executed via a direct or trusted function call this RteEventToTaskMapping is still specified but no RteMappedToTask element is included. The RtePositionInTask parameter is necessary to provide an ordering of events invoked by the same RTE API.
Configuration Parameters	

SWS Item	[ECUC_Rte_09018]		
Parameter Name	RteActivationOffset		
Parent Container	<a href="#">RteEventToTaskMapping</a>		
Description	Activation offset in seconds.		
Multiplicity	0..1		
Type	EcucFloatParamDef		
Range	[0 .. INF]		
Default value	–		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

SWS Item	[ECUC_Rte_09092]
Parameter Name	RteImmediateRestart
Parent Container	<a href="#">RteEventToTaskMapping</a>





<b>Description</b>	<p>When RteImmediateRestart is set to true the RunnableEntity shall be immediately re-started after termination if it was activated by this RTEEvent while it was already started.</p> <p>This parameter shall not be set to true when the mapped RTEEvent refers to a RunnableEntity which minimumStartInterval attribute is &gt; 0.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Rte_09022]		
<b>Parameter Name</b>	RteOsSchedulePoint		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	<p>Introduce a schedule point by explicitly calling Os Schedule service after the execution of the ExecutableEntity. The Rte generator is allowed to optimize several consecutive calls to Os schedule into one single call if the ExecutableEntity executions in between have been skipped.</p> <p>The absence of this parameter is interpreted as "NONE".</p> <p>It shall be considered an invalid configuration if the task is preemptable and the value of this parameter is not set to "NONE" or the parameter is absent.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	CONDITIONAL	A Schedule Point shall be introduced at the end of the execution of this ExecutableEntity. The Schedule Point can be skipped if several Schedule Points would be called without any ExecutableEntity execution in between.	
	NONE	No Schedule Point shall be introduced at the end of the execution of this ExecutableEntity.	
	UNCONDITIONAL	A Schedule Point shall always be introduced at the end of the execution of this ExecutableEntity.	
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Rte_09023]		
<b>Parameter Name</b>	RtePositionInTask		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		





<b>Description</b>	Each RunnableEntity mapped to an OsTask has a specific position within the task execution. For periodic activation this is the order of execution. For event driver activation this is the order of evaluation which actual RunnableEntity has to be executed. In case of direct or trusted function calls this parameter is necessary to provide an ordering of events when several ExecutableEntities are invoked by the same RTE API.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09214]</b>		
<b>Parameter Name</b>	RteServerNumberOfRequestProcessing		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	Specifies the maximum number of queued requests that can be handled within one Os Task execution.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09133]</b>		
<b>Parameter Name</b>	RteServerQueueLength		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	Specifies the length of the queue for the server call serialization. This value overwrites the queueLength specified at the ServerComSpec.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	-		





<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Rte_09128]		
<b>Parameter Name</b>	RteEventPredecessorSyncPointRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	<p>The RteEventPredecessorSyncPointRef is necessary to provide a cross core synchronization in case of RteEvents triggered by the same event source but mapped to tasks belonging to different partitions on different cores.</p> <p>The synchronization point must be reached by all referencing RteEvents before the execution in all related tasks is continued.</p> <p>In case of RteEventPredecessorSyncPointRef the RunnableEntity activated by the mapped RteEvent is executed after the synchronization point is passed.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to RteSyncPoint		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Rte_09019]		
<b>Parameter Name</b>	RteEventRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	Reference to the description of the RTEEvent which is pointing to the RunnableEntity being mapped. This allows a fine grained mapping of RunnableEntites based on the activating RTEEvent.		
<b>Multiplicity</b>	1..*		
<b>Type</b>	Foreign reference to RTE-EVENT		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09129]</b>		
<b>Parameter Name</b>	RteEventSuccessorSyncPointRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	<p>The RteEventSuccessorSyncPointRef is necessary to provide a cross core synchronization in case of RteEvents triggered by the same event source but mapped to tasks belonging to different partitions on different cores.</p> <p>The synchronization point must be reached by all referencing RteEvents before the execution in all related tasks is continued.</p> <p>In case of RteEventSuccessorSyncPointRef the RunnableEntity activated by the mapped RteEvent is executed before the synchronization point is entered.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to RteSyncPoint		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09021]</b>		
<b>Parameter Name</b>	RteMappedToTaskRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	<p>Reference to the OsTask the RunnableEntity activated by the RteEventRef is mapped to.</p> <p>If no reference to the OsTask is specified the RunnableEntity shall be executed via a direct or trusted function call.</p> <p>The fact that no reference to an OsTask is specified for a RunnableEntity does not necessarily imply that every RTE generator has to support the implementation of this RunnableEntity as a direct or trusted function call. The standard set of use cases for direct or trusted function calls that has to be supported by every RTE generator is explicitly stated as requirements in this document. For further optimization RTE vendors are free to support additional scenarios of direct or trusted function call implementations that are not explicitly required in this document.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">OsTask</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_89005]</b>		
<b>Parameter Name</b>	RteRipsFillRoutineRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	Reference to a Buffer-Fill Routine implemented by an RTE Implementation Plug-In. This routine gets invoked directly before the ExecutableEntity is started. <b>Attributes:</b> requiresIndex=true		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to destinationUri RteRipsUriDefSet/RteRipsPluginFillFlushRoutine		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_89006]</b>		
<b>Parameter Name</b>	RteRipsFlushRoutineRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	Reference to a Buffer-Flush Routine implemented by an RTE Implementation Plug-In. This routine gets invoked directly after the ExecutableEntity has terminated. <b>Attributes:</b> requiresIndex=true		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to destinationUri RteRipsUriDefSet/RteRipsPluginFillFlushRoutine		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_89008]</b>		
<b>Parameter Name</b>	RteRipsInvocationHandlerRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	Reference to a Buffer-Fill Routine implemented by an RTE Implementation Plug-In. This routine gets invoked directly before the ExecutableEntity is started.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to destinationUri RteRipsUriDefSet/RteRipsInvocationHandler		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	





	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09116]</b>		
<b>Parameter Name</b>	RteUsedInitFnc		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	The RunnableEntity is executed during initialization in the context of the Rte_Init_<Init Container> function.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">RteInitializationRunnableBatch</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09024]</b>		
<b>Parameter Name</b>	RteUsedOsAlarmRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	If an OsAlarm is used to activate the OsTask this RteEvent is mapped to it shall be referenced here.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">OsAlarm</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09025]</b>		
<b>Parameter Name</b>	RteUsedOsEventRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	If an OsEvent is used to activate the OsTask this RteEvent is mapped to it shall be referenced here.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">OsEvent</a>		
<b>Post-Build Variant Multiplicity</b>	false		







<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09026]</b>		
<b>Parameter Name</b>	RteUsedOsSchTblExpiryPointRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	If an OsScheduleTableExpiryPoint is used to activate the OsTask this RteEvent is mapped to it shall be referenced here.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">OsScheduleTableExpiryPoint</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Rte_09027]</b>		
<b>Parameter Name</b>	RteVirtuallyMappedToTaskRef		
<b>Parent Container</b>	<a href="#">RteEventToTaskMapping</a>		
<b>Description</b>	Optional reference to an OsTask where the activation of this RteEvent shall be evaluated. The actual execution of the Runnable Entity shall happen in the OsTask referenced by RteMappedToTaskRef.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">OsTask</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>No Included Containers</b>
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## C.2.2 RteInitializationRunnableBatch

<b>SWS Item</b>	[ECUC_Rte_09115]
<b>Container Name</b>	RteInitializationRunnableBatch
<b>Parent Container</b>	Rte
<b>Description</b>	This container corresponds to an Rte_Init_<shortName of this container> function invoking the mapped RunnableEntities.
<b>Configuration Parameters</b>	

<b>No Included Containers</b>
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## C.3 Os

### C.3.1 OsAlarm

<b>SWS Item</b>	[ECUC_Os_00003]
<b>Container Name</b>	OsAlarm
<b>Parent Container</b>	Os
<b>Description</b>	An OsAlarm may be used to asynchronously inform or activate a specific task. It is possible to start alarms automatically at system start-up depending on the application mode.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Os_00004]		
<b>Parameter Name</b>	OsAlarmAccessingApplication		
<b>Parent Container</b>	<a href="#">OsAlarm</a>		
<b>Description</b>	Reference to applications which have an access to this object.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsApplication</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	[ECUC_Os_00005]
<b>Parameter Name</b>	OsAlarmCounterRef
<b>Parent Container</b>	<a href="#">OsAlarm</a>
<b>Description</b>	Reference to the assigned counter for that alarm
<b>Multiplicity</b>	1
<b>Type</b>	Reference to <a href="#">OsCounter</a>





<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
OsAlarmAction	1	This container defines which type of notification is used when the alarm expires.
OsAlarmAutostart	0..1	If present this container defines if an alarm is started automatically at system start-up depending on the application mode.

### C.3.2 OsApplication

<b>SWS Item</b>	[ECUC_Os_00114]
<b>Container Name</b>	OsApplication
<b>Parent Container</b>	Os
<b>Description</b>	<p>An AUTOSAR OS must be capable of supporting a collection of OS objects (tasks, interrupts, alarms, hooks etc.) that form a cohesive functional unit. This collection of objects is termed an OS-Application.</p> <p>All objects which belong to the same OS-Application have access to each other. Access means to allow to use these objects within API services.</p> <p>Access by other applications can be granted separately.</p>
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Os_00115]		
<b>Parameter Name</b>	OsTrusted		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	<p>Parameter to specify if an OS-Application is trusted or not.</p> <p>true: OS-Application is trusted false: OS-Application is not trusted (default)</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU dependency: Required for scalability class 3 and 4.		

<b>SWS Item</b>	[ECUC_Os_00395]
<b>Parameter Name</b>	OsTrustedApplicationDelayTimingViolationCall
<b>Parent Container</b>	<a href="#">OsApplication</a>





<b>Description</b>	Parameter to specify if a timing violation which occurs within an trusted OS-Application is raised immediately of if it is delayed until the current task returns to the calling OS-Application (return of CallTrustedFunction) true: violation / call to ProtectionHook() is delayed false: timing violation cause an immediate call to the ProtectionHook().		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	true		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00394]</b>		
<b>Parameter Name</b>	OsTrustedApplicationWithProtection		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	Parameter to specify if a trusted OS-Application is executed with memory protection or not.  true: OS-Application runs within a protected environment. This means that write access is limited. false: OS-Application has full write access (default)		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00231]</b>		
<b>Parameter Name</b>	OsAppAlarmRef		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	Specifies the OsAlarms that belong to the OsApplication.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsAlarm</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00234]</b>		
<b>Parameter Name</b>	OsAppCounterRef		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	References the OsCounters that belong to the OsApplication.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsCounter</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00392]</b>		
<b>Parameter Name</b>	OsAppEcucPartitionRef		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	Denotes which "EcucPartition" is implemented by this "OSApplication".		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00221]</b>		
<b>Parameter Name</b>	OsApplsRef		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	references which OsIrs belong to the OsApplication		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsIrs</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00230]</b>		
<b>Parameter Name</b>	OsAppScheduleTableRef		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	References the OsScheduleTables that belong to the OsApplication.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsScheduleTable</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00116]</b>		
<b>Parameter Name</b>	OsAppTaskRef		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	references which OsTasks belong to the OsApplication		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsTask</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00402]</b>		
<b>Parameter Name</b>	OsMemoryMappingCodeLocationRef		
<b>Parent Container</b>	<a href="#">OsApplication</a>		
<b>Description</b>	Reference to the memory mapping containing details about the section where the code is placed.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to SW-ADDR-METHOD		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Os_00120]		
<b>Parameter Name</b>	OsRestartTask		
<b>Parent Container</b>	OsApplication		
<b>Description</b>	<p>Optionally one task of an OS-Application may be defined as Restart Task.</p> <p>Multiplicity = 1: Restart Task is activated by the Operating System if the protection hook requests it.</p> <p>Multiplicity = 0: No task is automatically started after a protection error happened.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to OsTask		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU dependency: Required for scalability class 3 and 4.		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
OsApplicationHooks	1	Container to structure the OS-Application-specific hooks
OsApplicationTrustedFunction	0..*	Container to structure the configuration parameters of trusted functions

### C.3.3 OsCounter

<b>SWS Item</b>	[ECUC_Os_00026]		
<b>Container Name</b>	OsCounter		
<b>Parent Container</b>	Os		
<b>Description</b>	Configuration information for the counters that belong to the OsApplication.		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_Os_00027]		
<b>Parameter Name</b>	OsCounterMaxAllowedValue		
<b>Parent Container</b>	OsCounter		
<b>Description</b>	Maximum possible allowed value of the system counter in ticks.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 18446744073709551615		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	





	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00028]</b>		
<b>Parameter Name</b>	OsCounterMinCycle		
<b>Parent Container</b>	<a href="#">OsCounter</a>		
<b>Description</b>	The MINCYCLE attribute specifies the minimum allowed number of counter ticks for a cyclic alarm linked to the counter.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 18446744073709551615		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00029]</b>		
<b>Parameter Name</b>	OsCounterTicksPerBase		
<b>Parent Container</b>	<a href="#">OsCounter</a>		
<b>Description</b>	The TICKSPERBASE attribute specifies the number of ticks required to reach a counterspecific unit. The interpretation is implementation-specific.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 4294967295		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00255]</b>		
<b>Parameter Name</b>	OsCounterType		
<b>Parent Container</b>	<a href="#">OsCounter</a>		
<b>Description</b>	This parameter contains the natural type or unit of the counter.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	HARDWARE	This counter is driven by some hardware e.g. a hardware timer unit.	
	SOFTWARE	The counter is driven by some software which calls the IncrementCounter service.	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		



<b>SWS Item</b>	<b>[ECUC_Os_00030]</b>		
<b>Parameter Name</b>	OsSecondsPerTick		
<b>Parent Container</b>	<a href="#">OsCounter</a>		
<b>Description</b>	Time of one counter tick in seconds.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. INF]		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00031]</b>		
<b>Parameter Name</b>	OsCounterAccessingApplication		
<b>Parent Container</b>	<a href="#">OsCounter</a>		
<b>Description</b>	Reference to applications which have an access to this object.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsApplication</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
OsDriver	0..1	<p>This Container contains the information who will drive the counter. This configuration is only valid if the counter has Os CounterType set to HARDWARE.</p> <p>If the container does not exist (multiplicity=0) the timer is managed by the OS internally (OSINTERNAL).</p> <p>If the container exists the OS can use the GPT interface to manage the timer. The user have to supply the GPT channel.</p> <p>If the counter is driven by some other (external to the OS) source (like a TPU for example) this must be described as a vendor specific extension.</p>





Included Containers		
Container Name	Multiplicity	Scope / Dependency
OsTimeConstant	0..*	Allows the user to define constants which can be e.g. used to compare time values with timer tick values.  A time value will be converted to a timer tick value during generation and can later on accessed via the OsConstName. The conversation is done by rounding time values to the nearest fitting tick value.

### C.3.4 OsEvent

SWS Item	[ECUC_Os_00033]
Container Name	OsEvent
Parent Container	Os
Description	Representation of OS events in the configuration context. Adopted from the ISO 17356-6 specification.
Configuration Parameters	

SWS Item	[ECUC_Os_00034]		
Parameter Name	OsEventMask		
Parent Container	<a href="#">OsEvent</a>		
Description	If event mask would be set to AUTO in OIL, this parameter should be omitted here.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

No Included Containers
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### C.3.5 OsResource

SWS Item	[ECUC_Os_00252]
Container Name	OsResource
Parent Container	Os





<b>Description</b>	An OsResource object is used to co-ordinate the concurrent access by tasks and ISRs to a shared resource, e.g. the scheduler, any program sequence, memory or any hardware area.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	<b>[ECUC_Os_00050]</b>		
<b>Parameter Name</b>	OsResourceProperty		
<b>Parent Container</b>	<a href="#">OsResource</a>		
<b>Description</b>	This specifies the type of the resource.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	INTERNAL	The resource is an internal resource.	
	LINKED	The resource is a linked resource (a second name for a existing resource).	
	STANDARD	The resource is a standard resource.	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00051]</b>		
<b>Parameter Name</b>	OsResourceAccessingApplication		
<b>Parent Container</b>	<a href="#">OsResource</a>		
<b>Description</b>	Reference to applications which have an access to this object.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsApplication</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00052]</b>		
<b>Parameter Name</b>	OsResourceLinkedResourceRef		
<b>Parent Container</b>	<a href="#">OsResource</a>		
<b>Description</b>	The link to the resource. Must be valid if OsResourceProperty is LINKED. If Os ResourceProperty is not LINKED the value is ignored.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">OsResource</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	





	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>No Included Containers</b>
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### C.3.6 OsScheduleTable

<b>SWS Item</b>	<b>[ECUC_Os_00141]</b>		
<b>Container Name</b>	OsScheduleTable		
<b>Parent Container</b>	Os		
<b>Description</b>	An OsScheduleTable addresses the synchronization issue by providing an encapsulation of a statically defined set of alarms that cannot be modified at runtime.		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Os_00053]</b>		
<b>Parameter Name</b>	OsScheduleTableDuration		
<b>Parent Container</b>	<a href="#">OsScheduleTable</a>		
<b>Description</b>	This parameter defines the modulus of the schedule table (in ticks).		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 18446744073709551615		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00144]</b>		
<b>Parameter Name</b>	OsScheduleTableRepeating		
<b>Parent Container</b>	<a href="#">OsScheduleTable</a>		
<b>Description</b>	true: first expiry point on the schedule table shall be processed at final expiry point delay ticks after the final expiry point is processed. false: the schedule table processing stops when the final expiry point is processed.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Os_00145]		
<b>Parameter Name</b>	OsScheduleTableCounterRef		
<b>Parent Container</b>	<a href="#">OsScheduleTable</a>		
<b>Description</b>	This parameter contains a reference to the counter which drives the schedule table.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">OsCounter</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Os_00054]		
<b>Parameter Name</b>	OsSchTblAccessingApplication		
<b>Parent Container</b>	<a href="#">OsScheduleTable</a>		
<b>Description</b>	Reference to applications which have an access to this object.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsApplication</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
OsScheduleTableAutostart	0..1	This container specifies if and how the schedule table is started on startup of the Operating System. The options to start a schedule table correspond to the API calls to start schedule tables during runtime.
<a href="#">OsScheduleTableExpiryPoint</a>	1..*	The point on a Schedule Table at which the OS activates tasks and/or sets events
OsScheduleTableSync	0..1	This container specifies the synchronization parameters of the schedule table.

### C.3.7 OsScheduleTableExpiryPoint

<b>SWS Item</b>	[ECUC_Os_00143]
<b>Container Name</b>	OsScheduleTableExpiryPoint
<b>Parent Container</b>	<a href="#">OsScheduleTable</a>
<b>Description</b>	The point on a Schedule Table at which the OS activates tasks and/or sets events
<b>Configuration Parameters</b>	

<b>SWS Item</b>	<b>[ECUC_Os_00062]</b>		
<b>Parameter Name</b>	OsScheduleTblExpPointOffset		
<b>Parent Container</b>	<a href="#">OsScheduleTableExpiryPoint</a>		
<b>Description</b>	The offset from zero (in ticks) at which the expiry point is to be processed.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 18446744073709551615		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>			

Included Containers		
Container Name	Multiplicity	Scope / Dependency
OsScheduleTableEventSetting	0..*	Event that is triggered by that schedule table.
OsScheduleTableTaskActivation	0..*	Task that is triggered by that schedule table.
OsScheduleTblAdjustableExpPoint	0..1	Adjustable expiry point

### C.3.8 OsSpinlock

<b>SWS Item</b>	<b>[ECUC_Os_00258]</b>		
<b>Container Name</b>	OsSpinlock		
<b>Parent Container</b>	Os		
<b>Description</b>	An OsSpinlock object is used to co-ordinate concurrent access by TASKs/ISR2s on different cores to a shared resource.		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Os_01038]</b>		
<b>Parameter Name</b>	OsSpinlockLockMethod		
<b>Parent Container</b>	<a href="#">OsSpinlock</a>		
<b>Description</b>	Lock method which is used when a spinlock is taken. Note that it is possible that a user (e.g. a Task) might hold more than one spinlock. In this case the last lock taken is forced to use at least a lock method which locks as strong as the current one.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	LOCK_ALL_INTERRUPTS	-	
	LOCK_CAT2_INTERRUPTS	-	
	LOCK_NOTHING	-	
	LOCK_WITH_RES_SCHEDULER	-	
<b>Default value</b>	<a href="#">LOCK_NOTHING</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants





	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_01021]</b>		
<b>Parameter Name</b>	OsSpinlockAccessingApplication		
<b>Parent Container</b>	<a href="#">OsSpinlock</a>		
<b>Description</b>	Reference to OsApplications that have an access to this object.		
<b>Multiplicity</b>	1..*		
<b>Type</b>	Reference to <a href="#">OsApplication</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_01022]</b>		
<b>Parameter Name</b>	OsSpinlockSuccessor		
<b>Parent Container</b>	<a href="#">OsSpinlock</a>		
<b>Description</b>	<p>Reference to OsApplications that have an access to this object.</p> <p>To check whether a spinlock can be occupied (in a nested way) without any danger of deadlock, a linked list of spinlocks can be defined. A spinlock can only be occupied in the order of the linked list. It is allowed to skip a spinlock.</p> <p>If no linked list is specified, spinlocks cannot be nested.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">OsSpinlock</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>No Included Containers</b>
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### C.3.9 OsTask

<b>SWS Item</b>	[ECUC_Os_00073]
<b>Container Name</b>	OsTask
<b>Parent Container</b>	Os
<b>Description</b>	This container represents an ISO 17356 task.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Os_00074]		
<b>Parameter Name</b>	OsTaskActivation		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	This attribute defines the maximum number of queued activation requests for the task. A value equal to "1" means that at any time only a single activation is permitted for this task. Note that the value must be a natural number starting at 1.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 4294967295		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Os_00404]		
<b>Parameter Name</b>	OsTaskPeriod		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	<p>This parameter specifies the period in seconds of this task in case of a cyclically activated task.</p> <p>If this parameter is not given the task can be activated sporadically or cyclically with a unknown period value.</p> <p>This value is information, e.g. for time base calculations in the RTE in case Timing Events are mapped onto this OsTask. Be aware, that this parameter is not supposed to be relevant for the OS! This information is given as part of the OS configuration to support configuration work flows using a fixed set of OsTasks.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[-INF .. INF]		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		



<b>SWS Item</b>	<b>[ECUC_Os_00075]</b>		
<b>Parameter Name</b>	OsTaskPriority		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	<p>The priority of a task is defined by the value of this attribute. This value has to be understood as a relative value, i.e. the values show only the relative ordering of the tasks.</p> <p>ISO 17356-3 defines the lowest priority as zero (0); larger values correspond to higher priorities.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00076]</b>		
<b>Parameter Name</b>	OsTaskSchedule		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	<p>The OsTaskSchedule attribute defines the preemptability of the task.</p> <p>If this attribute is set to NON, no internal resources may be assigned to this task.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	FULL		Task is preemptable.
	NON		Task is not preemptable.
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00402]</b>		
<b>Parameter Name</b>	OsMemoryMappingCodeLocationRef		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	Reference to the memory mapping containing details about the section where the code is placed.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to SW-ADDR-METHOD		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Os_00077]</b>		
<b>Parameter Name</b>	OsTaskAccessingApplication		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	Reference to applications which have an access to this object.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsApplication</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00078]</b>		
<b>Parameter Name</b>	OsTaskEventRef		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	This reference defines the list of events the extended task may react on.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsEvent</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Os_00079]</b>		
<b>Parameter Name</b>	OsTaskResourceRef		
<b>Parent Container</b>	<a href="#">OsTask</a>		
<b>Description</b>	This reference defines a list of resources accessed by this task.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">OsResource</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
OsTaskAutostart	0..1	This container determines whether the task is activated during the system start-up procedure or not for some specific application modes.  If the task shall be activated during the system start-up, this container is present and holds the references to the application modes in which the task is auto-started.
OsTaskTimingProtection	0..1	This container contains all parameters regarding timing protection of the task.

## C.4 NvM

### C.4.1 NvMBlockDescriptor

SWS Item	[ECUC_NvM_00061]
Container Name	NvMBlockDescriptor
Parent Container	NvM
Description	Container for a management structure to configure the composition of a given NVRAM Block Management Type. Its multiplicity describes the number of configured NVRAM blocks, one block is required to be configured. The NVRAM block descriptors are condensed in the NVRAM block descriptor table.
Configuration Parameters	

SWS Item	[ECUC_NvM_00476]		
Parameter Name	NvMBlockCrcType		
Parent Container	<a href="#">NvMBlockDescriptor</a>		
Description	Defines CRC data width for the NVRAM block. Default: NVM_CRC16, i.e. CRC16 will be used if NVM_BLOCK_USE_CRC==true		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	NVM_CRC16	(Default) CRC16 will be used if NVM_BLOCK_USE_CRC==true.	
	NVM_CRC32	CRC32 is selected for this NVRAM block if NVM_BLOCK_USE_CRC==true.	
	NVM_CRC8	CRC8 is selected for this NVRAM block if NVM_BLOCK_USE_CRC==true.	
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	–	
Scope / Dependency	scope: local dependency: NVM_BLOCK_USE_CRC, NVM_CALC_RAM_BLOCK_CRC		

<b>SWS Item</b>	<b>[ECUC_NvM_00554]</b>		
<b>Parameter Name</b>	NvMBlockHeaderInclude		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the header file where the owner of the NVRAM block has the declarations of the permanent RAM data block, ROM data block (if configured) and the callback function prototype for each configured callback. If no permanent RAM block, ROM block or callback functions are configured then this configuration parameter shall be ignored.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00477]</b>		
<b>Parameter Name</b>	NvMBlockJobPriority		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the job priority for a NVRAM block (0 = Immediate priority).		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 255		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00062]</b>		
<b>Parameter Name</b>	NvMBlockManagementType		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the block management type for the NVRAM block.[SWS_NvM_00137]		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	NVM_BLOCK_DATASET	NVRAM block is configured to be of dataset type.	
	NVM_BLOCK_NATIVE	NVRAM block is configured to be of native type.	
	NVM_BLOCK_REDUNDANT	NVRAM block is configured to be of redundant type.	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE





	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00557]</b>		
<b>Parameter Name</b>	NvMBlockUseAutoValidation		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines whether the RAM Block shall be auto validated during shutdown phase. true: if auto validation mechanism is used, false: otherwise		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00563]</b>		
<b>Parameter Name</b>	NvMBlockUseCompression		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines whether the data is compressed before written. true: data compression activated (takes more time to read and write) false: no compression <b>Tags:</b> atp.Status=draft		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00036]</b>		
<b>Parameter Name</b>	NvMBlockUseCrc		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines CRC usage for the NVRAM block, i.e. memory space for CRC is reserved in RAM and NV memory. true: CRC will be used for this NVRAM block. false: CRC will not be used for this NVRAM block.  Note: Configuring CRC for a block with immediate priority is not recommended, since the CRC calculation may extend over more than one NvM main function and this could increase the time of writing the immediate data significantly, thus defeating the purpose of immediate priority.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		





<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00556]</b>		
<b>Parameter Name</b>	NvMBlockUseCRCCompMechanism		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines whether 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.</p> <p>true: if compare mechanism is used, false: otherwise</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local dependency: False if NvMBlockUseCrc = False		

<b>SWS Item</b>	<b>[ECUC_NvM_00559]</b>		
<b>Parameter Name</b>	NvMBlockUsePort		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>If this parameter is true it defines whether:</p> <ul style="list-style-type: none"> <li>the port with interface 'NvMMirror' for synchronization mechanism callbacks are generated if the parameter NvMBlockUseSyncMechanism is configured TRUE;</li> <li>the port with interface 'NvMNotifyInitBlock' for initialization block callback is generated if NvMInitBlockCallback parameter is configured (independent of the content);</li> <li>the port with interface 'NvMNotifyJobFinished' for single block callback is generated if NvMSingleBlockCallback parameter is configured (independent of the content);</li> <li>the port with interface 'NvMAdmin' for SetBlockProtection operation is generated.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00552]</b>		
<b>Parameter Name</b>	NvMBlockUseSetRamBlockStatus		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		





<b>Description</b>	Defines if NvMSetRamBlockStatusApi shall be used for this block or not. Note: If NvMSetRamBlockStatusApi is disabled this configuration parameter shall be ignored. true: calling of NvMSetRamBlockStatus for this RAM block shall set the status of the RAM block. false: calling of NvMSetRamBlockStatus for this RAM block shall be ignored.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00519]</b>		
<b>Parameter Name</b>	NvMBlockUseSyncMechanism		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines whether an explicit synchronization mechanism with a RAM mirror and callback routines for transferring data to and from NvM module's RAM mirror is used for NV block. true if synchronization mechanism is used, false otherwise.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00033]</b>		
<b>Parameter Name</b>	NvMBlockWriteProt		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines an initial write protection of the NV block true: Initial block write protection is enabled. false: Initial block write protection is disabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00551]</b>		
<b>Parameter Name</b>	NvMBswMBlockStatusInformation		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		





<b>Description</b>	This parameter specifies whether BswM is informed about the current status of the specified block. True: Call BswM_NvM_CurrentBlockMode on changes False: Don't inform BswM at all		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00119]</b>		
<b>Parameter Name</b>	NvMCalcRamBlockCrc		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines CRC (re)calculation for the permanent RAM block or NVRAM blocks which are configured to use explicit synchronization mechanism. true: CRC will be (re)calculated for this permanent RAM block. false: CRC will not be (re)calculated for this permanent RAM block.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local dependency: NVM_BLOCK_USE_CRC		

<b>SWS Item</b>	<b>[ECUC_NvM_00533]</b>		
<b>Parameter Name</b>	NvMMaxNumOfReadRetries		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the maximum number of read retries.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 7		
<b>Default value</b>	0		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		



<b>SWS Item</b>	<b>[ECUC_NvM_00499]</b>		
<b>Parameter Name</b>	NvMMaxNumOfWriteRetries		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the maximum number of write retries for a NVRAM block with <a href="#">[ECUC_NvM_00061]</a> . Regardless of configuration a consistency check (and maybe write retries) are always forced for each block which is processed by the request NvM_WriteAll and NvM_WriteBlock.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 7		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00478]</b>		
<b>Parameter Name</b>	NvMNvBlockBaseNumber		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Configuration parameter to perform the link between the NVM_NVRAM_BLOCK_IDENTIFIER used by the SW-Cs and the FEE_BLOCK_NUMBER expected by the memory abstraction modules. The parameter value equals the FEE_BLOCK_NUMBER or EA_BLOCK_NUMBER shifted to the right by NvMDatasetSelectionBits. (ref. to chapter 7.1.2.1).  Calculation Formula: value = TargetBlockReference.[Ea/Fee]BlockConfiguration.[Ea/Fee]BlockNumber >> NvMDatasetSelectionBits		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65534		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local dependency: FEE_BLOCK_NUMBER, EA_BLOCK_NUMBER		

<b>SWS Item</b>	<b>[ECUC_NvM_00479]</b>		
<b>Parameter Name</b>	NvMNvBlockLength		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the NV block data length in bytes.  Note: The implementer can add the attribute 'withAuto' to the parameter definition which indicates that the length can be calculated by the generator automatically (e.g. by using a parser that searches and analyzes the data structure corresponding to the block). When '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.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		





<b>Range</b>	1 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00480]</b>		
<b>Parameter Name</b>	NvMNvBlockNum		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines the number of multiple NV blocks in a contiguous area according to the given block management type.</p> <p>1-255 For NVRAM blocks to be configured of block management type NVM_BLOCK_DATASET. The actual range is limited according to SWS_NvM_00444.</p> <p>1 For NVRAM blocks to be configured of block management type NVM_BLOCK_NATIVE</p> <p>2 For NVRAM blocks to be configured of block management type NVM_BLOCK_REDUNDANT</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 255		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local dependency: NVM_BLOCK_MANAGEMENT_TYPE		

<b>SWS Item</b>	<b>[ECUC_NvM_00481]</b>		
<b>Parameter Name</b>	NvMNvramBlockIdentifier		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Identification of a NVRAM block via a unique block identifier.</p> <p>Implementation Type: NvM_BlockIdType.</p> <p>min = 2 max = 2<sup>(16- NVM_DATASET_SELECTION_BITS)</sup>-1</p> <p>Reserved NVRAM block IDs: 0 -&gt; to derive multi block request results via NvM_GetErrorStatus 1 -&gt; redundant NVRAM block which holds the configuration ID (generation tool should check that this block is correctly configured from type,CRC and size point of view)</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	2 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	





<b>Scope / Dependency</b>	scope: local dependency: NVM_DATASET_SELECTION_BITS
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<b>SWS Item</b>	<b>[ECUC_NvM_00035]</b>		
<b>Parameter Name</b>	NvMNvramDeviceId		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the NVRAM device ID where the NVRAM block is located. Calculation Formula: value = TargetBlockReference.[Ea/Fee]DeviceIndex		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 1		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local dependency: EA_DEVICE_INDEX, FEE_DEVICE_INDEX		

<b>SWS Item</b>	<b>[ECUC_NvM_00482]</b>		
<b>Parameter Name</b>	NvMRamBlockDataAddress		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the start address of the RAM block data. If this is not configured, no permanent RAM data block is available for the selected block management type.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00521]</b>		
<b>Parameter Name</b>	NvMReadRamBlockFromNvCallback		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Entry address of a block specific callback routine which shall be called in order to let the application copy data from the NvM module's mirror to RAM block. Implementation type: Std_ReturnType E_OK: copy was successful E_NOT_OK: copy was not successful, callback routine to be called again		





<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00483]</b>		
<b>Parameter Name</b>	NvMResistantToChangedSw		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines whether a NVRAM block shall be treated resistant to configuration changes or not. If there is no default data available at configuration time then the application shall be responsible for providing the default initialization data. In this case the application has to use NvM_GetErrorStatus() to be able to distinguish between first initialization and corrupted data.</p> <p>true: NVRAM block is resistant to changed software. false: NVRAM block is not resistant to changed software.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00484]</b>		
<b>Parameter Name</b>	NvMRomBlockDataAddress		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines the start address of the ROM block data.</p> <p>If not configured, no ROM block is available for the selected block management type.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE





	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00485]</b>		
<b>Parameter Name</b>	NvMRomBlockNum		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines the number of multiple ROM blocks in a contiguous area according to the given block management type.</p> <p>0-254 For NVRAM blocks to be configured of block management type NVM_BLOCK_DATASET. The actual range is limited according to SWS_NvM_00444.</p> <p>0-1 For NVRAM blocks to be configured of block management type NVM_BLOCK_NATIVE</p> <p>0-1 For NVRAM blocks to be configured of block management type NVM_BLOCK_REDUNDANT</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 254		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local dependency: NVM_BLOCK_MANAGEMENT_TYPE, NVM_NV_BLOCK_NUM		

<b>SWS Item</b>	<b>[ECUC_NvM_00558]</b>		
<b>Parameter Name</b>	NvMSelectBlockForFirstInitAll		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines whether a block will be processed or not by NvM_FirstInitAll. A block can be configured to be processed even if it doesn't have permanent RAM and/or explicit synchronization.</p> <p>TRUE: block will be processed by NvM_FirstInitAll</p> <p>FALSE: block will not be processed by NvM_FirstInitAll</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00117]</b>		
<b>Parameter Name</b>	NvMSelectBlockForReadAll		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines whether a NVRAM block shall be processed during NvM_ReadAll or not. This configuration parameter has only influence on those NVRAM blocks which are configured to have a permanent RAM block or which are configured to use explicit synchronization mechanism.</p> <p>true: NVRAM block shall be processed by NvM_ReadAll false: NVRAM block shall not be processed by NvM_ReadAll</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local dependency: NVM_RAM_BLOCK_DATA_ADDRESS		

<b>SWS Item</b>	<b>[ECUC_NvM_00549]</b>		
<b>Parameter Name</b>	NvMSelectBlockForWriteAll		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>Defines whether a NVRAM block shall be processed during NvM_WriteAll or not. This configuration parameter has only influence on those NVRAM blocks which are configured to have a permanent RAM block or which are configured to use explicit synchronization mechanism.</p> <p>true: NVRAM block shall be processed by NvM_WriteAll false: NVRAM block shall not be processed by NvM_WriteAll</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local dependency: NVM_RAM_BLOCK_DATA_ADDRESS		

<b>SWS Item</b>	<b>[ECUC_NvM_00532]</b>		
<b>Parameter Name</b>	NvMStaticBlockIDCheck		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		





<b>Description</b>	Defines if the Static Block ID check is enabled. false: Static Block ID check is disabled. true: Static Block ID check is enabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00072]</b>		
<b>Parameter Name</b>	NvMWriteBlockOnce		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines write protection after first write. The NVRAM manager sets the write protection bit either after the NV block was written the first time or if the block was already written and it is detected as valid and consistent during a read for it. true: Defines write protection after first write is enabled. false: Defines write protection after first write is disabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00520]</b>		
<b>Parameter Name</b>	NvMWriteRamBlockToNvCallback		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Entry address of a block specific callback routine which shall be called in order to let the application copy data from RAM block to NvM module's mirror. Implementation type: Std_ReturnType E_OK: copy was successful E_NOT_OK: copy was not successful, callback routine to be called again		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	





<b>Scope / Dependency</b>	scope: local
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<b>SWS Item</b>	<b>[ECUC_NvM_00534]</b>		
<b>Parameter Name</b>	NvMWriteVerification		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines if Write Verification is enabled. false: Write verification is disabled. true: Write Verification is enabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00538]</b>		
<b>Parameter Name</b>	NvMWriteVerificationDataSize		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Defines the number of bytes to compare in each step when comparing the content of a RAM Block and a block read back.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00567]</b>		
<b>Parameter Name</b>	NvMBlockCipherringRef		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Reference to cipherring container. If configured, NvM encrypt the data before storage and decrypt the data after restoring. If empty, the NvM stores and restore the original user data. <b>Tags:</b> atp.Status=draft		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to NvMBlockCipherring		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	







	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local dependency: Key will be located in RAM if this configuration item is not present.		

<b>SWS Item</b>	<b>[ECUC_NvM_00564]</b>		
<b>Parameter Name</b>	NvMBlockEcucPartitionRef		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	Maps the NV block to zero or one ECUC partition to limit the access to this NV block. The ECUC partition referenced is within the subset of the ECUC partitions where the NvM is mapped to.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">NvMInitBlockCallback</a>	0..1	<p>The presence of this container indicates, that a block specific callback routine is called if no ROM data is available for initialization of the NVRAM block. If the container is not present, no callback routine is called for initialization of the NVRAM block with default data.</p> <p>In case the container has a NvMInitBlockCallbackFnc, the NvM will call this function.</p> <p>In case there is no NvMInitBlockCallbackFnc, the NvM will have an port PNIB_{Block}.</p>
<a href="#">NvMSingleBlockCallback</a>	0..1	<p>The presence of this container indicates, that the block specific callback routine which shall be invoked on termination of each asynchronous single block request [SWS_NvM_00113] If the container is not present, no callback routine is called..</p> <p>In case the container has a NvMSingleBlockCallbackFnc, the NvM will call this function.</p> <p>In case there is no NvMSingleBlockCallbackFnc, the NvM will have an port PNJF_{Block}.</p>
NvMTargetBlockReference	1	This parameter is just a container for the parameters for EA and FEE

### C.4.2 NvMInitBlockCallback

<b>SWS Item</b>	<b>[ECUC_NvM_00561]</b>
<b>Container Name</b>	NvMInitBlockCallback
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>





<b>Description</b>	<p>The presence of this container indicates, that a block specific callback routine is called if no ROM data is available for initialization of the NVRAM block. If the container is not present, no callback routine is called for initialization of the NVRAM block with default data.</p> <p>In case the container has a NvMInitBlockCallbackFnc, the NvM will call this function.</p> <p>In case there is no NvMInitBlockCallbackFnc, the NvM will have an port PNIB_{Block}.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_NvM_00116]</b>		
<b>Parameter Name</b>	NvMInitBlockCallbackFnc		
<b>Parent Container</b>	<a href="#">NvMInitBlockCallback</a>		
<b>Description</b>	<p>Entry address of a block specific callback routine which shall be called if no ROM data is available for initialization of the NVRAM block.</p> <p>If not configured, no specific callback routine shall be called for initialization of the NVRAM block with default data.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>No Included Containers</b>
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### C.4.3 NvMSingleBlockCallback

<b>SWS Item</b>	<b>[ECUC_NvM_00562]</b>		
<b>Container Name</b>	NvMSingleBlockCallback		
<b>Parent Container</b>	<a href="#">NvMBlockDescriptor</a>		
<b>Description</b>	<p>The presence of this container indicates, that the block specific callback routine which shall be invoked on termination of each asynchronous single block request [SWS_NvM_00113] If the container is not present, no callback routine is called..</p> <p>In case the container has a NvMSingleBlockCallbackFnc, the NvM will call this function.</p> <p>In case there is no NvMSingleBlockCallbackFnc, the NvM will have an port PNJF_{Block}.</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE





	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_NvM_00506]</b>		
<b>Parameter Name</b>	NvMSingleBlockCallbackFnc		
<b>Parent Container</b>	<a href="#">NvMSingleBlockCallback</a>		
<b>Description</b>	Entry address of the block specific callback routine which shall be invoked on termination of each asynchronous single block request [SWS_NvM_00113].		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>No Included Containers</b>
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## C.4.4 NvMCommon

<b>SWS Item</b>	<b>[ECUC_NvM_00028]</b>		
<b>Container Name</b>	NvMCommon		
<b>Parent Container</b>	NvM		
<b>Description</b>	Container for common configuration options.		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_NvM_00491]</b>		
<b>Parameter Name</b>	NvMApiConfigClass		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Preprocessor switch to enable some API calls which are related to NVM API configuration classes.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	NVM_API_CONFIG_CLASS_1	All API calls belonging to configuration class 1 are available.	
	NVM_API_CONFIG_CLASS_2	All API calls belonging to configuration class 2 are available.	
	NVM_API_CONFIG_CLASS_3	All API calls belonging to configuration class 3 are available.	





<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00550]</b>		
<b>Parameter Name</b>	NvMBswMMultiBlockJobStatusInformation		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	<p>This parameter specifies whether BswM is informed about the current status of the multiblock job.</p> <p>True: call BswM_NvM_CurrentJobMode if ReadAll and WriteAll are started, finished, canceled False: do not inform BswM at all</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	true		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00492]</b>		
<b>Parameter Name</b>	NvMCompiledConfigId		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Configuration ID regarding the NV memory layout. This configuration ID shall be published as e.g. a SW-C shall have the possibility to write it to NV memory.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00493]</b>		
<b>Parameter Name</b>	NvMCrcNumOfBytes		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	If CRC is configured for at least one NVRAM block, this parameter defines the maximum number of bytes which shall be processed within one cycle of job processing.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE





	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00572]</b>		
<b>Parameter Name</b>	NvMCsmRetryCounter		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	<p>This value specifies the number of CSM encryption/decryption job retry attempts.</p> <p>CSM jobs for block reading and writing may fail (e.g. module busy, queue full, ...). To not directly abort the read/write with an error status, the NvM will retry the CSM job for the configured NvMCsmRetryCounter times.</p> <p>Configuring 0 means: no retry behavior; job will be aborted directly.</p> <p><b>Tags:</b> atp.Status=draft</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 255		
<b>Default value</b>	0		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00494]</b>		
<b>Parameter Name</b>	NvMDatasetSelectionBits		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	<p>Defines the number of least significant bits which shall be used to address a certain dataset of a NVRAM block within the interface to the memory hardware abstraction.</p> <p>0..8: Number of bits which are used for dataset or redundant block addressing.</p> <p>0: No dataset or redundant NVRAM blocks are configured at all, no selection bits required.</p> <p>1: In case of redundant NVRAM blocks are configured, but no dataset NVRAM blocks.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 8		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local dependency: MemHwA, NVM_NVRAM_BLOCK_IDENTIFIER, NVM_BLOCK_MANAGEMENT_TYPE		

<b>SWS Item</b>	<b>[ECUC_NvM_00495]</b>		
<b>Parameter Name</b>	NvMDevErrorDetect		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		





<b>Description</b>	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00497]</b>		
<b>Parameter Name</b>	NvMDynamicConfiguration		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Preprocessor switch to enable the dynamic configuration management handling by the NvM_ReadAll request.  true: Dynamic configuration management handling enabled. false: Dynamic configuration management handling disabled.  This parameter affects all NvM processing related to Block with ID 1 and all processing related to Resistant to Changed Software. If the Dynamic Configuration is disabled, Block 1 cannot be used by NvM.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00498]</b>		
<b>Parameter Name</b>	NvMJobPrioritization		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Preprocessor switch to enable job prioritization handling  true: Job prioritization handling enabled. false: Job prioritization handling disabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00555]</b>		
<b>Parameter Name</b>	NvMMainFunctionPeriod		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		





<b>Description</b>	The period between successive calls to the main function in seconds.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	]0 .. INF[		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_NvM_00500]</b>		
<b>Parameter Name</b>	NvMMultiBlockCallback		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Entry address of the common callback routine which shall be invoked on termination of each asynchronous multi block request		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00501]</b>		
<b>Parameter Name</b>	NvMPollingMode		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Preprocessor switch to enable/disable the polling mode in the NVRAM Manager and at the same time disable/enable the callback functions useable by lower layers true: Polling mode enabled, callback function usage disabled. false: Polling mode disabled, callback function usage enabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00518]</b>		
<b>Parameter Name</b>	NvMRepeatMirrorOperations		
<b>Parent Container</b>	NvMCommon		
<b>Description</b>	Defines the number of retries to let the application copy data to or from the NvM module's mirror before postponing the current job.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 7		
<b>Default value</b>	0		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00502]</b>		
<b>Parameter Name</b>	NvMSetRamBlockStatusApi		
<b>Parent Container</b>	NvMCommon		
<b>Description</b>	Preprocessor switch to enable the API NvM_SetRamBlockStatus. true: API NvM_SetRamBlockStatus enabled. false: API NvM_SetRamBlockStatus disabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00503]</b>		
<b>Parameter Name</b>	NvMSizeImmediateJobQueue		
<b>Parent Container</b>	NvMCommon		
<b>Description</b>	Defines the number of queue entries for the immediate priority job queue. If NVM_JOB_PRIORITIZATION is switched OFF this parameter shall be out of scope.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	







<b>Scope / Dependency</b>	scope: local dependency: NVM_JOB_PRIORITIZATION
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<b>SWS Item</b>	<b>[ECUC_NvM_00504]</b>		
<b>Parameter Name</b>	NvMSizeStandardJobQueue		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Defines the number of queue entries for the standard job queue.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00505]</b>		
<b>Parameter Name</b>	NvMVersionInfoApi		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Pre-processor switch to enable / disable the API to read out the modules version information]. true: Version info API enabled. false: Version info API disabled.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_NvM_00573]</b>		
<b>Parameter Name</b>	NvMBufferAlignmentValue		
<b>Parent Container</b>	<a href="#">NvMCommon</a>		
<b>Description</b>	Parameter determines the alignment of the start address that NvM buffers need to have. Value shall be inherited from EaBufferAlignmentValue or FeeBufferAlignmentValue. <b>Tags:</b> atp.Status=draft		
<b>Multiplicity</b>	1		
<b>Type</b>	Choice reference to [ EaGeneral, FeeGeneral ]		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_NvM_00565]</b>		
<b>Parameter Name</b>	NvMEcucPartitionRef		
<b>Parent Container</b>	NvMCommon		
<b>Description</b>	Maps the NvM to one or multiple ECUC partitions to make its C-APIs available in the according partition.		
<b>Multiplicity</b>	1..*		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_NvM_00566]</b>		
<b>Parameter Name</b>	NvMMasterEcucPartitionRef		
<b>Parent Container</b>	NvMCommon		
<b>Description</b>	Maps the NvM master to zero or one ECUC partition to assign the master functionality to a certain core. The ECUC partition referenced is a subset of the ECUC partitions where the NvM is mapped to.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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## C.5 Dcm

### C.5.1 DcmDspDid

<b>SWS Item</b>	<b>[ECUC_Dcm_00601]</b>
<b>Container Name</b>	DcmDspDid
<b>Parent Container</b>	DcmDsp
<b>Description</b>	This container contains the configuration (parameters) of the DID.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	<b>[ECUC_Dcm_00602]</b>
<b>Parameter Name</b>	DcmDspDidIdentifier
<b>Parent Container</b>	<a href="#">DcmDspDid</a>
<b>Description</b>	2 byte Identifier of the DID Within each DcmConfigSet all DcmDspDidIdentifier values shall be unique.
<b>Multiplicity</b>	1
<b>Type</b>	EcucIntegerParamDef





<b>Range</b>	0 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_01099]</b>		
<b>Parameter Name</b>	DcmDspDidSize		
<b>Parent Container</b>	<a href="#">DcmDspDid</a>		
<b>Description</b>	Length of a DID in byte(s).		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00805]</b>		
<b>Parameter Name</b>	DcmDspDidUsed		
<b>Parent Container</b>	<a href="#">DcmDspDid</a>		
<b>Description</b>	Allow to activate or deactivate the usage of a DID, for multi purpose ECUs true = DID available false = DID not available		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_01122]</b>		
<b>Parameter Name</b>	DcmDspDidUsePort		
<b>Parent Container</b>	<a href="#">DcmDspDid</a>		
<b>Description</b>	Selects application interface type for DID data elements between a single operation for all data elements or data element specific operations.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	USE_ATOMIC_BNDM	The DID shall be read/written from/to BndM.	





	USE_ATOMIC_NV_DATA_INTERFACE	A single sender receiver interface with Nv Data-Ports is used for all data elements of this DID.	
	USE_ATOMIC_SENDER_RECEIVER_INTERFACE	A single sender receiver interface is used to access all data elements of this DID. The sender receiver interface is typed with IsService=false.	
	USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE	A single sender receiver interface is used to access all data elements of this DID. The sender receiver interface is typed with IsService=true.	
	USE_DATA_ELEMENT_SPECIFIC_INTERFACES	The data elements of this DID are collected by using the data element specific interfaces defined by DcmDspDataUsePort.	
<b>Default value</b>	USE_DATA_ELEMENT_SPECIFIC_INTERFACES		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	[ECUC_Dcm_01185]		
<b>Parameter Name</b>	DcmDspDidBndMBlockIdRef		
<b>Parent Container</b>	<a href="#">DcmDspDid</a>		
<b>Description</b>	Associate this DID with a BndM blockId.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Symbolic name reference to BndMBlockDescriptor		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU dependency: DcmDspDidUsePort == USE_ATOMIC_BNDM		

<b>SWS Item</b>	[ECUC_Dcm_00604]		
<b>Parameter Name</b>	DcmDspDidInfoRef		
<b>Parent Container</b>	<a href="#">DcmDspDid</a>		
<b>Description</b>	Reference to DcmDspDidInfo containing information on this DID.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">DcmDspDidInfo</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00606]</b>		
<b>Parameter Name</b>	DcmDspDidRef		
<b>Parent Container</b>	<a href="#">DcmDspDid</a>		
<b>Description</b>	Reference to DcmDspDid in case this DID refer to one or several other DID's <b>Attributes:</b> requiresIndex=true		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">DcmDspDid</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
DcmDspDidSignal	0..*	This container defines the reference to 1 DcmDspData container and position relevant for this DID.
DcmDspDidSignalCompositePool	0..*	Defines a collection of all contained signals for this root signal.
DcmDspDidSupportInfo	0..1	This container defines the support information to declare the usability of the data bytes within the DIDs

## C.5.2 DcmDspDidInfo

<b>SWS Item</b>	<b>[ECUC_Dcm_00607]</b>		
<b>Container Name</b>	DcmDspDidInfo		
<b>Parent Container</b>	DcmDsp		
<b>Description</b>	This container contains the configuration (parameters) of the DID's Info		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Dcm_00970]</b>		
<b>Parameter Name</b>	DcmDspDDDIDMaxElements		
<b>Parent Container</b>	<a href="#">DcmDspDidInfo</a>		
<b>Description</b>	Maximum number of source elements of a DDDID.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 255		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		





<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dcm_00612]</b>		
<b>Parameter Name</b>	DcmDspDidDynamicallyDefined		
<b>Parent Container</b>	<a href="#">DcmDspDidInfo</a>		
<b>Description</b>	Indicates if this DID can be dynamically defined true = DID can be dynamically defined false = DID can not be dynamically defined		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">DcmDspDidControl</a>	0..1	This container contains the configuration (parameters) of the DID control.
<a href="#">DcmDspDidRead</a>	0..1	This container contains the configuration (parameters) of the DID read.
<a href="#">DcmDspDidWrite</a>	0..1	This container contains the configuration (parameters) of the DID write.

### C.5.3 DcmDspData

<b>SWS Item</b>	<b>[ECUC_Dcm_00869]</b>	
<b>Container Name</b>	DcmDspData	
<b>Parent Container</b>	DcmDsp	
<b>Description</b>	This container contains the configuration (parameters) of a Data belonging to a DID	
<b>Configuration Parameters</b>		

<b>SWS Item</b>	<b>[ECUC_Dcm_01106]</b>	
<b>Parameter Name</b>	DcmDspDataByteSize	
<b>Parent Container</b>	<a href="#">DcmDspData</a>	
<b>Description</b>	Defines the array length in bytes or the maximum array length for variable datalengths.	





<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Dcm_00677]		
<b>Parameter Name</b>	DcmDspDataConditionCheckReadFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	<p>Function name to demand application if the conditions (e.g. System state) to read the DID are correct. (ConditionCheckRead-function).</p> <p>Multiplicity shall be equal to parameter DcmDspDataReadFnc. This parameter is related to the interface Xxx_ConditionCheckRead.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Dcm_00955]		
<b>Parameter Name</b>	DcmDspDataConditionCheckReadFncUsed		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	This parameter determines if a condition check function is available or not.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	





	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dcm_00825]</b>		
<b>Parameter Name</b>	DcmDspDataEcuSignal		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to control the access to a certain ECU Signal by the DCM. (IoHwAb_Dcm_<symbolic name of ECU signal>-function).		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00986]</b>		
<b>Parameter Name</b>	DcmDspDataEndianness		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Defines the endianness of the data belonging to a DID in a diagnostic request or response message.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	BIG_ENDIAN	Most significant byte shall be stored at the lowest address.	
	LITTLE_ENDIAN	Most significant byte shall be stored at the highest address.	
	OPAQUE	Opaque data endianness	
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		



<b>SWS Item</b>	<b>[ECUC_Dcm_00674]</b>		
<b>Parameter Name</b>	DcmDspDataFreezeCurrentStateFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to request to application to freeze the current state of an IOControl. (FreezeCurrentState-function). This parameter is related to the interface Xxx_FreezeCurrentState.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00676]</b>		
<b>Parameter Name</b>	DcmDspDataGetScalingInfoFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to request to application the scaling information of the DID. (GetScaling Information-function). This parameter is related to the interface Xxxx_GetScaling Information.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00671]</b>		
<b>Parameter Name</b>	DcmDspDataReadDataLengthFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to request from application the data length of a DID. (ReadData Length-function). This parameter is related to the interface Xxx_ReadDataLength.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		





<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00824]</b>		
<b>Parameter Name</b>	DcmDspDataReadEcuSignal		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name for read access to a certain ECU Signal by the DCM. (IoHwAb_Dcm_Read<EcuSignalName>-function). Only relevant if DcmDspDataUsePort==USE_ECU_SIGNAL.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00669]</b>		
<b>Parameter Name</b>	DcmDspDataReadFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to request from application the data value of a DID. (Read Data-function). This parameter is related to the interface Xxx_ReadData.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	





	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dcm_00673]</b>		
<b>Parameter Name</b>	DcmDspDataResetToDefaultFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to request to application to reset an IOControl to default value. (ResetToDefault-function). This parameter is related to the interface Xxx_ResetToDefault.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00672]</b>		
<b>Parameter Name</b>	DcmDspDataReturnControlToEcuFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to request to application to return control to ECU of an IOControl. (ReturnControlToECU-function). This parameter is related to the interface Xxx_ReturnControlToECU.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00675]</b>		
<b>Parameter Name</b>	DcmDspDataShortTermAdjustmentFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		





<b>Description</b>	Function name to request to application to adjust the IO signal. (ShortTerm Adjustment-function). This parameter is related to the interface Xxx_ShortTermAdjustment.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Dcm_00985]		
<b>Parameter Name</b>	DcmDspDataType		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Provide the implementation data type of data belonging to a DID.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	BOOLEAN	Type of the data is boolean.	
	FLOAT	Type of the data is float.	
	FLOAT_N	Type of the data is float array.	
	SINT16	Type of the data is sint16.	
	SINT16_N	Type of the data is sint16 array.	
	SINT32	Type of the data is sint32.	
	SINT32_N	Type of the data is sint32 array.	
	SINT8	Type of the data is sint8.	
	SINT8_N	Type of the data is sint8 array.	
	UINT16	Type of the data is uint16.	
	UINT16_N	Type of the data is uint16 array.	
	UINT32	Type of the data is uint32.	
	UINT32_N	Type of the data is uint32 array.	
	UINT8	Type of the data is uint8.	
	UINT8_DYN	Type of the data is uint8 array with dynamic length.	
UINT8_N	Type of the data is uint8 array.		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00713]</b>	
<b>Parameter Name</b>	DcmDspDataUsePort	
<b>Parent Container</b>	<a href="#">DcmDspData</a>	
<b>Description</b>	Defines which interface shall be used to access the data.	
<b>Multiplicity</b>	1	
<b>Type</b>	EcucEnumerationParamDef	
<b>Range</b>	USE_DATA_ASYNC_CLIENT_SERVER	The DCM will access the Data using an R-Port requiring a asynchronous ClientServerInterface DataServices_{Data}. The R-Port is named Data Services_{Data} where {Data} is the name of the container DcmDspData.
	USE_DATA_ASYNC_CLIENT_SERVER_ERROR	The Dcm will access the Data using an R-Port requiring a asynchronous ClientServerInterface DataServices_{Data}. The parameter ErrorCode can be returned to allow the application to trigger a negative response during the operation. The R-Port is named DataServices_{Data} where {Data} is the name of the container DcmDspData.
	USE_DATA_ASYNC_FNC	The DCM will access the Data using the functions that are defined in parameters of type EcucFunctionNameDef (but without DcmDsp DataReadDataLengthFnc) in the DcmDspData container. DCM_E_PENDING return is allowed. OpStatus is existing as IN parameter.
	USE_DATA_ASYNC_FNC_ERROR	The DCM will access the Data using the functions that are defined in parameters of type EcucFunctionNameDef (but without DcmDsp DataReadDataLengthFnc) in the DcmDspData container. DCM_E_PENDING return is allowed. OpStatus is existing as IN parameter. The parameter ErrorCode can be returned to allow the application to trigger a negative response during the operation.
	USE_DATA_ASYNC_FNC_PROXY	The DCM will access the Data using the functions that are defined in parameters of type EcucFunctionNameDef (with DataLength and ErrorCode parameter). DCM_E_PENDING return is allowed. OpStatus is existing as IN parameter. <b>Tags:</b> atp.Status=draft
	USE_DATA_SENDER_RECEIVER	The DCM will access the Data using an Port requiring a SenderReceiverInterface (with is Service=false) DataServices_{Data}. The Port is namedDataServices_{Data} where {Data} is the name of the container DcmDspData.
	USE_DATA_SENDER_RECEIVER_AS_SERVICE	The DCM will access the Data using an service Port requiring a SenderReceiverInterface (with is Service=true) DataServices_{Data} . The Port is namedDataServices_{Data} where {Data} is the name of the container DcmDspData.
	USE_DATA_SYNC_CLIENT_SERVER	The DCM will access the Data using an R-Port requiring a synchronous ClientServerInterface DataServices_{Data}. The R-Port is named Data Services_{Data} where {Data} is the name of the container DcmDspData.





	USE_DATA_SYNCH_FNC	The DCM will access the Data using the functions that are defined in parameters of type EcucFunctionNameDef (but without DcmDsp DataReadDataLengthFnc) in the DcmDspData container. DCM_E_PENDING return value is not allowed and OpStatus parameter is not existing in the prototype.	
	USE_DATA_SYNCH_FNC_PROXY	The DCM will access the Data using the functions that are defined in parameters of type EcucFunctionNameDef (with DataLength and ErrorCode parameter). DCM_E_PENDING return value is not allowed and OpStatus parameter is not existing in the prototype. <b>Tags:</b> atp.Status=draft	
	USE_ECU_SIGNAL	The DCM will access the Data using a direct access to IoHwAb	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00670]</b>		
<b>Parameter Name</b>	DcmDspDataWriteFnc		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Function name to request application to write the data value of a DID. (Write Data-function). This parameter is related to the interface Xxx_WriteData.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00988]</b>		
<b>Parameter Name</b>	DcmDspOdxDataDescription		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Defines additional description for ODX documentation		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucAddInfoParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		





<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dcm_00811]</b>		
<b>Parameter Name</b>	DcmDspDataInfoRef		
<b>Parent Container</b>	<a href="#">DcmDspData</a>		
<b>Description</b>	Reference to 1 DcmDspDataInfo		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">DcmDspDataInfo</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
DcmDspDiagnosisScaling	0..1	This container contains the configuration (parameters) of an alternative Diagnosis Representation. Out if this the scaling between Diagnosis and ECU internal representation and vice versa can be calculated.
DcmDspDidDataSupportInfo	0..1	This container defines the supported information.
DcmDspExternalSRDataElement Class	0..1	This container defines the source of data in a provided port which shall be read respectively the target of data in a required port which shall be written.  This container shall contain either one DcmSubElementInData ElementInstance OR DcmDataElementInstance OR DcmSub ElementInImplDataElementInstance reference.

### C.5.4 DcmDspDataInfo

<b>SWS Item</b>	<b>[ECUC_Dcm_00810]</b>
<b>Container Name</b>	DcmDspDataInfo
<b>Parent Container</b>	DcmDsp
<b>Description</b>	This container contains the configuration (parameters) of one Data.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	<b>[ECUC_Dcm_00611]</b>
<b>Parameter Name</b>	DcmDspDataScalingInfoSize
<b>Parent Container</b>	<a href="#">DcmDspDataInfo</a>





<b>Description</b>	If Scaling information service is available for this Data, it provides the size in bytes of the scaling information.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

### C.5.5 DcmDspPidService01

<b>SWS Item</b>	[ECUC_Dcm_00894]
<b>Container Name</b>	DcmDspPidService01
<b>Parent Container</b>	DcmDspPidData
<b>Description</b>	Contains specific configuration parameter of PID for service \$01. This container exists only if DcmDspPidService is set to DCM_SERVICE_01 or DCM_SERVICE_01_02.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Dcm_01012]	
<b>Parameter Name</b>	DcmDspPidDataEndianness	
<b>Parent Container</b>	<a href="#">DcmDspPidService01</a>	
<b>Description</b>	Defines the endianness of the data belonging to a PID in a diagnostic response message.  If no DcmDspPidDataEndianness is defined the value of DcmDspDataDefault Endianness is applicable.	
<b>Multiplicity</b>	0..1	
<b>Type</b>	EcucEnumerationParamDef	
<b>Range</b>	BIG_ENDIAN	Most significant byte shall be stored at the lowest address.
	LITTLE_ENDIAN	Most significant byte shall be stored at the highest address
	OPAQUE	Opaque data endianness
<b>Post-Build Variant Multiplicity</b>	false	
<b>Post-Build Variant Value</b>	false	
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X All Variants







	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00629]</b>		
<b>Parameter Name</b>	DcmDspPidDataReadFnc		
<b>Parent Container</b>	<a href="#">DcmDspPidService01</a>		
<b>Description</b>	Function name for reading PID data value. This is only relevant if DcmDspPidDataUsePort==USE_DATA_SYNCH_FNC. This parameter is related to the interface Xxx_ReadData.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_01018]</b>	
<b>Parameter Name</b>	DcmDspPidDataType	
<b>Parent Container</b>	<a href="#">DcmDspPidService01</a>	
<b>Description</b>	Provide the implementation data type of data belonging to a PID.	
<b>Multiplicity</b>	1	
<b>Type</b>	EcucEnumerationParamDef	
<b>Range</b>	BOOLEAN	Type of the data is boolean.
	SINT16	Type of the data is sint16.
	SINT16_N	Type of the data is sint16 array.
	SINT32	Type of the data is sint32.
	SINT32_N	Type of the data is sint32 array.
	SINT8	Type of the data is sint8.
	SINT8_N	Type of the data is sint8 array.
	UINT16	Type of the data is uint16.
	UINT16_N	Type of the data is uint16 array.
	UINT32	Type of the data is uint32.
	UINT32_N	Type of the data is uint32 array.
	UINT8	Type of the data is uint8.
	UINT8_N	Type of the data is uint8 array.





<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00720]</b>		
<b>Parameter Name</b>	DcmDspPidDataUsePort		
<b>Parent Container</b>	DcmDspPidService01		
<b>Description</b>	<p>If this parameter is set to USE_DATA_SYNCH_FNC, the Dcm will use the function defined in DcmDspPidDataReadFnc to get the PID data value.</p> <p>If this parameter is set to USE_DATA_SYNCH_CLIENT_SERVER, the Dcm will have an R-Port requiring the interface DataServices_{Data}.</p> <p>If this parameter is set to USE_DATA_SENDER_RECEIVER or USE_DATA_SENDER_RECEIVER_AS_SERVICE, the DCM will have an R-Port requiring a SenderReceiver Interface.</p> <p>The R-Port is named DataServices_{Data} where {Data} is the name of the container DcmDspPidData.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	USE_DATA_SENDER_RECEIVER	–	
	USE_DATA_SENDER_RECEIVER_AS_SERVICE	–	
	USE_DATA_SYNCH_CLIENT_SERVER	–	
	USE_DATA_SYNCH_FNC	–	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
DcmDspDiagnosisScaling	0..1	This container contains the configuration (parameters) of an alternative Diagnosis Representation. Out if this the scaling between Diagnosis and ECU internal representation and vice versa can be calculated.
DcmDspPidService01ExternalSRDataElementClass	0..1	<p>This container defines the source of data in a provided port which shall be read respectively the target of data in a required port which shall be written.</p> <p>This container shall contain either one DcmSubElementInDataElementInstance OR DcmDataElementInstance OR DcmSubElementInImplDataElementInstance reference.</p>

## C.5.6 DcmDspDidRead

<b>SWS Item</b>	[ECUC_Dcm_00613]
<b>Container Name</b>	DcmDspDidRead
<b>Parent Container</b>	<a href="#">DcmDspDidInfo</a>
<b>Description</b>	This container contains the configuration (parameters) of the DID read.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Dcm_00917]		
<b>Parameter Name</b>	DcmDspDidReadModeRuleRef		
<b>Parent Container</b>	<a href="#">DcmDspDidRead</a>		
<b>Description</b>	Reference to DcmModeRule Mode rule which controls to read this DID. If there is no reference, no check of the mode rule shall be done.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to DcmModeRule		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Dcm_01141]		
<b>Parameter Name</b>	DcmDspDidReadRoleRef		
<b>Parent Container</b>	<a href="#">DcmDspDidRead</a>		
<b>Description</b>	Reference to DcmDspAuthenticationRow that defines a role in that this DID can be read.		
<b>Multiplicity</b>	0..32		
<b>Type</b>	Reference to DcmDspAuthenticationRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Dcm_00614]		
<b>Parameter Name</b>	DcmDspDidReadSecurityLevelRef		
<b>Parent Container</b>	<a href="#">DcmDspDidRead</a>		
<b>Description</b>	Reference to DcmDspSecurityRow Referenced security levels are allowed to read this DID. If there is no reference, no check of security level shall be done.		





<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to DcmDspSecurityRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00615]</b>		
<b>Parameter Name</b>	DcmDspDidReadSessionRef		
<b>Parent Container</b>	<a href="#">DcmDspDidRead</a>		
<b>Description</b>	Reference to DcmDspSessionRow Referenced sessions are allowed to read this DID. If there is no reference, no check of session level shall be done.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to DcmDspSessionRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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### C.5.7 DcmDspDidWrite

<b>SWS Item</b>	<b>[ECUC_Dcm_00616]</b>
<b>Container Name</b>	DcmDspDidWrite
<b>Parent Container</b>	<a href="#">DcmDspDidInfo</a>
<b>Description</b>	This container contains the configuration (parameters) of the DID write.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	<b>[ECUC_Dcm_00922]</b>		
<b>Parameter Name</b>	DcmDspDidWriteModeRuleRef		
<b>Parent Container</b>	<a href="#">DcmDspDidWrite</a>		
<b>Description</b>	Reference to DcmModeRule Mode rule which controls to write this DID. If there is no reference, no check of the mode rule shall be done.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to DcmModeRule		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_01142]</b>		
<b>Parameter Name</b>	DcmDspDidWriteRoleRef		
<b>Parent Container</b>	<a href="#">DcmDspDidWrite</a>		
<b>Description</b>	Reference to DcmDspAuthenticationRow that defines a role in that this DID can be written.		
<b>Multiplicity</b>	0..32		
<b>Type</b>	Reference to DcmDspAuthenticationRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00617]</b>		
<b>Parameter Name</b>	DcmDspDidWriteSecurityLevelRef		
<b>Parent Container</b>	<a href="#">DcmDspDidWrite</a>		
<b>Description</b>	Reference to DcmDspSecurityRow Referenced security levels are allowed to write this DID. If there is no reference, no check of security level shall be done.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to DcmDspSecurityRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	





<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00618]</b>		
<b>Parameter Name</b>	DcmDspDidWriteSessionRef		
<b>Parent Container</b>	<a href="#">DcmDspDidWrite</a>		
<b>Description</b>	Reference to DcmDspSessionRow Referenced sessions are allowed to write this DID. If there is no reference, no check of session level shall be done.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to DcmDspSessionRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

No Included Containers

### C.5.8 DcmDspDidControl

<b>SWS Item</b>	<b>[ECUC_Dcm_00619]</b>		
<b>Container Name</b>	DcmDspDidControl		
<b>Parent Container</b>	<a href="#">DcmDspDidInfo</a>		
<b>Description</b>	This container contains the configuration (parameters) of the DID control.		
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Dcm_01059]</b>		
<b>Parameter Name</b>	DcmDspDidControlMask		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	This indicates the presence of "controlEnableMask" in SWC service interfaces and defines how the Dcm treats a service request.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DCM_CONTROLMASK_ EXTERNAL	The control enable mask record shall be forwarded within each interface and is handled externally.	





	DCM_CONTROLMASK_INTERNAL	The control enable mask record is handled internally and Dcm controls only the included signals.	
	DCM_CONTROLMASK_NO	No control enable mask handling.	
<b>Default value</b>	<a href="#">DCM_CONTROLMASK_INTERNAL</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_01060]</b>		
<b>Parameter Name</b>	DcmDspDidControlMaskSize		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	The value defines the size of the controlEnableMaskRecord in bytes.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 4294967294		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00624]</b>		
<b>Parameter Name</b>	DcmDspDidFreezeCurrentState		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	This indicates the presence of "FreezeCurrentState".		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00623]</b>		
<b>Parameter Name</b>	DcmDspDidResetToDefault		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	This indicates the presence of "ResetToDefault".		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants





	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00625]</b>		
<b>Parameter Name</b>	DcmDspDidShortTermAdjustment		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	This indicates the presence of "ShortTermAdjustment".		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00923]</b>		
<b>Parameter Name</b>	DcmDspDidControlModeRuleRef		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	Reference to DcmModeRule Mode rule which controls this DID. If there is no reference, no check of the mode rule shall be done.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to DcmModeRule		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_01143]</b>		
<b>Parameter Name</b>	DcmDspDidControlRoleRef		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	Reference to DcmDspAuthenticationRow that defines a role in that this IO can be controlled.		
<b>Multiplicity</b>	0..32		
<b>Type</b>	Reference to DcmDspAuthenticationRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	







	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00620]</b>		
<b>Parameter Name</b>	DcmDspDidControlSecurityLevelRef		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	Reference to DcmDspSecurityRow Security levels allowed to control this DID. If there is no reference, no check of security level shall be done.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to DcmDspSecurityRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00621]</b>		
<b>Parameter Name</b>	DcmDspDidControlSessionRef		
<b>Parent Container</b>	<a href="#">DcmDspDidControl</a>		
<b>Description</b>	Reference to DcmDspSessionRow Sessions allowed to control this DID. If there is no reference, no check of session level shall be done.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to DcmDspSessionRow		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
DcmDspDidControlEnableMask	0..32	The shortname of the container value defines the symbol of the controlMask.

### C.5.9 DcmDspRoutine

<b>SWS Item</b>	[ECUC_Dcm_00640]
<b>Container Name</b>	DcmDspRoutine
<b>Parent Container</b>	DcmDsp
<b>Description</b>	This container contains the configuration (parameters) for Routines
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Dcm_01215]		
<b>Parameter Name</b>	DcmDspRoutineFncSignature		
<b>Parent Container</b>	<a href="#">DcmDspRoutine</a>		
<b>Description</b>	<p>If the parameter is set to ROUTINE_FNC_NORMAL the routine control functions DcmDspStartRoutineFnc, DcmDspStopRoutineFnc or DcmDspRequestResultsRoutineFnc are defined with the signature for a cluster local user with separate arguments per signal. If the parameter is set to ROUTINE_FNC_PROXY the routine control functions DcmDspStartRoutineFnc, DcmDspStopRoutineFnc or DcmDspRequestResultsRoutineFnc with a fixed number of arguments passing a common buffer for all signals and a DataLength.</p> <p><b>Tags:</b> atp.Status=draft</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	ROUTINE_FNC_NORMAL	Function calls with normal set of arguments used for Sw Cluster internal interfaces. <b>Tags:</b> atp.Status=draft	
	ROUTINE_FNC_PROXY	Function call used with generic set of arguments used for Dcm low proxy. <b>Tags:</b> atp.Status=draft	
<b>Default value</b>	<a href="#">ROUTINE_FNC_NORMAL</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	[ECUC_Dcm_00641]		
<b>Parameter Name</b>	DcmDspRoutineIdentifier		
<b>Parent Container</b>	<a href="#">DcmDspRoutine</a>		
<b>Description</b>	<p>2 bytes Identifier of the RID</p> <p>Within each DcmConfigSet all DcmDspRoutineIdentifier values shall be unique.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_01063]</b>		
<b>Parameter Name</b>	DcmDspRoutineInfoByte		
<b>Parent Container</b>	<a href="#">DcmDspRoutine</a>		
<b>Description</b>	Manufacturer specific value reported to the tester for the record identifiers 0xE000 to 0xE1FF. (OBD use cases)		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 255		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00807]</b>		
<b>Parameter Name</b>	DcmDspRoutineUsed		
<b>Parent Container</b>	<a href="#">DcmDspRoutine</a>		
<b>Description</b>	Allow to activate or deactivate the usage of a Routine, for multi purpose ECUs True = Routine is available False = Routine is not available		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dcm_00724]</b>		
<b>Parameter Name</b>	DcmDspRoutineUsePort		
<b>Parent Container</b>	<a href="#">DcmDspRoutine</a>		
<b>Description</b>	<p>If this parameter is set to true, the DCM uses a port requiring a PortInterface Routine Services_{RoutineName}.</p> <p>The R-Port is named RoutineServices_{RoutineName} where {RoutineName} is the name of the container DcmDspRoutine. In that case, the configuration must not provide function names in DcmDspStartRoutineFnc, DcmDspStopRoutineFnc or DcmDsp RequestResultsRoutineFnc. If this is false, the DCM expects to find the names of the functions to be used in DcmDspStartRoutineFnc, DcmDspStopRoutineFnc or DcmDsp RequestResultsRoutineFnc.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	





<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
DcmDspRequestRoutineResults	0..1	Provides the configuration of RequestResult subservice for RoutineControl service. Existence indicates that the Request RoutineResults in the RoutineControl is supported.
DcmDspStartRoutine	0..1	Provides the configuration of Start subservice for RoutineControl service.
DcmDspStopRoutine	0..1	Provides the configuration of Stop subservice for RoutineControl service. Existence indicates that the StopRoutine in the Routine Control is supported.

## C.6 Dem

### C.6.1 DemEventParameter

<b>SWS Item</b>	[ECUC_Dem_00661]
<b>Container Name</b>	DemEventParameter
<b>Parent Container</b>	DemConfigSet
<b>Description</b>	This container contains the configuration (parameters) for events.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_Dem_00921]		
<b>Parameter Name</b>	DemCausalityDelayTime		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Time to wait until the event is considered as causal. The parameter is specified in seconds.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. 2.5]		
<b>Default value</b>	0		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dem_00909]</b>		
<b>Parameter Name</b>	DemComponentPriority		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Specifies the priority within the component. A lower value means higher priority.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 255		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dem_00969]</b>		
<b>Parameter Name</b>	DemEventAssociatedIdentification		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Event associated identifier that allows to identify an event. This value can be reported as internal data element in snapshot records or extended data records.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	-	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00792]</b>		
<b>Parameter Name</b>	DemEventAvailable		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	This parameter configures an Event as unavailable. It is treated by Dem as if it does not exist. true = Event is available false = Event is not available		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	-	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00968]</b>		
<b>Parameter Name</b>	DemEventAvailableInVariant		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	This parameter defines the enabled or disabled status of an event. If set to FALSE, the Event is generally disabled, even though the SW-C is integrated and the Event is described in the ECUC. The Dem shall ignore all calls from the SW-C. If set to TRUE, the availability of the event depends on other availability sources.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	true		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00924]</b>		
<b>Parameter Name</b>	DemEventConfirmationThreshold		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Defines the operation cycle threshold of the DTC confirmation status according "Confirmation Threshold" of ISO 14229-1.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	1 .. 255		
<b>Default value</b>	1		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00929]</b>		
<b>Parameter Name</b>	DemEventConfirmationThresholdCounterAdaptable		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Indicates whether the events confirmation Cycle threshold can be adapted by Dem_Set EventConfirmationThresholdCounter.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00659]</b>		
<b>Parameter Name</b>	DemEventId		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	<p>Unique identifier of a diagnostic event.</p> <p>This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id. The events should be sequentially ordered beginning with 1 and no gaps in between.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	1 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00660]</b>		
<b>Parameter Name</b>	DemEventKind		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	This parameter is used to distinguish between SW-C and BSW events.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DEM_EVENT_KIND_BSW	The event is assigned to a BSW module	
	DEM_EVENT_KIND_SWC	The event is assigned to a SW-C	
<b>Default value</b>	<a href="#">DEM_EVENT_KIND_SWC</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_Dem_00916]</b>		
<b>Parameter Name</b>	DemEventRecoverableInSameOperationCycle		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	If parameter is configured to FALSE, reporting of PASSED will be ignored if the event is already "testfailed this operation cycle".		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00970]</b>		
<b>Parameter Name</b>	DemEventReportingType		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	This parameter defines the way a monitor can report an event to the Dem. There are various ways to report an event and the Dem provides different APIs for it. <b>Tags:</b> atp.Status=draft		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	STANDARD_REPORTING	The event is reported over the API Dem_SetEventStatus. <b>Tags:</b> atp.Status=draft	
	STANDARD_REPORTING_WITH_MONITOR_DATA	The event is reported over the API Dem_SetEventStatusWithMonitorData. <b>Tags:</b> atp.Status=draft	
<b>Default value</b>	<a href="#">STANDARD_REPORTING</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dem_00948]</b>		
<b>Parameter Name</b>	DemFFPrestorageInNvm		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	If the event uses a pre-stored freeze-frame this attribute indicates if the event requires the pre-stored data to be stored in non-volatile memory. TRUE = store the pre-stored data in non-volatile memory, FALSE = pre-stored data is not stored in non-volatile memory.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dem_00671]</b>		
<b>Parameter Name</b>	DemFFPrestorageSupported		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	If this parameter is set to true, then the Prestorage of FreezeFrames is supported by the assigned event. This parameter is useful to calculate the buffer size.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	







<b>Scope / Dependency</b>	scope: ECU		
<b>SWS Item</b>	<b>[ECUC_Dem_00894]</b>		
<b>Parameter Name</b>	DemReportBehavior		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Indicates the reporting behavior of the BSW Module (DemEventKind == DEM_EVENT_KIND_BSW) in order to determine the size of the reporting queue. If the parameter is not defined it means REPORT_BEFORE_INIT.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	REPORT_AFTER_INIT	Indicates that the Event will not be reported before Dem_Init().	
	REPORT_BEFORE_INIT	Indicates that the Event may be reported before Dem_Init().	
<b>Default value</b>	<a href="#">REPORT_BEFORE_INIT</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dem_00908]</b>		
<b>Parameter Name</b>	DemComponentClassRef		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Reference to the monitored component.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to DemComponent		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Dem_00888]</b>		
<b>Parameter Name</b>	DemDTCRef		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		





<b>Description</b>	This parameter defines the DTC configuration (typically Uds) associated with the diagnostic event.  It is allowed to have events without a DTC (e.g. for ECU-internal events triggering safety reactions without being reported via diagnostic communication). The same DemDTCAttributes can be used from several events, to combine these (refer to chapter "Combination of diagnostic event").		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to DemDTC		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_Dem_00746]</b>		
<b>Parameter Name</b>	DemEnableConditionGroupRef		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	References an enable condition group.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to DemEnableConditionGroup		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00839]</b>		
<b>Parameter Name</b>	DemOBDDGroupingAssociativeEventsRef		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	This parameter defines a reference which points to a representative event of one group of associate events. The "reverence event" must refer to it self. Note: One event is only allowed to be reverenced to only one group of associate events.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">DemEventParameter</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants





	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00702]</b>		
<b>Parameter Name</b>	DemOperationCycleRef		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	Kind of operation cycle for the event (e.g. power cycle, driving cycle, ...)		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to DemOperationCycle		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_Dem_00769]</b>		
<b>Parameter Name</b>	DemStorageConditionGroupRef		
<b>Parent Container</b>	<a href="#">DemEventParameter</a>		
<b>Description</b>	References a storage condition group.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to DemStorageConditionGroup		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
DemCallbackClearEventAllowed	0..1	<p>The presence of this container indicates that the Dem has access to a "ClearEventAllowed" callback.</p> <p>In case there is a DemCallbackClearEventAllowedFnc, this parameter defines the name of the function that the Dem will call.</p> <p>In case there is no DemCallbackClearEventAllowedFnc, the Dem will have an R-Port requiring the interface CallbackClearEventAllowed whose name is generated by using the unique callback-prefix followed by the event name.</p>





Included Containers		
Container Name	Multiplicity	Scope / Dependency
DemCallbackEventDataChanged	0..1	<p>The presence of this container indicates that the Dem has access to an "EventDataChanged" callback.</p> <p>In case there is a DemCallbackEventDataChangedFnc, this parameter defines the name of the function that the Dem will call.</p> <p>In case there is no DemCallbackEventDataChangedFnc, the Dem will have an R-Port requiring the interface CallbackEventDataChanged whose name is generated by using the unique callback-prefix followed by the event name.</p>
DemCallbackEventUdsStatus Changed	0..*	<p>The presence of this container indicates, that the Dem has access to an "EventUdsStatusChanged" callback, which the Dem will call to notify other components about the change in the status of an event.</p> <p>In case there is a DemCallbackEventUdsStatusChangedFnc, this parameter defines the name of the function that the Dem will call.</p> <p>In case there is no DemCallbackEventUdsStatusChangedFnc, the Dem will have an R-Port requiring the interface CallbackEventUdsStatusChanged, whose name is generated by using the unique callback-prefix followed by the event name.</p>
DemCallbackInitMForE	0..1	<p>The presence of this container indicates, that the Dem has access to an "InitMonitorForEvent" callback, which the Dem will call to initialize a monitor.</p> <p>In case the container has a DemCallbackInitMForEFnc, this parameter defines the name of the function that the Dem will call.</p> <p>In case there is no DemCallbackInitMForEFnc, the Dem will have an R-Port requiring the interface CallbackInitMonitorForEvent, whose name is generated by using the unique callback-prefix followed by the event name.</p>
DemCallbackMonitorStatus Changed	0..*	<p>The presence of this container indicates, that the Dem has access to an "MonitorStatusChanged" callback, which the Dem will call to notify other components about the change in the status of an event.</p> <p>In case there is a DemCallbackMonitorStatusChangedFnc, this parameter defines the name of the function that the Dem will call.</p> <p>In case there is no DemCallbackMonitorStatusChangedFnc, the Dem will have an R-Port requiring the interface CallbackMonitorStatusChanged, whose name is generated by using the unique callback-prefix followed by the event name.</p>
DemDebounceAlgorithmClass	1	Debounce algorithm class: counter based, time based, or monitor internal.
DemIndicatorAttribute	0..255	This container contains the event specific configuration of Indicators.

## C.6.2 DemDataElementClass

<b>SWS Item</b>	[ECUC_Dem_00610]
<b>Choice Container Name</b>	DemDataElementClass
<b>Parent Container</b>	DemGeneral
<b>Description</b>	This container contains the configuration (parameters) for an internal/external data element class.

Container Choices		
Container Name	Multiplicity	Scope / Dependency
DemExternalCSDataElementClass	0..1	This container contains the configuration (parameters) for an external client/server based data element class.  It defines, how the Dem can obtain the value of the data element from either a SW-C or another BSW module. Whether a client/server port or a C function-call is used, is defined by DemDataElementUsePort.
DemExternalSRDataElementClass	0..1	This container contains the configuration (parameters) for an external sender/receiver based data element class. It defines, how the Dem can obtain the value of the data element from a SW-C, by using a sender/receiver port.
DemInternalDataElementClass	0..1	This container contains the configuration (parameters) for an internal data element class.

## C.7 FiM

### C.7.1 FiMFID

<b>SWS Item</b>	[ECUC_FiM_00039]
<b>Container Name</b>	FiMFID
<b>Parent Container</b>	FiMConfigSet
<b>Description</b>	This container includes symbolic names of all FIDs.
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_FiM_00085]		
<b>Parameter Name</b>	FiMFunctionId		
<b>Parent Container</b>	FiMFID		
<b>Description</b>	<p>Unique identifier of a FimFunctionId. This parameter should not be changeable by user, because the Id should be generated by Fim itself to prevent gaps and multiple use of an Id.</p> <p>Note: The implementer can add the attribute 'withAuto' to the parameter definition which indicates that the value can be calculated by the generator automatically. When '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.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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## C.8 Com

### C.8.1 ComMainFunctionTx

<b>SWS Item</b>	<b>[ECUC_Com_10014]</b>		
<b>Container Name</b>	ComMainFunctionTx		
<b>Parent Container</b>	ComConfig		
<b>Description</b>	Each element of this container defines one instance of Com_MainFunctionTx.		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Com_10010]</b>		
<b>Parameter Name</b>	ComMainTxTimeBase		
<b>Parent Container</b>	<a href="#">ComMainFunctionTx</a>		
<b>Description</b>	<p>The period between successive calls to according instance of Com_MainFunctionTx in seconds. This parameter may be used by the COM generator to transform the values of the reception related timing configuration parameters of the COM module to internal implementation specific counter or tick values. The COM module's internal timing handling is implementation specific.</p> <p>The COM module (generator) may rely on the fact that Com_MainFunctionTx is scheduled according to the value configured here.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	]0 .. INF[		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_10020]</b>		
<b>Parameter Name</b>	ComPreparationNotification		
<b>Parent Container</b>	<a href="#">ComMainFunctionTx</a>		
<b>Description</b>	<p>This callback function indicates that the signals/signal groups to be sent via a dedicated Com_MainFunctionTx instance will now be prepared for transmission.</p> <p>If this parameter is omitted no notification shall take place.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	





Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

SWS Item	[ECUC_Com_10019]		
Parameter Name	ComMainTxPartitionRef		
Parent Container	<a href="#">ComMainFunctionTx</a>		
Description	Reference to EcucPartition, where the according Com_MainFunction instance is assigned to.		
Multiplicity	0..1		
Type	Reference to <a href="#">EcucPartition</a>		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers

## C.8.2 ComMainFunctionRx

SWS Item	[ECUC_Com_10011]		
Container Name	ComMainFunctionRx		
Parent Container	ComConfig		
Description	Each element of this container defines one instance of Com_MainFunctionRx.		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

SWS Item	[ECUC_Com_10018]		
Parameter Name	ComMainRxTimeBase		
Parent Container	<a href="#">ComMainFunctionRx</a>		





<b>Description</b>	<p>The period between successive calls to according instance of Com_MainFunctionRx in seconds. This parameter may be used by the COM generator to transform the values of the reception related timing configuration parameters of the COM module to internal implementation specific counter or tick values. The COM module's internal timing handling is implementation specific.</p> <p>The COM module (generator) may rely on the fact that Com_MainFunctionRx is scheduled according to the value configured here.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	]0 .. INF[		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_10017]</b>		
<b>Parameter Name</b>	ComMainRxPartitionRef		
<b>Parent Container</b>	<a href="#">ComMainFunctionRx</a>		
<b>Description</b>	Reference to EcucPartition, where the according Com_MainFunction instance is assigned to.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

No Included Containers

### C.8.3 ComGroupSignal

<b>SWS Item</b>	<b>[ECUC_Com_00520]</b>		
<b>Container Name</b>	ComGroupSignal		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	This container contains the configuration parameters of group signals. I.e. signals that are included within a signal group.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME







	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Com_00259]</b>		
<b>Parameter Name</b>	ComBitPosition		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	Starting position within the I-PDU. This parameter refers to the position in the I-PDU and not in the shadow buffer. If the endianness conversion is configured to Opaque the parameter ComBitPosition shall define the bit0 of the first byte like in little endian byte order		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00158]</b>		
<b>Parameter Name</b>	ComBitSize		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	Size in bits, for integer signal types. For ComSignalType UINT8_N and UINT8_DYN the size shall be configured by ComSignalLength. For ComSignalTypes FLOAT32 and FLOAT64 the size is already defined by the signal type and therefore may be omitted.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 64		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00165]</b>		
<b>Parameter Name</b>	ComHandleId		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	The numerical value used as the ID.  This ID identifies signals and signal groups in the COM APIs using Com_SignalIdType or Com_SignalGroupIdType parameter respectively.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		





<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU withAuto = true		

<b>SWS Item</b>	<b>[ECUC_Com_00391]</b>		
<b>Parameter Name</b>	ComSignalDataInvalidValue		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	<p>Defines the data invalid value of the signal.</p> <p>In case the ComSignalType is UINT8, UINT16, UINT32, UINT64, SINT8, SINT16, SINT32, SINT64 the string shall be interpreted as defined in the chapter Integer Type in the AUTOSAR EcuC specification. In case the ComSignalType is FLOAT32, FLOAT64 the string shall be interpreted as defined in the chapter Float Type in the AUTOSAR EcuC specification. In case the ComSignalType is BOOLEAN the string shall be interpreted as defined in the chapter Boolean Type in the AUTOSAR EcuC specification. In case the ComSignal is a UINT8_N, UINT8_DYN the string shall be interpreted as a decimal representation of the characters separated by blanks, e.g. "97 98 100" means a string "abd", where the char "a" is in byte 0(lowest address), "b" is in byte 1, and "d" is in byte 2 and (highest address). For the ComSignalType UINT8_DYN the dynamic length shall be set to the number of configured characters. An empty string "" shall be interpreted as 0-sized dynamic signal.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local dependency: In case of UINT8_N the length of ComSignalDataInvalidValue has to be the same as ComSignalLength.		

<b>SWS Item</b>	<b>[ECUC_Com_00157]</b>		
<b>Parameter Name</b>	ComSignalEndianness		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		





<b>Description</b>	Defines the endianness of the signal's network representation.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	BIG_ENDIAN	–	
	LITTLE_ENDIAN	–	
	OPAQUE	–	
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00170]</b>		
<b>Parameter Name</b>	ComSignalInitValue		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	<p>Initial value for this signal. In case of UINT8_N the default value is a string of length ComSignalLength with all bytes set to 0x00. In case of UINT8_DYN the initial size shall be 0.</p> <p>In case the ComSignalType is UINT8, UINT16, UINT32, UINT64, SINT8, SINT16, SINT32, SINT64 the string shall be interpreted as defined in the chapter Integer Type in the AUTOSAR EcuC specification. In case the ComSignalType is FLOAT32, FLOAT64 the string shall be interpreted as defined in the chapter Float Type in the AUTOSAR EcuC specification. In case the ComSignalType is BOOLEAN the string shall be interpreted as defined in the chapter Boolean Type in the AUTOSAR EcuC specification. In case the ComSignal is a UINT8_N, UINT8_DYN the string shall be interpreted as a decimal representation of the characters separated by blanks, e.g. "97 98 100" means a string "abd", where the char "a" is in byte 0(lowest address), "b" is in byte 1, and "d" is in byte 2 and (highest address). For the ComSignalType UINT8_DYN the dynamic length shall be set to the number of configured characters. An empty string "" shall be interpreted as 0-sized dynamic signal.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	0		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local  dependency: In case of UINT8_N the length of ComSignalInitValue has to be the same as ComSignalLength.		

<b>SWS Item</b>	<b>[ECUC_Com_00437]</b>		
<b>Parameter Name</b>	ComSignalLength		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		





<b>Description</b>	<p>Description: For ComSignalType UINT8_N this parameter specifies the length n in bytes. For ComSignalType UINT8_DYN it specifies the maximum length in bytes. For all other types this parameter shall be ignored.</p> <p>The supported maximum length is restricted by the used transportation system. For non TP-PDUs the maximum size of a PDU, and therefore also of any included signal, is limited by the concrete bus characteristic. For example, the limit is 8 bytes for CAN and LIN, 64 bytes for CAN FD and 254 for FlexRay.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00127]		
<b>Parameter Name</b>	ComSignalType		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	<p>The AUTOSAR type of the signal. Whether or not the signal is signed or unsigned can be found by examining the value of this attribute. This type could also be used to reserved appropriate storage in AUTOSAR COM.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	BOOLEAN	–	
	FLOAT32	–	
	FLOAT64	–	
	SINT16	–	
	SINT32	–	
	SINT64	–	
	SINT8	–	
	UINT16	–	
	UINT32	–	
	UINT64	–	
	UINT8	–	
	UINT8_DYN	–	
	UINT8_N	–	
	<b>Post-Build Variant Value</b>	false	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_10006]</b>		
<b>Parameter Name</b>	ComTimeoutSubstitutionValue		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	<p>The signal substitution value will be used in case of a timeout and ComRxDataTimeout Action is set to SUBSTITUTE. In case of UINT8_N the default value is a string of length ComSignalLength with all bytes set to 0x00.</p> <p>In case of UINT8_DYN the initial size shall be 0.</p> <p>In case the ComSignalType is UINT8, UINT16, UINT32, UINTE64, SINT8, SINT16, SINT32, SINT64 the string shall be interpreted as defined in the chapter Integer Type in the AUTOSAR EcuC specification.</p> <p>In case the ComSignalType is FLOAT32, FLOAT64 the string shall be interpreted as defined in the chapter Float Type in the AUTOSAR EcuC specification.</p> <p>In case the ComSignalType is BOOLEAN the string shall be interpreted as defined in the chapter Boolean Type in the AUTOSAR EcuC specification.</p> <p>In case the ComSignal is a UINT8_N, UINT8_DYN the string shall be interpreted as a decimal representation of the characters separated by blanks, e.g. "97 98 100" means a string "abd", where the char "a" is in byte 0(lowest address), "b" is in byte 1, and "d" is in byte 2 and (highest address). For the ComSignalType UINT8_DYN the dynamic length shall be set to the number of configured characters. An empty string "" shall be interpreted as 0-sized dynamic signal.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	-		
<b>Regular Expression</b>	-		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00560]</b>		
<b>Parameter Name</b>	ComTransferProperty		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	<p>Optionally defines whether this group signal shall contribute to the TRIGGERED_ON_CHANGE transfer property of the signal group. If at least one group signal of a signal group has the "ComTransferProperty" configured all other group signals of that signal group shall have the attribute configured as well.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	PENDING	A change of the value of this group signal shall not be considered in the evaluation of the signal groups ComTransferProperty.	
	TRIGGERED_ON_CHANGE	A change of the value of this group signal shall be considered in the evaluation of the signal groups ComTransferProperty.	
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		





<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00002]		
<b>Parameter Name</b>	ComSystemTemplateSystemSignalRef		
<b>Parent Container</b>	<a href="#">ComGroupSignal</a>		
<b>Description</b>	Reference to the ISignalToIPduMapping that contains a reference to the ISignal (System Template) which this ComSignal (or ComGroupSignal) represents.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to I-SIGNAL-TO-I-PDU-MAPPING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
ComFilter	0..1	This container contains the configuration parameters of the AUTOSAR COM module's filters. Note: On sender side the container is used to specify the transmission mode conditions.

## C.8.4 ComIPdu

<b>SWS Item</b>	[ECUC_Com_00340]		
<b>Container Name</b>	ComIPdu		
<b>Parent Container</b>	ComConfig		
<b>Description</b>	Contains the configuration parameters of the AUTOSAR COM module's I-PDUs.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Com_00387]</b>		
<b>Parameter Name</b>	ComIPduCallout		
<b>Parent Container</b>	ComIPdu		
<b>Description</b>	This parameter defines the existence and the name of a callout function for the corresponding I-PDU. If this parameter is omitted no I-PDU callout shall take place for the corresponding I-PDU.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00709]</b>		
<b>Parameter Name</b>	ComIPduCancellationSupport		
<b>Parent Container</b>	ComIPdu		
<b>Description</b>	Defines for I-PDUs with ComIPduType NORMAL: If the underlying IF-modul supports cancellation of transmit requests.  Defines for I-PDUs with ComIPduType TP: If the underlying TP-module supports RX and TX cancellation of ongoing requests.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	–	
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU  dependency: This parameter shall not be set to true if ComCancellationSupport is set to false		

<b>SWS Item</b>	<b>[ECUC_Com_00493]</b>		
<b>Parameter Name</b>	ComIPduDirection		
<b>Parent Container</b>	ComIPdu		
<b>Description</b>	The direction defines if this I-PDU, and therefore the contributing signals and signal groups, shall be sent or received.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		





<b>Range</b>	RECEIVE	–	
	SEND	–	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local dependency: If configured to Sent also a ComTxIpdu container shall be included, see ECUC_Com_00496		

<b>SWS Item</b>	<b>[ECUC_Com_00175]</b>		
<b>Parameter Name</b>	ComIPduHandleId		
<b>Parent Container</b>	ComIPdu		
<b>Description</b>	The numerical value used as the ID of this I-PDU. The ComIPduHandleId is required by the API calls Com_RxIndication, Com_TpRxIndication, Com_StartOfReception and Com_CopyRxData to receive I-PDUs from the PduR (ComIPduDirection: Receive), as well as the PduId passed to an Rx-I-PDU-callout. For Tx-I-PDUs (ComIPduDirection: Send), this handle Id is used for the APIs calls Com_TxConfirmation, Com_TriggerTransmit, Com_TriggerIPDUSend or Com_TriggerIPDUSendWithMetaData, Com_CopyTxData and Com_TpTxConfirmation to transmit respectively confirm transmissions of I-PDUs, as well as the PduId passed to the Tx-I-PDU-callout configured with ComIPduCallout and/or ComIPduTriggerTransmitCallout.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU withAuto = true		

<b>SWS Item</b>	<b>[ECUC_Com_00119]</b>		
<b>Parameter Name</b>	ComIPduSignalProcessing		
<b>Parent Container</b>	ComIPdu		
<b>Description</b>	For the definition of the two modes Immediate and Deferred.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	DEFERRED	signal indication / confirmations are deferred for example to a cyclic task	
	IMMEDIATE	the signal indications / confirmations are performed in Com_RxIndication/ Com_TxConfirmation	
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE







	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00765]</b>		
<b>Parameter Name</b>	ComIPduTriggerTransmitCallout		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	If there is a trigger transmit callout defined for this I-PDU this parameter contains the name of the callout function.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFunctionNameDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00761]</b>		
<b>Parameter Name</b>	ComIPduType		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	Defines if this I-PDU is a normal I-PDU that can be sent unfragmented or if this is a large I-PDU that shall be sent via the Transport Protocol of the underlying bus.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	NORMAL	sent or received via normal L-PDU	
	TP	sent or received via TP	
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00206]</b>		
<b>Parameter Name</b>	ComIPduGroupRef		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	Reference to the I-PDU groups this I-PDU belongs to.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to ComIPduGroup		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE





<b>Value Configuration Class</b>	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_10012]</b>		
<b>Parameter Name</b>	ComIPduMainFunctionRef		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	Reference to the Com_MainFunctionRx/Com_MainFunctionTx this I-PDU belongs to. Mandatory, if multiple main functions of the relevant type are defined.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Choice reference to [ <a href="#">ComMainFunctionRx</a> , <a href="#">ComMainFunctionTx</a> ]		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00519]</b>		
<b>Parameter Name</b>	ComIPduSignalGroupRef		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	References to all signal groups contained in this I-Pdu		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">ComSignalGroup</a>		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00518]</b>		
<b>Parameter Name</b>	ComIPduSignalRef		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	References to all signals contained in this I-PDU.		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">ComSignal</a>		





<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_10021]		
<b>Parameter Name</b>	ComMainFunctionRouteSignalsRef		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	Reference to ComMainFunctionRouteSignals which performs signal gateway related activities.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Reference to ComMainFunctionRouteSignals		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00711]		
<b>Parameter Name</b>	ComPduldRef		
<b>Parent Container</b>	<a href="#">ComIPdu</a>		
<b>Description</b>	Reference to the "global" Pdu structure to allow harmonization of handle IDs in the COM-Stack.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">Pdu</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

Included Containers		
Container Name	Multiplicity	Scope / Dependency
ComTxIPdu	0..1	This container must be included if COM_IPDU_DIRECTION is configured to SEND.

## C.8.5 ComSignal

<b>SWS Item</b>	[ECUC_Com_00344]		
<b>Container Name</b>	ComSignal		
<b>Parent Container</b>	ComConfig		
<b>Description</b>	Contains the configuration parameters of the AUTOSAR COM module's signals.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_Com_00259]		
<b>Parameter Name</b>	ComBitPosition		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	Starting position within the I-PDU. This parameter refers to the position in the I-PDU and not in the shadow buffer. If the endianness conversion is configured to Opaque the parameter ComBitPosition shall define the bit0 of the first byte like in little endian byte order		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	-		
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00158]		
<b>Parameter Name</b>	ComBitSize		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	Size in bits, for integer signal types. For ComSignalType UINT8_N and UINT8_DYN the size shall be configured by ComSignalLength. For ComSignalTypes FLOAT32 and FLOAT64 the size is already defined by the signal type and therefore may be omitted.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 64		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00314]</b>		
<b>Parameter Name</b>	ComDataInvalidAction		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	This parameter defines the action performed upon reception of an invalid signal. Relating to signal groups the action in case if one of the included signals is an invalid signal. If Replace is used the ComSignalInitValue will be used for the replacement.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	NOTIFY	–	
	REPLACE	Literal for DataInvalidAction	
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00183]</b>		
<b>Parameter Name</b>	ComFirstTimeout		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	Defines the length of the first deadline monitoring timeout period in seconds. This timeout is used immediately after start (or restart) of the deadline monitoring service. The timeout period of the successive periods is configured by ECUC_Com_00263.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. 3600]		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00165]</b>		
<b>Parameter Name</b>	ComHandleId		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	The numerical value used as the ID.  This ID identifies signals and signal groups in the COM APIs using Com_SignalIdType or Com_SignalGroupIdType parameter respectively.		
<b>Multiplicity</b>	0..1		





<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU withAuto = true		

<b>SWS Item</b>	<b>[ECUC_Com_00811]</b>		
<b>Parameter Name</b>	ComInitialValueOnly		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	This parameter defines that the respective signal's initial value shall be put into the respective PDU but there will not be any update of the value through the users (e.g. RTE, SwCluC). Thus the Com implementation does not need to expect any API calls for this signal (group).		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00412]</b>		
<b>Parameter Name</b>	ComRxDataTimeoutAction		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	This parameter defines the action performed upon expiration of the reception deadline monitoring timer.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	NONE	no replacement shall take place	
	REPLACE	signals shall be replaced by their ComSignalInit Value	
	SUBSTITUTE	signals shall be replaced by their ComTimeout SubstitutionValue	
<b>Post-Build Variant Multiplicity</b>	false		





<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00391]</b>		
<b>Parameter Name</b>	ComSignalDataInvalidValue		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	<p>Defines the data invalid value of the signal.</p> <p>In case the ComSignalType is UINT8, UINT16, UINT32, UINT64, SINT8, SINT16, SINT32, SINT64 the string shall be interpreted as defined in the chapter Integer Type in the AUTOSAR EcuC specification. In case the ComSignalType is FLOAT32, FLOAT64 the string shall be interpreted as defined in the chapter Float Type in the AUTOSAR EcuC specification. In case the ComSignalType is BOOLEAN the string shall be interpreted as defined in the chapter Boolean Type in the AUTOSAR EcuC specification. In case the ComSignal is a UINT8_N, UINT8_DYN the string shall be interpreted as a decimal representation of the characters separated by blanks, e.g. "97 98 100" means a string "abd", where the char "a" is in byte 0(lowest address), "b" is in byte 1, and "d" is in byte 2 and (highest address). For the ComSignalType UINT8_DYN the dynamic length shall be set to the number of configured characters. An empty string "" shall be interpreted as 0-sized dynamic signal.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local  dependency: In case of UINT8_N the length of ComSignalDataInvalidValue has to be the same as ComSignalLength.		

<b>SWS Item</b>	<b>[ECUC_Com_00157]</b>		
<b>Parameter Name</b>	ComSignalEndianness		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	Defines the endianness of the signal's network representation.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		





<b>Range</b>	BIG_ENDIAN	–	
	LITTLE_ENDIAN	–	
	OPAQUE	–	
<b>Post-Build Variant Value</b>	true		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00170]</b>		
<b>Parameter Name</b>	ComSignalInitValue		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	<p>Initial value for this signal. In case of UINT8_N the default value is a string of length ComSignalLength with all bytes set to 0x00. In case of UINT8_DYN the initial size shall be 0.</p> <p>In case the ComSignalType is UINT8, UINT16, UINT32, UINT64, SINT8, SINT16, SINT32, SINT64 the string shall be interpreted as defined in the chapter Integer Type in the AUTOSAR EcuC specification. In case the ComSignalType is FLOAT32, FLOAT64 the string shall be interpreted as defined in the chapter Float Type in the AUTOSAR EcuC specification. In case the ComSignalType is BOOLEAN the string shall be interpreted as defined in the chapter Boolean Type in the AUTOSAR EcuC specification. In case the ComSignal is a UINT8_N, UINT8_DYN the string shall be interpreted as a decimal representation of the characters separated by blanks, e.g. "97 98 100" means a string "abd", where the char "a" is in byte 0(lowest address), "b" is in byte 1, and "d" is in byte 2 and (highest address). For the ComSignalType UINT8_DYN the dynamic length shall be set to the number of configured characters. An empty string "" shall be interpreted as 0-sized dynamic signal.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	0		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local dependency: In case of UINT8_N the length of ComSignalInitValue has to be the same as ComSignalLength.		

<b>SWS Item</b>	<b>[ECUC_Com_00437]</b>		
<b>Parameter Name</b>	ComSignalLength		
<b>Parent Container</b>	<a href="#">ComSignal</a>		







<b>Description</b>	<p>Description: For ComSignalType UINT8_N this parameter specifies the length n in bytes. For ComSignalType UINT8_DYN it specifies the maximum length in bytes. For all other types this parameter shall be ignored.</p> <p>The supported maximum length is restricted by the used transportation system. For non TP-PDUs the maximum size of a PDU, and therefore also of any included signal, is limited by the concrete bus characteristic. For example, the limit is 8 bytes for CAN and LIN, 64 bytes for CAN FD and 254 for FlexRay.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00127]		
<b>Parameter Name</b>	ComSignalType		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	The AUTOSAR type of the signal. Whether or not the signal is signed or unsigned can be found by examining the value of this attribute. This type could also be used to reserved appropriate storage in AUTOSAR COM.		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	BOOLEAN	–	
	FLOAT32	–	
	FLOAT64	–	
	SINT16	–	
	SINT32	–	
	SINT64	–	
	SINT8	–	
	UINT16	–	
	UINT32	–	
	UINT64	–	
	UINT8	–	
	UINT8_DYN	–	
	UINT8_N	–	
	<b>Post-Build Variant Value</b>	false	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00263]</b>		
<b>Parameter Name</b>	ComTimeout		
<b>Parent Container</b>	ComSignal		
<b>Description</b>	Defines the length of the deadline monitoring timeout period in seconds. The period for the first timeout period can be configured separately by ECUC_Com_00183.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. 3600]		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_10006]</b>		
<b>Parameter Name</b>	ComTimeoutSubstitutionValue		
<b>Parent Container</b>	ComSignal		
<b>Description</b>	<p>The signal substitution value will be used in case of a timeout and ComRxDataTimeout Action is set to SUBSTITUTE. In case of UINT8_N the default value is a string of length ComSignalLength with all bytes set to 0x00.</p> <p>In case of UINT8_DYN the initial size shall be 0.</p> <p>In case the ComSignalType is UINT8, UINT16, UINT32, UINT64, SINT8, SINT16, SINT32, SINT64 the string shall be interpreted as defined in the chapter Integer Type in the AUTOSAR EcuC specification.</p> <p>In case the ComSignalType is FLOAT32, FLOAT64 the string shall be interpreted as defined in the chapter Float Type in the AUTOSAR EcuC specification.</p> <p>In case the ComSignalType is BOOLEAN the string shall be interpreted as defined in the chapter Boolean Type in the AUTOSAR EcuC specification.</p> <p>In case the ComSignal is a UINT8_N, UINT8_DYN the string shall be interpreted as a decimal representation of the characters separated by blanks, e.g. "97 98 100" means a string "abd", where the char "a" is in byte 0(lowest address), "b" is in byte 1, and "d" is in byte 2 and (highest address). For the ComSignalType UINT8_DYN the dynamic length shall be set to the number of configured characters. An empty string "" shall be interpreted as 0-sized dynamic signal.</p>		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucStringParamDef		
<b>Default value</b>	–		
<b>Regular Expression</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME





	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00232]</b>		
<b>Parameter Name</b>	ComTransferProperty		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	Defines if a write access to this signal can trigger the transmission of the corresponding I-PDU. If the I-PDU is triggered, depends also on the transmission mode of the corresponding I-PDU.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	PENDING	A write access to this signal never triggers the transmission of the corresponding I-PDU.	
	TRIGGERED	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU.	
	TRIGGERED_ON_CHANGE	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU, but only in case the written value is different to the locally stored (last sent or initial value) in length or value.	
	TRIGGERED_ON_CHANGE_WITHOUT_REPETITION	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU just once without a repetition, but only in case the written value is different to the locally stored (last sent or initial value) in length or value.	
	TRIGGERED_WITHOUT_REPETITION	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU just once without a repetition.	
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00257]</b>		
<b>Parameter Name</b>	ComUpdateBitPosition		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	Bit position of update-bit inside I-PDU. If this attribute is omitted then there is no update-bit. This setting must be consistently on sender and on receiver side.  Range: 0..63 for CAN and LIN, 0..511 for CAN FD, 0..2031 for FlexRay, 0..4294967295 for TP.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		





<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00002]		
<b>Parameter Name</b>	ComSystemTemplateSystemSignalRef		
<b>Parent Container</b>	<a href="#">ComSignal</a>		
<b>Description</b>	Reference to the ISignalToIPduMapping that contains a reference to the ISignal (System Template) which this ComSignal (or ComGroupSignal) represents.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to I-SIGNAL-TO-I-PDU-MAPPING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
ComFilter	0..1	This container contains the configuration parameters of the AUTOSAR COM module's Filters.  Note: On sender side the container is used to specify the transmission mode conditions.

## C.8.6 ComUserModule

<b>SWS Item</b>	[ECUC_Com_10031]		
<b>Container Name</b>	ComUserModule		
<b>Parent Container</b>	ComConfig		
<b>Description</b>	Contains the configuration parameters of the Com user modules. <b>Tags:</b> atp.Status=draft		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	





	<b>Post-build time</b>	-	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_Com_10029]</b>		
<b>Parameter Name</b>	ComUserModuleCnfRef		
<b>Parent Container</b>	<a href="#">ComUserModule</a>		
<b>Description</b>	Reference to the Com user module configuration.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to destinationUri <a href="#">ComUserUriDefSet/ComUser</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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### C.8.7 ComUserUriDefSet

<b>SWS Item</b>	<b>[ECUC_Com_10039]</b>
<b>EcucDestinationUriDefSet Name</b>	ComUserUriDefSet
<b>Description</b>	Defines the set of DestinationUriDefs for the Com module.
<b>Included EcucDestinationUriDefs</b>	
<b>Name</b>	<b>Description</b>
<a href="#">ComUser</a>	Defines the configuration container content of the Com user modules relevant settings.

<b>SWS Item</b>	<b>[ECUC_Com_10040]</b>
<b>EcucDestinationUriDef Name</b>	ComUser
<b>Destination Uri Definition Set</b>	<a href="#">ComUserUriDefSet</a>
<b>Description</b>	Defines the configuration container content of the Com user modules relevant settings.
<b>destinationUriNestingContract</b>	vertexOfTargetContainer
<b>Configuration Parameters</b>	

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">ComUserModuleCnf</a>	0..1	Contains the configuration parameters of the Com user module.

## C.8.8 ComSignalGroup

<b>SWS Item</b>	[ECUC_Com_00345]		
<b>Container Name</b>	ComSignalGroup		
<b>Parent Container</b>	ComConfig		
<b>Description</b>	Contains the configuration parameters of the AUTOSAR COM module's signal groups.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_Com_00314]		
<b>Parameter Name</b>	ComDataInvalidAction		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	This parameter defines the action performed upon reception of an invalid signal. Relating to signal groups the action in case if one of the included signals is an invalid signal. If Replace is used the ComSignalInitValue will be used for the replacement.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	NOTIFY	–	
	REPLACE	Literal for DataInvalidAction	
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00183]		
<b>Parameter Name</b>	ComFirstTimeout		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	Defines the length of the first deadline monitoring timeout period in seconds. This timeout is used immediately after start (or restart) of the deadline monitoring service. The timeout period of the successive periods is configured by ECUC_Com_00263.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		
<b>Range</b>	[0 .. 3600]		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD





<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00165]</b>		
<b>Parameter Name</b>	ComHandleId		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	The numerical value used as the ID. This ID identifies signals and signal groups in the COM APIs using Com_SignalIdType or Com_SignalGroupIdType parameter respectively.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	-	
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: ECU withAuto = true		

<b>SWS Item</b>	<b>[ECUC_Com_00811]</b>		
<b>Parameter Name</b>	ComInitialValueOnly		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	This parameter defines that the respective signal's initial value shall be put into the respective PDU but there will not be any update of the value through the users (e.g. RTE, SwCluC). Thus the Com implementation does not need to expect any API calls for this signal (group).		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	false		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	-	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	-	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00412]</b>		
<b>Parameter Name</b>	ComRxDataTimeoutAction		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	This parameter defines the action performed upon expiration of the reception deadline monitoring timer.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	NONE	no replacement shall take place	
	REPLACE	signals shall be replaced by their ComSignalInit Value	
	SUBSTITUTE	signals shall be replaced by their ComTimeout SubstitutionValue	
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_10003]</b>		
<b>Parameter Name</b>	ComSignalGroupArrayAccess		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	Defines whether the uint8-array based access shall be used for this ComSignalGroup.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucBooleanParamDef		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>			

<b>SWS Item</b>	<b>[ECUC_Com_00263]</b>		
<b>Parameter Name</b>	ComTimeout		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	Defines the length of the deadline monitoring timeout period in seconds. The period for the first timeout period can be configured separately by ECUC_Com_00183.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucFloatParamDef		







<b>Range</b>	[0 .. 3600]		
<b>Default value</b>	–		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	[ECUC_Com_00232]		
<b>Parameter Name</b>	ComTransferProperty		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	Defines if a write access to this signal can trigger the transmission of the corresponding I-PDU. If the I-PDU is triggered, depends also on the transmission mode of the corresponding I-PDU.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	PENDING	A write access to this signal never triggers the transmission of the corresponding I-PDU.	
	TRIGGERED	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU.	
	TRIGGERED_ON_CHANGE	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU, but only in case the written value is different to the locally stored (last sent or initial value) in length or value.	
	TRIGGERED_ON_CHANGE_WITHOUT_REPETITION	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU just once without a repetition, but only in case the written value is different to the locally stored (last sent or initial value) in length or value.	
	TRIGGERED_WITHOUT_REPETITION	Depending on the transmission mode, a write access to this signal can trigger the transmission of the corresponding I-PDU just once without a repetition.	
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00257]</b>		
<b>Parameter Name</b>	ComUpdateBitPosition		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	Bit position of update-bit inside I-PDU. If this attribute is omitted then there is no update-bit. This setting must be consistently on sender and on receiver side.  Range: 0..63 for CAN and LIN, 0..511 for CAN FD, 0..2031 for FlexRay, 0..4294967295 for TP.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	EcucIntegerParamDef		
<b>Range</b>	0 .. 4294967295		
<b>Default value</b>	-		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_Com_00001]</b>		
<b>Parameter Name</b>	ComSystemTemplateSignalGroupRef		
<b>Parent Container</b>	<a href="#">ComSignalGroup</a>		
<b>Description</b>	Reference to the ISignalToIPduMapping that contains a reference to the ISignalGroup (SystemTemplate) which this ComSignalGroup represents.		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to I-SIGNAL-TO-I-PDU-MAPPING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">ComGroupSignal</a>	0..*	This container contains the configuration parameters of group signals. I.e. signals that are included within a signal group.

## C.9 LdCom

<b>SWS Item</b>	[ECUC_LdCom_00001]
<b>Module Name</b>	LdCom
<b>Description</b>	Configuration of the AUTOSAR LdCom module.
<b>Post-Build Variant Support</b>	true
<b>Supported Config Variants</b>	VARIANT-LINK-TIME, VARIANT-POST-BUILD, VARIANT-PRE-COMPILE

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">LdComConfig</a>	1	This container contains the configuration parameters and sub containers of the AUTOSAR LdCom module.
LdComGeneral	1	Contains the general configuration parameters of the LdCom module.

### C.9.1 LdComConfig

<b>SWS Item</b>	[ECUC_LdCom_00003]
<b>Container Name</b>	LdComConfig
<b>Parent Container</b>	<a href="#">LdCom</a>
<b>Description</b>	This container contains the configuration parameters and sub containers of the AUTOSAR LdCom module.
<b>Configuration Parameters</b>	

Included Containers		
Container Name	Multiplicity	Scope / Dependency
<a href="#">LdComIPdu</a>	0..*	Contains the configuration parameters of the LdCom's signal (IPdu) inside LdCom.
<a href="#">LdComUserModule</a>	0..*	Contains the configuration parameters of the LdCom user modules. <b>Tags:</b> atp.Status=draft

### C.9.2 LdComIPdu

<b>SWS Item</b>	[ECUC_LdCom_00006]		
<b>Container Name</b>	LdComIPdu		
<b>Parent Container</b>	<a href="#">LdComConfig</a>		
<b>Description</b>	Contains the configuration parameters of the LdCom's signal (IPdu) inside LdCom.		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_LdCom_00002]</b>		
<b>Parameter Name</b>	LdComApiType		
<b>Parent Container</b>	<a href="#">LdComIPdu</a>		
<b>Description</b>	<p>Defines if this I-PDU is a normal I-PDU that shall be sent unfragmented or if this is a large I-PDU that shall be sent via the Transport Protocol of the underlying bus.</p> <p>This setting is used by RTE to invoke the proper API.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	LDCOM_IF	sent or received via interface API.	
	LDCOM_TP	sent or received via transport protocol API.	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_LdCom_00005]</b>		
<b>Parameter Name</b>	LdComHandleId		
<b>Parent Container</b>	<a href="#">LdComIPdu</a>		
<b>Description</b>	<p>This is the ID used by the LdCom users (e.g. RTE) to invoke LdCom. A corresponding shortName is created, which is used for the invocations of the users (e.g. RTE). The same ID is used for invocations by PduR.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
<b>Range</b>	0 .. 65535		
<b>Default value</b>	–		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU withAuto = true		

<b>SWS Item</b>	<b>[ECUC_LdCom_00007]</b>		
<b>Parameter Name</b>	LdComIPduDirection		
<b>Parent Container</b>	<a href="#">LdComIPdu</a>		
<b>Description</b>	<p>The direction defines if this IPdu, and therefore the contributing signal, shall be sent or received.</p>		
<b>Multiplicity</b>	1		
<b>Type</b>	EcucEnumerationParamDef		
<b>Range</b>	LDCOM_RECEIVE	–	
	LDCOM_SEND	–	
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: local		

<b>SWS Item</b>	<b>[ECUC_LdCom_00010]</b>		
<b>Parameter Name</b>	LdComPduRef		
<b>Parent Container</b>	<a href="#">LdComIPdu</a>		
<b>Description</b>	Reference to the global Pdu.		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to <a href="#">Pdu</a>		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>SWS Item</b>	<b>[ECUC_LdCom_00011]</b>		
<b>Parameter Name</b>	LdComSystemTemplateSignalRef		
<b>Parent Container</b>	<a href="#">LdComIPdu</a>		
<b>Description</b>	Reference to the ISignalToIPduMapping that contains a reference to the ISignal (System Template).		
<b>Multiplicity</b>	0..1		
<b>Type</b>	Foreign reference to I-SIGNAL-TO-I-PDU-MAPPING		
<b>Post-Build Variant Multiplicity</b>	true		
<b>Post-Build Variant Value</b>	true		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	VARIANT-PRE-COMPILE
	<b>Link time</b>	X	VARIANT-LINK-TIME
	<b>Post-build time</b>	X	VARIANT-POST-BUILD
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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### C.9.3 LdComUserModule

<b>SWS Item</b>	<b>[ECUC_LdCom_00029]</b>		
<b>Container Name</b>	LdComUserModule		
<b>Parent Container</b>	<a href="#">LdComConfig</a>		
<b>Description</b>	Contains the configuration parameters of the LdCom user modules. <b>Tags:</b> atp.Status=draft		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	<b>[ECUC_LdCom_00032]</b>		
<b>Parameter Name</b>	LdComUserModuleCnfRef		
<b>Parent Container</b>	<a href="#">LdComUserModule</a>		
<b>Description</b>	Reference to the LdCom user module configuration. <b>Tags:</b> atp.Status=draft		
<b>Multiplicity</b>	1		
<b>Type</b>	Reference to destinationUri <a href="#">LdComUserUriDefSet/LdComUser</a>		
<b>Post-Build Variant Multiplicity</b>	false		
<b>Post-Build Variant Value</b>	false		
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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### C.9.4 LdComUserUriDefSet

<b>SWS Item</b>	<b>[ECUC_LdCom_00034]</b>
<b>EcucDestinationUriDefSet Name</b>	LdComUserUriDefSet
<b>Description</b>	Defines the set of DestinationUriDefs for the LdCom module.
<b>Included EcucDestinationUriDefs</b>	
<b>Name</b>	<b>Description</b>
<a href="#">LdComUser</a>	Defines the configuration container content of the LdCom user modules relevant settings.

<b>SWS Item</b>	<b>[ECUC_LdCom_00035]</b>
<b>EcucDestinationUriDef Name</b>	LdComUser
<b>Destination Uri Definition Set</b>	<a href="#">LdComUserUriDefSet</a>
<b>Description</b>	Defines the configuration container content of the LdCom user modules relevant settings.
<b>destinationUriNestingContract</b>	vertexOfTargetContainer
<b>Configuration Parameters</b>	

<b>Included Containers</b>		
<b>Container Name</b>	<b>Multiplicity</b>	<b>Scope / Dependency</b>
<a href="#">LdComUserModuleCnf</a>	0..1	Contains the configuration parameters of the LdCom user module.

## C.10 WdgM

### C.10.1 WdgMTransitionProxy

<b>SWS Item</b>	[ECUC_WdgM_00364]
<b>Container Name</b>	WdgMTransitionProxy
<b>Parent Container</b>	WdgMExternalLogicalSupervision
<b>Description</b>	<p>The WdgMTransitionProxy defines a proxy for a transition between the Host Software Cluster and an Application Software Cluster and vice versa. From the Host Software Cluster perspective a Cross Cluster Transition graph leaves the host after the transition which has the WdgMTransitionProxy as a destination or initial reference and returns in this WdgMTransitionProxy after the configured transitions are occurred in the related Application Software Cluster. Afterwards the transition in the host are expected which are referencing the WdgMTransitionProxy by a source or final reference.</p> <p><b>Tags:</b> atp.Status=draft</p>
<b>Configuration Parameters</b>	

<b>SWS Item</b>	[ECUC_WdgM_00367]
<b>Parameter Name</b>	WdgMResourceRef
<b>Parent Container</b>	<a href="#">WdgMTransitionProxy</a>
<b>Description</b>	<p>Reference to the CpSoftwareClusterServiceResource.</p> <p><b>Tags:</b> atp.Status=draft</p>
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

<b>No Included Containers</b>
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### C.10.2 WdgMBaseSocket

<b>SWS Item</b>	[ECUC_WdgM_00377]		
<b>Container Name</b>	WdgMBaseSocket		
<b>Parent Container</b>	WdgMGeneral		
<b>Description</b>	<p>This container configures how many EcucPartitions specific infrastructure links are required for the WdgM instances in Application Software Clusters provided by the Host Software Cluster. Such infrastructure links serve for: the initialization of Application Software Cluster WdgM instances by Host WdgM instance the transmission of supervision results from Application Software Cluster WdgM instances to Host WdgM instance any other implementation specific purpose which is need for the interaction of Application Software Cluster WdgM instances and Host WdgM instance</p> <p>If the infrastructure connection is specific to one or several EcucPartition(s) the WdgMSocketEcucPartitionRef(s) denotes the applicable EcucPartition.</p> <p><b>Tags:</b> atp.Status=draft</p>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Configuration Parameters</b>			

<b>SWS Item</b>	[ECUC_WdgM_00367]
<b>Parameter Name</b>	WdgMResourceRef
<b>Parent Container</b>	<a href="#">WdgMBaseSocket</a>
<b>Description</b>	Reference to the CpSoftwareClusterServiceResource. <b>Tags:</b> atp.Status=draft
<b>Multiplicity</b>	1
<b>Type</b>	Foreign reference to CP-SOFTWARE-CLUSTER-SERVICE-RESOURCE
<b>Scope / Dependency</b>	scope: ECU

<b>SWS Item</b>	[ECUC_WdgM_00366]		
<b>Parameter Name</b>	WdgMSocketEcucPartitionRef		
<b>Parent Container</b>	<a href="#">WdgMBaseSocket</a>		
<b>Description</b>	Reference to the EcucPartition. <b>Tags:</b> atp.Status=draft		
<b>Multiplicity</b>	0..*		
<b>Type</b>	Reference to <a href="#">EcucPartition</a>		
<b>Multiplicity Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Value Configuration Class</b>	<b>Pre-compile time</b>	X	All Variants
	<b>Link time</b>	–	
	<b>Post-build time</b>	–	
<b>Scope / Dependency</b>	scope: ECU		

<b>No Included Containers</b>
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## D Referenced C-API

### D.1 RTE

#### D.1.1 RTE Lifecycle API Reference

##### D.1.1.1 Rte\_Init

<b>Service Name</b>	Rte_Init_<InitContainer>
<b>Syntax</b>	void Rte_Init_<InitContainer> ( void )
<b>Service ID [hex]</b>	0x75
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	Rte_Init is intended schedule RunnableEntitys for initialization purpose which are mapped to the related RteInitializationRunnableBatch container.
<b>Available via</b>	Rte.h

##### D.1.1.2 Rte\_Start

<b>Service Name</b>	Rte_Start
<b>Syntax</b>	Std_ReturnType Rte_Start ( void )
<b>Service ID [hex]</b>	0x70
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	Std_ReturnType RTE_E_OK: No error occurred. RTE_E_LIMIT: An internal limit has been exceeded. The allocation of a required resource has failed.
<b>Description</b>	Rte_Start is intended to allocate and initialize system resources and communication resources used by the RTE.
<b>Available via</b>	Rte.h

## D.1.2 RTE RIPS API Reference

### D.1.2.1 Rte\_Rips\_DatalsUpdated

<b>Service Name</b>	Rte_Rips_<PlugIn>_DatalsUpdated_<SwcBswI>_<CGI>	
<b>Syntax</b>	boolean Rte_Rips_<PlugIn>_DataIsUpdated_<SwcBswI>_<CGI> ( void )	
<b>Service ID [hex]</b>	0xB4	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	boolean	The return value is used to indicate if the data has been updated or not.
<b>Description</b>	The Rte_Rips_DatalsUpdated API provides access to the update flag for an explicit receiver	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswI>.h	

### D.1.2.2 Rte\_Rips\_DRead

<b>Service Name</b>	Rte_Rips_<PlugIn>_DRead_<SwcBswI>[Partition][_<ExE>]_<CGI>	
<b>Syntax</b>	<return> Rte_Rips_<PlugIn>_DRead_<SwcBswI> [Partition] [_<ExE>]_<CGI> ( void )	
<b>Service ID [hex]</b>	0xFF	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	<return>	Return value provides access to the data value of the Variable DataPrototype. For details of the <return> value definition see section 5.2.6.6.
<b>Description</b>	Rte_Rips_DRead Performs an "explicit" read on a sender-receiver communication data element typed by a primitive data type.	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswI>.h	

### D.1.2.3 Rte\_Rips\_DatalsUpdated\_EventActivation

<b>Service Name</b>	Rte_Rips_<PlugIn>_DatalsUpdatedEventActivation_<SwcBswI>_<DR>_<CGI>	
<b>Syntax</b>	<pre>boolean Rte_Rips_&lt;PlugIn&gt;_DataIsUpdatedEventActivation_&lt;SwcBswI&gt;_&lt;DR&gt;_&lt;CGI&gt; (     void )</pre>	
<b>Service ID [hex]</b>	0xB5	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	boolean	The return value is used to indicate if the Runnable shall be activated or not.
<b>Description</b>	The Rte_Rips_DatalsUpdated_EventActivation API indicates the RTE to activate the Runnable Entity triggered by DataReceivedEvent when the related VariableDataPrototype has been updated	
<b>Available via</b>	Rte_Rips_<PlugIn>.h	

#### D.1.2.4 Rte\_Rips\_Feedback

<b>Service Name</b>	Rte_Rips_<PlugIn>_Feedback_<SwcBswI>[Partition]_<CGI>	
<b>Syntax</b>	<pre>Std_ReturnType Rte_Rips_&lt;PlugIn&gt;_Feedback_&lt;SwcBswI&gt;[Partition]_&lt;CGI&gt; (     void )</pre>	
<b>Service ID [hex]</b>	0xB6	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	The return value is used to pass error notifications.
<b>Description</b>	The Rte_Rips_Feedback API provides access to acknowledgment notifications for explicit and implicit sender-receiver communication and to pass error notification to senders in a Software Cluster	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswI>.h	

### D.1.2.5 Rte\_Rips\_Invoke

<b>Service Name</b>	Rte_Rips_<PlugIn>_Invoke_<SwcBswI>_<CGI>	
<b>Syntax</b>	Std_ReturnType Rte_Rips_<PlugIn>_Invoke_<SwcBswI>_<CGI> ( [IN IN/OUT OUT] <data_1>, [IN IN/OUT OUT] ..., [IN IN/OUT OUT] <data_n>, [Std_TransformerError transformerError] )	
<b>Service ID [hex]</b>	0xEC	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	<data_1>	The Rte_Rips_Invoke API includes zero or more IN, IN/OUT and OUT parameters according SWS_Rte_01102 and none in case of triggers
<b>Parameters (inout)</b>	...	The Rte_Rips_Invoke API includes zero or more IN, IN/OUT and OUT parameters according SWS_Rte_01102 and none in case of triggers
<b>Parameters (out)</b>	<data_n>	The Rte_Rips_Invoke API includes zero or more IN, IN/OUT and OUT parameters according SWS_Rte_01102 and none in case of triggers
	transformerError	The OUT parameter transformerError contains the transformer error which occurred during execution of the transformer chain.
<b>Return value</b>	Std_ReturnType	The return value is used to indicate communication errors.
<b>Description</b>	Rte_Rips_Invoke performs a transformer or cross cluster invocation for clients or trigger sources.	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswI>.h	

### D.1.2.6 Rte\_Rips\_InvocationHandler

<b>Service Name</b>	<name of the Invocation Handler>
<b>Syntax</b>	void <name of the Invocation Handler> ( void )
<b>Service ID [hex]</b>	0xEE
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Conditional Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	Performs invocation of server runnables, hard error runnables, ASCR runnables and triggered runnables via a transformer".
<b>Available via</b>	Rte_Rips_<PlugIn>.h

### D.1.2.7 Rte\_Rips\_Prm

<b>Service Name</b>	Rte_Rips_<PlugIn>_Prm_<CGI>	
<b>Syntax</b>	<return> Rte_Rips_<PlugIn>_Prm_<CGI> ( void )	
<b>Service ID [hex]</b>	0x100	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	<return>	For primitive data types, the Rte_Rips_Prm API returns the parameter value. For composite data types, the Rte_Rips_Prm API returns a reference (in C, a pointer) to the constant parameter.
<b>Description</b>	The Rte_Rips_Prm API provides access to a parameter provided by another Software Cluster	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswl>.h	

### D.1.2.8 Rte\_Rips\_Read

<b>Service Name</b>	Rte_Rips_<PlugIn>_Read_<SwcBswl>[[Partition][_<ExE>]_<CGI>	
<b>Syntax</b>	Std_ReturnType Rte_Rips_<PlugIn>_Read_<SwcBswl>[[Partition][_<ExE>]_<CGI> ( OUT <data>, [Std_TransformerError transformerError] )	
<b>Service ID [hex]</b>	0xEA	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	<data>	The OUT parameter <data> pass back the received data.
	transformerError	The OUT parameter transformerError contains the transformer error which occurred during execution of the transformer chain.
<b>Return value</b>	Std_ReturnType	The return value is used to indicate communication errors.
<b>Description</b>	Rte_Rips_Read Performs an "explicit" read on a sender-receiver communication data element.	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswl>.h	

### D.1.2.9 Rte\_Rips\_ReturnResult

<b>Service Name</b>	Rte_Rips_<PlugIn>_ReturnResult_<SwcBswI>_<CGI>	
<b>Syntax</b>	Std_ReturnType Rte_Rips_<PlugIn>_ReturnResult_<SwcBswI>_<CGI> ( [IN/OUT OUT] <param_1>, [IN/OUT OUT] <param_n>, [Std_TransformerError transformerError] )	
<b>Service ID [hex]</b>	0xED	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	<param_1>	The Rte_Rips_ReturnResult API includes zero or more IN/OUT and OUT parameters according SWS_Rte_01111.
<b>Parameters (out)</b>	<param_n>	The Rte_Rips_ReturnResult API includes zero or more IN/OUT and OUT parameters according SWS_Rte_01111.
	transformerError	The OUT parameter transformerError contains the transformer error which occurred during execution of the transformer chain.
<b>Return value</b>	Std_ReturnType	The return value is used to indicate communication errors
<b>Description</b>	Rte_Rips_ReturnResult get the server results of a performed a transformer or cross cluster invocation for clients.	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswI>.h	

### D.1.2.10 Rte\_Rips\_Start

<b>Service Name</b>	Rte_Rips_<PlugIn>_Rte_Start	
<b>Syntax</b>	void Rte_Rips_<PlugIn>_Rte_Start ( void )	
<b>Service ID [hex]</b>	0xF1	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	Rte_Rips_Rte_Start initializes those RTE Implementation Plug-In parts which are relevant for the RTE related operation.	
<b>Available via</b>	Rte_Rips_<PlugIn>.h	

### D.1.2.11 Rte\_Rips\_Stop

<b>Service Name</b>	Rte_Rips_<PlugIn>_Rte_Stop
<b>Syntax</b>	void Rte_Rips_<PlugIn>_Rte_Stop ( void )
<b>Service ID [hex]</b>	0xF2
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	Rte_Rips_Rte_Stop deinitializes those RTE Implementation Plug-In parts which are relevant for the RTE related operation.
<b>Available via</b>	Rte_Rips_<PlugIn>.h

### D.1.2.12 Rte\_Rips\_SchM\_Deinit

<b>Service Name</b>	Rte_Rips_SchM_Deinit
<b>Syntax</b>	void Rte_Rips_SchM_Deinit ( void )
<b>Service ID [hex]</b>	0xF3
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	Rte_Rips_SchM_Deinit deinitializes those RTE Implementation Plug-In parts which are relevant for the SchM related operations.
<b>Available via</b>	Rte_Rips_<PlugIn>.h

### D.1.2.13 Rte\_Rips\_SchM\_Init

<b>Service Name</b>	Rte_Rips_<PlugIn>_SchM_Init
<b>Syntax</b>	void Rte_Rips_<PlugIn>_SchM_Init ( void )
<b>Service ID [hex]</b>	0xF0
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant





<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	Rte_Rips_SchM_Init initializes those RTE Implementation Plug-In parts which are relevant for the SchM related operations.
<b>Available via</b>	Rte_Rips_<PlugIn>.h

### D.1.2.14 Rte\_Rips\_SwitchNotificationStatusType

<b>Name</b>	Rte_Rips_SwitchNotificationStatusType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	RTE_SWITCH_NOTIFICATION_SKIP	0x00	mode switch notification cannot be dequeued
	RTE_SWITCH_NOTIFICATION_ENQUEUED_FIRST	0x01	mode switch notification is enqueued into an empty mode queue
	RTE_SWITCH_NOTIFICATION_ENQUEUED_NOT_FIRST	0x02	mode switch notification is enqueued into a non empty mode queue
	RTE_SWITCH_NOTIFICATION_ENQUEUE_FAILED	0x03	enqueue operation into a non empty mode queue failed
	RTE_SWITCH_NOTIFICATION_DEQUEUED_LAST	0x04	last mode switch notification was enqueued from mode queue
	RTE_SWITCH_NOTIFICATION_DEQUEUED_NOT_LAST	0x05	mode switch notification was enqueued from mode queue, further mode switch notifications are in the queue
<b>Description</b>	Status of the en- and dequeue operation on a mode queue		
<b>Available via</b>	Rte_Type.h		

### D.1.2.15 Rte\_Rips\_Switch

<b>Service Name</b>	Rte_Rips_<PlugIn>_Switch_<BswSwcI>_<MMI>
<b>Syntax</b>	<pre>void Rte_Rips_&lt;PlugIn&gt;_Switch_&lt;BswSwcI&gt;_&lt;MMI&gt; (     Rte_Rips_SwitchNotificationStatusType switchNotificationStatus,     uint32 previousmode,     uint32 nextmode )</pre>
<b>Service ID [hex]</b>	0xB0
<b>Sync/Async</b>	Synchronous







<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	switchNotificationStatus	Status of the enqueue operation
	previousmode	The value of the ModeDeclaration of the mode being left
	nextmode	The value of the ModeDeclaration of the mode being entered
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	Rte_Rips_StartModeSwitch notifies the RTE Implementation Plug-In about an enqueue operation in a mode queue.	
<b>Available via</b>	Rte_Rips_<PlugIn>.h	

### D.1.2.16 Rte\_Rips\_DequeueModeSwitch

<b>Service Name</b>	Rte_Rips_<PlugIn>_DequeueModeSwitch_<MMI>_<OsTask>	
<b>Syntax</b>	<pre>Rte_Rips_SwitchNotificationStatusType Rte_Rips_&lt;PlugIn&gt;_DequeueModeSwitch_&lt;MMI&gt;_&lt;OsTask&gt; (     void )</pre>	
<b>Service ID [hex]</b>	0xB1	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Rte_Rips_SwitchNotificationStatusType	The return value is used indicate the status of the dequeue operation in a mode queue
<b>Description</b>	Rte_Rips_DequeueModeSwitch dequeues a mode switch notification from the mode queue when it is called after the last on-entry ExecutableEntity terminated.	
<b>Available via</b>	Rte_Buffers.h	

### D.1.2.17 Rte\_Rips\_Trigger

<b>Service Name</b>	Rte_Rips_<PlugIn>_Trigger_<BswSwcI>_<MMI>	
<b>Syntax</b>	<pre>void Rte_Rips_&lt;PlugIn&gt;_Trigger_&lt;BswSwcI&gt;_&lt;MMI&gt; (     void )</pre>	
<b>Service ID [hex]</b>	0xB2	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	





<b>Return value</b>	None
<b>Description</b>	Rte_Rips_Trigger notifies the RTE Implementation Plug-In about a raised trigger.
<b>Available via</b>	Rte_Rips_<PlugIn>.h

### D.1.2.18 Rte\_Rips\_Write

<b>Service Name</b>	Rte_Rips_<PlugIn>_Write_ [<SwcBswI>][Partition][_<ExE>]_<CGI>	
<b>Syntax</b>	Std_ReturnType Rte_Rips_<PlugIn>_Write_ [<SwcBswI>] [Partition] [_<ExE>]_<CGI> ( IN <data>, [Std_TransformerError transformerError] )	
<b>Service ID [hex]</b>	0xEB	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	<data>	The IN parameter <data> pass the received data.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	transformerError	The OUT parameter transformerError contains the transformer error which occurred during execution of the transformer chain.
<b>Return value</b>	Std_ReturnType	The return value is used to indicate communication errors.
<b>Description</b>	Rte_Rips_Write Performs an "explicit" write on a sender-receiver communication data element.	
<b>Available via</b>	Rte_Rips_<PlugIn>_<SwcBswI>.h	

### D.1.3 RTE API Reference

See document [4]:

- Rte\_Read
- Rte\_DRead
- Rte\_Write
- Rte\_Call
- Rte\_Switch
- Rte\_Trigger

## D.2 OS

See document [5] and [23] as reference for Os.

- TASK

- ActivateTask
- ChainTask
- TerminateTask
- GetResource
- ReleaseResource
- SuspendOSInterrupts
- ResumeOSInterrupts
- GetSpinlock
- ReleaseSpinlock
- GetApplicationID
- StartScheduleTable
- StopScheduleTable
- Schedule
- DisableAllInterrupts
- EnableAllInterrupts
- SuspendAllInterrupts
- ResumeAllInterrupts
- CallTrustedFunction
- GetCoreID

## D.3 NvM

### D.3.1 NvM\_CancelJobs

<b>Service Name</b>	NvM_CancelJobs	
<b>Syntax</b>	Std_ReturnType NvM_CancelJobs ( NvM_BlockIdType BlockId )	
<b>Service ID [hex]</b>	0x10	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.





<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: The job was successfully removed from queue. E_NOT_OK: The job could not be found in the queue.
<b>Description</b>	Service to cancel all jobs pending for a NV block.	
<b>Available via</b>	NvM.h	

### D.3.2 NvM\_EraseNvBlock

<b>Service Name</b>	NvM_EraseNvBlock	
<b>Syntax</b>	Std_ReturnType NvM_EraseNvBlock ( NvM_BlockIdType BlockId )	
<b>Service ID [hex]</b>	0x09	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to erase a NV block.	
<b>Available via</b>	NvM.h	

### D.3.3 NvM\_GetDataIndex

<b>Service Name</b>	NvM_GetDataIndex	
<b>Syntax</b>	Std_ReturnType NvM_GetDataIndex ( NvM_BlockIdType BlockId, uint8* dataIndexPtr )	
<b>Service ID [hex]</b>	0x02	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	DataIndexPtr	Pointer to where to store the current dataset index (0..255)
<b>Return value</b>	Std_ReturnType	E_OK: The index position has been retrieved successfully. E_NOT_OK: An error occurred.





<b>Description</b>	Service for getting the currently set DataIndex of a dataset NVRAM block
<b>Available via</b>	NvM.h

### D.3.4 NvM\_GetErrorStatus

<b>Service Name</b>	NvM_GetErrorStatus	
<b>Syntax</b>	<pre>Std_ReturnType NvM_GetErrorStatus (     NvM_BlockIdType BlockId,     NvM_RequestResultType* RequestResultPtr )</pre>	
<b>Service ID [hex]</b>	0x04	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	RequestResultPtr	Pointer to where to store the request result. See NvM_RequestResultType .
<b>Return value</b>	Std_ReturnType	E_OK: The block dependent error/status information was read successfully. E_NOT_OK: An error occurred.
<b>Description</b>	Service to read the block dependent error/status information.	
<b>Available via</b>	NvM.h	

### D.3.5 NvM\_InvalidateNvBlock

<b>Service Name</b>	NvM_InvalidateNvBlock	
<b>Syntax</b>	<pre>Std_ReturnType NvM_InvalidateNvBlock (     NvM_BlockIdType BlockId )</pre>	
<b>Service ID [hex]</b>	0x0b	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to invalidate a NV block.	
<b>Available via</b>	NvM.h	

### D.3.6 NvM\_ReadBlock

<b>Service Name</b>	NvM_ReadBlock	
<b>Syntax</b>	<pre>Std_ReturnType NvM_ReadBlock (     NvM_BlockIdType BlockId,     void* NvM_DstPtr )</pre>	
<b>Service ID [hex]</b>	0x06	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	NvM_DstPtr	Pointer to the RAM data block.
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to copy the data of the NV block to its corresponding RAM block.	
<b>Available via</b>	NvM.h	

### D.3.7 NvM\_ReadPRAMBlock

<b>Service Name</b>	NvM_ReadPRAMBlock	
<b>Syntax</b>	<pre>Std_ReturnType NvM_ReadPRAMBlock (     NvM_BlockIdType BlockId )</pre>	
<b>Service ID [hex]</b>	0x16	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to copy the data of the NV block to its corresponding permanent RAM block.	
<b>Available via</b>	NvM.h	

### D.3.8 NvM\_RestoreBlockDefaults

<b>Service Name</b>	NvM_RestoreBlockDefaults	
<b>Syntax</b>	<pre>Std_ReturnType NvM_RestoreBlockDefaults (     NvM_BlockIdType BlockId,     void* NvM_DestPtr )</pre>	
<b>Service ID [hex]</b>	0x08	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	NvM_DestPtr	Pointer to the RAM data block.
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to restore the default data to its corresponding RAM block.	
<b>Available via</b>	NvM.h	

### D.3.9 NvM\_RestorePRAMBlockDefaults

<b>Service Name</b>	NvM_RestorePRAMBlockDefaults	
<b>Syntax</b>	<pre>Std_ReturnType NvM_RestorePRAMBlockDefaults (     NvM_BlockIdType BlockId )</pre>	
<b>Service ID [hex]</b>	0x18	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to restore the default data to its corresponding permanent RAM block.	
<b>Available via</b>	NvM.h	

### D.3.10 NvM\_SetBlockLockStatus

Note: This API was removed from document [6]. Related requirements in this document will be reworked in future releases.

### D.3.11 NvM\_SetBlockProtection

<b>Service Name</b>	NvM_SetBlockProtection	
<b>Syntax</b>	<pre>Std_ReturnType NvM_SetBlockProtection (     NvM_BlockIdType BlockId,     boolean ProtectionEnabled )</pre>	
<b>Service ID [hex]</b>	0x03	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
	ProtectionEnabled	TRUE: Write protection shall be enabled FALSE: Write protection shall be disabled
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: The block was enabled/disabled as requested E_NOT_OK: An error occurred.
<b>Description</b>	Service for setting/resetting the write protection for a NV block.	
<b>Available via</b>	NvM.h	

### D.3.12 NvM\_SetDataIndex

<b>Service Name</b>	NvM_SetDataIndex	
<b>Syntax</b>	<pre>Std_ReturnType NvM_SetDataIndex (     NvM_BlockIdType BlockId,     uint8 DataIndex )</pre>	
<b>Service ID [hex]</b>	0x01	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
	DataIndex	Index position (association) of a NV/ROM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: The index position was set successfully. E_NOT_OK: An error occurred.
<b>Description</b>	Service for setting the DataIndex of a dataset NVRAM block.	
<b>Available via</b>	NvM.h	



### D.3.13 NvM\_SetRamBlockStatus

<b>Service Name</b>	NvM_SetRamBlockStatus	
<b>Syntax</b>	<pre>Std_ReturnType NvM_SetRamBlockStatus (     NvM_BlockIdType BlockId,     boolean BlockChanged )</pre>	
<b>Service ID [hex]</b>	0x05	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
	BlockChanged	TRUE: Validate the permanent RAM block or the explicit synchronization and mark block as changed. FALSE: Invalidate the permanent RAM block or the explicit synchronization and mark block as unchanged.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: The status of the permanent RAM block or the explicit synchronization was changed as requested. E_NOT_OK: An error occurred.
<b>Description</b>	Service for setting the RAM block status of a permanent RAM block or the status of the explicit synchronization of a NVRAM block.	
<b>Available via</b>	NvM.h	

### D.3.14 NvM\_WriteBlock

<b>Service Name</b>	NvM_WriteBlock	
<b>Syntax</b>	<pre>Std_ReturnType NvM_WriteBlock (     NvM_BlockIdType BlockId,     const void* NvM_SrcPtr )</pre>	
<b>Service ID [hex]</b>	0x07	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
	NvM_SrcPtr	Pointer to the RAM data block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to copy the data of the RAM block to its corresponding NV block.	
<b>Available via</b>	NvM.h	

### D.3.15 NvM\_WritePRAMBlock

<b>Service Name</b>	NvM_WritePRAMBlock	
<b>Syntax</b>	Std_ReturnType NvM_WritePRAMBlock ( NvM_BlockIdType BlockId )	
<b>Service ID [hex]</b>	0x17	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	BlockId	The block identifier uniquely identifies one NVRAM block descriptor. A NVRAM block descriptor contains all needed information about a single NVRAM block.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: request has been accepted E_NOT_OK: request has not been accepted
<b>Description</b>	Service to copy the data of the permanent RAM block to its corresponding NV block.	
<b>Available via</b>	NvM.h	

### D.3.16 NvM\_SingleBlockCallbackFunction

<b>Service Name</b>	NvM_SingleBlockCallbackFunction	
<b>Syntax</b>	Std_ReturnType NvM_SingleBlockCallbackFunction ( NvM_BlockRequestType BlockRequest, NvM_RequestResultType JobResult )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	BlockRequest	The request type (read, write, ... etc.) of the previous processed block job
	JobResult	The request result of the previous processed block job.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: callback function has been processed successfully any other: callback function has been processed unsuccessfully
<b>Description</b>	Per block callback routine to notify the upper layer that an asynchronous single block request has been finished.	
<b>Available via</b>	If NvMBlockHeaderInclude is configured NvM will include this to get the prototype, otherwise NvM provides NvM_Externals.h	

### D.3.17 NvM\_InitBlockCallbackFunction

<b>Service Name</b>	NvM_InitBlockCallbackFunction	
<b>Syntax</b>	Std_ReturnType NvM_InitBlockCallbackFunction ( NvM_InitBlockRequestType InitBlockRequest )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	InitBlockRequest	The request type (read, restore, ... etc.) of the currently processed block
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: callback function has been processed successfully any other: callback function has been processed unsuccessfully
<b>Description</b>	Per block callback routine which shall be called by the NvM module when default data needs to be restored in RAM, and a ROM block is not configured.	
<b>Available via</b>	If NvMBlockHeaderInclude is configured NvM will include this to get the prototype, otherwise NvM provides NvM_Externals.h	

### D.3.18 NvM\_ReadRamBlockFromNvm

<b>Service Name</b>	NvM_ReadRamBlockFromNvm	
<b>Syntax</b>	Std_ReturnType NvM_ReadRamBlockFromNvm ( const void* NvMBuffer )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	NvMBuffer	the address of the buffer where the data can be read from
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: callback function has been processed successfully any other: callback function has been processed unsuccessfully
<b>Description</b>	Block specific callback routine which shall be called in order to let the application copy data from NvM module's mirror to RAM block.	
<b>Available via</b>	If NvMBlockHeaderInclude is configured NvM will include this to get the prototype, otherwise NvM provides NvM_Externals.h	

### D.3.19 NvM\_WriteRamBlockToNvm

<b>Service Name</b>	NvM_WriteRamBlockToNvm	
<b>Syntax</b>	Std_ReturnType NvM_WriteRamBlockToNvm ( void* NvMBuffer )	
<b>Sync/Async</b>	Synchronous	





<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	NvMBuffer	the address of the buffer where the data shall be written to
<b>Return value</b>	Std_ReturnType	E_OK: callback function has been processed successfully any other: callback function has been processed unsuccessfully
<b>Description</b>	Block specific callback routine which shall be called in order to let the application copy data from RAM block to NvM module's mirror.	
<b>Available via</b>	If NvMBlockHeaderInclude is configured NvM will include this to get the prototype, otherwise NvM provides NvM_Externals.h	

### D.3.20 NvM\_ReadAll

<b>Service Name</b>	NvM_ReadAll
<b>Syntax</b>	<pre>void NvM_ReadAll (     void )</pre>
<b>Service ID [hex]</b>	0x0c
<b>Sync/Async</b>	Asynchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	Initiates a multi block read request.
<b>Available via</b>	NvM.h

### D.3.21 NvM\_WriteAll

<b>Service Name</b>	NvM_WriteAll
<b>Syntax</b>	<pre>void NvM_WriteAll (     void )</pre>
<b>Service ID [hex]</b>	0x0d
<b>Sync/Async</b>	Asynchronous
<b>Reentrancy</b>	Non Reentrant
<b>Parameters (in)</b>	None
<b>Parameters (inout)</b>	None
<b>Parameters (out)</b>	None
<b>Return value</b>	None
<b>Description</b>	Initiates a multi block write request.
<b>Available via</b>	NvM.h

## D.4 Com

### D.4.1 Com\_SendSignal

<b>Service Name</b>	Com_SendSignal	
<b>Syntax</b>	<pre>uint8 Com_SendSignal (     Com_SignalIdType SignalId,     const void* SignalDataPtr )</pre>	
<b>Service ID [hex]</b>	0x0a	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be sent.
	SignalDataPtr	Reference to the signal data to be transmitted.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	The service Com_SendSignal updates the signal object identified by SignalId with the signal referenced by the SignalDataPtr parameter.	
<b>Available via</b>	Com.h	

### D.4.2 Com\_SendDynSignal

<b>Service Name</b>	Com_SendDynSignal	
<b>Syntax</b>	<pre>uint8 Com_SendDynSignal (     Com_SignalIdType SignalId,     const void* SignalDataPtr,     uint16 Length )</pre>	
<b>Service ID [hex]</b>	0x21	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be sent.
	SignalDataPtr	Reference to the signal data to be transmitted.
	Length	Length of the dynamic length signal
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted E_NOT_OK: in case the Length is greater than the configured ComSignalLength of this sent signal COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked





<b>Description</b>	The service Com_SendDynSignal updates the signal object identified by SignalId with the signal referenced by the SignalDataPtr parameter.
<b>Available via</b>	Com.h

### D.4.3 Com\_SendSignalGroup

<b>Service Name</b>	Com_SendSignalGroup	
<b>Syntax</b>	<pre>uint8 Com_SendSignalGroup (     Com_SignalGroupIdType SignalGroupId )</pre>	
<b>Service ID [hex]</b>	0x0d	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be sent.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	The service Com_SendSignalGroup copies the content of the associated shadow buffer to the associated I-PDU.	
<b>Available via</b>	Com.h	

### D.4.4 Com\_SendSignalGroupArray

<b>Service Name</b>	Com_SendSignalGroupArray	
<b>Syntax</b>	<pre>uint8 Com_SendSignalGroupArray (     Com_SignalGroupIdType SignalGroupId,     const uint8* SignalGroupArrayPtr )</pre>	
<b>Service ID [hex]</b>	0x23	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be sent.
	SignalGroupArrayPtr	Reference to the signal group array.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling





<b>Description</b>	The service Com_SendSignalGroupArray copies the content of the provided SignalGroupArray Ptr to the associated I-PDU. The provided data shall correspond to the array representation of the signal group.
<b>Available via</b>	Com.h

#### D.4.5 Com\_SendSignalWithMetaData

<b>Service Name</b>	Com_SendSignalWithMetaData	
<b>Syntax</b>	<pre>uint8 Com_SendSignalWithMetaData (     Com_SignalIdType SignalId,     const void* SignalDataPtr,     const uint8* MetaDataPtr )</pre>	
<b>Service ID [hex]</b>	0x4d	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be sent.
	SignalDataPtr	Reference to the signal data to be transmitted.
	MetaDataPtr	Pointer to the meta data of the signal
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	The service Com_SendSignalWithMetaData updates the signal object identified by SignalId with the signal referenced by the SignalDataPtr parameter. The meta data is provided via the MetaDataPtr parameter.	
<b>Available via</b>	Com.h	

#### D.4.6 Com\_SendDynSignalWithMetaData

<b>Service Name</b>	Com_SendDynSignalWithMetaData	
<b>Syntax</b>	<pre>uint8 Com_SendDynSignalWithMetaData (     Com_SignalIdType SignalId,     const void* SignalDataPtr,     uint16 Length,     const uint8* MetaDataPtr )</pre>	
<b>Service ID [hex]</b>	0x4e	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be sent.
	SignalDataPtr	Reference to the signal data to be transmitted.





	Length	Length of the dynamic length signal
	MetaDataPtr	Pointer to the meta data of the signal
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted E_NOT_OK: in case the Length is greater than the configured ComSignalLength of this sent signal COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked
<b>Description</b>	The service Com_SendDynSignalWithMetaData updates the signal object identified by SignalId with the signal referenced by the SignalDataPtr parameter. The meta data is provided via the MetaDataPtr parameter.	
<b>Available via</b>	Com.h	

#### D.4.7 Com\_SendSignalGroupWithMetaData

<b>Service Name</b>	Com_SendSignalGroupWithMetaData	
<b>Syntax</b>	uint8 Com_SendSignalGroupWithMetaData ( Com_SignalGroupIdType SignalGroupId, const uint8* MetaDataPtr )	
<b>Service ID [hex]</b>	0x4f	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be sent.
	MetaDataPtr	Pointer to the meta data of the signal group
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	The service Com_SendSignalGroupWithMetaData copies the content of the associated shadow buffer to the associated I-PDU. The meta data is provided via the MetaDataPtr parameter.	
<b>Available via</b>	Com.h	



### D.4.8 Com\_SendSignalGroupArrayWithMetaData

<b>Service Name</b>	Com_SendSignalGroupArrayWithMetaData	
<b>Syntax</b>	<pre>uint8 Com_SendSignalGroupArrayWithMetaData (     Com_SignalGroupIdType SignalGroupId,     const uint8* SignalGroupArrayPtr,     const uint8* MetaDataPtr )</pre>	
<b>Service ID [hex]</b>	0x50	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be sent.
	SignalGroupArrayPtr	Reference to the signal group array.
	MetaDataPtr	Pointer to the meta data of the signal group.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	The service Com_SendSignalGroupArrayWithMetaData copies the content of the provided SignalGroupArrayPtr to the associated I-PDU. The provided data shall correspond to the array representation of the signal group. The meta data is provided via the MetaDataPtr parameter.	
<b>Available via</b>	Com.h	

### D.4.9 Com\_ReceiveSignal

<b>Service Name</b>	Com_ReceiveSignal	
<b>Syntax</b>	<pre>uint8 Com_ReceiveSignal (     Com_SignalIdType SignalId,     void* SignalDataPtr )</pre>	
<b>Service ID [hex]</b>	0x0b	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	SignalDataPtr	Reference to the location where the received signal data shall be stored
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	Com_ReceiveSignal copies the data of the signal identified by SignalId to the location specified by SignalDataPtr.	
<b>Available via</b>	Com.h	

### D.4.10 Com\_ReceiveDynSignal

<b>Service Name</b>	Com_ReceiveDynSignal	
<b>Syntax</b>	<pre>uint8 Com_ReceiveDynSignal (     Com_SignalIdType SignalId,     void* SignalDataPtr,     uint16* Length )</pre>	
<b>Service ID [hex]</b>	0x22	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be received.
<b>Parameters (inout)</b>	Length	in: maximum length that could be received out: length of the dynamic length signal
<b>Parameters (out)</b>	SignalDataPtr	reference to the location where the received signal data shall be stored
<b>Return value</b>	uint8	E_OK: service has been accepted E_NOT_OK: in case the Length (as in-parameter) is smaller than the received length of the dynamic length signal COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked
<b>Description</b>	Com_ReceiveDynSignal copies the data of the signal identified by SignalId to the location specified by SignalDataPtr and stores the length of the dynamical length signal at the position given by the Length parameter.	
<b>Available via</b>	Com.h	

### D.4.11 Com\_ReceiveSignalGroup

<b>Service Name</b>	Com_ReceiveSignalGroup	
<b>Syntax</b>	<pre>uint8 Com_ReceiveSignalGroup (     Com_SignalGroupIdType SignalGroupId )</pre>	
<b>Service ID [hex]</b>	0x0e	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	The service Com_ReceiveSignalGroup copies the received signal group from the I-PDU to the shadow buffer.	
<b>Available via</b>	Com.h	

#### D.4.12 Com\_ReceiveSignalGroupArray

<b>Service Name</b>	Com_ReceiveSignalGroupArray	
<b>Syntax</b>	<pre>uint8 Com_ReceiveSignalGroupArray (     Com_SignalGroupIdType SignalGroupId,     uint8* SignalGroupArrayPtr )</pre>	
<b>Service ID [hex]</b>	0x24	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	SignalGroupArrayPtr	reference to the location where the received signal group array shall be stored
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped COM_BUSY: in case the TP-Buffer is locked for large data types handling
<b>Description</b>	The service Com_ReceiveSignalGroupArray copies the received signal group array representation from the PDU to the location designated by SignalGroupArrayPtr.	
<b>Available via</b>	Com.h	

#### D.4.13 Com\_ReceiveSignalWithMetaData

<b>Service Name</b>	Com_ReceiveSignalWithMetaData	
<b>Syntax</b>	<pre>uint8 Com_ReceiveSignalWithMetaData (     Com_SignalIdType SignalId,     void* SignalDataPtr,     uint8* MetaDataPtr )</pre>	
<b>Service ID [hex]</b>	0x49	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	SignalDataPtr	Reference to the location where the received signal data shall be stored
	MetaDataPtr	Pointer to the meta data of the signal
<b>Return value</b>	uint8	–
<b>Description</b>	Com_ReceiveSignalWithMetaData copies the data of the signal identified by SignalId to the location specified by SignalDataPtr. The received meta data is stored at the position given by the MetaDataPtr parameter.	
<b>Available via</b>	Com.h	

#### D.4.14 Com\_ReceiveDynSignalWithMetaData

<b>Service Name</b>	Com_ReceiveDynSignalWithMetaData	
<b>Syntax</b>	<pre>uint8 Com_ReceiveDynSignalWithMetaData (     Com_SignalIdType SignalId,     void* SignalDataPtr,     uint16* Length,     uint8* MetaDataPtr )</pre>	
<b>Service ID [hex]</b>	0x4a	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	SignalDataPtr	reference to the location where the received signal data shall be stored
	Length	–
	MetaDataPtr	Pointer to the meta data of the signal
<b>Return value</b>	uint8	<p>E_OK: service has been accepted</p> <p>E_NOT_OK: in case the Length (as in-parameter) is smaller than the received length of the dynamic length signal</p> <p>COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped</p> <p>COM_BUSY: in case the TP-Buffer is locked</p>
<b>Description</b>	Com_ReceiveDynSignalWithMetaData copies the data of the signal identified by SignalId to the location specified by SignalDataPtr and stores the length of the dynamical length signal at the position given by the Length parameter. The received meta data is stored at the position given by the MetaDataPtr parameter.	
<b>Available via</b>	Com.h	

#### D.4.15 Com\_ReceiveSignalGroupWithMetaData

<b>Service Name</b>	Com_ReceiveSignalGroupWithMetaData	
<b>Syntax</b>	<pre>uint8 Com_ReceiveSignalGroupWithMetaData (     Com_SignalGroupIdType SignalGroupId,     uint8* MetaDataPtr )</pre>	
<b>Service ID [hex]</b>	0x4b	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	MetaDataPtr	Pointer to the meta data of the signal group
<b>Return value</b>	uint8	<p>E_OK: service has been accepted</p> <p>COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group was stopped</p> <p>COM_BUSY: in case the TP-Buffer is locked for large data types handling</p>





<b>Description</b>	The service Com_ReceiveSignalGroupWithMetaData copies the received signal group from the I-PDU to the shadow buffer. The received meta data is stored at the position given by the MetaDataPtr parameter.
<b>Available via</b>	Com.h

#### D.4.16 Com\_ReceiveSignalGroupArrayWithMetaData

<b>Service Name</b>	Com_ReceiveSignalGroupArrayWithMetaData	
<b>Syntax</b>	<pre>void Com_ReceiveSignalGroupArrayWithMetaData (     Com_SignalGroupIdType SignalGroupId,     uint8* SignalGroupArrayPtr,     uint8* MetaDataPtr )</pre>	
<b>Service ID [hex]</b>	0x4c	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	SignalGroupArrayPtr	reference to the location where the received signal group array shall be stored
	MetaDataPtr	Pointer to the meta data of the signal group.
<b>Return value</b>	None	
<b>Description</b>	The service Com_ReceiveSignalGroupArrayWithMetaData copies the received signal group array representation from the PDU to the location designated by SignalGroupArrayPtr. The received meta data is stored at the position given by the MetaDataPtr parameter.	
<b>Available via</b>	Com.h	

#### D.4.17 Com\_InvalidateSignal

<b>Service Name</b>	Com_InvalidateSignal	
<b>Syntax</b>	<pre>uint8 Com_InvalidateSignal (     Com_SignalIdType SignalId )</pre>	
<b>Service ID [hex]</b>	0x10	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalId	Id of signal to be invalidated.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	<p>E_OK: service has been accepted</p> <p>COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group is stopped, no ComSignalDataInvalidValue is configured for the given signalId</p> <p>COM_BUSY: in case the TP-Buffer is locked</p>





<b>Description</b>	The service Com_InvalidateSignal invalidates the signal with the given SignalId by setting its value to its configured ComSignalDataInvalidValue.
<b>Available via</b>	Com.h

#### D.4.18 Com\_InvalidateSignalGroup

<b>Service Name</b>	Com_InvalidateSignalGroup	
<b>Syntax</b>	uint8 Com_InvalidateSignalGroup ( Com_SignalGroupIdType SignalGroupId )	
<b>Service ID [hex]</b>	0x1b	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	SignalGroupId	Id of signal group to be invalidated.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	uint8	E_OK: service has been accepted COM_SERVICE_NOT_AVAILABLE: corresponding I-PDU group is stopped, no ComSignalDataInvalidValue is configured for any of the group signals COM_BUSY: in case the TP-Buffer is locked
<b>Description</b>	The service Com_InvalidateSignalGroup invalidates all group signals of the signal group with the given SignalGroupId by setting their values to their configured ComSignalDataInvalidValues.	
<b>Available via</b>	Com.h	

#### D.4.19 ComUser\_CbkRxAck

<b>Service Name</b>	<ComUser_CbkRxAck> (draft)	
<b>Syntax</b>	void <ComUser_CbkRxAck> ( CbkJHandleIdType ComUserCbkJHandleId )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant don't care	
<b>Parameters (in)</b>	ComUserCbkJHandleId	Com user callback handle Id of the signal/signal group, which has been received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	This callback represents notification class 1 of [17]. It is called immediately after the message has been stored in the receiving message object. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Configuration parameter ComUserHeaderInclude	

#### D.4.20 ComUser\_CbkInv

<b>Service Name</b>	<ComUser_CbkInv> (draft)	
<b>Syntax</b>	<pre>void &lt;ComUser_CbkInv&gt; (     CbkHandleIdType ComUserCbkJHandleId )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant don't care	
<b>Parameters (in)</b>	ComUserCbkJHandleId	Com user callback handle Id of the invalid signal/signal group.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>This callback function corresponds to SWS_Com_00680. It is called after reception of an invalid signal or signal group respectively.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	Configuration parameter ComUserHeaderInclude	

#### D.4.21 ComUser\_CbkRxTOut

<b>Service Name</b>	<ComUser_CbkRxTOut> (draft)	
<b>Syntax</b>	<pre>void &lt;ComUser_CbkRxTOut&gt; (     CbkHandleIdType ComUserCbkJHandleId )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant don't care	
<b>Parameters (in)</b>	ComUserCbkJHandleId	Com user callback handle Id of the signal/signal group, for which a reception deadline violation has occurred.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>This callback corresponds to notification class 3 of [17]. It is called immediately after a message reception error has been detected by the deadline monitoring mechanism.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	Configuration parameter ComUserHeaderInclude	

#### D.4.22 ComUser\_CbkTxAck

<b>Service Name</b>	<ComUser_CbkTxAck> (draft)	
<b>Syntax</b>	void <ComUser_CbkTxAck> ( CbkJHandleIdType ComUserCbkHandleId )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	don't care	
<b>Parameters (in)</b>	ComUserCbkHandleId	Com user callback handle Id of the signal/signal group, which transmission is acknowledged
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	This callback represents notification class 2 of [17]. It is called immediately after successful transmission of the I-PDU containing the message. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Configuration parameter ComUserHeaderInclude	

#### D.4.23 ComUser\_CbkTxErr

<b>Service Name</b>	<ComUser_CbkTxErr> (draft)	
<b>Syntax</b>	void <ComUser_CbkTxErr> ( CbkJHandleIdType ComUserCbkHandleId )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	don't care	
<b>Parameters (in)</b>	ComUserCbkHandleId	Com user callback handle Id of the signal/signal group, which could not be transmitted.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	This callback corresponds to notification class 4 of [17]. It is called in case the transmission is not possible because the corresponding I-PDU group is stopped. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Configuration parameter ComUserHeaderInclude	

#### D.4.24 ComUser\_CbkTxTOut

<b>Service Name</b>	<ComUser_CbkTxTOut> (draft)	
<b>Syntax</b>	void <ComUser_CbkTxTOut> ( CbkJHandleIdType ComUserCbkHandleId )	







<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant don't care	
<b>Parameters (in)</b>	ComUserCbkJHandleId	Com user callback handle Id of the signal/signal group, for which a transmission deadline violation has occurred.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	This callback corresponds to notification class 4 of [17]. It is called immediately after a message transmission error has been detected by the deadline monitoring mechanism. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Configuration parameter ComUserHeaderInclude	

## D.5 LdCom

### D.5.1 LdCom\_Transmit

<b>Service Name</b>	LdCom_Transmit	
<b>Syntax</b>	Std_ReturnType LdCom_Transmit ( PduIdType Id, const PduInfoType* InfoPtr )	
<b>Service ID [hex]</b>	0x49	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant for different Ids. Non reentrant for the same Id.	
<b>Parameters (in)</b>	Id	Identifier of the signal to be transmitted.
	InfoPtr	Length of and pointer to the signal data and pointer to MetaData.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Transmit request has been accepted. E_NOT_OK: Transmit request has not been accepted.
<b>Description</b>	Requests transmission of a signal.	
<b>Available via</b>	LdCom.h	

### D.5.2 LdComUser\_LdComCbkJTriggerTransmit

<b>Service Name</b>	<LdComUser_LdComCbkJTriggerTransmit> (draft)	
<b>Syntax</b>	Std_ReturnType <LdComUser_LdComCbkJTriggerTransmit> ( CbkJHandleIdType LdComUserCbkJHandleId, PduInfoType* PduInfoPtr )	





<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJHandleId	LdCom user callback handle Id corresponding to the ID of the SDU that is requested to be transmitted
	PduInfoPtr	Contains a pointer to a buffer (SduDataPtr) to where the SDU data shall be copied, and the available buffer size in SduLength. On return, the service will indicate the length of the copied SDU data in SduLength.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: SDU has been copied and SduLength indicates the number of copied bytes. E_NOT_OK: No SDU data has been copied. PduInfoPtr must not be used since it may contain a NULL pointer or point to invalid data.
<b>Description</b>	<p>Within this API, the upper layer module (called module) shall check whether the available data fits into the buffer size reported by PduInfoPtr-&gt;SduLength. If it fits, it shall copy its data into the buffer provided by PduInfoPtr-&gt;SduDataPtr and update the length of the actual copied data in PduInfoPtr-&gt;SduLength. If not, it returns E_NOT_OK without changing PduInfoPtr.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_XXX04])	

### D.5.3 LdComUser\_LdComCbkJRxIndication

<b>Service Name</b>	<LdComUser_LdComCbkJRxIndication> (draft)	
<b>Syntax</b>	<pre>void &lt;LdComUser_LdComCbkJRxIndication&gt; (     CbkJHandleIdType LdComUserCbkJHandleId,     const PduInfoType* PduInfoPtr )</pre>	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJHandleId	LdCom user callback handle Id corresponding to received I-PDU
	PduInfoPtr	Contains the length (SduLength) of the received PDU, a pointer to a buffer (SduDataPtr) containing the PDU, and the MetaData related to this PDU.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>Indication of a received PDU from a lower layer communication interface module.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_XXX04])	

### D.5.4 LdComUser\_LdComCbkJTxConfirmation

<b>Service Name</b>	<LdComUser_LdComCbkJxConfirmation> (draft)	
<b>Syntax</b>	<pre>void &lt;LdComUser_LdComCbkJxConfirmation&gt; (     CbkHandleIdType LdComUserCbkHandleId,     Std_ReturnType result )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkHandleId	LdCom user callback handle Id corresponding to the PDU that has been transmitted
	result	E_OK: The PDU was transmitted. E_NOT_OK: Transmission of the PDU failed.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	<p>The lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_xxx04])	

### D.5.5 LdComUser\_LdComCbkCopyRxData

<b>Service Name</b>	<LdComUser_LdComCbkCopyRxData> (draft)	
<b>Syntax</b>	<pre>BufReq_ReturnType &lt;LdComUser_LdComCbkCopyRxData&gt; (     CbkHandleIdType LdComUserCbkHandleId,     const PduInfoType* info,     PduLengthType* bufferSizePtr )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkHandleId	LdCom user callback handle Id corresponding to the received I-PDU
	info	Provides the source buffer (SduDataPtr) and the number of bytes to be copied (SduLength). An SduLength of 0 can be used to query the current amount of available buffer in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	bufferSizePtr	Available receive buffer after data has been copied.
<b>Return value</b>	BufReq_ReturnType	<p>BUFREQ_OK: Data copied successfully</p> <p>BUFREQ_E_NOT_OK: Data was not copied because an error occurred.</p>
<b>Description</b>	<p>This function is called to provide the received data of an I-PDU segment (N-PDU) to the upper layer. Each call to this function provides the next part of the I-PDU data. The size of the remaining data is written to the position indicated by bufferSizePtr.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_xxx04])	

## D.5.6 LdComUser\_LdComCbkJStartOfReception

<b>Service Name</b>	<LdComUser_LdComCbkJStartOfReception> (draft)	
<b>Syntax</b>	<pre>BufReq_ReturnType &lt;LdComUser_LdComCbkJStartOfReception&gt; (     CbkHandleIdType LdComUserCbkHandleId,     const PduInfoType* info,     PduLengthType TpSduLength,     PduLengthType* bufferSizePtr )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkHandleId	LdCom user callback handle Id corresponding to the I-PDU
	info	Pointer to a PduInfoType structure containing the payload data (without protocol information) and payload length of the first frame or single frame of a transport protocol I-PDU reception, and the MetaData related to this PDU. If neither first/single frame data nor MetaData are available, this parameter is set to NULL_PTR.
	TpSduLength	Total length of the N-SDU to be received.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	bufferSizePtr	Available receive buffer in the receiving module. This parameter will be used to compute the Block Size (BS) in the transport protocol module.
<b>Return value</b>	BufReq_ReturnType	<p>BUFREQ_OK: Connection has been accepted. bufferSizePtr indicates the available receive buffer; reception is continued. If no buffer of the requested size is available, a receive buffer size of 0 shall be indicated by bufferSizePtr.</p> <p>BUFREQ_E_NOT_OK: Connection has been rejected; reception is aborted. bufferSizePtr remains unchanged.</p> <p>BUFREQ_E_OVFL: No buffer of the required length can be provided; reception is aborted. bufferSizePtr remains unchanged.</p>
<b>Description</b>	<p>This function is called at the start of receiving an N-SDU. The N-SDU might be fragmented into multiple N-PDUs (FF with one or more following CFs) or might consist of a single N-PDU (SF). The service shall provide the currently available maximum buffer size when invoked with TpSduLength equal to 0.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_xxx04])	

## D.5.7 LdComUser\_LdComCbkJTpRxIndication

<b>Service Name</b>	<LdComUser_LdComCbkJTpRxIndication> (draft)	
<b>Syntax</b>	<pre>void &lt;LdComUser_LdComCbkJTpRxIndication&gt; (     CbkHandleIdType LdComUserCbkHandleId,     Std_ReturnType result )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkHandleId	LdCom user callback handle Id corresponding to the received I-PDU





	result	Result of the reception.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	Called after an I-PDU has been received via the TP API, the result indicates whether the transmission was successful or not. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_xxx04])	

### D.5.8 LdComUser\_LdComCbkJpTxConfirmation

<b>Service Name</b>	<LdComUser_LdComCbkJpTxConfirmation> (draft)	
<b>Syntax</b>	<pre>void &lt;LdComUser_LdComCbkJpTxConfirmation&gt; (     CbkHandleIdType LdComUserCbkJpHandleId,     Std_ReturnType result )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJpHandleId, otherwise Reentrant	
<b>Parameters (in)</b>	LdComUserCbkJpHandleId	LdCom user callback handle Id corresponding to the transmitted I-PDU
	result	E_OK - transmission successful E_NOT_OK - transmission not successful
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	None	
<b>Description</b>	This function is called after a Signal has been transmitted via the TP-API on its network. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_xxx04])	

### D.5.9 LdComUser\_LdComCbkJopyTxData

<b>Service Name</b>	<LdComUser_LdComCbkJopyTxData> (draft)	
<b>Syntax</b>	<pre>BufReq_ReturnType &lt;LdComUser_LdComCbkJopyTxData&gt; (     CbkHandleIdType LdComUserCbkJpHandleId,     const PduInfoType* info,     const RetryInfoType* retry,     PduLengthType* availableDataPtr )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant for same LdComUserCbkJpHandleId, otherwise Reentrant	





<b>Parameters (in)</b>	LdComUserCbkJd	LdCom user callback handle Id corresponding to the transmitted I-PDU
	info	Provides the destination buffer (SduDataPtr) and the number of bytes to be copied (SduLength). If not enough transmit data is available, no data is copied by the upper layer module and BUFREQ_E_BUSY is returned. The lower layer module may retry the call. An SduLength of 0 can be used to indicate state changes in the retry parameter or to query the current amount of available data in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
	retry	Will not be handled by LdCom and its upper layer.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	availableDataPtr	Indicates the remaining number of bytes that are available in the upper layer module's Tx buffer. availableDataPtr can be used by TP modules that support dynamic payload lengths (e.g. FrlsoTp) to determine the size of the following CFS.
<b>Return value</b>	BufReq_ReturnType	<p>BUFREQ_OK: Data has been copied to the transmit buffer completely as requested.</p> <p>BUFREQ_E_BUSY: Request could not be fulfilled, because the required amount of Tx data is not available. The lower layer module may retry this call later on. No data has been copied.</p> <p>BUFREQ_E_NOT_OK: Data has not been copied. Request failed.</p>
<b>Description</b>	<p>This function is called to acquire the transmit data of an I-PDU segment (N-PDU). Each call to this function provides the next part of the I-PDU data unless retry-&gt;TpDataState is TP_DATARETRY. In this case the function restarts to copy the data beginning at the offset from the current position indicated by retry-&gt;TxTpDataCnt. The size of the remaining data is written to the position indicated by availableDataPtr</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	LdComUserHeaderInclude ([ECUC_LdCom_xxx04])	

## D.6 Dcm

### D.6.1 DataServices

#### D.6.1.1 ReadData

If `DcmDspDataUsePort` is set to `USE_DATA_SYNCH_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ReadData (draft)
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ReadData (     uint8* Data,     uint16 DataLength,     Dcm_NegativeResponseType* ErrorCode )</pre>
<b>Service ID [hex]</b>	0x68
<b>Sync/Async</b>	Synchronous
<b>Reentrancy</b>	Non Reentrant





<b>Parameters (in)</b>	DataLength	Length in byte of the data to be read
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	Data	Buffer where the requested data shall be copied to
	ErrorCode	If the operation Xxx_ReadData returns value E_NOT_OK, the Dcm module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function requests to the application a data value of a DID/PID if DcmDspDataUsePort is set to USE_DATA_SYNCH_FNC_PROXY. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

If `DcmDspDataUsePort` is set to `USE_DATA_ASYNCH_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ReadData (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ReadData (     Dcm_OpStatusType OpStatus,     uint8* Data,     uint16 DataLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x69	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
	DataLength	Length in byte of the data to be read
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	Data	Buffer where the requested data shall be copied to
	ErrorCode	If the operation Xxx_ReadData returns value E_NOT_OK, the Dcm module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function requests to the application a data value of a DID/PID if DcmDspDataUsePort is set to USE_DATA_ASYNCH_FNC_PROXY.. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

### D.6.1.2 WriteData

If `DcmDspDataType` is set to `USE_DATA_SYNCH_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_WriteData (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_WriteData (     const uint8* Data,     uint16 DataLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x70	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	Data	Buffer containing the data to be written
	DataLength	Length in byte of the data to be written
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_WriteData returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	<p>This function requests the application to write a data value of a DID if DcmDspDataUsePort is set to USE_DATA_SYNCH_FNC_PROXY.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	Dcm_Externals.h	

If [DcmDspDataType](#) is set to [USE\\_DATA\\_ASYNCH\\_FNC\\_PROXY](#), the following definition is used:

<b>Service Name</b>	Xxx_WriteData (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_WriteData (     const uint8* Data,     uint16 DataLength,     Dcm_OpStatusType OpStatus,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x71	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	Data	Buffer containing the data to be written
	DataLength	Length in byte of the data to be written
	OpStatus	Status of the current operation
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_WriteData returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish.
<b>Description</b>	<p>This function requests the application to write a data value of a DID if DcmDspDataUsePort is set to USE_DATA_ASYNCH_FNC_PROXY.</p> <p><b>Tags:</b> atp.Status=draft</p>	
<b>Available via</b>	Dcm_Externals.h	



### D.6.1.3 ConditionCheckRead

If `DcmDspDataUsePort` is set to `USE_DATA_ASYNC_CLIENT_SERVER` or `USE_DATA_ASYNC_FNC`, or `USE_DATA_ASYNC_CLIENT_SERVER_ERROR`, `USE_DATA_ASYNC_FNC_ERROR` or `USE_DATA_ASYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ConditionCheckRead	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ConditionCheckRead (     Dcm_OpStatusType OpStatus,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x37	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation <code>Xxx_ConditionCheckRead</code> returns value <code>E_NOT_OK</code> , the DCM module shall send a negative response with NRC code equal to the parameter <code>ErrorCode</code> parameter value.
<b>Return value</b>	Std_ReturnType	<code>E_OK</code> : Request was successful. <code>E_NOT_OK</code> : Request was not successful. <code>DCM_E_PENDING</code> : Request is not yet finished. Further call(s) required to finish.
<b>Description</b>	This function requests to the application if the conditions to read the Data are correct.	
<b>Available via</b>	Dcm_Externals.h	

### D.6.1.4 ReadDataLength

If `DcmDspDataUsePort` is set to `USE_DATA_SYNC_CLIENT_SERVER`, or `USE_DATA_SYNC_FNC`, or `USE_DATA_SYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ReadDataLength (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ReadDataLength (     uint16* DataLength )</pre>	
<b>Service ID [hex]</b>	0x36	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	DataLength	Length in byte of the data to be read





<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function requests the application to return the data length in byte of a Data. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

If `DcmDspDataUsePort` is set to `USE_DATA_ASYNC_CLIENT_SERVER` or `USE_DATA_ASYNC_CLIENT_SERVER_ERROR` or `USE_DATA_ASYNC_FNC` or `USE_DATA_ASYNC_FNC_ERROR`, or `USE_DATA_SYNC_FNC_PROXY`, or `USE_DATA_ASYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ReadDataLength (draft)	
<b>Syntax</b>	Std_ReturnType Xxx_ReadDataLength ( Dcm_OpStatusType OpStatus, uint16* DataLength )	
<b>Service ID [hex]</b>	0x4c	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	DataLength	Length in byte of the data to be read
<b>Return value</b>	Std_ReturnType	E_OK: this value is always returned. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish.
<b>Description</b>	This function requests the application to return the data length in byte of a Data. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

### D.6.1.5 GetScalingInformation

If `DcmDspDataUsePort` is set to `USE_DATA_SYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_GetScalingInformation (draft)	
<b>Syntax</b>	Std_ReturnType Xxx_GetScalingInformation ( uint8* ScalingInfo, uint8 ScalingInfoLength, Dcm_NegativeResponseCodeType* ErrorCode )	
<b>Service ID [hex]</b>	0x72	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	





<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)}== (USE_DATA_SYNCH_FNC_PROXY) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataInfoRef->DcmDspDataScalingInfoSize)} != NULL))	
<b>Parameters (in)</b>	ScalingInfoLength	Length in byte of the scaling information to be read
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ScalingInfo	Scaling information (scalingByte and scalingByteExtension)
	ErrorCode	If the operation Xxx_GetScalingInformation returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function requests to the application for the scaling information of a Data. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

If `DcmDspDataUsePort` is set to `USE_DATA_ASYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_GetScalingInformation (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_GetScalingInformation (     Dcm_OpStatusType OpStatus,     uint8* ScalingInfo,     uint8 ScalingInfoLength,     Dcm_NegativeResponseType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x73	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)}== (USE_DATA_ASYNC_FNC_PROXY) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataInfoRef->DcmDspDataScalingInfoSize)} != NULL))	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
	ScalingInfoLength	Length in byte of the scaling information to be read
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ScalingInfo	Scaling information (scalingByte and scalingByteExtension)
	ErrorCode	If the operation Xxx_GetScalingInformation returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish.
<b>Description</b>	This function requests to the application for the scaling information of a Data. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

### D.6.1.6 ReturnControlToECU

If `DcmDspDataUsePort` is set to `USE_DATA_SYNCH_FNC_PROXY` or `USE_DATA_ASYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ReturnControlToECU (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ReturnControlToECU (     uint8* controlMask,     uint8 controlMaskLength,     Dcm_NegativeResponseCodeType ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x74	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Variation</b>	<pre>((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)) == (USE_DATA_SYNCH_FNC_PROXY    USE_DATA_ASYNC_FNC_PROXY)) &amp;&amp; ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef -&gt; DcmDspDidInfo/DcmDspDidControl)) != NULL)</pre>	
<b>Parameters (in)</b>	controlMask	Control enable mask
	controlMaskLength	Control enable mask length in byte
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation <code>Xxx_ReturnControlToECU</code> returns value <code>E_NOT_OK</code> , the DCM module shall send a negative response with NRC code equal to the parameter <code>ErrorCode</code> parameter value.
<b>Return value</b>	Std_ReturnType	<code>E_OK</code> : Request was successful. <code>E_NOT_OK</code> : Request was not successful.
<b>Description</b>	This function requests to the application to return control to ECU of an IOControl. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

### D.6.1.7 ResetToDefault

If `DcmDspDataUsePort` is set to `USE_DATA_SYNCH_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ResetToDefault (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ResetToDefault (     uint8* controlMask,     uint8 controlMaskLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x75	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	





<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)}== USE_DATA_ASYNC_FNC_PROXY) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl/DcmDspDidResetToDefault)} == TRUE)	
<b>Parameters (in)</b>	controlMask	Control enable mask
	controlMaskLength	Control enable mask length in byte
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_ResetToDefault returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function requests to the application to reset an IOControl to default value. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

If `DcmDspDataUsePort` is set to `USE_DATA_ASYNC_CLIENT_SERVER` or `USE_DATA_ASYNC_FNC` or `USE_DATA_ASYNC_CLIENT_SERVER_ERROR` or `USE_DATA_ASYNC_FNC_ERROR`, the following definition is used:

<b>Service Name</b>	Xxx_ResetToDefault	
<b>Syntax</b>	Std_ReturnType Xxx_ResetToDefault ( Dcm_OpStatusType OpStatus, [Dcm_ControlMask_{DID}]Type controlMask, [uint8* controlMask], Dcm_NegativeResponseType* ErrorCode )	
<b>Service ID [hex]</b>	0x3c	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == (USE_DATA_ASYNC_FNC    USE_DATA_ASYNC_FNC_ERROR    USE_DATA_ASYNC_CLIENT_SERVER    USE_DATA_ASYNC_CLIENT_SERVER_ERROR)) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl/DcmDspDidResetToDefault)} == TRUE)	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
	controlMask	-
	<b>Type</b>	Dcm_ControlMask_{DID}Type
	<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef -> DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMask)} == DCM_CONTROLMASK_EXTERNAL) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef -> DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMaskSize)} <= 0x04)
	controlMask	-
	<b>Type</b>	uint8*
	<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == (USE_DATA_ASYNC_CLIENT_SERVER    USE_DATA_ASYNC_CLIENT_SERVER_ERROR)) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef -> DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMask)} == DCM_CONTROLMASK_EXTERNAL) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef -> DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMaskSize)} => 0x05)





<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_ResetToDefault returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish.
<b>Description</b>	This function requests to the application to reset an IOControl to default value.	
<b>Available via</b>	Dcm_Externals.h	

Note: Square brackets [] indicate that an argument is optional.

### D.6.1.8 FreezeCurrentState

If `DcmDspDataUsePort` is set to `USE_DATA_SYNCH_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_FreezeCurrentState (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_FreezeCurrentState (     uint8* controlMask,     uint8 controlMaskLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x77	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Variation</b>	$((\text{ecuc}(\text{Dcm}/\text{DcmConfigSet}/\text{DcmDsp}/\text{DcmDspData}.\text{DcmDspDataUsePort}) == \text{USE\_DATA\_SYNCH\_FNC\_PROXY}) \ \&\& \ (\text{ecuc}(\text{Dcm}/\text{DcmConfigSet}/\text{DcmDsp}/\text{DcmDspDidInfo}/\text{DcmDspDidControl}/\text{DcmDspDidFreezeCurrentState})) == \text{TRUE})$	
<b>Parameters (in)</b>	controlMask	Control enable mask
	controlMaskLength	Control enable mask length in byte
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_FreezeCurrentState returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function requests to the application to freeze the current state of an IOControl. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

If `DcmDspDataUsePort` is set to `USE_DATA_ASYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_FreezeCurrentState (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_FreezeCurrentState (     Dcm_OpStatusType OpStatus,     uint8* controlMask,     uint8 controlMaskLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x78	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)}== USE_DATA_ ASYNCH_FNC_PROXY) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl/DcmDspDidFreezeCurrentState)} == TRUE)	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
	controlMask	Control enable mask
	controlMaskLength	Control enable mask length in byte
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_FreezeCurrentState returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish.
<b>Description</b>	This function requests to the application to freeze the current state of an IOControl. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

### D.6.1.9 ShortTermAdjustment

If `DcmDspDataUsePort` is set to `USE_DATA_SYNCH_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ShortTermAdjustment (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ShortTermAdjustment (     const uint8* ControlStateInfo,     uint16 DataLength,     uint8* controlMask,     uint8 controlMaskLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x79	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)}== USE_DATA_ SYNCH_FNC_PROXY) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl/DcmDspDidShortTermAdjustment)} == TRUE)	





<b>Parameters (in)</b>	ControlStateInfo	ControlState information contained in the ControlOptionRecord parameter of the InputOutputControlByIdentifier diagnostic request
	DataLength	ControlState information length in byte
	controlMask	Control enable mask
	controlMaskLength	Control enable mask length in byte
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_ShortTermAdjustment returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function requests to the application to adjust the IO signal. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

If `DcmDspDataUsePort` is set to `USE_DATA_ASYNC_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_ShortTermAdjustment (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_ShortTermAdjustment (     const uint8* ControlStateInfo,     uint16 DataLength,     Dcm_OpStatusType OpStatus,     uint8* controlMask,     uint8 controlMaskLength,     Dcm_NegativeResponseType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x83	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Variation</b>	<code>((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)) == USE_DATA_ASYNC_FNC_PROXY) &amp;&amp; ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl/DcmDspDidShortTermAdjustment)) == TRUE)</code>	
<b>Parameters (in)</b>	ControlStateInfo	ControlState information contained in the ControlOptionRecord parameter of the InputOutputControlByIdentifier diagnostic request
	DataLength	ControlState information length in byte
	OpStatus	Status of the current operation
	controlMask	Control enable mask
	controlMaskLength	Control enable mask length in byte
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_ShortTermAdjustment returns value E_NOT_OK, the DCM module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish.
<b>Description</b>	This function requests to the application to adjust the IO signal. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	



## D.6.2 RoutineServices

### D.6.2.1 Xxx\_Start Operation

<b>Service Name</b>	Xxx_Start (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_Start (     Dcm_OpStatusType OpStatus,     uint8* dataInOut,     uint16* currentDataLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x80	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
<b>Parameters (inout)</b>	dataInOut	Input and output data in the routine control request / response
	currentDataLength	This parameter contains the length in bytes of the dataInOut array. It include fixed length and variable length data.
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_Start returns value E_NOT_OK, the Dcm module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish. DCM_E_FORCE_RCRRP: application requests the transmission of a response Pending (NRC 0x78)
<b>Description</b>	This function requests to the application to start the execution of a routine. <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

### D.6.2.2 Xxx\_StartConfirmation Operation

If `DcmDspRoutineFncSignature` is set to `ROUTINE_FNC_NORMAL` or `ROUTINE_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_StartConfirmation	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_StartConfirmation (     Dcm_ConfirmationStatusType ConfirmationStatus )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ConfirmationStatus	Confirmation status of a StartRoutine request
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.





<b>Description</b>	This function indicates the transmission of a response to a StartRoutine request
<b>Available via</b>	Dcm_Externals.h

### D.6.2.3 Xxx\_Stop Operation

If `DcmDspRoutineFncSignature` is set to `ROUTINE_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_Stop (draft)	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_Stop (     Dcm_OpStatusType OpStatus,     uint8* dataInOut,     uint16* currentDataLength,     Dcm_NegativeResponseCodeType* ErrorCode )</pre>	
<b>Service ID [hex]</b>	0x81	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
<b>Parameters (inout)</b>	dataInOut	Input and output data in the routine control request / response
	currentDataLength	This parameter contains the length in bytes of the dataInOut array. It include fixed length and variable length data.
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_Stop returns value E_NOT_OK, the Dcm module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value.
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish DCM_E_FORCE_RCRRP: application requests the transmission of a response Pending (NRC 0x78)
<b>Description</b>	This function requests to the application to stop the execution of a routine <b>Tags:</b> atp.Status=draft	
<b>Available via</b>	Dcm_Externals.h	

### D.6.2.4 Xxx\_StopConfirmation Operation

If `DcmDspRoutineFncSignature` is set to `ROUTINE_FNC_NORMAL` or `ROUTINE_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_StopConfirmation	
<b>Syntax</b>	Std_ReturnType Xxx_StopConfirmation ( Dcm_ConfirmationStatusType ConfirmationStatus )	
<b>Service ID [hex]</b>	0x69	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ConfirmationStatus	Dcm_ConfirmationStatus Confirmation status of a StopRoutine request
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function indicates the transmission of a response to a StopRoutine request	
<b>Available via</b>	Dcm_Externals.h	

### D.6.2.5 Xxx\_RequestResults Operation

If `DcmDspRoutineFncSignature` is set to `ROUTINE_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_RequestResults (draft)	
<b>Syntax</b>	Std_ReturnType Xxx_RequestResults ( Dcm_OpStatusType OpStatus, uint8* dataInOut, uint16* currentDataLength, Dcm_NegativeResponseCodeType* ErrorCode )	
<b>Service ID [hex]</b>	0x82	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	OpStatus	Status of the current operation
<b>Parameters (inout)</b>	dataInOut	Input and output data in the routine control request / response If variable length routine input data is used, this parameter contains the length in bytes of the dataInVar array. If variable length routine output data is used, this parameter contains the length in bytes of the dataOutVar parameter.
	currentDataLength	This parameter contains the length in bytes of the dataInOut array. It include fixed length and variable length data.
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_RequestResults returns value E_NOT_OK, the Dcm module shall send a negative response with N
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. DCM_E_PENDING: Request is not yet finished. Further call(s) required to finish DCM_E_FORCE_RCRRP: application requests the transmission of a response Pending (NRC 0x78)





<b>Description</b>	This function requests to the application the result of a routine execution <b>Tags:</b> atp.Status=draft
<b>Available via</b>	Dcm_Externals.h

### D.6.2.6 Xxx\_RequestResultsConfirmation Operation

If `DcmDspRoutineFncSignature` is set to `ROUTINE_FNC_NORMAL` or `ROUTINE_FNC_PROXY`, the following definition is used:

<b>Service Name</b>	Xxx_RequestResultsConfirmation	
<b>Syntax</b>	Std_ReturnType Xxx_RequestResultsConfirmation ( Dcm_ConfirmationStatusType ConfirmationStatus )	
<b>Service ID [hex]</b>	0x70	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	ConfirmationStatus	Confirmation status of a RequestRoutineResults request
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.
<b>Description</b>	This function indicates the transmission of a response to a RequestRoutineResults request	
<b>Available via</b>	Dcm_Externals.h	

### D.6.3 ServiceRequestNotification

From the point of view of the DCM, the operations has the following signatures:

#### D.6.3.1 Indication

<b>Service Name</b>	Xxx_Indication	
<b>Syntax</b>	Std_ReturnType Xxx_Indication ( uint8 SID, const uint8* RequestData, uint32 DataSize, uint8 ReqType, uint16 ConnectionId, Dcm_NegativeResponseCodeType* ErrorCode, Dcm_ProtocolType ProtocolType, uint16 TesterSourceAddress )	
<b>Service ID [hex]</b>	0x65	





<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	SID	–
	RequestData	Complete request data (diagnostic buffer), except the service ID
	DataSize	Number of valid bytes in the RequestData parameter
	ReqType	Addressing type of the request(0=physical request,1=functional request)
	ConnectionId	Unique connection identifier
	ProtocolType	Type of the protocol to be indicated
	TesterSourceAddress	source address of the tester
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	ErrorCode	If the operation Xxx_Indication re- turns value E_NOT_OK, the Dcm module shall send a negative response with NRC code equal to the parameter ErrorCode parameter value
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful. E_REQUEST_NOT_ACCEPTED : Request not accepted
<b>Description</b>	This function indicates to the application that a service is about to be executed and allows the application to reject the execution of the service request	
<b>Available via</b>	Dcm_Externals.h	

### D.6.3.2 Confirmation

<b>Service Name</b>	Xxx_Confirmation	
<b>Syntax</b>	<pre>Std_ReturnType Xxx_Confirmation (     uint8 SID,     uint8 ReqType,     uint16 ConnectionId,     Dcm_ConfirmationStatusType ConfirmationStatus,     Dcm_ProtocolType ProtocolType,     uint16 TesterSourceAddress )</pre>	
<b>Service ID [hex]</b>	0x66	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	SID	Value of service identifier
	ReqType	Addressing type of the request(0=physical request,1=functional request)
	ConnectionId	Unique connection identifier
	ConfirmationStatus	Confirmation of a successful transmission or a transmission error of a diagnostic service.
	ProtocolType	Type of Dcm Protocol
	TesterSourceAddress	source address of the tester
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Request was successful. E_NOT_OK: Request was not successful.





<b>Description</b>	This function confirms to the application the successful transmission or a transmission error of a diagnostic service.
<b>Available via</b>	Dcm_Externals.h

## D.7 Dem

### D.7.1 Dem\_ClearPrestoredFreezeFrame

<b>Service Name</b>	Dem_ClearPrestoredFreezeFrame	
<b>Syntax</b>	Std_ReturnType Dem_ClearPrestoredFreezeFrame ( Dem_EventIdType EventId )	
<b>Service ID [hex]</b>	0x07	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Clear prestored freeze frame was successful E_NOT_OK: Clear prestored freeze frame failed
<b>Description</b>	Clears a prestored freeze frame of a specific event. This API can only be used through the RTE and therefore no declaration is exported via Dem.h.  API Availability: This API will be available only if ({ecuc(Dem/DemConfigSet/DemEventParameter.DemFFPrestorageSupported)} == true)	
<b>Available via</b>	Dem.h	

### D.7.2 Dem\_PrestoreFreezeFrame

<b>Service Name</b>	Dem_PrestoreFreezeFrame	
<b>Syntax</b>	Std_ReturnType Dem_PrestoreFreezeFrame ( Dem_EventIdType EventId )	
<b>Service ID [hex]</b>	0x06	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK Freeze frame prestorage was successful E_NOT_OK Freeze frame prestorage failed





<b>Description</b>	Captures the freeze frame data for a specific event. This API can only be used through the RTE and therefore no declaration is exported via Dem.h.  API Availability: This API will be available only if <code>((ecuc(Dem/DemConfigSet/DemEventParameter.DemFFPrestorageSupported)) == true)</code>
<b>Available via</b>	Dem.h

### D.7.3 Dem\_ResetEventDebounceStatus

<b>Service Name</b>	Dem_ResetEventDebounceStatus	
<b>Syntax</b>	<pre>Std_ReturnType Dem_ResetEventDebounceStatus (     Dem_EventIdType EventId,     Dem_DebounceResetStatusType DebounceResetStatus )</pre>	
<b>Service ID [hex]</b>	0x09	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
	DebounceResetStatus	Freeze or reset the internal debounce counter/timer of the specified event.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Only on development error
<b>Description</b>	Control the internal debounce counter/timer by BSW modules and SW-Cs. The event qualification will not be affected by these debounce state changes. This API is available for BSW modules as soon as Dem_Prenit has been completed (refer to SWS_Dem_00438 and SWS_Dem_00167).	
<b>Available via</b>	Dem.h	

### D.7.4 Dem\_ResetEventStatus

<b>Service Name</b>	Dem_ResetEventStatus	
<b>Syntax</b>	<pre>Std_ReturnType Dem_ResetEventStatus (     Dem_EventIdType EventId )</pre>	
<b>Service ID [hex]</b>	0x05	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	





<b>Return value</b>	Std_ReturnType	E_OK: Request to reset the event status was successful accepted. E_NOT_OK: Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.
<b>Description</b>	Resets the event failed status. This API can only be used through the RTE and therefore no declaration is exported via Dem.h.	
<b>Available via</b>	Dem.h	

## D.7.5 Dem\_SetEventDisabled

<b>Service Name</b>	Dem_SetEventDisabled	
<b>Syntax</b>	Std_ReturnType Dem_SetEventDisabled ( Dem_EventIdType EventId )	
<b>Service ID [hex]</b>	0x51	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK set of event to disabled was successfull. E_NOT_OK set of event disabled failed
<b>Description</b>	Service for reporting the event as disabled to the Dem for the PID \$41 computation. API is needed in OBD-relevant ECUs only.  API Availability: This API will be available only if ((ecuc(Dem/DemGeneral.DemOBDSupport)) != DEM_OBD_NO_OBD_SUPPORT)	
<b>Available via</b>	Dem.h	

## D.7.6 Dem\_SetEventStatus

<b>Service Name</b>	Dem_SetEventStatus	
<b>Syntax</b>	Std_ReturnType Dem_SetEventStatus ( Dem_EventIdType EventId, Dem_EventStatusType EventStatus )	
<b>Service ID [hex]</b>	0x04	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
	EventStatus	Monitor test result
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	







<b>Return value</b>	Std_ReturnType	E_OK: set of event status was successful E_NOT_OK: Event status setting or processing failed or could not be accepted.
<b>Description</b>	Called by SW-Cs or BSW modules to report monitor status information to the Dem. BSW modules calling Dem_SetEventStatus can safely ignore the return value. This API will be available only if ({Dem/DemConfigSet/DemEventParameter/DemEventReportingType} == STANDARD_REPORTING)	
<b>Available via</b>	Dem.h	

### D.7.7 Dem\_GetDTCOfEvent

<b>Service Name</b>	Dem_GetDTCOfEvent	
<b>Syntax</b>	Std_ReturnType Dem_GetDTCOfEvent ( Dem_EventIdType EventId, Dem_DTCFormatType DTCFormat, uint32* DTCOfEvent )	
<b>Service ID [hex]</b>	0x0d	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
	DTCFormat	Defines the output-format of the requested DTC value.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	DTCOfEvent	Receives the DTC value in respective format returned by this function. If the return value of the function is other than E_OK this parameter does not contain valid data.
<b>Return value</b>	Std_ReturnType	E_OK: get of DTC was successful E_NOT_OK: the call was not successful DEM_E_NO_DTC_AVAILABLE: there is no DTC configured in the requested format
<b>Description</b>	Gets the DTC of an event.	
<b>Available via</b>	Dem.h	

### D.7.8 Dem\_GetDebouncingOfEvent

<b>Service Name</b>	Dem_GetDebouncingOfEvent	
<b>Syntax</b>	Std_ReturnType Dem_GetDebouncingOfEvent ( Dem_EventIdType EventId, Dem_DebouncingStateType* DebouncingState )	
<b>Service ID [hex]</b>	0x9f	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	





<b>Parameters (out)</b>	DebouncingState	Bit 0 Temporarily Defective (corresponds to $0 < FDC < 127$ ) Bit 1 finally Defective (corresponds to $FDC = 127$ ) Bit 2 temporarily healed (corresponds to $-128 < FDC < 0$ ) Bit 3 Test complete (corresponds to $FDC = -128$ or $FDC = 127$ ) Bit 4 DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
<b>Return value</b>	Std_ReturnType	E_OK: get of debouncing status per event state successful E_NOT_OK: get of debouncing per event state failed
<b>Description</b>	Gets the debouncing status of an event. This function shall not be used for EventId with native debouncing within their functions. It is rather for EventIds using debouncing within the Dem.	
<b>Available via</b>	Dem.h	

### D.7.9 Dem\_GetEventAvailable

<b>Service Name</b>	Dem_GetEventAvailable	
<b>Syntax</b>	Std_ReturnType Dem_GetEventAvailable ( Dem_EventIdType EventId, boolean* AvailableStatus )	
<b>Service ID [hex]</b>	0xbe	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	AvailableStatus	TRUE if the event is available. FALSE if the event is not available.
<b>Return value</b>	Std_ReturnType	E_OK : Event availability has been obtained. E_NOT_OK : Event availability cannot be obtained.
<b>Description</b>	Get the Event's availability.	
<b>Available via</b>	Dem.h	

### D.7.10 Dem\_GetEventExtendedDataRecordEx

<b>Service Name</b>	Dem_GetEventExtendedDataRecordEx	
<b>Syntax</b>	Std_ReturnType Dem_GetEventExtendedDataRecordEx ( Dem_EventIdType EventId, uint8 RecordNumber, uint8* DestBuffer, uint16* BufSize )	
<b>Service ID [hex]</b>	0x6d	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
	RecordNumber	Identification of requested Extended data record. Valid values are between 0x01 and 0xEF as defined in ISO14229-1.





<b>Parameters (inout)</b>	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
<b>Parameters (out)</b>	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the extended data shall be written to. The format is raw hexadecimal values and contains no header-information.
<b>Return value</b>	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation could not be performed DEM_NO_SUCH_ELEMENT: The requested event data is not currently stored (but the request was valid) OR the requested record number is not supported by the event. DEM_BUFFER_TOO_SMALL: The provided buffer size is too small.
<b>Description</b>	Gets the data of an extended data record by event.	
<b>Available via</b>	Dem.h	

### D.7.11 Dem\_GetEventFreezeFrameDataEx

<b>Service Name</b>	Dem_GetEventFreezeFrameDataEx	
<b>Syntax</b>	<pre>Std_ReturnType Dem_GetEventFreezeFrameDataEx (     Dem_EventIdType EventId,     uint8 RecordNumber,     uint16 DataId,     uint8* DestBuffer,     uint16* BufSize )</pre>	
<b>Service ID [hex]</b>	0x6e	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
	RecordNumber	This parameter is a unique identifier for a freeze frame record as defined in ISO14229-1. <b>0xFF means most recent freeze frame record is returned.</b> 0x00 is only supported if the Dem module supports WWH-OBd (refer to DemOBDSupport)
	DataId	This parameter specifies the DID (ISO14229-1) that shall be copied to the destination buffer.
<b>Parameters (inout)</b>	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
<b>Parameters (out)</b>	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the freeze frame data record shall be written to. The format is raw hexadecimal values and contains no header-information.
<b>Return value</b>	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation could not be performed DEM_NO_SUCH_ELEMENT: The requested event data is not currently stored (but the request was valid) OR The requested record number is not supported by the event OR The requested DID is not supported by the freeze frame. DEM_BUFFER_TOO_SMALL: The provided buffer size is too small.
<b>Description</b>	Gets the data of a freeze frame by event.	
<b>Available via</b>	Dem.h	

### D.7.12 Dem\_GetEventUdsStatus

<b>Service Name</b>	Dem_GetEventUdsStatus	
<b>Syntax</b>	<pre>Std_ReturnType Dem_GetEventUdsStatus (     Dem_EventIdType EventId,     Dem_UdsStatusByteType* UDSStatusByte )</pre>	
<b>Service ID [hex]</b>	0xb6	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	UDSStatusByte	UDS DTC status byte of the requested event (refer to chapter "Status bit support"). If the return value of the function call is E_NOT_OK, this parameter does not contain valid data.
<b>Return value</b>	Std_ReturnType	E_OK: get of event status was successful E_NOT_OK: get of event status failed
<b>Description</b>	Gets the current UDS status byte assigned to the DTC for the event	
<b>Available via</b>	Dem.h	

### D.7.13 Dem\_GetFaultDetectionCounter

<b>Service Name</b>	Dem_GetFaultDetectionCounter	
<b>Syntax</b>	<pre>Std_ReturnType Dem_GetFaultDetectionCounter (     Dem_EventIdType EventId,     sint8* FaultDetectionCounter )</pre>	
<b>Service ID [hex]</b>	0x3e	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Non Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	FaultDetectionCounter	This parameter receives the Fault Detection Counter information of the requested EventId. If the return value of the function call is other than E_OK this parameter does not contain valid data.  -128dec...127dec PASSED...FAILED according to ISO 14229-1
<b>Return value</b>	Std_ReturnType	E_OK: request was successful E_NOT_OK: request failed DEM_E_NO_FDC_AVAILABLE: there is no fault detection counter available for the requested event
<b>Description</b>	Gets the fault detection counter of an event. This API can only be used through the RTE, and therefore no declaration is exported via Dem.h.	
<b>Available via</b>	Dem.h	

### D.7.14 Dem\_GetMonitorStatus

<b>Service Name</b>	Dem_GetMonitorStatus	
<b>Syntax</b>	<pre>Std_ReturnType Dem_GetMonitorStatus (     Dem_EventIdType EventID,     Dem_MonitorStatusType* MonitorStatus )</pre>	
<b>Service ID [hex]</b>	0xb5	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventID	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	MonitorStatus	Monitor status byte of the requested event. If the return value of the function call is E_NOT_OK, this parameter does not contain valid data.
<b>Return value</b>	Std_ReturnType	E_OK: Get monitor status was successful, E_NOT_OK: getting the monitor status failed.
<b>Description</b>	Gets the current monitor status for an event.	
<b>Available via</b>	Dem.h	

### D.7.15 Dem\_SetEventStatusWithMonitorData

<b>Service Name</b>	Dem_SetEventStatusWithMonitorData	
<b>Syntax</b>	<pre>Std_ReturnType Dem_SetEventStatusWithMonitorData (     Dem_EventIdType EventId,     Dem_EventStatusType EventStatus,     Dem_MonitorDataType monitorData0,     Dem_MonitorDataType monitorData1 )</pre>	
<b>Service ID [hex]</b>	0xbd	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
	EventStatus	Monitor test result
	monitorData0	-
	monitorData1	-
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: set of event status was successful E_NOT_OK: Event status setting or processing failed or could not be accepted.
<b>Description</b>	This API will be available only if ((Dem/DemConfigSet/DemEventParameter/DemEventReportingType) == STANDARD_REPORTING_WITH_MONITOR_DATA)	
<b>Available via</b>	Dem.h	

## D.7.16 Dem\_SetWIRStatus

<b>Service Name</b>	Dem_SetWIRStatus	
<b>Syntax</b>	<pre>Std_ReturnType Dem_SetWIRStatus (     Dem_EventIdType EventId,     boolean WIRStatus )</pre>	
<b>Service ID [hex]</b>	0x7a	
<b>Sync/Async</b>	Asynchronous	
<b>Reentrancy</b>	Reentrant for different EventIds. Non reentrant for the same EventId.	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId. The Event Number is configured in the DEM. Min.: 1 (0: Indication of no Event or Failure) Max.:Result of configuration of Event Numbers in DEM (Max is either 255 or 65535)
	WIRStatus	Requested status of event related WIR-bit (regarding to the current status of function inhibition) WIRStatus = TRUE -> WIR-bit shall be set to "1" WIRStatus = FALSE -> WIR-bit shall be set to "0"
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: Request to set the WIR status was successful. E_NOT_OK: Request to set the WIR status was not accepted (e.g. disabled controlDTCSetting) and should be repeated.
<b>Description</b>	Sets the WIR status bit via failsafe SW-Cs. This API can only be used through the RTE and therefore no declaration is exported via Dem.h.	
<b>Available via</b>	Dem.h	

## D.7.17 <Module>\_DemGetFaultDetectionCounter<ForEvent>

<b>Service Name</b>	<Module>_DemGetFaultDetectionCounter<ForEvent>	
<b>Syntax</b>	<pre>Std_ReturnType &lt;Module&gt;_DemGetFaultDetectionCounter&lt;ForEvent&gt; (     sint8* FaultDetectionCounter )</pre>	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	FaultDetectionCounter	This parameter receives the fault detection counter information of the requested EventId. If the return value of the function call is other than E_OK this parameter does not contain valid data. -128dec...127dec PASSED...FAILED according to ISO 14229-1
<b>Return value</b>	Std_ReturnType	E_OK: request was successful E_NOT_OK: request failed
<b>Description</b>	Gets the current fault detection counter value. There is one c-callback per event using monitor-internal debouncing, if no port interface is provided by the Dem.	
<b>Available via</b>	Dem_Externals.h	

### D.7.18 <Module>\_DemInitMonitorFor<EventName>

<b>Service Name</b>	<Module>_DemInitMonitorFor<EventName>	
<b>Syntax</b>	Std_ReturnType <Module>_DemInitMonitorFor<EventName> ( Dem_InitMonitorReasonType InitMonitorReason )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	InitMonitorReason	Specific (re-)initialization reason evaluated from the monitor to identify the initialization kind to be performed.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	Return value unused - only for compatibility with according RTE operation.
<b>Description</b>	Inits the diagnostic monitor of a specific event. There is one separate callback per event (if configured), if no port interface is provided by the Dem.	
<b>Available via</b>	Dem_Externals.h	

### D.7.19 <Module>\_DemTriggerOnMonitorStatus

<b>Service Name</b>	<Module>_DemTriggerOnMonitorStatus	
<b>Syntax</b>	Std_ReturnType <Module>_DemTriggerOnMonitorStatus ( void )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: this function always returns E_OK for compatibility reasons with RTE
<b>Description</b>	Triggers on changes of the monitor status. Called synchronously in context of event status reporting.	
<b>Available via</b>	Dem_Externals.h	

### D.7.20 <Module>\_DemClearEventAllowed<ForCondition>

<b>Service Name</b>	<Module>_DemClearEventAllowed<ForCondition>	
<b>Syntax</b>	Std_ReturnType <Module>_DemClearEventAllowed<ForCondition> ( boolean* Allowed )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	None	





<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	Allowed	True - clearance of event is allowed False - clearance of event is not allowed
<b>Return value</b>	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation failed
<b>Description</b>	Triggers on DTC-deletion, which is not allowed if the out-parameter returns False. There is one separate callback per condition, which can be assigned to one or several events, if no port interface is provided by the Dem. Parameter "Allowed" will be unchanged in case E_NOT_OK is returned.	
<b>Available via</b>	Dem_Externals.h	

### D.7.21 <Module>\_DemTriggerOnEventData

<b>Service Name</b>	<Module>_DemTriggerOnEventData	
<b>Syntax</b>	Std_ReturnType <Module>_DemTriggerOnEventData ( Dem_EventIdType EventId )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventId	Identification of an event by assigned EventId.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: this function always returns E_OK for compatibility reasons with RTE.
<b>Description</b>	Triggers on changes of the event related data in the event memory.	
<b>Available via</b>	Dem_Externals.h	

### D.7.22 <Module>\_DemTriggerOnEventUdsStatus

<b>Service Name</b>	<Module>_DemTriggerOnEventUdsStatus	
<b>Syntax</b>	Std_ReturnType <Module>_DemTriggerOnEventUdsStatus ( Dem_UdsStatusByteType EventStatusByteOld, Dem_UdsStatusByteType EventStatusByteNew )	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	EventStatusByteOld	UDS DTC status byte of event before change (refer to chapter "Status bit support").
	EventStatusByteNew	UDS DTC status byte of event after change (refer to chapter "Status bit support").
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	
<b>Return value</b>	Std_ReturnType	E_OK: this function always returns E_OK for compatibility reasons with RTE







<b>Description</b>	Triggers on changes of the UDS DTC status byte.
<b>Available via</b>	Dem_Externals.h

## D.8 FiM

### D.8.1 FiM\_GetFunctionPermission

<b>Service Name</b>	FiM_GetFunctionPermission	
<b>Syntax</b>	<pre>Std_ReturnType FiM_GetFunctionPermission (     FiM_FunctionIdType FID,     boolean* Permission )</pre>	
<b>Service ID [hex]</b>	0x01	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	FID	Identification of a functionality by assigned FID. The FunctionId is configured in the FiM.  Min.: 1 (0: Indication of no functionality) Max.: Result of configuration of FIDs in FiM (Max is either 255 or 65535)
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	Permission	TRUE: FID has permission to run FALSE: FID has no permission to run, i.e. shall not be executed
<b>Return value</b>	Std_ReturnType	E_OK: The request is accepted E_NOT_OK: The request is not accepted, ie. initialization of FiM not completed
<b>Description</b>	This service reports the permission state to the functionality.	
<b>Available via</b>	FiM.h	

### D.8.2 FiM\_SetFunctionAvailable

<b>Service Name</b>	FiM_SetFunctionAvailable	
<b>Syntax</b>	<pre>Std_ReturnType FiM_SetFunctionAvailable (     FiM_FunctionIdType FID,     boolean Availability )</pre>	
<b>Service ID [hex]</b>	0x07	
<b>Sync/Async</b>	Synchronous	
<b>Reentrancy</b>	Reentrant	
<b>Parameters (in)</b>	FID	Identification of a functionality by assigned FID.
	Availability	The permission of the requested FID: TRUE: Function is available. FALSE: Function is not available.
<b>Parameters (inout)</b>	None	
<b>Parameters (out)</b>	None	





<b>Return value</b>	Std_ReturnType	E_OK: The request is accepted E_NOT_OK: Request is not accepted (e.g. invalid FID is given)
<b>Description</b>	This service sets the availability of a function. The function is only available if FiMAvailability Support is configured as True.	
<b>Available via</b>	FiM.h	

## E Referenced Service Interfaces

### E.1 Os

### E.2 NvM

#### E.2.1 NvM\_BlockIdType

<b>Name</b>	NvM_BlockIdType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint16		
<b>Range</b>	0..2 <sup>(16- NvMDataset SelectionBits)</sup> -1	–	–
<b>Description</b>	Identification of a NVRAM block via a unique block identifier. Reserved NVRAM block IDs: 0 -> to derive multi block request results via NvM_GetErrorStatus 1 -> redundant NVRAM block which holds the configuration ID		
<b>Variation</b>	–		
<b>Available via</b>	Rte_NvM_Type.h		

#### E.2.2 NvM\_BlockRequestType

<b>Name</b>	NvM_BlockRequestType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	NVM_READ_BLOCK	0x00	NvM_ReadBlock/ NvM_Read PRAMBlock was performed on the block
	NVM_WRITE_BLOCK	0x01	NvM_WriteBlock/ NvM_Write PRAMBlock was performed on the block
	NVM_RESTORE_BLOCK_DEFAULTS	0x02	NvM_RestoreBlockDefaults/ NvM_RestorePRAMBlockDefaults was performed on the block
	NVM_ERASE_NV_BLOCK	0x03	NvM_EraseNvBlock was performed on the block
	NVM_INVALIDATE_NV_BLOCK	0x04	NvM_InvalidateNvBlock was performed on the block
	NVM_READ_ALL_BLOCK	0x05	NvM_ReadAll has finished processing this block
<b>Description</b>	Identifies the type of request performed on a block when signaled via the callback function		
<b>Variation</b>	–		
<b>Available via</b>	Rte_NvM_Type.h		

### E.2.3 NvM\_InitBlockRequestType

<b>Name</b>	NvM_InitBlockRequestType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	NVM_INIT_READ_BLOCK	0x00	NvM_ReadBlock/ NvM_ReadPRAMBlock is requested on the block
	NVM_INIT_RESTORE_BLOCK_DEFAULTS	0x01	NvM_RestoreBlockDefaults/ NvM_RestorePRAMBlockDefaults is requested on the block
	NVM_INIT_READ_ALL_BLOCK	0x02	NvM_ReadAll is processing this block
	NVM_INIT_FIRST_INIT_ALL	0x03	NvM_FirstInitAll is processing this block
<b>Description</b>	Identifies the type of request performed on a block when signaled via the callback function		
<b>Variation</b>	–		
<b>Available via</b>	Rte_NvM_Type.h		

### E.2.4 NvM\_RequestResultType

<b>Name</b>	NvM_RequestResultType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	NVM_REQ_OK	0x00	The last asynchronous request has been finished successfully. This shall be the default value after reset. This status shall have the value 0.
	NVM_REQ_NOT_OK	0x01	The last asynchronous read/write/control request has been finished unsuccessfully.
	NVM_REQ_PENDING	0x02	An asynchronous read/write/control request is currently pending.
	NVM_REQ_INTEGRITY_FAILED	0x03	The result of the last asynchronous request NvM_ReadBlock or NvM_ReadAll is a data integrity failure. Note: In case of NvM_ReadBlock the content of the RAM block has changed but has become invalid. The application is responsible to renew and validate the RAM block content.





	NVM_REQ_BLOCK_SKIPPED	0x04	The referenced block was skipped during execution of NvM_ReadAll or NvM_WriteAll, e.g. Dataset NVRAM blocks (NvM_ReadAll) or NVRAM blocks without a permanently configured RAM block.
	NVM_REQ_NV_INVALIDATED	0x05	The referenced NV block is invalidated.
	NVM_REQ_CANCELED	0x06	The multi block request NvM_WriteAll was canceled by calling NvM_CancelWriteAll. Or Any single block job request (NvM_ReadBlock, NvM_WriteBlock, NvM_EraseNvBlock, NvM_InvalidateNvBlock and NvM_RestoreBlock Defaults) was canceled by calling NvM_CancelJobs.
	NVM_REQ_RESTORED_DEFAULTS	0x08	The referenced NV block had the default values copied to the RAM image.
<b>Description</b>	This is an asynchronous request result returned by the API service NvM_GetErrorStatus. The availability of an asynchronous request result can be additionally signaled via a callback function.		
<b>Variation</b>	–		
<b>Available via</b>	Rte_NvM_Type.h		

## E.2.5 NvMService

<b>Name</b>	NvMService		
<b>Comment</b>	–		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	EraseBlock
<b>Comment</b>	Service to erase a NV block.
<b>Mapped to API</b>	<a href="#">NvM_EraseNvBlock</a>
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList ("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass3;</pre>
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>

<b>Operation</b>	GetDataIndex
<b>Comment</b>	Service for getting the currently set DataIndex of a dataset NVRAM block
<b>Mapped to API</b>	<a href="#">NvM_GetDataIndex</a>





<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2 = configClass.value() == "NVM_API_CONFIG_CLASS_2"; WHERE   isConfigClass2;</pre>	
<b>Parameters</b>	DataIndex	
	<b>Type</b>	uint8
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

<b>Operation</b>	GetErrorStatus	
<b>Comment</b>	Service to read the block dependent error/status information.	
<b>Mapped to API</b>	<a href="#">NvM_GetErrorStatus</a>	
<b>Variation</b>	–	
<b>Parameters</b>	RequestResult	
	<b>Type</b>	<a href="#">NvM_RequestResultType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

<b>Operation</b>	InvalidateNvBlock	
<b>Comment</b>	Service to invalidate a NV block.	
<b>Mapped to API</b>	<a href="#">NvM_InvalidateNvBlock</a>	
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass3;</pre>	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

<b>Operation</b>	ReadBlock	
<b>Comment</b>	Service to copy the data of the NV block to its corresponding RAM block.	
<b>Mapped to API</b>	<a href="#">NvM_ReadBlock</a>	
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2 = configClass.value() == "NVM_API_CONFIG_CLASS_2";   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass2 OR isConfigClass3;</pre>	
<b>Parameters</b>	DstPtr	
	<b>Type</b>	VoidPtr
	<b>Direction</b>	IN





	<b>Comment</b>	The parameter "DstPtr" shall be typed by an ImplementationDataType of category DATA_REFERENCE with the pointer target void to pass an address (pointer) to the RAM Block.
	<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK	

<b>Operation</b>	ReadPRAMBlock
<b>Comment</b>	–
<b>Mapped to API</b>	–
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList ("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2 = configClass.value() == "NVM_API_CONFIG_CLASS_2";   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass2 OR isConfigClass3;</pre>
<b>Possible Errors</b>	E_OK E_NOT_OK

<b>Operation</b>	RestoreBlockDefaults										
<b>Comment</b>	Service to restore the default data to its corresponding RAM block.										
<b>Mapped to API</b>	<a href="#">NvM_RestoreBlockDefaults</a>										
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList ("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2 = configClass.value() == "NVM_API_CONFIG_CLASS_2";   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass2 OR isConfigClass3;</pre>										
<b>Parameters</b>	<table border="1"> <tr> <td colspan="2">DstPtr</td> </tr> <tr> <td><b>Type</b></td> <td>VoidPtr</td> </tr> <tr> <td><b>Direction</b></td> <td>IN</td> </tr> <tr> <td><b>Comment</b></td> <td>The parameter "DstPtr" shall be typed by an ImplementationDataType of category DATA_REFERENCE with the pointer target void to pass an address (pointer) to the RAM Block.</td> </tr> <tr> <td><b>Variation</b></td> <td>–</td> </tr> </table>	DstPtr		<b>Type</b>	VoidPtr	<b>Direction</b>	IN	<b>Comment</b>	The parameter "DstPtr" shall be typed by an ImplementationDataType of category DATA_REFERENCE with the pointer target void to pass an address (pointer) to the RAM Block.	<b>Variation</b>	–
DstPtr											
<b>Type</b>	VoidPtr										
<b>Direction</b>	IN										
<b>Comment</b>	The parameter "DstPtr" shall be typed by an ImplementationDataType of category DATA_REFERENCE with the pointer target void to pass an address (pointer) to the RAM Block.										
<b>Variation</b>	–										
<b>Possible Errors</b>	E_OK E_NOT_OK										

<b>Operation</b>	RestorePRAMBlockDefaults
<b>Comment</b>	–
<b>Mapped to API</b>	–
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList ("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2 = configClass.value() == "NVM_API_CONFIG_CLASS_2";   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass2 OR isConfigClass3;</pre>
<b>Possible Errors</b>	E_OK E_NOT_OK

<b>Operation</b>	SetDataIndex										
<b>Comment</b>	Service for setting the DataIndex of a dataset NVRAM block.										
<b>Mapped to API</b>	<a href="#">NvM_SetDataIndex</a>										
<b>Variation</b>	<pre> FOR   configClass      : ECV.subEltList("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2  = configClass.value() == "NVM_API_CONFIG_CLASS_2";   isConfigClass3  = configClass.value() == "NVM_API_CONFIG_CLASS_3";   blockMgmTypes   = ECV.subEltList("NvM/NvMBlockDescriptor/     NvMBlockManagementType");   isMgd(mgmtType) = mgmtType.value() == "NVM_BLOCK_DATASET";   datasetMgdCount = blockMgmTypes.filter(isMgd).count(); WHERE   (isConfigClass2 OR isConfigClass3) AND (datasetMgdCount GT 0); </pre>										
<b>Parameters</b>	<table border="1"> <tr> <td>DataIndex</td> <td></td> </tr> <tr> <td><b>Type</b></td> <td>uint8</td> </tr> <tr> <td><b>Direction</b></td> <td>IN</td> </tr> <tr> <td><b>Comment</b></td> <td>-</td> </tr> <tr> <td><b>Variation</b></td> <td>-</td> </tr> </table>	DataIndex		<b>Type</b>	uint8	<b>Direction</b>	IN	<b>Comment</b>	-	<b>Variation</b>	-
DataIndex											
<b>Type</b>	uint8										
<b>Direction</b>	IN										
<b>Comment</b>	-										
<b>Variation</b>	-										
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>										

<b>Operation</b>	SetRamBlockStatus										
<b>Comment</b>	Service for setting the RAM block status of an NVRAM block.										
<b>Mapped to API</b>	<a href="#">NvM_SetRamBlockStatus</a>										
<b>Variation</b>	<pre> LET   nvMBlockUseSetRamBlockStatus = ECV.subEltList("NvM/     NvMBlockDescriptor/NvMBlockUseSetRamBlockStatus");   useSetRamBlockStatus(useApi) = useApi.value() == true;   useSetRamBlockStatusCount    = nvMBlockUseSetRamBlockStatus.filter(     useSetRamBlockStatus).count(); WHERE   (useSetRamBlockStatusCount GT 0); </pre>										
<b>Parameters</b>	<table border="1"> <tr> <td>BlockChanged</td> <td></td> </tr> <tr> <td><b>Type</b></td> <td>boolean</td> </tr> <tr> <td><b>Direction</b></td> <td>IN</td> </tr> <tr> <td><b>Comment</b></td> <td>-</td> </tr> <tr> <td><b>Variation</b></td> <td>-</td> </tr> </table>	BlockChanged		<b>Type</b>	boolean	<b>Direction</b>	IN	<b>Comment</b>	-	<b>Variation</b>	-
BlockChanged											
<b>Type</b>	boolean										
<b>Direction</b>	IN										
<b>Comment</b>	-										
<b>Variation</b>	-										
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>										

<b>Operation</b>	WriteBlock				
<b>Comment</b>	Service to copy the data of the RAM block to its corresponding NV block.				
<b>Mapped to API</b>	<a href="#">NvM_WriteBlock</a>				
<b>Variation</b>	<pre> FOR   configClass      : ECV.subEltList("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2  = configClass.value() == "NVM_API_CONFIG_CLASS_2";   isConfigClass3  = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass2 OR isConfigClass3; </pre>				
<b>Parameters</b>	<table border="1"> <tr> <td>SrcPtr</td> <td></td> </tr> <tr> <td><b>Type</b></td> <td>ConstVoidPtr</td> </tr> </table>	SrcPtr		<b>Type</b>	ConstVoidPtr
SrcPtr					
<b>Type</b>	ConstVoidPtr				







	<b>Direction</b>	IN
	<b>Comment</b>	The parameter "SrcPtr" shall be typed by an ImplementationDataType of category DATA_REFERENCE with the pointer target void to pass an address (pointer) to the RAM Block.
	<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK	

<b>Operation</b>	WritePRAMBlock
<b>Comment</b>	–
<b>Mapped to API</b>	–
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList ("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass2 = configClass.value() == "NVM_API_CONFIG_CLASS_2";   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass2 OR isConfigClass3;</pre>
<b>Possible Errors</b>	E_OK E_NOT_OK

## E.2.6 NvMAdmin

<b>Name</b>	NvMAdmin		
<b>Comment</b>	–		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	SetBlockProtection		
<b>Comment</b>	Service for setting/resetting the write protection for a NV block.		
<b>Mapped to API</b>	<a href="#">NvM_SetBlockProtection</a>		
<b>Variation</b>	<pre>FOR   configClass      : ECV.subEltList ("NvM/NvMCommon/NvMApiConfigClass"); LET   isConfigClass3 = configClass.value() == "NVM_API_CONFIG_CLASS_3"; WHERE   isConfigClass3;</pre>		
<b>Parameters</b>	ProtectionEnabled		
	<b>Type</b>	boolean	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
<b>Possible Errors</b>	E_OK E_NOT_OK		

## E.2.7 NvMNotifyJobFinished

<b>Name</b>	NvMNotifyJobFinished		
<b>Comment</b>	Callback that is called when a job has finished		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful

<b>Operation</b>	JobFinished		
<b>Comment</b>	Callback that gets called if a job has finished		
<b>Mapped to API</b>	–		
<b>Variation</b>	–		
<b>Parameters</b>	BlockRequest		
	<b>Type</b>	NvM_BlockRequestType	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	JobResult		
	<b>Type</b>	NvM_RequestResultType	
	<b>Direction</b>	IN	
<b>Comment</b>	–		
<b>Variation</b>	–		
<b>Possible Errors</b>	E_OK		

## E.2.8 NvMNotifyInitBlock

<b>Name</b>	NvMNotifyInitBlock		
<b>Comment</b>	Callback that is called by the NvM module when default data needs to be restored to the RAM image		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	RAM block content was updated
	1	RTE_E_RAM_UNCHANGED	RAM block content was not changed

<b>Operation</b>	InitBlock		
<b>Comment</b>	This callback is called if the initialization of a block has completed.		
<b>Mapped to API</b>	–		
<b>Variation</b>	–		
<b>Parameters</b>	InitBlockRequest		
	<b>Type</b>	NvM_InitBlockRequestType	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
<b>Possible Errors</b>	–		

## E.2.9 NvMMirror

<b>Name</b>	NvMMirror		
<b>Comment</b>	–		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	ReadRamBlockFromNvM		
<b>Comment</b>	Block specific callback routine which shall be called in order to let the application copy data from NvM module's mirror to RAM block.		
<b>Mapped to API</b>	<a href="#">NvM_ReadRamBlockFromNvm</a>		
<b>Variation</b>	–		
<b>Parameters</b>	SrcPtr		
	<b>Type</b>	ConstVoidPtr	
	<b>Direction</b>	IN	
	<b>Comment</b>	The parameter "SrcPtr" shall be typed by an ImplementationDataType of category DATA_REFERENCE with the pointer target void to pass an address (pointer) to the RAM Block.	
	<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

<b>Operation</b>	WriteRamBlockToNvM		
<b>Comment</b>	Block specific callback routine which shall be called in order to let the application copy data from RAM block to NvM module's mirror.		
<b>Mapped to API</b>	<a href="#">NvM_WriteRamBlockToNvm</a>		
<b>Variation</b>	–		
<b>Parameters</b>	DstPtr		
	<b>Type</b>	VoidPtr	
	<b>Direction</b>	IN	
	<b>Comment</b>	The parameter "DstPtr" shall be typed by an ImplementationDataType of category DATA_REFERENCE with the pointer target void to pass an address (pointer) to the RAM Block.	
	<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

## E.2.10 PS\_{Block}

<b>Name</b>	PS_{Block}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	<a href="#">NvMService</a>
<b>Description</b>	–		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	<a href="#">NvM_BlockIdType</a>	





	<b>Value</b>	<b>FOR</b> nvBlockDescriptor : ECV.subEltList("NvM/ NvMBlockDescriptor"); <b>LET</b> Block = nvBlockDescriptor.shortname(); BlockId = nvBlockDescriptor.subElt("NvMNvramBlockIdentifier").value();
<b>Variation</b>		<b>FOR</b> nvBlockDescriptor : ECV.subEltList("NvM/NvMBlockDescriptor"); <b>LET</b> Block = nvBlockDescriptor.shortname(); UsePort = nvBlockDescriptor.subElt("NvMBlockUsePort").value() == true; <b>WHERE</b> UsePort;

### E.2.11 PAdmin\_{Block}

<b>Name</b>	PAdmin_{Block}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	NvMAdmin
<b>Description</b>	-		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	NvM_BlockIdType	
	<b>Value</b>	<b>FOR</b> nvBlockDescriptor : ECV.subEltList("NvM/ NvMBlockDescriptor"); <b>LET</b> Block = nvBlockDescriptor.shortname(); BlockId = nvBlockDescriptor.subElt("NvMNvramBlockIdentifier").value();	
<b>Variation</b>	<b>FOR</b> nvBlockDescriptor : ECV.subEltList("NvM/NvMBlockDescriptor"); <b>LET</b> Block = nvBlockDescriptor.shortname(); UsePort = nvBlockDescriptor.subElt("NvMBlockUsePort").value() == true; <b>WHERE</b> UsePort;		

### E.2.12 PNJF\_{Block}

<b>Name</b>	PNJF_{Block}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	NvMNotifyJobFinished
<b>Description</b>	-		





<b>Variation</b>	<pre> <b>FOR</b>   nvBlockDescriptor : ECV.subEltList("NvM/NvMBlockDescriptor"); <b>LET</b>   Block                = nvBlockDescriptor.shortname();   UsePort              = nvBlockDescriptor.subElt("NvMBlockUsePort").     value() == true;   SingleBlockCallbackDef = nvBlockDescriptor.subElt("     NvMSingleBlockCallback").isDefined();   SingleBlockCallbackFncDef = nvBlockDescriptor.subElt("     NvMSingleBlockCallback/NvMSingleBlockCallbackFnc").isDefined(); <b>WHERE</b>   UsePort <b>AND</b> SingleBlockCallbackDef <b>AND NOT</b> SingleBlockCallbackFncDef; </pre>
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### E.2.13 PNIB\_{Block}

<b>Name</b>	PNIB_{Block}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	NvMNotifyInitBlock
<b>Description</b>	-		
<b>Variation</b>	<pre> <b>FOR</b>   nvBlockDescriptor : ECV.subEltList("NvM/NvMBlockDescriptor"); <b>LET</b>   Block                = nvBlockDescriptor.shortname();   UsePort              = nvBlockDescriptor.subElt("NvMBlockUsePort").     value() == true;   InitBlockCallbackDef = nvBlockDescriptor.subElt("     NvMInitBlockCallback").isDefined();   InitBlockCallbackFncDef = nvBlockDescriptor.subElt("     NvMInitBlockCallback/NvMInitBlockCallbackFnc").isDefined(); <b>WHERE</b>   UsePort <b>AND</b> InitBlockCallbackDef <b>AND NOT</b> InitBlockCallbackFncDef; </pre>		

### E.2.14 PM\_{Block}

<b>Name</b>	PM_{Block}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	NvMMirror
<b>Description</b>	-		
<b>Variation</b>	<pre> <b>FOR</b>   nvBlockDescriptor : ECV.subEltList("NvM/NvMBlockDescriptor"); <b>LET</b>   Block                = nvBlockDescriptor.shortname();   UsePort              = nvBlockDescriptor.subElt("NvMBlockUsePort").value()     == true;   UsePortSyncMech      = nvBlockDescriptor.subElt("NvMBlockUseSyncMechanism")     .value() == true; <b>WHERE</b>   UsePort <b>AND</b> UsePortSyncMech; </pre>		

## E.3 Dcm

### E.3.1 Implementation Data Types

#### E.3.1.1 Dcm\_OpStatusType

<b>Name</b>	Dcm_OpStatusType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DCM_INITIAL	0x00	Indicates the initial call to the operation
	DCM_PENDING	0x01	Indicates that a pending return has been done on the previous call of the operation
	DCM_CANCEL	0x02	Indicates that the DCM requests to cancel the pending operation
	DCM_FORCE_RCRRP_OK	0x03	Confirm a response pending transmission
<b>Description</b>	–		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dcm_Type.h		

#### E.3.1.2 Dcm\_ConfirmationStatusType

<b>Name</b>	Dcm_ConfirmationStatusType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DCM_RES_POS_OK	0x00	–
	DCM_RES_POS_NOT_OK	0x01	–
	DCM_RES_NEG_OK	0x02	–
	DCM_RES_NEG_NOT_OK	0x03	–
<b>Description</b>	–		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dcm_Type.h		

<b>Name</b>	Dcm_ProtocolType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DCM_OBD_ON_CAN	0x00	OBD on CAN (ISO15765-4; ISO15031-5)
	DCM_OBD_ON_FLEXRAY	0x01	(OBD on Flexray (Manufacturer specific; ISO15031-5))
	DCM_OBD_ON_IP	0x02	(OBD on Internet Protocol (Manufacturer specific; ISO15031-5))





DCM_UDS_ON_CAN	0x03	UDS on CAN (ISO15765-3; ISO14229-1)
DCM_UDS_ON_FLEXRAY	0x04	UDS on FlexRay (Manufacturer specific; ISO14229-1)
DCM_UDS_ON_IP	0x05	(UDS on Internet Protocol (Manufacturer specific; ISO14229-1))
DCM_ROE_ON_CAN	0x06	Response On Event on CAN
DCM_ROE_ON_FLEXRAY	0x07	Response On Event on FlexRay
DCM_ROE_ON_IP	0x08	(Response on Event on Internet Protocol)
DCM_PERIODICTRANS_ON_CAN	0x09	Periodic Transmission on CAN
DCM_PERIODICTRANS_ON_FLEXRAY	0x0A	Periodic Transmission on FlexRay
DCM_PERIODICTRANS_ON_IP	0x0B	(Periodic Transmission on Internet Protocol)
DCM_NO_ACTIVE_PROTOCOL	0x0C	No protocol has been started
DCM_UDS_ON_LIN	0x0D	UDS on LIN (ISO14229-1; ISO14229-7)
Reserved for further AUTOSAR implementation	0x0E..0xEF	–
DCM_SUPPLIER_1	0xF0	Reserved for SW supplier specific.
DCM_SUPPLIER_2	0xF1	Reserved for SW supplier specific.
DCM_SUPPLIER_3	0xF2	Reserved for SW supplier specific.
DCM_SUPPLIER_4	0xF3	Reserved for SW supplier specific.
DCM_SUPPLIER_5	0xF4	Reserved for SW supplier specific.
DCM_SUPPLIER_6	0xF5	Reserved for SW supplier specific.
DCM_SUPPLIER_7	0xF6	Reserved for SW supplier specific.
DCM_SUPPLIER_8	0xF7	Reserved for SW supplier specific.
DCM_SUPPLIER_9	0xF8	Reserved for SW supplier specific.
DCM_SUPPLIER_10	0xF9	Reserved for SW supplier specific.
DCM_SUPPLIER_11	0xFA	Reserved for SW supplier specific.
DCM_SUPPLIER_12	0xFB	Reserved for SW supplier specific.
DCM_SUPPLIER_13	0xFC	Reserved for SW supplier specific.
DCM_SUPPLIER_14	0xFD	Reserved for SW supplier specific.
DCM_SUPPLIER_15	0xFE	Reserved for SW supplier specific.





<b>Description</b>	Protocol type definition
<b>Variation</b>	–
<b>Available via</b>	Rte_Dcm_Type.h

### E.3.1.3 Dcm\_NegativeResponseCodeType

<b>Name</b>	Dcm_NegativeResponseCodeType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DCM_POS_RESP	0x00	PR
	range of values 0x01..0x0F reserved by ISO 14229	0x01..0x0F	ISOSAERESRVD
	DCM_E_GENERALREJECT	0x10	GR
	DCM_E_SERVICENOTSUPPORTED	0x11	SNS
	DCM_E_SUBFUNCTIONNOTSUPPORTED	0x12	SFNS
	DCM_E_INCORRECTMESSAGELENGTHORINVALIDFORMAT	0x13	IMLOIF
	DCM_E_RESPONSETOOLONG	0x14	RTL
	range of values 0x15..0x20 reserved by ISO 14229	0x15..0x20	ISOSAERESRVD
	DCM_E_BUSYREPEATREQUEST	0x21	BRR
	DCM_E_CONDITIONSNOTCORRECT	0x22	CNC
	value 0x23 reserved by ISO 14229	0x23	ISOSAERESRVD
	DCM_E_REQUESTSEQUENCEERROR	0x24	RSE
	DCM_E_NORESPONSEFROMSUBNETCOMPONENT	0x25	NRFSC
	DCM_E_FAILUREPREVENTSEXCUTIONOFREQUESTEDACTION	0x26	FPEORA
	range of values 0x27..0x30 reserved by ISO 14229	0x27..0x30	ISOSAERESRVD
	DCM_E_REQUESTOUTOFRANGE	0x31	ROOR
	value 0x32 reserved by ISO 14229	0x32	ISOSAERESRVD
	DCM_E_SECURITYACCESSDENIED	0x33	SAD
	value 0x34 reserved by ISO 14229	0x34	ISOSAERESRVD
	DCM_E_INVALIDKEY	0x35	IK







DCM_E_EXCEEDNUMBEROFATTEMPTS	0x36	ENOA
DCM_E_REQUIRED-TIMEDELAYNOTEXPIRED	0x37	RTDNE
range of values 0x38..0x4F reserved by ISO 15764	0x38..0x4F	RBEDLSD
range of values 0x50..0x6F reserved by ISO 14229	0x50..0x6F	ISOSAERESRVD
DCM_E_UPLOADDOWN-LOADNOTACCEPTED	0x70	UDNA
DCM_E_TRANSFERDATA-SUSPENDED	0x71	TDS
DCM_E_GENERALPRO-GRAMMINGFAILURE	0x72	GPF
DCM_E_WRONGBLOCK-SEQUENCECOUNTER	0x73	WBSC
range of values 0x74..0x77 reserved by ISO 14229	0x74..0x77	ISOSAERESRVD
range of values 0x79..0x7D reserved by ISO 14229	0x79..0x7D	ISOSAERESRVD
DCM_E_SUBFUNCTION-NOTSUPPORTEDINAC-TIVESESSION	0x7E	SFNSIAS
DCM_E_SERVICE-NOTSUPPORTEDINACTIV-ESSESSION	0x7F	SNSIAS
value 0x80 reserved by ISO 14229	0x80	ISOSAERESRVD
DCM_E_RPMTOOHIGH	0x81	RPMT
DCM_E_RPMTOOLOW	0x82	RPMTL
DCM_E_ENGINEISRUNNING	0x83	EIR
DCM_E_ENGINEISNOTRUNNING	0x84	EINR
DCM_E_ENGINE-RUN-TIMETOLOW	0x85	ERTTL
DCM_E_TEMPERATURETOOHIGH	0x86	TEMPH
DCM_E_TEMPERATURETOOLOW	0x87	TEMPL
DCM_E_VEHCLESPEEDTOOHIGH	0x88	VSTH
DCM_E_VEHCLESPEEDTOOLOW	0x89	VSTL
DCM_E_THROTTLE-PEDALTOOHIGH	0x8A	TPTH
DCM_E_THROTTLE-PEDALTOOLOW	0x8B	TPTL
DCM_E_TRANSMISSION-RANGENOTINNEUTRAL	0x8C	TRNIN
DCM_E_TRANSMISSION-RANGENOTINGEAR	0x8D	TRNIG
value 0x8E reserved by ISO 14229	0x8E	ISOSAERESRVD
DCM_E_BRAKESWITCH-NOTCLOSED	0x8F	BSNC





	DCM_E_SHIFTERLEVER-NOTINPARK	0x90	SLNIP
	DCM_E_TORQUECONVERTERCLUTCHLOCKED	0x91	TCCL
	DCM_E_VOLTAGETOOHIGH	0x92	VTH
	DCM_E_VOLTAGETOLOW	0x93	VTL
	range of values 0x94..0xEF reserved by ISO 14229	0x94..0xEF	RFSCNC
	DCM_E_VMSCNC_0	0xF0	VMSCNC
	DCM_E_VMSCNC_1	0xF1	VMSCNC1
	DCM_E_VMSCNC_2	0xF2	VMSCNC2
	DCM_E_VMSCNC_3	0xF3	VMSCNC3
	DCM_E_VMSCNC_4	0xF4	VMSCNC4
	DCM_E_VMSCNC_5	0xF5	VMSCNC5
	DCM_E_VMSCNC_6	0xF6	VMSCNC6
	DCM_E_VMSCNC_7	0xF7	VMSCNC7
	DCM_E_VMSCNC_8	0xF8	VMSCNC8
	DCM_E_VMSCNC_9	0xF9	VMSCNC9
	DCM_E_VMSCNC_A	0xFA	VMSCNCA
	DCM_E_VMSCNC_B	0xFB	VMSCNCB
	DCM_E_VMSCNC_C	0xFC	VMSCNCC
	DCM_E_VMSCNC_D	0xFD	VMSCNCD
	DCM_E_VMSCNC_E	0xFE	VMSCNCE
	value 0xFF reserved by ISO 14229	0xFF	ISOSAERESRVD
<b>Description</b>	This Table of available Negative Response Codes represents the allowed Response Codes an AUTOSAR SW Component shall return after a function call. For the allowed NRC of the executed Service ID please refer to the specification of the service in ISO14229-1 (UDS) and ISO15031-5 (OBD/CARB) (see chapter 4.2.4 Response code parameter definition Table 12).		
<b>Variation</b>	-		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.4 Dcm\_DataElement\_{Data}Type

<b>Name</b>	Dcm_DataElement_{Data}Type	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	<a href="#">Dcm_DataElement_{Data}_ArrayType</a>	((ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspDataType)) == ([S U]INT[8 16 32] FLOAT)_N)    (ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidDataType)) == ([S U]INT[8 16 32] FLOAT)_N)





	<a href="#">Dcm_DataElement_{Data}_PrimitiveType</a>	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == (BOOLEAN [S U]INT[8 16 32] FLOAT))    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == (BOOLEAN [S U]INT[8 16 32] FLOAT)))
	<a href="#">Dcm_DataElement_{Data}_StructuredType</a>	DcmDspDidSignal with at least one DcmDspDidSignalComposite Ref.
<b>Description</b>	Common description for S/R and C/S data elements.	
<b>Variation</b>	(({Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort == USE_DATA_ELEMENT_SPECIFIC_INTERFACES}) && ( ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == USE_DATA_SENDER_RECEIVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidDataUsePort)} == USE_DATA_SENDER_RECEIVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort)} == USE_DATA_SENDER_RECEIVER_AS_SERVICE)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == USE_DATA_SENDER_RECEIVER_AS_SERVICE) ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == USE_DATA_SYNCH_CLIENT_SERVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == USE_DATA_ASYNCH_CLIENT_SERVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == USE_DATA_ASYNCH_CLIENT_SERVER_ERROR)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01.DcmDspPidDataUsePort)} == USE_DATA_SYNCH_CLIENT_SERVER) )) Data = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)})    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.SHORT-NAME)})	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.5 Dcm\_DataElementType\_{Data}ArrayType

<b>Name</b>	Dcm_DataElement_{Data}_ArrayType	
<b>Kind</b>	Array	
<b>Element type</b>	<b>Type</b>	<b>Variation</b>
	float32	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == FLOAT_N)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == FLOAT_N))
	sint16	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == SINT16_N)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == SINT16_N))
	sint32	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == SINT32_N)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == SINT32_N))
	sint8	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == SINT8_N)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == SINT8_N))
	uint16	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == UINT16_N)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == UINT16_N))





	uint32	{{{ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspDataType) == UINT32_N)    (ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidDataType) == UINT32_N)}}
	uint8	{{{ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspDataType) == UINT8_N)    (ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidDataType) == UINT8_N)}}
<b>Size</b>	-	
<b>Description</b>	-	
<b>Variation</b>	{{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataType) == ([S U]INT[8 16 32] FLOAT)_N)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01.DcmDspPidDataType) == ([S U]INT[8 16 32] FLOAT)_N) && ((Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort == USE_DATA_ELEMENT_SPECIFIC_INTERFACES) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort) == USE_DATA_SENDER_RECEIVER)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort) == USE_DATA_SENDER_RECEIVER)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort) == USE_DATA_SENDER_RECEIVER_AS_SERVICE)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort) == USE_DATA_SENDER_RECEIVER_AS_SERVICE)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort) == USE_DATA_SYNCH_CLIENT_SERVER)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort) == USE_DATA_ASYNCH_CLIENT_SERVER)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort) == USE_DATA_ASYNCH_CLIENT_SERVER_ERROR)    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01.DcmDspPidDataUsePort) == USE_DATA_SYNCH_CLIENT_SERVER))) Data = (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME))    (ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.SHORT-NAME))}}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.6 Dcm\_DataElementType\_{Data}PrimitiveType

<b>Name</b>	Dcm_DataElement_{Data}_PrimitiveType	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	boolean	{{{ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspDataType) == BOOLEAN)    (ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidDataType) == BOOLEAN)}}
	float32	{{{ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspDataType) == FLOAT)    (ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidDataType) == FLOAT)}}
	sint16	{{{ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspDataType) == SINT16)    (ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidDataType) == SINT16)}}
	sint32	{{{ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspDataType) == SINT32)    (ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidDataType) == SINT32)}}





	sint8	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == SINT8)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == SINT8))
	uint16	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == UINT16)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == UINT16))
	uint32	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == UINT32)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == UINT32))
	uint8	(({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspData.?DcmDspData Type)} == UINT8)    ({ecuc(Dcm/?DcmConfigSet/?DcmDsp/?DcmDspPid/?DcmDspPidData/?DcmDspPidService01.?DcmDspPidData Type)} == UINT8))
<b>Description</b>	–	
<b>Variation</b>	((({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspData Type)} == (BOOLEAN [S U]INT[8 16 32] FLOAT))    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01.DcmDspPidData Type)} == (BOOLEAN [S U]INT[8 16 32] FLOAT))) && ({Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort == USE_DATA_ELEMENT_SPECIFIC_INTERFACES}) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == USE_DATA_SENDER_RECEIVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort)} == USE_DATA_SENDER_RECEIVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort)} == USE_DATA_SENDER_RECEIVER_AS_SERVICE)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == USE_DATA_SENDER_RECEIVER_AS_SERVICE)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == USE_DATA_SYNCH_CLIENT_SERVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == USE_DATA_ASYNC_CLIENT_SERVER)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == USE_DATA_ASYNC_CLIENT_SERVER_ERROR)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01.DcmDspPidDataUsePort)} == USE_DATA_SYNCH_CLIENT_SERVER))) Data = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)})    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.SHORT-NAME)})	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.7 Dcm\_DataArrayTypeUint8\_{Data}Type

<b>Name</b>	Dcm_DataArrayTypeUint8_{Data}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	((({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataByteSize)})    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.DcmDspPidDataByteSize)})) Elements		
<b>Description</b>	–		
<b>Variation</b>	(( {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_DATA_ELEMENT_SPECIFIC_INTERFACES) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspData Type)} == UINT8_N)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspData Type)} == UINT8_DYN)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01.DcmDspPidData Type)} == UINT8_N)) Data = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)})    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.SHORT-NAME)})		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.8 {DID}\_Struct\_DataType

This data type has a different modeling as other data types. The {DID}\_Struct\_DataType datatype is modeled as prosa text only. At the time this specification was created there are no means to visualize this datatype with existing AUTOSAR tooling as table as all the other data types. Still AUTOSAR allows modeling such data types. Simply that they cannot be shown here as table.

<b>Name</b>	{DID}_Struct_DataType
<b>Kind</b>	Structure
<b>Description</b>	The elements of this structure data type is a composition of all DcmDspDataElement of the DcmDspDid. Example: A DID with the 3 data elements uint32 data1, sint8 data2 and sint16 data 3, has a structure definition of struct { uint32 data1, sint8 data2, sint16 data 3}.
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)) == ((USE_ATOMIC_SENDER_RECEIVER_INTERFACE    USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE)    USE_ATOMIC_NV_DATA_INTERFACE)) DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})
<b>Available via</b>	Rte_Dcm_Type.h

### E.3.1.9 Dcm\_RangeArray\_{Range}Type

<b>Name</b>	Dcm_RangeArray_{Range}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidRangeMaxDataLength)} Elements		
<b>Description</b>	–		
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidRange.DcmDspDidRangeUsePort)} == TRUE Range = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidRange.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.10 Dcm\_ScalingInfoArray\_{Data}Type

<b>Name</b>	Dcm_ScalingInfoArray_{Data}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDataInfo.DcmDspDataScalingInfoSize)} Elements		
<b>Description</b>	–		
<b>Variation</b>	(((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)) == USE_DATA_ASYNC_CLIENT_SERVER)    ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)) == USE_DATA_SYNC_CLIENT_SERVER)    ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)) == USE_DATA_ASYNC_CLIENT_SERVER_ERROR)) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData->DcmDspDataInfoRef.DcmDspDataScalingInfoSize)) != NULL) Data = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.11 Dcm\_RequestDataOut\_{Routine}\_{Signal}PrimitivType

<b>Name</b>	Dcm_RequestDataOut_{Routine}_{Signal}PrimitivType	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == FLOAT
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == SINT16
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == SINT32
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == SINT8
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == UINT16
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == UINT32
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == UINT8
<b>Description</b>	–	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == [U S]INT[8 16 32]FLOAT) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.12 Dcm\_RequestDataIn\_{Routine}\_{Signal}PrimitiveType

<b>Name</b>	Dcm_RequestDataIn_{Routine}_{Signal}PrimitiveType	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>







	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == FLOAT
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == SINT16
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == SINT32
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == SINT8
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == UINT16
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == UINT32
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == UINT8
<b>Description</b>	-	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == [U S]INT[8 16 32]FLOAT) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.13 Dcm\_RequestDataOut\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_RequestDataOut_{Routine}_{Signal}Type	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	Dcm_RequestDataOut_{Routine}_{Signal}PrimitiveType	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32]FLOAT))
	Dcm_RequestDataOut_{Routine}_{Signal}ArrayType	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32]FLOAT)_N)







	Dcm_RequestDataOut_{Routine}_{Signal}Structured Type	DcmDspRequestRoutineResultsOutSignal with at least one DcmDspRequestRoutineResultsOutSignalCompositeSignalRef.
<b>Description</b>	–	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.14 Dcm\_RequestDataIn\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_RequestDataIn_{Routine}_{Signal}Type	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	Dcm_RequestDataIn_{Routine}_{Signal}Primitive Type	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT))
	Dcm_RequestDataIn_{Routine}_{Signal}ArrayType	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N)
	Dcm_RequestDataIn_{Routine}_{Signal}Structured Type	DcmDspRequestRoutineResultsInSignal with at least one DcmDspRequestRoutineResultsInSignalCompositeSignalRef.
<b>Description</b>	–	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.15 Dcm\_RequestDataOut\_{Routine}\_{Signal}ArrayType

<b>Name</b>	Dcm_RequestDataOut_{Routine}_{Signal}ArrayType	
<b>Kind</b>	Array	
<b>Element type</b>	<b>Type</b>	<b>Variation</b>
	float32	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == FLOAT_N)
	sint16	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == SINT16_N)





	sint32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == SINT32_N}
	sint8	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == SINT8_N}
	uint16	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == UINT16_N}
	uint32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == UINT32_N}
	uint8	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == UINT8_N}
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineParameterSize)} Elements	
<b>Description</b>	–	
<b>Variation</b>	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N} && {{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE} Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.16 Dcm\_RequestDataIn\_{Routine}\_{Signal}ArrayType

<b>Name</b>	Dcm_RequestDataIn_{Routine}_{Signal}ArrayType	
<b>Kind</b>	Array	
<b>Element type</b>	<b>Type</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == FLOAT_N
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == SINT16_N
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == SINT32_N
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == SINT8_N
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == UINT16_N





	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == UINT32_N
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == UINT8_N
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineParameterSize)} Elements	
<b>Description</b>	-	
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == ([U S INT[8 16 32] FLOAT)_N) && {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.17 Dcm\_RequestFlexibleOutArrayData\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_RequestFlexibleOutArrayData_{Routine}_{Signal}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineParameterSize)} Elements		
<b>Description</b>	-		
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH) && {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.18 Dcm\_RequestFlexibleInArrayData\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_RequestFlexibleInArrayData_{Routine}_{Signal}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineParameterSize)} Elements		
<b>Description</b>	-		





<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
<b>Available via</b>	Rte_Dcm_Type.h

### E.3.1.19 Dcm\_StartDataIn\_{Routine}\_{Signal}PrimitivType

<b>Name</b>	Dcm_StartDataIn_{Routine}_{Signal}PrimitivType	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == FLOAT
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == SINT16
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == SINT32
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == SINT8
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == UINT16
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == UINT32
uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == UINT8	
<b>Description</b>	–	
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == [U S]INT[8 16 32][FLOAT] && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.20 Dcm\_StartDataIn\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StartDataIn_{Routine}_{Signal}Type	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	Dcm_StartDataIn_{Routine}_{Signal}PrimitivType	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)}
	Dcm_StartDataIn_{Routine}_{Signal}ArrayType	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N}
	Dcm_StartDataIn_{Routine}_{Signal}StructuredType	DcmDspStartRoutineInSignal with at least one DcmDspStartRoutineInSignalCompositeSignalRef.
<b>Description</b>	-	
<b>Variation</b>	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE} Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.21 Dcm\_StartDataIn\_{Routine}\_{Signal}ArrayType

<b>Name</b>	Dcm_StartDataIn_{Routine}_{Signal}ArrayType	
<b>Kind</b>	Array	
<b>Element type</b>	<b>Type</b>	<b>Variation</b>
	float32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == FLOAT_N}
	sint16	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == SINT16_N}
	sint32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == SINT32_N}
	sint8	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == SINT8_N}
	uint16	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == UINT16_N}
	uint32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == UINT32_N}
	uint8	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == UINT8_N}
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineParameterSize)} Elements	





<b>Description</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
<b>Available via</b>	Rte_Dcm_Type.h

### E.3.1.22 Dcm\_StartDataOut\_{Routine}\_{Signal}PrimitivType

<b>Name</b>	Dcm_StartDataOut_{Routine}_{Signal}PrimitivType	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == FLOAT
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == SINT16
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == SINT32
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == SINT8
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == UINT16
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == UINT32
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == UINT8
<b>Description</b>	–	
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == [U S]INT[8 16 32] FLOAT && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.23 Dcm\_StartDataOut\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StartDataOut_{Routine}_{Signal}Type	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	Dcm_StartDataOut_{Routine}_{Signal}PrimitiveType	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)}
	Dcm_StartDataOut_{Routine}_{Signal}ArrayType	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N}
	Dcm_StartDataOut_{Routine}_{Signal}StructuredType	DcmDspStartRoutineOutSignal with at least one DcmDspStartRoutineOutSignalCompositeSignalRef.
<b>Description</b>	–	
<b>Variation</b>	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.24 Dcm\_StartDataOut\_{Routine}\_{Signal}ArrayType

<b>Name</b>	Dcm_StartDataOut_{Routine}_{Signal}ArrayType	
<b>Kind</b>	Array	
<b>Element type</b>	<b>Type</b>	<b>Variation</b>
	float32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == FLOAT_N}
	sint16	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == SINT16_N}
	sint32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == SINT32_N}
	sint8	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == SINT8_N}
	uint16	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == UINT16_N}
	uint32	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == UINT32_N}
uint8	{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == UINT8_N}	







<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineParameterSize)} Elements
<b>Description</b>	–
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)) == ([U S]INT[8 16 32] FLOAT)_N) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)) == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
<b>Available via</b>	Rte_Dcm_Type.h

### E.3.1.25 Dcm\_StartFlexibleInArrayData\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StartFlexibleInArrayData_{Routine}_{Signal}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineParameterSize)} Elements		
<b>Description</b>	–		
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)) == VARIABLE_LENGTH) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)) == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.26 Dcm\_StartFlexibleOutArrayData\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StartFlexibleOutArrayData_{Routine}_{Signal}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineParameterSize)} Elements		
<b>Description</b>	–		
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)) == VARIABLE_LENGTH) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)) == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		



### E.3.1.27 Dcm\_StopDataIn\_{Routine}\_{Signal}PrimitivType

<b>Name</b>	Dcm_StopDataIn_{Routine}_{Signal}PrimitivType	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == FLOAT
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == SINT16
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == SINT32
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == SINT8
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == UINT16
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == UINT32
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == UINT8
<b>Description</b>	–	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32]FLOAT)) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.28 Dcm\_StopDataIn\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StopDataIn_{Routine}_{Signal}Type	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	<a href="#">Dcm_StopDataIn_{Routine}_{Signal}PrimitivType</a>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32]FLOAT))
	<a href="#">Dcm_StopDataIn_{Routine}_{Signal}ArrayType</a>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32]FLOAT)_N)
	<a href="#">Dcm_StopDataIn_{Routine}_{Signal}StructuredType</a>	DcmDspStopRoutineInSignal with at least one DcmDspStopRoutineInSignalCompositeSignalRef.





<b>Description</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
<b>Available via</b>	Rte_Dcm_Type.h

### E.3.1.29 Dcm\_StopDataIn\_{Routine}\_{Signal}ArrayType

<b>Name</b>	Dcm_StopDataIn_{Routine}_{Signal}ArrayType	
<b>Kind</b>	Array	
<b>Element type</b>	<b>Type</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == FLOAT_N
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == SINT16_N
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == SINT32_N
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == SINT8_N
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == UINT16_N
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == UINT32_N
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == UINT8_N
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineParameterSize)} Elements	
<b>Description</b>	–	
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N && {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.30 Dcm\_StopDataOut\_{Routine}\_{Signal}PrimitivType

<b>Name</b>	Dcm_StopDataOut_{Routine}_{Signal}PrimitivType	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == FLOAT
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == SINT16
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == SINT32
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == SINT8
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == UINT16
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == UINT32
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == UINT8
<b>Description</b>	-	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == [U S]INT[8 16 32] FLOAT) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.31 Dcm\_StopDataOut\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StopDataOut_{Routine}_{Signal}Type	
<b>Kind</b>	Type	
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>
	Dcm_StopDataOut_{Routine}_{Signal}PrimitivType	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT))
	Dcm_StopDataOut_{Routine}_{Signal}ArrayType	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N)





	Dcm_StopDataOut_{Routine}_{Signal}Structured Type	DcmDspStopRoutineOutSignal with at least one DcmDspStopRoutineOutSignalCompositeSignalRef.
<b>Description</b>	–	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.32 Dcm\_StopDataOut\_{Routine}\_{Signal}ArrayType

<b>Name</b>	Dcm_StopDataOut_{Routine}_{Signal}ArrayType	
<b>Kind</b>	Array	
<b>Element type</b>	<b>Type</b>	<b>Variation</b>
	float32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == FLOAT_N
	sint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == SINT16_N
	sint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == SINT32_N
	sint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == SINT8_N
	uint16	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == UINT16_N
	uint32	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == UINT32_N
	uint8	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == UINT8_N
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineParameterSize)} Elements	
<b>Description</b>	–	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == ([U S]INT[8 16 32] FLOAT)_N) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)} == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
<b>Available via</b>	Rte_Dcm_Type.h	

### E.3.1.33 Dcm\_StopFlexibleInArrayData\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StopFlexibleInArrayData_{Routine}_{Signal}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineParameterSize) Elements		
<b>Description</b>	–		
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)) == VARIABLE_LENGTH) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)) == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.34 Dcm\_StopFlexibleOutArrayData\_{Routine}\_{Signal}Type

<b>Name</b>	Dcm_StopFlexibleOutArrayData_{Routine}_{Signal}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineParameterSize) Elements		
<b>Description</b>	–		
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)) == VARIABLE_LENGTH) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRoutineUsePort)) == TRUE) Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.35 Dcm\_KeyArray\_{SecurityLevel}Type

<b>Name</b>	Dcm_KeyArray_{SecurityLevel}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow.DcmDspSecurityKeySize)} Elements		
<b>Description</b>	–		
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow.DcmDspSecurityUsePort)} == USE_ASYNC_CLIENT_SERVER SecurityLevel = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.36 Dcm\_SeedArray\_{SecurityLevel}Type

<b>Name</b>	Dcm_SeedArray_{SecurityLevel}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow.DcmDspSecuritySeed Size)} Elements		
<b>Description</b>	–		
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow.DcmDspSecurityUse Port)} == USE_ASYNC_CLIENT_SERVER SecurityLevel = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurity Row.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.37 Dcm\_SecurityAccessDataRecordArray\_{SecurityLevel}Type

<b>Name</b>	Dcm_SecurityAccessDataRecordArray_{SecurityLevel}Type		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDsp/DcmDspSecurity/DcmDspSecurityRow/DcmDsp SecurityADRSIZE)} Elements		
<b>Description</b>	–		
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow.DcmDspSecurityUse Port)} == USE_ASYNC_CLIENT_SERVER) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDsp Security/DcmDspSecurityRow.DcmDspSecurityADRSIZE)} != NULL) SecurityLevel = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurity Row.SHORT-NAME)}		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.38 Dcm\_RequestDataArrayType

<b>Name</b>	Dcm_RequestDataArrayType		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	(MAX({ecuc(Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocol RxBufferID->DcmDslBuffer.DcmDslBufferSize)}) - 1) Elements		
<b>Description</b>	–		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.39 Dcm\_ControlMask\_{DID}Type

<b>Name</b>	Dcm_ControlMask_{DID}Type		
<b>Kind</b>	Type		
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>	
	Dcm_ControlMask_{Data} ArrayType	<pre>(( ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMaskSize)}) &gt;= 0x05) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)}) == (USE_DATA_SYNCH_CLIENT_SERVER    USE_DATA_ASYNCH_CLIENT_SERVER    USE_DATA_ASYNCH_CLIENT_SERVER_ERROR)))</pre>	
	Dcm_ControlMask_{Data} _PrimitiveType	<pre>{{ecuc(Dcm/DcmConfigSet/ DcmDsp/DcmDspDid/ DcmDspDidInfoRef-&gt;DcmDspDidInfo/ DcmDspDidControl/ DcmDspDidControlMaskSize)}) &lt;= 0x04)</pre>	
<b>Description</b>	-		
<b>Variation</b>	<pre>{{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)}) == (USE_DATA_SYNCH_CLIENT_SERVER    USE_DATA_ASYNCH_CLIENT_SERVER    USE_DATA_ASYNCH_CLIENT_SERVER_ERROR)) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMask)}) == DCM_CONTROLMASK_EXTERNAL) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlEnableMask)}) == NULL) DID = ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})</pre>		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.40 Dcm\_InputOutputControlParameterType

<b>Name</b>	Dcm_InputOutputControlParameterType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DCM_RETURN_CONTROL_TO_ECU	0x00	returnControlToECU
	DCM_RESET_TO_DEFAULT	0x01	resetToDefault
	DCM_FREEZE_CURRENT_STATE	0x02	freezeCurrentState
	DCM_SHORT_TERM_ADJUSTMENT	0x03	shortTermAdjustment
	DCM_IDLE	0xff	Idle state, no request in processing (initial value)
<b>Description</b>	-		
<b>Variation</b>	-		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.41 Dcm\_IOOperationRequest\_{DID}Type

<b>Name</b>	Dcm_IOOperationRequest_{DID}Type		
<b>Kind</b>	Structure		
<b>Elements</b>	inputOutputControlParameter		
	<b>Type</b>	Dcm_InputOutputControlParameterType	
	<b>Comment</b>	-	
	controlEnableMask		
	<b>Type</b>	Dcm_Cemr_{DID}Type	
	<b>Comment</b>	-	
<b>Description</b>	-		
<b>Variation</b>	<pre> ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE ))    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE ))&amp;&amp; ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt; DcmDspDidInfo/DcmDspDidControl)} != NULL) DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)}) </pre>		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.42 Dcm\_IOOperationResponseType

<b>Name</b>	Dcm_IOOperationResponseType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DCM_POSITIVE_RESPONSE	0x00	positive response (similar to E_OK)
	DCM_GENERAL_REJECT	0x10	NRC generalReject
	DCM_BUSY_REPEAT_REQUEST	0x21	NRC busyRepeatRequest
	DCM_CONDITIONS_NOT_CORRECT	0x22	NRC conditionsNotCorrect
	DCM_FAILURE_PREVENTS_EXECUTION	0x26	NRC FailurePreventsExecutionOf RequestedAction
	DCM_REQUEST_OUT_OF_RANGE	0x31	NRC requestOutOfRange
	DCM_RESPONSE_PENDING	0x78	ResponsePending (similar to E_PENDING)
<b>Description</b>	-		
<b>Variation</b>	-		
<b>Available via</b>	Rte_Dcm_Type.h		



### E.3.1.43 Dcm\_ResponseDataArrayType

<b>Name</b>	Dcm_ResponseDataArrayType		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	(MAX({ecuc(Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolTxBufferRef->DcmDslBuffer.DcmDslBufferSize)}) -1) Elements		
<b>Description</b>	-		
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRequestFileTransfer/DcmRequestFileTransferUsePort)} == TRUE)		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.44 Dcm\_ControlMask\_{Data}ArrayType

<b>Name</b>	Dcm_ControlMask_{Data}ArrayType		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef->DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMaskSize)}) Elements		
<b>Description</b>	The current DcmDspData is referenced by the DcmDspDID.		
<b>Variation</b>	(( {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef->DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMaskSize)} >= 0x05) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.DcmDspDataUsePort)} == (USE_DATA_SYNCH_CLIENT_SERVER    USE_DATA_ASYNCH_CLIENT_SERVER    USE_DATA_ASYNCH_CLIENT_SERVER_ERROR))) Data = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)})		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.1.45 Dcm\_Cemr\_{DID}Type

<b>Name</b>	Dcm_Cemr_{DID}Type		
<b>Kind</b>	Bitfield		
<b>Derived from</b>	<a href="#">Dcm_ControlMask_{DID}Type</a>		
<b>Elements</b>	<b>Variable bit</b>		
	<b>Kind</b>	bit	
	<b>Name</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidControl.DcmDspDidControlEnableMask.SHORT-NAME)})	
	<b>Mask</b>	2 <sup>{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMaskSize)}</sup> * 8 - 1) - {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef->DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlEnableMask/DcmDspDidControlMaskBitPosition)})	
<b>Description</b>	Bitmask of data element in control enable mask record.		
<b>Description</b>	-		
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDidControl/DcmDspDidControlEnableMask)} != NULL) DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})		
<b>Available via</b>	Rte_Dcm_Type.h		

### E.3.2 Sender-Receiver-Interfaces

Using the concepts of the SW-C template, the interface is defined as follows if Sender-Receiver interface is used (DcmDspDataUsePort set to USE\_DATA\_SENDER\_RECEIVER || USE\_DATA\_SENDER\_RECEIVER\_AS\_SERVICE):

#### E.3.2.1 DataServices\_{DID}

<b>Name</b>	DataServices_{DID}	
<b>Comment</b>	-	
<b>IsService</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE)	
<b>Variation</b>	(({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE    {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE))) DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)}	
<b>Data Elements</b>	data	
	<b>Type</b>	{DID}_Struct_DataType
	<b>Variation</b>	DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)}

#### E.3.2.2 DataServices\_{Data}

<b>Name</b>	DataServices_{Data}	
<b>Comment</b>	-	
<b>IsService</b>	(({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == USE_DATA_SENDER_RECEIVER_AS_SERVICE)    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort)} == USE_DATA_SENDER_RECEIVER_AS_SERVICE))	
<b>Variation</b>	(({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_DATA_ELEMENT_SPECIFIC_INTERFACES)&&({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == (USE_DATA_SENDER_RECEIVER    USE_DATA_SENDER_RECEIVER_AS_SERVICE)))    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort)} == (USE_DATA_SENDER_RECEIVER    USE_DATA_SENDER_RECEIVER_AS_SERVICE)) Data = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)})    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.SHORT-NAME)})	
<b>Data Elements</b>	data	
	<b>Type</b>	Dcm_DataElement_{Data}Type
	<b>Variation</b>	Data = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)})    ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.SHORT-NAME)})

### E.3.2.3 IOControlRequest\_{DID}

<b>Name</b>	IOControlRequest_{DID}	
<b>Comment</b>	Attention: controlState is only valid in case of IOOperationRequest is set to shortTerm Adjustment.  The DCM provides a byte stream which could be transformed via transformer into an complex type.	
<b>IsService</b>	true	
<b>Variation</b>	((({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE)    {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE)) && {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-> DcmDspDidInfo/ DcmDspDidControl)} != NULL) && (({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef->DcmDspDidInfo/DcmDspDidControl/DcmDspDidControlMask)} == DCM_CONTROLMASK_EXTERNAL))) DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})	
<b>Data Elements</b>	underControl	
	<b>Type</b>	<a href="#">Dcm_Cemr_{DID}Type</a>
	<b>Variation</b>	–
	IOOperationRequest	
	<b>Type</b>	<a href="#">Dcm_IOOperationRequest_{DID}Type</a>
	<b>Variation</b>	DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})
	controlState	
	<b>Type</b>	<a href="#">{DID}_Struct_DataType</a>
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-> DcmDspDidInfo/DcmDspDidControl/DcmDspDidShortTermAdjustment)} == True) DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})	

### E.3.2.4 IOControlResponse\_{DID}

<b>Name</b>	IOControlResponse_{DID}	
<b>Comment</b>	–	
<b>IsService</b>	true	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE    USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE)) && {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-> DcmDspDidInfo/DcmDspDidControl)} != NULL) DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})	
<b>Data Elements</b>	IOOperationResponse	
	<b>Type</b>	<a href="#">Dcm_IOOperationResponseType</a>
	<b>Variation</b>	–

### E.3.3 NvDataInterface

#### E.3.3.1 DataServices\_{DID}

<b>Name</b>	DataServices_{DID}	
<b>Comment</b>	–	
<b>IsService</b>	false	
<b>Variation</b>	( {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_ATOMIC_NV_DATA_INTERFACE) DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)}	
<b>Data Elements</b>	data	
	<b>Type</b>	{DID}_Struct_DataType
	<b>Variation</b>	DID = ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})

### E.3.4 Client-Server-Interfaces

#### E.3.4.1 DataServices\_{Data}

#### E.3.4.2 RoutineServices\_{RoutineName}

The following interface defines operations needed for the UDS Service RoutineControl (0x31).

<b>Name</b>	RoutineServices_{RoutineName}		
<b>Comment</b>	–		
<b>IsService</b>	true		
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.DcmDspRoutineUsePort)} == TRUE RoutineName = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed
	10	DCM_E_PENDING	Request is not yet finished. Further call(s) required to finish.
	12	DCM_E_FORCE_RCRRP	application request the transmission of a response Response Pending (NRC 0x78)

<b>Operation</b>	RequestResults	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Xxx_RequestResults</a>	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH)	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestDataIn_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–





	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	OpStatus	
	<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestDataOut_{Routine}_{Signal}Type</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	ErrorCode	
	<b>Type</b>	<a href="#">Dcm_NegativeResponseCodeType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DCM_E_PENDING</a> <a href="#">DCM_E_FORCE_RCRRP</a>	

<b>Operation</b>	RequestResults	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Xxx_RequestResults</a>	
<b>Variation</b>	{(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)) == VARIABLE_LENGTH} && {(ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)) != VARIABLE_LENGTH}	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestDataIn_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	OpStatus	
	<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–





	DataOut_{Signal}
<b>Type</b>	Dcm_RequestDataOut_{Routine}_{Signal}Type
<b>Direction</b>	OUT
<b>Comment</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataOut_{Signal}
<b>Type</b>	Dcm_RequestFlexibleOutArrayData_{Routine}_{Signal}Type
<b>Direction</b>	OUT
<b>Comment</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	currentDataLength
<b>Type</b>	uint16
<b>Direction</b>	OUT
<b>Comment</b>	–
<b>Variation</b>	–
	ErrorCode
<b>Type</b>	Dcm_NegativeResponseCodeType
<b>Direction</b>	OUT
<b>Comment</b>	–
<b>Variation</b>	–
<b>Possible Errors</b>	–

<b>Operation</b>	RequestResults
<b>Comment</b>	–
<b>Mapped to API</b>	Xxx_RequestResults
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH)
<b>Parameters</b>	DataIn_{Signal}
<b>Type</b>	Dcm_RequestDataIn_{Routine}_{Signal}Type
<b>Direction</b>	IN
<b>Comment</b>	–





	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestFlexibleInArrayData_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	OpStatus	
	<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestDataOut_{Routine}_{Signal}Type</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	ErrorCode	
	<b>Type</b>	<a href="#">Dcm_NegativeResponseCodeType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>		–

<b>Operation</b>	RequestResults	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Xxx_RequestResults</a>	
<b>Variation</b>	(({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH))	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestDataIn_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–





	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StartFlexibleInArrayData_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	OpStatus	
	<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestDataOut_{Routine}_{Signal}Type</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataOut_{Signal}	
	<b>Type</b>	<a href="#">Dcm_RequestFlexibleOutArrayData_{Routine}_{Signal}Type</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	currentDataLength	
	<b>Type</b>	uint16
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
	ErrorCode	
	<b>Type</b>	<a href="#">Dcm_NegativeResponseCodeType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DCM_E_PENDING</a> <a href="#">DCM_E_FORCE_RCRRP</a>	



<b>Operation</b>	RequestResultsConfirmation	
<b>Comment</b>	This operation indicates the transmission of a response to a RequestResultsRoutine request	
<b>Mapped to API</b>	<a href="#">Xxx_RequestResultsConfirmation</a>	
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsConfirmationEnabled)}==TRUE)	
<b>Parameters</b>	ConfirmationStatus	
	<b>Type</b>	<a href="#">Dcm_ConfirmationStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	Confirmation status of a RequestResultsRoutinerequest
<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

<b>Operation</b>	Start	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Xxx_Start</a>	
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH) && {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH)	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StartDataIn_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	OpStatus	
	<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StartDataOut_{Routine}_{Signal}Type</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	ErrorCode	
<b>Type</b>	<a href="#">Dcm_NegativeResponseCodeType</a>	
<b>Direction</b>	OUT	
<b>Comment</b>	–	
<b>Variation</b>	–	





<b>Possible Errors</b>	E_OK E_NOT_OK DCM_E_PENDING DCM_E_FORCE_RCRRP
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<b>Operation</b>	Start	
<b>Comment</b>	–	
<b>Mapped to API</b>	Xxx_Start	
<b>Variation</b>	(({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH))	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	Dcm_StartDataIn_{Routine}_{Signal}Type
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)} Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)}
	OpStatus	
	<b>Type</b>	Dcm_OpStatusType
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	Dcm_StartDataOut_{Routine}_{Signal}Type
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataOut_{Signal}	
	<b>Type</b>	Dcm_StartFlexibleOutArrayData_{Routine}_{Signal}Type
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
currentDataLength		
<b>Type</b>	uint16	
<b>Direction</b>	OUT	
<b>Comment</b>	–	
<b>Variation</b>	–	
ErrorCode		
<b>Type</b>	Dcm_NegativeResponseCodeType	
<b>Direction</b>	OUT	
<b>Comment</b>	–	





	<b>Variation</b>	–
<b>Possible Errors</b>		E_OK E_NOT_OK DCM_E_PENDING DCM_E_FORCE_RCRRP

<b>Operation</b>	Start	
<b>Comment</b>	–	
<b>Mapped to API</b>	Xxx_Start	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH)	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	Dcm_StartDataIn_{Routine}_{Signal}Type
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataIn_{Signal}	
	<b>Type</b>	Dcm_StartFlexibleInArrayData_{Routine}_{Signal}Type
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	OpStatus	
	<b>Type</b>	Dcm_OpStatusType
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	Dcm_StartDataOut_{Routine}_{Signal}Type
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
currentDataLength		
<b>Type</b>	uint16	
<b>Direction</b>	IN	
<b>Comment</b>	–	
<b>Variation</b>	–	
ErrorCode		
<b>Type</b>	Dcm_NegativeResponseCodeType	
<b>Direction</b>	OUT	





	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DCM_E_PENDING</a> <a href="#">DCM_E_FORCE_RCRRP</a>	

<b>Operation</b>	Start	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Xxx_Start</a>	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH)	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StartDataIn_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StartFlexibleInArrayData_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	OpStatus	
	<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
DataOut_{Signal}		
<b>Type</b>	<a href="#">Dcm_StartDataOut_{Routine}_{Signal}Type</a>	
<b>Direction</b>	OUT	
<b>Comment</b>	–	





	<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataOut_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StartFlexibleOutArrayData_{Routine}_{Signal}Type</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	currentDataLength	
	<b>Type</b>	uint16
	<b>Direction</b>	INOUT
	<b>Comment</b>	–
	<b>Variation</b>	–
	ErrorCode	
	<b>Type</b>	<a href="#">Dcm_NegativeResponseCodeType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DCM_E_PENDING</a> <a href="#">DCM_E_FORCE_RCRRP</a>	

<b>Operation</b>	StartConfirmation	
<b>Comment</b>	This operation indicates the transmission of a response to a StartRoutine request	
<b>Mapped to API</b>	<a href="#">Xxx_StartConfirmation</a>	
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineConfirmationEnabled)}==TRUE	
<b>Parameters</b>	ConfirmationStatus	
	<b>Type</b>	<a href="#">Dcm_ConfirmationStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	Confirmation status of a StartRoutine request
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

<b>Operation</b>	Stop
<b>Comment</b>	–
<b>Mapped to API</b>	<a href="#">Xxx_Stop</a>





<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH)		
<b>Parameters</b>	DataIn_{Signal}		
	<b>Type</b>	Dcm_StopDataIn_{Routine}_{Signal}Type	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}	
	OpStatus		
	<b>Type</b>	Dcm_OpStatusType	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	DataOut_{Signal}		
	<b>Type</b>	Dcm_StopDataOut_{Routine}_{Signal}Type	
	<b>Direction</b>	OUT	
	<b>Comment</b>	–	
<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		
ErrorCode			
<b>Type</b>	Dcm_NegativeResponseCodeType		
<b>Direction</b>	OUT		
<b>Comment</b>	–		
<b>Variation</b>	–		
<b>Possible Errors</b>	E_OK E_NOT_OK DCM_E_PENDING DCM_E_FORCE_RCRRP		

<b>Operation</b>	Stop	
<b>Comment</b>	–	
<b>Mapped to API</b>	Xxx_Stop	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH)	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	Dcm_StopDataIn_{Routine}_{Signal}Type
	<b>Direction</b>	IN
	<b>Comment</b>	–





	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	OpStatus	
	<b>Type</b>	Dcm_OpStatusType
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	Dcm_StopDataOut_{Routine}_{Signal}Type
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataOut_{Signal}	
	<b>Type</b>	Dcm_StopFlexibleOutArrayData_{Routine}_{Signal}Type
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
	currentDataLength	
	<b>Type</b>	uint16
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
	ErrorCode	
	<b>Type</b>	Dcm_NegativeResponseCodeType
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK DCM_E_PENDING DCM_E_FORCE_RCRFP	

<b>Operation</b>	Stop
<b>Comment</b>	–
<b>Mapped to API</b>	Xxx_Stop
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)) == VARIABLE_LENGTH) && ((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)) != VARIABLE_LENGTH)
<b>Parameters</b>	DataIn_{Signal}
	<b>Type</b> Dcm_StopDataIn_{Routine}_{Signal}Type
	<b>Direction</b> IN





	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StopFlexibleInArrayData_{Routine}_{Signal}Type</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	OpStatus	
	<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataOut_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StopDataOut_{Routine}_{Signal}Type</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
	currentDataLength	
	<b>Type</b>	uint16
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	ErrorCode	
	<b>Type</b>	<a href="#">Dcm_NegativeResponseCodeType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DCM_E_PENDING</a> <a href="#">DCM_E_FORCE_RCRRP</a>	

<b>Operation</b>	Stop	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Xxx_Stop</a>	
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH)	
<b>Parameters</b>	DataIn_{Signal}	
	<b>Type</b>	<a href="#">Dcm_StopDataIn_{Routine}_{Signal}Type</a>







<b>Direction</b>	IN
<b>Comment</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
DataIn_{Signal}	
<b>Type</b>	<a href="#">Dcm_StopFlexibleInArrayData_{Routine}_{Signal}Type</a>
<b>Direction</b>	IN
<b>Comment</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
OpStatus	
<b>Type</b>	<a href="#">Dcm_OpStatusType</a>
<b>Direction</b>	IN
<b>Comment</b>	–
<b>Variation</b>	–
DataOut_{Signal}	
<b>Type</b>	<a href="#">Dcm_StopDataOut_{Routine}_{Signal}Type</a>
<b>Direction</b>	OUT
<b>Comment</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} != VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
DataOut_{Signal}	
<b>Type</b>	<a href="#">Dcm_StopFlexibleOutArrayData_{Routine}_{Signal}Type</a>
<b>Direction</b>	OUT
<b>Comment</b>	–
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.DcmDspRoutineSignalType)} == VARIABLE_LENGTH Signal = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal.SHORT-NAME)} Routine = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}
currentDataLength	
<b>Type</b>	uint16
<b>Direction</b>	INOUT
<b>Comment</b>	–
<b>Variation</b>	–
ErrorCode	





	<b>Type</b>	Dcm_NegativeResponseCodeType
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK DCM_E_PENDING DCM_E_FORCE_RCRFP	

<b>Operation</b>	StopConfirmation	
<b>Comment</b>	This operation indicates the transmission of a response to a StopRoutine request	
<b>Mapped to API</b>	Xxx_StopConfirmation	
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineConfirmationEnabled))==TRUE)	
<b>Parameters</b>	ConfirmationStatus	
	<b>Type</b>	Dcm_ConfirmationStatusType
	<b>Direction</b>	IN
	<b>Comment</b>	Confirmation status of a StopRoutine request
	<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK	

### E.3.4.3 ServiceRequestNotification

The following interface indicates to the Application that a service is about to be executed and allows the Application to reject the execution of the service request.

<b>Name</b>	ServiceRequestNotification		
<b>Comment</b>	–		
<b>IsService</b>	true		
<b>Variation</b>	((ecuc(Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceRequestManufacturerNotification)) != NULL)  ((ecuc(Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceRequestSupplierNotification)) != NULL)		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed
	8	E_REQUEST_NOT_ACCEPTED	no response will be sent

<b>Operation</b>	Confirmation	
<b>Comment</b>	–	
<b>Mapped to API</b>	Xxx_Confirmation	
<b>Variation</b>	–	
<b>Parameters</b>	SID	
	<b>Type</b>	uint8
	<b>Direction</b>	IN
	<b>Comment</b>	Value of service identifier
	<b>Variation</b>	–





	ReqType	
	<b>Type</b>	uint8
	<b>Direction</b>	IN
	<b>Comment</b>	Addressing type of the request(0=physical request, 1=functional request)
	<b>Variation</b>	–
	ConnectionId	
	<b>Type</b>	uint16
	<b>Direction</b>	IN
	<b>Comment</b>	Unique connection identifier
	<b>Variation</b>	–
	ConfirmationStatus	
	<b>Type</b>	<a href="#">Dcm_ConfirmationStatusType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	Confirmation of a successful transmission or a transmission error of a diagnostic service.
	<b>Variation</b>	–
	ProtocolType	
	<b>Type</b>	<a href="#">Dcm_ProtocolType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
TesterSourceAddress		
<b>Type</b>	uint16	
<b>Direction</b>	IN	
<b>Comment</b>	–	
<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

<b>Operation</b>	Indication	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Xxx_Indication</a>	
<b>Variation</b>	–	
<b>Parameters</b>	SID	
	<b>Type</b>	uint8
	<b>Direction</b>	IN
	<b>Comment</b>	Value of service identifier
	<b>Variation</b>	–
	RequestData	
	<b>Type</b>	<a href="#">Dcm_RequestDataArrayType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	This parameter contains the complete request data (diagnostic buffer), except the service ID
	<b>Variation</b>	–
	DataSize	
	<b>Type</b>	uint32
<b>Direction</b>	IN	





	<b>Comment</b>	This parameter defines how many bytes in the RequestData parameter are valid	
	<b>Variation</b>	–	
	ReqType		
	<b>Type</b>	uint8	
	<b>Direction</b>	IN	
	<b>Comment</b>	Addressing type of the request(0=physical request, 1=functional request)	
	<b>Variation</b>	–	
	ConnectionId		
	<b>Type</b>	uint16	
	<b>Direction</b>	IN	
	<b>Comment</b>	Unique connection identifier	
	<b>Variation</b>	–	
	ErrorCode		
	<b>Type</b>	<a href="#">Dcm_NegativeResponseCodeType</a>	
	<b>Direction</b>	OUT	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	ProtocolType		
	<b>Type</b>	<a href="#">Dcm_ProtocolType</a>	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	TesterSourceAddress		
	<b>Type</b>	uint16	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">E_REQUEST_NOT_ACCEPTED</a>	

## E.3.5 Ports

### E.3.5.1 DataServices\_{DID} RPortProtoype

<b>Name</b>	DataServices_{DID}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">DataServices_{DID}</a> , <a href="#">DataServices_{DID}</a>
<b>Description</b>	–		





<b>Variation</b>	<pre> ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE )    {{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE )    ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_NV_DATA_INTERFACE)) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidWrite)}} == NULL) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidRead)}} != NULL)    ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidControl)}} !=NULL)) DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)} </pre>
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### E.3.5.2 DataServices\_{DID} PPortProtypce

<b>Name</b>	DataServices_{DID}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	DataServices_{DID}, DataServices_{DID}
<b>Description</b>	-		
<b>Variation</b>	<pre> ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE )    {{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE )    ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_NV_DATA_INTERFACE)) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidWrite)}} != NULL) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidRead)}} == NULL)    ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidControl)}} !=NULL)) DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)} </pre>		

### E.3.5.3 DataServices\_{DID} PRPortProtypce

<b>Name</b>	DataServices_{DID}		
<b>Kind</b>	Provided RequiredPort	<b>Interface</b>	DataServices_{DID}, DataServices_{DID}
<b>Description</b>	-		
<b>Variation</b>	<pre> ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE )   {{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE )    ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)}} == (USE_ATOMIC_NV_DATA_INTERFACE)) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidWrite)}} != NULL) &amp;&amp; ({{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt;DcmDspDidInfo/DcmDspDidRead)}} != NULL) DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)} </pre>		

### E.3.5.4 DataServices\_{Data} RPortProtyope

<b>Name</b>	DataServices_{Data}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	DataServices_{Data}, <a href="#">DataServices_{Data}</a>
<b>Description</b>	–		
<b>Variation</b>	<pre>( {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort)} == (USE_DATA_SYNCH_CLIENT_SERVER    USE_DATA_SENDER_RECEIVER    USE_DATA_SENDER_RECEIVER_AS_SERVICE)) Data = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)}    {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData.SHORT-NAME)}</pre>		

### E.3.5.5 DataServices\_{Data} RPortProtyope

<b>Name</b>	DataServices_{Data}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	DataServices_{Data}, <a href="#">DataServices_{Data}</a>
<b>Description</b>	–		
<b>Variation</b>	<pre>(( {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_DATA_ELEMENT_SPECIFIC_INTERFACES) &amp;&amp; ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == (USE_DATA_SENDER_RECEIVER    USE_DATA_SENDER_RECEIVER_AS_SERVICE)) &amp;&amp; ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt; DcmDspDidInfo/DcmDspDidWrite)} == NULL) &amp;&amp; (({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt; DcmDspDidInfo/DcmDspDidRead)} != NULL))) Data = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)}</pre>		

### E.3.5.6 DataServices\_{Data} PPortProtyope

<b>Name</b>	DataServices_{Data}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	DataServices_{Data}, <a href="#">DataServices_{Data}</a>
<b>Description</b>	–		
<b>Variation</b>	<pre>(( {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_DATA_ELEMENT_SPECIFIC_INTERFACES) &amp;&amp; ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == (USE_DATA_SENDER_RECEIVER    USE_DATA_SENDER_RECEIVER_AS_SERVICE)) &amp;&amp; ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt; DcmDspDidInfo/DcmDspDidWrite)} != NULL) &amp;&amp; ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-&gt; DcmDspDidInfo/DcmDspDidRead)} == NULL) Data = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)}</pre>		

### E.3.5.7 DataServices\_{Data} PRPortProtyope

<b>Name</b>	DataServices_{Data}		
<b>Kind</b>	Provided RequiredPort	<b>Interface</b>	<a href="#">DataServices_{Data}</a>





<b>Description</b>	–
<b>Variation</b>	((({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == USE_DATA_ELEMENT_SPECIFIC_INTERFACES)) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort)} == (USE_DATA_SENDER_RECEIVER    USE_DATA_SENDER_RECEIVER_AS_SERVICE))) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-> DcmDspDidInfo/DcmDspDidWrite)} != NULL) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-> DcmDspDidInfo/DcmDspDidRead)} != NULL) Data = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspData.SHORT-NAME)}

### E.3.5.8 IOControlRequest\_{DID}

<b>Name</b>	IOControlRequest_{DID}		
<b>Kind</b>	Provided RequiredPort	<b>Interface</b>	IOControlRequest_{DID}
<b>Description</b>	–		
<b>Variation</b>	(((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE    USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE))) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-> DcmDspDidInfo/DcmDspDidControl)} != NULL) DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})		

### E.3.5.9 IOControlResponse\_{DID}

<b>Name</b>	IOControlResponse_{DID}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	IOControlResponse_{DID}
<b>Description</b>	–		
<b>Variation</b>	(((ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidUsePort)} == (USE_ATOMIC_SENDER_RECEIVER_INTERFACE    USE_ATOMIC_SENDER_RECEIVER_INTERFACE_AS_SERVICE))) && ({ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidInfoRef-> DcmDspDidInfo/DcmDspDidControl)} != NULL) DID = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspDid.SHORT-NAME)})		

### E.3.5.10 ServiceRequestManufacturerNotification\_{Name}

<b>Name</b>	ServiceRequestManufacturerNotification_{Name}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	ServiceRequestNotification
<b>Description</b>	–		
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceRequestManufacturerNotification)} != NULL) Name = {ecuc(Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceRequestManufacturerNotification.SHORT-NAME)}		

### E.3.5.11 ServiceRequestSupplierNotification\_{Name}

<b>Name</b>	ServiceRequestSupplierNotification_{Name}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">ServiceRequestNotification</a>
<b>Description</b>	–		
<b>Variation</b>	({ecuc(Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceRequestSupplierNotification)} != NULL) Name = {ecuc(Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceRequestSupplierNotification.SHORT-NAME)}		

### E.3.5.12 RoutineServices\_{RoutineName}

<b>Name</b>	RoutineServices_{RoutineName}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">RoutineServices_{RoutineName}</a>
<b>Description</b>	–		
<b>Variation</b>	{ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.DcmDspRoutineUsePort)} == TRUE RoutineName = {ecuc(Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine.SHORT-NAME)}		

## E.4 Dem

### E.4.1 Implementation Data Types

#### E.4.1.1 Dem\_DebouncingStateType

<b>Name</b>	Dem_DebouncingStateType			
<b>Kind</b>	Bitfield			
<b>Derived from</b>	uint8			
<b>Elements</b>	<b>Kind</b>	<b>Name</b>	<b>Mask</b>	<b>Description</b>
	bit	DEM_TEMPORARILY_DEFECTIVE	0x01	Bit 0: Temporarily Defective (corresponds to 0 < FDC < 127)
	bit	DEM_FINALLY_DEFECTIVE	0x02	Bit 1: finally Defective (corresponds to FDC = 127)
	bit	DEM_TEMPORARILY_HEALED	0x04	Bit 2: temporarily healed (corresponds to -128 < FDC < 0)
	bit	DEM_TEST_COMPLETE	0x08	Bit 3: Test complete (corresponds to FDC = -128 or FDC = 127)
	bit	DEM_DTR_UPDATE	0x10	Bit 4: DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
<b>Description</b>	–			
<b>Variation</b>	–			
<b>Available via</b>	Rte_Dem_Type.h			



### E.4.1.2 Dem\_DTCOriginType

<b>Name</b>	Dem_DTCOriginType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint16		
<b>Range</b>	DEM_DTC_ORIGIN_PRIMARY_MEMORY	0x0001	Event information located in the primary memory
	DEM_DTC_ORIGIN_PERMANENT_MEMORY	0x0003	The Event information is located in the permanent memory
	DEM_DTC_ORIGIN_OBD_RELEVANT_MEMORY	0x0004	OBD event information located in the primary memory.
	DEM_DTC_ORIGIN_USERDEFINED_MEMORY_<Name>	0x01XX	Event information located in the user defined memory, where XX is the configured DemUserDefinedMemoryIdentifier in hexadecimal and <Name> is the Short-Name of the DemUserDefinedMemory.
<b>Description</b>	This enum is used to define the location of the events. The definition and use of the different memory types is OEM-specific.		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dem_Type.h		

### E.4.1.3 Dem\_EventIdType

<b>Name</b>	Dem_EventIdType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint16		
<b>Range</b>	1..65535	–	Internal identifier of a diagnostic event Remark: 0 is not a valid value
<b>Description</b>	Identification of an event by assigned EventId. The EventId is assigned by the Dem. Example: 1 refers to monitor x, 2 refers to monitor y, etc.		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dem_Type.h		

### E.4.1.4 Dem\_EventStatusType

<b>Name</b>	Dem_EventStatusType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DEM_EVENT_STATUS_PASSED	0x00	Monitor reports qualified test result passed.
	DEM_EVENT_STATUS_FAILED	0x01	Monitor reports qualified test result failed.





	DEM_EVENT_STATUS_PREPASSED	0x02	Monitor reports non-qualified test result pre-passed (debounced Dem-internally).
	DEM_EVENT_STATUS_PREFAILED	0x03	Monitor reports non-qualified test result pre-failed (debounced Dem-internally).
	DEM_EVENT_STATUS_FDC_THRESHOLD_REACHED	0x04	Monitor triggers the storage of ExtendedDataRecords and FreezeFrames ON_FDC_THRESHOLD.
		0x05 - 0xFF	reserved
<b>Description</b>	This type contains all monitor test result values, which can be reported via Dem_SetEventStatus().		
<b>Variation</b>	-		
<b>Available via</b>	Rte_Dem_Type.h		

#### E.4.1.5 Dem\_DebounceResetStatusType

<b>Name</b>	Dem_DebounceResetStatusType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DEM_DEBOUNCE_STATUS_FREEZE	0x00	Freeze the internal debounce counter/timer.
	DEM_DEBOUNCE_STATUS_RESET	0x01	Reset the internal debounce counter/timer.
		0x02 - 0xFF	reserved
<b>Description</b>	This type contains all definitions to control an internal debounce counter/timer via the function Dem_ResetEventDebounceStatus().		
<b>Variation</b>	-		
<b>Available via</b>	Rte_Dem_Type.h		

#### E.4.1.6 Dem\_DTCFormatType

<b>Name</b>	Dem_DTCFormatType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DEM_DTC_FORMAT_OBD	0	selects the 2-byte OBD DTC format (refer to configuration parameter DemObdDTC)
	DEM_DTC_FORMAT_UDS	1	selects the 3-byte UDS DTC format (refer to configuration parameter DemUdsDTC)
	DEM_DTC_FORMAT_J1939	2	selects the merged SPN + FMI to 3-byte J1939 DTC format (refer to DemJ1939DTC)





	DEM_DTC_FORMAT_OBD_3BYTE	3	Selects the 3-byte OBD DTC defined by DemDtcValue3Byte in case that SAE J2012 and UDS DTC format separation is used.
<b>Description</b>	This type is used to select the format of the DTC value.		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dem_Type.h		

### E.4.1.7 Dem\_InitMonitorReasonType

<b>Name</b>	Dem_InitMonitorReasonType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint8		
<b>Range</b>	DEM_INIT_MONITOR_CLEAR	0x01	Event was cleared and all internal values and states are reset.
	DEM_INIT_MONITOR_RESTART	0x02	Operation cycle of the event was restarted.
	DEM_INIT_MONITOR_REENABLED	0x03	Enable conditions or DTC settings re-enabled.
	DEM_INIT_MONITOR_STORAGE_REENABLED	0x04	Storage condition reenabled.
<b>Description</b>	(Re-)Initialization reason returned by the callback <Module>_DemInitMonitorFor<EventName>().		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dem_Type.h		

### E.4.1.8 Dem\_MaxDataValueType

<b>Name</b>	Dem_MaxDataValueType		
<b>Kind</b>	Array	<b>Element type</b>	uint8
<b>Size</b>	size of largest Extended data class / Freeze frame record Elements		
<b>Description</b>	–		
<b>Variation</b>	–		
<b>Available via</b>	Rte_Dem_Type.h		

### E.4.1.9 Dem\_MonitorDataType

<b>Name</b>	Dem_MonitorDataType		
<b>Kind</b>	Type		
<b>Derived from</b>	uint32		





<b>Description</b>	This type is used to pass monitoring data to the Dem.
<b>Variation</b>	–
<b>Available via</b>	Rte_Dem_Type.h

#### E.4.1.10 Dem\_MonitorStatusType

<b>Name</b>	Dem_MonitorStatusType			
<b>Kind</b>	Bitfield			
<b>Derived from</b>	uint8			
<b>Elements</b>	<b>Kind</b>	<b>Name</b>	<b>Mask</b>	<b>Description</b>
	bit	DEM_MONITOR_STATUS_TF	0x01	Bit0: TestFailed
	bit	DEM_MONITOR_STATUS_TNCTOC	0x02	Bit1: TestNotCompletedThisOperationCycle
<b>Description</b>	This type contains possible monitor status values.			
<b>Variation</b>	–			
<b>Available via</b>	Rte_Dem_Type.h			

#### E.4.1.11 Dem\_UdsStatusByteType

<b>Name</b>	Dem_UdsStatusByteType			
<b>Kind</b>	Bitfield			
<b>Derived from</b>	uint8			
<b>Lower limit</b>	0x00			
<b>Upper limit</b>	0xFF			
<b>Elements</b>	<b>Kind</b>	<b>Name</b>	<b>Mask</b>	<b>Description</b>
	bit	DEM_UDS_STATUS_TF	0x01	bit 0: TestFailed
	bit	DEM_UDS_STATUS_TFTOC	0x02	bit 1: TestFailedThisOperationCycle
	bit	DEM_UDS_STATUS_PDTC	0x04	bit 2: PendingDTC
	bit	DEM_UDS_STATUS_CDTC	0x08	bit 3: ConfirmedDTC
	bit	DEM_UDS_STATUS_TNCSLC	0x10	bit 4: TestNotCompletedSinceLastClear
	bit	DEM_UDS_STATUS_TFSLC	0x20	bit 5: TestFailedSinceLastClear
	bit	DEM_UDS_STATUS_TNCTOC	0x40	bit 6: TestNotCompletedThisOperationCycle
bit	DEM_UDS_STATUS_WIR	0x80	bit 7: WarningIndicatorRequested	
<b>Description</b>	In this data-type each bit has an individual meaning. The bit is set to 1 when the condition holds. For example, if the 2nd bit (0x02) is set to 1, this means that the test failed this operation cycle. If the bit is set to 0, it has not yet failed this cycle.			
<b>Variation</b>	–			
<b>Available via</b>	Rte_Dem_Type.h			

## E.4.2 Client-Server-Interfaces

### E.4.2.1 CallbackClearEventAllowed

<b>Name</b>	CallbackClearEventAllowed		
<b>Comment</b>	If configured, it gets the permission to clear a specific event from the SW-C. For each event, there can be one port of this interface type.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	ClearEventAllowed		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">&lt;Module&gt;_DemClearEventAllowed&lt;ForCondition&gt;</a>		
<b>Variation</b>	–		
<b>Parameters</b>	Allowed		
	<b>Type</b>	boolean	
	<b>Direction</b>	OUT	
	<b>Comment</b>	True - clearance of event is allowed False - clearance of event is not allowed	
	<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

### E.4.2.2 CallbackEventDataChanged

<b>Name</b>	CallbackEventDataChanged		
<b>Comment</b>	If configured it triggers SW-Cs on event related data changes. For each event, there can be one port of this interface type.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful

<b>Operation</b>	EventDataChanged		
<b>Comment</b>	–		
<b>Mapped to API</b>	–		
<b>Variation</b>	–		
<b>Possible Errors</b>	–		

### E.4.2.3 CallbackEventUdsStatusChanged

<b>Name</b>	CallbackEventUdsStatusChanged		
<b>Comment</b>	If configured it triggers SW-Cs on event status byte changes. For each event, there can be several ports of this interface type.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful

<b>Operation</b>	CallbackEventUdsStatusChanged		
<b>Comment</b>	–		
<b>Mapped to API</b>	–		
<b>Variation</b>	–		
<b>Parameters</b>	EventStatusByteOld		
	<b>Type</b>	<a href="#">Dem_UdsStatusByteType</a>	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	EventStatusByteNew		
	<b>Type</b>	<a href="#">Dem_UdsStatusByteType</a>	
	<b>Direction</b>	IN	
<b>Comment</b>	–		
<b>Variation</b>	–		
<b>Possible Errors</b>	–		

### E.4.2.4 CallbackGetFaultDetectCounter

<b>Name</b>	CallbackGetFaultDetectCounter		
<b>Comment</b>	If configured it get the monitor-internal fault detection counter value of a specific event from the SW-C.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	GetFaultDetectionCounter		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">&lt;Module&gt;_DemGetFaultDetectionCounter&lt;ForEvent&gt;</a>		
<b>Variation</b>	–		
<b>Parameters</b>	FaultDetectionCounter		
	<b>Type</b>	sint8	
	<b>Direction</b>	OUT	
	<b>Comment</b>	Value of FaultDetectionCounter	
	<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

### E.4.2.5 CallbackInitMonitorForEvent

<b>Name</b>	CallbackInitMonitorForEvent		
<b>Comment</b>	If configure it triggers an event-specific initialization of the monitor part of the SW-C). For each event, there can be one port of this interface type.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	InitMonitorForEvent		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">&lt;Module&gt;_DemInitMonitorFor&lt;EventName&gt;</a>		
<b>Variation</b>	–		
<b>Parameters</b>	InitMonitorReason		
	<b>Type</b>	<a href="#">Dem_InitMonitorReasonType</a>	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

### E.4.2.6 CallbackMonitorStatusChange

<b>Name</b>	CallbackMonitorStatusChange		
<b>Comment</b>	If configured it triggers SW-Cs on monitor status changes. For each event, there can be several ports of this interface type.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful

<b>Operation</b>	MonitorStatusChanged		
<b>Comment</b>	–		
<b>Mapped to API</b>	–		
<b>Variation</b>	–		
<b>Possible Errors</b>	–		

### E.4.2.7 DiagnosticInfo

<b>Name</b>	DiagnosticInfo		
<b>Comment</b>	Provides the capability to obtain the event information. One port of this interface type is provided per diagnostic event by the Dem Service Component. It has EventId as a port-defined argument.		
<b>IsService</b>	true		





<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed
	10	DEM_E_NO_DTC_AVAILABLE	there is no DTC configured in the requested format
	14	DEM_E_NO_FDC_AVAILABLE	there is no fault detection counter available for the requested event
	21	DEM_BUFFER_TOO_SMALL	The provided buffer size is too small
	48	DEM_NO_SUCH_ELEMENT	The requested event data is not currently stored (but the request was valid) OR The requested record number is not supported by the event OR The requested DID is not supported by the freeze frame (GetEventFreezeFrameDataEx)

<b>Operation</b>	GetDTCOfEvent	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Dem_GetDTCOfEvent</a>	
<b>Variation</b>	–	
<b>Parameters</b>	DTCFormat	
	<b>Type</b>	<a href="#">Dem_DTCFormatType</a>
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DTCOfEvent	
	<b>Type</b>	uint32
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DEM_E_NO_DTC_AVAILABLE</a>	

<b>Operation</b>	GetDebouncingOfEvent	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Dem_GetDebouncingOfEvent</a>	
<b>Variation</b>	<pre>(({ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass)} instanceof {ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass/DemDebounceCounterBased)})    ({ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass)} instanceof {ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass/DemDebounceTimeBased)}))</pre>	
<b>Parameters</b>	DebouncingState	
	<b>Type</b>	<a href="#">Dem_DebouncingStateType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	Bit 0 Temporarily Defective (corresponds to 0 < FDC < 127) Bit 1 finally Defective (corresponds to FDC = 127) Bit 2 temporarily healed (corresponds to -128 < FDC < 0) Bit 3 Test complete (corresponds to FDC = -128 or FDC = 127) Bit 4 DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
	<b>Variation</b>	–







<b>Possible Errors</b>	E_OK E_NOT_OK
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<b>Operation</b>	GetEventAvailable	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Dem_GetEventAvailable</a>	
<b>Variation</b>	–	
<b>Parameters</b>	AvailableStatus	
	<b>Type</b>	boolean*
	<b>Direction</b>	OUT
	<b>Comment</b>	TRUE if the event is available. FALSE if the event is not available.
<b>Variation</b>	–	
<b>Possible Errors</b>	E_OK E_NOT_OK	

<b>Operation</b>	GetEventExtendedDataRecordEx	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Dem_GetEventExtendedDataRecordEx</a>	
<b>Variation</b>	–	
<b>Parameters</b>	RecordNumber	
	<b>Type</b>	uint8
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DestBuffer	
	<b>Type</b>	<a href="#">Dem_MaxDataValueType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
	Bufsize	
	<b>Type</b>	uint16
<b>Direction</b>	INOUT	
<b>Comment</b>	–	
<b>Variation</b>	–	
<b>Possible Errors</b>	E_OK E_NOT_OK DEM_BUFFER_TOO_SMALL DEM_NO_SUCH_ELEMENT	

<b>Operation</b>	GetEventFreezeFrameDataEx	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Dem_GetEventFreezeFrameDataEx</a>	
<b>Variation</b>	–	
<b>Parameters</b>	RecordNumber	
	<b>Type</b>	uint8
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DataId	





	<b>Type</b>	uint16
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
	DestBuffer	
	<b>Type</b>	<a href="#">Dem_MaxDataValueType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
	<b>Variation</b>	–
	BufSize	
	<b>Type</b>	uint16
	<b>Direction</b>	INOUT
	<b>Comment</b>	–
<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DEM_BUFFER_TOO_SMALL</a> <a href="#">DEM_NO_SUCH_ELEMENT</a>	

<b>Operation</b>	GetEventUdsStatus	
<b>Comment</b>	Gets the current UDS status byte assigned to the DTC for the event	
<b>Mapped to API</b>	<a href="#">Dem_GetEventUdsStatus</a>	
<b>Variation</b>	–	
<b>Parameters</b>	UDSStatusByte	
	<b>Type</b>	<a href="#">Dem_UdsStatusByteType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	–
<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

<b>Operation</b>	GetFaultDetectionCounter	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Dem_GetFaultDetectionCounter</a>	
<b>Variation</b>	–	
<b>Parameters</b>	FaultDetectionCounter	
	<b>Type</b>	sint8
	<b>Direction</b>	OUT
	<b>Comment</b>	–
<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a> <a href="#">DEM_E_NO_FDC_AVAILABLE</a>	

<b>Operation</b>	GetMonitorStatus	
<b>Comment</b>	–	
<b>Mapped to API</b>	<a href="#">Dem_GetMonitorStatus</a>	
<b>Variation</b>	–	
<b>Parameters</b>	MonitorStatus	





	<b>Type</b>	<a href="#">Dem_MonitorStatusType</a>
	<b>Direction</b>	OUT
	<b>Comment</b>	Monitor status byte of the requested event. If the return value of the function call is E_NOT_OK, this parameter does not contain valid data.
	<b>Variation</b>	–
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>	

### E.4.2.8 DiagnosticMonitor

<b>Name</b>	DiagnosticMonitor		
<b>Comment</b>	Provide the capability to modify the event information. One port of this interface type is provided per application-related diagnostic event by the Dem Service Component. It has Event Id as a port-defined argument.		
<b>IsService</b>	true		
<b>Variation</b>	(((Dem/DemGeneral/DemStorageCondition.DemStorageConditionReplacementEvent Ref))!={Dem/DemConfigSet/DemEventParameter}) && ((Dem/DemConfigSet/DemEventParameter/DemEventReportingType) == STANDARD_REPORTING))		
<b>Possible Errors</b>	0	<a href="#">E_OK</a>	Operation successful
	1	<a href="#">E_NOT_OK</a>	Operation failed

<b>Operation</b>	ClearPrestoredFreezeFrame		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">Dem_ClearPrestoredFreezeFrame</a>		
<b>Variation</b>	{ecuc(Dem/DemGeneral/DemMaxNumberPrestoredFF)} > 0		
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

<b>Operation</b>	PrestoreFreezeFrame		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">Dem_PrestoreFreezeFrame</a>		
<b>Variation</b>	{ecuc(Dem/DemGeneral/DemMaxNumberPrestoredFF)} > 0		
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

<b>Operation</b>	ResetEventDebounceStatus		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">Dem_ResetEventDebounceStatus</a>		
<b>Variation</b>	((ecuc(Dem/DemGeneral/DemDebounceCounterBasedSupport)) == true)    ((ecuc(Dem/DemGeneral/DemDebounceTimeBasedSupport)) == true)		
<b>Parameters</b>	DebounceResetStatus		
	<b>Type</b>	<a href="#">Dem_DebounceResetStatusType</a>	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	





<b>Possible Errors</b>	E_OK E_NOT_OK
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<b>Operation</b>	ResetEventStatus
<b>Comment</b>	–
<b>Mapped to API</b>	Dem_ResetEventStatus
<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK

<b>Operation</b>	ResetMonitorStatus
<b>Comment</b>	–
<b>Mapped to API</b>	Dem_ResetMonitorStatus
<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK

<b>Operation</b>	SetEventDisabled
<b>Comment</b>	–
<b>Mapped to API</b>	Dem_SetEventDisabled
<b>Variation</b>	{ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT
<b>Possible Errors</b>	E_OK E_NOT_OK

<b>Operation</b>	SetEventStatus	
<b>Comment</b>	–	
<b>Mapped to API</b>	Dem_SetEventStatus	
<b>Variation</b>	–	
<b>Parameters</b>	EventStatus	
	<b>Type</b>	Dem_EventStatusType
	<b>Direction</b>	IN
	<b>Comment</b>	–
	<b>Variation</b>	–
<b>Possible Errors</b>	E_OK E_NOT_OK	

### E.4.2.9 DiagnosticMonitor\_MonitorData

<b>Name</b>	DiagnosticMonitor_MonitorData		
<b>Comment</b>	Provide means to report diagnostic monitor status with monitor data.		
<b>IsService</b>	true		
<b>Variation</b>	({Dem/DemConfigSet/DemEventParameter/DemEventReportingType} == STANDARD_REPORTING_WITH_MONITOR_DATA)		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	SetEventStatusWithMonitorData		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">Dem_SetEventStatusWithMonitorData</a>		
<b>Variation</b>	–		
<b>Parameters</b>	EventStatus		
	<b>Type</b>	<a href="#">Dem_EventStatusType</a>	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	monitorData0		
	<b>Type</b>	<a href="#">Dem_MonitorDataType</a>	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
	monitorData1		
	<b>Type</b>	<a href="#">Dem_MonitorDataType</a>	
<b>Direction</b>	IN		
<b>Comment</b>	–		
<b>Variation</b>	–		
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

#### E.4.2.10 EventStatus

<b>Name</b>	EventStatus		
<b>Comment</b>	Provides the capability modify the event status. One port of this interface type is provided per application-related diagnostic event by the Dem Service Component. It has EventId as a port-defined argument.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	<a href="#">E_OK</a>	Operation successful
	1	<a href="#">E_NOT_OK</a>	Operation failed

<b>Operation</b>	SetWIRStatus		
<b>Comment</b>	–		
<b>Mapped to API</b>	<a href="#">Dem_SetWIRStatus</a>		
<b>Variation</b>	–		
<b>Parameters</b>	WIRStatus		
	<b>Type</b>	boolean	
	<b>Direction</b>	IN	
	<b>Comment</b>	–	
	<b>Variation</b>	–	
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

## E.4.3 Ports

### E.4.3.1 Event

<b>Name</b>	Event_{Name}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	DiagnosticMonitor
<b>Description</b>	–		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	Dem_EventIdType	
	<b>Value</b>	{ecuc(Dem/DemConfigSet/DemEventParameter/DemEventId.value)}	
<b>Variation</b>	Name = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)}		

### E.4.3.2 DiagnosticMonitor\_MonitorData

<b>Name</b>	DiagnosticMonitor_MonitorData_{Name}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	DiagnosticMonitor_MonitorData
<b>Description</b>	–		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	Dem_EventIdType	
	<b>Value</b>	{ecuc(Dem/DemConfigSet/DemEventParameter/DemEventId.value)}	
<b>Variation</b>	Name = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)}		

### E.4.3.3 EventStatus

<b>Name</b>	EventStatus_{Name}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	EventStatus
<b>Description</b>	–		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	Dem_EventIdType	
	<b>Value</b>	{ecuc(Dem/DemConfigSet/DemEventParameter/DemEventId.value)}	
<b>Variation</b>	Name = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)}		

### E.4.3.4 EventInfo

<b>Name</b>	EventInfo_{Name}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	DiagnosticInfo
<b>Description</b>	–		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	Dem_EventIdType	
	<b>Value</b>	{ecuc(Dem/DemConfigSet/DemEventParameter/DemEventId.value)}	
<b>Variation</b>	Name = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)}		

### E.4.3.5 CBClrEvt

<b>Name</b>	CBClrEvt_{Name}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">CallbackClearEventAllowed</a>
<b>Description</b>	–		
<b>Variation</b>	(({ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackClearEventAllowed)} != NULL) && ({ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackClearEventAllowed/DemCallback ClearEventAllowedFnc)} == NULL)) Name = {ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackClearEvent Allowed.SHORT-NAME)}		

### E.4.3.6 CBDataEvt

<b>Name</b>	CBDataEvt_{Name}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">CallbackEventDataChanged</a>
<b>Description</b>	–		
<b>Variation</b>	(({ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackEventDataChanged)} != NULL) && ({ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackEventDataChanged/DemCallback EventDataChangedFnc)} == NULL)) Name = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)}		

### E.4.3.7 CBFaultDetectCtr

<b>Name</b>	CBFaultDetectCtr_{Name}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">CallbackGetFaultDetectCounter</a>
<b>Description</b>	–		
<b>Variation</b>	({ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass/DemDebounce MonitorInternal/DemCallbackGetFDC/DemCallbackGetFDCFnc)} == NULL) Name = {ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass/Dem DebounceMonitorInternal/DemCallbackGetFDC.SHORT-NAME)}		

### E.4.3.8 CBInitEvt

<b>Name</b>	CBInitEvt_{Name}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">CallbackInitMonitorForEvent</a>
<b>Description</b>	–		
<b>Variation</b>	(({ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackInitMForE)} != NULL) && ({ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackInitMForE/DemCallbackInitMFor EFnc)} == NULL)) Name = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)}		

### E.4.3.9 CBEventUdsStatusChanged

<b>Name</b>	CBEventUdsStatusChanged_{EventName}_{CallbackName}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">CallbackEventUdsStatusChanged</a>
<b>Description</b>	–		
<b>Variation</b>	EventName = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)} CallbackName = {ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackEventUdsStatusChanged.SHORT-NAME)}		

### E.4.3.10 CBMonitorStatusChanged

<b>Name</b>	CBMonitorStatusChanged_{EventName}_{CallbackName}		
<b>Kind</b>	RequiredPort	<b>Interface</b>	<a href="#">CallbackMonitorStatusChange</a>
<b>Description</b>	–		
<b>Variation</b>	({ecuc(Dem/DemConfigSet/DemEventParameter.DemEventKind)} == DEM_EVENT_KIND_SWC) EventName = {ecuc(Dem/DemConfigSet/DemEventParameter.SHORT-NAME)} CallbackName = {ecuc(Dem/DemConfigSet/DemEventParameter/DemCallbackMonitorStatusChanged.SHORT-NAME)}		

## E.5 FiM

### E.5.1 Implementation Data Types

#### E.5.1.1 FiM\_FunctionIdType

<b>Name</b>	FiM_FunctionIdType		
<b>Kind</b>	Type		
<b>Derived from</b>	<b>Basetype</b>	<b>Variation</b>	
	uint16	platform depended	
	uint8	platform depended	
<b>Range</b>	0..255, 0..65535	–	Identifier of functionality Configurable, size depends on System complexity. Remark: Not all numbers are valid. The FiM data generation tool shall only assign valid values.
<b>Description</b>	Type for the FunctionID		
<b>Variation</b>	–		
<b>Available via</b>	Rte_FiM_Type.h		



## E.5.2 Client-Server-Interfaces

### E.5.2.1 FiM\_FunctionInhibition

<b>Name</b>	FunctionInhibition		
<b>Comment</b>	The SW Components can use this service to query for the permission to execute a certain functionality represented by a FID.		
<b>IsService</b>	true		
<b>Variation</b>	–		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	GetFunctionPermission		
<b>Comment</b>	Get the permission state of the respective FID.		
<b>Mapped to API</b>	<a href="#">FiM_GetFunctionPermission</a>		
<b>Variation</b>	–		
<b>Parameters</b>	Permission		
	<b>Type</b>	boolean	
	<b>Direction</b>	OUT	
	<b>Comment</b>	The permission of the requested FID. TRUE: FID has permission to run FALSE: FID has no permission to run, i.e. shall not be executed	
<b>Variation</b>	–		
<b>Possible Errors</b>	<a href="#">E_OK</a> <a href="#">E_NOT_OK</a>		

### E.5.2.2 FiM\_ControlFunctionAvailable

<b>Name</b>	ControlFunctionAvailable		
<b>Comment</b>	SW Components can use this service to set the availability of a function.		
<b>IsService</b>	true		
<b>Variation</b>	({ecuc(FiM/FiMGeneral/FiMAvailabilitySupport)} == True)		
<b>Possible Errors</b>	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed

<b>Operation</b>	SetFunctionAvailable		
<b>Comment</b>	Sets the availability of a function.		
<b>Mapped to API</b>	<a href="#">FiM_SetFunctionAvailable</a>		
<b>Variation</b>	–		
<b>Parameters</b>	Availability		
	<b>Type</b>	boolean	
	<b>Direction</b>	IN	
	<b>Comment</b>	The permission of the requested FID: TRUE: Function is available. FALSE: Function is not available.	
<b>Variation</b>	–		





<b>Possible Errors</b>	E_OK E_NOT_OK
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## E.5.3 Ports

### E.5.3.1 FiM\_FunctionInhibition

<b>Name</b>	Func_{Name}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	FunctionInhibition
<b>Description</b>	A client can query the FiM for execution permission for a specific function. The FIDs which represent the functions are not directly used by the client SW-C. Instead, the mechanism of "port-defined argument values" is used and every FID is mapped to a separate port that is responsible for the data exchange via RTE.		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	FiM_FunctionIdType	
	<b>Value</b>	{ecuc(FiM/FiMConfigSet/FiMFID/FiMFunctionId.value)}	
<b>Variation</b>	Name = {ecuc(FiM/FiMConfigSet/FiMFID.SHORT-NAME)}		

### E.5.3.2 FiM\_ControlFunctionAvailable

<b>Name</b>	Control_{Name}		
<b>Kind</b>	ProvidedPort	<b>Interface</b>	ControlFunctionAvailable
<b>Description</b>	A client can set the availability for a specific function.		
<b>Port Defined Argument Value(s)</b>	<b>Type</b>	FiM_FunctionIdType	
	<b>Value</b>	{ecuc(FiM/FiMConfigSet/FiMFID/FiMFunctionId.value)}	
<b>Variation</b>	({ecuc(FiM/FiMGeneral/FiMAvailabilitySupport)} == True) Name = {ecuc(FiM/FiMConfigSet/FiMFID.SHORT-NAME)}		

## F Changes History

### F.1 Changes in R20-11 compared to R19-11

Please note that the document was initially created in R20-11.

#### F.1.1 Added Specification Items in R20-11

[SWS\_SwCluC\_00001] [SWS\_SwCluC\_00002] [SWS\_SwCluC\_00003] [SWS\_SwCluC\_00004] [SWS\_SwCluC\_00005] [SWS\_SwCluC\_00006] [SWS\_SwCluC\_00007] [SWS\_SwCluC\_00008] [SWS\_SwCluC\_00009] [SWS\_SwCluC\_00010] [SWS\_SwCluC\_00011] [SWS\_SwCluC\_00012] [SWS\_SwCluC\_00013] [SWS\_SwCluC\_00014] [SWS\_SwCluC\_00015] [SWS\_SwCluC\_00016] [SWS\_SwCluC\_00017] [SWS\_SwCluC\_00018] [SWS\_SwCluC\_00019] [SWS\_SwCluC\_00020] [SWS\_SwCluC\_00021] [SWS\_SwCluC\_00022] [SWS\_SwCluC\_00023] [SWS\_SwCluC\_00024] [SWS\_SwCluC\_00025] [SWS\_SwCluC\_00026] [SWS\_SwCluC\_00027] [SWS\_SwCluC\_00028] [SWS\_SwCluC\_00029] [SWS\_SwCluC\_00030] [SWS\_SwCluC\_00031] [SWS\_SwCluC\_00032] [SWS\_SwCluC\_00033] [SWS\_SwCluC\_00034] [SWS\_SwCluC\_00035] [SWS\_SwCluC\_00036] [SWS\_SwCluC\_00037] [SWS\_SwCluC\_00038] [SWS\_SwCluC\_00039] [SWS\_SwCluC\_00040] [SWS\_SwCluC\_00041] [SWS\_SwCluC\_00042] [SWS\_SwCluC\_00043] [SWS\_SwCluC\_00044] [SWS\_SwCluC\_00045] [SWS\_SwCluC\_00046] [SWS\_SwCluC\_00047] [SWS\_SwCluC\_00048] [SWS\_SwCluC\_00049] [SWS\_SwCluC\_00050] [SWS\_SwCluC\_00051] [SWS\_SwCluC\_00052] [SWS\_SwCluC\_00053] [SWS\_SwCluC\_00054] [SWS\_SwCluC\_00055] [SWS\_SwCluC\_00056] [SWS\_SwCluC\_00057] [SWS\_SwCluC\_00058] [SWS\_SwCluC\_00059] [SWS\_SwCluC\_00060] [SWS\_SwCluC\_00061] [SWS\_SwCluC\_00062] [SWS\_SwCluC\_00063] [SWS\_SwCluC\_00064] [SWS\_SwCluC\_00065] [SWS\_SwCluC\_00066] [SWS\_SwCluC\_00067] [SWS\_SwCluC\_00068] [SWS\_SwCluC\_00069] [SWS\_SwCluC\_00070] [SWS\_SwCluC\_00071] [SWS\_SwCluC\_00072] [SWS\_SwCluC\_00075] [SWS\_SwCluC\_00076] [SWS\_SwCluC\_00077] [SWS\_SwCluC\_00079] [SWS\_SwCluC\_00080] [SWS\_SwCluC\_00081] [SWS\_SwCluC\_00082] [SWS\_SwCluC\_00083] [SWS\_SwCluC\_00084] [SWS\_SwCluC\_00085] [SWS\_SwCluC\_00086] [SWS\_SwCluC\_00088] [SWS\_SwCluC\_00089] [SWS\_SwCluC\_00999] [SWS\_SwCluC\_01000] [SWS\_SwCluC\_01002] [SWS\_SwCluC\_02000] [SWS\_SwCluC\_02001] [SWS\_SwCluC\_02002] [SWS\_SwCluC\_02003] [SWS\_SwCluC\_02004] [SWS\_SwCluC\_02005] [SWS\_SwCluC\_02006] [SWS\_SwCluC\_02007] [SWS\_SwCluC\_02008] [SWS\_SwCluC\_02101] [SWS\_SwCluC\_02102] [SWS\_SwCluC\_02103] [SWS\_SwCluC\_02104] [SWS\_SwCluC\_02105] [SWS\_SwCluC\_02106] [SWS\_SwCluC\_02107] [SWS\_SwCluC\_02108] [SWS\_SwCluC\_02109] [SWS\_SwCluC\_02110] [SWS\_SwCluC\_02111] [SWS\_SwCluC\_02112] [SWS\_SwCluC\_02113] [SWS\_SwCluC\_02114] [SWS\_SwCluC\_02115] [SWS\_SwCluC\_02116] [SWS\_SwCluC\_02117] [SWS\_SwCluC\_02118] [SWS\_SwCluC\_02119] [SWS\_SwCluC\_02120] [SWS\_SwCluC\_02121] [SWS\_SwCluC\_02122] [SWS\_SwCluC\_02123]

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### F.1.2 Changed Specification Items in R20-11

none

### F.1.3 Deleted Specification Items in R20-11

none

## F.2 Changes in R21-11 compared to R20-11

### F.2.1 Added Specification Items in R21-11

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## F.2.2 Changed Specification Items in R21-11

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## F.2.3 Deleted Specification Items in R21-11

[SWS\_NvM\_00448] [SWS\_NvM\_00449] [SWS\_NvM\_00450] [SWS\_NvM\_00451] [SWS\_NvM\_00453] [SWS\_NvM\_00454] [SWS\_NvM\_00455] [SWS\_NvM\_00456] [SWS\_NvM\_00457] [SWS\_NvM\_00459] [SWS\_NvM\_00467] [SWS\_NvM\_00469] [SWS\_NvM\_00470] [SWS\_NvM\_00471] [SWS\_NvM\_00535] [SWS\_NvM\_00548] [SWS\_NvM\_00734] [SWS\_NvM\_00735] [SWS\_NvM\_00736] [SWS\_NvM\_00737] [SWS\_NvM\_00738] [SWS\_NvM\_00764] [SWS\_NvM\_00793] [SWS\_NvM\_00813] [SWS\_NvM\_00843] [SWS\_NvM\_00844] [SWS\_NvM\_00845] [SWS\_NvM\_00846] [SWS\_NvM\_00847] [SWS\_NvM\_91002] [SWS\_Rte\_89016] [SWS\_Rte\_89017]



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### **F.3 Changes in R22-11 compared to R21-11**

#### **F.3.1 Added Specification Items in R22-11**

[SWS\_SwCluC\_00095] [SWS\_SwCluC\_02278] [SWS\_SwCluC\_02279] [SWS\_SwCluC\_02280] [SWS\_SwCluC\_03083] [SWS\_SwCluC\_03084] [SWS\_SwCluC\_03085] [SWS\_SwCluC\_03086] [SWS\_SwCluC\_03087] [SWS\_SwCluC\_03088] [SWS\_SwCluC\_03089] [SWS\_SwCluC\_03090] [SWS\_SwCluC\_03091] [SWS\_SwCluC\_03092] [SWS\_SwCluC\_03094] [SWS\_SwCluC\_03095] [SWS\_SwCluC\_03096] [SWS\_SwCluC\_03097] [SWS\_SwCluC\_03098] [SWS\_SwCluC\_03099] [SWS\_SwCluC\_03178] [SWS\_SwCluC\_03401] [SWS\_SwCluC\_03402] [SWS\_SwCluC\_09000] [SWS\_SwCluC\_09001] [SWS\_SwCluC\_10012] [SWS\_SwCluC\_91001] [SWS\_SwCluC\_91002] [SWS\_SwCluC\_CONSTR\_00096] [SWS\_SwCluC\_CONSTR\_02281] [SWS\_SwCluC\_CONSTR\_02282] [SWS\_SwCluC\_CONSTR\_02283] [SWS\_SwCluC\_CONSTR\_03093] [SWS\_SwCluC\_CONSTR\_03400] [SWS\_SwCluC\_CONSTR\_03403] [SWS\_SwCluC\_NA\_00999]

#### **F.3.2 Changed Specification Items in R22-11**

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### F.3.3 Deleted Specification Items in R22-11

[SWS\_SwCluC\_00999] [SWS\_SwCluC\_03151] [SWS\_SwCluC\_03157] [SWS\_SwCluC\_03174] [SWS\_SwCluC\_03175] [SWS\_SwCluC\_CONSTR\_02228] [SWS\_SwCluC\_CONSTR\_02229] [SWS\_SwCluC\_CONSTR\_02230]

## F.4 Changes in R23-11 compared to R22-11

### F.4.1 Added Specification Items in R23-11

[SWS\_SwCluC\_00097] [SWS\_SwCluC\_02147] [SWS\_SwCluC\_02149] [SWS\_SwCluC\_02150] [SWS\_SwCluC\_02151] [SWS\_SwCluC\_02152] [SWS\_SwCluC\_02153] [SWS\_SwCluC\_02154] [SWS\_SwCluC\_02155] [SWS\_SwCluC\_02156] [SWS\_SwCluC\_02157] [SWS\_SwCluC\_03405] [SWS\_SwCluC\_03406] [SWS\_SwCluC\_91003]

### F.4.2 Changed Specification Items in R23-11

[SWS\_SwCluC\_00080] [SWS\_SwCluC\_00081] [SWS\_SwCluC\_00082] [SWS\_SwCluC\_00083] [SWS\_SwCluC\_00085] [SWS\_SwCluC\_02114] [SWS\_SwCluC\_02140] [SWS\_SwCluC\_02426] [SWS\_SwCluC\_02545] [SWS\_SwCluC\_02650] [SWS\_SwCluC\_02750] [SWS\_SwCluC\_03076] [SWS\_SwCluC\_03112] [SWS\_SwCluC\_03113] [SWS\_SwCluC\_03216] [SWS\_SwCluC\_09001] [SWS\_SwCluC\_NA\_00999]

### F.4.3 Deleted Specification Items in R23-11

none

### F.4.4 Added Constraints in R23-11

[SWS\_SwCluC\_CONSTR\_02145] [SWS\_SwCluC\_CONSTR\_02146] [SWS\_SwCluC\_CONSTR\_02148] [SWS\_SwCluC\_CONSTR\_02158] [SWS\_SwCluC\_CONSTR\_02159] [SWS\_SwCluC\_CONSTR\_02160] [SWS\_SwCluC\_CONSTR\_03404]

### F.4.5 Changed Constraints in R23-11

none

### F.4.6 Deleted Constraints in R23-11

none