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|---|---|---|---|
| 2025-11-27 | R25-11 | AUTOSAR Release Management | • Release Life Cycle Status: R25-11 is in Evolution, R25-11 supersedes R24-11 |

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# References

[1] ISO/IEC Directives, Part 2, Principles and rules for the structure and drafting of ISO and IEC documents
https://www.iso.org/sites/directives/current/part2/index.xhtml

[2] MISRA C++:2023: Guidelines for the use of C++17 in critical systems, ISBN 978-1911700104

[3] ISO/IEC 14882:2017, Programming languages – C++
https://www.iso.org

[4] ISO/IEC 14882:2020, Programming languages – C++
https://www.iso.org

[5] Specification of Remote Persistency
AUTOSAR_AP_SWS_RemotePersistency

[6] Specification of Persistency
AUTOSAR_AP_SWS_Persistency

[7] Specification of Manifest
AUTOSAR_AP_TPS_ManifestSpecification

# 1 Introduction

## 1.1 Scope of This Document

This document provides an overview of the AUTOSAR standard Adaptive Platform release R25-11.

## 1.2 Terminology and Licenses

### 1.2.1 Disclaimer Regarding Language in This Release

This release may contain terminology or phrasing that, while historically or technically conventional, could be perceived as outdated, insensitive, or discriminatory in modern contexts. AUTOSAR wishes to explicitly state that any such language is unintentional and is not meant to offend, exclude, or imply prejudice against any individual or group.

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**Legacy Systems** Descriptions inherited from older systems or standards that predate current inclusive language guidelines.

**Technical Specificity** Language chosen for precise technical meaning, which may inadvertently carry unintended connotations.

**Backward Compatibility and External References** In some cases, specific terminologies cannot be altered without breaking backward compatibility with existing systems, codebases, or processes. Additionally, certain terms may be retained to align with established industry standards, external specifications, or third-party documentation, where consistency is critical for interoperability and clear communication across different platforms and organizations.

AUTOSAR is committed to fostering an inclusive environment and regularly reviews our documentation to identify and update language that does not align with our values. Among other guidelines, AUTOSAR is referring to the relevant ISO standard ISO/IEC Directives, Part 2 [1].

If you encounter any language within this document that you find concerning, AUTOSAR encourages you to provide feedback so AUTOSAR can address the feedback in future revisions.

### 1.2.2 Usage of W3C XML Schema

The AUTOSAR XML Schema requires the XML namespace definition file xml.xsd.

There are several occurrences of the “xml.xsd” file within this release. For all occurrences the W3C license applies which can be found on https://www.w3.org/Consortium/Legal/2015/copyright-software-and-document.

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## 1.3 AUTOSAR Standards

### 1.3.1 Introduction

AUTOSAR addresses a wide range of use cases in automotive software development with its standards. These use cases have different requirements and lead to different technical solutions.

Packaging its deliverables into different standards

- eases the access to AUTOSAR solutions for users and
- allows AUTOSAR to scale with market needs.

### 1.3.2 Definition

An AUTOSAR standard is a consistent set of AUTOSAR deliverables, which are released at the same time. AUTOSAR deliverables can be of but are not limited to the following kinds:

- Textual explanations
- Textual specifications
- Test specifications
- Source code
- Other formal or semi-formal textual formats (e.g., ARXML, UML models, XML schemata)

At the time of release, AUTOSAR ensures that dependencies are fulfilled.

### 1.3.3 Overview of AUTOSAR's Standards

AUTOSAR delivers the following standards:

| Standard | Abbreviation |
|---|---|
| Adaptive Platform | AP |
| Classic Platform | CP |
| Foundation | FO |

#### 1.3.3.1 Adaptive Platform

The Adaptive Platform is AUTOSAR's solution for high-performance computing ECUs to build safety-related systems for use cases such as highly automated and autonomous driving.

#### 1.3.3.2 Classic Platform

The Classic Platform is AUTOSAR's solution for embedded systems with hard real-time and safety constraints.

#### 1.3.3.3 Foundation

The purpose of the Foundation standard is to enforce interoperability between the AUTOSAR platforms.

Foundation contains the generic artifacts that are common for AP and CP to ensure compatibility between

- Classic- and Adaptive Platform and
- Non-AUTOSAR platforms to AUTOSAR platforms.

### 1.3.4 Dependencies Between Standards

Each release of Classic and Adaptive Platform relies on a dedicated version of Foundation. The specific dependency is documented in chapter 1.4.5.

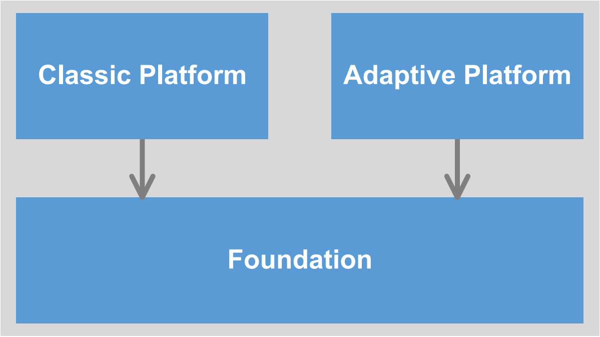

**Figure 1.1: Dependencies of AUTOSAR standards**

### 1.3.5 Dependencies to Other Standards

This release of the Adaptive Platform depends on the standard Foundation in release R25-11, which

- defines protocols implemented by Adaptive Platform
- contains the project objectives and the common requirements from which the features of the Adaptive Platform are derived
- contains common specification parts which apply to both, the Adaptive Platform and the Classic Platform

These dependencies are refined in the trace information of the requirements in the respective specifications.

## 1.4 Release Numbering and Life Cycle

### 1.4.1 Release Life Cycle of a Major Release

Each major release goes through four consecutive steps within its life cycle (examples based on the internal release numbering scheme):

1. Development: Between start of life cycle and the initial release (e.g., R4.0.1)
2. Evolution: Following the initial release with zero, one or several minor releases and/or revisions (e.g., R4.0.2, R4.1.1)
3. Maintenance: No new content is added to a major release but only maintenance of the existing content with zero, one or several revisions (e.g., R3.2.2) is provided
4. Issue Notice: No more revisions but zero, one or several issue notices, i.e., updates of the list of known issues until end of life cycle.

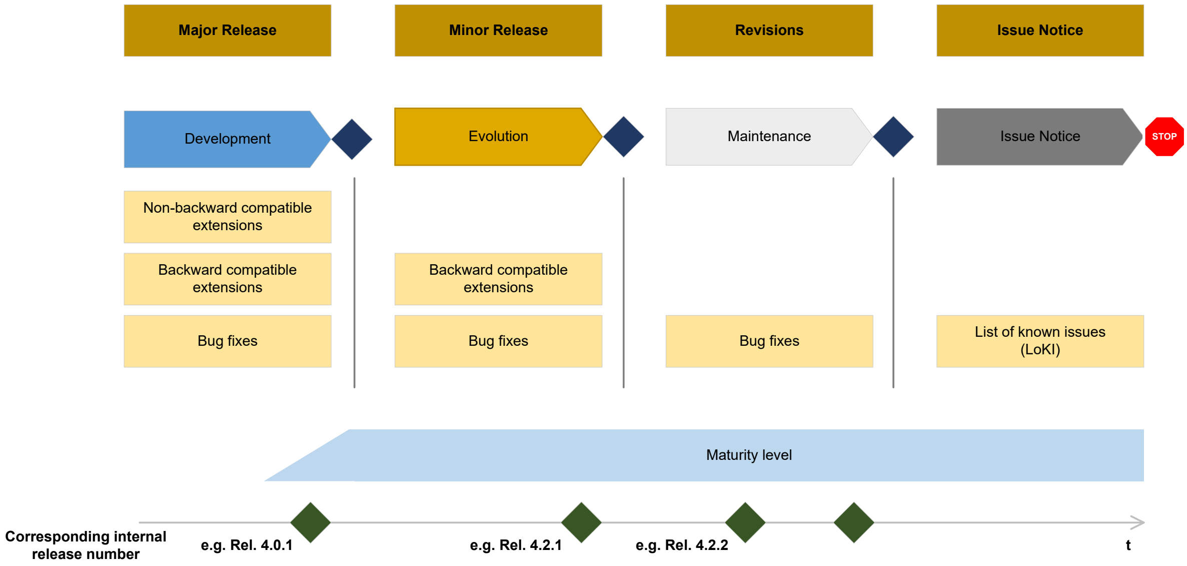

**Figure 1.2: Life cycle model of AUTOSAR standards**

### 1.4.2 Life Cycle States of Specification Items and Requirements

The life cycle state of a specification item is found after the specification item ID surrounded by curly brackets. The states are:

**VALID** This indicates that the related entity is a valid part of the document. This is the default and also applies if no dedicated life cycle status is annotated for the related entity.

**DRAFT** This indicates that the related entity is newly introduced but still experimental. This information is published but is subject to change without backward compatibility guarantee.

**OBSOLETE** This indicates that the related entity is subject to be removed in one of the following releases without further notice.

The life cycle state of a requirement is found in the attribute “Status”. The states are the same as the specification item states.

### 1.4.3 Platform Release Number

AUTOSAR applies a four-digit numbering scheme Ryy-mm to identify releases. The identifiers “yy” and “mm” depict the year and month of the release date, for example, R20-11 for the November 2020 release.

### 1.4.4 Internal Release Number

AUTOSAR additionally maintains an internal release number for different purposes (e.g., usage in BSW modules in Classic Platform).
The internal release number is used for all platforms and follows up on the Classic Platform release number. In Adaptive Platform this is newly introduced. In Foundation this leads to a discontinuation of the former numbering pattern (e.g., R1.5.0).
A mapping between Platform Releases and corresponding internal release numbers can be found in chapter 1.4.5. The internal release number uses a three-digit numbering scheme R<major>.<minor>.<revision> to identify releases. Its primary purpose is to identify a release as

- a major release: Valid and draft specification parts may be changed backward incompatibly.
- a minor release: Valid specification parts may only be changed backward compatibly. Draft specification parts may be changed backward incompatibly.
- a revision: Does not contain extensions but only backward compatible bugfixes.

### 1.4.5 Overview of AUTOSAR Releases and Corresponding AUTOSAR Schema Versions

Until the Releases CP R4.4.0 and AP R19-03, AUTOSAR released the platforms separately where a Foundation release went along with each platform release. Since compatibility between the platforms is essential to be able to have AP and CP ECUs within one vehicle project, an XML schema needs to be available that works with the different releases. The following table gives an overview about the different schema versions and the corresponding platform releases they can be used for.

The AUTOSAR schema does not have an impact on the Foundation. The Foundation releases are mentioned for the sake of completeness.

| Schema version | Classic Platform release | Adaptive Platform release | Foundation release |
|---|---|---|---|
| AUTOSAR_00042 | R4.3.0 | R17-03 | R1.1.0 |
| AUTOSAR_00043 | R4.3.0 | R17-10 | R1.2.0 |
| AUTOSAR_00044 | R4.3.1 | R17-10 | R1.3.0 |
| AUTOSAR_00045 | R4.3.1 | R18-03 | R1.4.0 |
| AUTOSAR_00046 | R4.4.0 | R18-10 | R1.5.0 |
| AUTOSAR_00047 | R4.4.0 | R19-03 | R1.5.1 |

**Table 1.1: Mapping schema version to platform releases (until CP R4.4.0/AP R19-03)**

Starting with release R19-11, all platforms are released as one AUTOSAR release and therefore come along with one schema version.

| Schema version | Platform release | Internal release number |
|---|---|---|
| AUTOSAR_00048 | R19-11 | R4.5.0 |
| AUTOSAR_00049 | R20-11 | R4.6.0 |
| AUTOSAR_00050 | R21-11 | R4.7.0 |
| AUTOSAR_00051 | R22-11 | R4.8.0 |
| AUTOSAR_00052 | R23-11 | R4.9.0 |
| AUTOSAR_00053 | R24-11 | R4.10.0 |
| **AUTOSAR_00054** | **R25-11** | **R4.11.0** |

**Table 1.2: Mapping schema version to platform release and internal release number (since R19-11)**

According to the release life cycle of AUTOSAR the release R25-11 is a minor release.

## 1.5 Introduction to the Adaptive Platform

The AUTOSAR Adaptive Platform is the standardized platform for microprocessor-based ECUs supporting use cases like highly automated driving as well as high speed on-board and off-board communication.

The Adaptive Platform differs in from the standardization approach of the Classic Platform as it specifies functional clusters instead of modules.

### 1.5.1 Specification Depth

Based on the development history of the Classic Platform, AUTOSAR has decided to specify functional clusters for the Adaptive Platform instead of a specific software architecture to provide the implementers with options to find efficient solutions for the standardized features.

### 1.5.2 Release Strategy

The Adaptive Platform has changed its life cycle state to "Evolution" according to AUTOSAR's life cycle model for its standards (as depicted in chapter 1.4.1). Since R19-11, AUTOSAR releases the Adaptive Platform together with the Classic Platform and Foundation in a yearly cycle. The life cycle state “Evolution” implies that users of the Adaptive Platform have a guarantee on backward compatibility for certain parts of the specifications. The differentiation is handled by the life cycle state of the requirements and specification items according to chapter 1.4.2.

### 1.5.3 Adaptive Platform Stabilization

AUTOSAR saw the market need to have interfaces to the applications that are stable throughout the different releases of AUTOSAR. Therefore, AUTOSAR decided to declare the R24-11 a stabilization release. The main goals were

- Achieve a stable and consistent set of APIs for production-grade applications
- Provide a more predictable software environment
- Increase interoperability by improving the compatibility across releases and vendors
- Increase predictability for AUTOSAR partners

The remaining issues from the R24-11 stabilization have been solved in R25-11.

### 1.5.4 Minimal C++ version

In order to formally align with MISRA C++:2023 [2] and due to some OS suppliers deprecating support for C++14 (QNX v8), the minimum C++ version for the AUTOSAR code base has been increased to C++17 (see [3]).
Due to further language-safety related improvements in C++20 (see [4]) AUTOSAR is currently evaluating a further move to C++20 in the coming releases.

## 1.6 Content of Chapters

This document is structured as follows:

- Chapter 1 provides an introduction to AUTOSAR's release strategy, the Adaptive Platform and its standardization approach.
- Chapter 2 provides a summary of changes since the previous release of the Adaptive Platform.
- Chapter 3 contains the overview of specifications comprising the release R25-11. This chapter is structured according to the clusters of AUTOSAR release R25-11.

- Chapter 4 contains remarks about known technical deficiencies.
- Chapter 5 contains the detailed release history of all released specifications.

# 2 Summary of Changes in Release R25-11

This chapter contains a summary of changes which have been implemented since the previous release R24-11.

Several concepts affecting the Adaptive Platform have been introduced with release R25-11 thereby adding functionality to the platform.
Additionally one concept targets the Classic and Adaptive Platform, strengthening the interaction between the two platforms.

## 2.1 Concepts

### 2.1.1 Introduced Concepts

The following concepts in 2.1.1.1- 2.1.1.5 have been introduced.

#### 2.1.1.1 Safe API for hardware accelerators

The generic API for Safe Hardware Acceleration utilization has been introduced in the AUTOSAR Adaptive platform in the R24-11. In the R25-11 the API has been adjusted/updated to consider AUTOSAR Adaptive real-world use-cases. The new Software Specification document for Safe Hardware Acceleration has been introduced. The Requirements document was updated with new requirements as well as with removal of non-actual ones to be aligned with new SWS document. The Explanatory document was partially updated to be aligned with RS and new SWS document.

#### 2.1.1.2 Suspend-to-RAM Support in State Management

**Suspend-to-RAM Support in State Management**
State Management now supports Suspend-to-RAM functionality, allowing the system to enter a low-power state while preserving its operational context in memory. This enhancement is made possible through coordinated interactions between applications, functional clusters, and the underlying operating system.

By managing transitions into and out of Suspend-to-RAM, State Management ensures that system integrity and responsiveness are maintained - enabling seamless resumption of services upon wake-up.

**Enhanced Coordination for S2R-Aware Applications**

State Management introduces a dedicated S2R Hub to coordinate Suspend-to-RAM operations for Adaptive Applications requiring a state synchronization before entering suspend mode. The S2R Hub manages communication with dynamically registering S2R Satellites and is accessible via the StateMachine interface or the C++ API (ara::sm::s2r::S2RHub).

#### 2.1.1.3 Hardware test (STL) manager on AP

The Hardware Test Manager (HTM) is a new component for AUTOSAR Adaptive Platform that provides standardized interfaces for hardware testing. HTM enables:

- Registration and execution of hardware test patterns
- Support for various hardware accelerators (DSP, GPU, NPU, etc.)
- Vendor-independent test execution through adapter pattern
- Integration with platform safety mechanisms
- Test result collection and reporting

The HTM addresses the growing need for systematic hardware validation in modern automotive systems, particularly for AI/ML accelerators and safety-critical hardware components.

#### 2.1.1.4 Remote Persistency

Remote Persistency provides a global storage (for multiple applications within a vehicle or an ECU) for configuration and coding data, that can be used in a similar way to the local Persistency by any application, but which is provided by a central instance via ara::com services and can therefore be accessed by any application in the same ECU or vehicle.
The Remote Persistency allows access to and update of stored data within an ECU or a whole vehicle.

- It provides service interfaces for reading and writing of stored data.
- IAM is used to protect the stored data from unwanted access.
- It uses Persistency Key-Value Storages to store its data.

#### 2.1.1.5 Crypto Rework

The Crypto Rework concept introduces simplified usage and standardized algorithm identifiers, streamlining implementation and ensuring consistency across different platforms. It also accounts for the limitations of hardware security modules (HSMs), enhancing compatibility with secure hardware environments. Additionally, the update offers more flexible X.509 certificate validation and management, allowing for easier integration and customization. Performance is further improved by minimizing the need for dynamic memory allocations, resulting in faster and more efficient operations.

### 2.1.2 Impact of Concepts

The introduced concepts had impact on several specifications. The following table provides a detailed overview.

Please note that some of the specifications are marked by special text formatting:

- Specifications in **bold** font are completely new specifications originating from the particular concept.
- If specifications or models like the BSW UML model or the ECUC model are only indirectly affected because they just provide artifacts for other specifications, they are not listed here.

| Concept Name | Specification Name | Affected Standard | Concept Lifecycle |
|---|---|---|---|
| Safe API for hardware accelerators | **AP SWS SafeHardwareAcceleration** | Adaptive Platform, Foundation | draft |
| | AP EXP SafeHardwareAccelerationAPI | | |
| | AP EXP SWArchitecture | | |
| | AP RS SafeHardwareAcceleration | | |
| | AP SWS Core | | |
| | FO EXP SafetyOverview | | |
| | FO TR Features | | |
| | AP EXP PlatformDesign | | |
| Suspend to RAM (STR) | AP EXP PlatformDesign | Adaptive Platform, Foundation | valid |
| | AP RS StateManagement | | |
| | AP SWS PlatformHealthManagement | | |
| | AP SWS StateManagement | | |
| | AP EXP SWArchitecture | | |
| | AP TPS ManifestSpecification | | |
| | FO TR Features | | |
| | FO TR SecurityEventsSpecification | | |

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| Concept Name | Specification Name | Affected Standard | Concept Lifecycle |
|---|---|---|---|
| Hardware test (STL) manager on AP | **AP RS HWTestManager** | Adaptive Platform | valid |
| Remote Persistency | **AP SWS Remote Persistency** | Adaptive Platform | valid |
| | AP SWS Core | | |
| | AP RS Persistency | | |
| | AP EXP PlatformDesign | | |
| | AP EXP SWArchitecture | | |
| AP Crypto Rework | AP SWS Cryptography | Adaptive Platform | valid |
| | AP RS Cryptography | | |
| | AP TPS ManifestSpecification | | |
| | CP TPS SystemTemplate | | |

**Table 2.1: Impact of concepts**

### 2.1.3 Validated Concepts

The following concepts have been validated:

- none

## 2.2 Specifications

### 2.2.1 New Specifications

The following new specifications have been introduced via concepts:

- AP SWS SafeHardwareAcceleration
  (Specification of Safe Hardware Acceleration, UID 1088)
- AP RS HWTestManager
  (Requirements on HWTestManager, UID 1130)
- AP SWS RemotePersistency
  (Specification of Remote Persistency, UID 1099)

In addition to the above listed new specifications, the following documents have been added with this release:

- AP MOD MachineConfigurationParameters
  (Specification of Machine Configuration Parameters, UID 1113)

### 2.2.2 Migrated Specifications

With this release, the following specifications have been moved from or to Adaptive Platform:

- none

### 2.2.3 Obsolete Specifications

The following specification has been set to status "obsolete" in this release:

- none

### 2.2.4 Removed Specifications

The following specification has been set to status "removed" in this release:

- AP RS ManifestSpecification
  (Requirements on Manifest Specification, UID 712)
- AP RS IdentityAndAccessManagement
  (Requirements on Identity and Access Management, UID 899)

### 2.2.5 Reworked Specifications

The following specifications have been changed fundamentally in this release:

- none

### 2.2.6 Moved Specification Parts

The following specification parts have been moved to other documents in this release:

- none

### 2.2.7 Renamed Specifications

The following specifications have been renamed in this release:

- none

## 2.3 Release Documentation

There are no major changes in the Release Documentation.

# 3 Specification Overview

The published specifications are divided into the clusters:

- ReleaseDocumentation
- AdaptiveFoundation
- AdaptiveServices
- General
- MethodologyAndTemplates

The assignment of the specifications to these clusters is shown below.

| Specification Name | Long Name | File Name | Life cycle changes |
|---|---|---|---|
| **ReleaseDocumentation** | | | |
| AP TR ReleaseOverview | Adaptive Platform Release Overview | AUTOSAR_AP_TR_ReleaseOverview | |
| AP TR SpecificationHashes | AUTOSAR Adaptive Platform Specification Hashes | AUTOSAR_AP_TR_SpecificationsHashes | |
| **AdaptiveFoundation** | | | |
| AP EXP ARAComAPI | Explanation of ara::com API | AUTOSAR_AP_EXP_ARAComAPI | |
| AP EXP IPsecImplementationGuidelines | Explanation of IPsec Implementation Guidelines | AUTOSAR_AP_EXP_IPsecImplementationGuidelines | |
| AP EXP IdentityAndAccessManagement | Explanation of Identity and Access Management | AUTOSAR_AP_EXP_IdentityAndAccessManagement | |
| AP EXP MACsec | Explanation of MACsec and MKA Protocols implementation and configuration guidelines | AUTOSAR_AP_EXP_MACsec | |
| AP EXP SOVD | Explanation of Service-Oriented Vehicle Diagnostics | AUTOSAR_AP_EXP_SOVD | |
| AP RS CommunicationManagement | Requirements on Communication Management | AUTOSAR_AP_RS_CommunicationManagement | |
| AP RS Cryptography | Requirements on Cryptography | AUTOSAR_AP_RS_Cryptography | |
| AP RS ExecutionManagement | Requirements on Execution Management | AUTOSAR_AP_RS_ExecutionManagement | |
| AP RS OperatingSystemInterface | Requirements on Operating System Interface | AUTOSAR_AP_RS_OperatingSystemInterface | |
| AP RS Persistency | Requirements on Persistency | AUTOSAR_AP_RS_Persistency | |
| AP RS PlatformHealthManagement | Requirements on Platform Health Management | AUTOSAR_AP_RS_PlatformHealthManagement | |
| AP SWS CommunicationManagement | Specification of Communication Management | AUTOSAR_AP_SWS_CommunicationManagement | |
| AP SWS Core | Specification of Adaptive Platform Core | AUTOSAR_AP_SWS_Core | |
| AP SWS Cryptography | Specification of Cryptography | AUTOSAR_AP_SWS_Cryptography | |

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| Specification Name | Long Name | File Name | Life cycle changes |
|---|---|---|---|
| AP SWS Diagnostics | Specification of Diagnostics | AUTOSAR_AP_SWS_Diagnostics | |
| AP SWS Execution Management | Specification of Execution Management | AUTOSAR_AP_SWS_ExecutionManagement | |
| AP SWS Firewall | Specification of Firewall for Adaptive Platform | AUTOSAR_AP_SWS_Firewall | |
| AP SWS IntrusionDetection SystemManager | Specification of Intrusion Detection System Manager for Adaptive Platform | AUTOSAR_AP_SWS_IntrusionDetectionSystemManager | |
| AP SWS LanguageBindingFor ModeledAPdatatypes | Specification of Language Binding for modeled AP data types | AUTOSAR_AP_SWS_LanguageBindingForModeledAPdatatypes | |
| AP SWS LogAndTrace | Specification of Log and Trace | AUTOSAR_AP_SWS_LogAndTrace | |
| AP SWS NetworkManagement | Specification of Network Management | AUTOSAR_AP_SWS_NetworkManagement | |
| AP SWS OperatingSystem Interface | Specification of Operating System Interface | AUTOSAR_AP_SWS_OperatingSystemInterface | |
| AP SWS Persistency | Specification of Persistency | AUTOSAR_AP_SWS_Persistency | |
| AP SWS PlatformHealth Management | Specification of Platform Health Management | AUTOSAR_AP_SWS_PlatformHealthManagement | |
| AP SWS RawDataStream | Specification of Raw Data Stream | AUTOSAR_AP_SWS_RawDataStream | |
| AP SWS TimeSynchronization | Specification of Time Synchronization | AUTOSAR_AP_SWS_TimeSynchronization | |
| AP TR DDSSecurityIntegration | Integration of DDS Security | AUTOSAR_AP_TR_DDSSecurityIntegration | |
| **AdaptiveServices** | | | |
| AP EXP AutomotiveAPI | Explanation of Automotive API | AUTOSAR_AP_EXP_AutomotiveAPI | |
| AP EXP SafeHardware AccelerationAPI | Explanation of Safe API for hardware accelerators | AUTOSAR_AP_EXP_SafeHardwareAccelerationAPI | |
| AP EXP SensorInterfaces | Explanation of Sensor Interfaces | AUTOSAR_AP_EXP_SensorInterfaces | |
| AP RS AutomatedDriving Interfaces | Requirements on Automated Driving Interfaces | AUTOSAR_AP_RS_AutomatedDrivingInterfaces | |
| AP RS AutomotiveAPIGateway | Requirements on Automotive API Gateway | AUTOSAR_AP_RS_AutomotiveAPIGateway | |
| AP RS HWTestManager | Requirements on HWTestManager | AUTOSAR_AP_RS_HWTestManager | Initial release |
| AP RS SafeHardware Acceleration | Requirements on Safe Hardware Acceleration | AUTOSAR_AP_RS_SafeHardwareAcceleration | |
| AP RS StateManagement | Requirements of State Management | AUTOSAR_AP_RS_StateManagement | |
| AP RS UpdateAnd ConfigurationManagement | Requirements on Update and Configuration Management | AUTOSAR_AP_RS_UpdateAndConfigurationManagement | |
| AP RS VehicleUpdateAnd ConfigurationManagement | Requirements on Vehicle Update and Configuration Management | AUTOSAR_AP_RS_VehicleUpdateAndConfigurationManagement | |
| AP SWS Automotive APIGateway | Specification of Automotive API Gateway | AUTOSAR_AP_SWS_AutomotiveAPIGateway | |

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| Specification Name | Long Name | File Name | Life cycle changes |
|---|---|---|---|
| AP SWS RemotePersistency | Specification of Remote Persistency | AUTOSAR_AP_SWS_RemotePersistency | Initial release |
| AP SWS SafeHardware Acceleration | Specification of Safe Hardware Acceleration | AUTOSAR_AP_SWS_SafeHardwareAcceleration | Initial release |
| AP SWS SensorInterfaces | Specification of Sensor Interfaces | AUTOSAR_AP_SWS_SensorInterfaces | |
| AP SWS StateManagement | Specification of State Management | AUTOSAR_AP_SWS_StateManagement | |
| AP SWS UpdateAnd ConfigurationManagement | Specification of Update and Configuration Management | AUTOSAR_AP_SWS_UpdateAndConfigurationManagement | |
| AP SWS VehicleUpdateAnd ConfigurationManagement | Specification of Vehicle Update and Configuration Management | AUTOSAR_AP_SWS_VehicleUpdateAndConfigurationManagement | |
| AP TR OperatingSystem TracingInterface | Technical Report on Operating System Tracing Interface | AUTOSAR_AP_TR_OperatingSystemTracingInterface | |
| AP TR VSSRepresentation | Technical Report on VSS Representation | AUTOSAR_AP_TR_VSSRepresentation | |
| **General** | | | |
| AP EXP ARARustApplications | Explanation of ARA Applications in Rust | AUTOSAR_AP_EXP_ARARustApplications | |
| AP EXP InterfacesGuidelines | Guidelines for using Adaptive Platform interfaces | AUTOSAR_AP_EXP_InterfacesGuidelines | |
| AP EXP ParallelProcessing Guidelines | Design guidelines for using parallel processing technologies on Adaptive Platform | AUTOSAR_AP_EXP_ParallelProcessingGuidelines | |
| AP EXP PlatformDesign | Explanation of Adaptive Platform Design | AUTOSAR_AP_EXP_PlatformDesign | |
| AP EXP SWArchitecture | Explanation of Adaptive Platform Software Architecture | AUTOSAR_AP_EXP_SWArchitecture | |
| AP RS General | General Requirements specific to Adaptive Platform | AUTOSAR_AP_RS_General | |
| AP TR DemandsConstraints BaseSW | Technical Report on Demands and Constraints on Base Software | AUTOSAR_AP_TR_DemandsConstraintsBaseSW | |
| AP TR SystemTests | System Tests for Adaptive Platform Demonstrator | AUTOSAR_AP_TR_SystemTests | |
| **MethodologyAndTemplates** | | | |
| AP MOD GeneralBlueprints | Collection of blueprints for AUTOSAR Adaptive Platform M1 models | AUTOSAR_AP_MOD_GeneralBlueprints | |
| AP MOD MachineConfiguration Parameters | Specification of Machine Configuration Parameters | AUTOSAR_AP_MOD_MachineConfigurationParameters | Initial release |
| AP SWS PlatformTypes | Specification of Platform Types for Adaptive Platform | AUTOSAR_AP_SWS_PlatformTypes | |
| AP TPS MachineConfiguration | Adaptive Platform Machine Configuration | AUTOSAR_AP_TPS_MachineConfiguration | |
| AP TPS ManifestSpecification | Specification of Manifest | AUTOSAR_AP_TPS_ManifestSpecification | |
| AP TPS TimingExtensions | Specification of Timing Extensions for Adaptive Platform | AUTOSAR_AP_TPS_TimingExtensions | |
| AP TR Methodology | Methodology for Adaptive Platform | AUTOSAR_AP_TR_Methodology | |

**Table 3.1: Specification overview**

# 4 Remarks to Known Technical Deficiencies

This section and its subsections provide an overview of several important technical deficiencies of the specification. All known technical deficiencies and limitations are detailed in the individual documents.

| Document UID | Document name | Document type | Section reference |
|---|---|---|---|
| 1099 | AP SWS RemotePersistency | SWS | 4.1 |
| 723 | AP SWS Diagnostics | SWS | 4.2 |
| 858 | AP SWS Persistency | SWS | 4.3 |
| 1063 | AP SWS Firewall | SWS | 4.4 |

## 4.1 AP SWS RemotePersistency

- The service interface of Remote Persistency (see [5] Chapter 9) is in a preliminary state. It is currently not available as a blueprint like the service interfaces of other functional clusters.
- Remote Persistency does not support access to files. The feature of File Storages of the underlaying Persistency is not supported.

## 4.2 AP SWS Diagnostics

- For details see chapter 4.1.1 in AP SWS Diagnostics.

## 4.3 AP SWS Persistency

The Table [6] 10.1 *"Correspondence between APMC (M1) elements and MetaModel (M2) elements for FunctionalCluster Persistency"* between model elements in the [7, TPS Manifest Specification] and the APMC model elements described in [6] Chapter 10 *"Configuration"* is in some places misleading due to limitations of the document tooling, e.g. PersistencyFile.ElementUpdateStrategy.DELETE should actually only map to PersistencyElementLevelUpdateStrategyEnum.delete and not also to PersistencyCollectionLevelUpdateStrategyEnum.delete.

## 4.4 AP SWS Firewall

Features not supported for this release:

- Firewall rule (de-)activation during runtime
- Support for OEM-defined SEVs

# 5 Release History

## 5.1 Release R25-11

| Specification Name | Specification history entry |
|---|---|
| AP EXP ARAComAPI | • Removed OBSOLETE CommunicationGroups content |
| AP EXP ARARustApplications | • No content changes |
| AP EXP AutomotiveAPI | • No content changes |
| AP EXP IPsecImplementationGuidelines | • No content changes |
| AP EXP IdentityAndAccessManagement | • Update chapter 3.1 to clarify implementation of PEP<br>• Add chapter 3.3 about access violation event reporting<br>• Remove references to RS_IAM document<br>• Update chapter 4.2 with references to functional clusters which support IAM<br>• Update chapter 5 with references to documents from relevant functional clusters |
| AP EXP InterfacesGuidelines | • Introduction of Sensor Interfaces<br>• Updates of Persistency, RawDataStream, Diagnostics, Execution Management, and Platform Health Management |
| AP EXP MACsec | • No content changes |
| AP EXP ParallelProcessingGuidelines | • No content changes |
| AP EXP PlatformDesign | • Introduction of Remote Persistency, Sensor Interfaces, and Safe Hardware Acceleration.<br>• Updates of State Management, Update and Configuration Management, Diagnostics, and Time Synchronization. |
| AP EXP SOVD | • Changes in chapter for use case "SW Update" |
| AP EXP SWArchitecture | • Added the Functional Clusters Remote Persistency and Safe Hardware Acceleration.<br>• Added Suspend-to-RAM functionality to State Management.<br>• Reworked use cases and scenarios for Platform Health Management. |
| AP EXP SafeHardwareAccelerationAPI | • Initial alignment with new SWS |
| AP EXP SensorInterfaces | • No content changes |
| AP RS AutomatedDrivingInterfaces | • No content changes; |
| AP RS AutomotiveAPIGateway | • No content changes |
| AP RS CommunicationManagement | • Extended requirements to include triggers<br>• Editorial changes |
| AP RS Cryptography | • Remove requirements tracing to RS_Main<br>• Removed:RS_CRYPTO_02006 RS_CRYPTO_02106 RS_CRYPTO_02116 |
| AP RS ExecutionManagement | • Minor changes, document clean up |
| AP RS General | • Upgrade minimum C++ version to C++17<br>• Clarification for checks after ara::core::Deinitialize<br>• Demand to define thread-safety<br>• Clarifications |
| AP RS HWTestManager | • Initial release |

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| Specification Name | Specification history entry |
|---|---|
| AP RS OperatingSystemInterface | • Updated to C++17<br>• Minor changes, document clean up |
| AP RS Persistency | • Added Remote Persistency<br>• Fixed uptrace to RS Safety<br>• Removed uptraces to RS Main |
| AP RS PlatformHealthManagement | • Removed RS_PHM_00107 (Multiple instantiation of PHM)<br>• Clarified and cleaned acronyms and abbreviations |
| AP RS SafeHardwareAcceleration | • Alignment with new AP SWS SafeHardwareAcceleration |
| AP RS StateManagement | • Adding support for Suspend to RAM |
| AP RS UpdateAndConfigurationManagement | • Removal of RS_Main uptracing |
| AP RS VehicleUpdateAndConfigurationManagement | • Removal of RS Main uptraces |
| AP SWS AutomotiveAPIGateway | • Renamed kNetworkBindingFailure to kCommunication Failure |
| AP SWS CommunicationManagement | • Added Inhibit time monitoring for events, triggers and method calls<br>• Added support for Bitfield Data Types in SOME/IP<br>• Renamed error code kNetworkBindingFailure to k CommunicationFailure<br>• Added Security Event for IAM Access violation<br>• Removed automatic conversion to upper camel case in proxies and skeletons<br>• Clarifications, bugfixes, and editorial changes |
| AP SWS Core | • Add full specification of ara::core::String, ara::core::Map, ara::core::Vector, and ara::core::Bitset<br>• Document undefined and implementation-defined behavior<br>• Harmonize Violations across data types<br>• Adapt some APIs to C++17's enhanced language and library capabilities<br>• Standardize Functional Clusters' Error Domain identifiers along with their Log and Trace settings<br>• Remove standardized stderr output for Violations<br>• Introduce various minor extensions, corrections, and clarifications to the C++ data-type specifications |
| AP SWS Cryptography | • Reworked the entire Crypto, Keys, and Certificates handling APIs |

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| Specification Name | Specification history entry |
|---|---|
| AP SWS Diagnostics | • Native Handling of SOVD Data and Operations<br>• Enhanced Snapshot Record Handling for SOVD Use Cases<br>• Harmonized Use of SOVD and UDS Extended Data Records<br>• Adapt DoIP Behavior Based on Configured DoIP Protocol Version<br>• Add SecurityEvents for DoIP<br>• Extend IAM with New SecurityEvents<br>• Add Class Derivation Details and Semantic Constraints for C++ Data Type Mapping<br>• Enhance Code Quality, Reliability, and Robustness |
| AP SWS ExecutionManagement | • Added thread safety assessment of API<br>• Clarified error reporting and error recovery<br>• Added log and violation messages<br>• Added security event for integrity check |
| AP SWS Firewall | • Updated context data for security events generated by the firewall<br>• PortInterface to API class binding introduced<br>• Added access control for FirewallStateSwitchInterface and corresponding security event for access violations<br>• Fixed various issues (missing thread-safety definition, obsolete tracing) |
| AP SWS IntrusionDetectionSystemManager | • Minor improvements and clarifications |
| AP SWS LanguageBindingForModeledAPdatatypes | • Added C++ language binding for Bitfield Data Type (CompuMethod.category = BITFIELD_TEXTTABLE) |
| AP SWS LogAndTrace | • Introduced modelled message for meta data<br>• Fixed configuration of trace switch<br>• Refactoring and editorial changes |
| AP SWS NetworkManagement | • Added PortInterface to API class binding. Network ManagementPortInterface mapped to ara::nm::Network Handle<br>• The algorithm for Handle Multiple Network Requests for Partial Networking is moved out of the document<br>• Editorial changes |
| AP SWS OperatingSystemInterface | • Updated to C++17<br>• Minor changes, document clean up |
| AP SWS Persistency | • Introduced write-only-once semantics<br>• Introduction of APMC<br>• Reworked ara::per::FileStorage hierarchy<br>• Several additional small improvements |
| AP SWS PlatformHealthManagement | • Description of security issues extended<br>• Chapter of Reporting extended |
| AP SWS PlatformTypes | • No content changes |
| AP SWS RawDataStream | • Renamed RawErrorDomain -> RdsErrorDomain<br>• Editorial changes and bugfixes |

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| Specification Name | Specification history entry |
|---|---|
| AP SWS RemotePersistency | • Initial release |
| AP SWS SafeHardwareAcceleration | • Initial release |
| AP SWS SensorInterfaces | • No Content changes; |
| AP SWS StateManagement | • Adding support for Suspend to RAM<br>• Introduction of ErrorCodes for StateMachines<br>• Introduction of ActionListTimeout<br>• Clarifying the order for ActionList processing |
| AP SWS TimeSynchronization | • Add rate correction limit checks<br>• Add rate correction state to Time Base status<br>• Harmonize TimeSyncCorrection and GlobalTime CorrectionProps<br>• Define thread-safety for runtime registered handlers |
| AP SWS UpdateAndConfigurationManagement | • Convert M2 modeling to APMC |
| AP SWS VehicleUpdateAndConfigurationManagement | • Add RegisterSoftwarePackage use case |
| AP TPS MachineConfiguration | • Support interaction between functional clusters<br>• Add parameters that conform to specific regular expressions<br>• Add reference to Traceable |
| AP TPS ManifestSpecification | • Improve support for SOVD<br>• Add support for suspend-to-RAM<br>• Rework support for cryptography<br>• minor corrections / clarifications / editorial changes |
| AP TPS TimingExtensions | • No content changes |
| AP TR DDSSecurityIntegration | • No content changes |
| AP TR DemandsConstraintsBaseSW | • No content changes |
| AP TR Methodology | • Editorial changes - removal of FO RS Methodology |
| AP TR OperatingSystemTracingInterface | • No content changes |
| AP TR ReleaseOverview | • Release Life Cycle Status: R25-11 is in Evolution, R25-11 supersedes R24-11 |
| AP TR SystemTests | • No content changes |
| AP TR VSSRepresentation | • No content changes |

**Table 5.1: Overview of specification changes in R25-11**