AUTOSAR Overview and Classic Platform

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Overview

AUTOSAR Overview and Classic Platform

- The AUTOSAR Development Community

- AUTOSAR Classic Platform - The Release 4.2
  - Concepts overview
  - Major achievements

- Future developments
  - AUTOSAR Products Overview
  - Releases Roadmap
  - Release 4.3
More than 70 companies active in the development of the standard

More than 250 persons active in technical workgroups
AUTOSAR Development
Technical workgroups

WP-A
Software Architecture
- WP-A-LIB Libraries
- WP-A-PRODERR Production Errors

WP-A1
VFB and RTE

WP-A2
COM Stack

WP-A3
Functional Safety

WP-A4
Diagnostics

WP-A5
MCAL

WP-M
Methodology and Templates
- WP-M-METH Methodology
- WP-M-GST Generic Structure Template
- WP-M-SWCT Software Component Template
- WP-M-SYST System Template ECU Configuration
- WP-M-TIMEX Timing Extensions

WP-M1
Timing Analysis

WP-M
Subgroups
- WP-M-METH Methodology
- WP-M-GST Generic Structure Template
- WP-M-SWCT Software Component Template
- WP-M-SYST System Template ECU Configuration
- WP-M-TIMEX Timing Extensions

WP-I
Application Interfaces
- WP-I-BODY Body and Comfort
- WP-I-ENGINE Powertrain Engine
- WP-I-TRSM Powertrain Transmission
- WP-I-CHASSIS Chassis Control
- WP-I-OCSAFE Occupant and Pedestrian Safety

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WP-T
Acceptance Test

WP-R-JP
Japan

WP-X-SEC
Security

WP-X-VAL
Validation

Cross-product concerns

Legend:
- Lead Work Package
- Work Package
- Subgroups

+ Workgroups for Adaptive Platform
+ Concept workgroups
+ Non-technical workgroups
+ Supporting Functions
Evolution of AUTOSAR Classic Platform
The Release 4.2

AUTOSAR Classic Platform
Release 4.2.2

218
Specification documents

26.000
Requirements and specification items

19.600
Specification pages
Release 4.2
Enhanced support for IP / Ethernet communication

- Introduction of transformers to support serialization/de-serialization of large and complex data.
- E2E and SOME/IP standard transformers.
- New approach for efficient handling and transmitting of large data blocks.
- New features for configuring and controlling Ethernet switches.
- IPv6 support
Release 4.2
Improved usability

- Reduced configuration and integration effort
- Enhanced support for software re-use
- Enhanced support for multi-core software architectures

Example: ECU State Manager Flex and Fixed have been improved for utilization multi-core projects
Release 4.2
Enhanced support for Functional Safety

- Improved handling of Basic SW distribution through different partitions
- Protection of software in ASIL partition against failure of QM software
- New E2E profiles to protect communication of large data.
- Extensions to support the documentation necessary for Functional Safety.
Release 4.2
Enhanced support for Security

Secure on-board communication

- Introduction of security mechanisms to identify attempts of data manipulation.
- Secure Onboard Communication (SeOC) provides means to verify data authenticity, integrity and freshness in PDU based communication.
Release 4.2
*Enhanced methodology support for distributed development*

Distributed diagnostics configuration
- Enables common exchange format for diagnostic information in an AUTOSAR project

**Use Case 1: OEM as collector for diagnostic requirements**

- **Appl. Dev.**
  - SW-Cs
  - Diagnostic Contribution (.arxml)

- **OEM**
  - Collecting and merging by OEM specific process
  - OEM Diagnostics Definitions (.doc, .xls, ...)
  - Diagnostic Description (.arxml)
  - OEM Diagnostic Extract (.arxml)

- **ECU-Supplier**
  - Supplier Diagnostic Extract (.arxml)

**Use Case 2: Supplier as collector for diagnostic requirements**

- **Appl. Dev.**
  - SW-Cs
  - Diagnostic Contribution (.arxml)

- **OEM**
  - OEM Diagnostic Extract (partially filled) (.arxml)

- **ECU-Supplier**
  - Collecting and merging by Supplier specific process
  - Mapping to EcuC (AR 4.x)
  - EcuC Parameter Values
  - ECU-Implementation

Distributed development
Release 4.2
Global Time Synchronization

- High precision local time base synchronized with the global time base.
- Synchronization between different ECUs over multiple in-vehicle networks.

Simplified example for clock hierarchy within a vehicle network architecture

Features enrichment
Evolution of AUTOSAR Classic Platform
The Release 4.2

- Increased quality of existing specifications
- Improved usability for multi-core architectures
- Enhanced support for safety and security
- New features for IP / Ethernet communication and CAN FD
- Support distributed diagnostics configuration
- Improved support for software re-use
- Integration of non-AUTOSAR systems

The Release 4.2 is a major achievement for the AUTOSAR Classic Platform
AUTOSAR Products

To keep the growing standard manageable, AUTOSAR introduces the notion of Products:

- AUTOSAR Classic Platform (CP) available, R4.2.2
- AUTOSAR Acceptance Tests (TC) available, R1.0.0
- AUTOSAR Foundation (AF) planned
- AUTOSAR Adaptive Platform (AP) planned
AUTOSAR Classic or Adaptive?

AUTOSAR Classic Platform
- Remain the first choice for deeply embedded ECUs with high demands regarding safety and deterministic execution
- Targets small and medium sized microcontrollers.

AUTOSAR Adaptive Platform
- Complements AUTOSAR Classic Platform
- Targets at high performance microcontrollers with several cores and a large amount of memory.

Adaptive Platform **does NOT** substitute the Classic Platform, which addresses different types of ECUs and use cases.
AUTOSAR Classic Platform - An Outlook: The Release 4.3

Concepts under elaboration*:

- Security policy management
- V2X Support
- Crypto Interface
- Error Detection and Correction for Communication
- Profile for Data Exchange Points
- Ethernet testability
- Decentralized Configuration (Extension)
- Extended Buffer Access Method for Rapid Prototyping
- Remote Event Communication Manager
- Hardware Test Management on Startup and Shutdown

Release 4.3 will continue the evolution of the AUTOSAR Classic Platform to sustain its long-term exploitation for series developments.

*Candidate concepts for incorporation to Release 4.3
Thank you!