AUTOSAR securing the safety and cybersecurity requirements of the Software-Defined Vehicle

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AUTOSAR securing the safety and cybersecurity requirements of the Software-Defined Vehicle

Agenda

▶ Modern Software Vehicle Architecture
▶ AUTOSAR as vertebraion of in-vehicle architecture
▶ The role of DDS in AUTOSAR and benefits to the industry
Modern Software-Defined Architecture

The SDV Dera

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Modern Software-Defined Architecture

Foundational Pillars

- Flexible Deployment
- Safety and Cybersecurity
- Standarised Communication
- Future Proof
- Decoupled from Platform

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Modern Software-Defined Architecture

Challenges

• **Scalability** – Exponential system complexity
• **Interoperability** – Guaranteeing interoperability with legacy technologies and future high-performing domains
• **Updates** – Continuous development and systems updates
• **Safety** – Managing the path to Safety
• **Business Model** – Creating a Business model that adapts to the new paradigm and enable a heterogeneous supply chain
Modern Software-Defined Architecture

Standarised and Interoperable Architecture

Sensor Fusion  Planning  Vehicle Control

AUTOSAR Classic (DDS)

Adaptive Component  Adaptive Component

Classic Component  Classic Component

DDS Application  DDS Application

ROS Component  ROS2 (DDS)

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AUTOSAR Classic

DDS Journey

- **2021**
  - Initiate development **DDS technology** specification

- **2022**
  - Incorporation of **DDS BSwM at ECU level**

- **2023**
  - Incorporation of **DDS at System level**

- **2024**
  - **Consolidation** of DDS protocols in Foundation
AUTOSAR Classic

The Role of DDS

The DDS integration in AUTOSAR Classic provides:

- DDS standard interface support
- Signal Based Publisher/Subscriber communication path
- QoS handling
- Full static configuration
AUTOSAR Adaptive

DDS Journey

2016
- Initiate development **DDS technology** specification

2018
- Incorporation of **DDS Network Binding** within ara::com functional cluster

2020
- Incorporation of **Enhanced Discovery** for the DDS Network Binding

2021
- Incorporation of **DDS Security Integration** Technical Report

2024
- **Consolidation** of DDS protocols in Foundation
AUTOSAR Adaptive

The Role of DDS

Adaptive Application

- DDS data-centric publish-subscribe model is a super pattern
- Service-oriented architectures such as that provided by ara::com can also be deployed on top of DDS while leveraging its most important features
AUTOSAR & DDS

Benefits to the Industry

• **Performance** – Enable Real-time large data communication with low latency and high reliability

• **Interoperability** – Reach every ecosystem, platform and feature set in the vehicle

• **Scalability** – Ability to adapt to the increasing range of in-vehicle communication and processing demands

• **Functional Safety and Cybersecurity** – Leverage from a wide range of vendor implementations offering functional safety implementations up to ASIL-D certification and compliance with ISO21434

• **Business Model** – Enable Vendors inside and outside the OEMs’ supply chains compete to provide built-in and off-the-shelf components that must integrate seamlessly
**AUTOSAR & DDS**

**Summary**

**DDS standardisation** enhances the already rich AUTOSAR technology offering, opening the door to one of the **most dynamic and growing technology ecosystems**.
Thank You!