



AUTOSAR Platforms and Organization

Dr.-Ing. Thomas Scharnhorst
AUTOSAR Spokesperson

Meetup
2018-04-03, Santa Clara

BMW
GROUP



BOSCH

Continental

DAIMLER



PSA
GROUPE

TOYOTA

VOLKSWAGEN
AKTIENGESELLSCHAFT

Topics

- › AUTOSAR Introduction
- › Approaches and standards
- › Developing the Adaptive Platform
- › Achievements, plans, organization



(AUTomotive Open System ARchitecture)

is a worldwide development partnership of car manufacturers, suppliers and other companies from the electronics, semiconductor and software industry.

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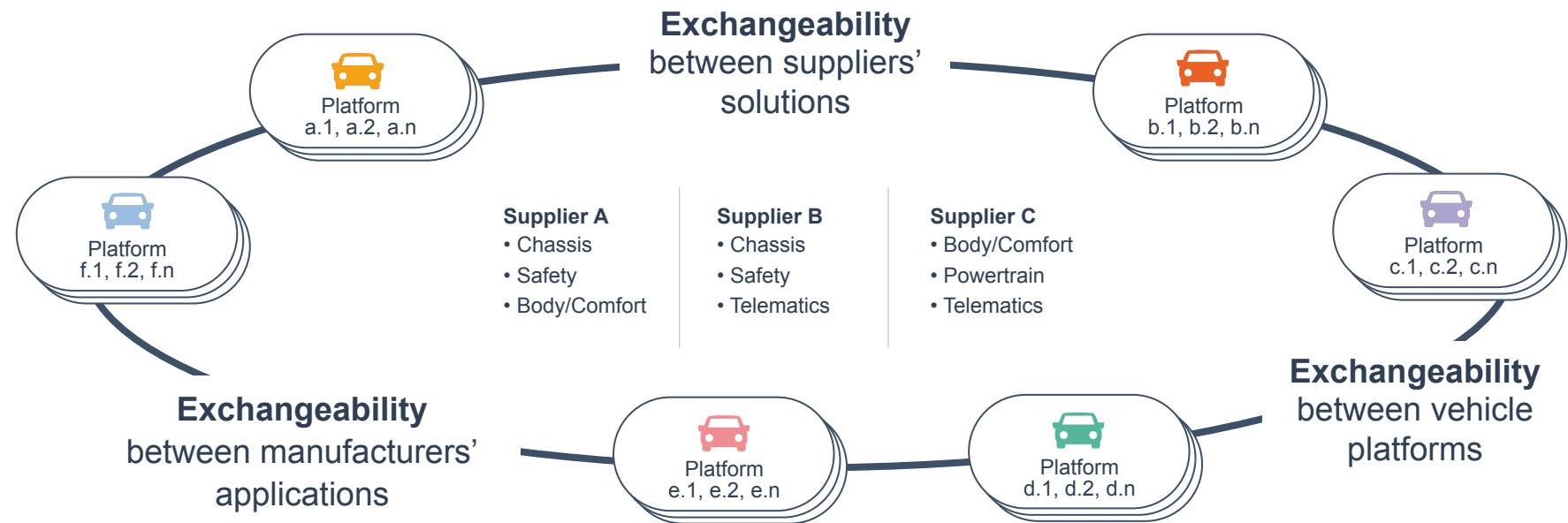


Meetup Santa Clara USA | April 2018

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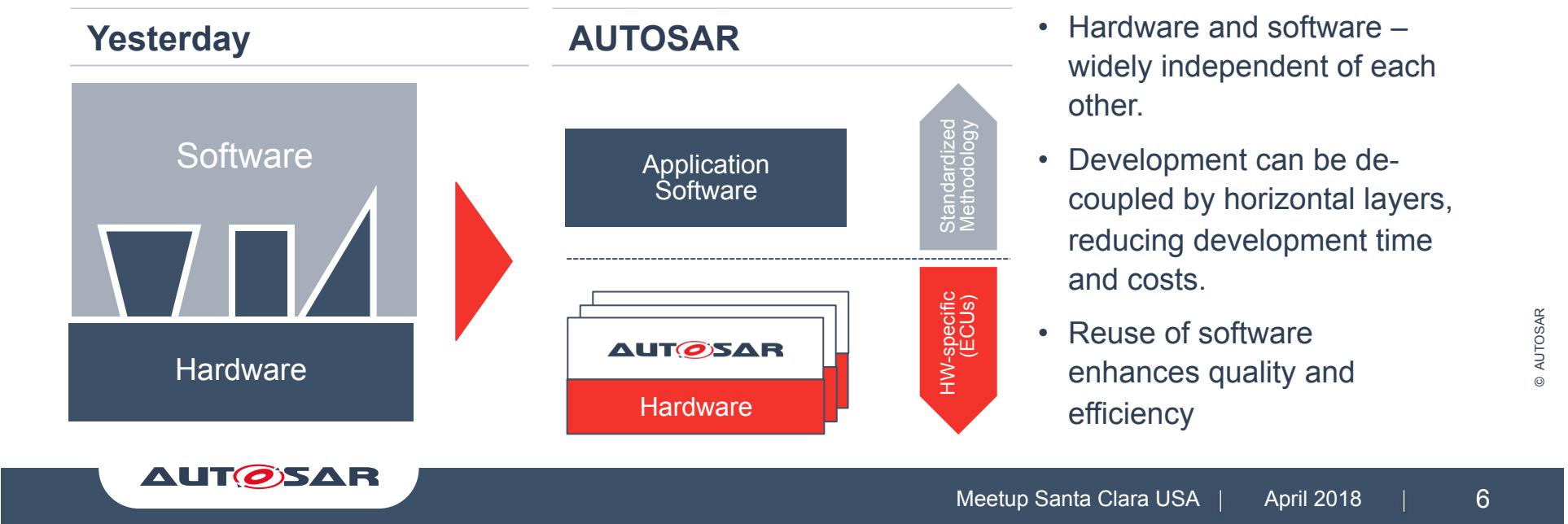
AUTOSAR Vision

AUTOSAR aims to improve complexity management of integrated E/E architectures through increased reuse and exchangeability of SW modules between OEMs and suppliers.



Aims and benefits of using AUTOSAR

AUTOSAR aims to standardize the software architecture of **Electronic Control Units (ECUs)**. AUTOSAR paves the way for innovative electronic systems that further improve performance, safety and environmental friendliness.

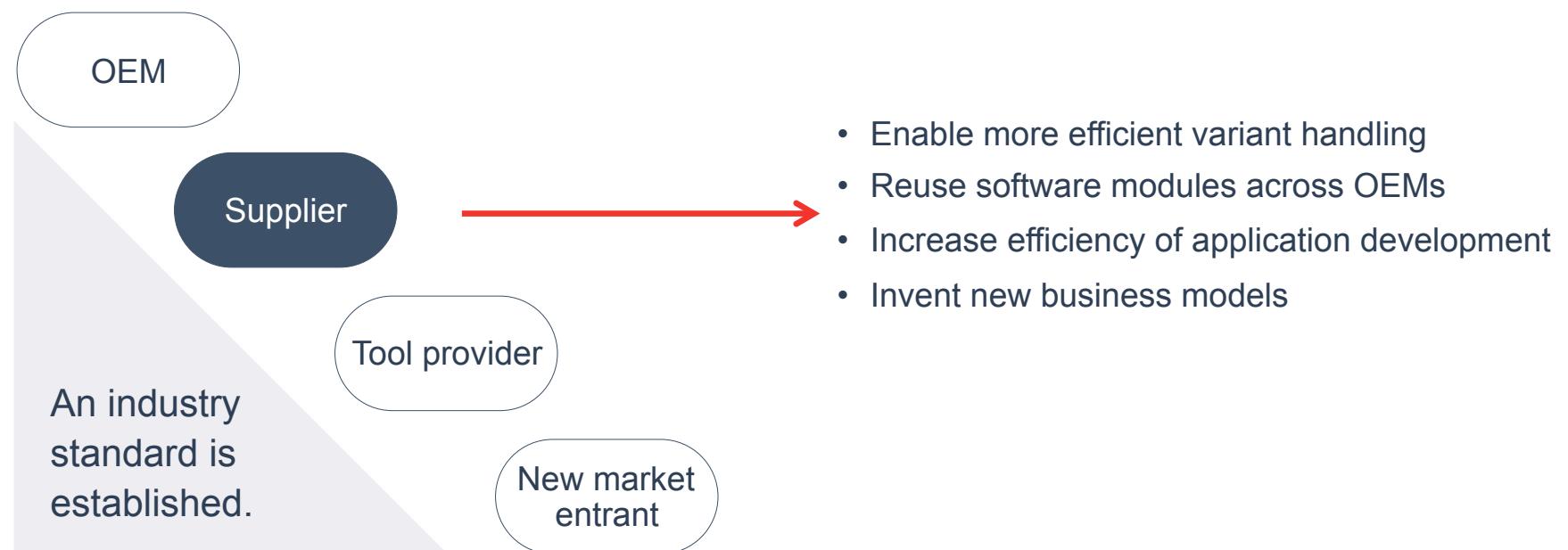


Exploitation of the standard provides significant benefits



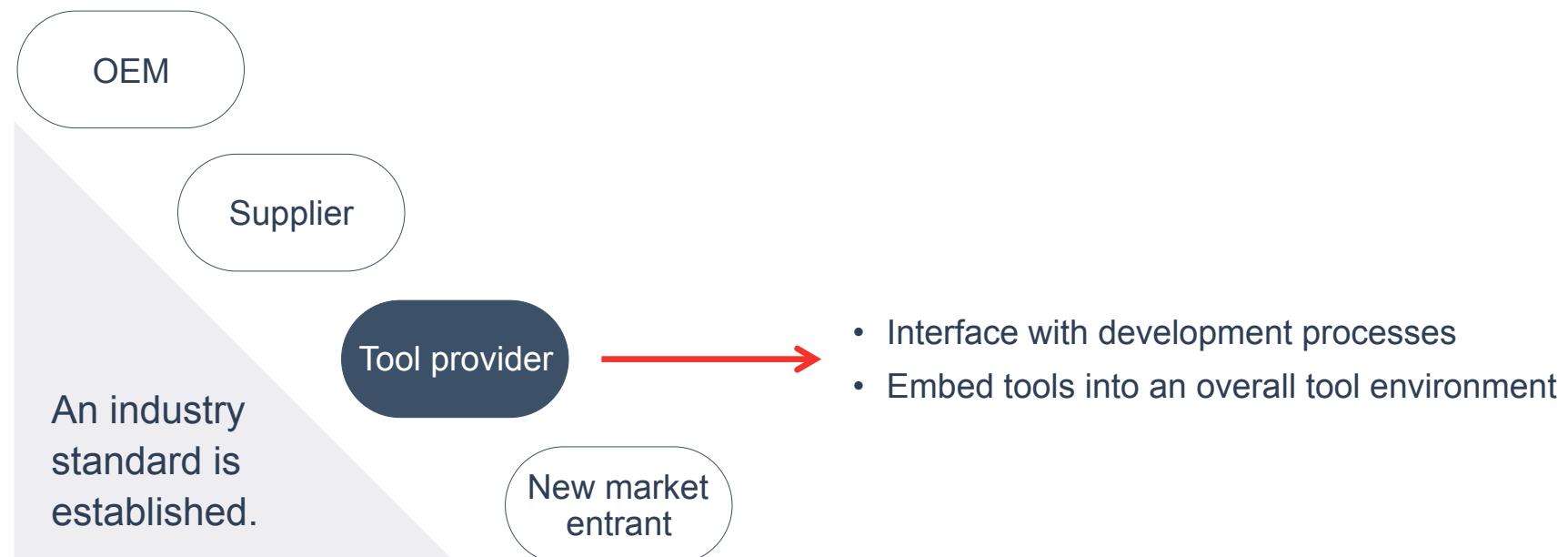
- Establish development distribution among suppliers
- Compete on innovative functions with increased design flexibility
- Simplify software and system integration
- Reduce overall software development costs

Exploitation of the standard provides significant benefits



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Exploitation of the standard provides significant benefits



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Exploitation of the standard provides significant benefits



- Enable new business models by means of standardized interfaces
- Easily understand how automotive software is developed

AUTOSAR – Core Partners and Partners



9 Core Partners

BMW Group

BOSCH

Continental

Ford

DAIMLER

PSA
GROUPE

GM

TOYOTA

VOLKSWAGEN AG

AUTOSAR



53 Premium Partners

General OEM

VOLVO TRUCKS **HONDA** **TATA MOTORS** **HYUNDAI** **VOLVO** **RENAULT** **NISSAN** **Great Wall**

Generic Tier 1

Autoliv **an assystem** **HELLA** **dSPACE** **DENSO** **JTEKT** **LEAR CORPORATION**
ADVANCE RELENTLESSLY

DELPHI **Panasonic** **ZF** **NEC** **ThyssenKrupp** **CNH INDUSTRIAL** **Valeo**

Standard Software

MathWorks **intel** **MathWorks** **KPIT** **eSOL** **VECTOR** **SCSK** **LUXOFT**

Tools and Services

ALTRAN **ETRI** **itk** **L&T Technology Services** **cea** **Deloitte** **Green Hills SOFTWARE**

TATA ELXSI LIMITED **LG Electronics** **automotive engineering** **iav** **ETAS** **DASSAULT SYSTEMES** **sodius**

ARC CORE **Fraunhofer** **SOFT INNOVATION**

Semiconductors

Infineon **RENESAS** **ST** **NXP** **Qorvo**



36 Development Partners

ANSYS

Advanced Telematic
SYSTEMS

PRQA
Programming Research

avelabs

basicworx
ENGINEERING SOFTWARE, INC.

E.S.R.LABS
EMBEDDED SOFTWARE RESEARCH LABS

INCHRON

THINK REAL-TIME

rti
Your systems. Working as one.

Timing Architects

PROVE & RUN

easycore

itemis

elcon gest

OFFIS
INSTITUTE FOR
INFORMATION TECHNOLOGY

SPIRENT

Gliwa

Fpt Software

OPENSYNERGY

LAUTERBACH

IP Camp

IncQueryLabs

EVIDENCE

osb TTtech

ixia

VALIDAS

smartbytes

nordsys

NCES

TECHNICAL

seneos

PopcornSAR

120 Associate Partners
21 Attendees

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Topics

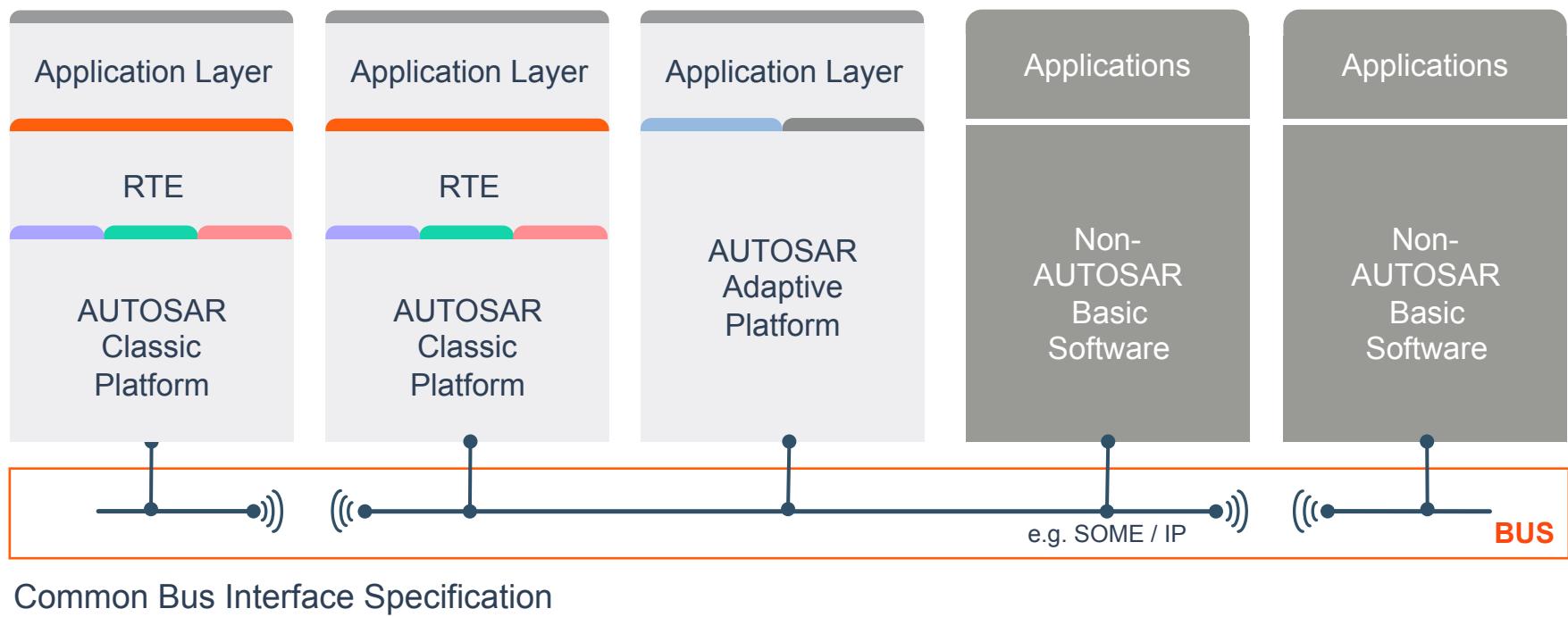
› AUTOSAR Introduction

› Approaches and standards

› Developing the Adaptive Platform

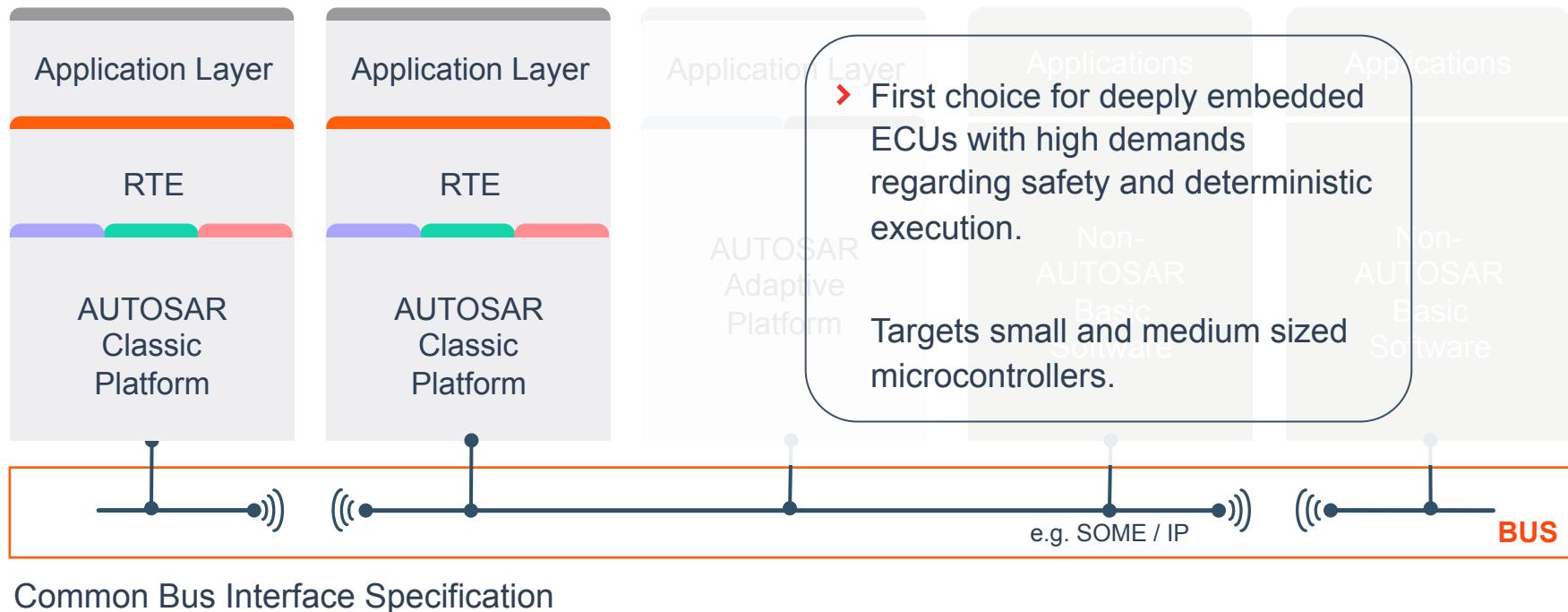
› Achievements, plans, organization

AUTOSAR standardizes two software platforms – Classic and Adaptive

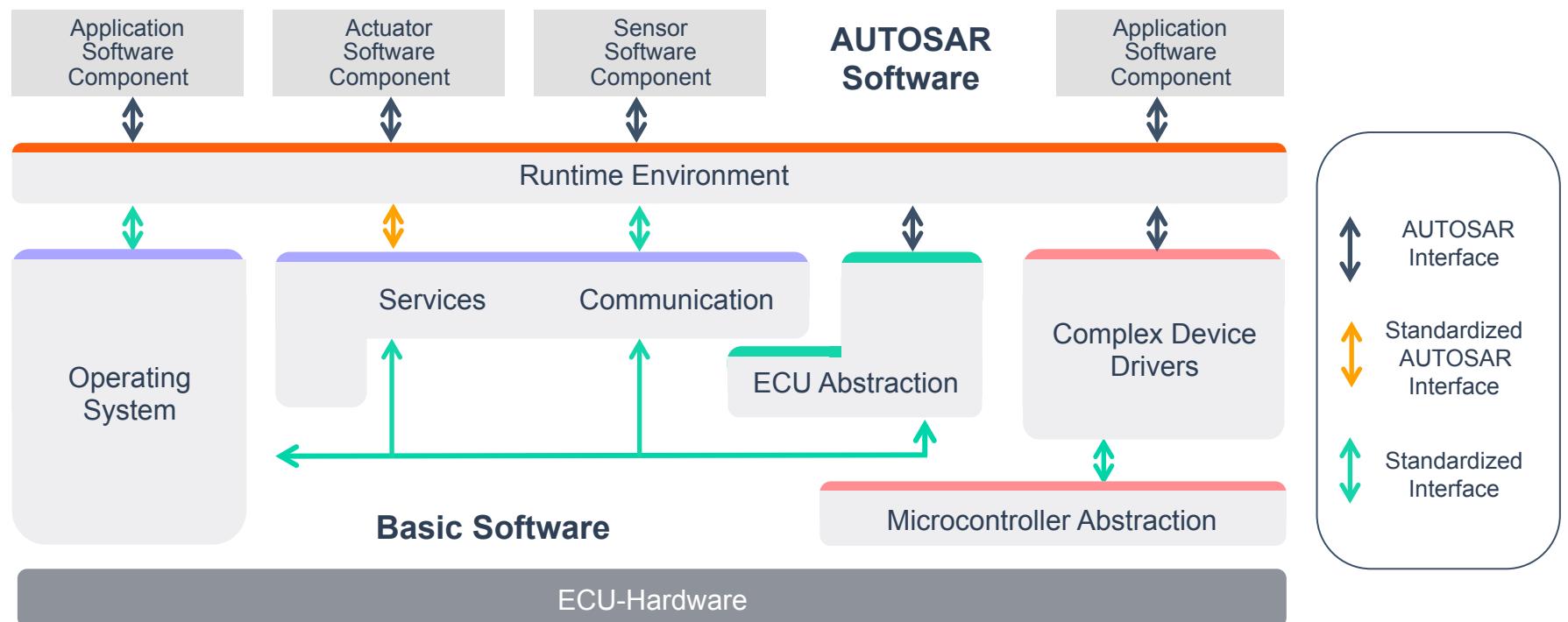


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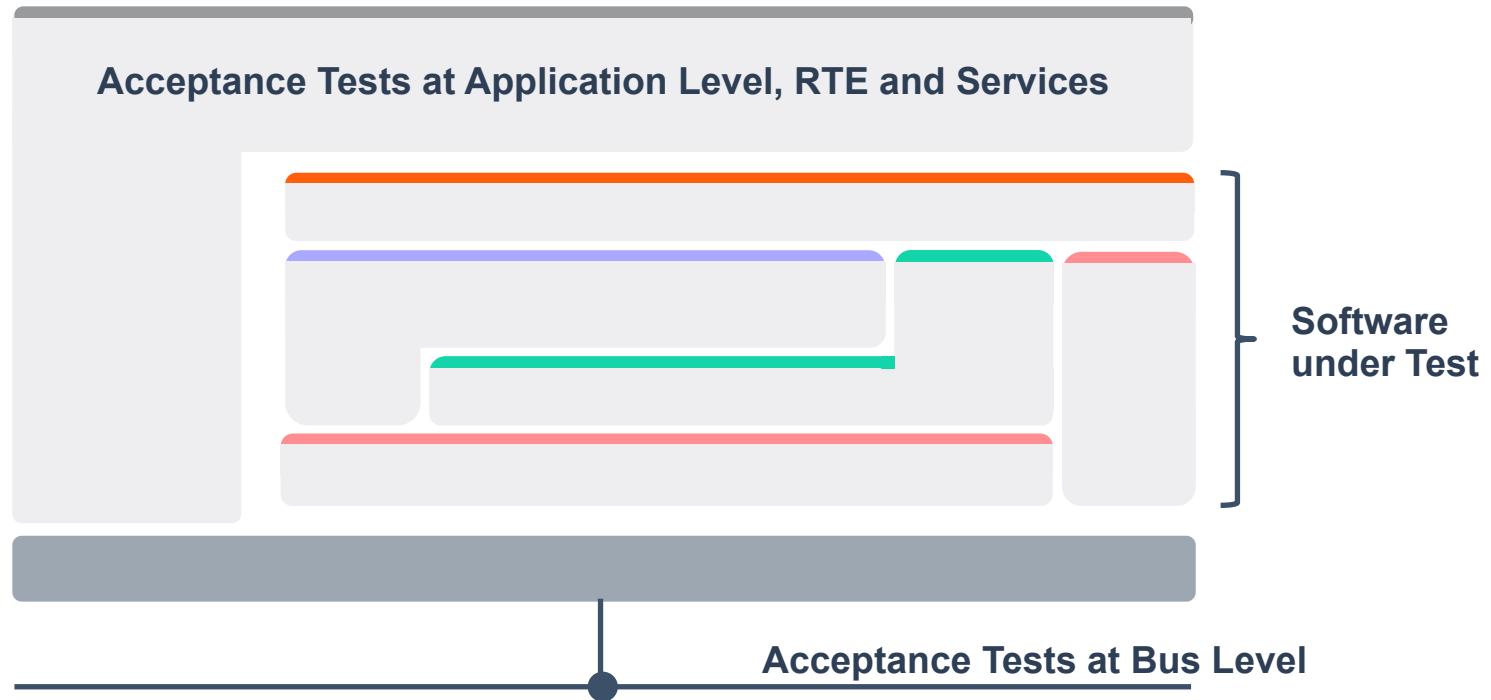
AUTOSAR Classic Platform is worldwide on the road



Software architecture of AUTOSAR Classic Platform



AUTOSAR Classic Platform Acceptance Test Architecture



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Game changer for AUTOSAR – selected main drivers

Main drivers for new automotive software systems have been determined.



- Highly automated driving

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Game changer for AUTOSAR – selected main drivers

Main drivers for new automotive software systems have been determined.

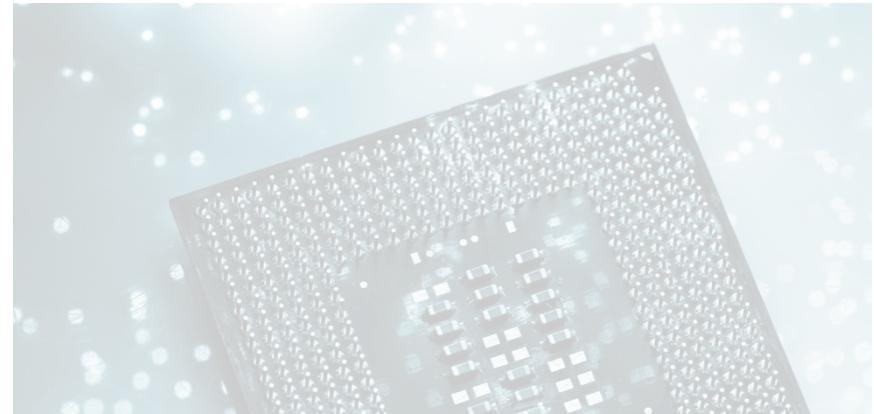


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- › Car-2-X applications
- › Internet of Things and cloud services

Game changer for AUTOSAR – selected main drivers

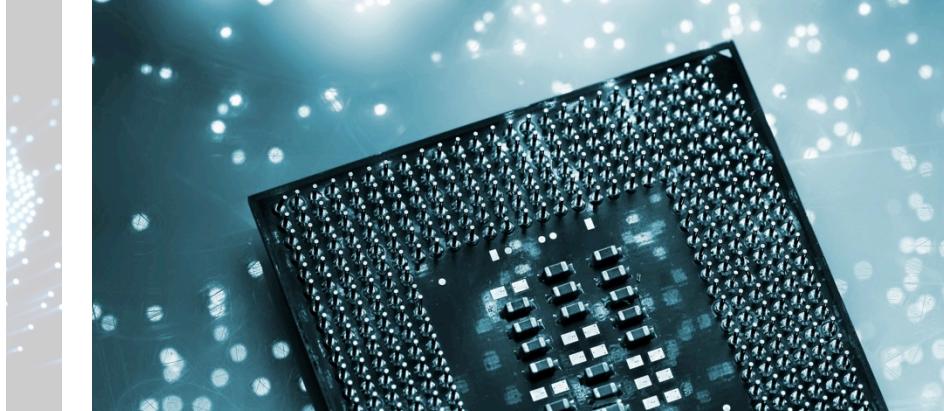
Main drivers for new automotive software systems have been determined.



- Increasing data rates

Game changer for AUTOSAR – selected main drivers

Main drivers for new automotive software systems have been determined.



- New processor technologies

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AUTOSAR Adaptive Platform – emerging from deeply embedded systems to high performance computing (HPC)

Application framework

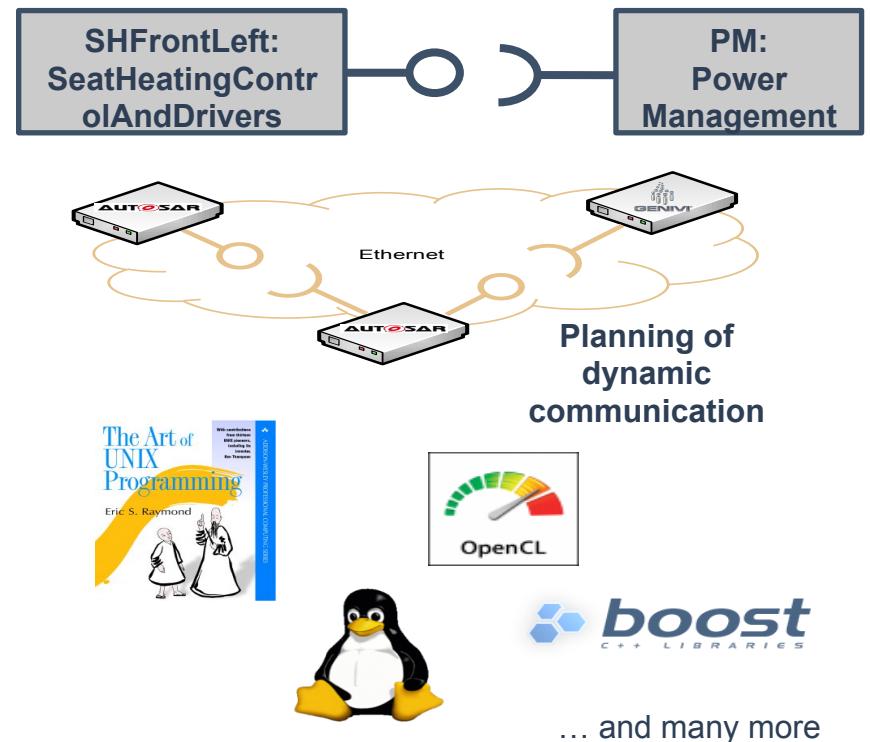
- Support for run-time configuration
- Service-oriented communication
- Partial update

Formats for design data

- Planning of dynamic behavior (e.g. constraints for scheduling and communication)
- Consider automotive specific cooperation scenarios
- Support integration with existing systems (Classic Platform)

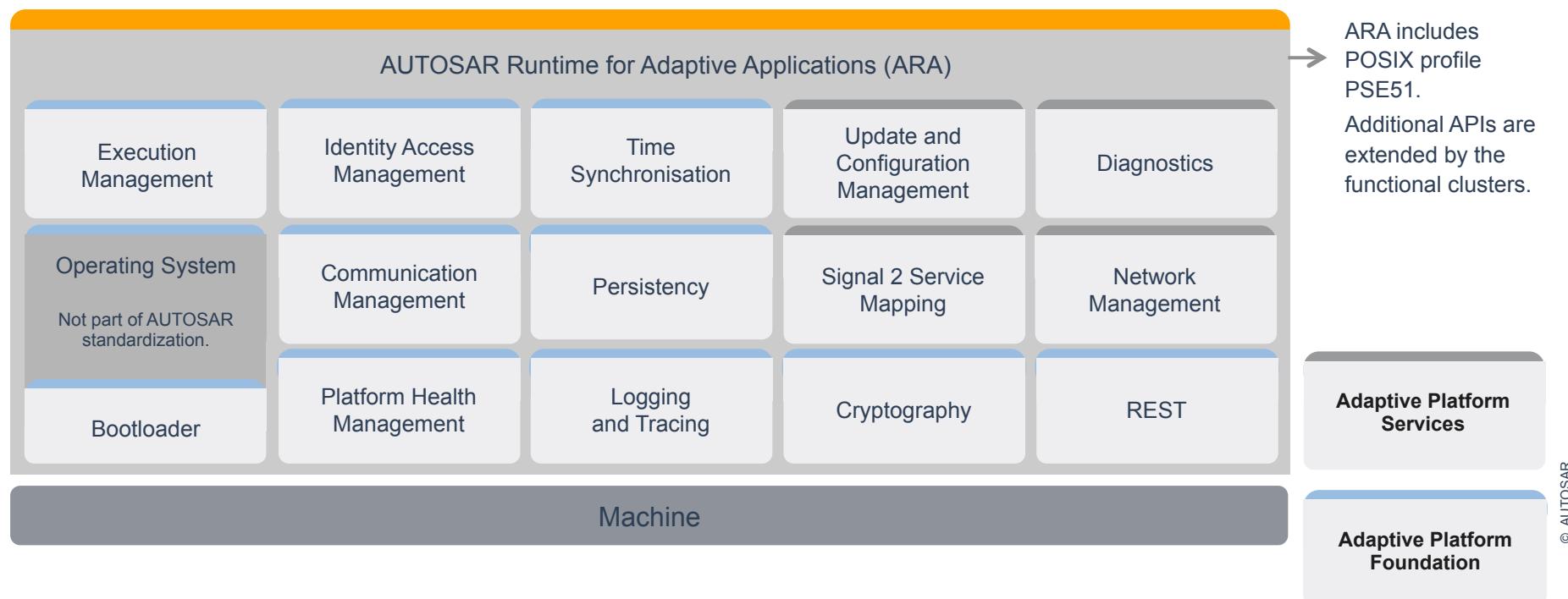
Reference architecture

- Reuse existing (non-automotive) standards
- Open Source Software utilization
- Ease software development
- Support automotive use-cases and protocols
- Reference Implementation



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AUTOSAR runtime for adaptive applications – functional clusters



Classic Platform vs. Adaptive Platform

Technical characteristics



Based on OSEK

Execution of code directly from ROM

Same address space for all applications
(MPU support for safety)

Optimized for signal-based communication
(CAN, FlexRay)

Fixed task configuration

Specification



Based on POSIX

App. is loaded from persistent memory into RAM

Each application has its own (virtual) address space (MMU support)

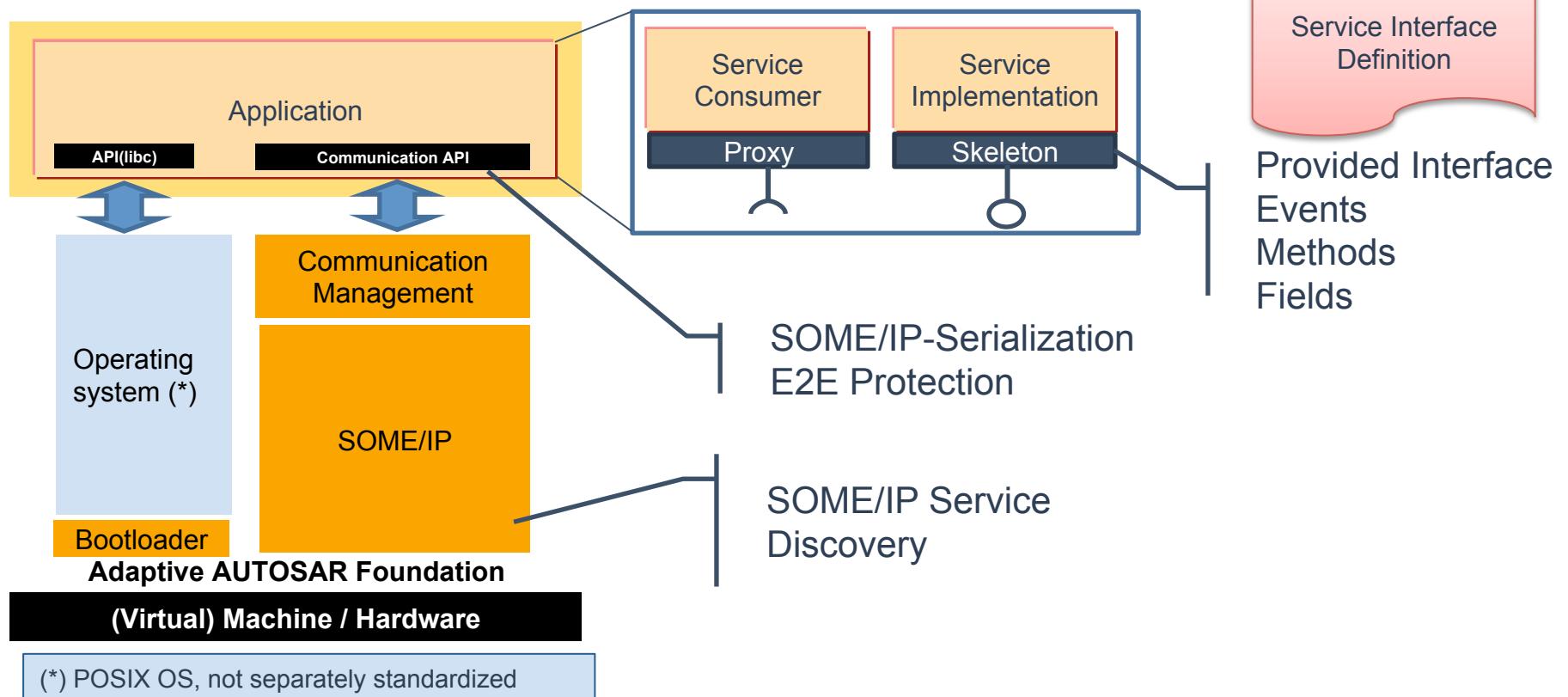
Service-oriented communication

Support of multiple (dynamic) scheduling strategies

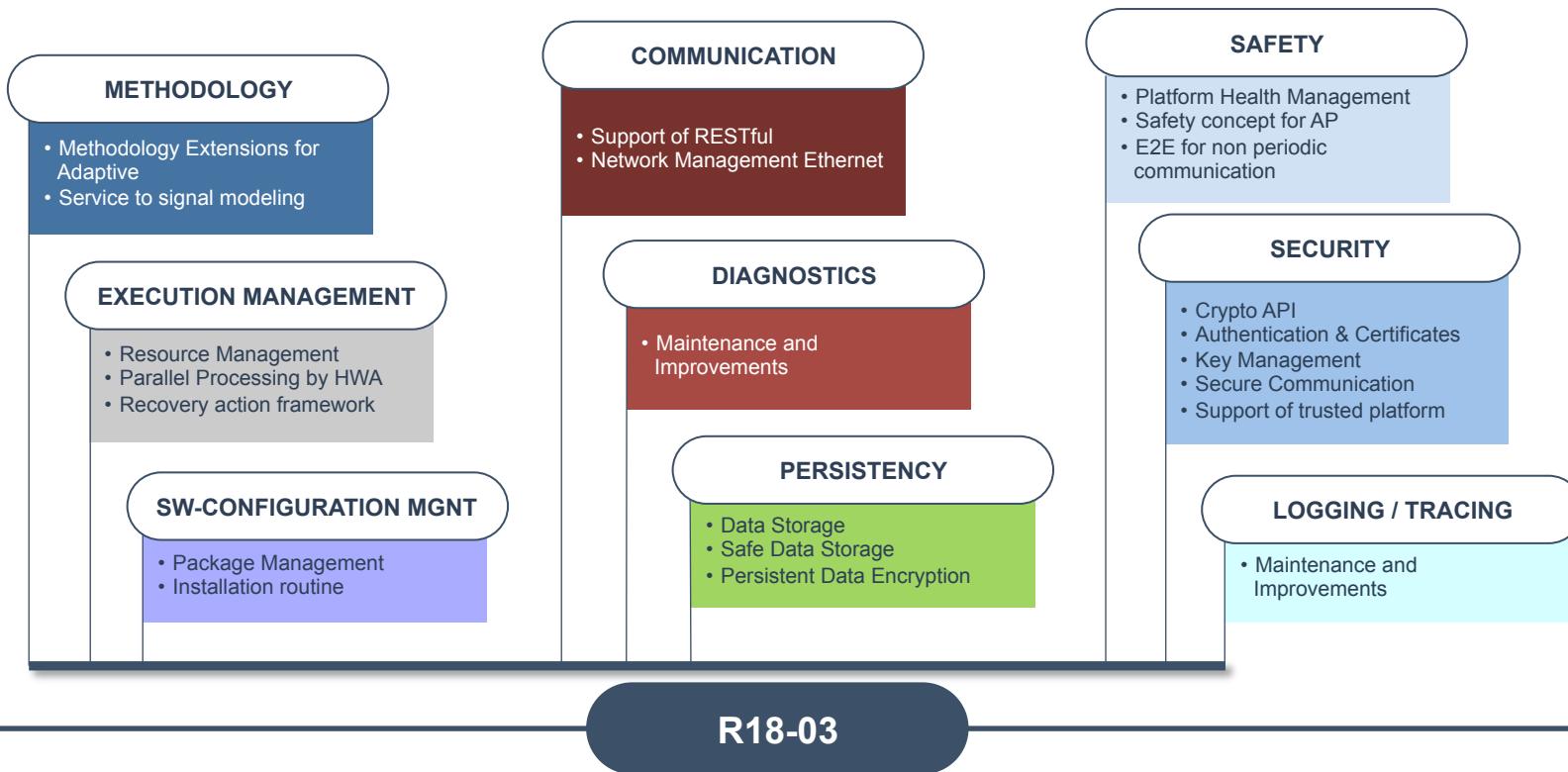
Specification and code



Service-oriented Ethernet communication (3/3)

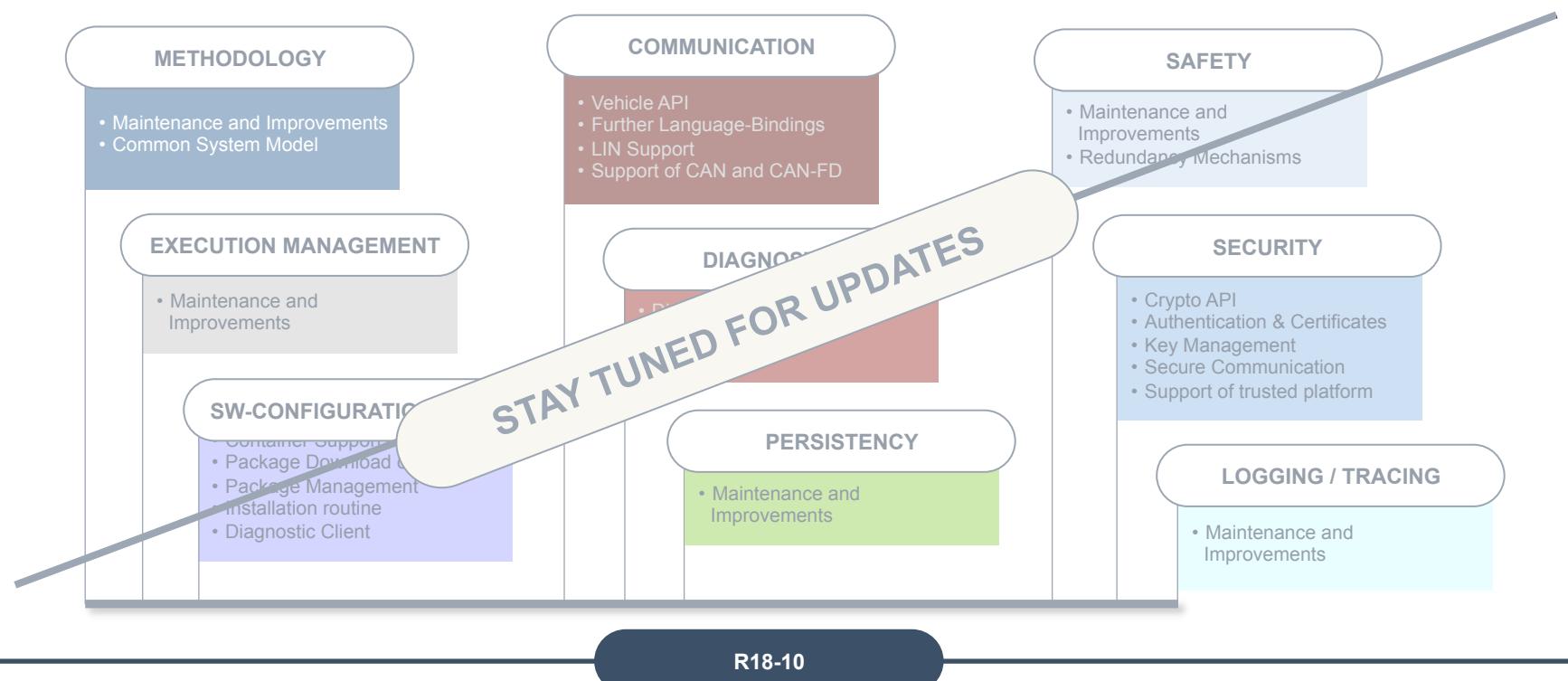


Features of Adaptive Platform Release 18-03.



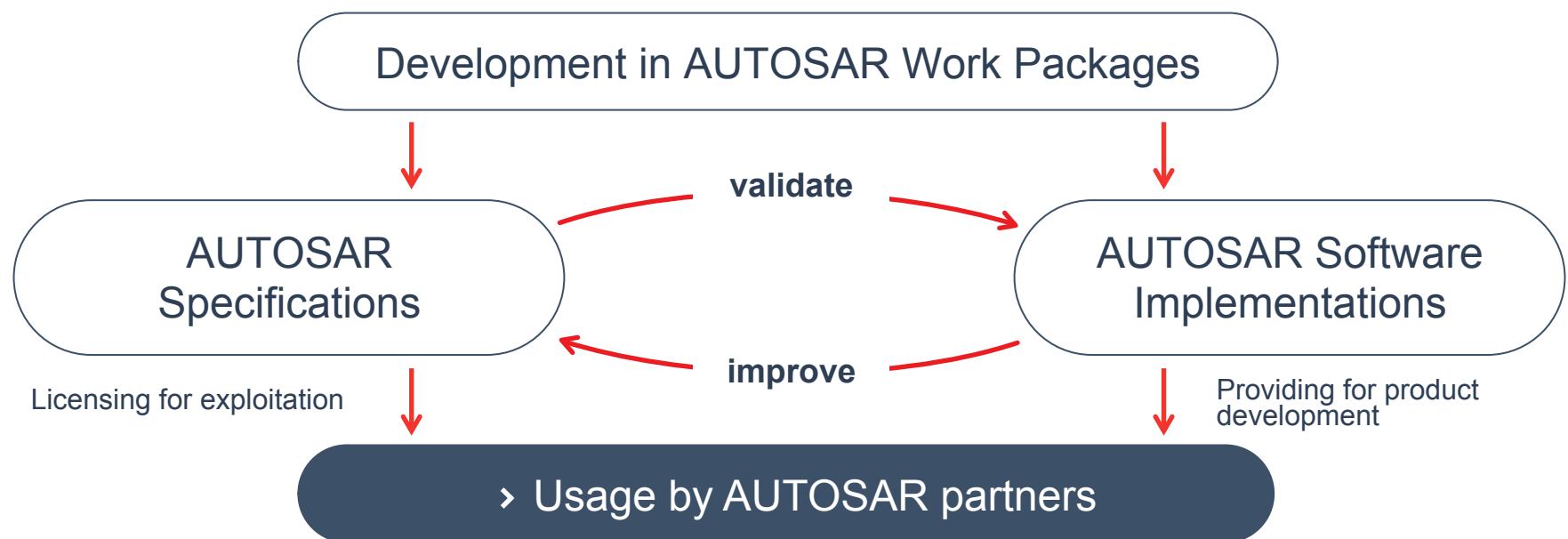
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Adaptive Platform – Planned features



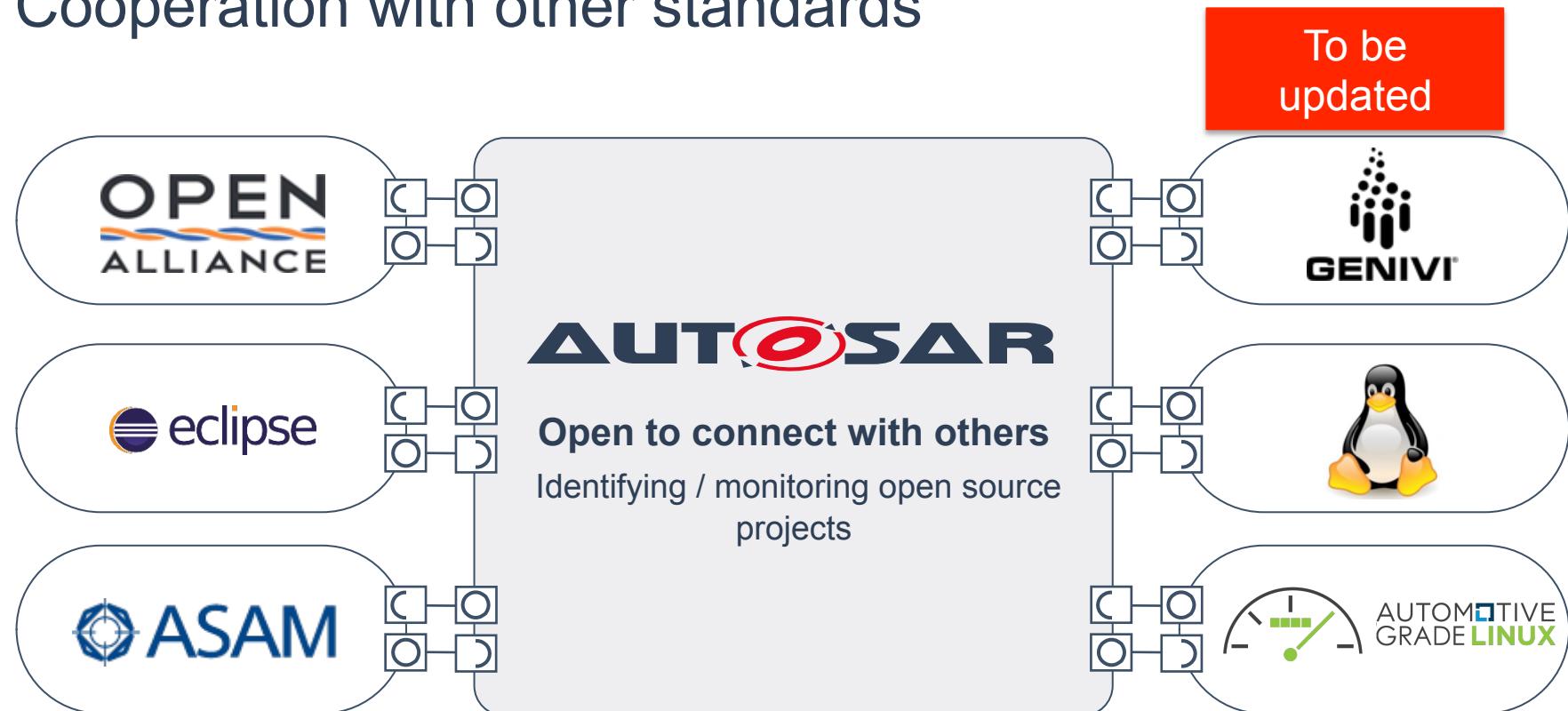
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Joint development of AUTOSAR specifications and exemplary software implementations for the AUTOSAR Adaptive Platform



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Cooperation with other standards



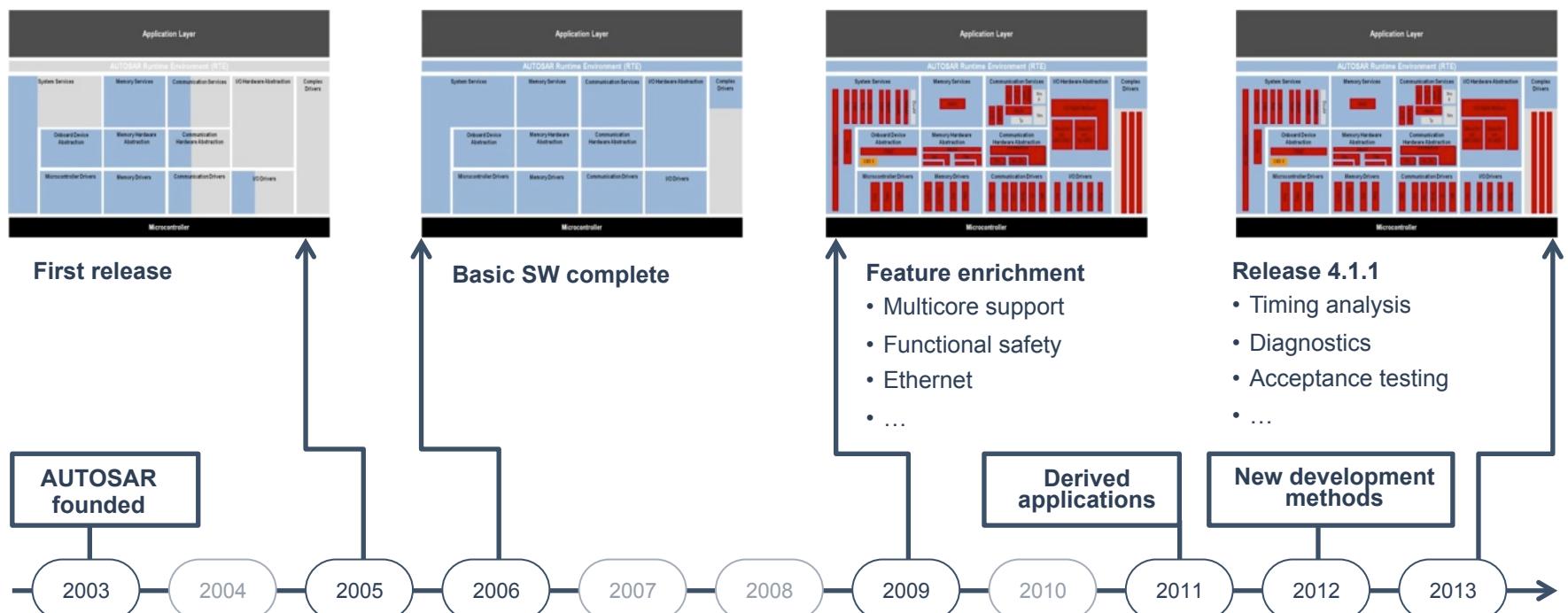
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AUTOSAR Achievements and Outlook (1/2)

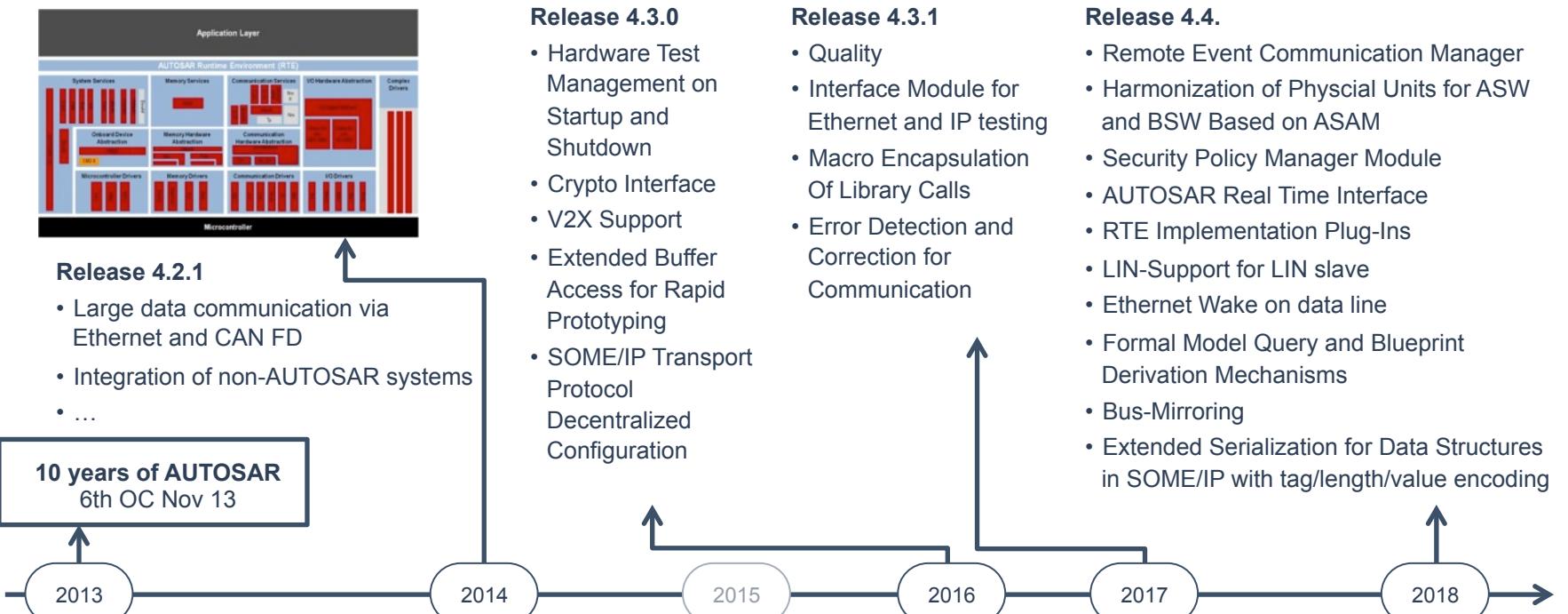
Milestones, just to name a few



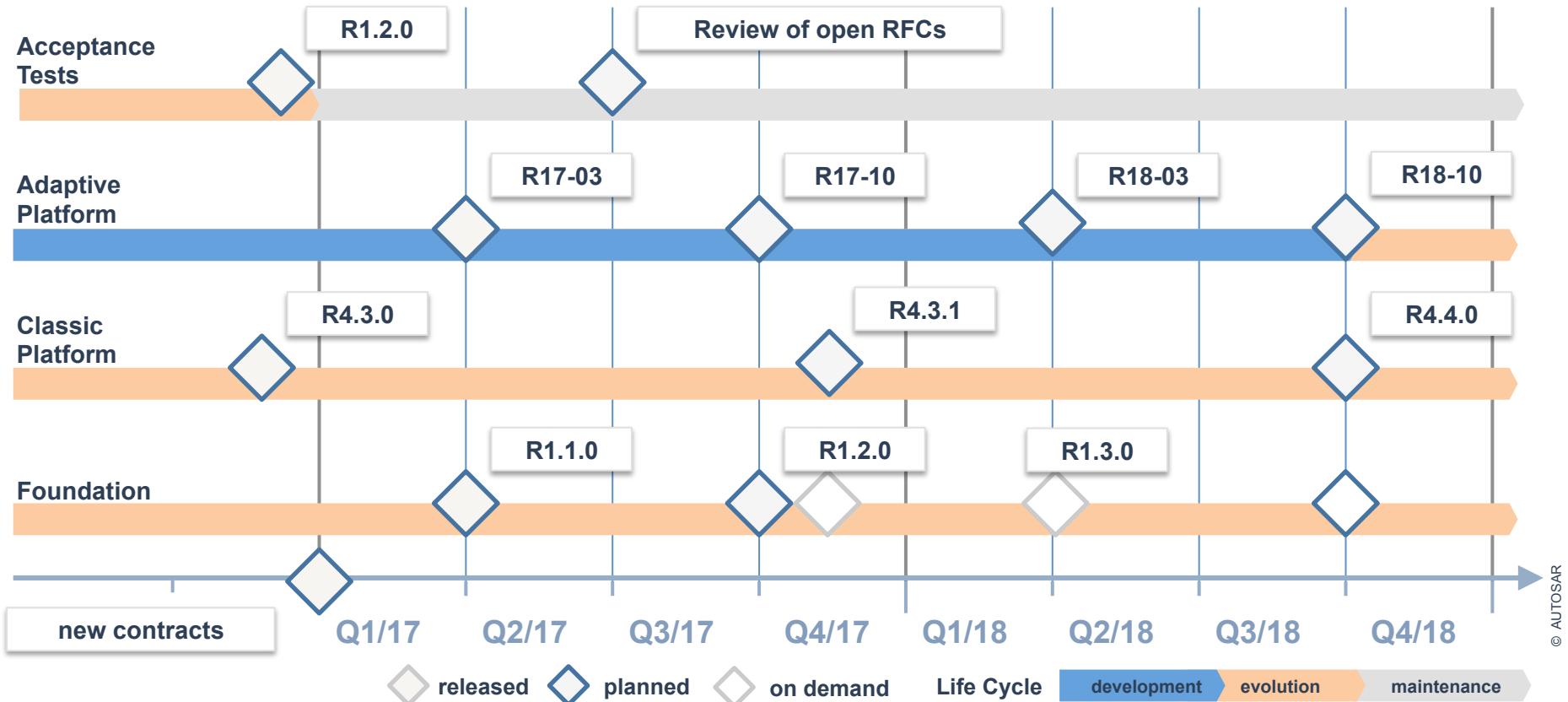
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AUTOSAR Achievements and Outlook (2/2)

Milestones, just to name a few



AUTOSAR Platform Roadmap



The AUTOSAR Core Partners are fully committed to the standardization of the AUTOSAR Adaptive Platform

- Number-crunching algorithms and high interconnectivity are the demands of future technologies. The Adaptive Platform is what we need.
- AUTOSAR is one of the key enablers for autonomous driving cars.
- AUTOSAR is our standard of choice for realizing new technologies such as autonomous driving and interconnectivity.



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Further information on AUTOSAR

For more information on AUTOSAR:

- Working results
- User Experiences
- Exploitation

You are welcome to have a look at
AUTOSAR's publications available at the
AUTOSAR website www.autosar.org.

The screenshot shows the official website of AUTOSAR (AUTomotive Open System ARchitecture). The header features the AUTOSAR logo and the tagline "Enabling continuous innovations". The main banner has a dark background with blurred city lights and the text "The standardized software framework for intelligent mobility". Below the banner, a section about the AUTOSAR partnership is shown, mentioning it is a worldwide development partnership of vehicle manufacturers, suppliers, service providers and companies from the automotive electronics, semiconductor and software industry. It highlights opportunities for Development Partners (small companies) and Associate Partners (large companies like Bosch, Continental, Daimler, Intel, PSA, Toyota, Volkswagen). The footer contains links for News, Events, Document Search, Standards, and a FAQ section.



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