



AUTOSAR Adaptive Platform Introduction

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ASAM General Assembly

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BMW Group



BOSCH

Continental

DAIMLER



PSA
GROUPE

TOYOTA

VOLKSWAGEN

AKTIENGESELLSCHAFT

Agenda



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Architectural overview



Organization



Status and Roadmap



Collaboration ASAM and AUTOSAR



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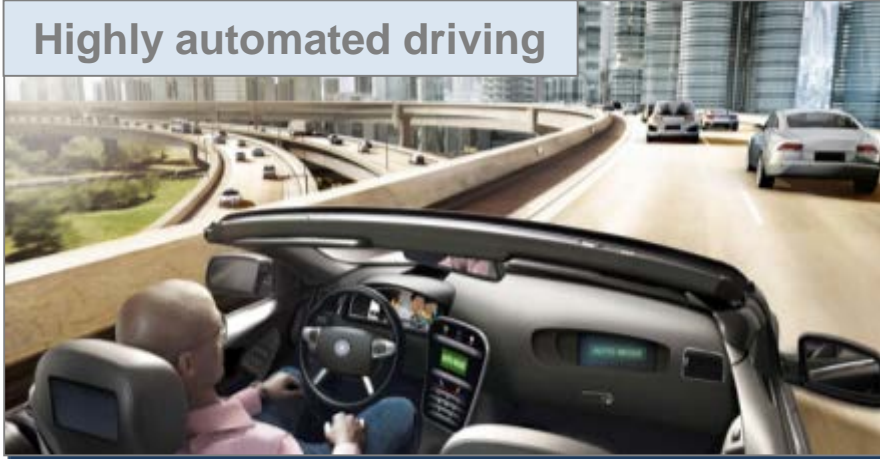


Conclusion

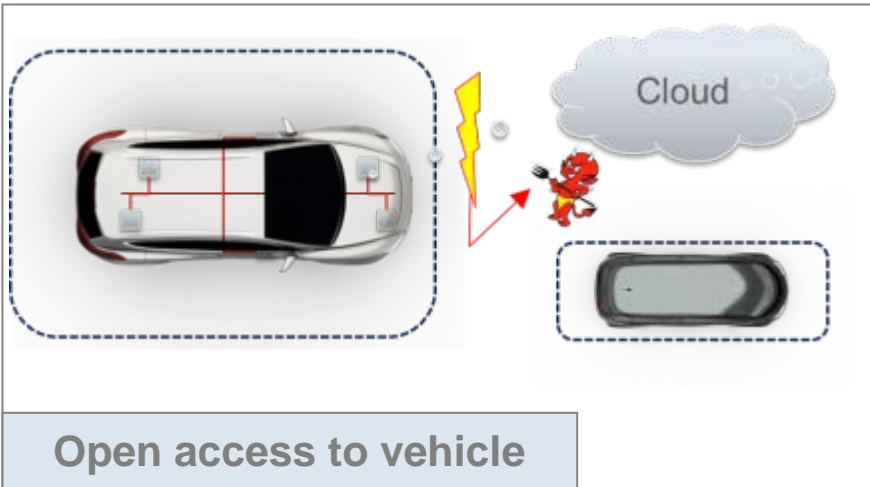
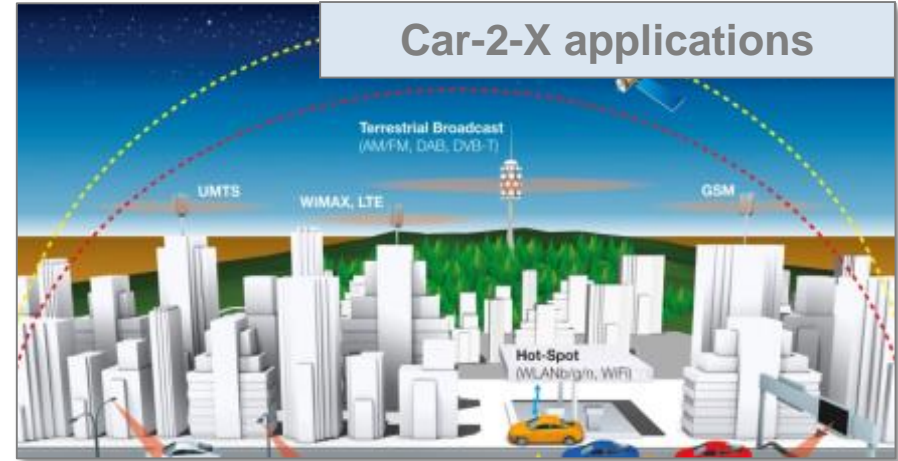
Motivation

Main drivers to develop the Adaptive Platform

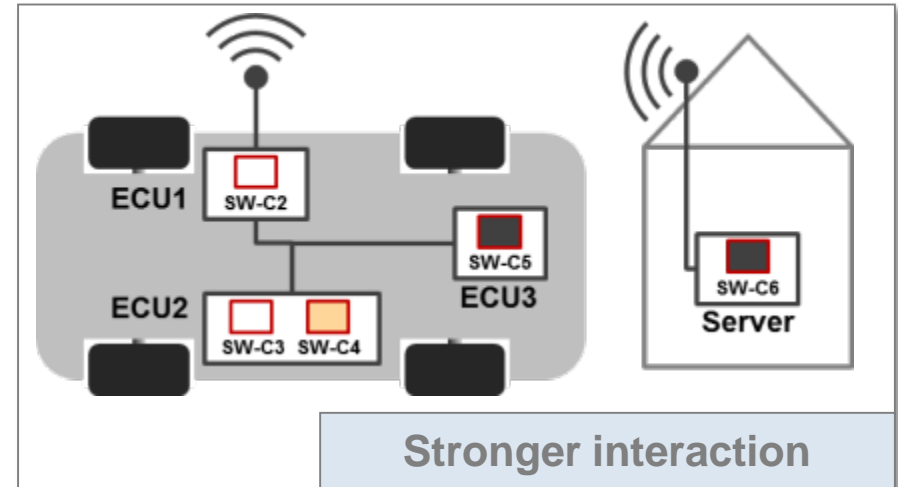
Highly automated driving



Car-2-X applications



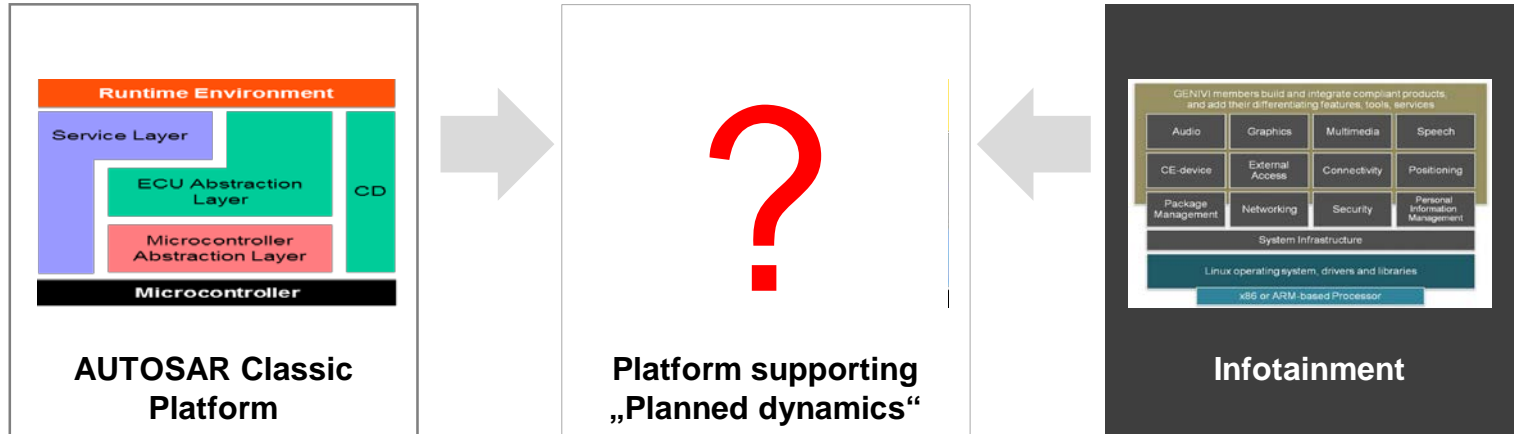
Open access to vehicle



Stronger interaction

Motivation

Another platform for different applications



Real time Requirements	High, in the range of micro-sec	Mid, in the range of milli-sec	Low, in the range of sec
Safety Criticality	High, up to ASIL-D	High, at least ASIL-B	Low, QM
Computing power	Low, ~ 1000 DMIPs	High, > 20.000 DMIPs	High, ~ 10.000 DMIPs

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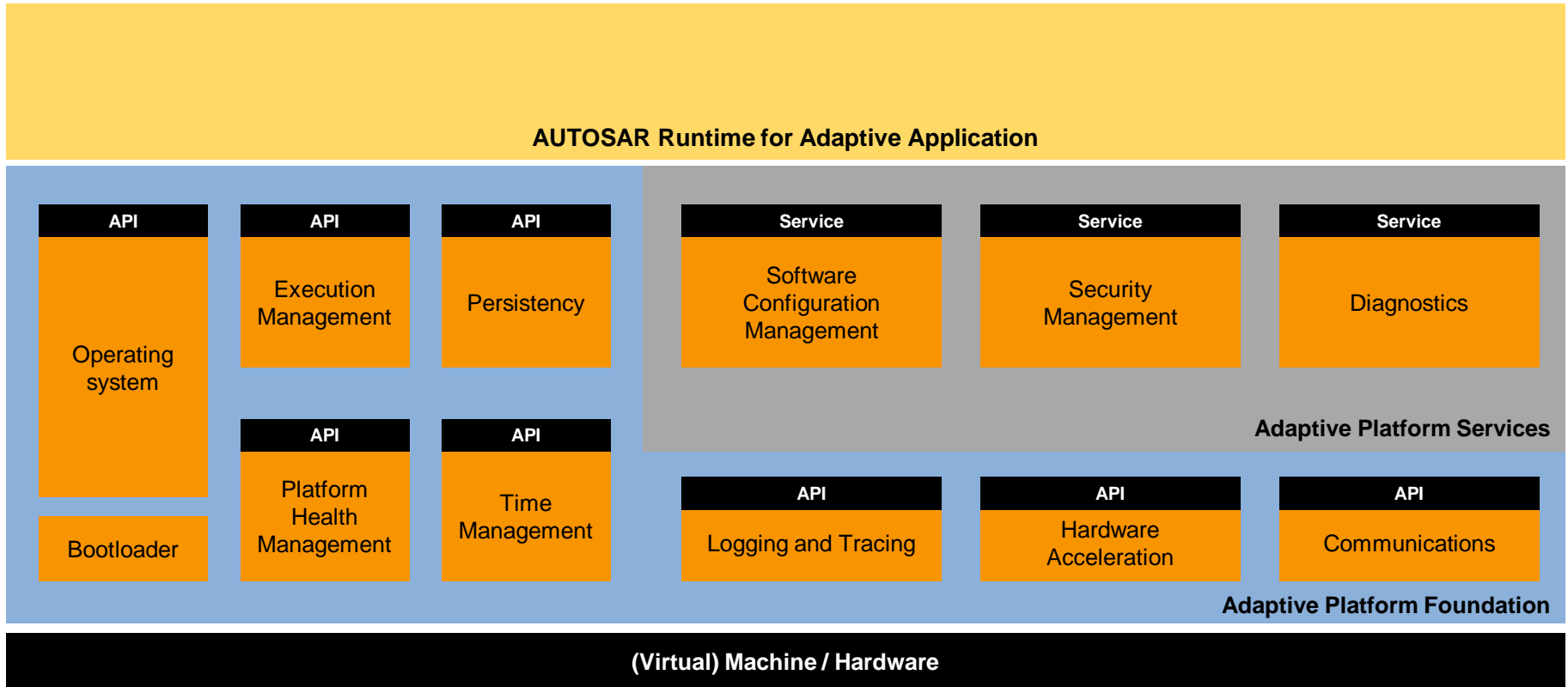
Collaboration ASAM and AUTOSAR



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Architectural Overview

Functional Clusters



ARA

AUTOSAR Runtime for Adaptive Applications = Σ of all Functional Cluster APIs / Services

API or Service

API or Service Interface of a Functional Cluster.

Functional Cluster

- Programming language specific API for a Functional Cluster as specified in SWS
- The first programming language supported by the Adaptive Platform will be C++

Behavioral specification of Functional Cluster

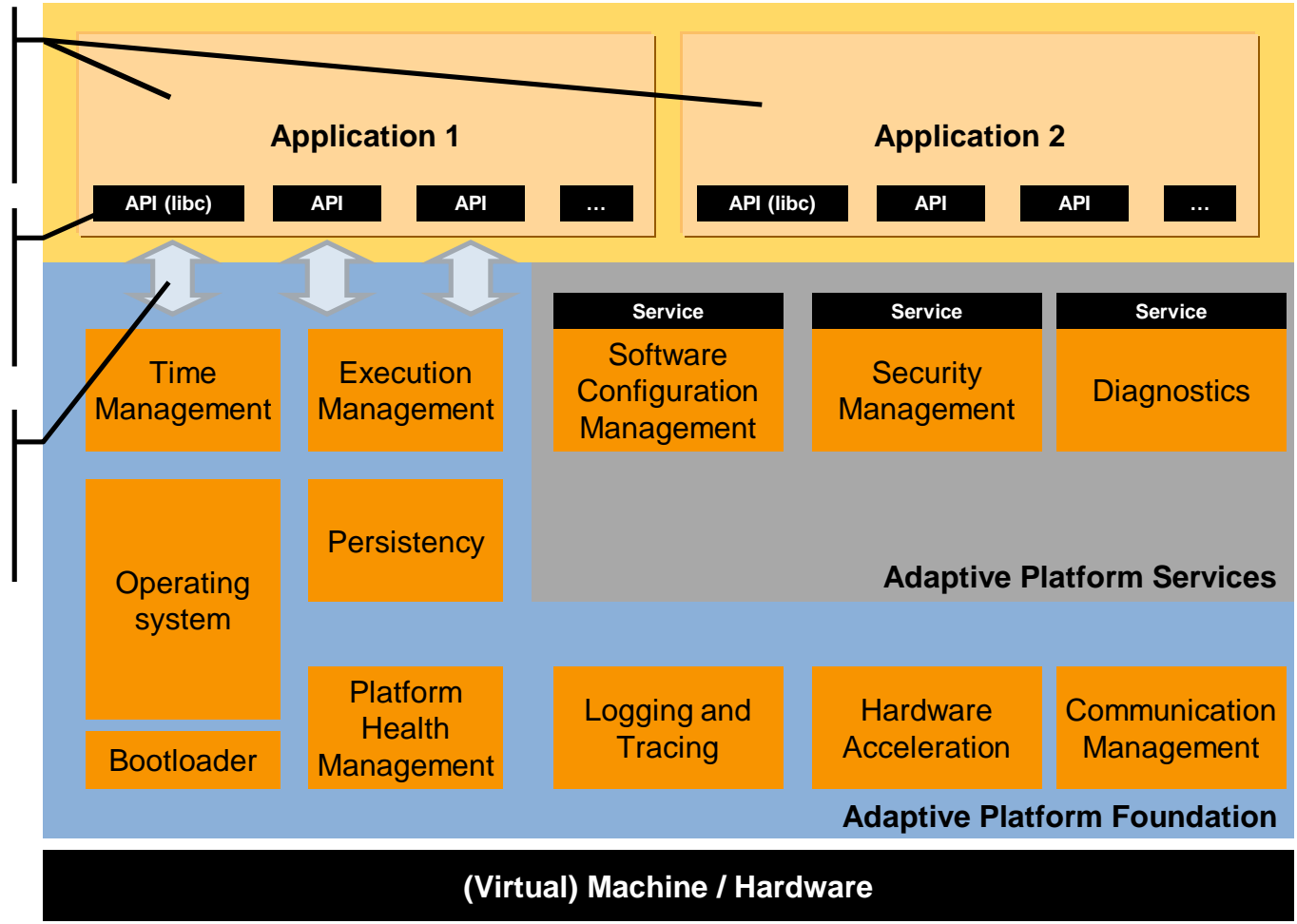
Architectural Overview

Address space virtualization

Each application runs in its own protected address space

Access to platform functionality via libraries

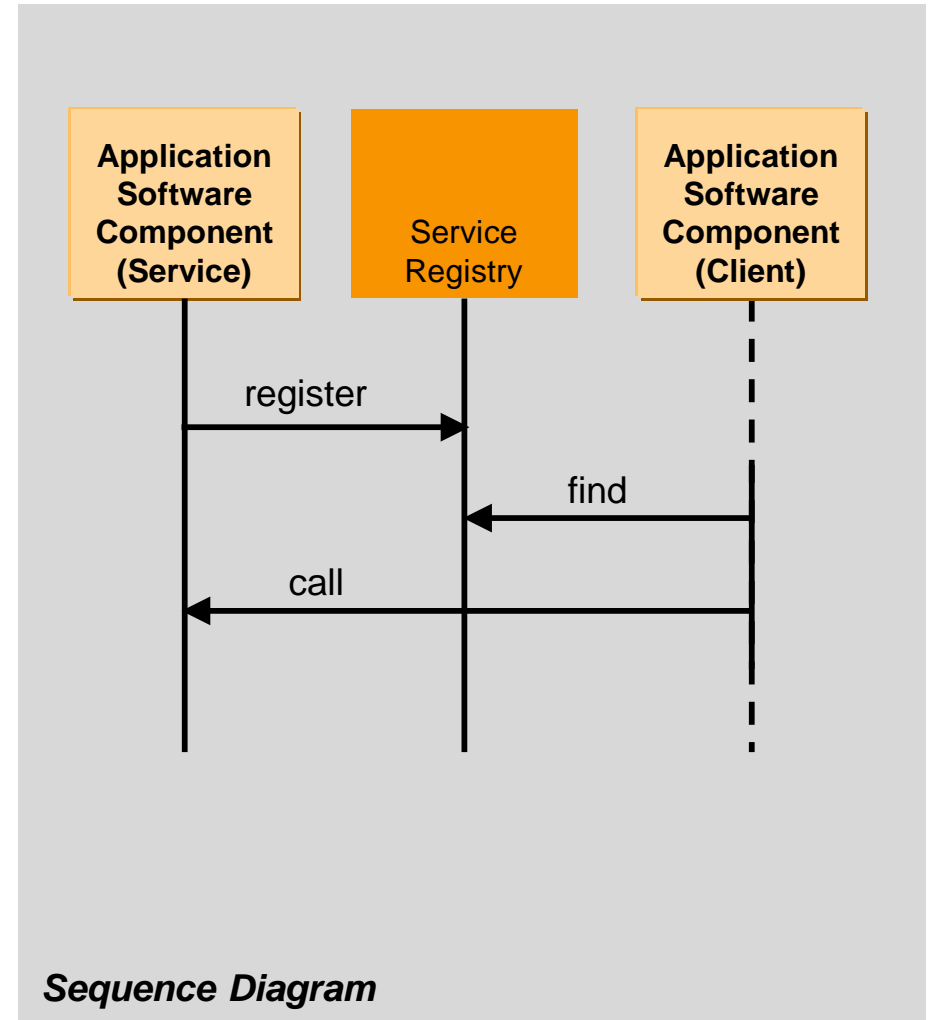
Communication via implementation specific inter process communication (IPC)



Architectural Overview

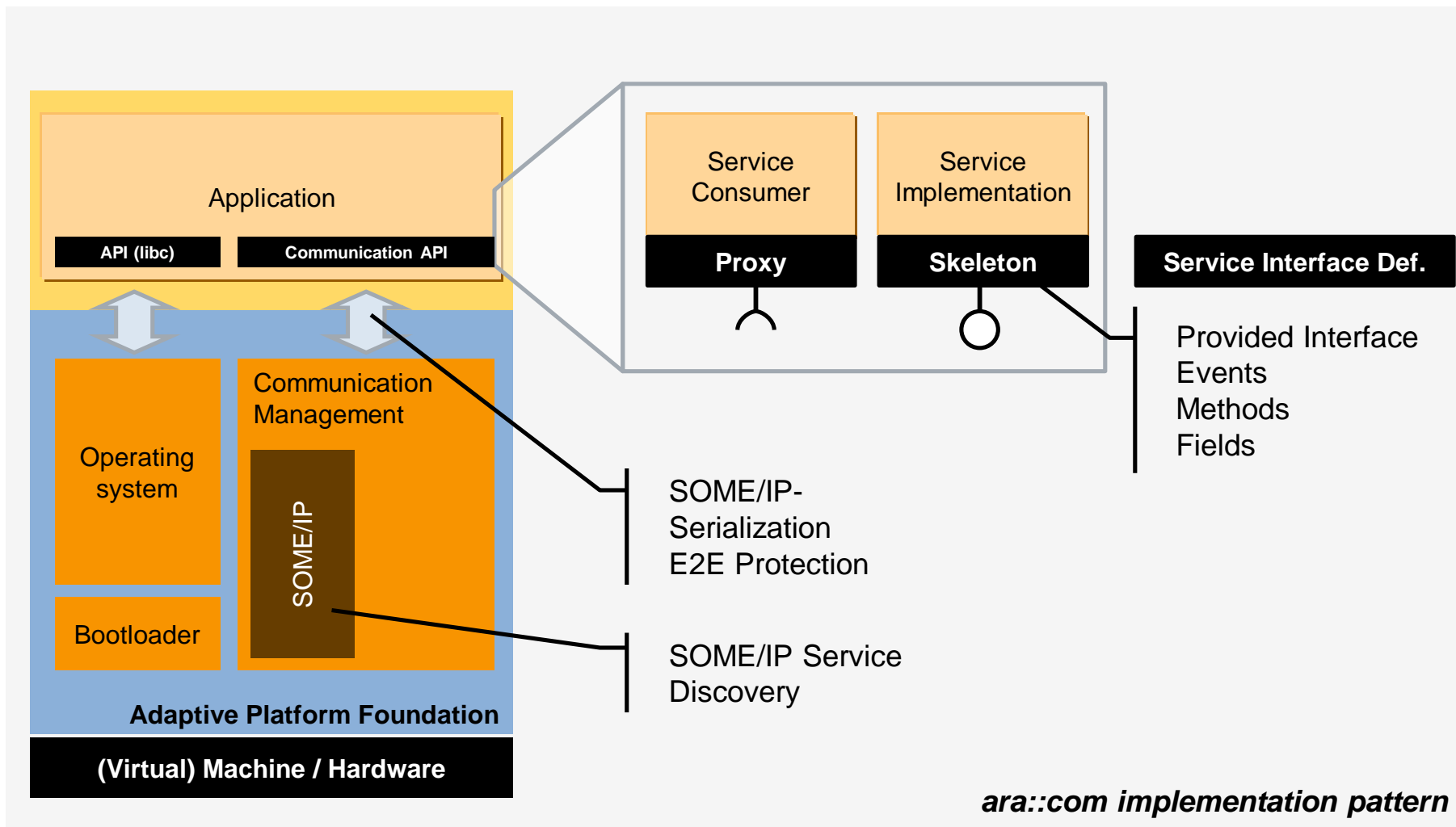
Service-oriented communication (1/3)

- SW components executed on the adaptive platform will use service-oriented communication.
- Communication paths can be established at design- and at run-time.
- The AUTOSAR Adaptive platform will therefore provide middleware functionality.



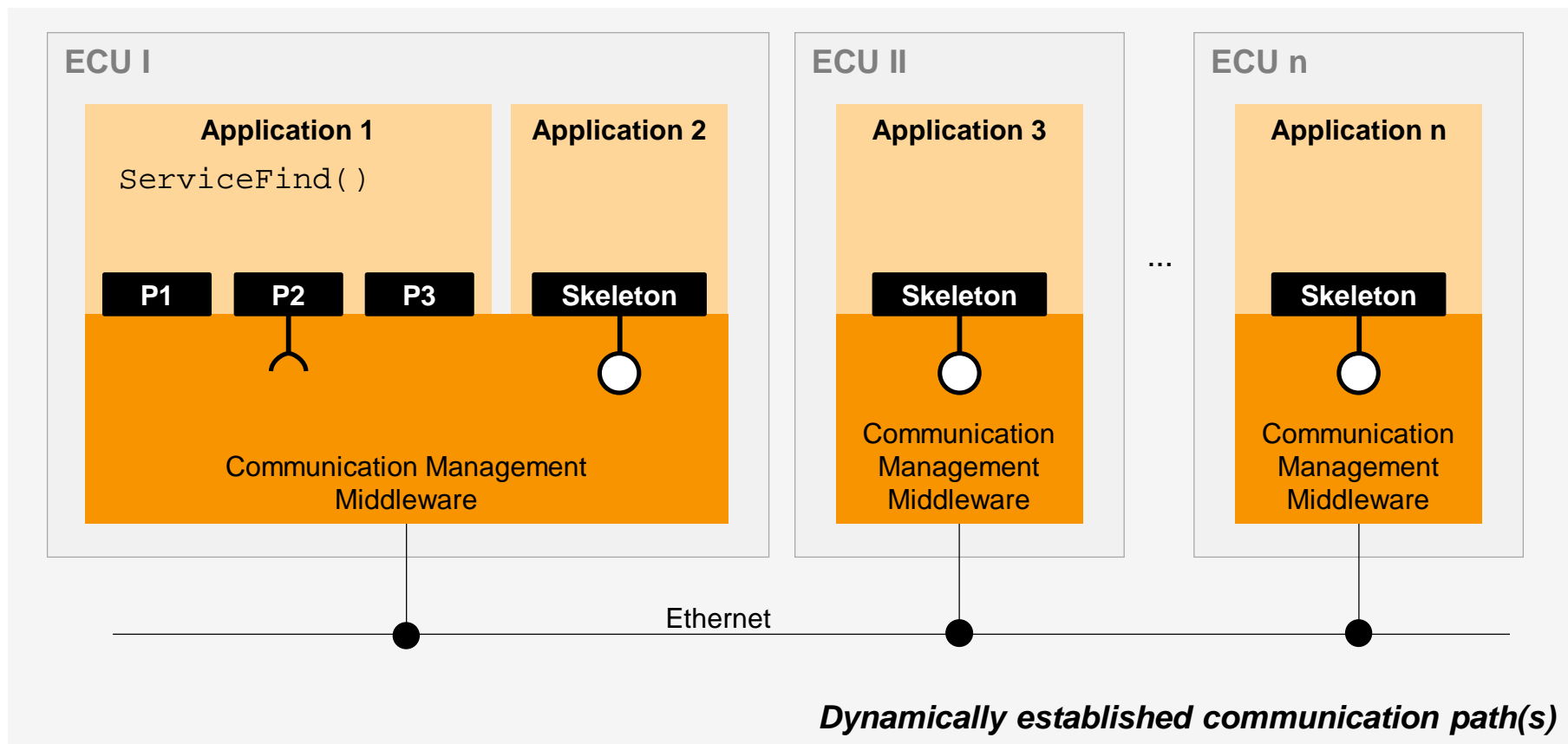
Architectural Overview

Service-oriented communication (2/3)



Architectural Overview

Service-oriented communication (3/3)



- ServiceDiscovery finds all local and remote ServiceInstances in the System.
- Available ServiceInstances are represented by Proxies (P1 ... P3) to the Application.
- Application can choose which ServiceInstance(s) to use.

Architectural Overview

Classic Platform vs. Adaptive Platform



Based on OSEK

Based on POSIX (PSE51)

Execution of code directly from ROM

Application is loaded from persistent memory into RAM

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

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

Optimized for signal-based communication (CAN, FlexRay)

Service-oriented communication







Fixed task configuration

Support of multiple (dynamic) scheduling strategies

Specification

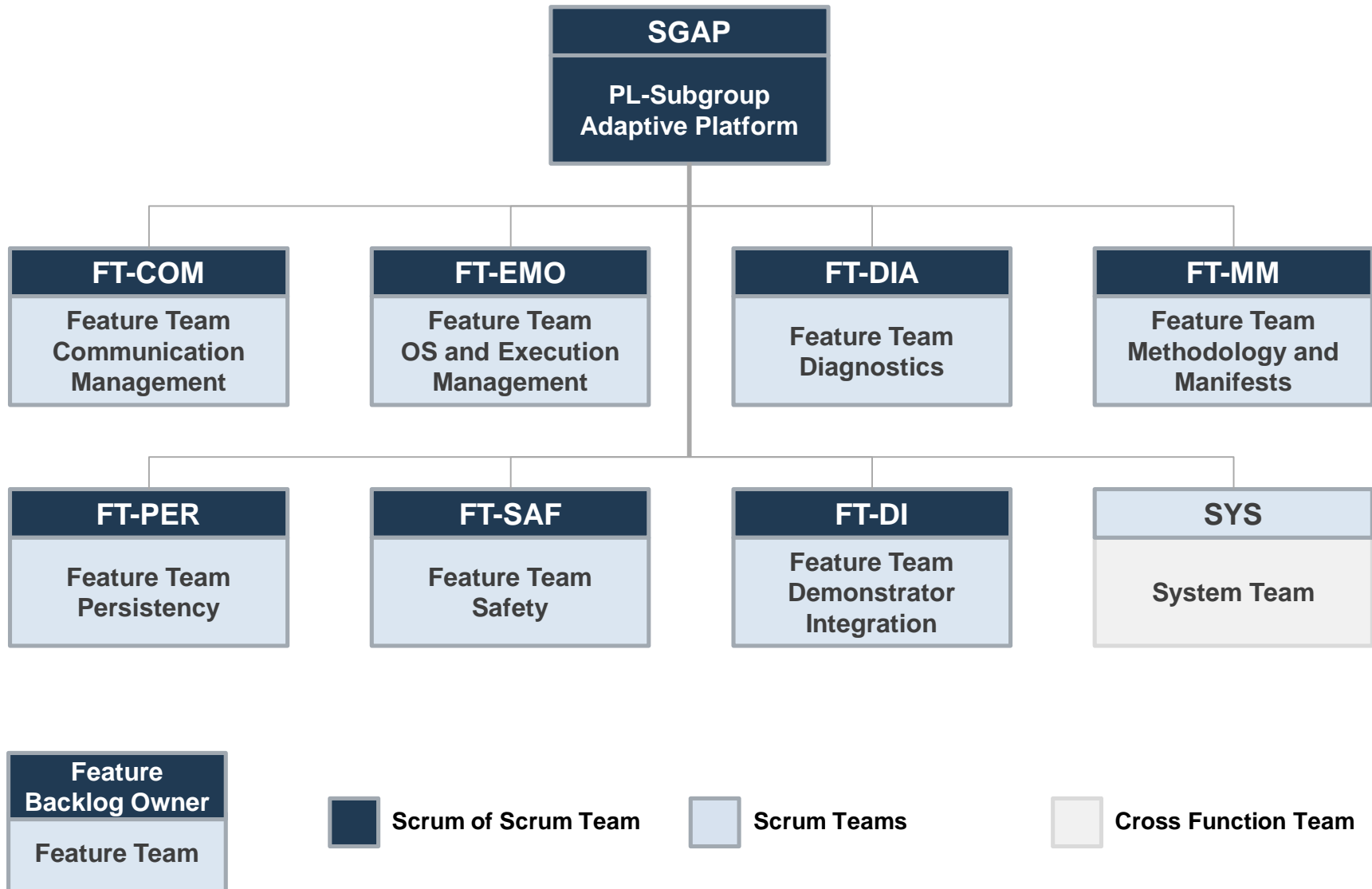
Specification as binding Standard Code as Demonstrator

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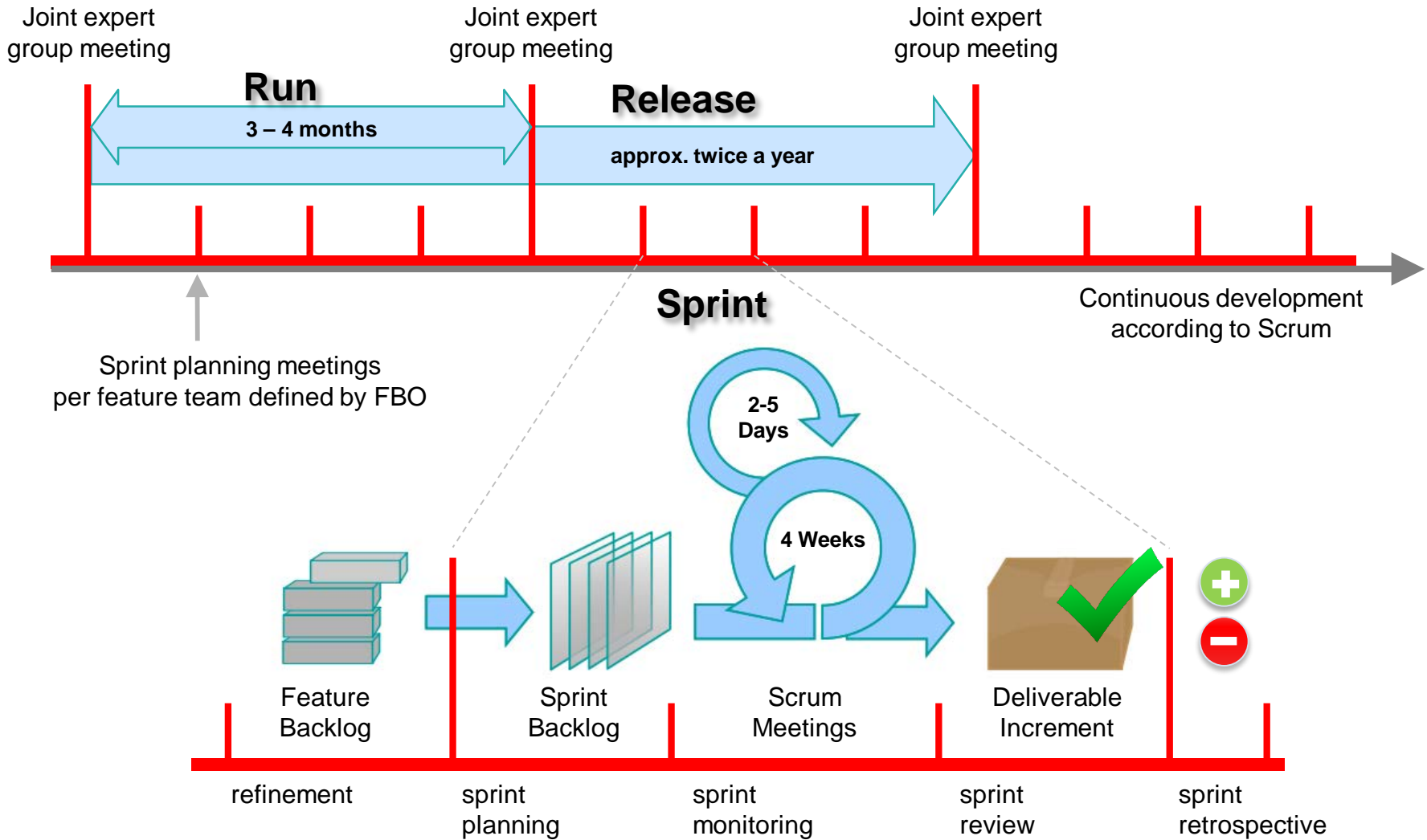
Organisation

Feature Teams



Organization

Work mode and contributions



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Quality and Process Standards



Release	Level	Basic System	Traceability	Design	Code	Test
	QL0	Jira based workflow for planning Git repository structure	Infrastructure for tracing SRS ↔ SWS ↔ code no metrics	Central UML Model defined no metrics	Google coding guidelines (CG) selected no metrics	First unit and system tests developed no metrics
	QL1	Generic framework for integration of quality measures	80% coverage code ↔ SWS 60% coverage SWS ↔ SRS	1 st functional cluster design specification	Establish checks against CGs in infrastructure	
	QL2	Change management for released parts Backward compatibility statement defined	100% coverage code ↔ SWS 100% coverage SWS ↔ SRS traceability metrics for code, SWS and SRS	Architecture review implemented Architecture description for all func. clusters Design reviews implemented	all modules on dev. branches accord. to CG metrics for implementation of CG CG extension for safety defined	unit tests for all func. clusters test coverage metrics, 50% coverage goal system tests defined and implemented
	QL3	tbd.				
	QL4	tbd.				

Under Development

AUTOSAR follows its proven life cycle model in order to achieve series quality in 10/2018. Intermediate releases are available.

Status and Roadmap

Development in progress



Deliverables	QL	Responsible	Jira Visions
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R17-03 Features

➤ Operating System	QL0	FT-EMO	AP-60,
➤ Execution Manager	QL1	FT-EMO	AP-3, AP-4, AP-15, ...
➤ Diagnostics	QL1	FT-DIA	AP-11, AP-15
➤ Data Logging and Tracing	QL0	FT-DIA	AP-289
➤ Communication (Ethernet, SOME/IP + ara::com)	QL1	FT-COM	AP-4, AP-9, AP-10, ...

Basic features are available end of March 2017 in our first release.
Features may have achieved different quality levels.

Status and Roadmap

Planned features (adaptations and refinements possible !)



Deliverables	QL	Responsible	Jira Visions
R17-10 Features			
➤ Package Management	QL2	FT-EMO	AP-387, AP-417, AP-418
➤ Persistency	QL2	FT-PER	AP-376, AP-418
➤ Hardware Acceleration (OpenCL)	QL1	FT-EMO	AP-388
➤ Signal Based Com. (CAN)	QL2	FT-COM	AP-384, AP-385
➤ Cloud Interaction	QL1	FT-COM	AP-383, AP-417, AP-418
➤ Extension of Execution Management	QL2	FT-EMO	AP-212
➤ Safe Key-Value Storage	QL2	FT-SAF	AP-382
➤ E2E Protection	QL2	FT-SAF	AP-381
➤ Platform Health Management	QL2	FT-SAF	AP-380
➤ File Encryption	QL1	WP-X-SEC	AP-379
➤ User Management	QL1	WP-X-SEC	AP-378
➤ Secure Communication	QL1	WP-X-SEC	AP-418



Further features are on the roadmap for the October release 2017

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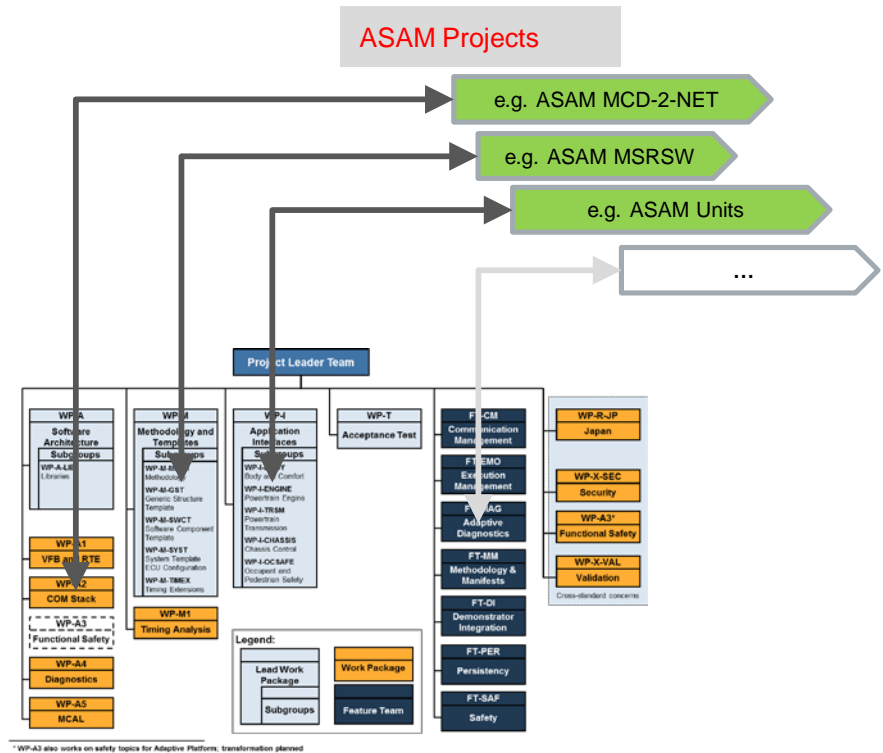
ASAM - AUTOSAR - Collaboration

ASAM and AUTOSAR already established collaborations in the following areas:

- ASAM MSR-SW
- WP-I (ASAM-Units)
- WP-A2 (ASAM MCD-2-NET)

Why not continuing the collaboration also for the adaptive platform?

- ASAM-representative is invited to join the AUTOSAR Joint Expert Meetings (4 p.a.)
- ASAM needs can be evaluated based on AUTOSAR specifications and concepts.
- Further contacts can be established via the respective representatives at ASAM and AUTOSAR.



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Achievements



- AUTOSAR continues to provide well documented standard solutions also for future market needs
- The adaptive Platform is developed based on a scrum process
- AUTOSAR continues to supports the classic platform as well

Plan



- End of development phase is supposed to be Oct. 2018
- The development phase will be followed by the evolution phase.
- Intermediate results with feature wise assigned quality levels will be released twice a year.

Collaboration



- Use the established contacts between ASAM and AUTOSAR to tackle the upcoming challenges for debugging and measurement.

End

✓	Motivation
✓	Architectural overview
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✓	Conclusion

**Thank you
very much for
your attention!**

Questions?