



# Adaptive Platform

Status and Outlook

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12<sup>th</sup> AUTOSAR Open Conference

04 Mar 2020

Lisbon, Portugal

BMW  
GROUP



**BOSCH**



DAIMLER



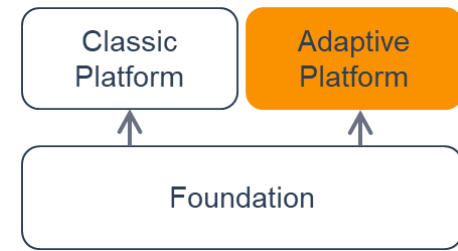
PSA  
GROUPE

**TOYOTA**

VOLKSWAGEN  
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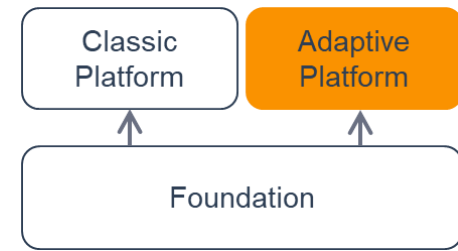
# Agenda

- > Motivation
- > Overview Adaptive Platform
- > Released & Planned Features and Roadmap
- > Conclusion
- > Feature Catalog



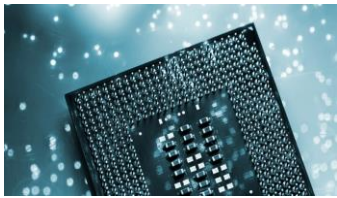
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# Motivation for AUTOSAR Adaptive Platform

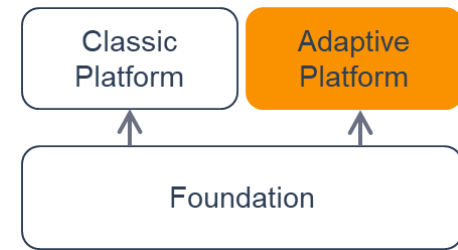
Supporting the requests for highly automated driving and IoT



- ✓ Provision of state-of-the-art safety and security mechanisms
- ✓ Dynamic linking of functions, services and clients during ECU runtime
- ✓ Designed for advanced computer platforms with many core processors
- ✓ Supporting high speed data communication and high performance computing
- ✓ Allowing software upgrades and over-the-air software updates

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# AUTOSAR Adaptive Platform

Emerging from deeply embedded systems

Deeply embedded ECUs  
~ MB, ~ 1000 DMIPs

High-performance computers  
~ GB , > 20.000 DMIPs,

?

## Classic Platform

- C only
- Static configuration
- Monolithic updates
- Signal-oriented comm.
- Low-speed bus

## Adaptive Platform

- C++, other tbd
- Run-time configuration
- Partial updates and upgrades
- Service-oriented comm.
- High-speed bus

Adaptive Platform fulfills the needs of the emerging high-performance computers

# AUTOSAR Adaptive Platform

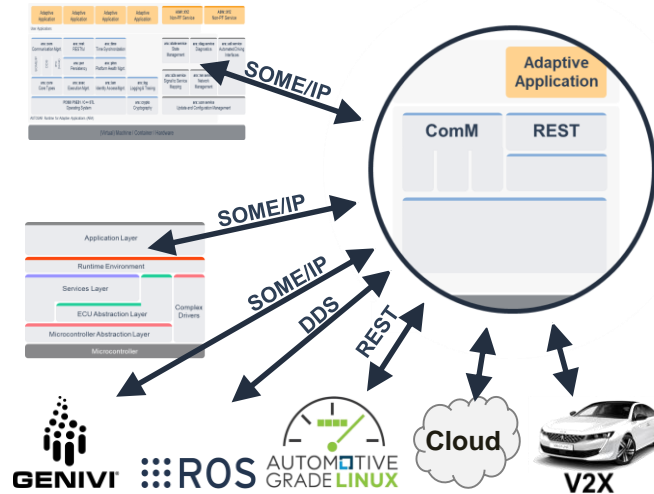
## The 3 Pillars of the Adaptive Platform ...

### I – Safe & Secure

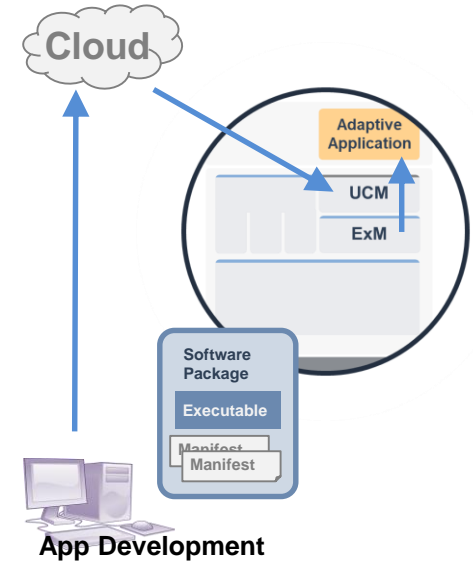


### II – Connected

#### Service-Oriented Communication



### III – Dynamic & Updateable



... are the prerequisites for highly automated driving and IoT

# AUTOSAR Adaptive Platform

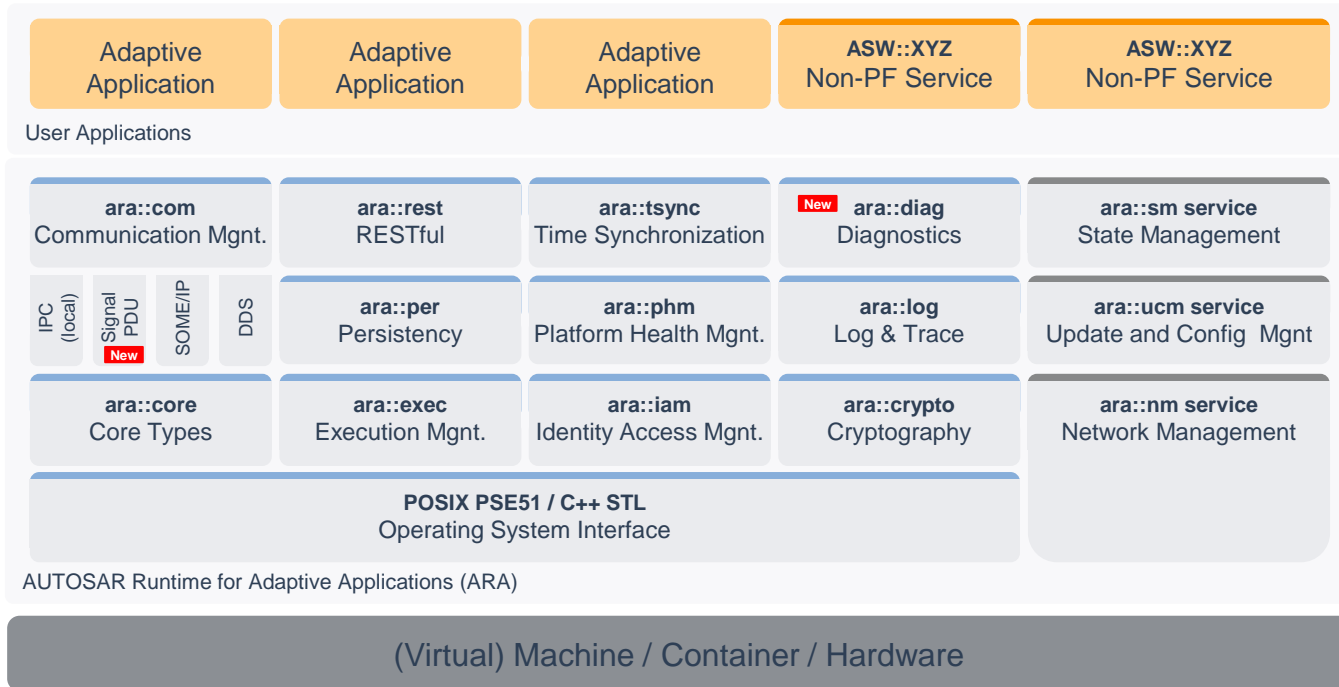
## Logical view

Legend

SERVICE  
Non-PF Service

SERVICE  
Func. Cluster

API  
Func. Cluster





# Adaptive Platform strategy breakdown

## Specification

→ Identify needs & use-cases

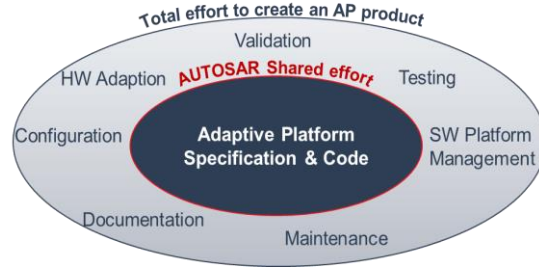
- 1) Concepts
- 2) Features
- 3) Requirements



## Implementation

→ Major goals

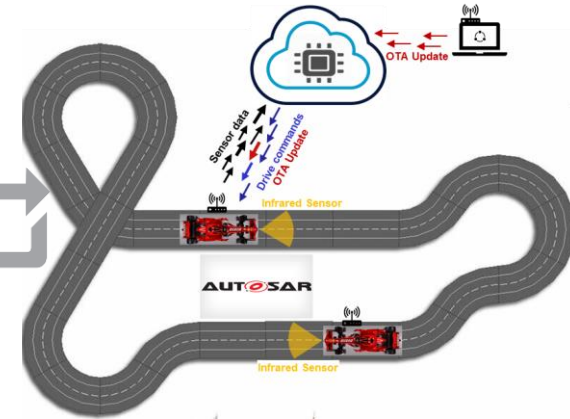
- 1) Spec validation
- 2) Reduce room for spec interpretation
- 3) Training/dissemination of AP



## Demonstration

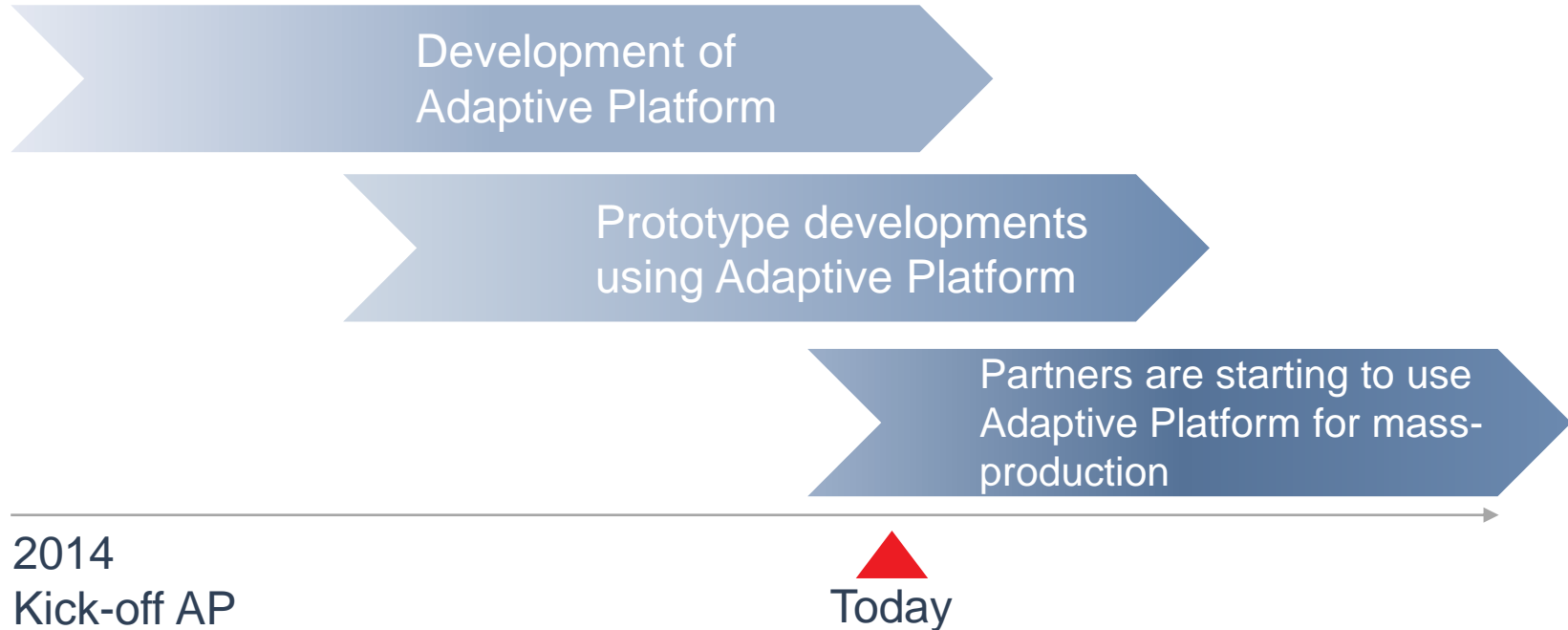
→ Showcase in every AOC

- 1) Advertises the progress
- 2) Highlights some specific features



Best tradeoff between commercial cooperation & compatibility between different vendors

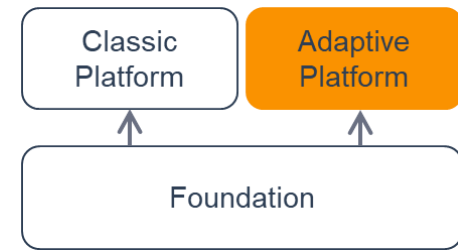
# Adaptive Platform in the Market



First products were launched in 2019, with more products to follow in the next few years. Adaptive Platform will evolve based on feedback from the market.





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# Released Features (1/2)





## AUTOSAR Adaptive Platform R19-11

Feature	Customer Benefit	Ref.
DoIPExtension	Introduce a generic solution for multiple interfaces on which DoIP can be handled independently irrespective of Internal/External tester	
IPsec Protocol	It increases communication security without the need to modify any application	
Signal Service Translation	Make Adaptive Machines interact with Classic ECUs	
Abstract Platform System Description (VFB++)	Vehicle Functional Communications Abstraction Layer	

**R19-11 introduced 4 new features supporting AP-CP interoperability**

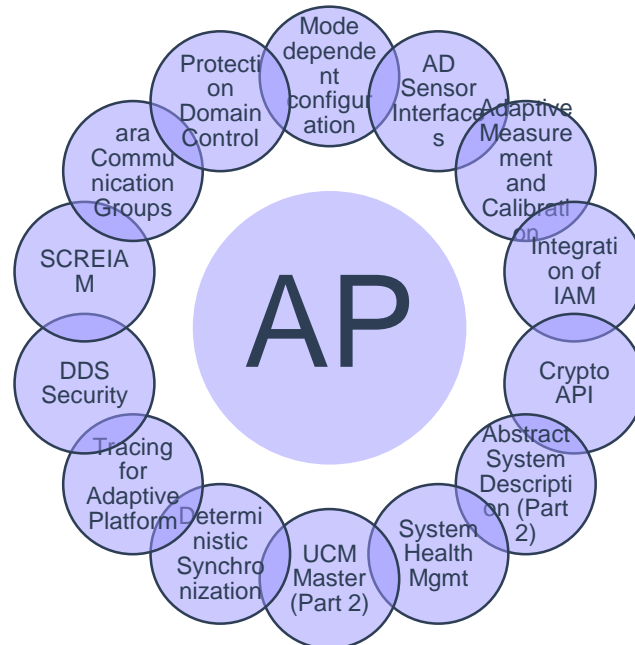
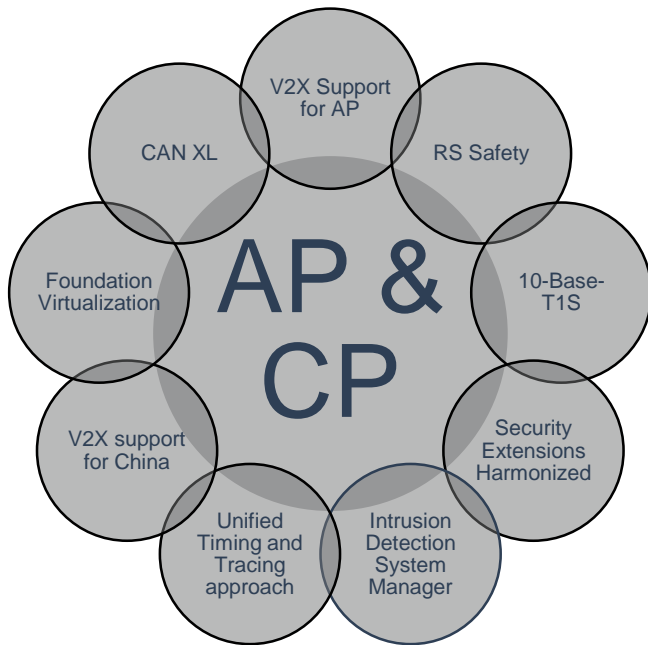
# Released Features (2/2)

## AUTOSAR Adaptive Platform R19-11

Feature	Customer Benefit	Ref.
UCM Master	Allow frequent secure and safe updates of vehicle software at low cost.	
Recovery action via application	Allows lightweight, responsive and project specific error reactions	
Service versioning ara:com	Enables service contract versioning for AUTOSAR platforms.	
Socket Network Binding	Offers a very efficient socket communication within the original design of the Adaptive AUTOSAR architecture.	

R19-11 introduced in total 8 new features enhancing the Adaptive Platform

# Planned Features (1/2)



As of today, 23 features are already planned for future releases of Adaptive Platform

# Planned Features (2/2)



New features focus mainly on the following areas

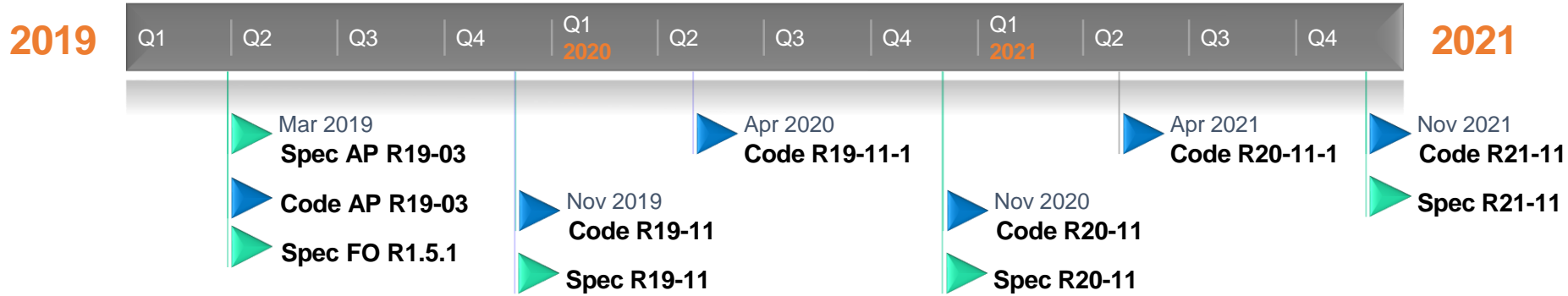
- Improving interoperability between CP and AP
  - E.g. UCM Master, Unified Timing and Tracing Approach
- Evolving security approach
  - E.g. CryptoAPI, Integration of IAM, Intrusion detection system Manager, DDS Security
- Evolving safety approach
  - E.g. RS Safety, System Health Management



**Adaptive Platform is continuously developed based on AUTOSAR partner demands**

# What's next: Adaptive Platform Roadmap

 code  
 specification



**Common processes and tools across all standards**  
 → Benefit from the well-established CP process

**Increase quality of AP**  
 → Focus on qualification of AP  
 → Incorporate feedback from first series projects

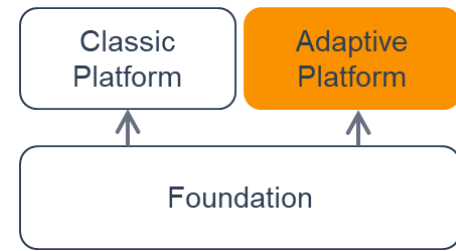
**Evolve AP**  
 - based on market feedback while maintaining quality

**Stable Adaptive Platform is pre-condition for market acceptance**



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# Conclusion

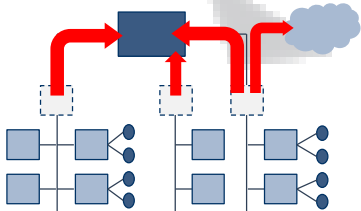
## Basic Principles

- Middleware on POSIX OS
- Service Oriented Communication
  - Safety & Security
- Complements Classic Platform

**AUTOSAR**  
Adaptive

## Gain

- Solid foundation for HPCs
- Enables the use of OSS like Linux
- Platform: Updatable, Flexible, Compatible
- App: Portable, Reusable, Low complexity



## Development Status

- R19-11 will be deployed to products
- Quality improvements are underway
- Further development is needed to keep up with the evolving market



**Adaptive Platform is the Standard Platform  
for enabling highly automated driving and IoT connection of vehicles**

**AUTOSAR™**

Thank you very much for your  
attention!

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