



AUTOSAR Adaptive Platform

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BMW Group



BOSCH

Continental



DAIMLER



PSA PEUGEOT CITROËN

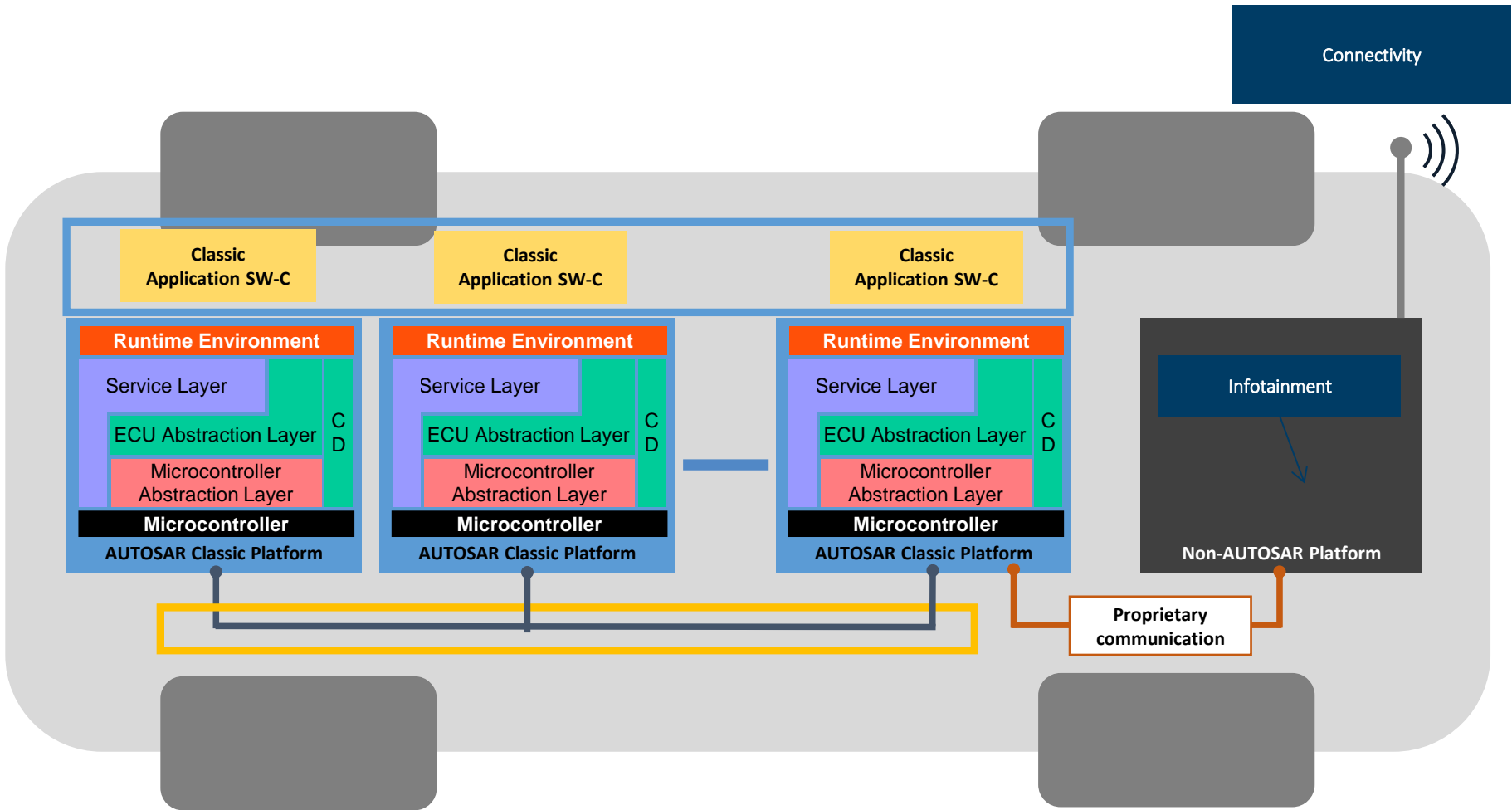


TOYOTA

VOLKSWAGEN

AKTIENGESELLSCHAFT

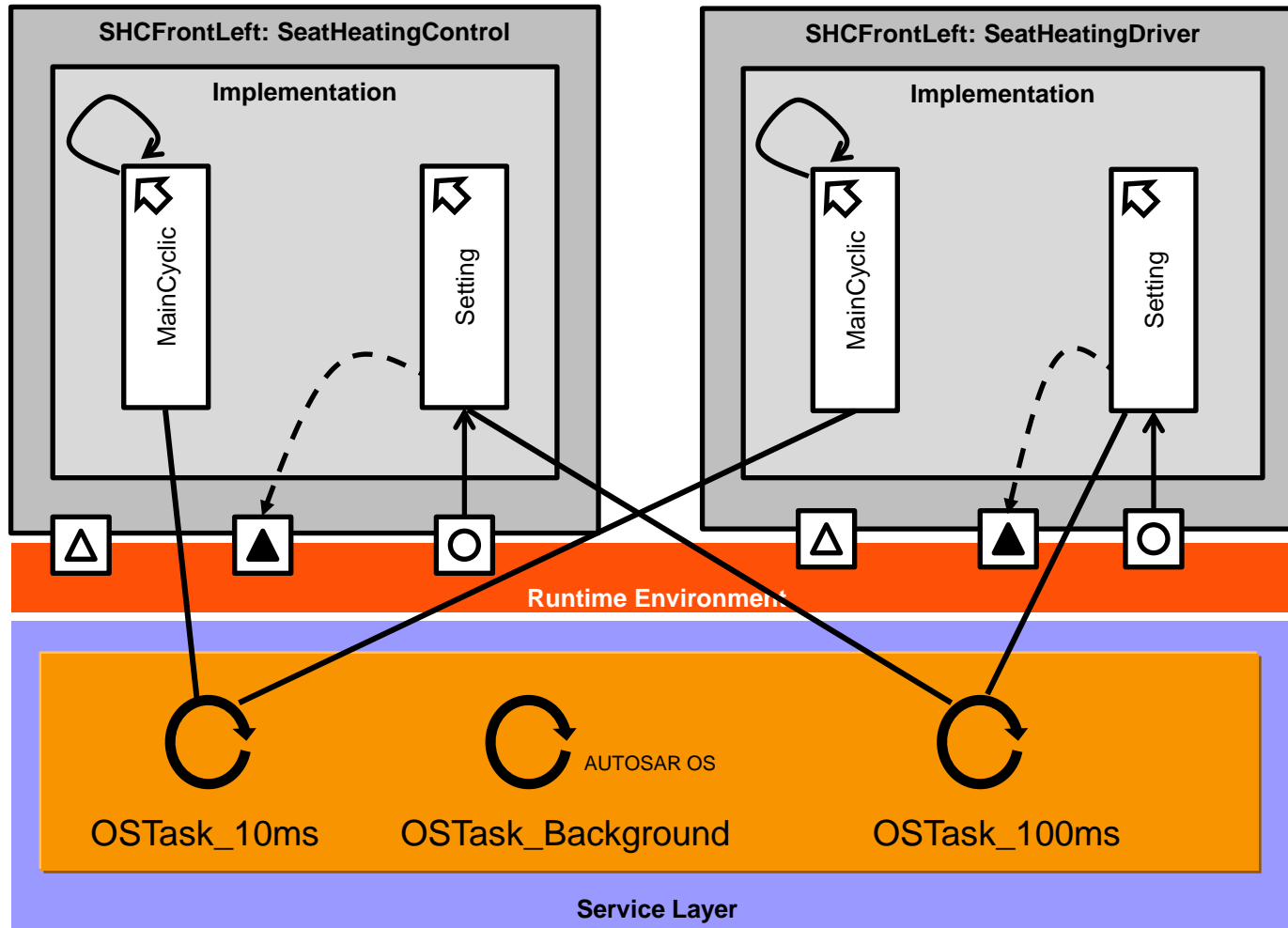
The E/E world today from an AUTOSAR perspective



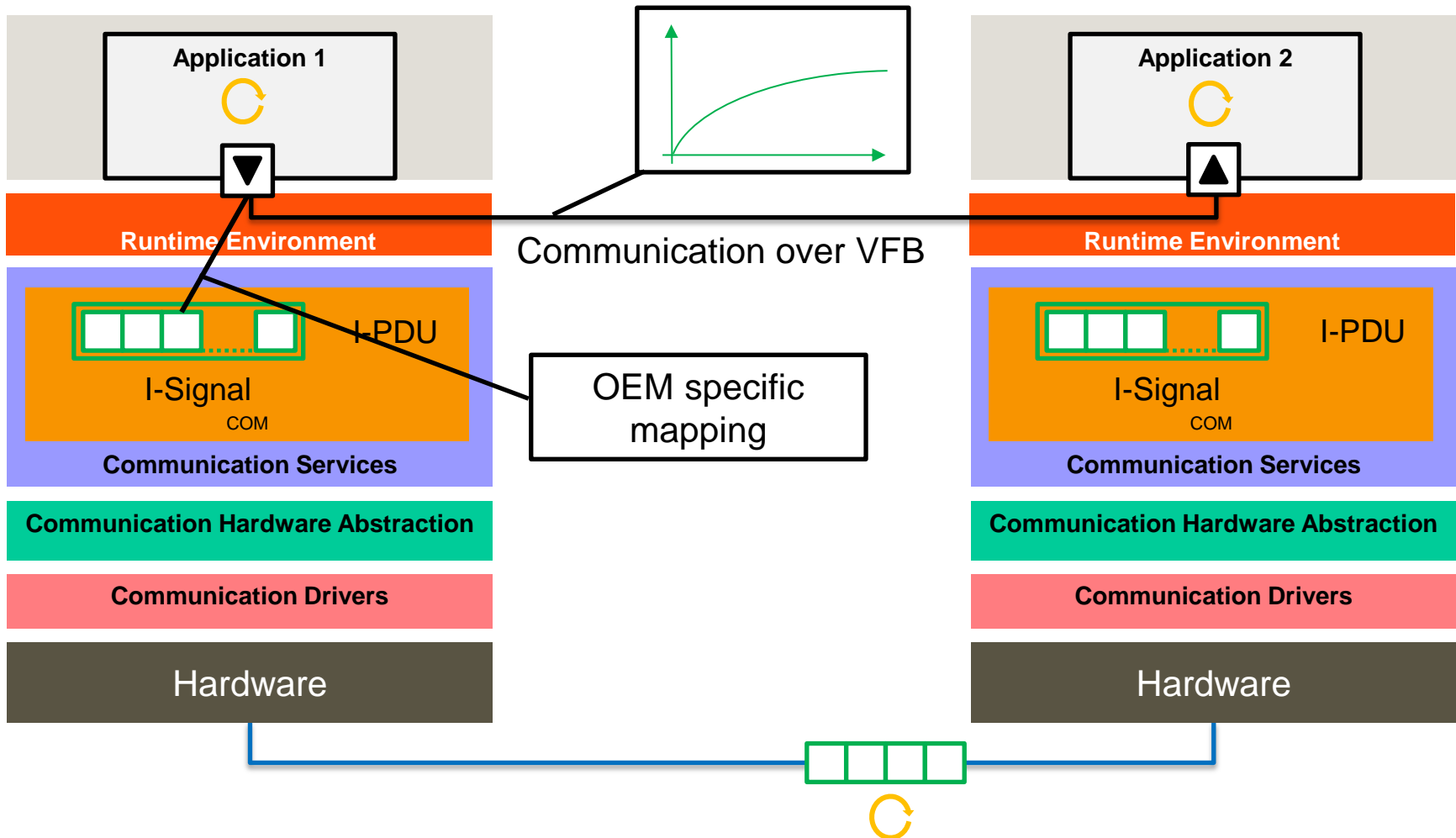
Software Abstraction

Common Bus Interface Specification

AUTOSAR Classic Platform – static execution model



AUTOSAR Classic Platform – static communication relationships





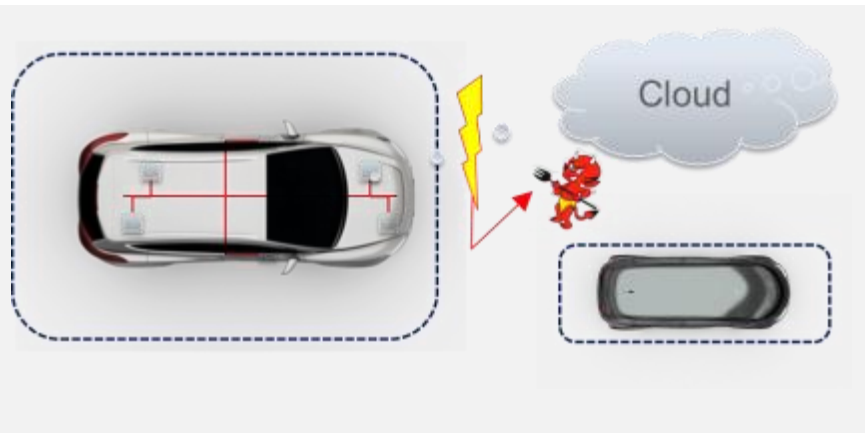
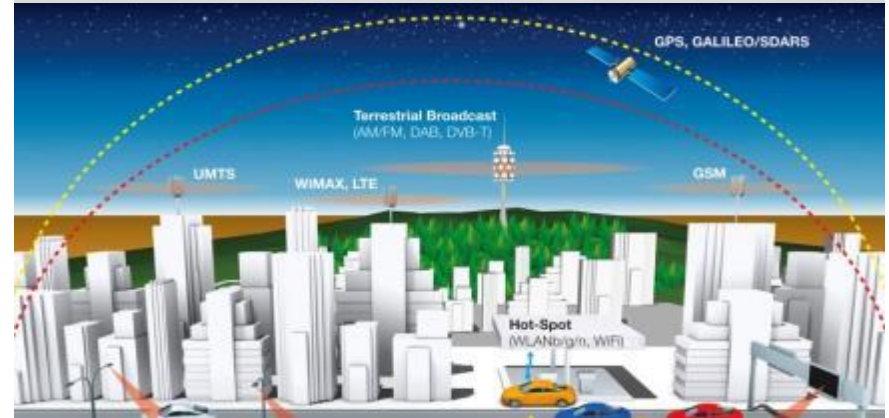
**Perfect
world?**

Main drivers for a new software platform

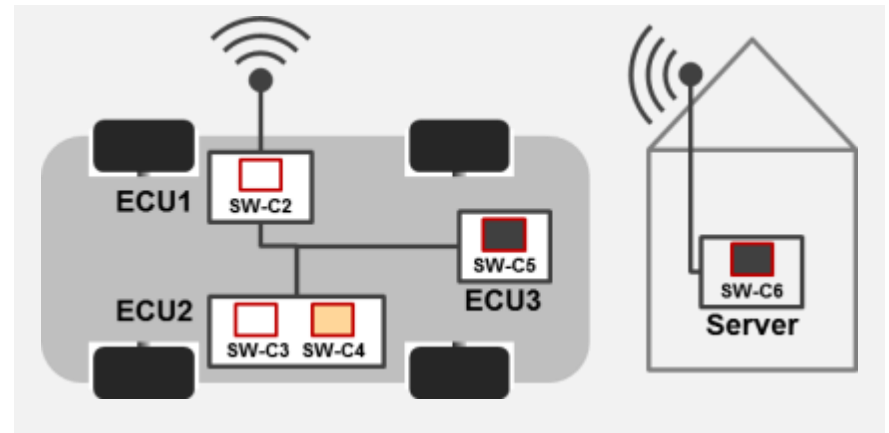
Highly automated driving



Car-2-X applications



Vehicle in the cloud

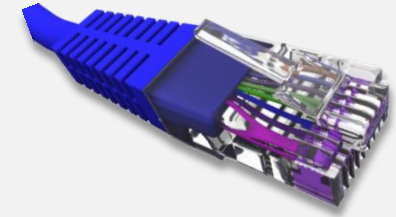


Increased connectivity

Technology drivers

Ethernet

- High bandwidth
- Communication system is not the limiting aspect anymore
- Switched networks
- Efficient point-to-point communication
- Efficient transfer of long messages

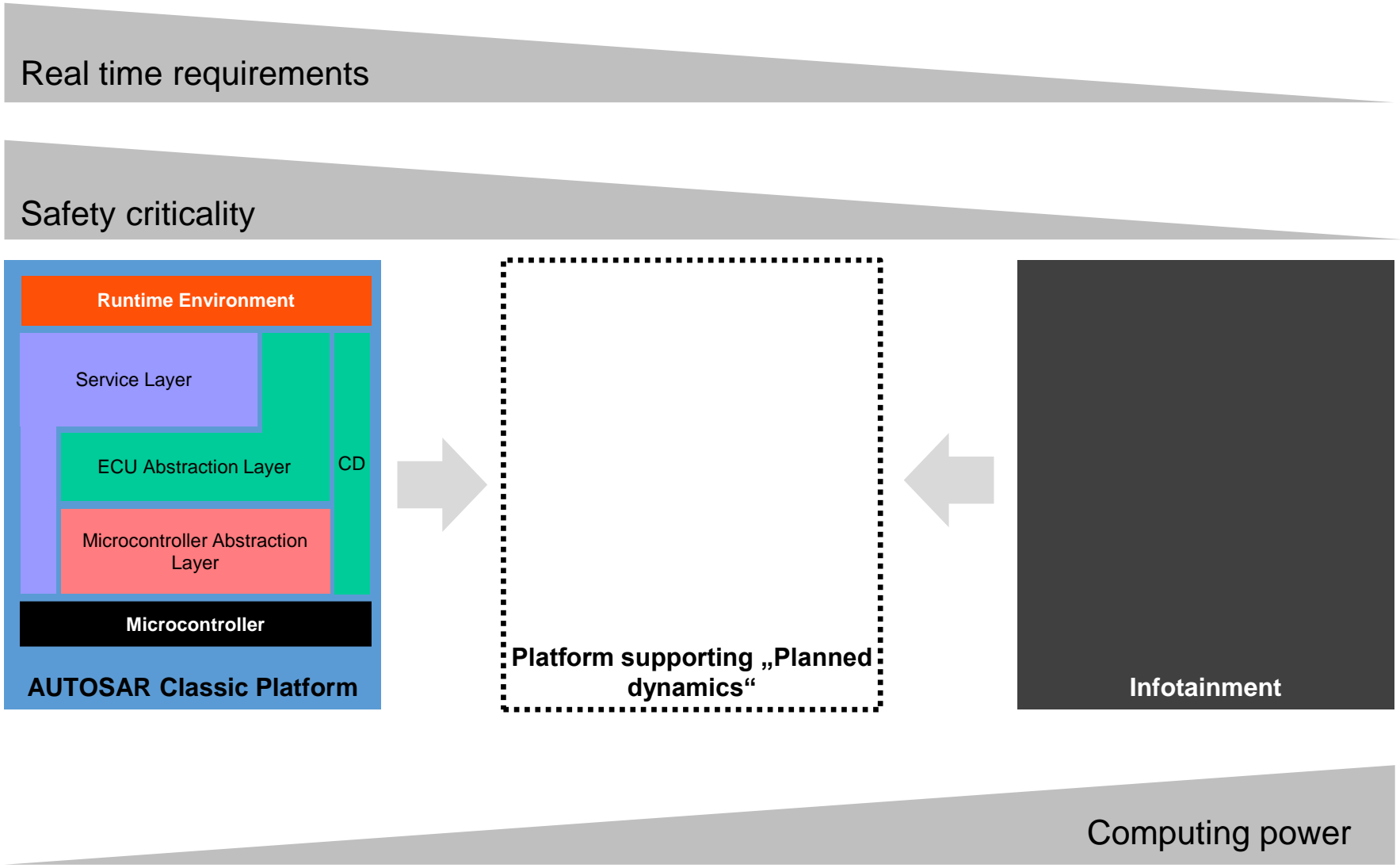


Processors

- Switch from microcontroller to processors with external memory (and maybe filesystems)
- Many core processors
- Parallel computing
- „Cheap“ availability of computing power
- Heterogeneous architectures: Special purpose processors



Another platform for different applications



AUTOSAR Adaptive Platform – characteristics

Application framework

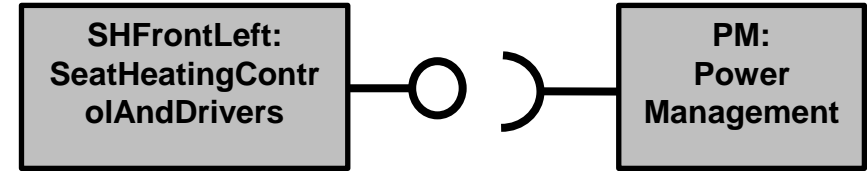
- Support for run-time configuration
- Service-oriented communication
- Partial update

Formats for design data

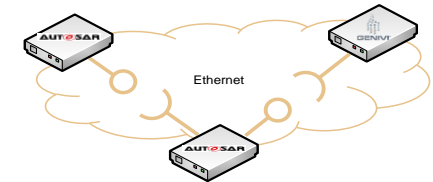
- Planning of dynamic behavior (e.g. constraints for scheduling and communication)
- Consider automotive specific cooperation scenarios
- Support integration with existing systems (Classic Platform)

Reference architecture

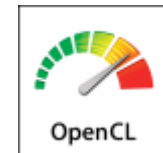
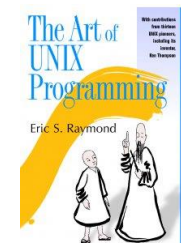
- Reuse existing (non-automotive) standards
- Ease software development
- Support automotive use-cases and protocols



Support of different scheduling strategies



Planning of dynamic communication

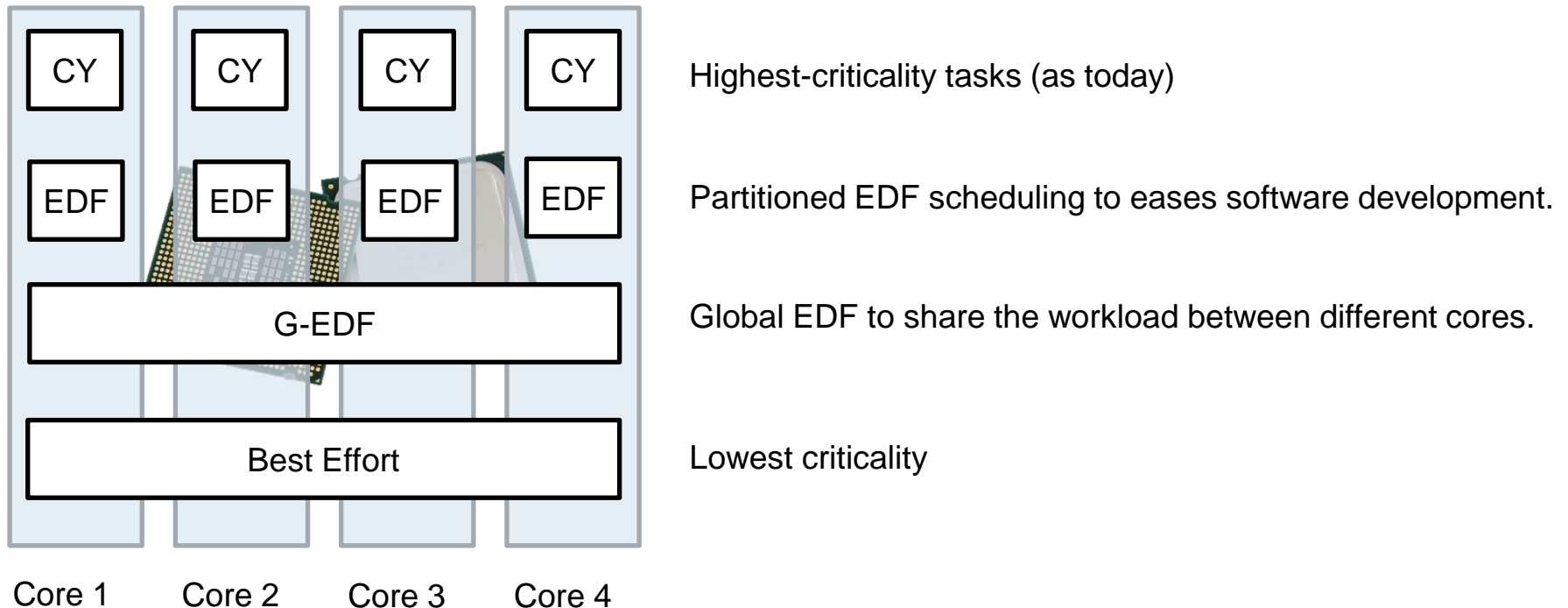


... and many more



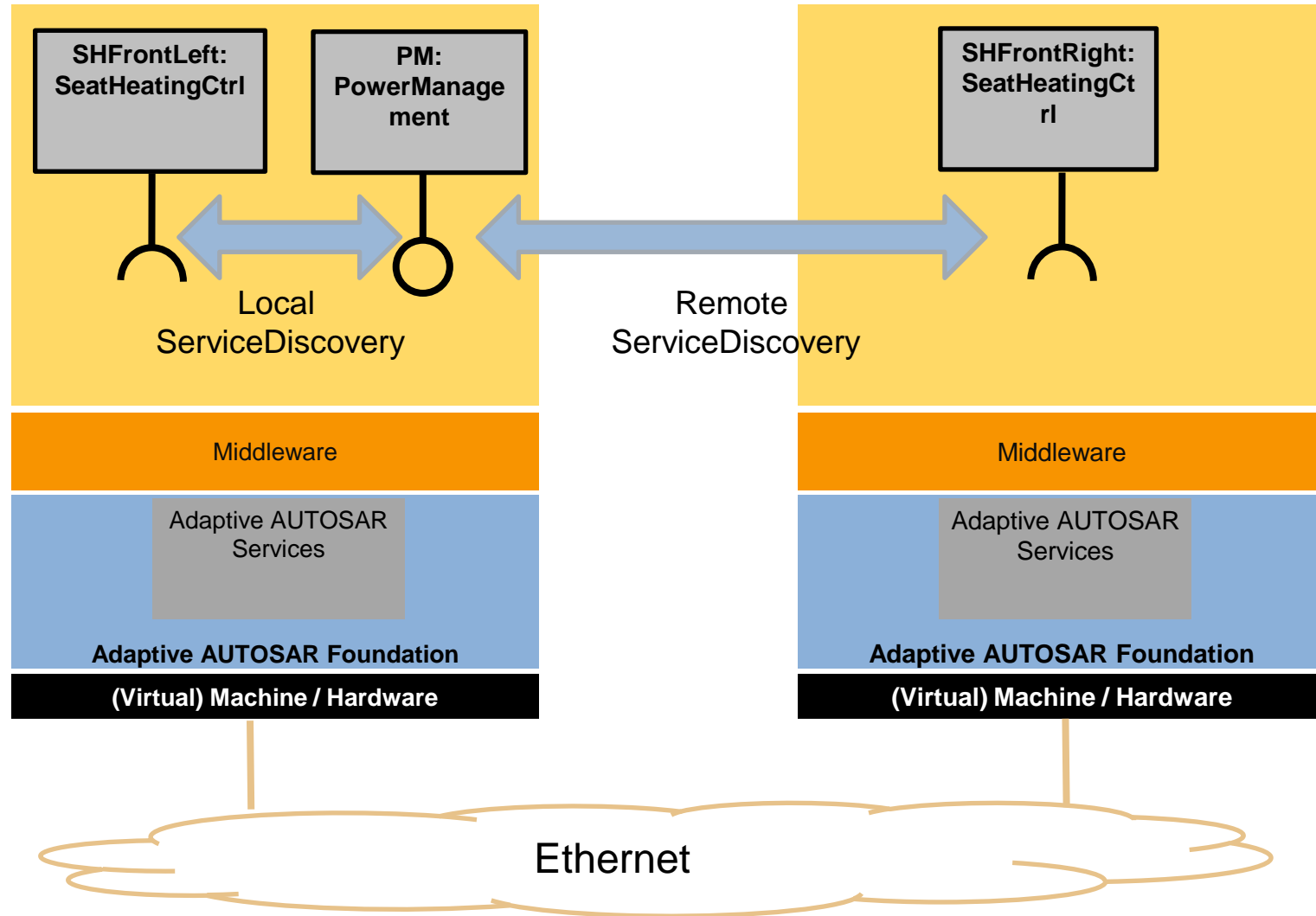
Planned dynamics – scheduling

Scheduling architecture for mixed-criticality task systems on multicore platforms

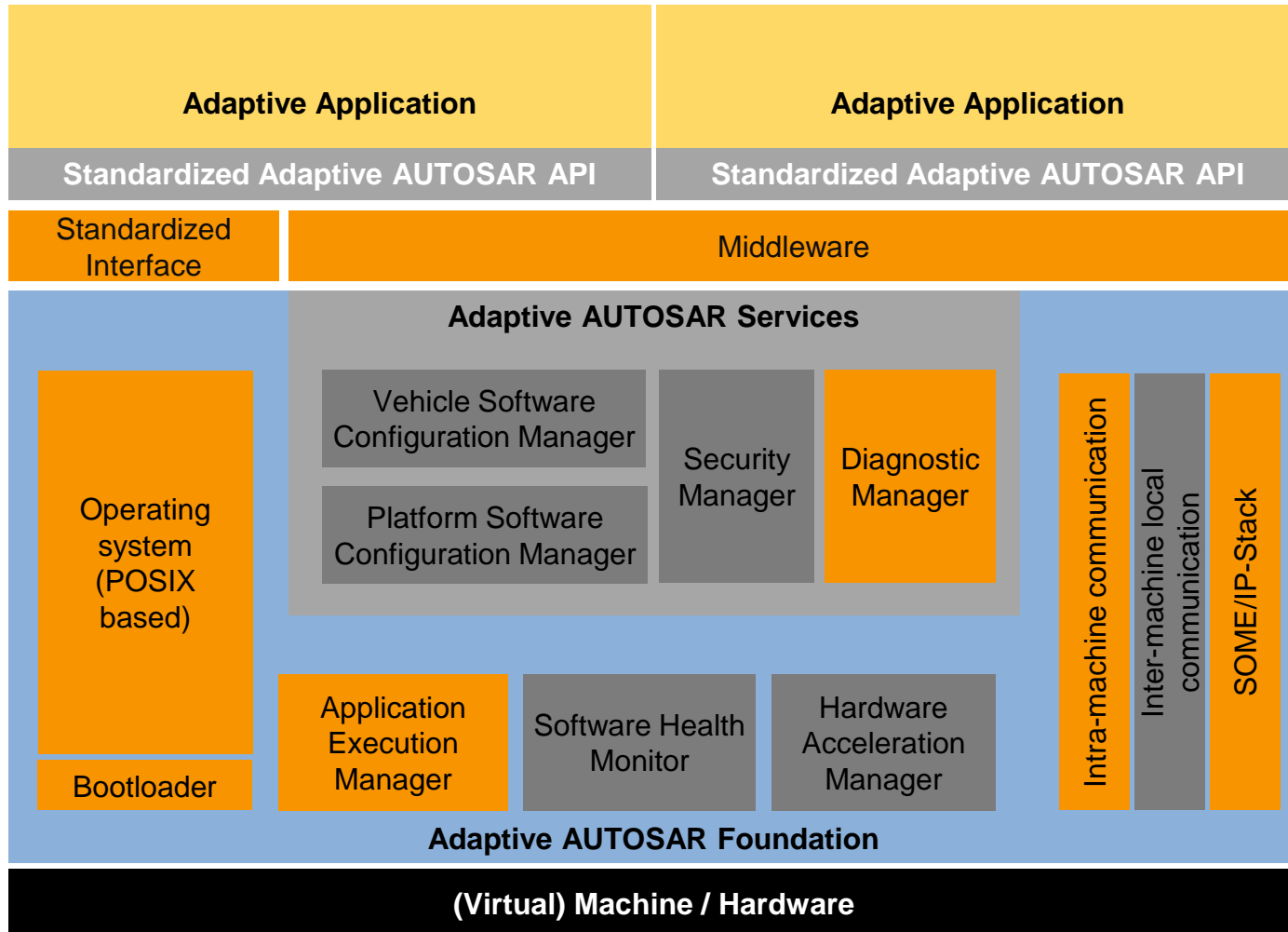


Malcolm S. Mollison, Jeremy P. Erickson, James H. Anderson, Sanjoy K. Baruah, and John A. Scoredos. 2010. Mixed-Criticality Real-Time Scheduling for Multicore Systems. In *Proceedings of the 2010 10th IEEE International Conference on Computer and Information Technology (CIT '10)*. IEEE Computer Society, Washington, DC, USA, 1864-1871. DOI=10.1109/CIT.2010.320 <http://dx.doi.org/10.1109/CIT.2010.320>

Planned dynamics – communication



Architecture of the AUTOSAR Adaptive Platform



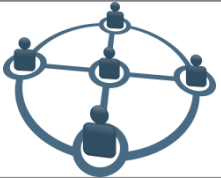
In scope of R1.0.0

Planned for future releases

Scope for Adaptive Platform Release 1.0



The system can start up and execute applications controlled by the Execution Manager

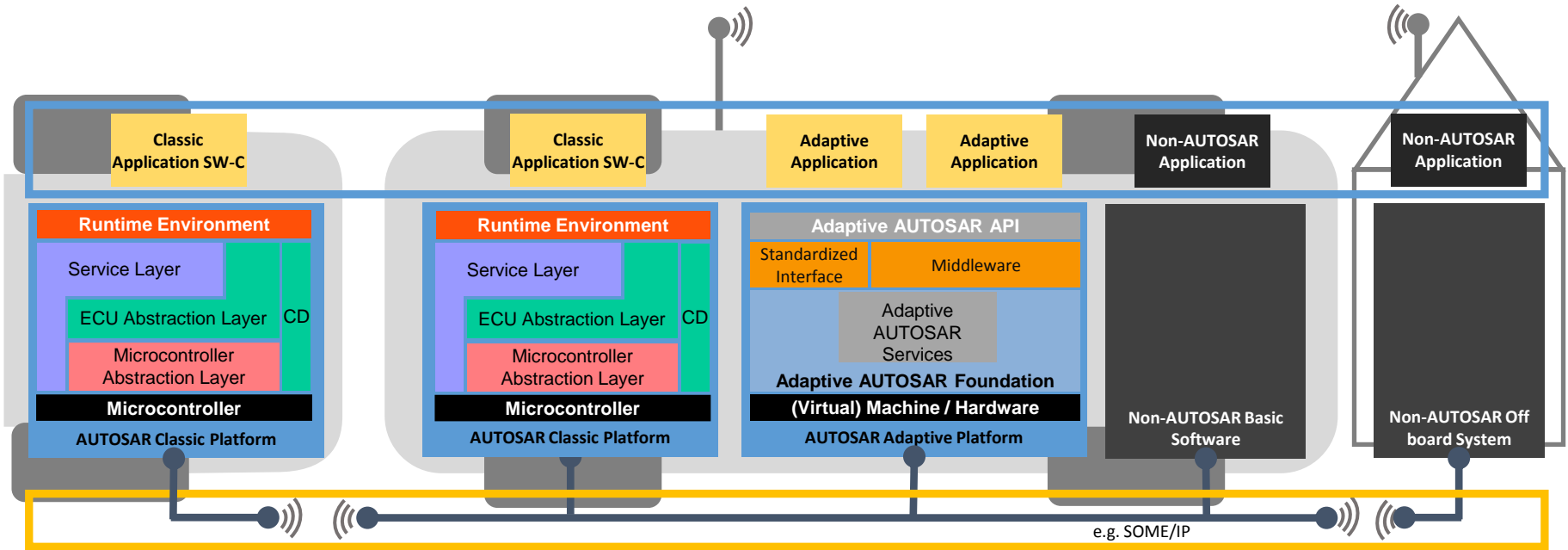


Applications can communicate with other applications using service oriented communication via Ethernet



The system features an integrated failure management

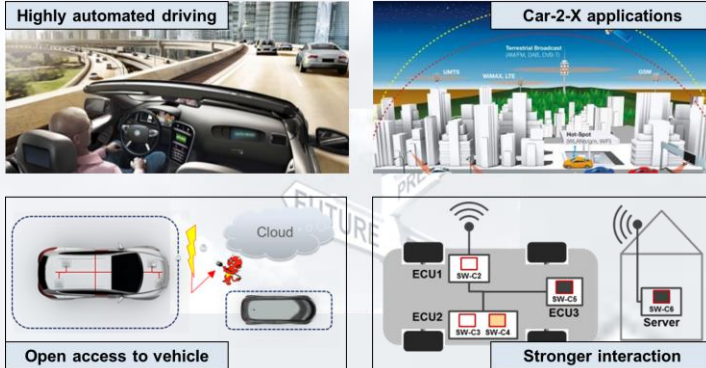
The challenge: Integration of different platforms



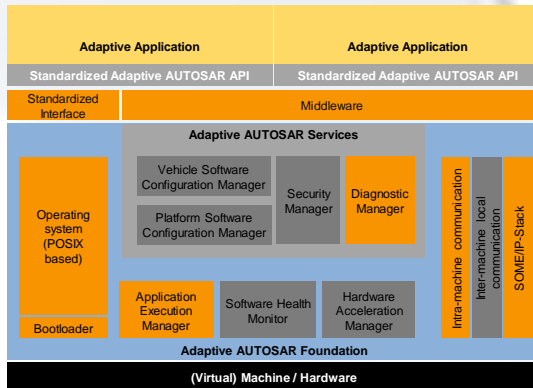
Software Abstraction

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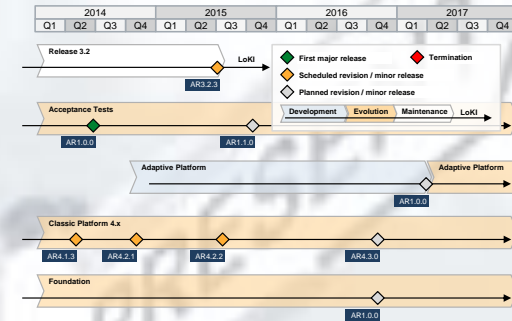
Summary



New challenges and applications



AUTOSAR Adaptive Platform



Provision of standard in time...



...with the right scope