

AUTOSAR Activities for Realizing SDV (Software Defined Vehicle)

- (Forth Report) OSS (Open Source Software) activities for Middleware -

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The third report showed the High-Performance Computer in Vehicle (HPC) and the technologies required for its realization. This report aims to provide vehicle use level source code development in AUTOSAR OSS activity called CAPI (Common Adaptive Platform Implementation) and other OSS activities. Then the challenges that are necessary to be solved for realizing SDV as the vehicle system is shown.

The software for realizing functionality on SDV is required to work as distributed real-time system according to the future of its function requirement. This means that SDV involves the whole vehicle distributed real-time system. And the software system in SDV is required to update installed software and add new software functions after vehicle launched as before mentioned. Thus, it is necessary to have “basic software” called middleware for isolating between processor and application software which realizes desired functionality. The adequate middleware should be chosen according to the processor capability and implemented software requirements. An example deployment pattern of middleware by AUTOSAR is shown in Fig. 1.

The latest ADAS introduces AI based technology called “E2E (End To End)” architecture. The very high-performance SOC in HPC processes E2E AI system and distributed other functions works for vehicle wide ADAS system shown in Fig.2. The ADAS system is required to comply with functional safety (ISO 26262), SOTIF (Safety Of The Intended Functionality, ISO 21448) and Cybersecurity (ISO 21434) as well.

Eclipse SDV, AUTOSAR and SOAFEE intend to provide its middleware as OSS. Eclipse SDV S-CORE (Safet Open Vehicle Core) project has released its middleware software stack with tools version 0.6 in Feb. 2026 and its version 1.0 is expected in Q3 2026. AUTOSAR has extended its activity for Adaptive Platform called CAPI (Common Adaptive Platform Implementation) as OSS activity for partners shown in Fig.3

These OSS activities are useful for SOC in HPC to improve software development efficiency. But it is necessary to solve how its software quality and real-time capability are secured with OSS. In addition, how to evaluate whole implemented functionality working correctly in the largescale ECU like HPC as the EUC is a challenge as well.

We will continue to contribute to solving the challenges shown.

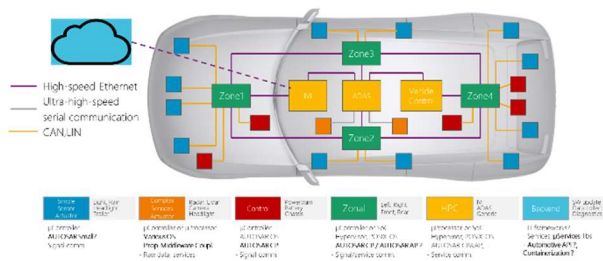


Fig.1 AUTOSAR Deployment Patterns

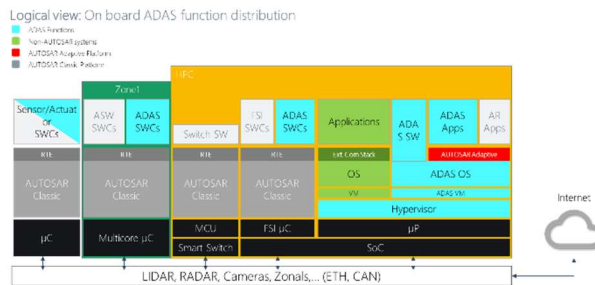


Fig.2 AUTOSR for ADAS functions in SDV

Goal do eliminate non-differentiating efforts will in future not only be limited to specification and arc designs aspects but extended towards implementations, called CAP(Common Adaptive Platform Implementation)

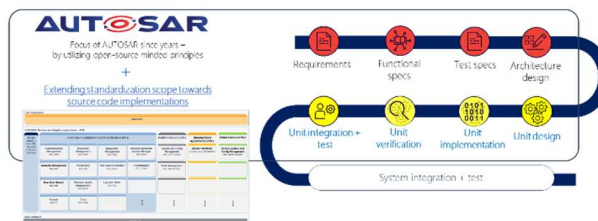


Fig.3 Extending AUTOSR activity