Interaction between AUTOSAR and non-AUTOSAR Systems on top of a Hypervisor

Abstract for 7th AUTOSAR Open Conference

Author: Pierre-Antoine Bernard

The virtualization technology enables the integration of AUTOSAR and non-AUTOSAR software systems on a single system-on-chip (SoC). The hypervisor is the major component responsible for the management of the isolated software partitions. AUTOSAR and guest operating systems (e.g. Android or Linux) can run inside the partitions, preventing them from interfering with each other. In addition, partitioning acts as a firewall, protecting the software from outside attacks. The setup is suitable for systems that need to comply with safety and security requirements.

The hypervisor enables the interconnection of software partitions by means of basic communication mechanisms (e.g. IPC or shared memory). These mechanisms set the foundation for the development of more complex technologies. Virtual interfaces (e.g. Ethernet or CAN) provide a standard way to transfer data between software partitions.

A typical use case is the integration of infotainment and in-vehicle software systems on a single chip inside a head unit. The AUTOSAR application layer and a guest operating system may communicate either over virtual Ethernet using an integrated TCP/IP stack or may use shared memory for less overhead. In addition, virtual CAN is convenient for the communication with third-party automotive operating systems.