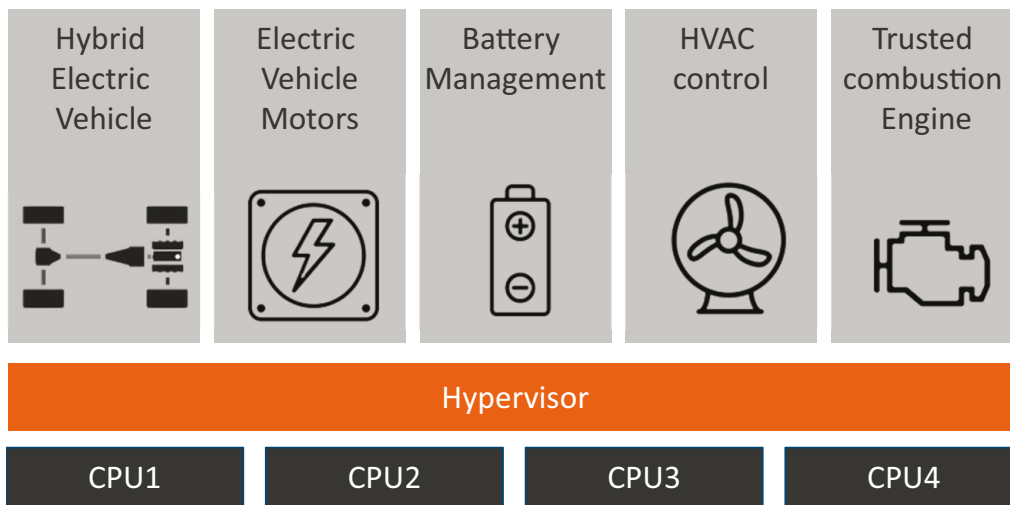


Electrical Powertrain based on Hypervisor Technology



Legend: Thrid party OpenSynergy Hardware

Reducing hardware and simplifying complexity is a common challenge in the automotive industry and this is even more the case for powertrain in electrical vehicles. COQOS Micro SDK reflects these requirements enabling the convergence of software systems with dissimilar requirements and from different vendors. NXP, Mathworks and OpenSynergy have created a reference platform for a (hybrid) powertrain to show the effect of virtualization on real-time processors. COQOS Micro SDK in this platform takes advantage of the virtualization extensions on the new generation of microcontroller such as Arm Cortex®-R52. The hypervisor improves efficiency up to 15 % and enhances battery health.

Key Data

Hardware

- NXP GREENBOX II
- NXP S32S247; Arm Cortex™-R52 with Lock Step
- AUTOSAR OS Scalability Class 4 support

Software

- COQOS Micro SDK
- AUTOSAR OS 4.x
- Baremetal Applications

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Benefits

- Integrates functions with different safety requirements (ASIL levels)
- Reduces vehicle network complexity
- Integrates AUTOSAR-based basic software and applications from different vendors
- Provides freedom from interference
- Reduces time and cost of testing and (re-) certification
- Enables modular software update.

Key Features

- Virtual Machines (VMs) act as virtual ECUs
- Inter-VM communication.

Demonstrator Features

Five real-time applications on four cores:

- Hybrid Electric Vehicle (HEV) VM
- Inv/RDC VM
- Battery Management System (BMS) VM
- Heating, cooling and ventilation (HVAC) VM
- Trusted combustion engine VM

The Virtual Machine hosting the trusted safe monitor has privileges to re-start a corrupted Virtual Machine after a fault injection.