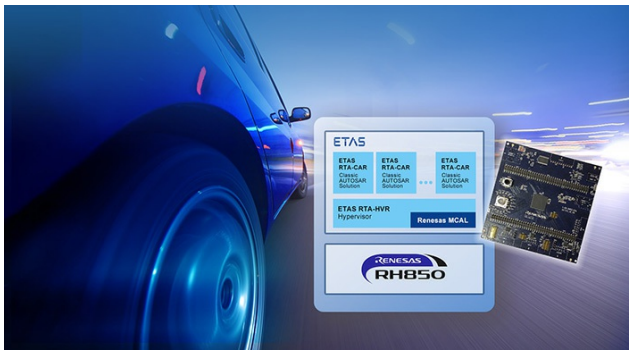
CAN Newsletter Online

ECU VIRTUALIZATION PLATFORM

Secure integration of automotive zonal networks

Renesas announced an automotive ECU (electronic control unit) development platform including CAN FD connectable RH850/U2x MCUs (micro-controller units) along with RTA-HVR software from Etas.



Automotive ECU virtualization solution platform (Source: Renesas)

The platform enables designers to integrate multiple applications into a single ECU. The ECUs are safely and securely separated from each other to avoid interference. The solution enables customers to adopt recent electrical-electronic (E/E) architectures using MCU-based zone ECUs supporting multiple logical ECUs on one physical ECU. Migration to the platform maximizes legacy reuse with minimum development effort to leverage gains in lower power consumption and reduced wiring harness weight and complexity in the vehicle.

The solution combines Renesas' CAN FD connectable RH850/U2x MCUs with Etas' RTA-HVR software, a hypervisor designed for micro-controllers with hardware virtualization support. This platform provides a ready-to-use demonstrator environment comprising pre-configured embedded software, tools and an interactive demonstrator environment for RH850/U2x MCUs. This allows automotive customers to explore design choices for the development for their individual zone-ECU project.

"The transition to a zone architecture increases the design burden by changing the functional role assignments between the central ECU and each zone ECU," said Satoshi Yoshida, Senior Director, Automotive Digital Products Marketing Division at Renesas. "In addition to the high performance provided by the RH850/U2x MCUs, I am confident that this new ECU Virtualization Solution Platform will give our customers the advantage of easy, fast development of advanced systems with built-in safety and security features." "Working together with Renesas, we were able to leverage the HW capabilities of the RH850/U2x MCUs to deliver a high performance, low overhead, embedded hypervisor for automotive applications that complements class-leading Autosar OS technologies" said Nigel Tracey, Vice President of Vehicle Operating Systems at Etas. The RH850/U2x MCUs including RH850/U2A and RH850/U2B provide a set of embedded hardware that realizes integration of multiple ASIL-D-compliant software partitions.

Etas' software provides one or more virtual machines (VMs). VMs are separated from each other in space and time to meet automotive safety and security requirements. RTA-HVR provides a toolkit to build a virtual device extension (VDE). Each VM comprises one or more virtual CPU (central processing unit) cores, a subset of device memory space and a collection of peripherals. The RH850/U2x Zone-ECU starter kit is available as part of the solution. It provides a "ready-to-run" configuration of RTA-HVR showcasing different VM configurations (single core, multi-core, and multi-VM per core). Guest software images are provided for each of the configured VMs, including bare-metal and guest images using Etas' RTA-CAR Classic Autosar solution. It offers example virtual devices for peripheral sharing and virtual inter-VM networking (a "virtual CAN"). In addition, a PC-hosted application enables users to observe and interact with the VMs at runtime.

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