Multi-Display Cockpit

OpenSynergy presents COQOS Hypervisor SDK at Arm TechCon

OpenSynergy is showing the latest version of COQOS Hypervisor SDK (Version 9.3) at the Arm TechCon on October 16-18, 2018 in San Jose. The product is suited to build the next generation of highly integrated domain controllers, such as cockpit controllers. It takes optimal advantage of the capabilities of the Arm v8-A architecture and supports many Arm-based System-on-Chips. In addition to the core hypervisor features, COQOS Hypervisor SDK allows the sharing of devices and multiple displays between the guests and includes solutions to achieve the required ASIL levels.

OpenSynergy's hypervisor platform COQOS Hypervisor SDK supports processors from Arm such as Cortex-A 53/72. It runs on several Arm-based System-on-Chips (SoCs) such as Renesas R-Car H3, NXP i.MX8 and Qualcomm Snapdragon S820A.

In addition, such SoC's contain powerful co-processors such as Graphic Processor Units (GPUs) that can drive a large number of pixels on multiple displays. They provide enough computing power to build cockpit controllers.

A cockpit controller is a new kind of integrated automotive ECU that centralizes the visual interaction between the driver and the car. It integrates a large number of very different functions that are implemented in software: from entertainment and infotainment applications to driver information systems providing safety critical information from various vehicle systems to the driver.
In new vehicle designs, using many displays, it is important that the driver does not need to interact with isolated systems but gets a fully integrated driver experience, where the information is displayed where the driver needs and expects it.

OpenSynergy's COQOS Hypervisor SDK includes an out-of-the-box implementation for such a Cockpit Controller, which needs to render many pixels on several displays with the right quality-of-service. OEMs typically require that the instrument cluster domain is rendered on the instrument cluster display with the highest priority to ensure a stable frame-rate of 60 fps. Other functional domains are allowed to use the remaining GPU rendering power to display potentially very complex scenes in a more flexible way, such as 3D maps from the navigation system, without affecting the output on the instrument cluster.

Moreover, HMI designers want to have flexibility in changing the layout of the Instrument Cluster display depending on the vehicle situation and the driver's preference. In some cases, the dials showing the vehicle speed must move to the side to blend in a 3D rendered map from the

navigation system. In other cases, the dials are in full focus and only a small space is reserved for turn-by-turn navigation.

This is technologically challenging on the cockpit controller as the same hardware pipe-line is used by both functional domains. OpenSynergy will show two key technologies at the Arm TechCon that meets these requirements:

1. Shared GPU: This feature enables several VMs to use the GPU of one SoC concurrently. This sharing mechanism must support the required Quality-of-Service. Some SoC vendors include smart extensions in their hardware to optimize sharing the GPU.
2. Shared Display: This feature decouples virtual from physical displays. Applications in VMs can render in virtual displays. A central compositor controls how these virtual displays are shown on the physical displays available to the Cockpit Controller.

As information flows within one SoC (and not over networks), efficient communication mechanisms, such as “zero-copy” shared memory, can be used.

“We invite visitors of Arm TechCon to come and see the live demonstration of OpenSynergy’s COQOS Hypervisor SDK at booth 227-AP3”, announces OpenSynergy’s CEO Stefaan Sonck Thiebaut. “This technology makes it possible to take best advantage of the features of ARM-based SoC’s to build highly integrated automotive domain controllers, such as a cockpit controller.”

About OpenSynergy

OpenSynergy provides embedded software products for the next generation of vehicles. Our hypervisor and communication products pave the way for an integrated driving experience.

The virtualization platform COQOS Hypervisor SDK supports the convergence of software-based vehicle functions with different requirements on safety and security. It is designed for multi-display cockpit controllers, smart antennae or powerful domain controllers using a mix of AUTOSAR technology and open solutions, such as Linux and Android.

OpenSynergy’s communication stacks allow the wireless connection between the car and the cloud or between the car and mobile devices. OpenSynergy’s Blue SDK is the reference bluetooth implementation for many OEMs around the world.

Our engineering services complement the products.
Read more on www.opensynergy.com

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