Advanced Visualization of Virtualized Systems for Maximum Control

OpenSynergy and INCHRON join forces to ease time-domain analysis in virtualized environments.

Berlin, November 30, 2022. A detailed time-domain analysis allows architects and integrators to optimize temporal behavior in virtualized automotive domain controllers, such as cockpit and virtualized powertrain domain controllers. Therefore, the Berlin-based software company OpenSynergy has announced a new feature of their automotive virtual platform COQOS Hypervisor SDK. OpenSynergy designed the feature to work with chronVIEW, a tool to visualize and analyze hardware traces, developed by OpenSynergy's partner INCHRON. chronVIEW is a powerful timing visualization tool for use with virtualized solutions running on application processors as well as on real-time domain controllers.

COQOS Hypervisor SDK enables the convergence of several functionalities on a single System-on-Chip (SoC) while providing freedom from interference between different systems. For a hypervisor to run optimally, it is necessary to provide all virtual machines with sufficient computing time at the right moment. This integration process stretches the limits of the hardware resources, safety requirements, and drivers' expectations. Customers using the COQOS Hypervisor SDK and its variant for real-time microcontrollers need to fine-tune the allocation of processing resources to tasks, e.g., to ensure maximum utilization of the compute resources, adherence to safety requirements (by ensuring that specific processes run within a specified period) as well as low end-to-end latency. The COQOS Hypervisor supports several standard tools for this. Especially for the variant of the COQOS Hypervisor SDK for real-time processors, OpenSynergy cooperates with INCHRON. By utilizing their tracing tool chronVIEW with COQOS, customers can record and visualize timing behavior, and make configuring the COQOS Hypervisor scheduler faster, more precise, and more comfortable.

The procedure begins by importing trace data generated by the hypervisor into chronVIEW. Once the data is in chronVIEW, automated verification of requirements combined with interactive diagrams contributes to a better understanding of the overall system behavior and the root causes of real-time errors. The visualization provided by chronVIEW enables integration and test engineers to analyze recorded data from many different perspectives and easily determine potential optimizations to the overall virtualized system.

Typical use cases include IVI audio routing, button-press-to-action latencies, safety-relevant cluster tell-tails, camera overlays for augmented reality, safety-critical torque vectoring in electrical powertrain, and many more. The challenge is to ensure end-to-end latencies and maximum core load despite the two-tier hierarchical scheduling (OS and hypervisor) of functional tasks. Optimizing both schedulers is key to the overall system performance.

Tero Salminen, responsible for the development of COQOS Hypervisor at OpenSynergy, is sure about the value-add of chronVIEW for COQOS's customers: "In the end, it's all about how quickly and easily the application of the product works in the everyday development. Customers have signaled to us that they wanted more support in this field. This feature integration is our reply."

PRESS RELEASE

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

The automotive virtual platform COQOS Hypervisor SDK integrates a mix of real-time applications and open-source solutions on powerful domain controllers. It supports a large bundle of features corresponding to the virtualization standard VIRTIO, creating maximum flexibility: guest operating systems can be used and reused on different Systems on Chips.

The automotive leading Bluetooth® stack Blue SDK is one of OpenSynergy's communications platforms. It is the reference Bluetooth® implementation for many OEMs around the world.

OpenSynergy further provides complimentary Automotive-Grade software components tailored for the Android™ Open Source Project (AOSP) to boost Android's adoption in the automotive domain. OpenSynergy also provides engineering services to support the customization of its products.
Read more on www.opensynergy.com

Contact:

OpenSynergy GmbH
Sabine Mutumba
Director of Marketing
Rotherstr. 20
D-10245 Berlin
Tel.: +49 (0)30.60 98 540-41
Email: marketing@opensynergy.com

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