

## VOSySmcs - Automotive mixed-criticality virtualization product software stack

In the era of connected electric/hybrid vehicles, the automotive industry is facing a revolution, accelerated by an un-avoidable integration of Autonomous Driving and AI. Its electronic components, based on increasingly complex, heterogeneous hardware platforms and an exponentially growing software represent a key strategic challenge. To cope with this revolution while limiting the number and costs of Electronic Components Units (ECU), car-makers are pushing for ECU consolidation with mixed-criticality requirements.

### Features

- ▶ VOSYSmonitor - ISO 26262 ASIL-C certified system partitioner for consolidation of mixed-critical automotive systems
- ▶ VOSYSVirtualNet - Safe, portable and efficient communication link based on IP stack (virtual Ethernet)
- ▶ FreeRTOS - ISO 26262 certifiable open source RTOS extended version
- ▶ Safe Peripheral Sharing - Solution to share peripherals between both domains, while ensuring the critical output is not impacted by non-critical system
- ▶ GPU virtualization - Enhance non-critical Virtual Machines (VMs) with 3D acceleration capacity for advanced graphic rendering close to native performance

### Benefits

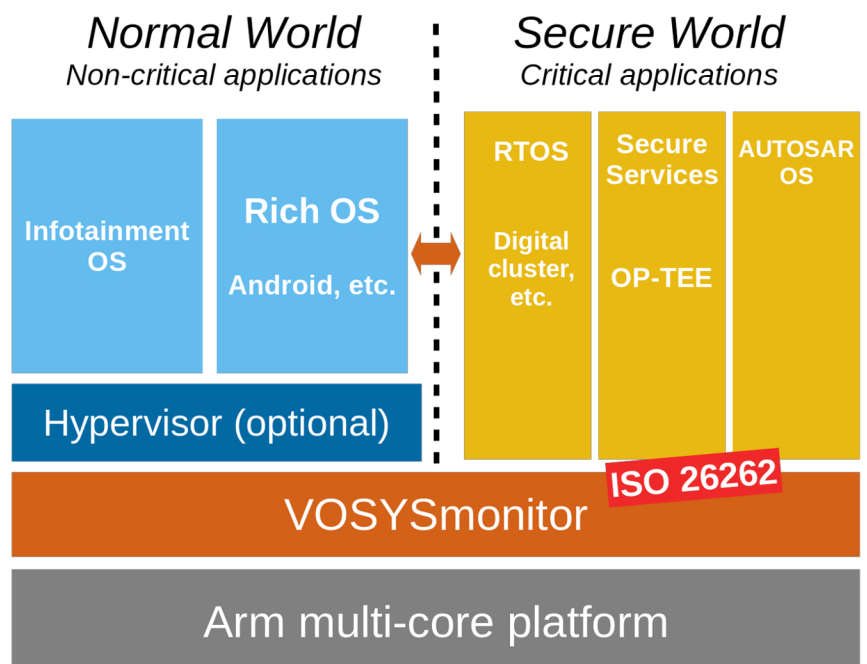
- ▶ Strongest security isolation for safety critical partitions
- ▶ Modular and scalable solution (additional software components, peripheral sharing, etc.)
- ▶ ISO 26262 certified software stack for Automotive system
- ▶ System cost reduction based on an open software stack
- ▶ High performance, no overhead
- ▶ Compatible with legacy OSES

### Virtual Open Systems' Solution

In this disruptive context, VOSySmcs, an innovative, scalable and open software stack solution, enables Tier-1 vendors to answer the requirements set by the car-makers with a secure, modular and high performance solution. VOSySmcs innovation resides into open source components (including certified RTOS) modular integration upon a slim proprietary certified virtualization layer called VOSYSmonitor.

VOSySmcs opens to a completely new generation of software driven vehicles, where autonomous driving with virtualized access to hardware accelerators can be orchestrated and executed in isolated virtual machines, with stringent ISO-26262 certification requirements. Indeed, VOSySmcs provides as key certified components, VOSYSmonitor (the system partitioner) and an open source RTOS (FreeRTOS) extended to address safety critical applications.

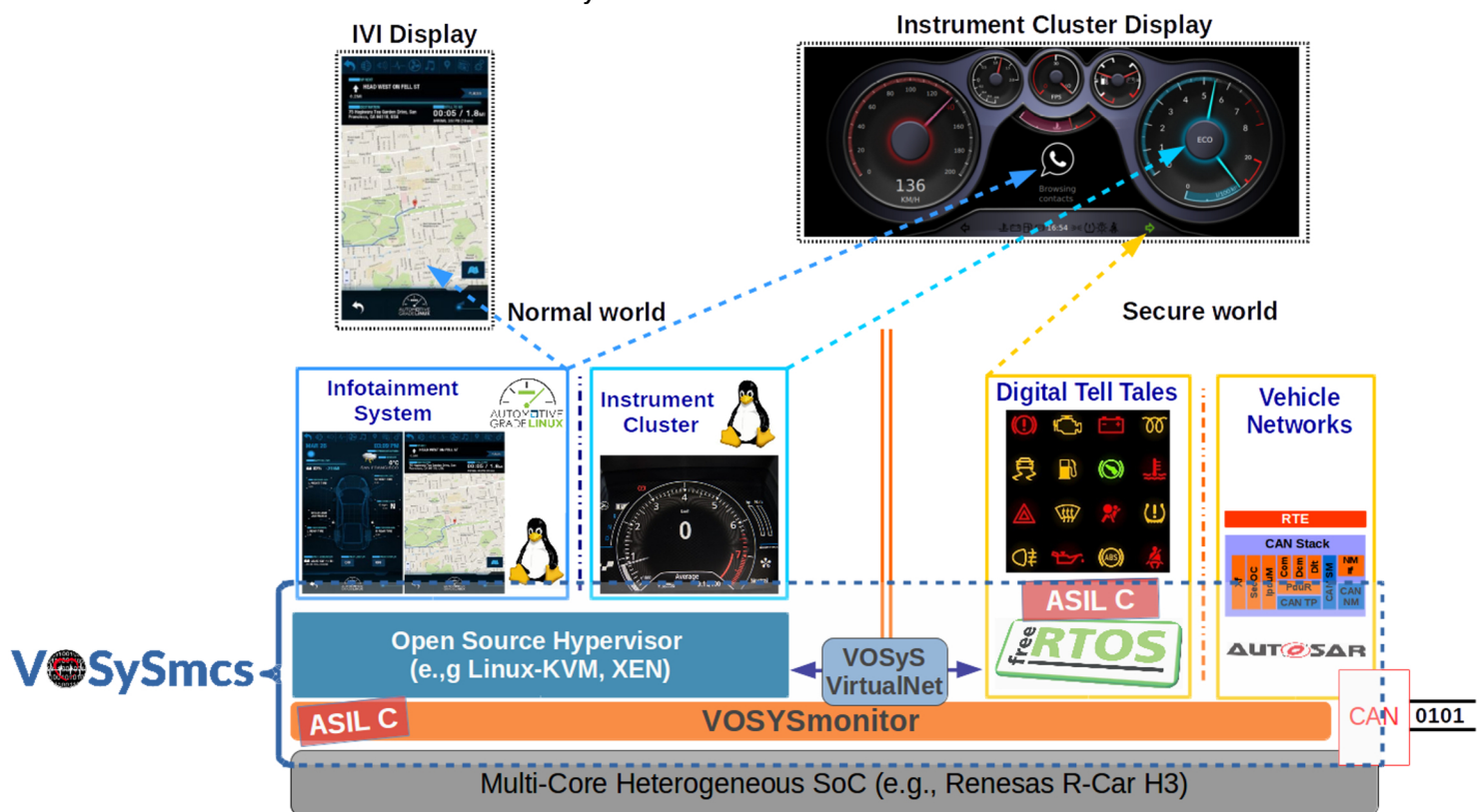
## VOSySmcs



Virtual Open Systems is a software company providing open virtualization solutions and custom services in complex mixed-criticality systems for Automotive, connected vehicles, IoT edge, and more in general for embedded systems.

## VOSySmcs automotive Safety-aware virtual cockpit for modern vehicles

VOSySmcs provides a full fledged software stack to support a modern generation of car virtual cockpit where the In-Vehicle Infotainment (IVI) system and the Instrument Digital Cluster are consolidated and interact on a single platform. Indeed, traditional gauges and lamps are replaced by digital screens offering opportunities for new functions and interactivity. Vehicle information, entertainment, navigation, camera/video and device connectivity are being combined into displays but these different applications does not have the same level of criticality.



VOSySmcs enables the integration of safety-critical and non-critical information on a single display, while providing rendering guarantees for the safety-critical output thanks to a key ISO 26262 certified component called VOSYSmonitor.

## More information about VOSYSmonitor

### Description

VOSYSmonitor is a software system partitioner that enables consolidation of mixed-critical applications on a single multi-core platform by leveraging on ARM Trustzone.

VOSYSmonitor is proposed as a software binary allowing the co-execution of critical and non-critical operating systems.

### Supported SoC's

- ▶ Renesas R-Car H3/M3 (ARMv8)
- ▶ Xilinx Zynq US+ (ARMv8)
- ▶ Renesas RZ/N1D (ARMv7)
- ▶ NVIDIA Jetson TX1 (ARMv8)
- ▶ ARM JUNO r0/r1/r2 (ARMv8)

### Key Characteristics

- ▶ Portable on ARMv7-A/ARMv8-A platforms with TrustZone
- ▶ High performance: RTOS interrupt latency < 1us
- ▶ Certified for safety systems (e.g, IEC61508, ISO26262, etc)
- ▶ System monitoring to recover failures and preserve critical OS