

ADVANCED AND SECURE AUTOMOTIVE COMPUTE PLATFORM FOR NEXT-GEN

SOFTWARE-DEFINED VEHICLES ENABLED BY NXP, GUARKNOX, AND GREEN HILLS SOFTWARE

INTRO

GuardKnox, NXP, and Green Hills Software have partnered to introduce a vehicle compute solution based on NXP's S32G vehicle network processor and Green Hills INTEGRITY RTOS. The solution introduces a consolidated, scalable, dynamic, and secure vehicle compute platform based on a consolidated single System-on-Chip (SoC) mixed-criticality platform that empowers OEMs and Tier suppliers to offer functionality as a service while decreasing the development and end solution cost.

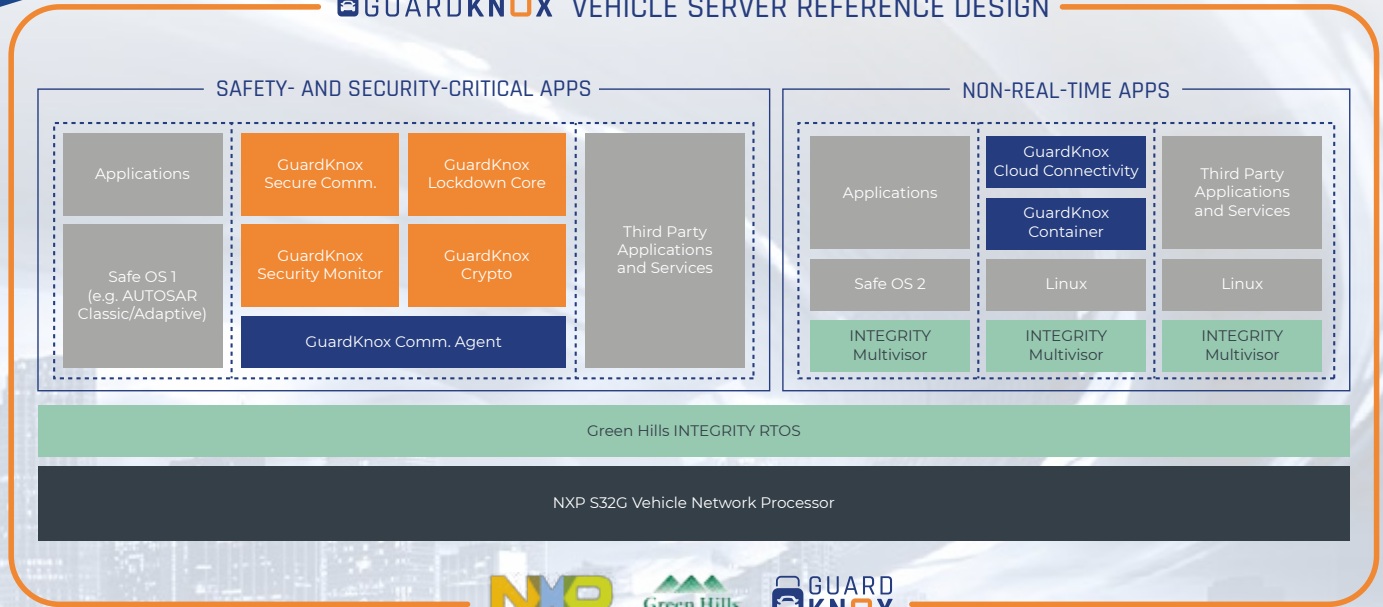
The partnership is bridging the gap in the automotive value chain where traditional market players are required to implement, innovate and introduce technological advancements needed to enable emerging Zonal Electrical/Electronic (E/E) architectures using new types of hardware and software technologies to usher in a new era of mobility.

THE VALUE OF PARTNERSHIP

Scalability (both hardware and software) will allow the industry to unlock the technological capabilities needed to deliver a personalized and customizable user experience in the form of the Service-Oriented Architecture. Furthermore, with regulation mandating future security to be designed-in (ISO/SAE 21434 and WP.29), lifecycle management with OTA updates, in particular, need to be addressed. This synergistic partnership lays the foundation to address and empower automotive players to

GuardKnox's solutions empower the auto industry with the **FREEDOM TO EVOLVE** to meet the changing needs of connected vehicles safely and securely

GUARDKNOX VEHICLE SERVER REFERENCE DESIGN



INDUSTRY TRENDS AND PAIN POINTS

The automotive landscape and traditional supply chain are undergoing a paradigm shift. No longer is the vehicle viewed as a simple transportation mechanism, but as a mobility service or the mobility experience that it provides.

The traditional approach of designing a vehicle's E/E architecture, one that has proven itself for decades, cannot scale to meet future demands. The automotive industry has responded to the consumer trends by gradually adding more and more ECUs, millions of lines of code, and hundreds of specialized suppliers and parts to the modern vehicle to increase functionality. The current E/E architecture has reached its scalability limits and can only be surpassed by a technological shift. Furthermore, new age consumers demand a personalized and immersive driving experience, founded on the concept of application hosting and downloading. The most important technical innovations for the evolution of the vehicle and its underlying E/E architecture are:

- 1. Ethernet Backbone:** Moving from CAN bus architecture to a modern high-speed switched Ethernet communication network.
- 2. Hardware Consolidation:** Consolidating multiple functions that are today served by separate ECUs into ECUs that are multi-role.
- 3. Wiring Optimization:** Consolidation of ECUs and digital traffic to reduce the needed cabling length, weight, and cost to a fraction of current implementations.
- 4. Software Driven Service:** Oriented Architecture-Functionality is evolving towards software as a Service-Oriented Architecture (SOA) that can address the needed flexibility, security, and agility for the new software-defined vehicles.

These 4 vectors are key drivers for implementing a "Zonal E/E Architecture".

NXP SEMICONDUCTORS

NXP Semiconductors N.V. enables secure connections for a smarter world, advancing solutions that make lives easier, better, and safer. As the world leader in secure connectivity solutions for embedded applications, NXP is driving innovation in the automotive, industrial & IoT, mobile, and communication infrastructure markets. The versatile NXP's S32G vehicle network processors help accelerate the automotive industry shift to high-performance domain and zonal-based vehicle architectures by enabling service-oriented gateways, vehicle compute, domain controller and safety processor solutions. The S32G processors combine high-performance real-time and application processing with network acceleration and hardware security and support ASIL D functional safety applications.

GREEN HILLS SOFTWARE

Green Hills Software is the worldwide leader in embedded safety and security and has a prodigious track record across many industries. In 2008, the Green Hills INTEGRITY-178 RTOS was the first and only operating system to be certified by NIAP (National Information Assurance Partnership comprised of NSA & NIST) to EAL 6+, High Robustness, the highest level of security ever achieved for any software product. The INTEGRITY RTOS and MULTI IDE are certified to the highest levels of safety providing the safe and secure foundation and development environment required for the creation of complex embedded devices. Our open architecture integrated development solutions address deeply embedded, absolute security and high-reliability applications for the military/ avionics, medical, industrial, automotive, networking, consumer and other markets that demand industry-certified solutions. Green Hills Software is headquartered in Santa Barbara, CA, with European headquarters in the United Kingdom. Visit Green Hills Software at www.ghs.com.

GUARDKNOX

GuardKnox is the automotive industry's first Cybertech Tier supplier that gives OEMs, Tier 1 suppliers, and the aftermarket the freedom to evolve to meet mounting consumer and industry expectations in the new era of mobility. The Cybertech Tier is a new category on the automotive supply chain designed to complement OEMs and traditional Tier suppliers, offering a suite of innovative products and solutions that will usher in the next generation of software-defined and service-oriented vehicles, including next-gen Zonal E/E architectures with Ethernet backbones. Cybertech Tier suppliers consolidate components and applications from other Tier suppliers into integrated products that are high-performing, cost-effective, and secure by design. GuardKnox offers the know-how, technologies, and patented solutions and capabilities that allow the automotive industry to rapidly deliver revolutionary vehicle functionality, over-the-air and in real-time, and on a cost-effective evolutionary budget.

