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Green Hills Software and Tata Elxsi Unveil Safe and Secure, Highly Integrated Software-Defined Automotive Cockpit

Linux, Android and Adaptive AUTOSAR safely combined by relying on the INTEGRITY RTOS' proven freedom-from-interference platform architecture

Nuremberg, Germany/ Bangalore, India, February 25, 2020 embedded world 2020 — Green Hills Software, the worldwide leader in embedded safety and security, and Tata Elxsi, the leading design and technology services provider, have announced their partnership to deliver the next generation of software-driven, highly integrated automotive cockpit solutions. The companies will showcase the first result of their cooperation, Tata Elxsi's eCockpit solution running on Green Hills Software's safe and secure INTEGRITY® real-time operating system (RTOS) and INTEGRITY Multivisor® secure virtualization, at embedded world 2020 (Hall 4, Stand 4-325).

The Tata Elxsi eCockpit solution addresses all the requirements of a full feature vehicle cockpit, supporting infotainment, instrument cluster, HUD and ADAS functionalities on a single SoC while maintaining the highest levels of safety, security and performance. The demonstration pairs Tata's eCockpit with the Green Hills ASIL-certified INTEGRITY RTOS and its Multivisor secure virtualization architecture to safely and securely consolidate mixed-criticality applications on a single, automotive-grade Renesas R-Car H3 processor. INTEGRITY Multivisor runs Linux and Android in independent, secure virtualized partitions. Tata Elxsi Infotainment is based on Automotive Android and the instrument cluster is running on Linux. Infotainment features are shown through a 2D/3D custom HMI on Automotive Android. V2X features are also integrated and displayed on the instrument cluster as warning messages. Linux guest OS is partitioned using Linux Containers to accommodate sub domains like ADAS. A separate Linux Container runs Tata Elxsi's Sensor Fusion ADAS IP over Tata Elxsi's own Adaptive AUTOSAR. Complete vehicle interface functionality is based on Tata Elxsi's own classic AUTOSAR 4.3.

The INTEGRITY RTOS microkernel architecture is designed for critical embedded systems demanding proven separation, security, and real-time determinism. Its separation architecture helps software teams to safely and securely partition software running at different levels of criticality on the Renesas R-Car H3 processor while guaranteeing applications the system resources required for their proper execution. This enables safe and secure execution of applications running graphics and multimedia while at the same time ensuring the safe operation of critical functions, such as the tell-tale status and warning lights.

"Tata Elxsi's eCockpit, combined with Green Hills INTEGRITY Multivisor, is platform agnostic and it provides automotive makers with a complete single-ECU solution for instrument cluster, infotainment and ADAS functionalities that delivers real-time performance on a single multicore automotive-grade microprocessor," *said Dan Mender, Vice-president Business Development, Green Hills Software.* "Tata Elxsi's software development and system integration for cockpit systems is driving the industry and we will continue to work together for providing safe and secure systems while supporting the cost and space reduction demands that are driving the trend of ECU consolidation."

"Green Hills Software's years of production program experience in mixed-criticality, safety-certified system design, coupled with their advanced MULTI® toolchain, significantly simplified our integration effort and reduced development time without requiring compromises in performance, safety or security in the system," said *Nitin Pai, Chief Marketing Officer & Chief Strategy Officer, Tata Elxsi*. "Our collaboration with Green Hills on this type of mixed-criticality platform consolidation allows us to provide customers with truly unique value propositions as the automotive industry looks to our joint, proven, production-ready capabilities."

Demonstration at embedded world 2020

See the joint demonstration at embedded world in Hall 4, Stand 4-325. Schedule a meeting at https://ghs.com/go/ew-meet.

About Green Hills Software

Founded in 1982, Green Hills Software is the worldwide leader in embedded safety and security. 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. 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.

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About Tata Elxsi (www.tataelxsi.com)

Tata Elxsi works with leading OEMs and suppliers in the automotive and transportation industries for R&D, design and product engineering services from architecture to launch and beyond. It brings together domain experience across Connected Infotainment, Autonomous Driving, Telematics, Powertrain, Body & Chassis electronics, along with digital technologies such as Artificial Intelligence, Analytics, Cloud and IoT.

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