Green Hills Software INTEGRITY-178B Time-Variant Unified Multi-Processing Operating System Deployed on X-ES Freescale™ QorIQ™ Single Board Computers

Middleton, WI – September 27, 2012 – Extreme Engineering Solutions (X-ES) announces that Green Hills Software's INTEGRITY®-178B Time-Variant Unified Multi-Processing (tuMP) multicore operating system is supported on all of the X-ES Single Board Computers (SBCs) hosting Freescale™ QorIQ™ P2041, P3041, P4040, and P4080 processors. INTEGRITY-178B tuMP running on the X-ES rugged XPedite5470 P4080-based 3U VPX SBC has been selected by Rockwell Collins for use in their Unmanned Air System (UAS) GPC-3000 Mission Computer.

With support for Freescale Semiconductor's family of QorIQ processors based on the e500mc core, INTEGRITY-178B tuMP runs on a number of X-ES SBCs and processor mezzanine cards, listed in the following table. All of these boards are ruggedized and available in air- and conduction-cooled versions.

Product Name	Supported QorIQ Processors with e500mc Cores	Form Factor
XPedite5400	P3041, P4040, P4080	Air-cooled XMC/PMC
XPedite5401	P3041, P4040, P4080	Conduction-cooled XMC/PMC
XPedite5430	P3041, P4040, P4080	3U CompactPCI
XPedite5470	P3041, P4040, P4080	3U VPX
XPedite5600	P2041	Air-cooled XMC/PMC
XPedite5650	P2041	COM Express
XCalibur1600	P3041, P4040, P4080	6U CompactPCI
XCalibur1630	P3041, P4040, P4080	VME
XCalibur1640	P3041, P4040, P4080	6U VPX

"X-ES has been a trusted partner of Green Hills Software for many years," said Pat Rodenbeck, Vice-President of Safety and Security Critical Products at Green Hills Software. "With their full range of Freescale QorIQ processor support for all of the industry standard form factors commonly required in avionics systems, Green Hills Software is now able to provide its INTEGRITY-178B tuMP product on reliable QorIQ multicore processor boards from a proven and credible COTS supplier."

Bret Farnum, VP of Sales, X-ES stated, "the recent introduction of INTEGRITY-178B tuMP positions Green Hills Software as the clear leader among vendors of high assurance RTOSs for multicore processors. tuMP allows our customers to effectively utilize the latest multicore processors from Freescale in mission-critical avionics applications."

Green Hills Software's INTEGRITY-178B tuMP multicore operating system builds upon a proven eleven-year service history and certification pedigree in the safety and security critical software market by incorporating patent-pending multicore operating system capabilities, including support for AMP and SMP. These tuMP capabilities enable multiple independent safety- and/or security-critical applications to execute on a multicore operating environment in a predictable, bounded, and application-independent manner. INTEGRITY-178B tuMP's partitioning enforcing scheduling method results in a single OS (i.e. unified) that provides practical time-variant scheduling of both AMP and SMP applications simultaneously by enabling the association of cores and applications into groupings (called Affinity Groups) corresponding to an end-user intended function (or functions). tuMP defines groupings (called affinity groups) of how cores will be utilized by one or more applications, with the grouping of cores and applications being permitted to vary over time. Sets of affinity groups are then scheduled independently of other sets of affinity groups, permitting time-lines that closely correspond to application requirements, yet also permitting other sets of affinity groups to be developed that can make use of any of the time windows where cores are not being utilized. Multiple schedule support (i.e. Mode Change) further extends the INTEGRITY-178B tuMP scheduling capabilities, permitting tailoring of available applications and processor time resources based on the vehicle's operational needs such as flight or combat phase.

The Freescale QorIQ Advanced Multiprocessing (AMP) T-series 64-bit processors, T4240 and T4160, will be supported on the rugged 6U VPX XCalibur1840, with a scheduled 4Q12 introduction by X-ES. In the same timeframe, Green Hills Software plans to support INTEGRITY-178B tuMP on the XCalibur1840. Additionally, Green Hills Software will add support for Freescale Semiconductor's family of QorIQ processors based on the e5500 core, specifically the QorIQ P5020 and P5040 processors, which are supported on all of the X-ES products currently supporting the P3 and P4 families of QorIQ processors. Green Hills Software's INTEGRITY-178B operating system is also supported on all X-ES boards supporting a Freescale QorIQ P1011, P1020, P2010 or P2020 processor.

About X-ES — Extreme Engineering Solutions, Inc. (X-ES), a 100% U.S.A.-based company, designs and builds single-board computers, I/O boards, power supplies, backplanes, chassis, and system-level solutions for embedded computing customers. X-ES offers cutting-edge performance and flexibility in design, plus an unparalleled level of customer support and service. For further information on X-ES products or services, please visit our website: www.xes-inc.com or call (608) 833-1155.

About Green Hills Software — Founded in 1982, Green Hills Software is the largest independent vendor of embedded development solutions. In 2008, the Green Hills INTEGRITY-178B RTOS was the first and only operating system to be certified by NIAP (National Information Assurance Partnership comprised of NSA & NIST) to EAL6+, High Robustness, the highest level of security ever achieved for any software product. Green Hills Software's 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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