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New Research Report from Embedded Market Forecasters Shows That Embedded Linux Has Become as Dependable for Developers as Real Time OSes

-- Increased development tool availability and support leads to comparable design outcomes for projects using commercial embedded Linux and RTOSes --

FRAMINGHAM, Mass. – December 5, 2007 – Embedded Market Forecasters (EMF), a strategic consulting and embedded research firm, today released a new research report entitled "Embedded Linux Total Cost of Development Analyzed." Based on interviews with more than 1,300 embedded developers, the new study compares the outcomes of hundreds of design projects that used embedded Linux to those that used commercial RTOSes (real-time operating systems), and further compares project outcomes using commercial embedded Linux with non-commercial "roll your own" embedded Linux. The findings provide device manufacturers with empirical information to support decision-making on embedded OS selection.

The new report updates the findings of EMF's often-quoted 2003 report, "Total Cost of Development, a Comprehensive Cost Evaluation Framework for Evaluating Embedded Development Platforms," in light of the many changes which have occurred since 2003 in embedded development technology.

According to the new EMF report:

- **Embedded Linux has achieved design parity with commercial RTOSes for most projects.** Embedded Linux design outcomes are consistent with the outcomes of projects using OSes (operating systems) from commercial RTOS vendors.
- **Use of a commercial embedded Linux OS is more effective than a non-commercial "in-house" Linux development undertaking.** In spite of the fact that "in-house" Linux development projects typically involve much less complexity than projects that use commercial embedded Linux and RTOSes, 15.9% fewer in-house embedded Linux projects meet the pre-design expectation levels achieved by developers using commercial Linux and RTOSes.
- **Embedded Linux can be used in a mission-critical environment** that requires MILS (Multiple Independent Levels of Security) or EAL (Evaluation Assurance Level) certification or POSIX (Portable Operating System Interface) conformance, when used in protected memory under a certified RTOS. A stable and application-proven embedded Linux design could be directly incorporated within a mission-critical application that requires MILS or EAL certification.

"This study shows that designing with an embedded Linux OS can be as dependable as designing with an RTOS," said Dr. Jerry Krasner, an embedded technology authority and

the author of the study. “The availability of general and application-specific tool sets has enabled designs that are on-time and close to pre-design expectations. However, these results are specific to commercial embedded Linux and RTOSes, and were not experienced to the same extent by in-house Linux development efforts. Our studies have clearly shown that time-to-market and final design results play a huge role in the financial success of a design project. Clearly, a few tens of thousands of dollars in up-front costs to purchase a superior time-to-market OS is very small compared to the downside risk of cost overruns and loss of market share.”

EMF’s report is based on interviews with more than 1,300 embedded developers in 2006 and 2007 across a broad range of embedded vertical market applications. The developers’ responses were gathered via a comprehensive survey designed to obtain information regarding current and anticipated tool usage, design starts, completions and cancellations, development (host) and target platforms, microprocessors used and more. EMF’s analysis included such parameters as time from design start to shipment, percent of designs completed behind schedule and the number of months behind, design complexity (based on lines of written and final code), as well as the relationship between final design results compared with pre-design expectations.

Embedded Market Forecasters’ “Embedded Linux Total Cost of Development Analyzed” report can be downloaded at www.embeddedforecast.com.

About Embedded Market Forecasters

EMF is the premier market intelligence and advisory firm in the embedded technology industry. Embedded technology refers to the ubiquitous class of products which use some type of processor as a controller. These products include guided missiles, radars, and avionics as well as robots, automobiles, telecom gear, and medical electronics. Embedded Market Forecasters (EMF) is the market research division of American Technology International, Inc. EMF clients range from startups to Global 100 companies worldwide. Founded by Dr. Jerry Krasner, a recognized authority on electronics markets, product development and channel distribution, EMF is headquartered in Framingham, Mass. For more information, please visit www.embeddedforecast.com.

About the Author

Jerry Krasner, Ph.D., MBA, is Vice President of Embedded Market Forecasters and its parent company, American Technology International. A recognized authority with over 30 years of embedded industry experience, Dr. Krasner was formerly Chairman of Biomedical Engineering at Boston University, and Chairman of Electrical and Computer Engineering at Wentworth Institute of Technology and Bunker Hill Community College. In addition to his academic appointments, Dr. Krasner served as President of Biocybernetics, Inc. and CLINCO, Inc., Executive Vice President of Plasmedics, Inc. and Clinical Development Corporation, and Director of Medical Sciences for the Carnegie-Mellon Institute of Research. Earlier, he was Senior Engineer at the MIT Instrumentation Laboratory. Dr. Krasner earned BSEE and MSEE degrees from Washington University, a Ph.D. in Medical Physiology / Biophysics from Boston University and an MBA from

Nichols College. He is a visiting professor at the Universidad de Las Palmas (Spain) where he is recognized for his work in neurosciences and computer technology.

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