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**THIRD-ANNUAL EMBEDDED SOFTWARE DEVELOPMENT SURVEY REVEALS THAT  
TRADITIONAL EDIT-COMPILE-DEBUG CYCLE IS NO LONGER ADEQUATE**

*Growing Difficulty to Reproduce Bugs, Increased Inaccessibility of Production Hardware and Shorter  
Development Timelines Cited as Most Significant Challenges*

**SAN JOSE, Calif.—May 14, 2007**—Virtutech, Inc., the leading provider of virtualized software development solutions for embedded electronic systems, today announced the results of the third annual debugging survey conducted at the Embedded Systems Conference in San Jose, Calif., April 2-6, 2007. For the third consecutive year, the survey identified debugging as the most problematic and costly phase of the software development lifecycle, with more survey respondents than last year citing increased inaccessibility to silicon, lack of bug reproducibility and more pressure to meet shorter development schedule cycles. The survey highlights the need for innovative solutions that provide a more comprehensive development infrastructure than the traditional edit-compile-debug cycle. Survey respondents were developers and decision-makers in the embedded industry.

**Survey highlights:**

- Sixty percent of respondents are using the production hardware to debug, down from 72 percent in 2006. No longer willing or able to wait for hardware availability, developers cited an increase in the use of prototypes, virtual platforms and instruction set simulation.
- An additional challenge is the current trend toward shorter-term development cycles. In fact, 34 percent of engineers cited six- to 12-month project timelines from “whiteboard” to “volume” for their current projects. This group had the most significant growth since 2006 (up from 27 percent) and indicates that developers are being tasked with meeting increasingly shorter development cycles.
- Forty-two percent of respondents named the ability to resolve and reproduce difficult bugs as the area where their current software development environment is most lacking. Up 11 percentage points from

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2006, difficult bugs are the most challenging to reproduce and resolve with current solutions. In fact, 56 percent of respondents cited debugging as the most time-consuming aspect of their work — more than double any other single task.

- Quality was once again named the most worrisome aspect of respondents' current projects (28 percent), indicating that developers face more pressure than ever to produce high-quality products on time.

At this year's Embedded Systems Conference, multicore again emerged as a key trend, evidenced by the numerous lectures and panels dedicated to the topic. In contrast to last year when multicore was largely anticipated and not yet implemented, this year's survey illustrated the beginnings of the practical application of multicore-based processors. Sixty-eight percent of respondents reported that they are involved with at least one multicore or multiprocessor project, and 20 percent spend the majority of their time working on multicore or multiprocessor systems.

Traditional development and debugging technologies, however, have not kept adequate pace with multicore adoption. Nearly six out of 10 respondents (59 percent) reported that their current debugging tools do not provide support for multicore development, and nearly one in four developers (22 percent) cited single-processor biased tools as the most difficult aspect of debugging software on multicore systems — up 8 percentage points from the previous year. The survey provided additional insight into the unique set of challenges introduced by parallel programming, particularly as it relates to software development. Respondents listed lack of determinism/bug reproducibility (33 percent), the fact the breakpoints do not freeze the system (28 percent) and thread locking (27 percent) as the most difficult aspects of debugging in a multicore environment.

#### **About Simics: Virtualized Software Development for Project Optimization and Risk Mitigation**

Virtualized software development is increasingly becoming the most effective method to develop, debug and test software, better, faster and at a lower cost. Designed for the most rigorous system development demands, Virtutech Simics is a high-performance virtualized software development environment that provides a controlled, deterministic and scalable infrastructure for the development, debugging and testing of software embedded in digital systems, including those utilizing multicore devices. Simics models are so accurate that even production binaries can run unchanged, providing customers with a significant increase in quality and faster time-to-market of the final product. Virtutech Hindsight, the first development tool for reversible



execution, enables reverse execution and debugging of a multi-threaded program on single or multiple cores simultaneously, vastly increasing the productivity of software engineers. By offering debugging capabilities not easily available in physical hardware, Virtutech Simics addresses the most pressing development challenges in today's complex electronic systems, including multicore architectures, and the dramatically increasing amount of mission-critical software in all electronics.

### **About Virtutech**

Virtutech, Inc. is the leading provider of full-system simulation for embedded software development. Virtutech's Simics is a revolutionary, award-winning simulator that provides a programmer-friendly environment for developing, testing and debugging embedded software. Simics frees software developers from hardware dependencies and supports concurrent hardware and software development. Simics customers experience lower capital expenditure, accelerate time to market, improve the quality of the released product and reduce project risk. Based on more than a decade of R&D and close collaboration with leading universities and systems vendors, Virtutech's technology serves the needs of the world's leading technology providers, including Cisco, Ericsson, Honeywell, IBM and Smiths Aerospace.

Virtutech is headquartered in San Jose, Calif. For more information, visit [www.virtutech.com](http://www.virtutech.com).

### **Methodology**

In conjunction with Virtutech, Inc., Schwartz Communications' marketing research team developed the questions used in this software development issues and insights survey, conducted at the Embedded Systems Conference 2007, in San Jose, Calif., April 2-6. Schwartz Communications administered the survey in-person, on the exhibit hall floor, to a random sampling of 354 embedded industry developers and IT decision-makers. The survey was conducted on April 3, 4 and 5, 2007.