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## **STMicroelectronics, ARM and Cadence Improve Tool and Model Interoperability with Three Joint Contributions to Accellera Systems Initiative**

*Proposed Interfaces for Interrupt Modeling, Register Introspection and Modeling of Memory Maps Enable Third-Party Model and Tools Markets*

**Geneva, Switzerland, Cambridge, UK, San Jose, California, July 29, 2013 --**

STMicroelectronics, ARM and Cadence Design Systems, Inc. today announced three new contributions to the SystemC Language Working Group of the Accellera Systems Initiative. This collaboration will further increase model and tool interoperability for electronic system-level (ESL) design at the transaction-level.

The joint work includes new interfaces for interrupt modeling, which allow seamless integration of models from different companies; application programming interfaces for register introspection that enable tool interoperability to seamlessly display and update register values; and new approaches for memory-map modeling that improve users' productivity during debugging of virtual platforms for hardware/software multicore systems. The contributions consist of fully working application programming interfaces (API) and implementations, as well as documentation and examples, released under an Apache 2.0 open-source license and available online at <http://forums.accellera.org/files/>.

"These new interfaces are crucial to strengthening the ESL ecosystem. As a step towards interoperability driven by ST, ARM and Cadence, these proposed standards dramatically reduce risks and efforts associated with the integration of virtual prototypes. Eliminating the need for adapters will increase virtual prototype simulation performances, enable sooner and faster hardware-software integration, and therefore improve product time-to-market," said Philippe Magarshack, executive vice president, Design Enablement & Services, STMicroelectronics.

"Cadence has worked closely with ST, ARM and other partners to develop these open standards proposals," said Stan Krolikoski, distinguished engineer, Cadence. "Adoption of these proposed standard interfaces in virtual prototyping solutions will enable the expansion of the ESL ecosystem and provide added value through interoperability to users."

“The Accellera TLM 2 standard has been very important in enabling an ecosystem of models that can be integrated into SystemC virtual prototypes,” said John Goodenough, vice president of Design Technology and Automation, ARM. “By addressing a key gap in the model-to-model interface and by enhancing tool integration, these proposed contributions further help in ensuring virtual prototypes can be predictably and consistently integrated.”

"With the growing adoption of virtual prototypes for early software development, it is important to continue to simplify their creation while adding value for users," said Yatin Trivedi, director, standards and interoperability at Synopsys. "As a market leader in virtual prototyping, we welcome contributions and discussions that help to advance the Accellera SystemC TLM standard."

“We look forward to working together and collaborating in the Accellera Systems Initiative SystemC Language Working Group to advance the needs for improved virtual prototyping model and tool interoperability,” said Shabtay Matalon, ESL market development manager from Mentor Graphics Corporation. “The initial open source contributions serve as a good catalyst to start the process of addressing and refining these pressing standards challenges.”

The first technical proposal addresses the need for better interoperability among SystemC TLM (Transaction Level Modeling) models and proposes a standard interface to model interrupts and wires at the Transaction Level. This will enable seamless integration of models from different companies with standardized memory-mapped connections, further enhancing the growth of a market for third-party TLM models.

The second proposal defines a standard interface between models and tools to support register introspection, enabling tools to seamlessly display and update register values. This interface works in a mix of different user-defined register classes to support platforms integrating heterogeneous models from various model providers. This capability is a key enabler for integration and debug of embedded software on pre-silicon virtual prototypes.

The third proposal introduces an approach to reconstruct system memory maps as seen from initiators, enabling ESL tools to support hardware/software debug on complex virtual platforms, for which understanding of the memory maps is instrumental. It addresses the challenge that memory maps depend on the interconnection of models and as a result each system initiator might have its own view.

With these new contributions, ST, ARM and Cadence expect the integration of SystemC models in virtual prototypes will be significantly improved for all users, enabling the models' quick and efficient deployment. In addition, standard interfaces between models and tools will extend hardware/software integration and debug capabilities using appropriate tools.

Within the Accellera Systems Initiative, ARM, Cadence, and ST plan to work with other companies to refine and fully standardize these proposals.

### **About STMicroelectronics**

ST is a global leader in the semiconductor market serving customers across the spectrum of sense and power and automotive products and embedded processing solutions. From energy management and savings to trust and data security, from healthcare and wellness to smart consumer devices, in the home, car and office, at work and at play, ST is found everywhere microelectronics make a positive and innovative contribution to people's life. By getting more from technology to get more from life, ST stands for life.augmented.

In 2012, the company's net revenues were \$8.49 billion. Further information on ST can be found at [www.st.com](http://www.st.com).

### **About ARM**

ARM designs the technology that is at the heart of advanced digital products, from wireless, networking and consumer entertainment solutions to imaging, automotive, security and storage devices. ARM's comprehensive product offering includes RISC microprocessors, graphics processors, video engines, enabling software, cell libraries, embedded memories, high-speed connectivity products, peripherals and development tools. Combined with comprehensive design services, training, support and maintenance, and the company's broad Partner community, they provide a total system solution that offers a fast, reliable path to market for leading electronics companies. Find out more about ARM at <http://www.arm.com>

### **About Cadence**

Cadence enables global electronic design innovation and plays an essential role in the creation of today's integrated circuits and electronics. Customers use Cadence software, hardware, IP, and services to design and verify advanced semiconductors, consumer electronics, networking and telecommunications equipment, and computer systems. The company is headquartered in San Jose, Calif., with sales offices, design centers, and research facilities around the world to serve the global electronics industry. More information about the company, its products, and services is available at [www.cadence.com](http://www.cadence.com). Follow us on Facebook, Twitter, Flickr and Google+.

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