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IEEE catches the Spirit of IP reuse

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Santa Cruz, Calif. -- Spirit, an emerging standard aimed at simplifying silicon intellectual property integration and reuse, has quietly entered the IEEE standards process with the formation of the IEEE P1685 working group. The result may be accelerated adoption of a meta-data description and an application programming interface that many observers see as critical catalysts for system-on-chip (SoC) design.

Spirit, which stands for "Structure for packaging, integrating and reusing IP within tool flows," was launched by several companies at the Design Automation Conference in 2003. The goal is a common specification mechanism for describing intellectual-property integration data, and to allow automatic IP configuration and integration using compatible tools.

To that end, the Spirit Consortium has developed an IP metadata description based on an XML schema. Compatible with automated integration techniques, it allows the use of IP from multiple sources with Spirit-compatible tools. Spirit has also developed an IP tool integration application programming interface that lets Spirit-enabled tools interpret, configure, integrate and manipulate IP blocks that comply with the IP metadata description.

Support coalesced quickly, and today the consortium has 54 members. Steering committee members are ARM, Cadence Design Systems, LSI Logic, Mentor Graphics, Philips Semiconductors, STMicroelectronics and Synopsys. The Spirit version 1.0 spec was released in December 2004. In May 2006, the consortium released its version 1.2 spec, which covers RTL design and integration. An electronic system-level (ESL) extension is expected to be released later this year.

"I think [Spirit] comes at an important time for SoC designers," said Victor Berman, group director of language standards at Cadence Design Systems Inc. and chair of the IEEE P1685 working group. "People have been talking for a long time about being able to automate the process of integrating IP. In talking to people, we see that it [Spirit] meets their needs."

Berman said that IEEE standardization will ensure that Spirit is "an open, understood, well-defined specification" that will be stable and available worldwide. "It gives people a feeling of confidence that it will be around for a long time," he said.

There's more to Spirit than what first meets the eye, said Gary Smith, chief EDA analyst at Gartner Dataquest. "Spirit has grown from a fairly boring standards effort to an extremely exciting effort over the past few years," he said.

Beyond IP metadata, Smith said, the technical community is looking at Spirit as a way to embed constraints from the behavioral level down to RTL implementation. Some, he said, are looking at Spirit as a way of developing the "intention layer" needed to imply parallelization for C-language code. That means Spirit could be an important part of what Smith calls the "concurrent software compiler," a future development that will be important for large-scale multiprocessor SoC design.

The IEEE standardization effort is new, and the working group has completed initial meetings to agree on policies and procedures, Berman said. The group will start with the 1.2 spec, but there's no timetable for deliverables. IEEE P1685 will be part of the IEEE's corporate standards program, in which each company represented in the committee has a vote. So far, said Berman, all of the Spirit Consortium steering committee companies are represented.



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Since the Spirit specification is young, it hasn't yet seen widespread use beyond the members of the Spirit Consortium steering committee, Berman noted. But Philips, STMicroelectronics and ARM are all using Spirit, and the major EDA vendors are starting to support it with their tools.

Ralph von Vignau, Spirit Consortium chair and director of technology and standards for Philips Semiconductors' Chief Technology Office, described the Philips NX-Builder SoC design environment at the recent Medea+DAC workshop in Prien, Germany. Starting with ESL design, NX-Builder leverages the Spirit XML schema to support IP import and packaging, platform design entry, design implementation, verification and software development.

Spirit is gaining strong momentum at STMicroelectronics, said Frank Ghenassia, director of ST's system platforms group. "Many of our design teams consider it as a way to consolidate ad hoc techniques that they've been using for years into a single industry standard," Ghenassia said. He added that "IEEE P1685 is a very important step toward the adoption of the Spirit standard by the whole industry."

ARM released its RealView SoC Designer tool suite with support for the initial Spirit spec in 2005. "Spirit is becoming established among systems integrators as an integration solution for front-end system flows," said Chris Lennard, strategic-marketing manager for ESL solutions at ARM.

Cadence hasn't yet announced Spirit tool support but plans to do so, Berman said. "We see this as a central database we can integrate a tool flow around," he said. "Similar to the early days of EDA, when frameworks and databases were so important, it's an integration point for all the data. It allows you to build tools around it, launches tools and gives you information about the components you're integrating."

Mentor Graphics Corp. conceived of the technology behind Spirit's XML spec, noted John Wilson, Mentor Graphics product-marketing manager. He said that Mentor's Platform Express product supports Spirit 1.2, and that Spirit XML data is provided for Mentor's IP offerings.

Synopsys Inc. tools support the Spirit XML data model, and the company is providing Spirit views of some of its verification IP, said Joachim Kunkel, vice president of engineering for Synopsys' solutions group. Synopsys also provides Spirit views for its DesignWare cores and library IP.

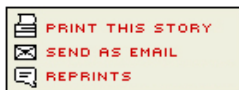
The Spirit Consortium is holding a general meeting July 24 at DAC in San Francisco, where it will present the consortium's road map and the proposed IEEE 1685 standard.



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