New Internet Reconfigurable Logic

for Creating Web-enabled Devices

Continuing its Internet-based Silicon Xpresso initiative, Xilinx recently announced Java-based tools and technology that will revolutionize the development and deployment of Internet network appliances, using Virtex FPGAs.

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Internet Reconfigurable Logic (IRL) technologies will be the basis for new products that can be dynamically upgraded with both software and logic on the customer premises. The concept of IRL will revolutionize network-connected products.

Xilinx IRL solutions are targeted at emerging network appliances such as multi-use set top boxes, games, security systems, and process controllers. In addition, IRL will be deployed in network equipment such as ATM, cellular base stations, and satellite communications systems. The hardware for these Virtex-based products can be upgraded over the Internet to add new features or capabilities.

The combination of three fundamental technologies will empower the design of radically new IRL products: pervasive networking, Java technology, and reconfigurable FPGAs such as Virtex. These technologies will allow you to create products that can be enhanced with new features, after installation, at the customer site.

To support Internet Reconfigurable Logic, Xilinx also unveiled the new JBits™ API and ChipScope™ tools.

JBits API

The JBits API is a new Java-based tool set, or application programming interface (API), that allows you to write information directly to a Xilinx FPGA to carry out the logic operations that were designed for it. The JBits API permits the FPGA bitstream to be modified quickly, allowing fast reconfiguration of the device. With Virtex FPGAs, the JBits API can partially or fully reconfigure the internal logic.

The Virtex architecture allows partial reconfiguration to occur while maintaining the logic on the remainder of the device. The JBits API also makes it possible to integrate the operations of the FPGA with other system components such as an embedded processor, a graphics coprocessor, or any digital peripheral device.

JBits applications can use the "Java API for Boundary Scan," unveiled by Xilinx in September, for platform-independent device configurations deployed locally or remotely over the Internet. These applets can be control programs, consumer interface programs, or updates. Previously, Java applets were only used to send software updates via the Internet. The JBits API now makes its possible to create Java logic applets that can be used to send new hardware updates as well.

ChipScope

ChipScope is a portable, interactive debugging tool, written in Java, that allows you to examine the operation of Xilinx FPGA circuits. The ChipScope tool, like the JBits API, is Internet enabled, allowing for remote debugging of IRL-based products. Designed to show data flow, the ChipScope tool displays the internal states of all FPGAs in the system.

The ChipScope tool simplifies the tedious design verification required for system-on-a-chip designs. A waveform display permits both bit-level signal and multi-bit busses to be viewed. Moreover, a remote access feature lets multiple users communicate with the hardware over a network for Internet team-based design. ChipScope also allows you to functionally

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view tagged, secure, intellectual property. This enables discrete core manipulation for system-on-a-chip design.

The JBits and ChipScope tools follow two earlier Silicon Xpresso announcements introducing the Java API for Boundary Scan and the Webfitter tool, plus the release of new Xilinx Foundation 1.5i design tools that provide instant access to Web-enabled design.

What People are Saying about IRL

"This third phase of our Silicon Xpresso initiative is focused on advanced technology that will help electronic equipment manufacturers bring Internet-enabled products to their customers' businesses and consumers. International Data Corp. projects that this exploding marketplace will account for an installed base of more than 500 million Web-enabled hardware devices by 2003," said Rich Sevcik, senior vice president of software, cores and support solutions at Xilinx. "We're confident that the system-level features of our new Virtex FPGAs, combined with the innovative JBits and ChipScope tools, will provide the necessary foundation to help bring IRL applications into the mainstream. The Java programming language and the Internet will play a key role in the development of reconfigurable end products whose hardware literally can be upgraded over the network."

"We have utilized many of these FPGA-based reconfigurable concepts in our ATM switches at IBM," said Jean Calvignac, an IBM Fellow with IBM's Networking Hardware Division in Research Triangle Park, N.C. "Our customers have been

pleased to see product updates occur automatically via the network. These seamless updates have included both software and hardware changes. With its tools for Internet Reconfigurable Logic, Xilinx is broadening the appeal of this exciting technology."

"Compaq's PCI Development Platform embodies many of the Internet Reconfigurable Logic concepts which can benefit our customers today," said Gene Nelson, vice president, Compaq Custom Systems. "We are pleased that Xilinx selected Compaq's Xilinx FPGA-based 'PCI Development Platform' in the development of JBits and ChipScope tools, saving them time and development costs by providing an open and flexible reconfigurable board on the PCI bus. By Xilinx providing standardized support, we will be able to take these IRL concepts much further in future FPGA-based products."

A number of other industry leaders, including, Siemens, Sun Microsystems Inc., and Synplicity, announced support for IRL services and products. In addition, two longtime Xilinx development partners in the reconfigurable logic arena, Annapolis Micro Systems Inc. and Virtual Computer Corp., announced Virtex-based development systems that support IRL.

Conclusion

Internet Reconfigurable Logic is a revolutionary new way to create network appliances that can easily be re-wired to perform many different applications. Xilinx is creating the tools, the software, and the device technology that makes it all happen. ⚡

Beta versions of the JBits and ChipScope tools will be available in the first quarter of 1999, with pricing to be announced at that time. For more information on Silicon Xpresso, visit www.xilinx.com/products/software/sx/sxpresso.html