Xilinx Virtex-II Pro X FPGAs Cut System Cabling Costs By Tens Of Thousands Of Dollars

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At DesignCon 2005, Xilinx Inc. today showcased the industry's first demonstration of Virtex-II Pro X RocketIO Multi-Gigabit Transceivers (MGTs) driving 10 Gbps of serial data over one meter of industry standard InfiniBand copper cable assemblies, developed by Meritec. The demonstration proves that a cost effective and reliable cabling solution at data rates up to 10 Gbps is possible with off the shelf components. As a result, designers seeking lower-cost system cabling can now save tens of thousands of dollars compared to optical based solutions. For instance, a multi-shelf system composed of two 80 gigabit Metro Aggregation Switches requires eight bidirectional 10 Gbps links. Using two Virtex-II Pro X FPGAs and a standard x12 InfiniBand cable, this solution can be provided for less than $800 while a comparable solution using the XFP or X2 optical modules would cost more than $15K.

According to Ken Braund, marketing manager at Meritec, "The market is demanding new, robust, low cost solutions for very high bandwidth applications such as 10G Ethernet, CX4, 10G Fibre Channel, 10G ATM, SONET, InfinBand, and more. Regardless of application, be it box-to-box, rack-to-rack, or virtual backplanes, the combination of Xilinx FPGA technology and Meritec's Direct Attach 4x and 12x cable assemblies delivers the high-speed, cost-effective solution the market needs."

"Xilinx designed the RocketIO MGT with the goal of providing high-

performance serial solutions for a range of system requirements while reducing system cost and offering faster time-to-market," said Tim Hemken, marketing director for the Communications Technology Division at Xilinx. "As a part of our High-Speed Serial Initiative to provide pre-engineered solutions that simplify the design of serial systems, we are very pleased to be working with Meritec to offer proven flexible, reliable system cabling alternatives."

The InfiniBand Specification provides for cable configurations of x1, x4, and x12 bidirectional channels in a single connector/cable assembly. These multi-channel cables provide a new approach for multi-gigabit interconnects. Customers can now easily run up to 12 channels at 6 Gbps, solving a long-standing copper connect design challenge. A more significant point lies in the fact that performance-leading companies can now run 12 channels at 10 Gbps delivering an astonishing 120 Gbps in each direction.

These multi-gigabit transmissions over standard copper cables will provide customers reliable high-speed cabling solutions for numerous interconnect applications, such as shelf-to-shelf and rack-to-rack for network equipment, storage systems, server clusters, scalable multi-processing and proprietary interconnects. This new copper cabling solution provides more flexibility to customers, while reducing program risk and costs by combining industry standard FPGAs with cost-effective InfiniBand interconnect products.

Demonstration Drill Down

The demonstration is based on multiple 10 Gbps channels running in alternating directions through a 1-meter cable and connector assembly, therefore injecting maximum cross talk from adjacent aggressors. The error free performance easily exceeds 10-15, making it ideal for shelf-to-shelf applications. Error free performance has also been shown with four

links operating simultaneously at 6.25 Gbps over six meters of x4 InfiniBand cable. The bit error rate measurements were performed using the XBERT reference design from Xilinx. The XBERT reference design (available as a free download at www.xilinx.com/bvdocs/appnotes/xapp661.pdf) allows users to run bit error testing on any combination of channels simultaneously, or even one at a time. For more information on this solution, please visit the Xilinx high-speed serial solution portal at www.xilinx.com/serialsolution.

About Xilinx Virtex-II Pro X FPGAs

Xilinx Virtex-II Pro X FPGAs incorporate up to 20 RocketIO multi-gigabit transceivers, supporting operating ranges of 2.488 Gbps to 10.3125 Gbps per channel. Virtex-II Pro X FPGAs are the first programmable ICs that can directly drive OC-48 SONET compliant systems and support SONET implementation for OC-192 data rates as well as 10GE applications. Virtex-II Pro X FPGAs also enable new applications which require multiple high-speed serial channels, each running at speeds up to 10.3125 Gbps, including popular bandwidth nodes such as 4.25 Gbps, 5 Gbps, and 6.25 Gbps. The 10 Gbps transceivers, when used in multiples, support effective bandwidths through the FPGA of more than 200 Gbps.

About the Xilinx High-Speed Serial Initiative

The Xilinx High-Speed Serial Initiative was established to accelerate the industry's migration from parallel to high-speed serial I/O by delivering a new generation of connectivity solutions for system designers. The trend toward high-speed serial connectivity is being driven by companies across a wide range of industries as a means to reduce system costs, simplify system design, and provide scalability to keep pace with current and future bandwidth requirements. Serial solutions will ultimately be

deployed in nearly every aspect of every electronic product imaginable, from chip-to-chip interfacing, backplane connectivity, and box-to-box communications.