Who's Using Virtex and Spartan FPGAs *in Xilinx Online Applications?*

Though it was only recently introduced, Xilinx Online technology is already being used by some leading-edge companies to create unique new field upgradable systems.

by Wallace Westfeldt,
Marketing Manager IRL, Xilinx,
wallace@xilinx.com

Many companies are now taking advantage of the enormous benefits provided by the Xilinx Online program, which was created to enable, identify, and promote field upgradable applications based upon the award winning Internet Reconfigurable Logic (IRL) methodology from Xilinx. These field upgradable applications are defined as being those that are connected to a private or public network (such as the Internet), with the ability to be updated, fixed, or modified after they have been deployed in the field. Such applications are being widely developed today by a growing number of leading-edge companies; many use Virtex devices for their size, speed, and flexibility; others use Spartan FPGAs for their lower cost.

Apex

Apex is one of the fastest growing network companies; they were recently ranked fifth in Business Week's list of "100 Hottest Growth Companies," and the company has been in the top five of this list for three consecutive years. Apex uses SpartanXL FPGAs in their latest remote server management product introduced in August.

The Emerge 2000™ system from Apex is a breakthrough remote server device that can dynamically update its performance characteristics depending on the workload and systems to which it is connected. "The Emerge family addresses several needs regarding remote server management," said Kevin J. Hafer, president and CEO of Apex. "IT managers require speed, security, ease-of-use, and the ability to manage servers without burdening server or network performance. Our team worked very closely with Xilinx to ensure that Emerge 2000 meets all these key requirements."

Emerge 2000 is expected to be a key cost-reduction component of server management strategies for data centers, Internet service providers, and "server farms" of all types, especially for round-the-clock mission-critical applications. It allows operators to manage large numbers of servers connected to local area networks, wide area networks, or the Internet using only a single console, mouse and key-

APEX Emerge 2000

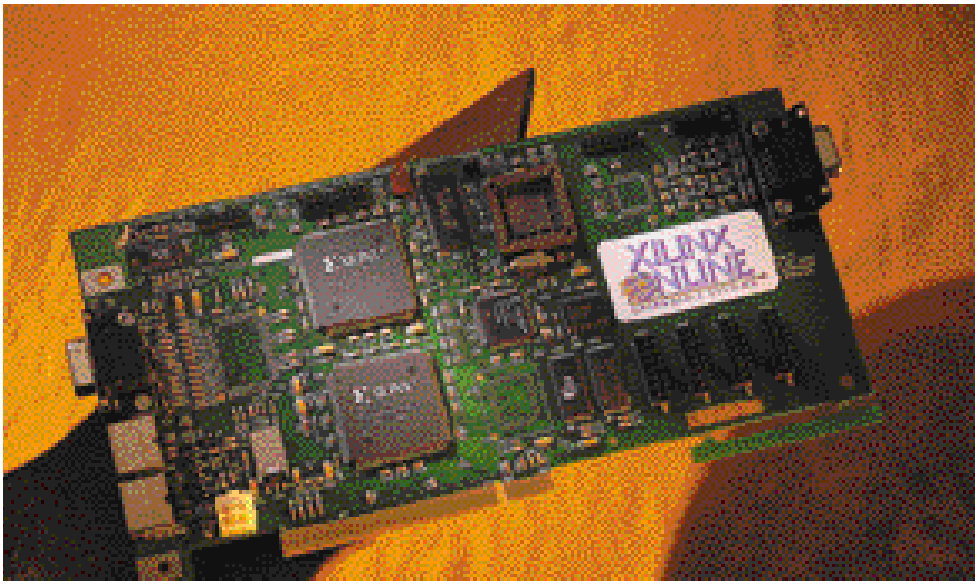

Figure 1

board, without the need to load software or hardware directly on each server.

Emerge 2000 customers can access racks of servers from remote locations through dial-in modems, networks, or Internet protocol addresses. When combined with Apex's OutLook® and ViewPoint® console switches, Emerge 2000 permits system administrators to remotely switch among, view, and control up to hundreds of servers.

Emerge 2000 can be reconfigured to support the operating system, BIOS, video subsystem, keyboard map, or mouse pointing system of a given server, and it provides compatibility with the display resolution, color depth, and refresh rate parameters for the server's console. Additionally, Emerge supports various physical connections between the console and the server farm, ranging from broadband optical and T-1 to dial-up modem.

The key element of Emerge is a compactly designed PCI circuit board (Figure 1). One of its Xilinx SpartanXL FPGAs serves as a 32-bit, 33-MHz PCI interface (based on the Xilinx Real PCI LogiCORE) and a video signal processor. The other SpartanXL FPGA is reconfigured dynamically, with digital signal processing algorithms, to overcome problems associated with remote access. The Emerge 2000 system swaps communications optimization algorithms in the SpartanXL FPGA almost every time it switches to another server. The reconfiguration data is stored on disk and read into the SpartanXL FPGA in milliseconds.

"Apex is to be congratulated on its forward looking design of the Emerge 2000 and its use of the Xilinx Internet Reconfigurable Logic methodology to create advanced server management products," said Xilinx CEO Wim Roelandts. "The Emerge 2000 systems exemplifies the beginning of a new generation of Xilinx Online field upgradable applications whose FPGA-based hardware can be modified after installation at the customer's premises."

TSI TelSys

"Our customers include many of the world's space agencies and leading aerospace firms," said Toby Bennett, Vice President, TSI TelSys. "Their satellite ground station facilities, which utilize our protocol agile communication products, are often located in remote, inhospitable regions such as near the North Pole. TSI TelSys develops Xilinx Online applications so that our systems can be easily maintained and updated over the Internet." Figure 2 shows a TSI TelSys board.

NDS

NDSalready makes great useof field upgrades," said John Simmons, Project Leader, NDS, Ltd., speaking on their downloading procedures for making post-installation upgrades. "For example, all our FPGA design data is stored in flash memory and the flash is upgradable via the Ethernet. Field upgradability is essential to our success. It allows fast, cheap resolutions to the rare problems that we get in the field, and is a delight to our customers." NDS provides broadcast systems for HDTV.

Xilinx Online Reference Designs on the Web

In addition to these customer examples, Xilinx continues to enable field upgradable applications by providing, information, discussion, and reference designs through the Xilinx Online website (http://www.xilinx.com/xilinxonline/). Recently published on this website is a description of an Internet-upgradable application for Virtex, based on the WildCard general purpose reconfiguration card from Annapolis Microsystems.

This application, demonstrated at DAC '99, allows users to select Photoshop filters (configured for a Virtex FPGA) from an Internet appliance website, and securely download them using Java-based technology. These filters, are downloaded to a laptop and then programmed

(Continued)

TSI TelSys Board

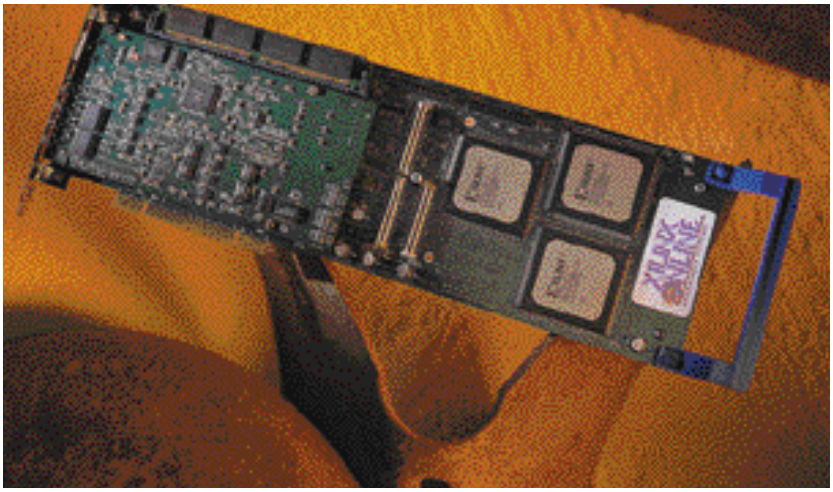

Figure 2

into a Virtex FPGA on a PCMCIA card, for high speed graphics processing.

"In this demonstration application, which provides hardware acceleration for Photoshop filters, we wanted to show a complete system using standard tools available today for doing field upgrades," said Rich Sevcik, senior vice president software, cores, and support at Xilinx. "With our tools, the Virtex FPGAs, our design service partners, and the reference designs, we are providing a complete environment to enable our customers to build the next wave of programmable logic applications."

Conclusion

The number of Xilinx Online applications is growing quickly because of the many benefits offered by this revolutionary technology. Xilinx Online field upgradable applications are currently being used in network equipment such as ATM switches, cellular base stations, and satellite communications systems, and the Xilinx Online program is additionally targeting opportunities in emerging markets such as network appliances, multi-use set top boxes, and mobile network devices. Σ

Virtex FPGAs

The Virtex family was developed to address system-level designs and field upgradable systems, integrating 200 MHz system interfaces and timing management capabilities within a million–gate FPGA that includes a hierarchy of memory resources. Virtex FPGAs support partial reconfiguration, thus allowing new circuitry to be downloaded while standard operation continues within the device.

A fast 400Mb/second reconfiguration rate ensures that a full reconfiguration can be done in milliseconds and a partial reconfiguration can be done in microseconds. Reference designs will be available on the Xilinx Online Web page within the Xilinx website. These Web pages also contain frequently asked questions, a user forum, application notes, white papers, links to third-party reconfiguration companies, and links to design service companies supporting the development of Xilinx Online field upgradable applications.

Spartan FPGAs

Spartan FPGAs are targeted as gate array replacements for low-cost, high-volume designs under 40,000 system gates that require on-chip RAM and can benefit from pre-defined software cores. Current Spartan devices operate at 3.3 volts and 5 volts.