

The Promise of Field Upgradable Systems

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One of the most exciting developments in our industry is the increasing shift toward using networks, including the Internet, to remotely upgrade the digital equipment that is already installed at a customer's location, anywhere in the world, and beyond.



Updating software remotely, with new enhancements and bug fixes, is a common practice. However, remotely updating hardware may appear to be more challenging because hardware is typically a fixed entity that is updated by manually replacing circuit boards. Now, with our current FPGA families and the Xilinx Online software technologies, doing automatic, remote hardware upgrades is not only a reality, it is becoming a necessity in many new applications.

Researchers have been investigating this concept for years, and a few forward looking companies have already deployed FPGA-based remotely reconfigurable products. IBM, for example, currently markets an ATM switch whose FPGA-based logic can be changed over the network to bring it into accord with the latest changes in the ATM standard. A number of Xilinx customers, including large communications companies building the next generation of WCDMA wireless systems, are very interested in the idea, and a few are well along the way with major designs efforts.

The advantages of this new possibility are enormous. For example, the ability to remotely update hardware with new features or the latest bug fix can accelerate your time-to-market, extend the useful life of existing systems, and significantly cut production, maintenance, and support costs. Many of today's systems already come with some form of built-in com-

munications or microprocessor interface, making the addition of remote field update capability a simple matter. If you consider doing remote updates during the initial specification and design process, your systems can easily reap all the benefits of being updated remotely.

Remote upgradability significantly increases the useful lifetime of a system. The ability to add new hardware features and fix existing ones without sending a technician out to the field can add up to considerable maintenance and support savings over the entire life of the system. Imagine the implications for satellite-based communications equipment.

Remotely upgradeable systems can also provide new revenue prospects. After the initial product is released, you can develop new hardware features then sell and distribute those features to existing customers just as software developers do today. Or a standard "off-the-shelf" application can be developed so features can be swapped in and out depending on what the end-user purchases or needs.

Any system that has some type of connectivity to the "outside world" could potentially benefit from being designed to support field updates. Typical products include network appliances, set-top boxes, security systems, network equipment, cellular base stations, and satellite communications systems. Other likely applications are HDTV, video and image processing, encryption, military communications, surveillance, radar, and sonar.

Clearly, electronic equipment manufacturers who begin to think about the benefits of remote hardware upgrades today will be the ones who lead their markets in the not-to-distant future. ❧