

Thunderbolt Extends The Benefits of FireWire

By Dave Thompson, LSI

Thunderbolt products continue to roll into the marketplace after Apple and Intel's announcement of the technology in 2011. While many articles have been authored on the bandwidth offered by Thunderbolt technology, fewer articles have been published on what real-world consumer capabilities are enabled by Thunderbolt.

Every few months for almost two decades, the same question has been asked on the Internet: "Why can't I buy a USB-to-1394 converter so that I can connect my 1394 camcorder to a USB port on my PC?" The answer for the last two decades has been a single product from Pixela Corp. that advertised the ability to connect a single 1394 camcorder to a USB port when running WinXP. I've had one on my desk for about a decade and I have never evaluated it. I never evaluated the product because I knew that the product only allowed a single 1394 camcorder (isochronous traffic) to be attached and would not work with my 1394 storage products (asynchronous traffic). I did have it x-rayed once to find out how many chips were inside (two).

The root problem is that USB is a master-slave bus and slave products connected via USB have limited access to PC CPU resources.

Thunderbolt technology has changed all that.

Thunderbolt is a master-master bus that allows true expansion far beyond the capabilities of a USB hub that simply repeats traffic to and from slave devices. Today you can buy that converter for \$29, enabling connection of any 1394 product to a PC that has a Thunderbolt connector. It works because Thunderbolt cables carry PCI-Express from the PC's CPU and memory subsystem "outside the box".

The \$29 Thunderbolt-to-1394 cable available in the Apple store provides exactly the same capabilities as the 1394 connector that resides in Apple and Windows PC's that have 1394 connections "inside-the-box". The advantage for system providers is that the hardware for that 1394 connection can be moved "outside-the-box" to increase flexibility while reducing cost. This is true of any hardware that sits on the PCI-Express bus inside the box. The advantage for consumers is that their investment in 1394 products has been extended indefinitely through Thunderbolt technology.

No additional software drivers are needed for PC, MAC or Linux operating systems in order to use the Thunderbolt to 1394 cable. The 1394 host controller in the cable looks just like the 1394 host controller that was previously "inside-the-box."

What could be easier?