Tech Note #10: Demystifying Firewire and Interfaces
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There is a lot of "wisdom" on the Internet regarding Firewire and how it does (and doesn't) work. Unfortunately, much of it is incorrect and leads to a lot of confusion. Let's take a look at some common statements about Firewire:

GENERAL:

- "You can't use a FW400 device on a computer with FW800 ports." **-False**

  All you need is a FW400 to FW800 cable or adapter. Your computer and peripherals will do the rest.

- "My computer has two FW ports, so I have two FW busses." **-False**

  Your computer has one Firewire bus and an internal hub. To have more than one FW bus you need to use a PCI card or ExpressCard expansion card.

- "If I connect a FW400 device to a FW800 bus, it will slow the entire bus down to 400 Mbs." **-False**

  In a mixed speed bus, everything *after* the slowest device runs at the slower speed.
  For example, in this FW800 chain:

  The FW800 device communicates with the computer at 800 Mbs, and the FW400 device communicates at 400 Mbs. However, in this chain:


  The FW800 device's speed *is* reduced to 400 Mbs, since the slower device is connected between it and the computer.

  If you keep the FW800 connections together those devices will run at 800 Mbs regardless of whether there are FW400 devices in the chain. If you intermix FW800 and FW400 devices, you will lose bus speed on any FW800 device connected *after* a FW400 device.

- "Using a FW hub will speed up my connection." **-Not exactly?**

  A hub won't speed up your FW bus, but *will* allow all devices connected to it to run at their maximum speed. If a FW800 hub is connected to the computer with a FW800 cable, then all the FW800 connections to the hub will run at 800 Mbs, and all FW400 connections will run at 400 Mbs. The connection between the computer and the hub will switch between 800 Mbs and 400 Mbs on a per-packet basis depending on the speed of the source

or destination of the packet (source for inbound to the computer, destination for outbound from the computer).
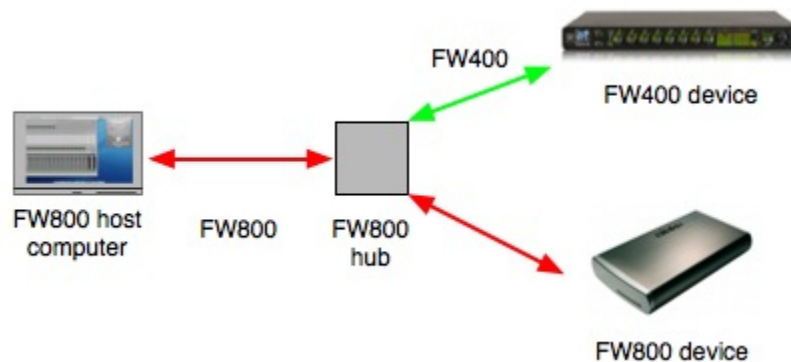
The other advantages of a hub are:

1. External hubs usually provide power isolation, so bad cables or faulty devices can't damage your computer's or device's FW ports.
2. Easier patching; you don't have to shut down an entire FW chain to unpatch or shut off a device in the middle.

METRIC-HALO SPECIFIC:

- "How many boxes can I use on one Firewire bus?"

  This depends on the sample rate you're working in. You can currently use three interfaces on one bus at 44.1-48 kHz, and two at 88.2-192 kHz.

- "Can I attach hard drives or more interfaces to the second Firewire port on my MIO?"

  Yes, with two things to remember:

  1. Remember the rules about connecting FW800 & FW400 devices on the same bus.
  2. If you're recording at high track counts or sample rates, you may need to connect your hard drive to another bus (or another type of bus, like SATA).

- "I can't expand my Mac, so I can't add another FW bus or SATA bus. How can I work with high track counts?"

  Try using a USB 2 drive. While you want Firewire's isochronous transfers to get audio *into* your computer, asynchronous transfers to your hard drive are fine. If you are having dropouts, noise or other problems in your audio chain with your interface and drive on the same bus, try connecting the hard drive via USB to lighten the load on your FW bus. Even if you decide not to use the USB drive full time, this is a good troubleshooting tool.

Hopefully this clears up some of the common misconceptions about Firewire!

Revision History:

- Revision 1.0 - April 16, 2010 - Initial Release