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USB 3.0 to Deliver a Tenfold Speed Increase

Fasten your seat belts — data transfer is going into overdrive. The ubiquitous Universal Serial Bus, better known as USB, is on track to make its first major upgrade in eight years — a tenfold speed increase over the current USB 2.0 standard. That means we'll be able to rip music, video, photos from the [...]



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The ubiquitous Universal Serial Bus, better known as USB, is on track to make its first major upgrade in eight years — a tenfold speed increase over the current USB 2.0 standard. That means we'll be able to rip music, video, photos from the vast array of peripherals we connect to our computers much more quickly, and it makes such up-and-coming devices as HD video cameras that much more practical.

USB 3.0 will also deliver greater power efficiency and the ability to recharge a wider variety of gadgets — and it will most likely mean the death of the competing standard known as FireWire.

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To get a sense of the speed increase, consider this: Under USB 2.0 it takes about 10 minutes to transfer a high-def video from a Blu-ray disc. With USB 3.0, it will take just about a minute.

"What the user will see is really a much faster response time, less waiting, more productivity," says Patrick Moorhead, vice president of advanced marketing at AMD, one of the supporters of the USB 3.0 standard.

But none of this will happen tomorrow. The first USB 3.0 devices probably won't show up until the end of 2009 or early 2010, say analysts. Users can get a glimpse into future devices sporting SuperSpeed USB as early as the annual Consumer Electronics Show in January, and Wired.com will be there.

"The first places that you will see this show up is where you get the biggest benefits — HD video cameras and hard drives," says Moorhead.

The [USB Implementers Forum](#), a nonprofit group founded by companies to promote the standard, will announce Monday the final set of specs that will clear the way for the adoption of USB 3.0 by device and component manufacturers.

"USB 3.0 will take USB 2.0 to the next level and take away performance as an issue for data transfer in many devices," says Brian O'Rourke, an analyst with research firm In-Stat. "USB 3.0 will make it even more pervasive across devices than it is today."

Since the USB specification was first introduced in 1996, it has changed the way we interact with our computers. USB has allowed everything from keyboards, mouse, PDAs, printers, digital cameras and personal media players — pretty much the entire spectrum of consumer electronics — to be connected to a host PC using a single standardized socket.

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It has also made the process truly plug-and-play. Devices can be connected and disconnected without having to reboot the host computer and the technology offered perks such as allowing for many devices to be charged using the USB socket with no need for individual device drivers to be installed first.

Not surprisingly, USB's ease of use and capabilities has meant it has become nearly ubiquitous. More than 2.6 billion USB-enabled devices were shipped in 2007, estimates research firm In-Stat.

And USB's star will continue to rise, says the firm. Nearly four billion USB-enabled devices are expected to ship by 2012. Its ubiquity has meant that some manufacturers use USB ports and plugs for recharging devices such as Bluetooth headsets and phones without utilizing its data-transfer capabilities.

But USB 2.0 is getting a bit long in the tooth, with its slow speed, inefficient power usage and relatively small wattage. The new standard takes aim at all of those shortcomings.

Pour on the Speed

At a glance:USB 3.0

Faster: 10 times faster than USB 2.0 and six times faster than FireWire 800 Greater power efficiency: New interrupt driven protocol optimizes power management.

Better Power Output: Power output bump to 900 milliamps from 100 milliamps allows more devices to be charged faster via USB.

Backward Compatible: New connectors and cables will work with work with devices running the older USB 2.0

The new spec will support data transfers at 4.8 gigabits per second, or Gbps, nearly 10 times faster than the current standard's 480 megabits per second and six times faster than FireWire 800. It's also 400 times faster than the 12 Mbps offered by the original spec, USB 1.0.

USB 2.0 is also known as "Hi-Speed USB," while USB 3.0 will have the confusingly similar moniker "SuperSpeed USB."

The new USB 3.0 connectors and devices will be compatible with older USB ports (on devices using USB 2.0 and 1.0) but they will be limited to the older ports' slower speeds.

Power and Efficiency

USB 2.0 uses a polling-based architecture, which means the host computer has to constantly check the bus to see if any devices are attached and if so, whether they are doing anything. As a result, that keeps the host computer busy, drawing power even when it's not needed.

"It's a problem when you attach a USB device to a laptop running on battery," says Steve Kleynhans, vice president, client computing for research firm Gartner.

USB 3.0 offers better specifications for power management. "We will move to an interrupt-driven architecture where your PC can ignore the connected device till the latter actually does something," says Kleynhans. "That can really lower the power consumption."

It also has better power output, 900 milliamps compared to 100 milliamps with USB 2.0. That means up to four devices can be charged from a single USB port and charged faster.

Standardizing the specifications for USB 3.0 hasn't been easy. Two months ago, [Intel released](#) part of the draft specifications for USB 3.0 to developers resolving a dispute between itself, Nvidia and AMD over it.

Nvidia and AMD [claimed that Intel](#) was not sharing the specifications that potentially compete with it. Intel denied it.

"There was some debate between us," says Moorhead, "but we have buried the hatchet and we are all in the same boat now."

USB Implementers Forum chairman Jeff Ravencraft declined to be available for comment.

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USB 3.0 devices are coming soon, consumers won't immediately see all the benefits. "You can get the USB 3.0 speeds only when one 3.0 device connects to another," says Gartner's Kleynhans. So the latest SuperSpeed USB-enabled devices connecting to older PCs running USB 2.0 or lower will experience data transfer rates that are much slower.

Killing FireWire

USB 3.0 is likely to signal the death of FireWire/IEEE 1394, a competing interface standard also known as i.Link and Lynx. Today, the industry is bifurcated between IEEE 1394 and USB 2.0. Many devices support both, though a single standard would be optimal.

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"If we are all aligned, we are saving money and development time for the industry," says Moorhead.

With

Apple seemingly taking step away from FireWire, it seems like USB could gain the upper hand. Apple's newly introduced [MacBook computers lack](#) a FireWire port and instead has USB. MacBook Pro still sports FireWire 800.

That leaves Sony as one of the few remaining proponents of the standard.

"FireWire stably declining in most markets and USB 3.0 will continue that trend," says O'Rourke. "We could see USB emerge as the standardization of a high-speed interconnect."

Monday's first USB 3.0 developer conference will be a big step towards that, say experts. "It's for everyone in the USB value chain, from chipmakers to software makers to learn the new USB standard and get on it," says O'Rourke.

Photo: [Teo/Flickr](#)

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