

## PATA vs. SATA: Does it matter?

**With the buzz about Serial ATA (SATA), why are leading vendors still shipping parallel ATA-configured systems?**

Indeed, leading vendors of turnkey ATA (a.k.a. IDE) storage systems—companies like EMC, Network Appliance, and Nexsan—are all still shipping products with parallel ATA (PATA) drives. Understandably, this has created a lot of confusion among users who wonder whether they should stick with PATA or go with SATA. The short answer is that if the drives are sold inside of a cabinet and the cabinet is doing its job at the right price, it doesn't matter what interface the drives use.

### SATA versus PATA

The acronyms SATA and PATA refer to the way in which data is encoded and transported electronically. Parallel interfaces break a byte into eight bits and send each bit down individual wires. A clock signal is sent down a separate wire. On the receiving end, with each stroke of the clock, the eight bits are re-assembled into a byte. Thus, a bunch of relatively slow signals sent down a common bus can be aggregated into a single fast signal. The frequency with which the clock strikes is typically measured in megahertz (MHz); if you multiply the number of MHz by the number of bytes transferred with each cycle, you get the speed of the bus in megabytes per second. Serial interfaces also rely on a clock to identify the indi-

vidual bits of data. The difference is that the bits all run down the same set of wires along with the clock signal.

Should you care? Probably not; as long as your data reliably gets transferred, your job is done.

### IS THERE SOMETHING WRONG WITH PARALLEL SIGNALING?

Not really. The biggest challenge for parallel signaling is that, as the clock gets faster and faster, it is increasingly difficult from an engineering perspective to ensure that all of the related bits arrive at the end of the cable at the same stroke of the clock. If they don't, you get a transmission error. Thus, in order for parallel interfaces to get faster and faster, they require tighter and tighter cabling specifications.

Should you care which kind of cable is used? Probably not, but PC manufacturers may prefer a skinny SATA cable to a bulky PATA cable if it makes it quicker and easier for them to assemble PCs.

### WHICH IS FASTER?

Serial is not necessarily faster than parallel. For instance, Parallel SCSI has a maximum transfer rate of 320MBps. Fibre

*If you have a question you would like to ask one of our experts, please e-mail Heidi Biggar at [heidib@pennwell.com](mailto:heidib@pennwell.com).*



**JACOB FARMER**  
Cambridge  
Computer

Channel, a serial implementation of SCSI, peaks out at 200MBps. SATA currently has a 150MBps rate, although 300MBps is expected by 2005. PATA maxes out at 133MBps.

Should you care about the bus speed of your drive? No, because you are smart enough to know the difference between theoretical bandwidth and actual throughput! There are no disk storage systems on the market today (nor will there be any, any time soon) that can take advantage of the additional bandwidth that SATA promises. In other words, SATA is not inherently faster than PATA.

### WHY SATA?

When it comes to enterprise storage systems, SATA has one big advantage over PATA: Its specs provide for hot-plugging. Before SATA, manufacturers had to engineer a solution for hot-plugging drives. However, all of the leading vendors of ATA storage devices have already engineered these solutions, so SATA does not solve any major problems. There is not immediate reason for them to switch to SATA.

Should you care if your drives use an industry standard method of hot-plugging or a proprietary one? Probably not. All drive vendors produce their own drive sleds anyway. How they implement them is nobody's business but their own.

### WHY NOT SATA?

The biggest problem with SATA is that it is new to the market, so the patterns of sup-

ply and demand have not been balanced. It is difficult to find consistent stock of high-capacity SATA drives; however, it is relatively easy to get PATA variants. Also, high-capacity SATA disks are not yet available, and when they become available, the supply will likely be constrained. For the consumer, short supply means higher prices. In fact, high-capacity SATA drives cost about 10% more than the same drive with PATA. For the vendors who are actively shipping disk-array systems, it is vital that they have a consistent supply of components. Without a consistent supply, they cannot fulfill orders and could run into problems supplying replacement parts.

Should you care if you have to wait a long time for your shipments? Should you mind if there is no stock on replacement parts when you have a drive failure? I'm guessing you will.

#### **SATA-1 VERSUS SATA-2**

We should see the next generation of SATA drives in about 2005. These devices will

have new features that are not likely to be available in PATA. In particular, SATA-2 will support environmental monitoring inside the disk enclosure. This will allow SATA and Serial SCSI (yes, SCSI is getting a new serial interface, too!) to use the same—or at least very similar—enclosures. Again, this makes life easier for manufacturers and does not directly impact the user.

#### **IS SATA ALL HYPE?**

Certainly not. From the perspective of a manufacturer, SATA will make it easier and less costly to design and deliver storage subsystems and computers with internal storage. This, in turn, may result in lower prices for you, the user. How much lower? Well, maybe a few bucks and maybe enough for you to care.

In the meantime, SATA does have some real advantages on the desktop. In particular, SATA offers standardized support for tagged command queuing, a performance enhancement typically found on SCSI and Fibre Channel drives.

This feature could do wonders for application software but it is not likely to affect performance in drives behind a RAID controller.

#### **The bottom line**

By the time SATA-2 comes out, all of the leading storage subsystem makers will have switched to SATA to take advantage of its enterprise features. By then, the supply and prices of SATA will be in line with PATA, and SATA will dominate the market.

Will you care? Hopefully not! There are better things in life to care about. In the meantime, PATA is fine and SATA is fine. You should focus your choice on the subsystem, not the drive interface. □

**Jacob Farmer** is chief technology officer at Cambridge Computer ([www.cambridgecomputer.com](http://www.cambridgecomputer.com)) in Waltham, MA. He can be contacted at [jacobf@cambridgecomputer.com](mailto:jacobf@cambridgecomputer.com).