Serial ATA (SATA) for Servers and Networked Storage

What is Serial ATA?

Serial ATA is a disk-interface technology developed by a group of the industry's leading vendors to replace parallel ATA. The group is known as the Serial ATA Working Group. The Serial ATA 1.0 specification was released in August 2001.

What are the compelling reasons why Serial ATA is a viable option for server and NAS networked storage?

Scalability—Serial ATA is a point-to-point connection and allows multiple ports to be aggregated into a single controller that is typically located either on the motherboard or as an add-in, RAID card. Through backplanes and external enclosures, Serial ATA will be deployed in high-capacity server and networked-storage environments.

Price—Serial ATA was created, with desktop prices in mind, as a replacement for Parallel ATA. Initial hard disk drives (HDD's) are expected to be priced competitively for the desktop. With the scalable features of Serial ATA combined with desktop price-points, greater storage capacity may be realized at a lower total solution cost than with traditional server and networked storage.

Cabling—Serial ATA specifies a thin, point-to-point connection which allows for easy cable routing within a system. This avoids master/slave, "daisy-chaining", and termination issues. Also, better airflow can be realized compared to systems with wider ribbon cables.

Performance—Serial ATA technology will deliver 1.5 Gbps (150 MB/sec) of performance to each drive within a disk drive array.

When will Serial ATA infrastructure products be shipping in volume?

Individual vendors will best be able to advise on product plans. However, hard disk drives, cables, enclosures, and controllers are expected to be available to OEM and channel customers in 2002, with enterprise system vendors shipping platforms with Serial ATA storage by the second half of the year.

Where is Serial ATA positioned relative to other interface technologies?

Serial ATA technology provides a new serial interconnect designed to change the way vendors develop storage systems. The first deployments, where price is an important issue, are intended for entry-level servers and network-attached storage. As the infrastructure continues to develop, Serial ATA will penetrate into higher-end servers and more complex storage systems.

What is the long-term road map for Serial ATA?

Serial ATA defines a roadmap starting at 1.5 gigabits per second (equivalent to a data rate of 150MB/s) and migrating to 3.0 gigabits per second (300 MB/s), then to 6.0 gigabits per second (600 MB/s). This roadmap supports up to 10 years of storage evolution, based on historical trends.

How does Serial ATA handle backward compatibility issues?

Serial ATA supports legacy drivers for Parallel ATA. OEMs can deploy Serial ATA, today, using existing parallel ATA drivers. Vendors intend to supply bridges for parallel-to-serial conversion for legacy devices.

Are there any known interoperability issues with Serial ATA?

One of the primary requirements of the Serial ATA 1.0 specification was to maintain backward compatibility with existing operating system drivers to eliminate incompatibility issues.

How will operating systems handle Serial ATA?

Because of the legacy support inherent in the specification, operating support will be simplified. The Serial ATA specification allows for additional features to be added to applications. Additional features will be subject to normal driver validation processes.

How does the end-user benefit from using Serial ATA technology in servers and NAS?

The end-user will benefit from lower cost, higher performance (via increased speed and scalability), and easier configuration. Serial ATA allows for higher performance while using existing, proven features such as 3.5" disk drives. Configuration of Serial ATA devices will eliminate many of today's requirements for jumpers and settings.

How does the system vendor benefit from using Serial ATA technology in servers and NAS?

Benefits for the OEM:

Easier configuration and design with cables that are thinner, have smaller connectors, and are simpler to route and install

Ability to use HDD technology across multiple segments such as desktops, entry and midrange servers, and networked storage

Easier training for Sales and Tech Support staff

Improved silicon design with lower voltage that will ease current design requirements in Parallel ATA
Compatibility with today's software that will enable Serial ATA to run on the new architecture without modification