

Dual-Port SAS Drives are a Boon to IT

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Introduction

The new serial interfaces, Serial Attached SCSI (SAS) and Serial ATA (SATA), have been designed to replace their parallel predecessors. They will support faster data transfer rates and more devices per controller, as well as reduce the size and complexity of the cables and connectors (thus enabling smaller, more densely-packed disk arrays). System builders will also be able to integrate SAS and SATA hard drives in a single enclosure.



SAS goes beyond SATA by adding dual porting, full duplex, device addressing and it offers higher reliability, performance and data availability services, as well as logical SCSI compatibility. It will continue to enhance these metrics as the specification evolves, including increased device support and longer cabling distances.

SAS reliability

For customers requiring the highest levels of reliability and performance in mission-critical server environments, SAS hard drives will offer the highest performance and reliability. This is due, in part, to the dual-port attributes of the SAS interface.

Redundancy

SAS hard drives are designed to withstand the demands of high duty cycle enterprise storage applications. The dedicated, point-to-point SAS architecture provides reliable connectivity and full bandwidth to each drive. Dual porting provides two separate data paths, allowing for higher levels of performance and eliminating single points of failure. The support for redundant connections enabled by the dual port feature is one of several key differentiators between SAS and SATA drives. It is one of the reasons that SAS drives are well suited for use in highly available enterprise storage environments.

In parallel architectures, multiple initiators have traditionally been used to provide hard drive access to multiple hosts and host bus adapters. The multiple initiator approach however, can result in single points of failure that can prevent drive access.

The dual-port characteristics of SAS address this challenge by eliminating single points of failure, enabling the design of high availability systems. This “full failover” capability, previously the exclusive domain of Fibre Channel SANs, will positively impact the reliability of entry-level direct-attached storage (DAS) architectures.

Performance benefits

Point-to-point SAS architecture will eliminate the shared (parallel) bus bottleneck. In addition, SAS bandwidth can be aggregated over multiple, low-cost, full-duplex SAS links, allowing data to be streamed in both directions simultaneously, increasing data throughput and overall system performance.

SAS also supports applications such as clustering by allowing dynamic load balancing. Dynamic load balancing is an application that distributes the load across multiple controllers and data paths to increase throughput. Load balancing requires dual-port SAS drives and multiple initiators.

SAS will feature data transfer rates of 3Gb/s with a performance roadmap to 6Gb/s, 12Gb/s and beyond. These interface speeds will deliver the highest levels of system performance for bandwidth-intensive applications in direct-attached, networked-attached and networked storage environments.

For enterprise customers with stringent reliability, availability and performance requirements, use of dual-port SAS hard drives will be a major step forward and will help the IT staff rest easy.

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