12Gb SAS: Performance, Flexibility, ROI
Upgrade to ATTO ExpressSAS® SAS/SATA Host Bus Adapters

Challenge
Strong demand from high-performance database, analytics, streaming video and other applications is driving the need for improved access time to stored data. Revolutionary new server and workstation architectures are part of the solution. Additionally, solid state storage devices are providing a boost to performance and reducing latencies in a cost-effective way. Nevertheless, IT professionals who need better, faster and more efficient storage options are looking for a cohesive solution. Upgrading to an ATTO Technology Inc. ExpressSAS® 12Gb SAS/SATA host bus adapter (HBA) is an ideal way to overcome this obstacle.

Solution
ATTO ExpressSAS12Gb SAS/SATA HBAs double the performance over previous generations of HBAs and offer fresh new features that reduce downtime, improve efficiency and save money on the bottom line. They provide more flexibility for connecting to storage while greatly decreasing latency to drives, making it easier to manage the overall storage infrastructure and improve connection diagnostic capabilities, all at a lower total cost of ownership.

Performance
12Gb SAS/SATA data transfer rates are up to 1200 MB/s for each connection. Simply put – it is twice as fast as 6Gb SAS/SATA. Pair this performance gain with PCIe 3.0 host computer bus speeds and the adapter is capable of delivering performance of up to 8000 MB/s. This allows users to run faster backups, complete more online transactions or deliver more streams of video concurrently.

The ability to move twice as much data means one 12Gb SAS/SATA controller is required instead of two similar 6Gb controllers to accomplish the same tasks. Users will realize a lower total cost of ownership with reduced initial hardware costs, decreased management costs, lower power consumption, lower heat output, fewer cables and the use of fewer PCI slots.

About ATTO
For over 30 years, ATTO Technology, has been a global leader across the IT and media & entertainment markets, specializing in network and storage connectivity and infrastructure solutions for the most data-intensive computing environments. ATTO works with partners to deliver end-to-end solutions to better store, manage and deliver data.

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The Power Behind the Storage
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**Improved Efficiency and Usability**

To ease the transition to 12Gb SAS/SATA, customers can take advantage of a new feature: End Device Frame Buffering. A SAS host connection can physically connect to multiple SAS or SATA drives through a SAS Expander. 6Gb SAS adapters support multiplexing, which allows multiple 3Gb SATA drives to share a connection to a 6Gb SAS host adapter. This works great for 3Gb SATA drives but adds no value to 6Gb SATA drives. The difficulty is that when SATA drives are used, they will hold the connection to the host open until all of the data for a particular command is transferred, essentially starving the other SATA drives on that connection. This challenge is eliminated with 12Gb SAS/SATA End Device Frame Buffering as this technology efficiently allows multiple SATA drives to share a host connection.

**Reduced Downtime**

Migrating from 6Gb to 12Gb SAS/SATA provides new cabling options through the use of Mini-SAS HD connectors. Not only do they require a smaller footprint, these new connectors incorporate intelligence in the cabling. Problems related to performance, access errors and latency can all be attributed to intermittent cable issues. Additionally, it can be difficult to determine that a cable is the cause of these problems. Figure 3 shows a small three node cluster connected to several SAS RAID storage arrays. In this small installation, there are four (4) SAS cables per node for a total of 12 cables. Narrowing down a problem to a cable can be a daunting task, even in this small cluster. Using an ATTO 12Gb SAS/SATA adapter, operators can quickly troubleshoot cable problems. A cable that is generating errors, or simply showing a lack of connectivity, is reported to the operating system so the operator can quickly determine the defective cable, saving time and money.

**The Bottom Line**

Upgrading to an ATTO 12Gb SAS/SATA HBA is not only a good investment for the future, but a simple way to improve the overall value of a storage system at minimal cost.

ATTO products of 12Gb SAS/SATA HBAs help maximize your productivity through cutting edge technologies associated with 12Gb SAS, including Advanced Data Streaming (ADS™) Technology.