LSI and AIC Minimize Total Cost of Storage Ownership with SAS/SATA Solutions for a Broad Range of Markets

For SATA or SAS Functionality, Design Right First Time™ with Scalable LSI HBAs and MegaRAID® SAS Adapters Coupled with Turnkey Chassis from Advanced Industrial Computer (AIC)

Multi-level Partnership

Advanced Industrial Computer (AIC) (http://www.aicipc.com) is one of the industry's leading designers and manufacturers of rack-mount Server and Data Storage enclosure solutions. With over 100 years of combined experience between the mechanical, electronic, and system-level engineering teams, AIC leads the industry in all categories. With a complete silicon-to-systems portfolio of storage solutions, LSI develops multi-level partnerships with companies such as AIC to assure differentiated solutions that are valued by the end customer.

"Together, LSI and AIC are addressing the needs of IT managers challenged with business continuance and regulatory standards that demand data be secure and readily available," said John Roeser, director of channel sales at LSI. "Requirements for privacy, fraud, and identity theft protection are also pushing businesses to manage data in high performance, complex systems. As the sheer volume of data increases along with rich content and the velocity of data center activity, the need to store data economically and retrieve it quickly in an energy-efficient manner continues to rise."

Storage Interface Technologies

As servers are pushed to meet these advancing system and computing requirements, reducing total cost of storage ownership becomes increasingly critical. Applications such as streaming multimedia, e-commerce, email and management of large medical images are causing IT managers to look for improved productivity in the way storage is used. The result has been a new evolution of storage interface technologies.

When computing engines, server and high-end workstations were suddenly available to small offices, schools, and homes, many manufacturers began introducing entry-level ATA as a more cost-effective to SCSI solution. Then came Serial ATA (SATA). Fundamentally, SATA is the same as ATA except that instead of data flowing in parallel, it flows in a serial stream. The new Serial ATA standard came out silently and was driven by very practical reasons such as the need to ensure data transfer at reliable speeds while maintaining cooling requirements.

Similar to its ATA counterpart, SCSI has also recently transitioned to a serial architecture. As the latest generation of the SCSI interface, Serial Attached SCSI (SAS) is now meeting the demands of today's business through improved performance, flexibility and deployment topologies, while still maintaining the legacy SCSI cost structure.

Executive Summary

Challenge

- Demand for secure and readily available data is rapidly rising

- IT managers must minimize total cost of storage ownership

- Drive life cycles have been extended, storage components need to maintain ROI

Solutions

- Fully tested LSI controllers with AIC server mid-planes, expander and Xtore storage subsystems

- Ability to integrate LSI SAS/SATA MegaRAID controllers and HBAs into AIC SA1-SD™ series SAS storage chassis

- For storage expansion, Xtore XJ1100™ JBOD can be implemented

Results

- Readily available AIC-Xtore and LSI products through major distributors such as Bell Micro and ASI

- Right First Time storage solutions with high reliability and performance

- LSI and AIC-Xtore product development and tech support

- Simplified cabling and enhanced cooling

Market: Storage

With its serial interface, SAS provides better signal integrity and greater device addressability. Using an expander, one or more SAS host controllers can connect to a large number of drives. Each expander allows connectivity to 128 physical links, which may include other host connections, other SAS expanders, or hard disks. This highly scalable connection scheme enables enterprise-level topologies that easily support multi-node clustering for automatic fail-over availability or load balancing. Numerous other features of SAS such as the full duplex architecture effectively doubles the throughput.

Additional benefits include simplified cabling and improved space, heat management and power consumption in the data center. Perhaps the most significant advantage, SAS provides unprecedented customization opportunities for system integrators by supporting SATA protocols. By adding support for SATA (Serial ATA) Tunneling Protocol, SAS controllers are able to communicate with both SAS and SATA drive devices. The subsystem uses SATA Tunneling Protocol for SATA devices and serial SCSI Protocol for SAS drive devices. In addition, drives can be hot swapped and may be physically inserted on the same back plane connector. This flexibility allows IT managers to use SAS to achieve the enterprise-class storage and network performance required by mission-critical applications, while protecting their investments in SCSI software and middleware.

Designing Right First Time™ with LSI and AIC

Since the SAS interface is compatible with SATA drives, system builders using the combination of LSI SAS MegaRAID and AIC chassis have the flexibility to integrate either SAS or SATA devices and slash the costs associated with supporting two separate system designs. Designers using a single enclosure with SAS and SATA functionality are building "right first time" to maximize performance, scalability, and affordability. This type of flexible solution can be easily paired to the right business environment. "Designing with SAS gives system builders the highest level of scalability and flexibility by allowing them to use either SAS or SATA drives," Roeser added. "The ability to deploy either type of drive allows the overall storage solution to be optimized for specific application and cost requirements. Using the technologies together gives businesses a means for maximizing their current storage investments while still taking advantage of new, more efficient technology."

Low-Risk SAS Success

LSI has been a leader in the development of storage interface technologies and was first to market with SAS components. LSI HBAs (host bus adapters) and MegaRAID® adapters span the direct attached storage ecosystem; from the very low end SATA to the very high end SAS. All products share the same proven software stack, management utilities and upgrade path. AIC excels in providing very cost effective enclosures for any application. For storage, AIC offers enclosures supporting 2.5 inch and 3.5 inch form factor SAS/SATA drives to fulfill numerous needs. AIC also offers a JBOD product line with SAS configuration through its Xtore business unit. With a single external SAS port, multiple JBODS can be connected to a server and added easily as needed.

To ensure low-risk SAS success, AIC conducted extensive interoperability testing with its storage enclosures and LSI adapters. The combination of these two storage solutions provides customers a "plug-and-play" solution that can maximize reliability and performance for any application or vertical market. The ease-of-use in a total SAS solution gives IT managers the ability to enhance revenue and realize a greater range of capability.

"IT managers are pressed by cost constraints and the need for flexibility and scalability in their storage systems. Because SAS is software compatible with Parallel SCSI and is interoperable with SATA, SAS technology offers the ability to manage costs by staging deployment and fine-tuning a data center's storage configuration on an ongoing basis."

Paul Snapp, Sr.
Director of Business Development and Strategic Account, Xtore
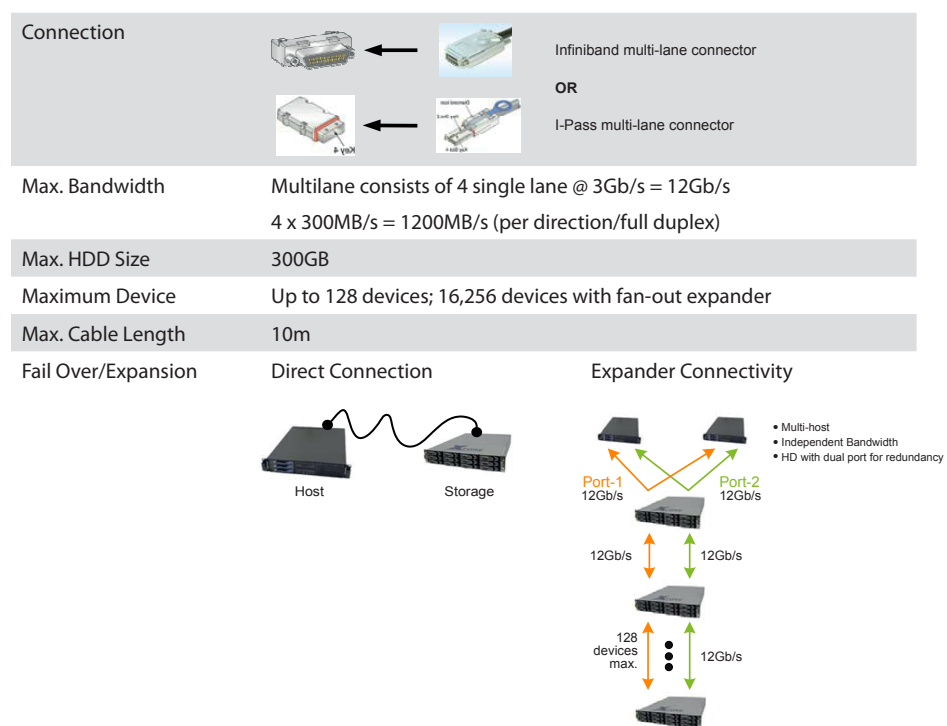
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"Drive life cycles are getting longer, so the components IT managers select for their systems need to have equal flexibility, scalability and longevity," said Gene Lee, Corporate Vice President, AIC. "Choosing the right components becomes a real factor in managing the total cost of ownership of storage."

Customers using the combination of LSI adapters and AIC chassis also benefit from AIC standard support without any additional service add-ons, further maximizing revenue potential. LSI and AIC product development and technical support teams work hand-in-hand to ensure product interoperability and system reliability.

The strategic partnership of LSI and AIC simply provides the latest technology innovations with the highest return on investment. AIC-Xtore and LSI products are readily available through major distributors such as Bell Micro, and ASI. LSI and AIC are both members of the SCSI Trade Association.

Figure 1. SAS topology

Connection		Infiniband multi-lane connector
		OR
		I-Pass multi-lane connector
Max. Bandwidth	Multilane consists of 4 single lane @ 3Gb/s = 12Gb/s	
	4 x 300MB/s = 1200MB/s (per direction/full duplex)	
Max. HDD Size	300GB	
Maximum Device	Up to 128 devices; 16,256 devices with fan-out expander	
Max. Cable Length	10m	
Fail Over/Expansion	Direct Connection	Expander Connectivity

For more information and sales office locations, please visit the LSI website at: **www.lsi.com**

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