LSI

Storage. Networking. **Accelerated.**™

Storage Solutions

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LSI Storage Solutions

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Introduction to LSI

As the world's No. 1 provider of RAID controllers in the channel, our commitment to channel partners starts at the top, reaches throughout the company and is backed by the industry's most complete selection of SATA and SAS RAID controllers and host bus adapters (HBAs) and SAS system building blocks. We're providing our partners with a powerful performance advantage and focused innovations that address their customers' evolving storage requirements in an ultra-competitive industry. The powerful combination of technology and channel leadership positions LSI as a leading storage provider to the channel network.

With a complete portfolio of 6Gb/s SAS and SATA storage solutions available in the channel, including MegaRAID® and 3ware® RAID controllers, host bus adapters (HBAs), 6Gb/s SAS switch, advanced software options, the WarpDrive™ SLP-300 acceleration card and the Nytro™ family of application acceleration products, LSI delivers a trusted store solution that is designed to meet all of your needs, regardless of application or budget.

LSI's ongoing vision to deliver first-to-market product provides you with a unique opportunity. Proactively support your storage needs by supplying the latest and greatest technologies. Choose from a breadth of storage adapters that is unequalled by any other single supplier.
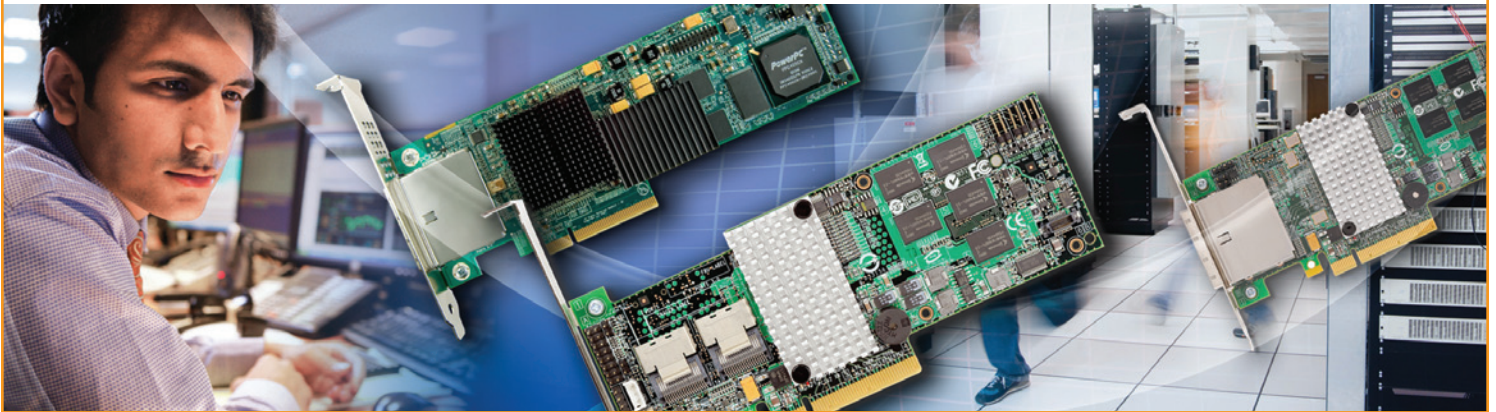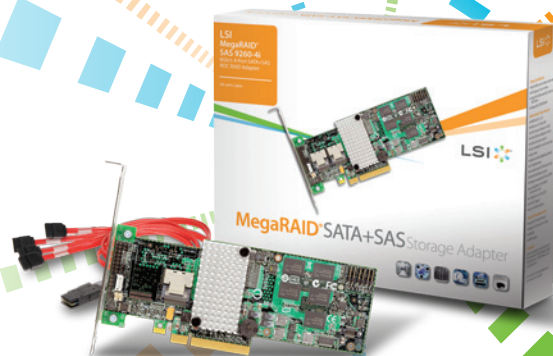
MegaRAID® SATA+SAS

As storage demands continue to grow, the cost, performance, security and energy efficiency of your storage components are even more important. With every MegaRAID product, LSI delivers value in our four cornerstones of leadership: Features and Usability, Data Protection and Availability, Performance, and Green.

LSI offers a complete selection of 6Gb/s SATA+SAS MegaRAID controller cards for direct attached storage (DAS) connectivity.

Powered by the LSI dual-core 6Gb/s SAS RAID-on-Chip (ROC) IC, the 2nd-generation of 6Gb/s MegaRAID controllers deliver the industry's highest server RAID performance, extending the performance leadership offered by the existing family of LSI MegaRAID 6Gb/s SATA+SAS controllers. The full MegaRAID product line-up includes entry, value and feature products, ranging from 4 to 28 ports in a variety of internal and external connector configurations.

 The superior read/write performance of the LSI 6Gb/s MegaRAID controllers make them ideally suited for a broad range of application workloads, from data center applications such as web servers and database servers to more compute-intensive applications such as cloud computing and the clustered systems used with high-performance computing.

MegaRAID SATA+SAS Feature Line
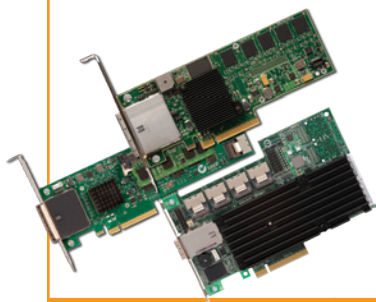
Providing the ultimate in performance and scalability, the MegaRAID SATA+SAS feature line offers 6Gb/s transfer rates, external connectivity, and maximum device support for external SATA and SAS enclosures.
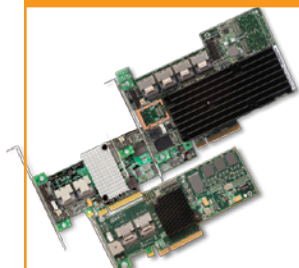
KEY FEATURES:

- External connectivity for scalability beyond the confines of the server chassis
- Maximum device support for applications requiring a large number of drives
- LSI RAID-on-Chip (ROC) technology and PCI Express® host interface for high-bandwidth applications
- Support for CacheVault module or battery backup to help prevent data loss in the event of a server failure

Row	Product	Ordering Part Number(s)	Port Count	Data Transfer Rate	Host Interface	RAID Levels	Number of Devices Supported	Onboard Memory	Internal Connector	External Connector	Cache Protection Option
1	9280-24i4e	LSI00211 (SGL)	28	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	240	512MB	6 x SFF8087 Mini-SAS	1 x SFF8088 Mini-SAS	LSIiBBU07 or LSIiBBU08
2	9280-16i4e	LSI00210 (SGL)	20	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	240	512MB	4 x SFF8087 Mini-SAS	1 x SFF8088 Mini-SAS	LSIiBBU07 or LSIiBBU08
3	9286CV-8e	LSI00333 (SGL)	8	6Gb/s	PCI Express 3.0 x8	0, 1, 5, 6, 10, 50, 60	240	1GB		2 x SFF8088 Mini-SAS	CacheVault Included
4	9286CV-8eCC	LSI00335 (SGL)	8	6Gb/s	PCI Express 3.0 x8	0, 1, 5, 6, 10, 50, 60	240	1GB		2 x SFF8088 Mini-SAS	CacheVault Included
5	9285CV-8e	LSI00298(SGL)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	240	1GB		2 x SFF8088 Mini-SAS	CacheVault Included
6	9286-8e	LSI00322 (SGL)	8	6Gb/s	PCI Express 3.0 x8	0, 1, 5, 6, 10, 50, 60	240	1GB		2 x SFF8088 Mini-SAS	LSIiBBU09
7	9285-8e	LSI00284 (SGL)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	240	1GB		2 x SFF8088 Mini-SAS	LSIiBBU09
8	9280-8e	LS00205 (SGL)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	240	512MB		2 x SFF8088 Mini-SAS	LSIiBBU07 or LSIiBBU08
9	9280-4i4e	LS00209 (SGL)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	240	512MB	1 x SFF8087 Mini-SAS	2 x SFF8088 Mini-SAS	LSIiBBU07 or LSIiBBU08

MegaRAID SATA+SAS Value Line

The MegaRAID SATA+SAS value line offers a mix of value and performance for internal SATA and SAS systems. These products feature 3Gb/s or 6Gb/s transfer rates, internal connectivity and support for both SATA and SAS drives.

KEY FEATURES:

- Internal connectivity for SATA or SAS HDDs or SSDs that reside within the server
- Support for up to 128 devices using SAS expanders
- LSI RAID-on-Chip (ROC) technology and PCI Express host interface for high-bandwidth applications
- Optional CacheVault module or battery backup to help prevent data loss in the event of a server failure

Row	Product	Ordering Part Number(s)	Port Count	Data Transfer Rate	Host Interface	RAID Levels	Number of Devices Supported	Onboard Memory	Internal Connector	External Connector	Cache Protection Option
1	9260-16i	LSI00208 (SGL)	16	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	128	512MB	4 x SFF8087 Mini-SAS		LSIiBBU07 or LSIiBBU08
2	9271-8i	LSI00330 (SGL) LSI00331 (KIT)	8	6Gb/s	PCI Express 3.0 x8	0, 1, 5, 6, 10, 50, 60	128	1GB	2 x SFF8087 Mini-SAS		LSIiBBU09 or LSICVM01
3	9271-8iCC	LSI00334 (SGL)	8	6Gb/s	PCI Express 3.0 x8	0, 1, 5, 6, 10, 50, 60	128	1GB	2 x SFF8087 Mini-SAS		LSIiBBU09 or LSICVM01
4	9270-8i	LSI00326 (SGL) LSI00327 (KIT)	8	6Gb/s	PCI Express 3.0 x8	0, 1, 5, 6, 10, 50, 60	128	1GB	2 x SFF8087 Mini-SAS		LSIiBBU09
5	9266-8i	LSI00295 (SGL) LSI00296 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	128	1GB	2 x SFF8087 Mini-SAS		CacheVault (LSICVM01) or LSIiBBU09
6	9265-8i	LSI00277 (SGL) LSI00278 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	128	1GB	2 x SFF8087 Mini-SAS		LSIiBBU09
7	9260CV-8i	LSI00282 (SGL) LSI00283 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 10, 50, 60	128	512MB	2 x SFF8087 Mini-SAS		CacheVault Included
8	9260-8i	LSI00198 (SGL) LSI00202 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	128	512MB	2 x SFF8087 Mini-SAS		LSIiBBU07 or LSIiBBU08
9	9261-8i	LSI00212 (SGL)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	128	512MB	2 x SFF8087 Mini-SAS		LSIiBBU07 or LSIiBBU08
10	9271-4i	LSI00328 (SGL) LSI00329 (KIT)	4	6Gb/s	PCI Express 3.0 x8	0, 1, 5, 6, 10, 50, 60	128	1GB	1 x SFF8087 Mini-SAS		LSIiBBU09 or LSICVM01
11	9266-4i	LSI00305 (SGL) LSI00306 (KIT)	4	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	128	1GB	1 x SFF8087 Mini-SAS		CacheVault (LSICVM01) or LSIiBBU09
12	9260CV-4i	LSI00280 (SGL) LSI00281 (KIT)	4	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 10, 50, 60	128	512MB	1 x SFF8087 Mini-SAS		CacheVault Included
13	9260-4i	LSI00197 (SGL) LSI00201 (KIT)	4	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, 60	128	512MB	1 x SFF8087 Mini-SAS		LSIiBBU07 or LSIiBBU08

MegaRAID SATA+SAS Entry Line

LSI MegaRAID® SATA+SAS entry controller cards allow small to medium business owners and gaming enthusiasts to enjoy the latest RAID technology at affordable prices with low power consumption. This product line delivers trusted MegaRAID reliability with minimal maintenance effort. MegaRAID entry controller cards offer users a straight-forward solution that includes essential RAID levels and uncomplicated configuration options.

KEY FEATURES:

• Low-cost RAID 5 protection against hard drive failure
• Internal connectivity for 3Gb/s or 6Gb/s, SATA or SAS drives that reside within the server
• Common management utility across entire MegaRAID SATA+SAS offering
• 6Gb/s controller cards are environmentally friendly with a low-power controller and cardboard packaging

Row	Product	Ordering Part Number(s)	Port Count	Data Transfer Rate	Host Interface	RAID Levels	Number of Drives Supported	Onboard Memory	Internal Connector	External Connector	Cache Protection Option
1	9240-8i	LSI00204 (KIT) LSI00200 (SGL)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 10, 50, JBOD	64		2 x SFF8087 Mini-SAS		
2	9240-4i	LSI00203 (KIT) LSI00199 (SGL)	4	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 10, 50, JBOD	64		1 x SFF8087 Mini-SAS		

Advanced Software Options

LSI advanced software options, combined with industry-leading MegaRAID® controller cards, enable end users to address key business challenges while helping to deliver a higher return on their IT investment. These new offerings are designed to enhance performance and provide advanced data management and protection for whitebox channel customers employing 6Gb/s MegaRAID SATA+SAS controllers.

| Row	Product Name	Description	Ordering PN	Compatible Controllers
1	MegaRAID CacheCade Pro 2.0 Software Pack	MegaRAID CacheCade™ software enables SSDs to be configured as a secondary layer of cache to maximize transactional I/O performance for read- and write-intensive applications.	LSI00293 (SW License) LSI00292 (HW Key) LSI00290 (HW Key)	*With SW License:* MR SAS 9260/9261/9265/9266/9270/9271/9280/9285/9286 series controllers *With LSI00292:* 9260 (-4i, -8i, -16i, CV-4i, CV-8i), 9280 (-4i4e, -16i4e, -24i4e) *With LSI00290:* 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9285 (-8e, CV-8e), 9286 (-8e, CV-8e, CV-8eCC)
2	MegaRAID Fast Path Software	LSI MegaRAID Fast Path software provides high-performance I/O acceleration for SSDs connected to a 6Gb/s MegaRAID SATA+SAS controller, to substantially boost transactional application throughput.	LSI00266 (SW License) LSI00247 (HW Key) LSI00289 (HW Key)	*With SW License:* MR SAS 9260/9261/9265/9266/9270/9271/9280/9285/9286 series controllers *With LSI00247:* 9260 (-4i, -8i, -16i, CV-4i, CV-8i), 9280 (-4i4e, -16i4e, -24i4e) *With LSI00289:* 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9285 (-8e, CV-8e), 9286 (-8e, CV-8e, CV-8eCC)
3	MegaRAID Recovery Software	LSI MegaRAID Recovery software provides IT organizations with new levels of data protection and improved business continuity by using snapshots to enable rapid file and volume-level data recovery capabilities.	LSI00267 (SW License) LSI00246 (HW Key) LSI00288 (HW Key)	*With SW License:* MR SAS 9260/9261/9265/9266/9270/9271/9280/9285/9286 series controllers *With LSI00246:* 9260 (-4i, -8i, -16i, CV-4i, CV-8i), 9280 (-4i4e, -16i4e, -24i4e) *With LSI00288:* 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9285 (-8e, CV-8e), 9286 (-8e, CV-8e, CV-8eCC)
4	MegaRAID SafeStore Software	LSI MegaRAID SafeStore™ software, together with self-encrypting drives (SEDs), helps secure a drive's data from unauthorized access or modification resulting from theft, loss or repurposing of drives.	LSI00268 (SW License) LSI00245 (HW Key) LSI00287 (HW Key)	*With SW License:* MR SAS 9260/9261/9265/9266/9270/9271/9280/9285/9286 series controllers *With LSI00245:* 9260 (-4i, -8i, -16i, CV-4i, CV-8i), 9280 (-4i4e, -16i4e, -24i4e) *With LSI00287:* 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9285 (-8e, CV-8e), 9286 (-8e, CV-8e, CV-8eCC)

3ware® SATA+SAS

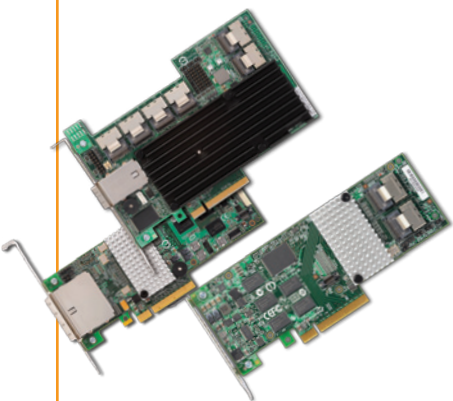**High Performance SATA+SAS RAID Controllers**
3ware builds on an established SATA leadership with the 3ware SAS 9750 controller cards, featuring high-performance RAID. 3ware pioneered the way for SATA and now capitalizes on time-proven serial storage expertise to take users from SCSI to SAS in sequential I/O intensive and multi-stream environments.

3ware RAID controllers feature StorSwitch®, which is a unique non-blocking fabric architecture that allows 3ware controllers to concurrently communicate to all attached drives through a pool of 32 direct memory access (DMA) channels for superb performance and data availability. The result is superior overall system performance compared to non-scalable, hub-based systems that share the bandwidth of a single DMA channel.

In addition, 3DM®2 is powerful remote management software that simplifies the configuration, management and monitoring of 3ware storage arrays. It provides an intuitive interface to remotely create, manage and monitor your 3ware RAID arrays and single disks in a robust, secure array management environment for your RAID protected data. Proven self-monitoring technologies and automatic notification services can maximize your storage availability while minimizing the pressure on system administrators.
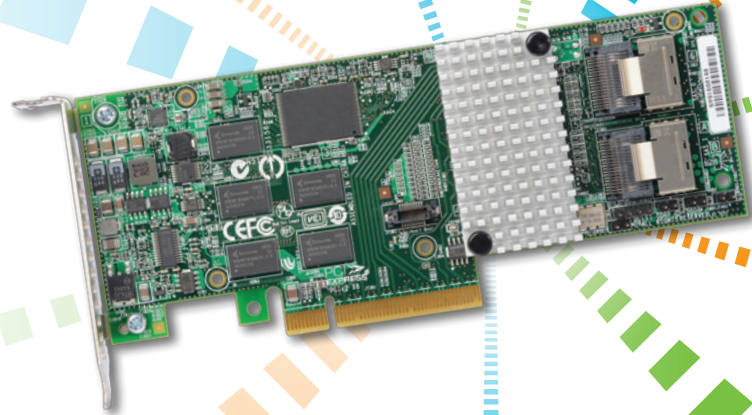
3ware 9750 SATA+SAS Product Line

LSI° 3ware 6Gb/s SATA+SAS RAID controller cards provide a new level of reliability, availability, and performance to businesses that are facing storage challenges, particularly in sequential I/O intensive and multi-stream environments. These 3ware controllers employ the latest in RAID-on-Chip technology and provides a higher standard of data protection and performance through advanced processes.

KEY FEATURES:

• Support for up to 127 6Gb/s or 3Gb/s, SATA or SAS physical devices
• PCI Express x8 host interface
• RAID levels 0, 1, 5, 6, 10, 50, and Single Disk
• Native Command Queuing
• Low-profile form factor available on certain cards
• StreamFusion+ provides enhanced features and functionality

| Row	Product	Ordering Part Number(s)	Port Count	Data Transfer Rate	Host Interface	RAID Levels	Number of Devices Supported	Onboard Memory	Internal Connector	External Connector	Battery Back-up Option
1	9750-24i4e	LSI00251 (SGL)	28	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, Single Disk	127	512MB	6 x SFF8087	1 x SFF8088	LSIiBBU07
2	9750-16i4e	LSI00252 (SGL)	20	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, Single Disk	127	512MB	4 x SFF8087	1 x SFF8088	LSIiBBU07
3	9750-8e	LSI00243 (SGL) LSI00250 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, Single Disk	127	512MB		2 x SFF8088	LSIiBBU07
4	9750-4i4e	LSI00242 (SGL) LSI00241 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10, 50, Single Disk	127	512MB	1 x SFF8087	1 x SFF8088	LSIiBBU07
5	9750-8i	LSI00213 (KIT) LSI00214 (SGL)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10 ,50, Single Disk	127	512MB	1 x SFF8087		LSIiBBU07
6	9750-4i	LSI00215 (KIT) LSI00216 (SGL)	4	6Gb/s	PCI Express 2.0 x8	0, 1, 5, 6, 10 ,50, Single Disk	127	512MB	1 x SFF8087		LSIiBBU07

3ware 9650SE Product Line
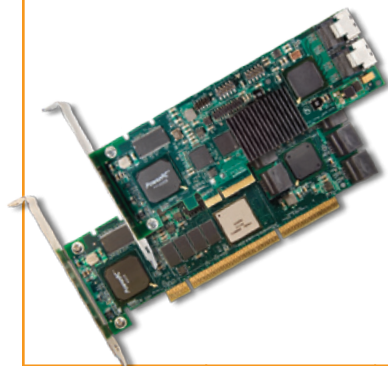
3ware's 9650SE SATA II hardware RAID controllers deliver industry-leading RAID performance, robust fault tolerance, and multi-terabyte capacities. A PCI Express host interface, Multi-lane™ connectivity, StorSwitch architecture, and sophisticated SATA II features drive this unrivaled performance.

KEY FEATURES:

• Native Command Queuing
• RAID levels 0, 1, 5, 6, 10, 50, Single Disk
• SATA II advanced features
• Low-profile form factor
• StreamFusion+ provides enhanced features and functionality

Row	Product	Ordering Part Number(s)	Port Count	Data Transfer Rate	Host Interface	RAID Levels	Number of Devices Supported	Onboard Memory	Internal Connector	External Connector	Battery Back-up Option
1	9650SE-24M8	9650SE-24M8 (SGL) 9650SE-24M8 (KIT)	24	3Gb/s	PCI Express 1.1 x8	0, 1, 5, 6, 10, 50, Single Disk, JBOD	24	512MB	3 x M8		BBU-MODULE-03
2	9650SE-16ML	9650SE-16ML (SGL) 9650SE-16ML (KIT)	16	3Gb/s	PCI Express 1.1 x8	0, 1, 5, 6, 10, 50, Single Disk, JBOD	16	256MB	4 x SFF8087		BBU-MODULE-03
3	9650SE-12ML	9650SE-12ML (SGL) 9650SE-12ML (KIT)	12	3Gb/s	PCI Express 1.1 x8	0, 1, 5, 6, 10, 50, Single Disk, JBOD	12	256MB	3 x SFF8087		BBU-MODULE-03
4	9650SE-8LPML	9650SE-8LPML (SGL) 9650SE-8LPML (KIT)	8	3Gb/s	PCI Express 1.1 x4	0, 1, 5, 6, 10, 50, Single Disk, JBOD	8	256MB	2 x SFF8087		BBU-MODULE-03
5	9650SE-4LPML	9650SE-4LPML (SGL) 9650SE-4LPML (KIT)	4	3Gb/s	PCI Express 1.1 x4	0, 1, 5, 10, Single Disk, JBOD	4	256MB	1 x SFF8087		BBU-MODULE-03
6	9650SE-2LP	9650SE-2LP (SGL) 9650SE-2LP (KIT)	2	3Gb/s	PCI Express 1.1 x1	0, 1, Single Disk, JBOD	2	128MB	Discrete		N/A

Host Bus Adapter SATA+SAS External and Combo Product Line
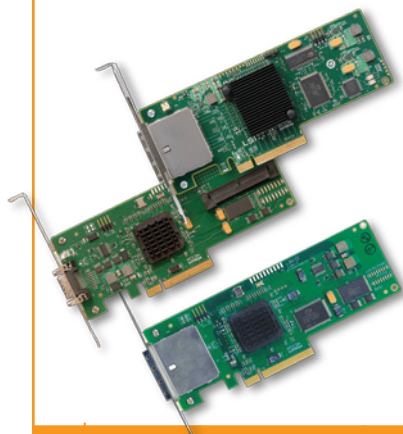
LSI SATA+SAS External and Combo HBAs deliver superior performance and external connectivity that satisfies both SAS and SATA requirements. Providing extreme scalability, these adapters support a high number of physical devices and are optimal for large-capacity server storage for RAID and non-RAID enclosures. LSI SAS HBAs are able to connect to SATA and SAS hard disk drives, allowing for tiered storage that optimizes costs and performance. SAS drives are optimal when speed and reliability are of the utmost concern while SATA drives are appropriate when capacity and cost are more important.

New 6Gb/s SAS features include support for self-discovery/self-configuring expanders and longer cables, simplifying the deployment of larger and more complex storage topologies. The new controllers also have standardized zoning which improves storage efficiencies by allowing multiple servers to share storage devices.

KEY FEATURES:
- Flexibility to use SATA or SAS HDDs or SSDs
- Fusion-MPT™ architecture provides over 500,000 I/Os per second
- Embedded CPU in ASIC performs RAID operations
- Integrated RAID available on certain boards
- Supports all major Operating Systems

Row	Product	Ordering Part Number(s)	Port Count	Data Transfer Rate	Host Interface	RAID Levels	Number of Devices Supported	Internal Connector	External Connector
1	9207-8e	LSI00300 (SGL)	8	6Gb/s	PCI Express 3.0 x8	JBOD	1024		2 x SFF8088
2	9207-4i4e	LSI00303 (SGL) LSI00304 (KIT)	8	6Gb/s	PCI Express 3.0 x8	JBOD	256	1 x SAS SFF-8087 x4	1 x SAS SFF-8088 x4
3	9206-16e	LSI00299 (SGL)	16	6Gb/s	PCI Express 3.0 x8	JBOD	256		4 x SFF8644
4	9201-16e	LSI00276 (SGL)	16	6Gb/s	PCI Express 2.0 x8	JBOD	1024		4 x SFF8088
5	9205-8e	LSI00285 (SGL)	8	6Gb/s	PCI Express 2.0 x8	JBOD	1024		2 x SFF8088
6	9200-8e	LSI00188 (SGL)	8	6Gb/s	PCI Express 2.0 x8	JBOD	512		2 x SFF8088
7	9212-4i4e	LSI00192 (SGL) LSI00193 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 1E, 10, JBOD	256	4 x SATA	1 x SFF8088
8	3801E	LSI00138 (SGL)	8	3Gb/s	PCI Express 1.1 x8	JBOD	252		2 x SFF8088
9	3442E-R	LSI00167 (SGL) LSI00110 (KIT)	8	3Gb/s	PCI Express 1.1 x8	0, 1, 1E, JBOD	252	1 x SFF8484	1 x SFF8470

Host Bus Adapter SATA+SAS Internal Product Line
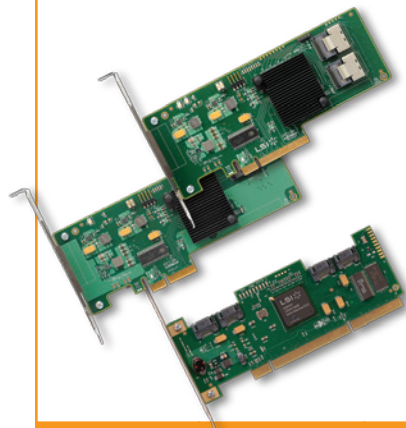
LSI SATA+SAS Internal Connectivity HBAs provide a high-performance, low-cost solution that satisfies both SAS and SATA requirements. Optimal for servers and workstations needing ultra high-speed data transfers, these adapters deliver high-throughput and maximum air-flow for internal storage needs.

KEY FEATURES:

• Integrated RAID 0, 1, 1E, and 10 available on certain HBAs
• PCI Express host interfaces
• SATA and SAS functionality at SATA pricing
• Fusion-MPT architecture provides over 140,000 I/Os per second
• Embedded CPU in ASIC performs RAID operations
• Supports all major Operating Systems

Row	Product	Ordering Part Number(s)	Port Count	Data Transfer Rate	Host Interface	RAID Levels	Number of Devices Supported	Internal Connector	External Connector
1	9207-8i	LSI00301 (SGL) LSI00302 (KIT)	8	6Gb/s	PCI Express 3.0 x8	JBOD	256	2 x SAS SFF-8087 x4	
2	9201-16i	LSI00244	16	6Gb/s	PCI Express 2.0 x8	JBOD	512	4 x SFF8087 Mini-SAS	
3	9211-8i	LSI00194 (SGL) LSI00195 (KIT)	8	6Gb/s	PCI Express 2.0 x8	0, 1, 1E, 10, JBOD	256	2 x SFF8087	
4	9211-4i	LSI00190 (SGL) LSI00191 (KIT)	4	6Gb/s	PCI Express 2.0 x8	0, 1, 1E, 10, JBOD	256	1 x SFF8087	
5	3081E-R	LSI00182 (SGL) LSI00151 (KIT)	8	3Gb/s	PCI Express 1.1 x8	0, 1, 1E, JBOD	252	2 x SFF8087	
6	3041E-R	LSI00168 (SGL) LSI00112 (KIT)	4	3Gb/s	PCI Express 1.1 x4	0, 1, 1E, JBOD	128	1 x SFF8087	

SAS Switch

The innovative 16 port SAS 2.1 SAS Switch is a 1⁄2 wide, 1U high unit that has an optional rack mounting tray for dual switch requirements and support for Active SAS cables, which can extend the reach for two of the 24Gb/s ports (4 lanes each) to 20 meters. Embedded in the switch is a powerful management tool that enables full T-10 compliant zoning to individual SAS devices.

Row	SAS Switch	Ordering PN	Description	# of devices	Connections
1	SAS Switch	LSI00269	1U, 1/2 wide SAS Switch	1000 SAS Address via 16 wide ports	SFF8088
2	Mounting Tray	LSI00270	1U Mounting Tray	up to 2 switches	N/A

LSI Nytro MegaRAID Application Acceleration Cards

The Nytro MegaRAID® card combines on-board flash technology with LSI market leading RAID-on-Chip (ROC) technology to help accelerate key business applications, using intelligent caching algorithms to identify application "hot spots" and promote them to fast on-board NAND flash. The Nytro MegaRAID card is designed to deliver intelligent application acceleration and enterprise level data protection while offering cost savings over SSD-only arrays or over-provisioned direct attached HDD environments.

KEY FEATURES:

• Application Acceleration for Direct Attach Storage
• Automatic Hot Spot Data Caching
• 100GB, 200GB and 800GB NAND flash, Low profile, MD2, x8 PCIe 3.0, x4 SAS ports

Row	Nytro MegaRAID Card	Ordering Part Number(s)	Form Factor	Description	NAND Type	Application Type	Packaging	Kit Contents
1	NMR 8100-4i	LSI00350	Low Profile	The LSI Nytro MegaRAID NMR 8100-4i, 100GB NAND flash, Low profile, MD2, x8 PCIe 3.0, x4 SAS ports with automatic hot spot data caching	SLC	Balanced Reads and Writes across data with significant hot spots	Kit Only	NMR-8100-4i, USB drive with drivers, software and documentation, One Full Height Bracket
2	NMR 8110-4i	LSI00351	Low Profile	The LSI Nytro MegaRAID NMR 8110-4i, 200GB NAND flash, Low profile, MD2, x8 PCIe 3.0, x4 SAS ports with automatic hot spot data caching	eMLC	Balanced Reads and Writes across data with significant hot spots	Kit Only	NMR-8110-4i, USB drive with drivers, software and documentation, One Full Height Bracket
3	NMR 8120-4i	LSI00353	Low Profile	The LSI Nytro MegaRAID NMR 8120-4i, 800GB NAND flash, Low profile, MD2, x8 PCIe 3.0, x4 SAS ports with automatic hot spot data caching	eMLC	Balanced Reads and Writes across data with significant hot spots	Kit Only	NMR-8120-4i, USB drive with drivers, software and documentation, One Full Height Bracket
4	Nytro MegaRAID SCM01	LSI00355	N/A	Optional SuperCap kit for DRAM Cache Protection for the LSI Nytro MegaRAID NMR 8100-4i, 8110-4i, and 8120-4i	SLC	N/A	Kit Only	N/A

LSI Nytro WarpDrive Application Acceleration Cards

The new family of LSI Nytro WarpDrive™ application acceleration cards are designed to offer high performance with low latency and a low CPU burden, accelerating applications such as Web serving, data warehousing, data mining, online transaction processing and high-performance computing. Their PCIe® host interface, industry standard drivers and small form factor make them more flexible and easier to integrate into today's low profile, high performance system chassis.

KEY BENEFITS:

- Fast responses enable low latency enterprise quality flash
- Smart onboard flash management reduces load on server resources
- Easy to use with your current applications and storage environment

Row	Nytro WarpDrive	Ordering Part Number(s)	Form Factor	Description	NAND Type	Application Type	Packaging	Kit Contents
1	NWD-WLP4-200	LSI00323	Low Profile	The Nytro WarpDrive NWD-WLP4-200, low profile, small form factor PCIe 2.0 enterprise NAND flash card in single and retail kit configurations	SLC	Write Intensive	Kit Only	NWD-WLP4-200, USB drive with drivers, software and documentation, One Full Height Bracket
2	NWD-WLP4-400	LSI00324	Low Profile	The Nytro WarpDrive NWD-WLP4-400, low profile, small form factor PCIe 2.0 enterprise NAND flash card in single and retail kit configurations	SLC	Write Intensive	Kit Only	NWD-WLP4-400, USB drive with drivers, software and documentation, One Full Height Bracket
3	NWD-BLP4-400	LSI00318	Low Profile	The Nytro WarpDrive NWD-BLP4-400, low profile, small form factor PCIe 2.0 enterprise NAND flash card in single and retail kit configurations	MLC	Balanced Reads and Writes	Kit Only	NWD-BLP4-400, USB drive with drivers, software and documentation, One Full Height Bracket
4	NWD-BLP4-800	LSI00319	Low Profile	The Nytro WarpDrive NWD-BLP4-800, low profile, small form factor PCIe 2.0 enterprise NAND flash card in single and retail kit configurations	MLC	Balanced Reads and Writes	Kit Only	NWD-BLP4-800, USB drive with drivers, software and documentation, One Full Height Bracket
5	NWD-BLP4-1600	LSI00320	Low Profile	The Nytro WarpDrive NWD-BLP4-1600, low profile, small form factor PCIe 2.0 enterprise NAND flash card in single and retail kit configurations	MLC	Balanced Reads and Writes	Kit Only	NWD-BLP4-1600, USB drive with drivers, software and documentation, One Full Height Bracket

LSI Nytro XD Application Acceleration Storage Solution

The Nytro XD solution's host-based software is designed to intelligently and dynamically handle application acceleration, often without the need to reconfigure the application or file system to make the best use of flash storage. The result is faster system performance and smarter, faster application performance, while at the same time improving HDD access times because more transactions are being supported by the Nytro WarpDrive card. Cached data stored in the Nytro WarpDrive card is protected by the permanent storage on HDD volumes that are associated with Nytro XD solution caching volumes.

KEY FEATURES:

• Fast acceleration of SAN or direct-attached storage
• Smart caching algorithms place data in PCIe connected flash cards
• Easy to use with your current applications and storage environment

Row	Nytro XD	Ordering Part Number(s)	Form Factor	Description	NAND Type	Application Type	Packaging	Kit Contents
1	NXD BLP4-400	LSI00325	Low Profile	The Nytro WarpDrive NXD-BLP4-400, low profile, small form factor PCIe 2.0 enterprise NAND flash card in single and retail kit configurations	MLC	Balanced Reads and Writes across data with significant hot spots	Kit Only	NWD-BLP4-400, USB drive with drivers, software and documentation, One Full Height Bracket
2	NXD BLP4-800	LSI00352	Low Profile	The Nytro WarpDrive NXD-BLP4-800, low profile, small form factor PCIe 2.0 enterprise NAND flash card in single and retail kit configurations	MLC	Balanced Reads and Writes across data with significant hot spots	Kit Only	NWD-BLP4-800, USB drive with drivers, software and documentation, One Full Height Bracket

LSI Nytro Predictor Software Tool

Many software applications can be accelerated by using smart caching. The LSI Nytro Predictor™ software tool identifies "hot spots" in applications that frequently access an area of SAN or DAS storage. Locating these hot spots and accessing them from PCIe® based flash memory can help speed access to this data providing the user with faster responses. The Nytro Predictor software is designed to allow IT management and DBAs to identify which applications may benefit from smart caching using flash-based storage.

Solid State Storage
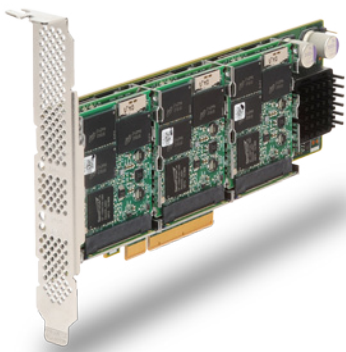
Advances in flash memory technology are increasing the range of storage system solutions available to meet the expanding challenges of today's market. In applications where high transaction rates are required, but where size, heat and total cost of ownership are equally compelling factors, LSI technology has taken a leadership position.

Placing flash memory in HDD form factors can remove the latency of traditional rotating memory as well as reducing power and size requirements. Further system enhancement is possible by also moving this new storage technology into a more advantageous place in the performance hierarchy, "closer" to the processor on a PCIe bus. The LSI WarpDrive SLP-300 is a LSI high performance product in this exciting new product category.

WarpDrive SLP-300	Ordering PN	Description	Technology	Connections
WarpDrive	LSI00263	Solid State Storage Acceleration Card • 300GB user capacity • 240,000 IOP • <25 watts	SLC flash memory with wear leveling and 28% over provisioning	PCIe Gen2

Cables

Row	Cables P/Ns	Compatible Controllers
1	**SFF-8088 to SFF-8088** **(Multi-lane external SAS)** CBL-SFF8088SAS-10M (1.0 m) CBL-SFF8088SAS-20M (2.0 m) CBL-SFF8088ASAS-100M (10m, Active)* CBL-SFF8088ASAS-200M (20m, Active)*	9750 (-8e, -4i4e, -16i4e, -24i4e), 9280 (-8e, -4i4e, -16i4e, -24i4e), 9285-8e, 9286 (-8e, CV-8e, CV-8eCC), 9200 (-8e, -16e), 9201-16e, 9207 (-4i4e, -8e), 9212-4i4e, 8880EM2, 8888ELP, 3442E-R, 3801E, LSISAS6160*
2	**SFF-8644 to SFF-8088** **SFF-8644 to SFF-8644** **(external "HD" SAS)** CBL-SFF8644-8088-10M CBL-SFF8644-8088-20M CBL-SFF8644-8088-60M CBL-SFF8644-10M CBL-SFF8644-20M CBL-SFF8644-60M	9206-16e
3	**SFF-8087 to SFF-8482** **(Forward SAS breakout cable w/drive power connectors)** CBL-SAS8087OCF-06M (0.6 m)	9650SE (-4LPML, -8LPML, -12ML, -16ML), 9750 (-4i, -8i, -4i4e, -24i4e), 9240 (-4i, -8i), 9260 (-4i, -8i, -16i), 9261-8i, 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9280 (-4i4e, -24i4e), 9201-16i, 9207 (-4i4e, -8i), 9211 (-4i,-8i), 9212-4i4e, 8704EM2, 8708EM2, 8888ELP, 3041E-R, 3081E-R, 3442E-R
4	**SFF-8087 to SFF-8087** **(Multi-lane internal)** CBL-SFF8087-05M (0.5 m) CBL-SFF8087-06M (0.6 m)	9650SE (-4LPML, -8LPML, -12ML, -16ML), 9750 (-4i, -8i, -4i4e, -24i4e), 9240 (-4i, -8i), 9260 (-4i, -8i, -16i), 9261-8i, 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9280 (-4i4e, -24i4e), 9201-16i, 9207 (-4i4e, -8i), 9211 (-4i,-8i), 9212-4i4e, 8704EM2, 8708EM2, 8888ELP, 3041E-R, 3081E-R, 3442E-R
5	**SFF-8087 to SFF-8087** **(Right angle cable)** CBL-RA8087SB-10M (1.0m)	9750 (-16i4e, -24i4e), 9280 (-16i4e,-24i4e)
6	**SFF-8087 to SFF-8087** **(Mulit-lane internal cable with sideband)** CBL-SFF8087SB-08M (.8m) CBL-SFF8087SB-06M (.6m) CBL-SFF8087SB-05M (.5m)	9650SE (-4LPML, -8LPML, -12ML, -16ML), 9750 (-4i, -8i, -4i4e, -24i4e), 9240 (-4i, -8i), 9260 (-4i, -8i, -16i), 9261-8i, 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9280 (-4i4e, -24i4e), 9201-16i, 9207 (-4i4e, -8e), 9211 (-4i,-8i), 9212-4i4e, 8704EM2, 8708EM2, 8888ELP, 3041E-R, 3081E-R, 3442E-R
7	**SFF-8087 to Discrete** **(Right angle cable)** CBL-RA8087SATASB-10M (1.0m)	9750 (-16i4e, -24i4e), 9280 (-16i4e,-24i4e)
8	**SFF-8087 to Discrete** **(Multi-lane internal cable with sideband)** CBL-SFF8087-SATASB-10M (1.0m) CBL-SFF8087-SATASB-06M (0.6m)	9750 (-4i, 8i, -8e, -4i4e, -16i4e, -24i4e)
9	**SFF-8087 to Discrete** **(Forward breakout cable)** CBL-SFF8087OCF-05M (0.5 m) CBL-SFF8087OCF-06M (0.6 m) CBL-SFF8087OCF-10M (1.0 m)	9650SE (-4LPML, -8LPML, -12ML, -16ML), 9750 (-4i, -8i, -4i4e, -24i4e), 9240 (-4i, -8i), 9260 (-4i, -8i, -16i), 9261-8i, 9265-8i, 9266 (-4i, -8i), 9270-8i, 9271 (-4i, -8i, -8iCC), 9280 (-4i4e, -24i4e), 9201-16i, 9211 (-4i,-8i), 9212-4i4e, 8704EM2, 8708EM2, 8888ELP, 3041E-R, 3081E-R, 3442E-R
10	**M8 to SFF-8087** **(Multi-lane internal "Y" cable)** CBL-M8ML-06M (0.6 m) CBL-M8ML-10M (1.0 m)	9650SE-24M8
11	**M8 to Discrete** **(Forward breakout cable)** CBL-M8OCF-06M (0.6 m) CBL-M8OCF-10M (1.0 m)	9650SE-24M8

Active cables only compatible with 9201-16e and LSISAS6160

MegaRAID Cache Protection Options

RAID caching is a cost-effective way to improve I/O performance by writing data to a controllers' cache before it is written to disk. In write-back mode, data written to cache is vulnerable until it is made permanent on disk. To avoid the possibility of data loss or corruption during a power or server failure, LSI offers the CacheVault™ flash cache protection module or the battery backup units for MegaRAID SATA+SAS controllers.

CacheVault flash cache protection uses NAND flash memory powered by a super-capacitor to protect data stored in the MegaRAID controller cache in the even of a power failure. LSI 6Gb/s MegaRAID SATA+SAS controllers, together with CacheVault flash technology, virtually eliminate hardware maintenance associated with Lithium-ION batteries, lower total cost of ownership over the life of the controller card, and provide more environmentally friendly cache protection, all while maintaining optimal RAID performance.

Row	Cache Protection Option	Ordering Part Number	Compatible Controller Cards
1	LSICVM01	LSI00297	9266-4i, 9266-8i, 9271-4i, 9271-8i
2	LSIiBBU09	LSI00279	9265-xx, 9271-xx, 9285-8e, 9286-8e
3	LSIiBBU08	LSI00264	9260/1-xx and 9280-xx
4	LSIiBBU07	LSI00161	8880EM2, 9260/1-xx, 9280-xx and 9750-xx
5	LSIiBBU06	LSI00160	8704EM2, 8708EM2
6	LSIiBBU05	LSI00183	8704ELP, 8708ELP, 8888ELP
7	BBU-BRACKET-05	LSI00291	Remote Mounting Bracket for LSI BBUs and CacheVault Power Modules
8	LSIiBBU01	LSI00184	300-8X, 300-8XLP, 300-4XLP, 8344ELP, 8308ELP, 84016E
9	LSIiTBBU02	LSI00185	256MB TBBU for 8408E and 8480E

3ware Battery Back-up Units

3ware's combination of powerful reliability enhancements and BBUs help maximize data protection without sacrificing performance.

KEY FEATURES:

• Battery Backup Unit (BBU) – Maximum reliability with cached write data protection
• Secondary Power Loss Support – Safeguards data against power interrupts during system resumption
• Missing Array Detection – Helps eliminate silent data loss by retaining unwritten data until user intervention
• Write Journaling – Uses and protects drive write cache for solid data protection and maximum performance
• Dynamic Sector Repair – Increased drive reliability with on-the-fly correction of drive media errors
• Drive Power-On Reset Detection – Enhances data protection by degrading a drive that may have lost data during transient power reset
• Extensive Drive Timeout Recovery – Maximizes drive error recovery with intelligent timeout algorithm
• Out of Band Signaling Retry – Ensures drive health during power-up with enhanced drive detection

Row	Battery	Ordering Part Number	Compatible Controller Cards
1	BBU-MODULE-03	BBU-MODULE-03	9650SE, 9550SX, 9550SXU, 9590SE
2	BBU-MODULE-04	BBU-MODULE-04	9690SA, 9650SE, 9550SX, 9550SXU, 9590SE (remote mount option)
3	BATT-SPARE-02	BATT-SPARE-02	Spare Battery for BBU-MODULE-03, BBU-MODULE-04, BBU-9550SX-01
4	LSIiBBU07	LSI00161	9750-24i4e, 9750-16i4e, 9750-8e, 9750-4i4e, 9750-8i, 9750-4i

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