

LSI® SAS6160

Switch

June 2012



SAS Switch



LSI SAS6160 SAS Switch

The LSI SAS6160 Switch is a ½ wide, 16-port switch that fits into the 1U form factor. The switch extends the capabilities of SAS in direct-attached storage (DAS) environments by allowing multiple servers to connect to one or more independent storage systems. Additionally, with its built-in zoning capabilities, the SAS6160 allows customers to securely share only selected storage resources. The SAS6160 is designed to provide customers with a low-cost and easy to use storage networking option for rack-mount server and storage installations in cloud computing, data center and small- to medium-sized business (SMB) environments.

KEY FEATURES:

- Provides a new level of functionality for DAS
 - Cluster-able direct-attach solution
 - Efficiently connect multiple servers to multiple storage resources
- “Start small, grow big” scalability
 - Lowers acquisition cost without sacrificing expansion capabilities
 - Supports SAS and SATA connectivity to nearly 1,000 devices
- Low cost, higher performance storage interconnect
 - SAS wide bus aggregate bandwidth over 4 lanes
 - Each connection can run at 2400MB/s
- Higher bandwidth, lower latency and improved fairness in switched topologies
- Tiered storage solution with SAS and SATA drives
 - Efficiently connect multiple servers to multiple storage
- Reduce complexity with simpler management software

Model # / Name	Size	Ports
LSI SAS6160 SAS Switch	1U ½ Wide	16 x4 SFF8088 6GB/s SAS ports (24Gb/s per port) (2 powered Mini-SAS connectors provide active copper cable support)

Target Markets

Hosting

- Shareable DAS
- Cost Efficient
- Performance
- Security

Data Center

- Tiered Storage
- Shareable DAS
- Performance

Virtualization

- Max Utilization
- Cluster-able
- Shareable DAS

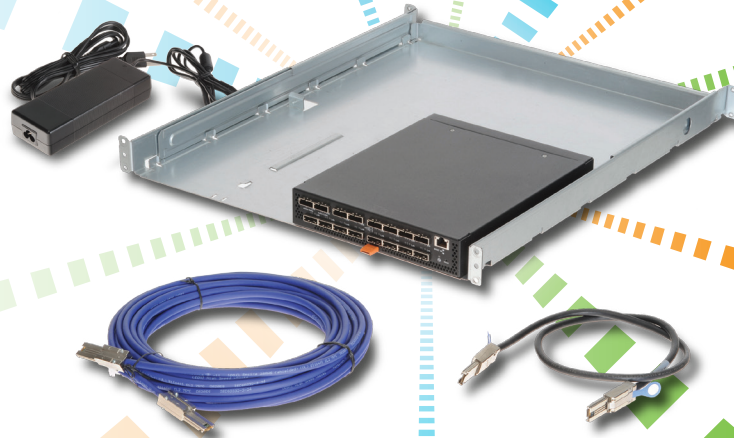
Cloud

- Max Utilization
- Cluster-able
- Shareable DAS

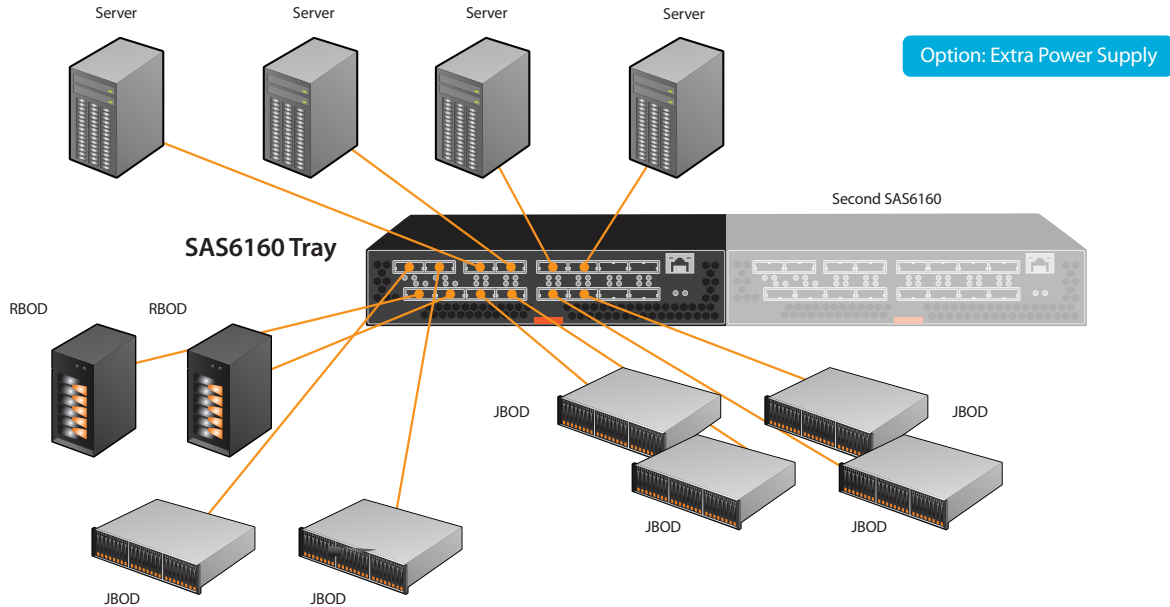


LSI SAS6160 Options and Spares

Product	Description
SAS6160 SAS Switch	16 port, 6Gb/s SAS Switch, ½ W
SAS6160 1U Mounting Tray	1U Mounting Tray
SAS6160 Replacement Power Supply	SAS Switch Spare Power Supply (FRU)
SAS Active 20m Cable	Optional Active SAS 20m Cable
SAS Active 10m Cable	Optional Active SAS 10m Cable

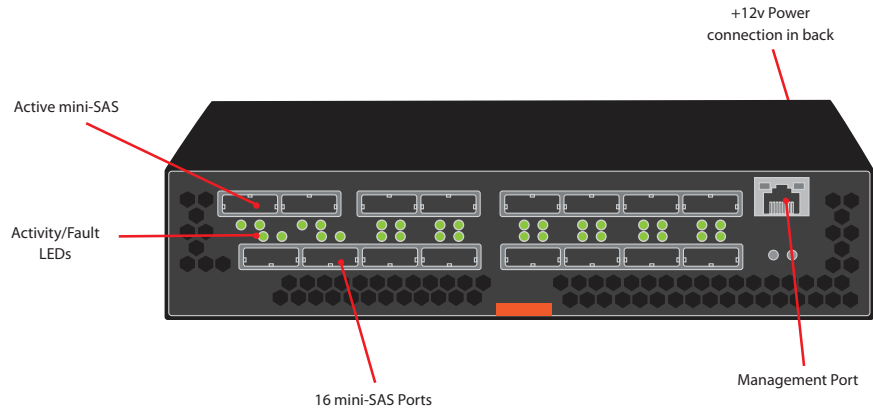


SAS6160 Deployment Example



This is intended to show how the SAS6160 can be used to easily connect one or more servers to multiple storage systems

SAS6160 SAS Switch

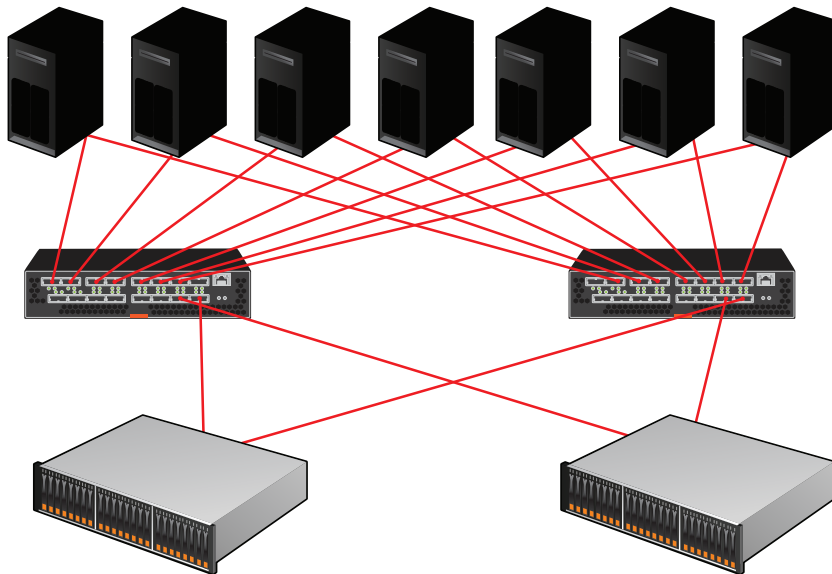


SAS SWITCH

- 16 x4 SAS 2 ports (24Gb/s per port)
- 16 mini-SAS (SFF8088 connector)
 - 2 powered Mini-SAS (active copper cable support) connectors
- Activity / Fault LEDs per x4 port
- Fits in 1/2 standard rack width
- Two 16-port switches can fit in a 1 U form factor
- Powerful Embedded Management GUI
- Single external 12 volt Power Supply connector
 - Power Supply included

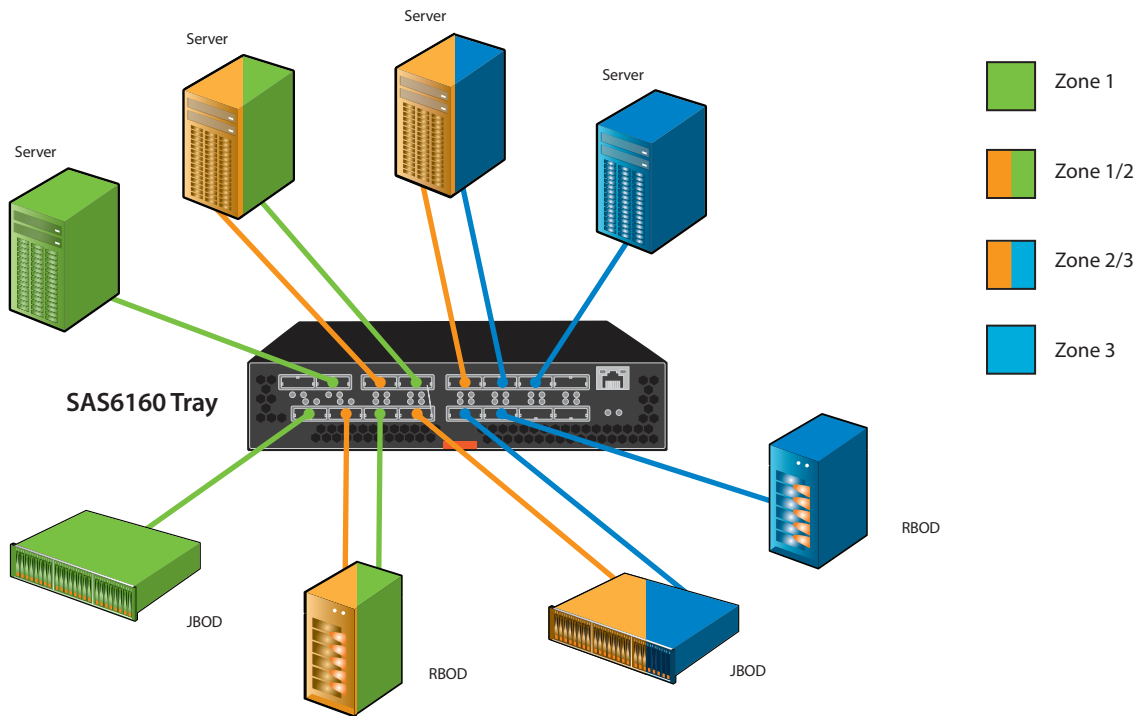
The SAS6160 provides 16 x4 ports to more easily allow one or more servers to seamlessly connect and share multiple storage systems like JBODs and RBODs. Two active ports provide connection distances of up to 25 meters.

High Availability Deployment Example

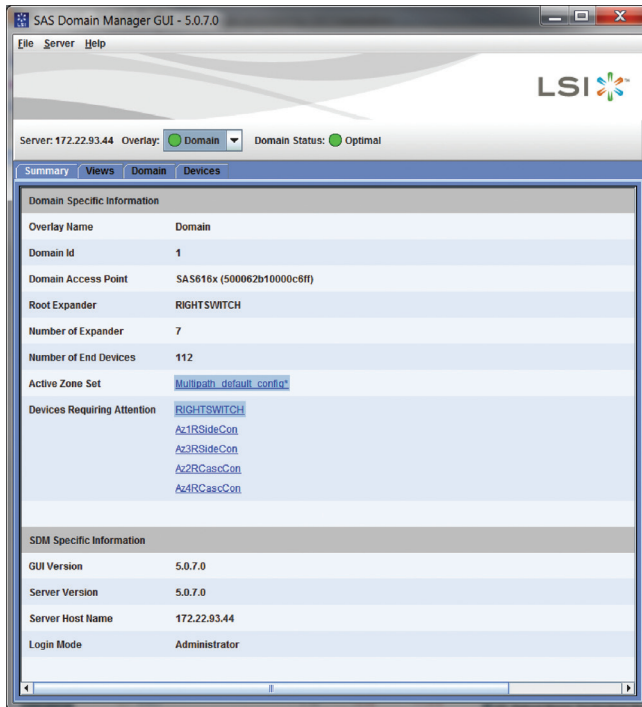


Using two (2) SAS6160 switches, I/O paths to each Storage Resource (JBOD or RBOD) should be established for full redundancy and failover protection

SAS6160 Zoning



SAS6160 Switch Management Interface



The screenshot shows the SAS Domain Manager GUI - 5.0.7.0. The window title is "SAS Domain Manager GUI - 5.0.7.0". The menu bar includes "File", "Server", and "Help". The LSI logo is visible in the top right corner. Below the logo, the server information is displayed: "Server: 172.22.93.44", "Overlay: Domain", and "Domain Status: Optimal".

The main content area is divided into two sections:

- Domain Specific Information**

Overlay Name	Domain
Domain Id	1
Domain Access Point	SAS616x (500062b10000c8ff)
Root Expander	RIGHTSWTCH
Number of Expander	7
Number of End Devices	112
Active Zone Set	Multipath_default_config
Devices Requiring Attention	RIGHTSWTCH Az1RSideCon Az3RSideCon Az2RCascCon Az4RCascCon
- SDM Specific Information**

GUI Version	5.0.7.0
Server Version	5.0.7.0
Server Host Name	172.22.93.44
Login Mode	Administrator

SAS6160 Integrated Management GUI Summary screen provides current status and open alerts .

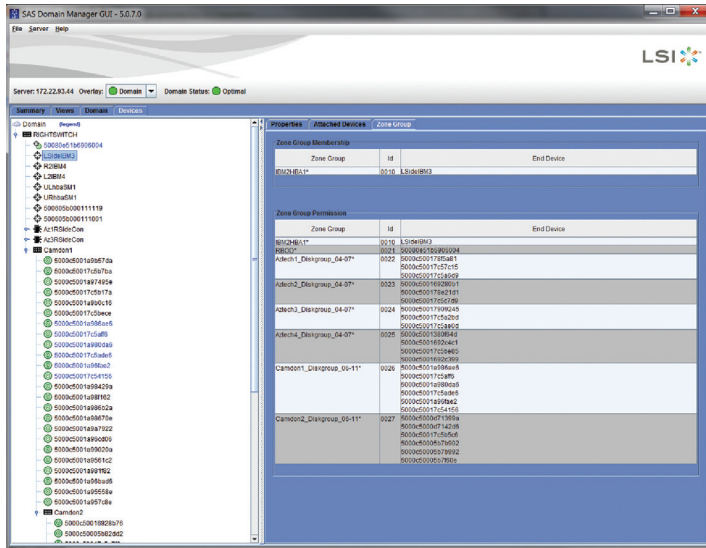
SAS6160 Switch Management Interface

The screenshot displays the SAS Domain Manager GUI (version 5.0.7.0) with the LSI logo. The interface is divided into a left-hand tree view and a right-hand properties window. The tree view shows a hierarchy of devices under the 'Domain' and 'Devices' tabs. The 'Attached Devices' tab is active, showing a list of devices. One device, 'Az1R5ideCon', is selected, and its properties are displayed in the right-hand window.

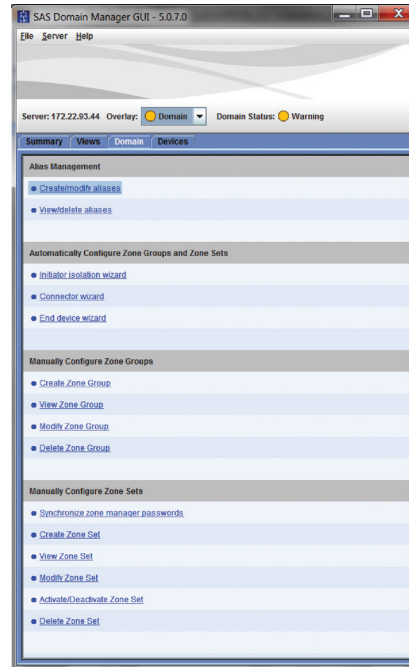
Property	Value	Property	Value
SAS Address	5000c50016928aa5	Company Name	Unknown
IEEE ID	00 0c 50	Device Type	End Device
Link Speed	6.0 Gb/s	Vendor Id	SEAGATE
Product Id	ST91600325	Product Revision Level	0005
Device Phys	00	Parent SAS Address	50012000003770f
Parent Alias	Az1R5ideCon	Parent Phys	00
Capabilities	SAS Target		

SAS6160 Integrated Management device list Tab provides a detailed list of all connected Host based controllers (SAS Initiators) and End Devices (SAS Targets - Storage resources down to the individual drive level).

SAS6160 Switch Management Interface



SAS6160 Integrated Management Domain tab provides the tools to name and zone (both manually and automatically) a customer's storage resources.



The SAS6160 Zoning feature enables a customer to zone down to the individual drive level.

SAS6160 Switch Management Interface

View Zone Sets

Notes
 - Active Zone Sets, which are copies taken at activation, are noted by the presence of an asterisk (*) appended to the name.
 - Rescan button will refresh and reset the dialog.

Select zone set:

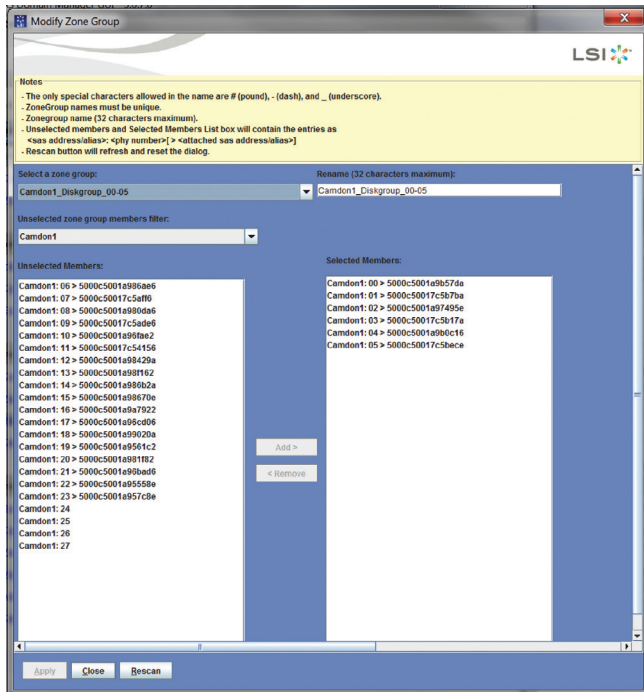
Zone Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32			
BMT-HBA1-1	X	X						X	X	X	X	X	X	X																					
BMT-HBA2-2	X	X						X	X	X	X	X	X	X																					
BMT-HBA1-3			X											X	X	X	X	X	X	X															
SMA-HBA1-4				X	X									X							X	X	X	X	X										
SMA-HBA2-5				X	X									X							X	X	X	X	X										
SMA-HBA1-6				X	X									X							X	X	X	X	X		X	X	X	X	X	X			
SMA-HBA2-7				X	X									X							X	X	X	X	X		X	X	X	X	X	X			
Adtech1_Diskgroup_00-03-8	X	X																																	
Adtech2_Diskgroup_00-03-9	X	X																																	
Adtech3_Diskgroup_00-03-10	X	X																																	
Adtech4_Diskgroup_00-03-11	X	X																																	
Camson1_Diskgroup_00-05-12	X	X																																	
Camson2_Diskgroup_00-05-13	X	X																																	
TS600-14	X	X																																	
Adtech1_Diskgroup_04-07-15	X	X																																	
Adtech2_Diskgroup_04-07-16	X	X																																	
Adtech3_Diskgroup_04-07-17	X	X																																	
Adtech4_Diskgroup_04-07-18	X	X																																	
Camson1_Diskgroup_06-11-19	X	X																																	
Camson2_Diskgroup_06-11-20	X	X																																	
Adtech1_Diskgroup_12-15-21	X	X																																	
Adtech2_Diskgroup_12-15-22	X	X																																	
Adtech3_Diskgroup_12-15-23	X	X																																	
Adtech4_Diskgroup_12-15-24	X	X																																	
Camson1_Diskgroup_18-17-25	X	X																																	
Camson2_Diskgroup_18-17-26	X	X																																	
Adtech1_Diskgroup_20-31-27				X	X																														
Adtech2_Diskgroup_20-31-28				X	X																														
Adtech3_Diskgroup_20-31-29				X	X																														
Adtech4_Diskgroup_20-31-30				X	X																														
Camson1_Diskgroup_18-23-31	X	X																																	
Camson2_Diskgroup_18-23-32	X	X																																	

Zone Group	Expander	Phys
BMT-HBA1*	IRIGHTSWTCH	40 41 42 43
BMT-HBA2*	IRIGHTSWTCH	44 45 46 47
BMT-HBA1*	IRIGHTSWTCH	36 37 38 39
SMA-HBA1*	IRIGHTSWTCH	48 49 50 51
SMA3-HBA2*	IRIGHTSWTCH	52 53 54 55
SMA4-HBA1*	IRIGHTSWTCH	56 57 58 59
SMA1-HBA2*	IRIGHTSWTCH	60 61 62 63
Adtech1_Diskgroup_00-03*	IRIGHTSIDECON	6 1 0 3

Close Rescan

Using the SAS6160 Integrated Management GUI, a customer can easily see a detailed list of all zoned End Devices connected to each Host.

SAS6160 Switch Management Interface



SAS6160 Integrated Management GUI Zone Sets page provides all current Zone and the storage resources in each.

SAS6160 Switch Management Interface

SAS6160 Integrated Management GUI allows a customer to easily modify zone sets to reallocation resource as needed.

Activate/Deactivate Zone Set

LSI

Notes

- A zone set must be activated for its definitions to be applied to the domain. Only one zone set can be active at a time.
- When no zone set is active, zoning is disabled and domain access is unrestricted.
- Changes to the active zone set or zone group permissions, do not take affect until the next zone set activation.
- A zone set deactivation is not required prior to activating a different zone set.
- Reactivating the current zone set will apply any outstanding changes made to that zone set to the domain.
- Depending on the zoning configuration and how SIM accesses a domain, a valid Zone Manager Password may not always be required to modify or disable zoning once it is enabled.
- Rescan button will refresh and reset the dialog.

Current active zone set: Multipath_default_config

Select a zone set:

- Deactivate all zone sets
- Activate a zone set
 - Multipath_default_config

Zone manager password:

Zone Set: Multipath_default_config

Zone Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
IBM1HBA1:1	X	X						X			X			X		X		X		X			X			X		X		X		
IBM1HBA2:2	X	X						X			X			X		X		X		X			X			X		X		X		
IBM2HBA1:3			X						X			X			X		X		X		X		X		X		X		X		X	
SM3HBA1:4				X	X				X			X			X		X		X		X		X		X		X		X		X	
SM3HBA2:5			X	X					X			X			X		X		X		X		X		X		X		X		X	
SM4HBA1:6				X	X				X			X			X		X		X		X		X		X		X		X		X	
SM4HBA2:7				X	X				X			X			X		X		X		X		X		X		X		X		X	
Aztech1_Diskgroup_00-0			X	X																												
Aztech1_Diskgroup_04-0			X																													
Aztech1_Diskgroup_12-1				X	X																											
Aztech1_Diskgroup_28-3						X	X																									
Aztech2_Diskgroup_00-0		X	X																													
Aztech2_Diskgroup_04-0			X																													
Aztech2_Diskgroup_12-1				X	X																											
Aztech2_Diskgroup_28-3						X	X																									
Aztech3_Diskgroup_00-0		X	X																													
Aztech3_Diskgroup_04-0			X																													
Aztech3_Diskgroup_12-1				X	X																											
Aztech3_Diskgroup_28-3						X	X																									
Aztech4_Diskgroup_00-0		X	X																													
Aztech4_Diskgroup_04-0			X																													
Aztech4_Diskgroup_12-1				X	X																											
Aztech4_Diskgroup_28-3						X	X																									
Camdon1_Diskgroup_0		X	X																													
Camdon1_Diskgroup_1			X	X																												
Camdon1_Diskgroup_2				X	X																											
Camdon2_Diskgroup_0		X	X																													

Apply Close Rescan

Summary



The LSI SAS6160 switch provides a new level of functionality for direct attached, SAS-based storage. It allows customers to more easily and cost efficiently share multiple storage resources among one or more servers. The SAS6160 was designed to support:

- Applications needing shared and pooled storage
 - Example: Use fewer, larger storage arrays
- Applications needing increased connectivity
 - Example: Use multiple switches in a topology
- Applications needing higher availability
 - Example: Building a redundant configuration with two switches
- Configurations using tiered storage solution with SAS and SATA drives
- Customers wanting to lower storage acquisition cost without sacrificing expansion capabilities
- Customers wanting to efficiently connect multiple servers to multiple storage
- Customers wanting to securely share chosen storage resources with selected servers

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