

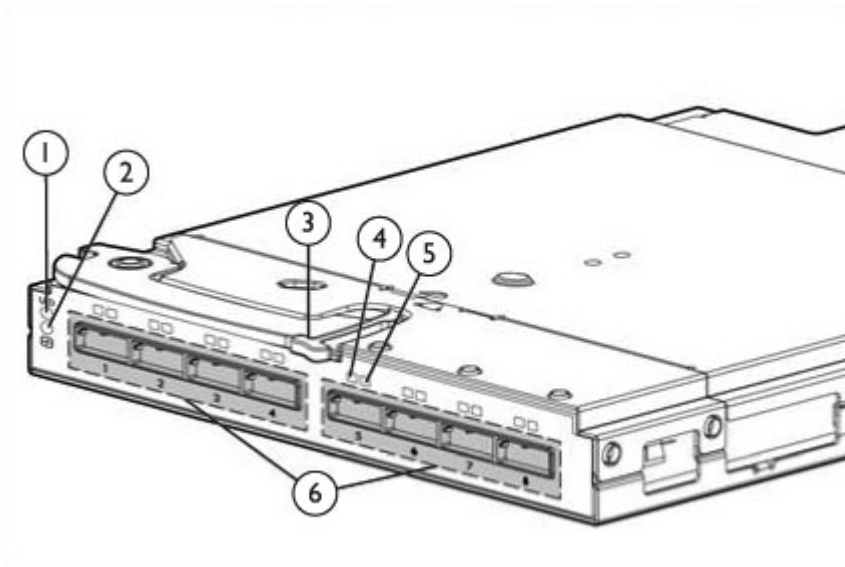
Overview

The HP 6Gb SAS BL Switch for HP BladeSystem c-Class enclosures is an integral part of HP direct connect SAS storage, enabling a shared SAS storage solution. The SAS architecture combines an HP Smart Array P711m, P712m (with cache module), P721m, or P731m in each server and 6Gb/s SAS BL switches connected to supported HP storage enclosures for SAS storage. The 6 Gb/s SAS BL Switch contains an embedded Virtual SAS Manager (VSM) GUI & CLI interface used to zone, monitor, and update SAS fabric devices.

The 6 Gb/s SAS BL Switch enables two external SAS storage solutions for BladeSystem servers:

- **Shared SAS:** The 6 Gb/s SAS BL Switch can be used to access shared SAS storage provided by the P2000 G3 SAS array system or the MSA2040 SAS storage. An HP Smart Array P711m, P712m (with cache module), P721m, or P731m controller installed in each server acts as a pass-through. The P2000 G3 SAS array system or the MSA2040 SAS storage creates a shared storage environment where more than one blade server can access a storage logical unit.
- **Zoned Direct Attached Storage:** Use the Virtual SAS Manager of the 6Gb SAS BL Switch to zone groups of drive bays in the MDS600 or D2000 (D2600/D2700) and assign them to individual blade server bays. An HP Smart Array P711m, /P721m or P731m controller installed in the server provides RAID functionality for the group of SAS and SATA drives that have been zoned to that server. The logical drives provided by the Smart Array controller will appear as local drives to that individual server. The logical drives as presented by the Smart Array controller will appear as local drives to that individual server. The controller offers load balancing and failover capabilities when dual-ported SAS drives are available, using two HP 6Gb SAS BL Switches cabled to Dual I/O Modules on the D2600/D2700 or D6000 JBODs.

For more information on 6Gb/s SAS storage solutions for HP BladeSystem, see: www.hp.com/go/directconnect.



1. Unit ID LED

- Solid Blue-Being identified.
- Blinking Blue-Firmware is being updated
- Off-Normal.

4. Link LED

- Solid green-A link between switch and storage enclosure is established.
- Blinking green-There is activity on the established link.
- Off-There is no link between the server and storage.

Overview

2. Health LED

- Solid Green-Healthy.
- Blinking Amber-There is a problem with the switch.
- Off-Not powered up.

3. Release button for the ejector handle

5. Fault LED

- Off-Normal.
- Solid Amber-There is a link error detected by the switch. Service either the Switch, SAS Cable, or attached Device.

6. Mini-SAS ports containing 4x 6G SAS links (attach to external storage enclosures)

What's New

- Support for MSA2040 SAS storage
- Support for HP Smart Array P731m controller

At A Glance

- Hot Pluggable 6Gb/s SAS Switch for HP BladeSystem
- Sixteen internal blade bay ports containing 2x 6Gb/s SAS links
- Eight external Mini-SAS ports containing 4x 6Gb/s SAS links
- Use Mini-SAS cables to connect to P2000 G3 SAS array system enclosures for shared SAS storage or MDS600 or D2000 enclosures for zoned direct attached SAS storage
- Dual Domain direct attached SAS architecture supported with MDS600 or D2000.
- Supported by c3000 and c7000 BladeSystem enclosures (see supported options list for specific SKUs)
- SAS fabric Topology View allows users to easily view their SAS fabric connectivity.
- View unzoned hard drive information (capacity, RPM, link rate, etc.) while creating zone groups.
- Advanced tape support - port splitting allows up to 4 tape devices to attach to a single SAS switch port.
- SAS switch web interface allows the capture and deployment of configuration scripts.
- Full SNMP support for SAS switch and attached storage enclosures.
- Detailed diagnostic information provided for MDS600 field issues

For detailed deployment information, see the HP direct connect external SAS storage for HP BladeSystem external SAS storage deployment guide for 6Gb at: <http://bizsupport1.austin.hp.com/bc/docs/support/SupportManual/c02775615/c02775615.pdf>

Models

6Gb/s SAS Switch

HP 6Gb SAS Switch Single Pack for HP BladeSystem c-Class

BK763A

HP 6Gb SAS Switch Dual Pack for HP BladeSystem c-Class

BK764A

Solutions Components

Configuration Rules:

6Gb/s SAS Switch:

- The SAS Switch is supported only in the HP c-Class Enclosures (c7000RoHS or later enclosures& c3000 enclosures)
- Support installation of the 6 Gb/s SAS BL Switch in up to 6 interconnect bays in the c7000 and up to 2 interconnect bays in the c3000.
- (2) SAS Switches are required in the same c-Class enclosure interconnect bay row for redundancy. Single switch configurations are supported as non-redundant.

Use the embedded Virtual SAS Manager GUI or CLI interface to zone switch ports to server bays. Supported Internet browser versions: Microsoft Internet Explorer 6.0/7.0, Mozilla Firefox 3.

Related Items

MSA2040 SAS	HP MSA 2040 SAS Dual Controller LFF Storage	C8S54
	HP MSA 2040 SAS Dual Controller SFF Storage	C8S55A
P2000 G3 SAS	HP P2000 G3 SAS MSA Dual Controller LFF Array System	AW593B
	HP P2000 G3 SAS MSA Dual Controller SFF Array System	AW594B
MDS600	HP MDS600 with Dual I/O Modules Disk System	AJ866A
	HP MDS600 Dual I/O Module Option Kit	AP763A
D6000	HP D6000 Dual I/O Module Disk Enclosure	QQ695A
D2000	HP D2600 Disk Enclosure	AJ940A
	HP D2700 Disk Enclosure	AJ941A

NOTE: For MDS600 6Gb host connectivity , P711m firmware 5.32 or higher, 6Gb BL SAS switch firmware 2.0.1.0 or higher and MDS600 firmware 3.44 are required.

NOTE: For D2600/D2700 support in Blade configuration, P711m firmware 5.32 or higher, 6Gb BL SAS switch firmware 2.0.1.0 or higher and D2600/D2700 firmware 1.34 or higher are required

Smart Array	HP Smart Array P712m/256 6Gb 2-ports Int/2-ports Ext Mezzanine SAS Controller	488348-B21
	HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller	513778-B21
	HP Smart Array P721m/2G FBWC 4-ports Ext Mezzanine SAS Controller	650072-B21
	HP Smart Array P721m/512 4-ports Ext Mezzanine SAS Controller	655636-B21
	HP Smart Array P731m/2G Controller	698535-B21
SAS cable	HP External Mini SAS 2m Cable	407339-B21
	2M Mini-SAS (SFF8088) to Mini-SAS (SFF8088) 4x SAS Cable	
	NOTE: Use this cable to connect HP P2000 G3 SAS, MDS600, D2000	
Tape Drives	Tape Autoloaders	
	HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader	BL536A
	HP 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
	HP 1/8 G2 Ultrium 920 SAS Autoloader	AH558A
	Tape Libraries	
	HP MSL2024 1 LTO-4 Ultrium 1760 SAS Tape Library	AK378A
	HP MSL2024 Ultrium 920 SAS Tape Library	AH559A
	HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library	BL537A
	HP MSL4048 2 LTO-4 Ultrium 1760 SAS Tape Library	AK380A
	HP MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library	BL538A

Solutions Components

HP MSL8096 2 LTO-4 Ultrium 1760 SAS Tape Library	AK382A
HP MSL8096 2 LTO-5 Ultrium 3000 SAS Tape Library	BL539A

NOTE: HP recommends a maximum of 2 tape drives per 6Gb/s SAS BL Switch and 64K transfer sizes. Attaching a library with 4 tape drives requires purchasing a second tape library SAS cable (AN975A or AN976A) and attaching 2 drives to the redundant 6Gb/s SAS BL Switch. Attaching more than 2 tape drives per switch and transfer sizes greater than 64K could result in a failed backup or restore. A future release of firmware on the tape library drives will allow more than 2 tape drives to be attached to a switch.

SAS cables for tape drives HP SAS Min-Min 1x-2M Cable Assembly Kit	AE470A
2M External Mini-SAS (SFF8088) to Mini-SAS (SFF8088) 1x SAS Cable	

NOTE: Use this cable to connect HP SAS external tape devices

HP SAS MIN-MIN 1X-4M Cable Assembly Kit	AE465A
4M External Mini-SAS (SFF8088) to Mini-SAS (SFF8088) 1x SAS Cable	

NOTE: Use this cable to connect HP SAS external tape devices

HP 2m External Mini-SAS to 4x1 Mini-SAS Cable	AN975A
2M External Mini-SAS (SFF8088) 1x to Mini-SAS (SFF8088) 4x fanout SAS Cable	

NOTE: Use this cable to connect HP MSL SAS Tape Libraries

HP 4m External Mini-SAS to 4x1 Mini-SAS Cable	AN976A
4M External Mini-SAS (SFF8088) 1x to Mini-SAS (SFF8088) 4x fanout SAS Cable	

NOTE: Use this cable to connect HP MSL SAS Tape Libraries

For more information on tape products, see: www.hp.com/go/tape

c-Class BladeSystem Enclosures	
HP BLc7000 Configure-to-order 3 In LCD ROHS Enclosure	507019-B21
HP BLc7000 Enclosure with 1 Phase 2 Power Supply 4 Fan ROHS ICE License	507014-B21
HP BLc7000 Enclosure with 1 Phase 6 Power Supply 10 Fan FI ROHS ICE License	507015-B21
HP BLc7000 Enclosure with 3 Phase 6 Power Supply 10 Fan INTL ROHS ICE License	507016-B21
HP BLc7000 Enclosure with 3 Phase 6 Power Supply 10 Fan ENG ROHS ICE License	507017-B21
HP BLc7000 Platinum Enclosure with 1 Phase 6 Power Supplies 10 Fans ROHS 16 Insight Control Licenses	681842-B21
HP BLc7000 Platinum Enclosure w/ 1 Phase 2 Power Supplies 4 Fans ROHS Trial Insight Control License	681840-B21
HP BLc3000 Platinum Enclosure with 4 AC Power Supplies 6 Fans ROHS 8 Insight Control Licenses	696908-B21
HP BLc3000 Platinum Enclosure with 4 AC Power Supplies 6 Fans ROHS Trial Insight Control License	696909-B21
HP BLc3000 Enclosure with 4 AC Power Supplies 6 Fan Full ICE License	508664-B21
HP BLc3000 Enclosure with 4 AC Power Supplies 6 Fan Trial ICE License	508665-B21
HP BLc3000 Enclosure with 2 AC Power Supplies 4 Fan Trial ICE License	536841-B21

Solutions Components

Warranty

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

NOTE: Server Blade Interconnect Limited Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

HP services provide total care and support expertise with committed response designed to meet your IT and business needs.

Service and Support and Warranty Information

HP Care Pack Services

Scalable, Flexible, Dependable. Like your storage.

Your storage is evolving. Get scalable support that evolves with it. HP Care Pack Services is an easy-to-buy, easy-to-use portfolio of packaged services covering your lifecycle needs. You can rely on our highly skilled, HP certified professionals to offer a breadth of expertise across leading storage technologies, and work side by side with you for optimal results. Push services beyond expectations and choose support that meets the changing needs of your business with the same reliability, scalability and flexibility you demand of your storage.

Protect your business beyond the warranty

Standard warranty protects against product defects and some causes of downtime. HP Care Pack Services helps you proactively guard against unplanned downtime which can reduce your productivity and profitability. By using a standard approach to warranty uplifts, such as HP Care Pack Services, customers can be more sure of consistency of operations for both mission-critical and standard business computing.

Extending warranties with HP Care Pack Services

The key to normalizing the warranty of combined solutions-is making service uplift simple: HP Care Pack Services. This portfolio of predefined packages, extending across the entire IT lifecycle, offering consulting, education, technical support, optimization, risk assessment, and more. It's entirely flexible allowing customers to extend the cover to the precise level of support required. Customer's standard hardware warranty, for example, can be upgraded to next-business-day response, to same-day coverage, or even to a committed six-hour call-to-repair service available 24 hours every day of the week.

- Provide consistent, predictable levels of support across your entire department or business
- Give you direct access to proven technical and problem-solving expertise
- Offer a choice of response-time and repair-time commitments
- Are available whenever and wherever you do business

For many products, post-warranty HP Care Pack Services are available when your original warranty has expired. Choose the support levels that meet your business requirements, from basic to mission-critical.

<http://www.hp.com/services/storage>

NOTE: Care Pack Services availability may vary by product and country.

Service and Support and Warranty Information

Recommended Services **HP Care Pack Services recommended for optimal satisfaction of all deployments of your product.**
3-Year HP Support Plus 24 24x7x365 hardware and software services - plus cost-saving software updates and more

HP Support Plus 24 helps you increase performance and availability with comprehensive, consistent hardware and software services. Working with your IT team, HP Services engineers deliver onsite hardware support and over-the-phone software support around-the-clock 365 days per year. Service coverage encompasses HP products and selected multivendor hardware and software.

In addition, this convenient HP Care Pack packaged service makes software updates available to you at substantial savings.

Choose Support Plus 24 when you need to:

Improve uptime with responsive hardware and software services available anytime

Cost-effectively obtain expert 24x7 multivendor hardware and software support

Enjoy consistent service coverage across geographically dispersed sites

Update HP and selected third-party software at a predictable cost

Take advantage of subscription savings on software updates

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure (OS + ICE)

HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure (OS + ICE)

Product Number	Product Name	Service Name	Care Pack Services Product # and Band	Alternate Care Pack Services Product #
BK763A	HP 6Gb/s SAS BL Switch (CTO Only)	3-Year HP Support Plus 24	HA110A3-9LZ	-
-	-	HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure	HA114A1-5N9	UF817E
BK764A	HP 6Gb/s SAS BL Switch - Dual Pack	3-Year HP Support Plus 24	HA110A3-4CS	-
-	-	HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure	HA114A1-5N9	UF817E

Service and Support and Warranty Information

Related Services

Services that will enhance the user experience in many product deployments.

HP SAN Solution Service Get your SAN implementation right - right from the start.

Storage has become essential to the growth and agility of your business. That's why choosing an HP SAN as your data management solution is a smart business decision. But your SAN can deliver the results you need only if it is implemented correctly and integrated with your business.

SAN installation, startup, and integration call for specialized expertise in planning and design, hardware configuration, network software installation, and operability verification. Your SAN needs to be configured for high performance and availability. And it needs to be integrated with your applications, management environment, and business processes.

HP Data Migration Service Minimize the risks involved in transferring data to your HP Storage SAN.

You need to move your critical enterprise data to your new HP Storage SAN platform. And you need to accomplish that without losing data. And without interrupting your ongoing business operations.

HP Data Migration Service helps you lessen the risk of data loss, minimize threats to data integrity, and avoid productivity-sapping performance slowdowns during data transport. A highly experienced HP Services storage specialist works with you to rapidly and securely migrate mission-critical business information across your data center or around the globe - regardless of the complexity of your environment.

HP Proactive BladeSystem Service HP Proactive BladeSystem Service helps you improve the ongoing management and utilization of your HP blade technology and tools in order to provide the reliability and the cost-effective performance your business expects. It covers HP blade servers, storage, network and SAN devices, as well as the HP blade management software suite included in the HP blade enclosure. This proactive service leverages HP's global delivery organization with its experienced technical experts who help IT organizations manage and maintain their IT infrastructures to be more cost-effective and change-ready.

Product Number	Product Name	Service Name	Care Pack Services Product # and Band	Alternate Care Pack Services Product #
-	-	HP SAN Solution Service	Contact your HP sales rep or Channel Partner for assistance	Contact your HP sales rep or Channel Partner for assistance
-	-	HP Data Migration Service	Contact your HP sales rep or Channel Partner for assistance	Contact your HP sales rep or Channel Partner for assistance
-	-	HP Proactive BladeSystem Service	HE805A1	Contact your HP sales rep or Channel Partner for assistance

Service and Support and Warranty Information

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: <http://www.hp.com/support>

Remote Support Technology (RST)-HP Remote Support Pack

Taking a more proactive approach to IT support, the HP Remote Support pack plug-in module easily integrates with HP Systems Insight Manager to provide a powerful, unified "single pane of glass" solution for onsite and remote management.

HP Remote Support Pack enhances HP Systems Insight Manager with intelligent event diagnosis plus the automatic submission of hardware event notifications securely to HP support, including acknowledgment and status returns. It adds remote configuration collections to allow the delivery of assessment and proactive services for your SAN storage and HP-UX environments.

Customer Technical Training

Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online. <http://www.hp.com/learn/storage>

HP Services Awards

HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit: <http://h20129.www2.hp.com/services/cache/77318-0-0-225-121.html>.

Additional Services Information

For more information about HP Care Pack Services for Storage, please visit: <http://www.hp.com/hps/storage>

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

Technical Specifications

General Specifications	Communications Processor	SSH, Telnet, HTTP, RS232 using OA CLI and SNMP	
	Data path	6Gb/s SAS x2 to Server Blade 6Gb/s SAS x4 to external storage enclosures	
	Dimensions (L xW)	Single-wide 1.1" tall, 7.584" wide, and 10.548" deep	
	Weight	5.2 lbs	
Power and Environmental Specifications	Operating	Temperature	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305m (1.8°F per every 1000ft) above sea level to a maximum of 3050m (10,000ft), no direct sustained sunlight. Maximum rate of change is 10°C/Hr (18°F/Hr). The upper limit may be limited by the type and number of options installed.
		Humidity (non-condensing)	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Power requirement	40Watts (Max), 3Watts (Min)	
	Emissions Classifications		

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.