

Overview

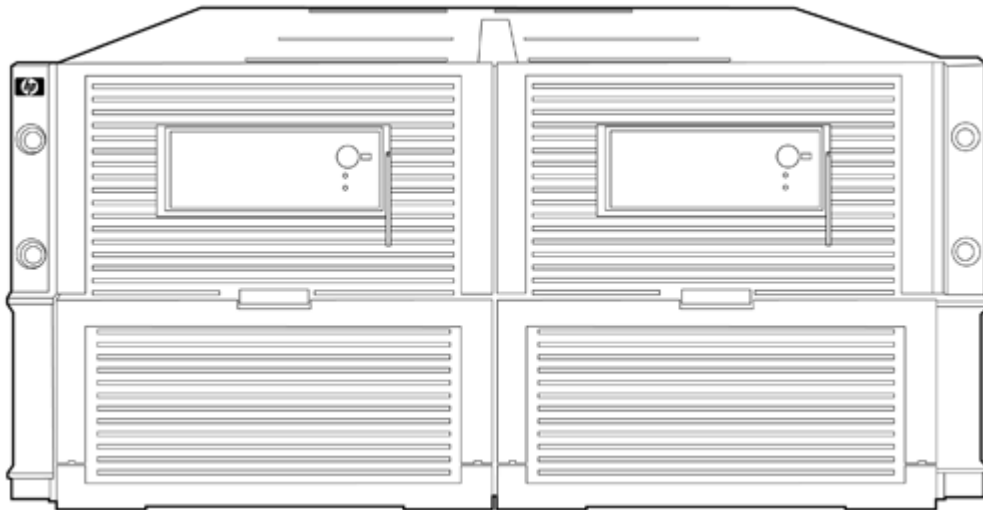
Finding it difficult to keep up with the growth in unstructured data? Looking for a cost-effective high capacity storage option?

With the HP 600 Modular Disk System, HP extends and redefines direct-attached storage for BladeSystem servers, combining the simplicity and cost effectiveness of direct-attached storage without sacrificing flexibility or performance.

Use the MDS600 as part of a straight-forward in-rack 3 Gb/s SAS implementation that delivers high-density, low-cost external zoned direct attach storage for HP BladeSystem servers. Easily configure storage on the fly with easy to use management software.

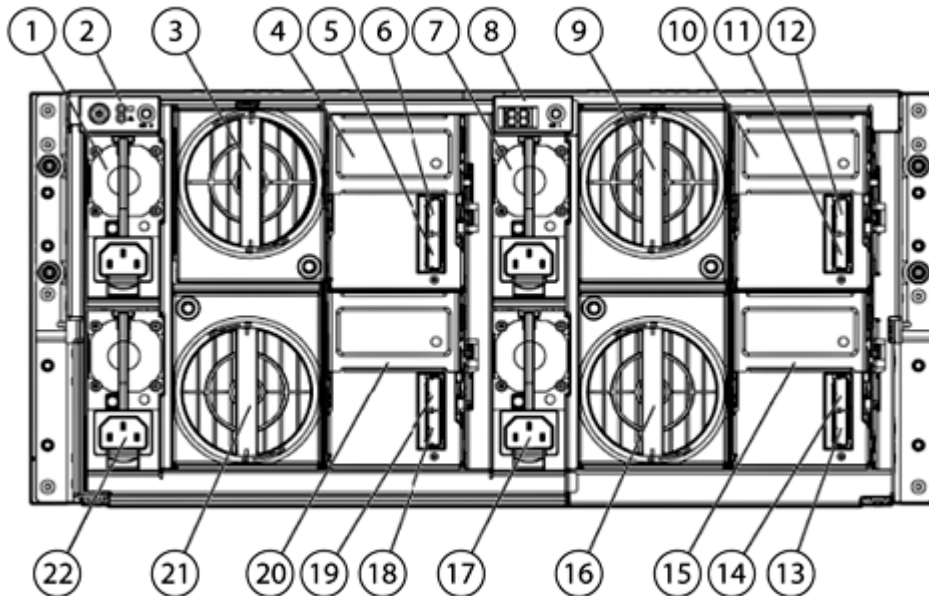
The MDS600 can also be directly connected to ProLiant DL and ML servers using the Smart Array P212, P411, P812 and P822 Controller using a standard 2M SAS cable; Single Domain only. Up to six MDS600 storage devices can be supported off a single BladeSystem enclosure for up to 1680 TB of capacity. End-to-end 3 Gb/s SAS connectivity enables a high performance storage solution using an HP Smart Array P700m controller, 3Gb SAS BL switches, and the MDS600. Connection to 6Gb SAS infrastructure products enables higher performance, eases configuration/deployment and broadens supported features of an MDS600 using HP Smart Array P711m or P721m controller and 6Gb SAS BL switches.

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



HP 600 Modular Disk System

Overview



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|----------------------------------|-------------------------------------|-------------------------------------|
| 1. Power supply 1 | 9. Fan module 1 (Drawer 1) | 17. Power supply 4 |
| 2. Power On/UID 2 status panel | 10. Primary I/O module (Drawer 1) | 18. SAS 1 connector |
| 3. Fan module 1 (Drawer 2) | 11. SAS 1 connector | 19. SAS 2 connector |
| 4. Primary I/O module (Drawer 2) | 12. SAS 2 connector | 20. Secondary I/O module (Drawer 2) |
| 5. SAS 1 connector | 13. SAS 1 connector | 21. Fan module 2 (Drawer 2) |
| 6. SAS 2 connector | 14. SAS 2 connector | 22. Power supply 2 |
| 7. Power supply 3 | 15. Secondary I/O module (Drawer 1) | |
| 8. UID 1 status pane | 16. Fan module 2 (Drawer 1) | |

What's New

- Support for 4TB SAS Hot Plug LFF MDL drives
- Support for HP Smart Array P721m Controller
- **NOTE:** P721m+MDS600 support requires MDS600 firmware 3.60 or higher , P721m firmware 3.42 or higher and 6Gb/s BL SAS switch firmware 3.1.3.0 or higher.
- **NOTE:** The solution requires c7000 ROHS enclosure and P721m/2G Smart Array Controller (650072-B21) for functionality.
- **NOTE :** The solution will support only SAS HDDs.

Overview

At A Glance

- 5U rackmount form factor
- Supports seventy (70) 3.5" LFF Universal hot pluggable SAS or SATA drives
- Two pull-out drive drawers support hot plug large form factor dual-ported SAS or SATA drives in just 5U of rack space (35 hot plug drives per drawer)
- 3 Gb/s SAS connectivity using HP Storage 3Gb SAS BL switches in the interconnect bays, and HP Smart Array P700m Controllers in each BladeSystem server
- Connection to 6Gb SAS infrastructure products i.e. 6Gb SAS BL switches in the interconnect bays, and HP Smart Array P711m or HP Smart Array P721m controller in each BladeSystem server
- Using the Virtual SAS Manager (VSM) in the HP SAS BL switch, assign or 'zone' MDS600 drive bays directly to BladeSystem server bay
- Two dual-port I/O module system recommended for SATA customers in single domain environments
- Additional option kit with two dual port I/O modules is added for SAS drives, creating a dual domain environment. A single BladeSystem enclosure supports up to six MDS600's externally. 3-0-0 warranty

Deployment Guide

For detailed deployment information, see the HP direct connect external SAS storage for HP BladeSystem deployment guide. Select Manuals under Resources for HP 600 Modular Disk System:

[HP BladeSystems external SAS storage deployment guide for 3Gb](#)

[HP BladeSystems external SAS storage deployment guide for 6Gb](#)

Models

HP 600 Modular Disk System	<p>HP MDS600 with two Dual Port I/O Module System AJ866A</p> <p>NOTE: Base model for SAS and SATA drives. Add AP763A when using dual ported SAS drives to create a dual domain environment for BladeSystems only.</p> <p>NOTE: Includes redundant hot plug power supplies and redundant hot plug fans.</p> <p>NOTE: Includes two right angle and two left angle power cords.</p>
	<p>HP MDS600 Dual I/O Module Option Kit AP763A</p> <p>NOTE: Add AP763A option kit to AJ866A when using dual-ported SAS drives to create a dual domain environment for BladeSystems only.</p> <p>NOTE: Configuring the MDS600 with four I/O modules and dual port SAS hard drives creates a dual domain environment for data path redundancy. Configurations using single port SATA hard drives and only two dual port I/O modules will not have data path redundancy, and a warning message will occur stating that the storage shelf is not redundant.</p> <p>NOTE: This option kit is not needed when connecting directly to ProLiant DL, ML and SL servers as only single domain is supported.</p>
	<p>HP MDS600 w/35 3TB 6G SAS 105TB Bundle QW930A</p> <p>NOTE: Includes MDS600 with (35) 3TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans</p> <p>NOTE: For ProLiant BladeSystems Only</p>
	<p>HP MDS600 w/70 3TB 6G SAS 210TB Bundle QW931A</p> <p>NOTE: Includes MDS600 with (70) 3TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans</p> <p>NOTE: For ProLiant BladeSystems Only</p>
	<p>HP MDS600 w/70 3TB 3G SATA 210TB Bundle QW935A</p> <p>NOTE: Includes MDS600 with (70) 3TB LFF Midline SATA drives, (2) dual port I/O modules, redundant power supplies and redundant fans</p>
	<p>HP MDS600 w/35 2TB 6G SAS 70TB Bundle BK823A</p> <p>NOTE: Includes MDS600 with (35) 2TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.</p> <p>NOTE: For ProLiant BladeSystems Only</p>
	<p>HP MDS600 w/70 2TB 6G SAS 140TB Bundle BK824A</p> <p>NOTE: Includes MDS600 with (70) 2TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.</p> <p>NOTE: For ProLiant BladeSystems Only</p>
	<p>HP MDS600 with (35) 1TB LFF SATA Hard Disk Drive Bundle AP764A</p> <p>NOTE: Includes thirty-five 1TB LFF SATA drives, two dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans.</p>
	<p>HP MDS600 with (70) 1TB LFF SATA Hard Disk Drive Bundle AX668A</p> <p>NOTE: Includes seventy 1TB LFF SATA drives, two dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans.</p>
	<p>HP MDS600 with (70) 600GB LFF SAS Hard Disk Drive Bundle BK820A</p> <p>NOTE: Includes seventy 600GB LFF SAS drives, four dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans.</p> <p>NOTE: For HP c-Class Blade System Only</p>
	<p>HP 2 Stick 4X C-13 Offset Fixed Bar Extension Kit AF502B</p> <p>NOTE: This power cord option kit connects four MDS600 power supplies to a single</p>

Models

power plug, reducing the number of PDUs needed in a rack. Can be used in several configurations, including all four power supplies on a single MDS600 or with two power supplies on each of two adjacent MDS600. This power cord has a C-20 connector for the PDU attach and four C-13 connectors for attach to the MDS600 power supplies.

Related Items

HP 3Gb SAS BL Switch	HP 3Gb SAS BL Switch - Single Pack	AJ864A
	HP 3Gb SAS BL Switch - Dual Pack	AJ865A
HP 6Gb SAS BL Switch	HP 6Gb/s SAS BL Switch - Single Pack	BK763A
	HP 6Gb/s SAS BL Switch - Dual Pack	BK764A
P700m Smart Array Controller	HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller	508226-B21
	NOTE: P700m Smart Array Controller/512 recommended for optimum performance with the MDS600 in 3Gb solutions.	
	HP Smart Array P-Series Low Profile Battery	452348-B21
P711m Smart Array Controller	HP Smart Array P700m/256 4-ports Ext PCIe x8 SAS Controller	507925-B21
	NOTE: Does not support RAID 5 or 6. Does not support battery-backup.	
	HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller	513778-B21
HP Smart Array P212 Controller	HP Smart Array P212/256MB Controller	462834-B21
	For more information on the P212, see: www.hp.com/products/smartarray	
HP Smart Array P411 Controller	HP Smart Array P411/256MB Controller	462830-B21
	HP Smart Array P411/512MB Battery Backed Write Cache	462832-B21
	HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
	HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21
	For more information on the P411, see: www.hp.com/products/smartarray	
HP Smart Array P812 Controller	HP Smart Array P812/1G Flash Backed Cache Controller	487204-B21
	For more information on the P812, see: www.hp.com/products/smartarray	
HP Smart Array P822 Controller	HP Smart Array P822/2GB FBWC 2-ports Int/4-ports Ext SAS Controller	615418-B21
HP Smart Array P721m Controller	HP Smart Array P721m/2G FBWC 4-ports Ext Mezzanine SAS Controller	650072-B21
SAS cable	mini-SAS 4x 2M Cable AI	407339-B21

Compatibility

HP ProLiant Servers

HP ProLiant BL280c G6
HP ProLiant BL460c G7
HP ProLiant BL465c G7
HP ProLiant BL490c G7
HP ProLiant BL620c G7
HP ProLiant BL680c G5
HP ProLiant BL680c G7
HP ProLiant BL685c G7
HP ProLiant BL420c Gen8
HP ProLiant BL460c Gen8
HP ProLiant BL465c Gen8
HP ProLiant BL660c Gen8
HP ProLiant DL980 G7 Server
HP ProLiant DL785 G6 Server
HP ProLiant DL585 G7 Server
HP ProLiant DL580 G7 Server
HP ProLiant DL385 G7 Server
HP ProLiant DL380 G6 Server
HP ProLiant DL380 G7 Server
HP ProLiant DL370 G6Server
HP ProLiant DL360 G7 Server
HP ProLiant DL320 G6 Server
HP ProLiant DL180 G6 Server
HP ProLiant DL165 G7 Server
HP ProLiant DL160 G6 Server
HP ProLiant ML370 G6 Server
HP ProLiant ML350 G6 Server
HP ProLiant ML330 G6 Server
HP ProLiant ML310 G5 Server
HP ProLiant ML150 G6 Server
HP ProLiant SL170z G6 Server
HP ProLiant SL160z G6 Server
HP ProLiant DL360e Gen8 Server
HP ProLiant DL360p Gen8 Server
HP ProLiant DL380e Gen8 Server
HP ProLiant DL380p Gen8 Server
HP ProLiant DL385p Gen8 Server
HP ProLiant DL560 Gen8 Server
HP ProLiant DL585 Gen8 Server

NOTE: For MDS600 support with BL620c/680c G7, HP 3Gb SAS switch firmware version 2.2.15.0 or higher is required

NOTE: Some servers listed above may be discontinued.

HP Integrity Servers

HP Integrity BL860c
HP Integrity BL860c i2
HP Integrity BL870c
HP Integrity BL870c i2
HP Integrity BL890c i2

NOTE: HP Integrity BL860c supports 508226-B21 only. Use 452348-B21 Battery Option

Compatibility

Kit. HP Integrity BL870c supports 508226-B21 only. Use 383280-B21 Battery Option Kit.

Supported OS

x86

Windows 2003
Windows 2008
Windows 2012
VMware ESX 4.0
VMware ESX 4.1
VMware ESX 5.0
VMware ESX 5.1
RHEL5
RHEL6
SLES10
SLES 11
Solaris 10 (for BL 3Gb SAS host connectivity only)

Features and Benefits

Key Features

High density, low cost SAS storage for BladeSystem servers

- 70 LFF Universal SAS or SATA drives in 5U
- Two pull-out drive drawers support hot plug large form factor dual-ported SAS or SATA drives in just 5U of rack space
- Each pull-out drive drawer is supported by a redundant set of hot plug power supplies and redundant hot plug fans.
- Straight forward SAS architecture provides zoned direct attach storage for BladeSystem servers; just a Smart Array P700m, P711m, or P721m controller in the blade server, a dual or single 3Gb or 6Gb SAS BL switches in the chassis connected to an MDS600.

Build BladeSystem server storage on the fly

- MDS600 drive bays are assigned or 'zoned' to individual blade bays using SAS 2.0 zoning capabilities. Use the Virtual SAS Manager (VSM) in the 3Gb or 6Gb SAS BL switch to dynamically assign up to 100 drives to specific BladeSystem servers, without complex configuration or re-cabling. Drives zoned to each server appear as local storage to that server. This allows complete flexibility to reconfigure quickly and easily without moving cables
- With zoned direct attached storage capabilities; server administrators can build local storage on the fly according to their configuration requirements.
- Quickly deploy and expand capacity by configuring additional drive bays to a P700m, P711m, or P721m Smart Array Controller without moving a single cable.

High performance 6 Gb/s SAS connectivity to external storage

- To enhance performance even further, the Smart Array P711m controller installed in the blade server provides 1 GB Flash -backed write cache (FBWC) and the Smart Array P721m controller installed in the blade server provides 2GB Flash -backed write cache (FBWC).
- Supports higher performance between the 6G SAS Switch and MDS600 by attaching 2 SAS cables from any quad of 6G SAS Switch ports to the 2 ports on the MDS600 IO module to create an 8x wide SAS port.
- High Performance Smart Array P212 256MB BBWC, P411 256MB\512MB BBWC, P812 1GB FBWC and P822 2GB FBWC available for ProLiant DL, ML, and SL servers.

Directly connect to ProLiant DL, ML, and SL servers

- Directly connect the Smart Array P212, P411, P812 or P822 Controller to SAS Connector 1 on the MDS600 Primary IO module(s) using a 2m SAS cables (8x wide SAS is not supported).
- Connect one or two ProLiant servers to the MDS600 drawers using one or two Smart Array P212, P411, and/or P812/P822 controllers. NOTE: Maximum configuration with the P812 and MDS600 is 2 Drawers and 70 drives. And the maximum configuration with the P822 and MDS600 is 4 MDS600 drawers.
- No Zoning. The Smart Array controller sees all 35 drive bays in the MDS600 drive drawer.
- The Smart Array P812 with firmware 3.50 or greater supports MDS600 with firmware 2.66 or greater. P812 firmware 3.50 or greater has the ability to update the MDS600 firmware with a minimum version of 2.60 to the latest version.
- P822 with MDS600 support requires MDS600 firmware at 3.60 and P822 firmware at 3.04 or greater.
- P212, P411, P812 and P822 only supports single domain with the MDS600.
- MDS600 does not support cascading SAS IO modules.

HP reliability

- " Familiar Smart Array technology of the Smart Array Controllers enables support for RAID levels 0, 1, 1+0, 5, RAID 6, RAID 50 (requires P711m or P721m) & RAID 60 (requires 711m or P721m).
 - RAID 50: Protects against failure of one drive (and failure of particular multiple drives). RAID 50 is a nested RAID method that uses RAID 0 striping across RAID 5 arrays. RAID 50 tolerates one drive failure in each spanned array without loss of data. RAID 50 requires less rebuild

Features and Benefits

- time than single RAID 5 arrays RAID 50 requires a minimum of six drives. Requires P711m or P721m.
- RAID 60: Allows administrators to split the RAID 6 storage across multiple external boxes. RAID 60 requires a minimum of eight drives. RAID 60 is a nested RAID method that uses RAID 0 block-level striping across multiple RAID 6 arrays with dual distributed parity. With the inclusion of dual parity, RAID 60 will tolerate the failure of two disks in each spanned array without loss of data. Requires P711m or P721m.
- Advanced Data Guarding (RAID 6):. It allocates two sets of parity data across drives and allows simultaneous write operations. This level of fault tolerance can withstand two simultaneous drive failures without downtime or data loss.
- Distributed Data Guarding (RAID 5): This allocates parity data across multiple drives and allows simultaneous write operations. It is recommended for up to 14 hard drives.
- Receive pre-failure alerts with HP SIM. When drives installed in an MDS600 are used in conjunction with the Smart Array Controller and Systems Insight Manager, the Smart Array firmware in HP hard drives enables extensive fault prediction capabilities. If potential problems develop in one of the drives, the Smart Array Controller, Systems Insight Manager and/or Smart hard disk drive will send a pre-failure alert so you can have the drive replaced, before it fails, under warranty.

Family Information

Product Technology	SAS	3Gb/s SAS
	Modular Chassis	5U, 70 Large Form Factor Universal SAS or SATA drive bays
	Drives available	Serial Attached SCSI (SAS) enterprise-class drives designed for high volume 24x7 usage. Serial-ATA (SATA) are usually reserved for archival of data as they are both relatively inexpensive and are available in very large capacities. The MDS600 can accommodate both SAS and SATA drives within the same enclosure. SAS drive performance can be approximately 30% greater than SATA performance on sequential host IO. SAS performance excels in sequential lower latency response time and random IO per second transaction performance due to higher rpm disk speeds yielding lower seek times.
	Scalability	Up to 70 SAS or SATA 3.5" hot plug hard drives per MDS600 A single BladeSystem enclosure supports up to six MDS600's externally.
	RAID	RAID is provided by the Smart Array P721m, P711m, P700m, P212, P411, P812 or P822 Controller.
	Power supplies	Includes four redundant 1200W 12V hot plug power supplies.
	Fans	<ul style="list-style-type: none">• Includes four redundant hot plug fans.
	Configuration and Management Tools	SAS BL switch for use with BladeSystem servers: Use the Virtual SAS Manager (VSM) to dynamically assign drive bays in the MDS600 to each BladeSystem server bay, without complex configuration or re-cabling. This allows complete flexibility to reconfigure quickly and easily without moving cables. Smart Array Controller: Array Configuration Utility (ACU) provides configuration and management of hard drives, and supports online array capacity expansion, logical drive extension, assignment of online spares and RAID or stripe size migration.
	Management/Health Utilities	Active hardware management using HP SIM: Manage the array with the highly refined HP Systems Insight Manager. Smart Components are available to easily update firmware. A convenient Integrated Management Log records hundreds of events and stores them in an easy-to-view format.

Service and Support, HP Care Pack and Warranty Information

Warranty

3-0-0 warranty

Three-year parts exchange, next business day delivery

NOTE: The warranties of the hard drive options purchased for the MDS600 are different for SAS hard drives versus SATA hard drives. SAS hard drive options have a three year warranty and SATA hard drives options have a one year warranty.

Warranty Upgrade Options

- Response - Upgrade on-site response from next business day to same day 4-hour response or 6 Hour Call To Repair
- Coverage - Extend hours of coverage from next business day to 9 hours x 5 days to 24 hours x 7 days
- Duration Select duration of coverage for a period of 1, 3, 4 or 5 years

Service and Support

Technology Services for increased uptime, productivity and ROI

TRUST HP storage technology experts for every level of service and support. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HP Storage Systems' capabilities requires a service partner who understands your increasingly complex environment. Team with the people who know HP infrastructure hardware and software best—the experienced professionals at HP Services.

Protect your business beyond warranty

Warranty protects against manufacturer defects, however warranty uplifts, such as HP Care Pack Services protect the business—by reducing downtime risks and providing operational consistency for mission-critical and standard business computing.

What HP Storage Technology Services can do for you

HP Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HP storage lifecycle support services offers a full spectrum of customer care—from technology support to complex migrations to complete managed services.

Choose the right level of support, deployment and integration services

HP support recommendations are designed to help you enhance technology operations and lower risk—and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs—Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network—plus, a full set of infrastructure services designed to power a Converged Infrastructure.

Optimized Care - delivers best performance and stability through deployment and proactive management

HP Proactive Care 24x7 - for a higher return on your storage investment, Proactive Care delivers hardware and software support services designed specifically for your technology; rapid access to Advanced Solution Center Specialists plus, Firmware/Software management and best practice advice. Customers can optimize the return on their IT investment and realize the advantage of running their business critical applications on virtualized/x86 infrastructure.

Plus, 10 credits per year, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Basic Care—Minimum recommended support

3-Year Support Plus 24 - For a higher return on your server and storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-

Service and Support, HP Care Pack and Warranty Information

the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure. Plus, 10 credits per year, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Implementation

HP Installation Service - For smooth startup and better business outcomes, HP Installation Service provides initial installation of your product into your technology environment (system configuration is not included). In today's new era of business technology- customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

Remote Support Tools

HP Insight Remote Support - Count on proven technology to deliver secure, reliable 24x7 remote monitoring, diagnosis, and problem resolution, all available at no extra charge if you have an existing warranty, service agreement, or HP Care Pack Service with HP.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4676ENW.pdf>

Additional service to meet your needs

HP Enhanced Implementation Service for SANs (EISS) SANs - HP delivers complete design and implementation services for Fibre Channel, FCOE, FCIP, SAS, and iSCSI SAN connectivity components.

Standard Care - maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support

HP Proactive Care 24x7 - for a higher return on your storage investment, Proactive Care delivers hardware and software support services designed specifically for your technology; rapid access to Advanced Solution Center Specialists plus, Firmware/Software management and best practice advice. Customers can optimize the return on their IT investment and realize the advantage of running their business critical applications on virtualized/x86 infrastructure. Plus, 10 credits per year, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Basic Care - Minimum recommended support

3-Year Support Plus 24 - For a higher return on your server and storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure. **Plus, 10 credits per year**, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Implementation

HP Installation Service - For smooth startup and better business outcomes, HP Installation Service provides initial installation of your product into your technology environment (system configuration is not included). In today's new era of business technology- customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

Remote Support Tools

HP Insight Remote Support - Count on proven technology to deliver secure, reliable 24x7 remote monitoring, diagnosis, and problem resolution, all available at no extra charge if you have an existing warranty, service agreement, or HP Care Pack Service with HP.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4676ENW.pdf>

Additional service to meet your needs

HP Enhanced Implementation Service for SANs (EISS) SANs - HP delivers complete design and implementation services for Fibre Channel, FCOE, FCIP, SAS, and iSCSI SAN connectivity components.

Service and Support, HP Care Pack and Warranty Information

For more information

www.hp.com/services/storage

To learn more on HP Storage Services, please contact your HP sales representative or HP Authorized Channel Partner

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.'
- Customers purchasing from a commercial reseller can find HP Care Pack Services at www.hp.com/go/lookuptool

Configuration Information

Step 1 - MDS600 - Choose SAS or SATA configurations

Select one:

Model Name	Model Description:	Part Number
MDS600	<p>HP MDS600 with two Dual Port I/O Module System</p> <p>NOTE: Base model for SAS and SATA drives. Add AP763A when using dual-ported SAS drives to create a dual domain environment.</p> <p>NOTE: Includes four hot plug power supplies for n+2 redundancy and four hot plug fans for n+1 redundancy.</p> <p>NOTE: Includes two right angle and two left angle power cords.</p>	AJ866A
	<p>HP MDS600 Dual I/O Module Option Kit</p> <p>NOTE: Add AP763A option kit to AJ866A when using dual-ported SAS drives to create a dual domain environment.</p> <p>NOTE: This option kit is not need when connecting directly to ProLiant DL, ML and SL servers as only single domain is supported.</p>	AP763A
	<p>HP MDS600 w/35 3TB 6G SAS 105TB Bundle</p> <p>NOTE: Includes MDS600 with (35) 3TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans</p> <p>NOTE: For ProLiant BladeSystems Only</p>	QW930A
	<p>HP MDS600 w/70 3TB 6G SAS 210TB Bundle</p> <p>NOTE: Includes MDS600 with (70) 3TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans</p> <p>NOTE: For ProLiant BladeSystems Only</p>	QW931A
	<p>HP MDS600 w/70 3TB 3G SATA 210TB Bundle</p> <p>NOTE: Includes MDS600 with (70) 3TB LFF Midline SATA drives, (2) dual port I/O modules, redundant power supplies and redundant fans</p>	QW935A
	<p>HP MDS600 w/35 2TB Midline SAS drives 70TB Bundle</p> <p>NOTE: Includes MDS600 with (35) 2TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.</p> <p>NOTE: For HP c-Class Blade Systems only.</p>	BK823A
	<p>HP MDS600 w/70 2TB Midline SAS drives 140TB Bundle</p> <p>NOTE: Includes MDS600 with (70) 2TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.</p> <p>NOTE: For HP c-Class Blade Systems only.</p>	BK824A
	<p>HP MDS600 w/35 1TB LFF SATA Hard Disk Drive Bundle</p> <p>NOTE: Includes thirty-five 1TB LFF SATA drives, two dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans.</p>	AP764A

Configuration Information

HP MDS600 w/35 450GB LFF SAS Hard Disk Drive Bundle NOTE: Includes thirty-five 450GB LFF SAS drives, four dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans. NOTE: For HP c-Class Blade System Only	AP765A
HP MDS600 w/35 300GB LFF SAS Hard Disk Drive Bundle NOTE: Includes thirty-five 300GB LFF SAS drives, four dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans. NOTE: For HP c-Class Blade System Only	AX670A
HP MDS600 w/70 1TB LFF SATA Hard Disk Drive Bundle NOTE: Includes seventy 1TB LFF SATA drives, two dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans.	AX668A
HP MDS600 w/70 450GB LFF SAS Hard Disk Drive Bundle NOTE: Includes seventy 450GB LFF SAS drives, four dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans. NOTE: For HP c-Class Blade System Only.	AX669A
HP MDS600 w/70 300GB LFF SAS Hard Disk Drive Bundle NOTE: Includes seventy 300GB LFF SAS drives, four dual port I/O modules, redundant hot plug power supplies and redundant hot plug fans. NOTE: For HP c-Class Blade System Only	AX671A

Step 2 - Choose Supported Options

	Part Number
HP Smart Array P700m controller	HP Smart Array P700m/512 4-ports Ext PCIe x8 SAS Controller 508226-B21 HP Smart Array P-Series Low Profile Battery 452348-B21
HP Smart Array P711m controller	HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller 513778-B21
HP Smart Array P721m controller	HP Smart Array P721m/2G FBWC 4-ports Ext Mezzanine SAS Controller 650072-B21
HP 3Gb SAS BL Switch	HP 3Gb SAS BL Switch - Single Pack AJ864A HP 3Gb SAS BL Switch - Dual Pack AJ865A
HP 6Gb SAS BL Switch	HP 6Gb SAS BL Switch - Single Pack BK763A HP 6Gb SAS BL Switch - Dual Pack BK764A
HP Smart Array P212 Controller	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller 462834-B21
HP Smart Array P411 Controller	HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller 462830-B21 HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller 462832-B21 HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller 578229-B21 HP Smart Array P411/1G Flash Backed Write Cache 572531-B21

Configuration Information

HP Smart Array P812 Controller	HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
HP Smart Array P822 Controller	HP Smart Array P822/2GB FBWC 2-ports Int/4-ports Ext SAS Controller	615418-B21

Step 2b - SAS Cable

Model Description

mini-SAS 4x 2M Cable All	407339-B21
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Step 3 - MDS600 SAS and SATA Drive Options

Hot Plug 3.5" SATA Drives

HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
HP 3TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	628059-B21
HP 4TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	694374-B21

NOTE: The MDS600 will run 3 Gb/s SATA drives at 1.5 Gb/s.

NOTE: For 3TB HDD support in MDS600 for HP Bladesystem requires P711m and 6GB BL SAS switch

Hot Plug 3.5" SAS Drives

HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	693689-B21
HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	625031-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21

NOTE: 4TB HDD Support (693689-B21) is BTO only.

NOTE: The MDS600 will run 6 Gb/s SAS drives at 3 Gb/s.

NOTE: For 3TB HDD support in MDS600 for HP BladeSystem requires P711m and 6GB BL SAS switch

Step 4 - Choose Rack Options

Choose HP Rack 10000 series Cabinets for the MDS600

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

<http://h18004.www1.hp.com/products/servers/proliantstorage/racks/10000series/index.html>

NOTE: An MDS600 fully loaded with drives weighs 320lbs.

Technical Specifications

NOTE: HP has not tested or validated the MDS600 with any third-party racks. Before installing the MDS600 in a third-party rack, be sure to properly scope the limitations of the rack. Before proceeding with the installation, consider the following:

- You must fully understand the static and dynamic load carrying capacity of the rack and be sure that it can accommodate the weight of the MDS600.
- If the MDS600 is not sitting atop a Blade c-Class enclosure or another MDS600, then you must install a 1U tray (part no 501037-B21) beneath the MDS600 to ensure proper support .
- Be sure sufficient clearance exists for cabling, installation and removal of the enclosure, actuation of the rack doors, and full articulation of the drive drawers
- Some racks other than the HP Rack 10000 Series rack do not allow full access to hard drive bays 29-35 in hard drive drawer 2.

NOTE: Please note that while configured as CTO, a maximum of four MDS600 is supported in a 42u standard rack (AF002A) and five in a 42u deep rack(AF092A). The 47U deep rack (AF094A) will also be limited to a maximum of five MDS600 for CTO config. But additional MDS600 can still be ordered as BTOs. Customers can then install them into racks at the customer site for a maximum of six MDS600 per rack. The quantity of MDS600 units supported in a rack is dependent upon the other components configured in the rack relative to the rack weight limit.

MDS600	INPUT POWER (per power supply)	Rated Line Voltage	90 to 132 VAC 180 to 264 VAC
		Rated Input Frequency	47 to 63 Hz
		Rated Input Current	10A (at 100 VAC), 7.8A (at 200VAC)
		Rated Input Power	964 W (at 100 VAC), 1412 W (at 240 VAC)
	TEMPERATURE AND HUMIDITY RANGES	Operating Temperature	50° to 95° F (10° to 35° C) NOTE: Maximum Rated 10°C per/hr (50°F/hr)
		Storage Temperature	-22° to 140° F (-30° to 60° C) NOTE: Maximum Rated 20°C/hr (68°F/hr)
		Operating Humidity	10% to 90% relative humidity (Rh), 28° C (82.4° F) maximum wet bulb temperature, non-condensing
		Non-Operating Humidity	5% to 95% relative humidity (Rh), 38.7° C (101.66° F) maximum wet bulb temperature, non-condensing
	PHYSICAL	Length	89.12 cm
		Width	44.7 cm (17.6 in)
Height		22.1 cm (8.7 in)	
Chassis Weight		72.58 kg (160 lb) with no hard drives installed	
Weight		145 kg (320 lb) with hard drives installed	

Technical Specifications

Power Consumption (maximum)	Power consumption at 208V		
	Drive Type	Typical	Service Position Maximum
	7200 RPM SATA	800W	1140W
	10K 400G SAS	940W	1340W
	15K SAS	1280W	1710W
	Power consumption at 120V		
	Drive Type	Typical	Service Position Maximum
	7200 RPM SATA	1000W	1500W
	10K 400G SAS	1100W	1600W
	15K SAS	1320W	1770W
	NOTE: Input Power and Heat Dissipation specifications are maximum values and apply to worst-case conditions at full rated power supply load. The power/heat dissipation for your installation will vary depending on the equipment configuration.		
	NOTE: Temperature ratings shown are for sea level. An altitude derating of 1°C per 300 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. The upper limit may be limited by the type and number of options installed.		
	NOTE: Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.		
	NOTE: The "service position maximum" column is the test result with the drawers open.		
	Upgradeable Firmware	Offline	
	Disk Drives and Enclosure Protocol Support	HP 3.5" SAS 3 Gb/s and 1.5 Gb/s SATA	
I/O Module	Connector Type	External mini-SAS 4x (SFF8088)	
	Number of Ports	Two	

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