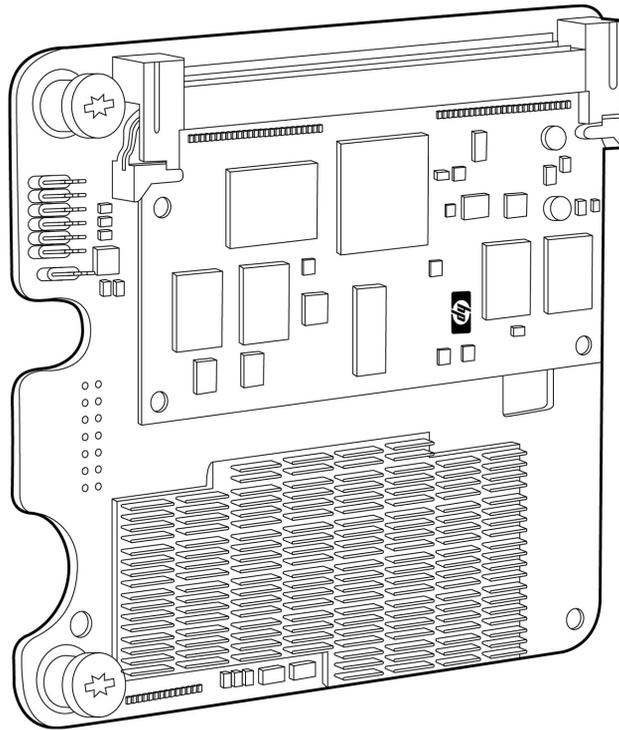


Overview

The HP Smart Array P711m is a PCI-Express (PCI-E) mezzanine card supporting shared and direct attached SAS Storage. It is one of the highest performing controllers in the HP 6Gb/s SAS portfolio and provides new levels of reliability, connectivity, and storage performance for HP Blade servers through its support of the latest SCSI technology and advanced RAID capabilities. Supports up to 108 zoned direct attached SAS or SATA hard drives per HP Smart Array P711m Controller.



HP Smart Array P711m Controller

What's New

- Support for HP MSA 2040 Storage

Models

HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller

513778-B21

NOTE: For MDS600 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.

Standard Features

The Smart Array Advantage

- **HP's innovative design** and integration work within the Smart Array family of products creates customer value that is unmatched in the industry. Use of Smart Array products across multiple applications results in a much lower Total Cost of Ownership (TCO) than any other server storage RAID product. The HP Smart Array family brings an unparalleled return on investment.
- **Data Compatibility** with all Serial Smart Array controllers allows simple and easy upgrades any time needs for higher performance, capacity, and availability increase.
- **Consistent Configuration and Management Tools.** All Smart Array products utilize a standard set of management and utility software. These tools minimize Total Cost of Ownership (TCO) by reducing training requirements and technical expertise necessary to install and maintain HP server storage.
- **Pre-Failure Warranty** Pre-Failure Warranty means Systems Insight Manager not only reports when a drive is going to fail but allows replacement of failing drives prior to actual failure. For complete details, consult the HP Support Center or refer to your HP Server documentation

Key Features

- Smart Array PCIe mezzanine card that connects to a HP 6Gb/s SAS BL Switch through the c-Class enclosure high-speed mid-plane supporting shared SAS storage.
- Eight (8) 6Gb/s SAS physical links distributed across 4 external 2x ports to supports up to 4 6Gb/s SAS Switches
- Storage interface (SAS/SATA)
 - 6Gb/s SAS technology delivers up to 600 MB/s per physical link.
 - 3Gb/s SATA technology delivers up to 300 MB/s for directly attached SATA drives.
 - Mix-and-match SAS and SATA drives. Deploy drive technology as needed to fit the computing environment.
 - Support for SAS tape drives, SAS tape autoloaders and SAS tape libraries.
- RAID controller features
 - 1 GB flash-backed write cache (not all of which is available for user data)
 - RAID 0, 1, 5, 6, 50, 60
 - RAID configuration for shared storage is controlled by the Array Controller of enclosure the array
 - RAID 0.1.3, 5.6.10.50
- License key for Smart Array Advanced Pack (SAAP) included
- Software consistency among all Smart Array family products: Array Configuration Utility, Systems Insight Manager, Array Diagnostic Utility (ADU) and SmartStart
- 1G Flash Backed Write Cache (FBWC) provides indefinite write cache data retention in the case of unexpected power outage.
- Multi-path support available in Smart Array firmware when using zoned direct attached storage. Both direct attached storage paths are load balanced for improved performance when using the enclosure in dual domain mode using SAS HDDs.

Online Management Features

- Online Array Expansion
- Online RAID Level Migration Online Stripe Size Migration Online Spares (Global)
- User Selectable Expand and Rebuild Priority
- Online Logical Drive Extension Availability

Standard Features

Performance

- Eight (8) 6Gb/s SAS physical links distributed across 4 external 2x ports which supports up to 4 6Gb/s SAS Switches
- 6Gb/s SAS (600MB/s bandwidth per physical link)
- The P711m 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
- 1G Flash Backed Write Cache

Capacity

- Dependent upon attached enclosures and arrays.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:

http://h18004.www1.hp.com/products/quickspecs/14603_div/14603_div.html
(HP MSA 2040 Storage)

http://h18000.www1.hp.com/products/quickspecs/13257_div/13257_div.html
(HP 600 Modular Disk System)

http://h18000.www1.hp.com/products/quickspecs/13551_div/13551_div.html
(HP P2000 G3 Modular Smart Array Systems)

Availability

Provides increased server uptime by providing advanced storage functionality:

- Online RAID Level Migration (between any RAID level)
- Online Capacity Expansion
- Logical Drive Capacity Extension
- Global Online Spare
- Pre-Failure Warranty

Fault Tolerance RAID Descriptions

Keeps data available and server running while a failed drive is being replaced; several fault tolerance configurations are supported including:

- **RAID 6** (Advanced Data Guarding): Supported with a minimum of 4 drives. This allocates two sets of parity data across drives. This level of fault tolerance can withstand a double drive failure without downtime or data loss.
- **RAID 60:** Supported with a minimum of 8 drives. This volume is composed of two or more RAID 6 sub-volumes (parity groups) where data is striped across each parity group as if it were a single physical drive. Each RAID 6 parity group can sustain up to two drive failures without incurring data loss.
- **RAID 5** (Distributed Data Guarding): Supported with a minimum of 3 drives. This allocates one set of parity data across drives. This level of fault tolerance can withstand a single drive failure without downtime or data loss.
- **RAID 50:** Supported with a minimum of 6 drives. This volume is composed of two or more RAID 5 sub-volumes (parity groups) where data is striped across each parity group as if it were a single physical drive. Each RAID 5 parity group can sustain a single drive failure without incurring data loss.
- **RAID 1 & 10** (Drive Mirroring): Supported with a minimum of 2 drives. This allocates half of the drive array to the data and the other half to the mirrored data, providing two copies of the data.
- **RAID 1 ADM & 10 ADM** (Advanced Data Mirroring): Supported with a minimum of 3 drives. RAID 1 ADM creates redundant copies of the data using 3 drives. RAID 10 ADM stripes data across two or more sets of RAID 1 ADM volumes. This level of fault tolerance can withstand a double drive failure within a RAID 1 ADM volume without downtime or data loss.

Standard Features

NOTE: When the P711m is connected to the MDS600 configured with the HP MDS600 Dual I/O Module Option Kit or to D2600/D2700 with dual domain SAS HDDs, there are multiple physical paths to each HDD, enabling the server to endure P711m port failures, switch failures, cable pulls, cable failures, and MDS600 IO module failures without interruption of normal storage I/O.

NOTE: See Enclosure QuickSpecs for descriptions of RAID levels specific to the HP P2000 G3 Arrays at: http://h18000.www1.hp.com/products/quickspecs/13551_div/13551_div.html

Fault Recovery

Minimizes downtime, reconstructs data, and facilitates a quick recovery from drive failure

- **Recovery ROM:** This feature provides unique redundancy that protects from a ROM image corruption. A new version of firmware can be flashed to the ROM while the controller maintains the last known working version of firmware. If the firmware becomes corrupt, the controller will revert back to the previous version of firmware and continue operating. This reduces the risk of flashing firmware to the controller.
 - **On-Line Spares:** There is no limit to the number of spare drives that can be installed prior to drive failure. If a failure occurs, recovery begins with an On-Line Spare and data is reconstructed automatically.
-

Ease of Use

Consistency and Upgradeability make the Smart Array family unique in the industry:

- GUI based configuration, management and diagnostic software tools
- Common data format between generations of products

Compatibility

Supported Servers

HP ProLiant Server Blades

HP ProLiant BL280c G6
HP ProLiant BL460c G6 & G7
HP ProLiant BL465c G6 & G7
HP ProLiant BL490c G6 & G7
HP ProLiant BL620c G7
HP ProLiant BL680c G5 & G7
HP ProLiant BL685c G6 & G7

HP Integrity Server Blades

HP Integrity BL860c i2
HP Integrity BL870c i2
HP Integrity BL870c i4
HP Integrity BL890c i2
HP Integrity BL890c i4

NOTE: Some servers listed above may be discontinued.

NOTE: For more information on supported server options, please refer to appropriate server QuickSpecs

Operating Systems and Virtualization Software Support for ProLiant Servers

Microsoft Windows 2003
Microsoft Windows 2008 R2
SLES 10
SLES 11
Red Hat Enterprise Linux 5
Red Hat Enterprise Linux 6
VMware ESX 4.0
VMware ESX 4.1
VMware ESXi 5.0
HP-UX 11iv3

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: <http://www.hp.com/go/ossupport>.

Compatibility

Software Suite

All Smart Array products share a common set of configuration, management and diagnostic tools, including Array Configuration Utility, Array Diagnostic Utility (ADU), and Systems Insight Manager. This software consistency of tools reduces the cost of training for each successive generation of product and takes much of the guesswork out of troubleshooting field problems. These tools lower the total cost of ownership by reducing training and technical expertise necessary to install and maintain HP server storage.

Systems Insight Manager

- Powerful server and server options/storage manager tool
- Monitors over 1200 system wide parameters
- Configuration/Diagnostic Utilities

HP Array Configuration Utility (ACU)

- Powerful Web based configuration utility for all Smart Array controllers
- Provides a graphical view of HP server drive array configurations
- Allows for management of multiple arrays over a secure internet connection from anywhere in the world
- Easy to use Wizards for configuration
- Runs offline (via Smart Start) and online on Windows

HP Option ROM Configuration for Arrays (ORCA)

- An alternative method for easily viewing, creating, and deleting multiple arrays and logical volumes during system power up.
- For advanced array configurations use ACU

HP Storage Management Utility

- Initial System Configuration Wizard is the easiest and simplest method for configuring the storage system initially.
- Command Line Interface (CLI) for command level method of configuring and managing the storage
- Main User Interface for multi server environments that need customization for creation of storage Luns and targets.
- P2000 G3 Arrays can be configured using Storage Management Utility (SMU) or Command Line Interface (CLI) both of which are embedded in the P2000 G3 Array controller firmware.

HP Array Diagnostic Utility (ADU)

- In depth diagnostic and reporting utility for all Smart Array controllers

Service and Support, HP Care Pack, and Warranty Information

Warranty

The warranty for this device is 3 years parts only.

Pre-Failure Warranty: Drives attached to the Smart Array Controller and monitored under Insight Manager are supported by a Pre-Failure (replacement) Warranty. For complete details, consult the HP Support Center or refer to your HP Server Documentation.

Software Product Services Standalone telephone support

Rights to new license version

Media and documentation updates

Hardware Product Services

Installation services

On-site maintenance (includes warranty support)

Response time upgrades during the warranty period

Post-warranty coverage

RAID setup and performance consulting via statement of work

Warranty Upgrade Options

Response - Upgrade on-site response from next business day to same day 4 hours

Coverage - Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days

Duration - Select duration of coverage for a period of 1, 3, or 5 years

Warranty upgrade options can come in the form of Care Packs, which are sold at the HP System level this product attaches too.

HP Care Pack Information

HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage. Care Packs for this option is sold at the system level this option attaches too.

HP Care Pack is not available for less than the product's warranty duration.

HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer).

Proof of purchase may be required.

HP Care Pack services are prepaid.

NOTE: For additional HP Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL: <http://www.hp.com/hps/carepack/>

Related Options

HP Disk Storage Systems	Disk Enclosures and Storage Array		
	HP D2000 Disk Enclosures		
	HP D2600 Disk Enclosure		AJ940A
	NOTE: Supports 12 LFF drives, and SAS 6 Gb/s and SATA 3 Gb/s.		
	HP D2700 Disk Enclosure		AJ941A
	NOTE: Supports 25 SFF drives, and SAS 6 Gb/s and SATA 3 Gb/s.		
	NOTE: Please see the supported Disk Enclosure QuickSpecs for a list of compatible hard drives: vhttp://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html (Worldwide)		
	HP MDS600 with Dual I/O Modules Disk System		AJ866A
	HP MDS600 Dual I/O Module Option Kit		AP763A
	NOTE: Includes all MDS600 supported bundles.		
NOTE: Please see the supported Disk Enclosure QuickSpecs for a list of compatible hard drives: http://h18000.www1.hp.com/products/quickspecs/13257_div/13257_div.html (Worldwide)			
HP MSA 2040 Storage			
HP MSA 2040 SAS Dual Controller LFF Storage		C8S54A	
HP MSA 2040 SAS Dual Controller SFF Storage		C8S55A	
NOTE: Please see the supported MSA QuickSpecs for a list of compatible hard drives: http://h18004.www1.hp.com/products/quickspecs/14603_div/14603_div.html			
Mini SAS to Mini SAS Cables	HP External Mini SAS 2m Cable		407339-B21
HP SAS Switches	HP 6Gb SAS Switch Single Pack for HP BladeSystem c-Class		BK763A
	HP 6Gb SAS Switch Dual Pack for HP BladeSystem c-Class		BK764A
NOTE: Please see the QuickSpecs for Technical Specifications and additional information at: http://h18000.www1.hp.com/products/quickspecs/13960_div/13960_div.html (Worldwide)			
HP c Class Blade 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

Related Options

HP P2000 G3 Modular Smart Array Systems

P2000 G3 SAS Controller

HP P2000 G3 SAS MSA Array System Controller

AW592A

NOTE: Four 6Gb SAS ports per controller.

P2000 Chassis

P2000 Controller-less Chassis (AC-powered)

HP P2000 LFF Modular Smart Array Chassis

AP838A

NOTE: Will accept one or two controllers or Disk Enclosure I/O modules.

HP P2000 SFF Modular Smart Array Chassis

AP839A

NOTE: Will accept one or two controllers, not I/O modules.

Configured Units, 6 Gb SAS Systems

HP P2000 G3 SAS MSA Dual Controller LFF Array System

AW593A

HP P2000 G3 SAS MSA Dual Controller SFF Array System

AW594A

Disk Enclosures

HP P2000 Dual I/O LFF Drive Enclosure

AP843A

NOTE: Twelve 3.5" drive bays w/ two .5m mini-SAS to mini-SAS cables. Used with single or dual controller LFF or SFF array head.

HP P2000 LFF Drive Enclosure I/O Module

AJ844A

NOTE: Cable not included. Designed exclusively for use with the LFF chassis PN AP838A to create a single I/O JBOD.

HP Tape Backup

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

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.

Technical Specifications

Dimensions	4 in x 4.5 in x 0.8 in (10.1 cm x 11.4 cm x 2 cm)
Disk Drive and Enclosure Protocol Support	SAS protocol: 6 Gb/s, 3 Gb/s, or 1.5 Gb/s SATA protocol: 3 Gb/s or 1.5 Gb/s
SAS Connectors	Four (4) 2x connectors external
Memory Bus Speed	DDR2-800 (6.4 GiB/s maximum bandwidth)
SAS Port Link Rate	6Gb/s per physical link
Software Upgradeable Firmware	Yes
Cache Memory	1 GB capacity (not all of which is available for user data) 64-bit data width with 8-bit error correcting code (ECC) Flash-backed on power loss Tether to capacitor pack Removable
Logical Drives Supported	512 logical drives external for shared storage 64 logical drives for direct attached storage
Maximum Capacity	Variable depending on attached enclosure
Memory Addressing	64-bit, supporting servers memory space greater than 4 GB
RAID Support	RAID 0, 1, 3, 5, 6, 10, 50 on P2000 SA G3
Maximum Number of Physical Drives	108 for direct attach storage 149 small form factor drives or 96 large form factor for shared storage
Upgradeable Firmware	Flashable ROM with redundant firmware images

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green . To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
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The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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