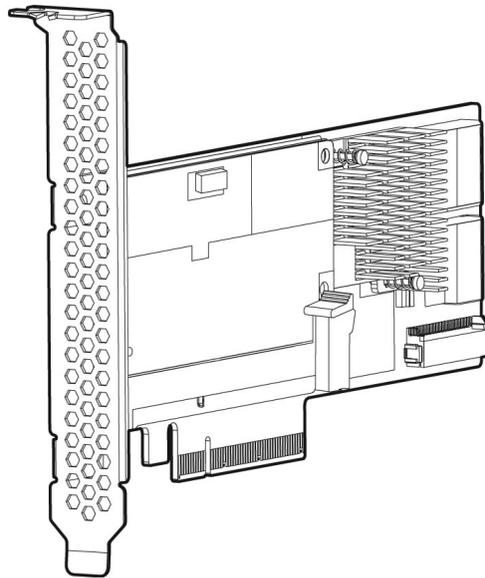


Overview

The HP Smart Array P420 Controller is a low profile, 6 Gb/s, PCIe 3.0, Serial Attached SCSI (SAS) RAID controller that provides enterprise class, storage performance and data protection for select HP ProLiant Gen8 rack servers and tower servers. It features eight internal SAS ports and delivers increased server uptime by providing advanced storage functionality, including online RAID level migration (between any RAID levels) with flash back write cache, global online spare, and pre-failure warning. Data Compatibility among all models of Smart Array controllers allows simple and easy migration at any time when needs for higher performance, capacity, and availability increase. Even new generations of Smart Array controllers can understand the data format of previous generations of Smart Array controllers.



What's New

- HP Smart Array Advanced Pack 2.0 features are part of the base features for the HP Smart Array P420 Controller." HP Smart Array Advanced Pack 2.0 features are now part of the base features for the HP Smart Array P420 Controller at no additional cost

Models

HP Smart Array P420 Controller	HP Smart Array P420/1GB FBWC 6Gb 2-ports Int SAS Controller	631670-B21
	HP Smart Array P420/2GB FBWC 6Gb 2-ports Int SAS Controller	631671-B21

Standard Features

The Smart Array Advantage

HP's innovative design and integration work of 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 through:

Data Compatibility among most current shipping Smart Array controllers allows simple and easy upgrades any time needs for higher performance, capacity, and availability increase. Even successive generations of Smart Array controllers understand the data format of other Smart Array Controllers.

Consistent Configuration and Management Tools. Most current shipping 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 the HP server storage.

SmartDrive Carrier form factor is for use across multiple HP servers, Universal Hard Drive form factor is for disk enclosures and storage systems. With compatibility across many enterprise platforms, you are free to deploy and re-deploy these drives to quickly deliver increased storage capacity, migrate data between systems, and easily manage spare drives.

Pre-Failure Warranty means HP 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

- The SA-P420 Controller supports up to 27 drives depending on the server implementation.
- Seamless upgrades from past generations and upgrades to next generation HP high performance and high capacity Serial Attached SCSI Smart Array controllers.
- 6Gb/s SAS technology delivers high performance and data bandwidth and contains full compatibility with 6Gb/s SATA technology.
- x8 PCIe 3.0 host interface technology delivers high performance and data bandwidth up to 8 GB/s maximum bandwidth.
- Modular, easy-to-upgrade design lets you optimize performance by upgrading from 40-bit 512MB cache to 72-bit 1GB Flash Backed Write Cache or 72-bit 2GB Flash Backed Write Cache (FBWC).
- Addition of the flash backed cache upgrade enables array expansion, logical drive extension, RAID migration, and stripe size migration.
- Standard on the P420 are RAID 6 ADG, RAID 60 ADG, RAID 1 ADM, Capacity Expansion, mirror split, recombine, and rollback in Online Mode, Drive Erase, Performance Optimization-Degraded Reads and Read Coalescing, Move/Delete any individual LUNS and Online Split Mirror
- The HP SSD Smart Path feature included in the Smart Array software stack improves SSD read for all RAID levels and RAID 0 write operations by optimizing the path to each SSD attached to the controller
- The HP SmartCache licensed feature (available as an additional option) is a controller-based read caching solution in a DAS environment that caches the most frequently accessed data ("hot" data) onto lower latency SSDs to dynamically accelerate application workloads.
- Mix-and-match SAS and SATA hard drives, lets you deploy drive technology as needed to fit your computing environment.
- Software consistency on most current shipping Smart Array products: HP Smart Storage Administrator, HP Systems Insight Manager (SIM), and Intelligent Provisioning.
- Low-profile PCI Express form factor - ships with a full size bracket for deployment in either a low-profile or full sized slot.

Standard Features

Management Features

- Online array expansion (with FBWC)
- Online Advanced Capacity Expansion (with FBWC)
- Online logical drive extension (with FBWC)
- Online RAID level migration (with FBWC)
- Online stripe size migration (with FBWC)
- Online mirror split, recombine and rollback (with FBWC)
- Unlimited global online spare assignment
- User selectable expand and rebuild priority
- User selectable RAID level and stripe size
- User selectable read and write cache sizes
- Supports Predictive Spare Activation

Ports

- Eight (8) SAS physical links distributed across 2 internal x4 wide port connectors.

Performance

- 6Gb/s SAS [(600MB/s bandwidth per physical link)]
- x8 6Gb/s SAS physical links (compatible with 3Gb/s SATA)
- 512 MB 72-bit wide DDR3-800MHz Flash Backed Write Cache, 1 GB 72-bit wide DDR3-1333MHz Flash Backed Write Cache or 2GB 72-bit wide DDR3-1333MHz Flash Back Write Cache provides up to 10.6 GB/s maximum bandwidth (on the DDR3-1333MHz cache)
- x8 PCIe 3.0 host interface provides maximum bandwidth
- Read ahead caching
- Write-back caching (with FBWC)

Native Command Queuing Native Command Queuing (NCQ) is a technology designed to increase performance of SATA hard disk drives by allowing the individual hard disk to internally optimize the order in which received read and write commands are executed. This can reduce the amount of unnecessary going back-and-forth on the drive's heads, resulting in increased performance for workloads where multiple simultaneous read/write requests are outstanding, most often occurring in server or storage-type applications. Without NCQ the drive has to process and complete one command at a time. For NCQ to be enabled, it must be supported and turned on in the controller and in the hard drive itself.

NOTE: Please see the [SATA Hard Drive QuickSpecs](http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html) for specific SATA hard drive capacities that support NCQ: http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html

Capacity

Given the increasing need for high performance and rapid capacity expansion, the SA-P420 Controller offers:

- Up to 240TB of total internal storage with 60 x 4TB LFF SATA hard drives
- Up to 24TB of total internal storage 900GB SFF SAS hard drives

Above stated total internal storage LFF is based on the HP SL4540 Gen8 server. Maximum internal storage is dependent on the server.

Standard Features

Availability

Provides increased server uptime by providing advanced storage functionality:

- Online RAID level migration between any RAID levels (with FBWC)
- Online stripe size migration
- Online capacity expansion
- Online logical drive extension
- Online active drive replacement
- Online drive firmware upgrade
- Unlimited global online spare
- Pre-Failure Warranty

Fault Prevention

The following features offer detection of possible failures before they occur, allowing preventive action to be taken:

- **S.M.A.R.T.:** Self Monitoring Analysis and Reporting Technology first developed at HP detects possible hard disk failure before it occurs, allowing replacement of the hard drive before a real failure occurs.
- **Drive Parameter Tracking** monitors drive operational parameters, predicting failure and notifying the administrator.
- **Dynamic Sector Repairing** continually performs background surface scans on the hard disk drives during inactive periods and automatically remaps bad sectors, ensuring data integrity.
- **Smart Array Cache Tracking** monitors integrity of controller cache, allowing pre-failure preventative maintenance.

Fault Tolerance

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

Fault Recovery

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

- **Recovery ROM:** This feature protects the user from a firmware image corruption by storing a redundant copy of the firmware image. If the active firmware image becomes corrupt, the controller will use the redundant firmware image and continue operating.
- **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.
- **DRAM ECC** detects and corrects data bit errors.
- **Battery-backed write cache** upgrade provides for up to two days of battery power for data cache retention. The data backup duration could be extended anytime the server's auxiliary power is available during system power down.

Ease of Use

Consistency and upgradeability on most current shipping Smart Array products make them unique in the industry:

- GUI based configuration, management and diagnostic software tools with the HP Smart Storage Administrator
- Common data format between generations of products
- Data migration between servers and external Modular Smart Array enclosures

HP SSD SmartPath

The HP SSD Smart Path feature included in the Smart Array software stack improves Solid State Disk (SSD) read performance. With up to 4x better SSD read performance, HP SSD Smart path chooses the optimum path to the SSD and accelerates reads for all RAID levels and RAID 0 writes. HP SSD Smart Path Requires updated firmware, drivers, and configuration utility available at www.hp.com/go/ssdsmartpath . HP SSD Smart Path is ideal for read intensive workloads and is included as a base feature on HP Smart Array P-series controllers. The following operating systems are supported by the HP SSD Smart Path feature::

- Microsoft® Microsoft Windows Server 2008
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2012

HP SmartCache

The HP SmartCache licensed feature is a controller-based read caching solution in a DAS environment that caches the most frequently accessed data ("hot" data) onto lower latency SSDs to dynamically accelerate application workloads. The HP SmartCache architecture is flexible and supports any HP ProLiant Gen8 supported HDD for bulk storage and any HP ProLiant Gen8 supported SSD as an accelerator.

HP SmartCache is deployed and managed using the HP SmartStorage Administrator (HP SSA) and HP Array Configuration Utility (HP ACU).

The basic HP SmartCache architecture is comprised of the following three elements:

- **Bulk storage:** The first element is the bulk storage device, which is any supported HDD attached to the HP Smart Array controller.
- **Accelerator:** The second element, the accelerator, is a faster/lower latency SSD device that caches data.
- **Metadata:** The final element is metadata, information held in a relatively small storage area that maps the location of information residing on the accelerator and bulk storage devices.

For more information please visit www.hp.com/go/smartcache

Standard Features

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.

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 to which this product attaches

Compatibility

Server Compatibility

For up to date compatibility, please see the following URL for complete Smart Array Controller compatibility and support information:

www.hp.com/go/smartarray

Operating Systems

Microsoft Windows Server 2008 x64

Microsoft Windows Server 2008 x86

Red Hat Enterprise Linux 5 (x64 & x86)

Red Hat Enterprise Linux 6

SUSE Linux Enterprise Server 10 (x64 & x86)

SUSE Linux Enterprise Server 11 (x64 & x86)

VMware ESX 4.1

VMware ESXi 4.1, 5.0, 5.1

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

NOTE: For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix: <http://h18004.www1.hp.com/products/servers/linux/hplinuxcert.html>

Software Suite

Most current shipping Smart Array products share a common set of configuration, management and diagnostic tools, including HP Smart Storage Administrator, and HP 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.

HP Systems Insight Manager

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

HP Smart Storage Administrator

- Comprehensive management for HP Smart Storage products
- Simplified and intuitive interface and functionality
- Advanced scripting and diagnostic features

For more information please visit www.hp.com/go/hpssa

Service and Support

Service and Support

HP Technology Services

Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

Protect your business beyond warranty with HP Care Pack Services

When you buy HP Options, it's also a good time to think about what level of service you may need. HP Care Pack services provide total care and support expertise with committed response choices designed to meet your IT and business need

HP Foundation Care services offer scalable reactive support-packages for HP servers and software. You can choose the type and level of service that is most suitable for your IT and business needs. HP Proactive Care delivers high levels of system availability through proactive service management and advanced technical response.

Recommended HP Care Pack Services for optimal satisfaction with your HP product

Optimized Care

3-Year HP 6 hour Call to Repair Response, Proactive Care

Combined reactive and proactive support for hardware and software helping optimize your systems and delivering high levels of availability through proactive service management and advanced technical response. Hardware problem resolution to return the hardware in operating condition within 6 hours of the initial service request. A Technical Account Manager, as your single point of contact, will own your call or issue end to end until resolved.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855EEE.pdf>

HP Installation of ProLiant Add On Options Service

This easy-to-buy, easy-to-use HP Care Pack service helps ensure that your new HP hardware or software is installed smoothly, efficiently, and with minimal disruption of your IT and business operations.

Standard Care

3-Year HP 24x7 4 hour response, Proactive Care Service

This service gives you combined reactive and proactive support including rapid access to our Advanced Solution Center to manage and prevent problems and a Technical Support Specialist with a broad level of technical knowledge that will engage with additional technical expertise as needed from HP's vast global resources.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855EEE.pdf>

HP Installation of ProLiant Add On Options Service

This easy-to-buy, easy-to-use HP Care Pack service helps ensure that your new HP hardware or software is installed smoothly, efficiently, and with minimal disruption of your IT and business operations.

Service and Support

Related Services

3 HP Proactive Care Personalized Support - Environmental Option

The Personalized Support option provides an assigned Account Support Manager who can bring best practices from across the industry plus extra technical skills to your IT team. This option is only available as an add-on to HP Proactive Care Support

HP Proactive Select Service

Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months. <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN.pdf>

NOTE: Additional HP Care Pack services can be found at: <http://hp.com/go/cpc>

Insight Online/Insight Remote Support

HP Insight Remote Support provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. This comes at no additional cost with your HP solution. Learn more about Insight Remote Support <http://www.hp.com/go/insightremotesupport> and Insight Online <http://h18013.www1.hp.com/products/servers/management/insight-online/index.html>

HP Support Center

Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more <http://www.hp.com/go/hpsc>

HP's Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

NOTE: *HP's Support Center Mobile App is subject to local availability

Parts and materials

HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction.

For more information

To learn more on services for HP ProLiant Servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant>.

Related Options

HP Optional Upgrades	HP 512MB P-series Smart Array Flash Backed Write Cache	661069-B21
	HP 1GB P-series Smart Array Flash Backed Write Cache	631679-B21
	HP 2GB P-series Smart Array Flash Backed Write Cache	631681-B21

NOTE: This is a list of supported options. Some may be discontinued.

HP Hard Drives

HP SAS Hot Plug SmartDrive Carriers for Gen8 Servers only

SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise Drives

HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	697574-B21
HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652605-B21

SAS Hot Plug SmartDrive SFF (2.5-inch) Midline Drives

HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-B21

SAS Hot Plug SmartDrive LFF (3.5-inch) Enterprise Drives

HP 600GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652620-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652615-B21

SAS Hot Plug SmartDrive LFF (3.5-inch) Midline Drives

HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	695510-B21
HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652766-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652757-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652753-B21

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

http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html
(Worldwide)

HP 6G SATA Hard Drives

6G SATA Hot Plug with SmartDrive SFF (2.5-inch) Midline (MDL) Drives

HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21

6G SATA Hot Plug with SmartDrive LFF (3.5-inch) Midline (MDL) Drives

HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	693687-B21
HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	628061-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658079-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	657750-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658071-B21

6G SATA Non-hot Plug LFF (3.5-inch) Midline (MDL) Drives

Related Options

HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	628065-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659339-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659337-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659341-B21

NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html
 (Worldwide)

HP Solid State Drives (SSD)

HP SSD SATA Drives

6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Boot Solid State Drives

HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	717965-B21
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HP 80GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734360-B21
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6G SATA Value Endurance Hot Plug LFF (3.5-inch) Enterprise Boot Solid State Drives

HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Boot 3yr Wty Solid State Drive	718171-B21
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HP 80GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734362-B21
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6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives

HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717973-B21
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HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717971-B21
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HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717969-B21
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6G SATA Value Endurance Hot Plug LFF (3.5-inch) Enterprise Value Solid State Drives

HP 800GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718189-B21
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HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718183-B21
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HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718177-B21
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6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
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HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691866-B21
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HP 200GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691864-B21
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HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21
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Related Options

6G SATA ME Hot Plug SFF (3.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691860-B21
HP 400GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691856-B21
HP 200GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691854-B21
HP 100GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691852-B21

HP SSD SAS Drives

6G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690829-B21
HP 400GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690827-B21
HP 200GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690825-B21

6G SAS SLC Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives

HP 400GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653082-B21
HP 200GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653078-B21

3G SATA MLC Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 400GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653120-B21
HP 200GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653118-B21
HP 100GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653112-B21

3G SATA MLC Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives

HP 400GB 3G SATA MLC LFF (3.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653126-B21
HP 200GB 3G SATA MLC LFF (3.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653124-B21
HP 100GB 3G SATA MLC LFF (3.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653122-B21

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

http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)

NOTE: Go to the HP Hard Drive Compatibility table for complete drive compatibility information (<http://www.hp.com/products/harddiskdrives>). Using hard drives in unsupported configurations will result in voiding the warranty and could result in damage to the drive and/or loss of data.

NOTE: There is a known compatibility issue with some early 3.5" SATA HDD that will

Related Options

make them unable to be used with the SA-P400 controller. Customers should verify that they are not using hard drive part number 332649-002/003 (spare 353042-001), 332650-002/003 (spare 353043-001), or 356536-002/003 (spare 353044-001).

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

HP Cable Options

Mini SAS Cables

HP Mini SAS Straight to Left 33in Cable Assembly	662899-B21
HP Mini SAS Straight to Straight 37in Cable Assembly	662897-B21
HP Double Mini SAS Y 36in Cable Assembly	662901-B21

HP SmartCache

HP SmartCache No Media 24x7 Technical Support 1 Svr License	D7S26A
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NOTE: This part number can be used to purchase a single license or to order multiple licenses with a unique activation key per server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services.

HP SmartCache No Media 24x7 Technical Support Electronic License	D7S27AAE
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NOTE: This part number can be used to purchase multiple licenses with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24x7 HP Software Technical Support Services.

HP SmartCache No Media 24x7 Technical Support Flexible License	D7S27A
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NOTE: This part number can be used to purchase a single license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services.

NOTE: HP SmartCache requires the following: Min 1 or 2 GB FBWC module along with HP ProLiant Gen8 supported HDD(s) and SSD(s) for more information visit: www.hp.com/go/smartcache

Technical Specifications

Dimensions (not including bracket)	Low Profile PCIe Form Factor 7.5 in x 9.5 in x 2.25 in (19.05 cm x 24.13 cm x 5.72 cm)
Disk Drive and Enclosure Interface - Transfer rate	6Gb/s SAS (Serial Attached SCSI) Up to 6Gb/s SATA (Serial ATA)
SAS Connectors	2 internal (Mini-SAS) x8 wide port connectors
Cache Memory Speed	DDR3-800MHz with 40-bit for 512MB FBWC or DDR3-1333MHz with 72-bit wide bus provides up to 10.6 GB/s maximum bandwidth.
Server Interface	x8 PCIe 3.0 provides 8GB/s maximum bandwidth
SAS Speed	x8 6Gb/s SAS provides 4.8GB/s maximum bandwidth
Cache Memory	40-bit 512MB ECC protected cache, 72-bit 1GB FBWC or 72-bit 2GB FBWC module upgrades available; transportable with flash upgrade
Logical Drives Supported	Zero Memory for embedded controller supports up to 2 logical volumes 512MB cache and greater, Up to 64 logical volumes
Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
RAID Support	RAID 6, 60 (Advanced Data Guarding) NOTE: RAID 6, 60 can be enabled with a minimum of 512 MB FBWC RAID 5, 50 (Distributed Data Guarding) NOTE: A minimum of 512 MB cache is required to enable RAID 5, 50 support of the Smart Array P420i RAID 1, 10 (Drive Mirroring) RAID 1 ADM, 10 ADM (Advanced Data Mirroring)
Upgradeable Firmware	Upgradeable Firmware with recovery ROM feature

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.