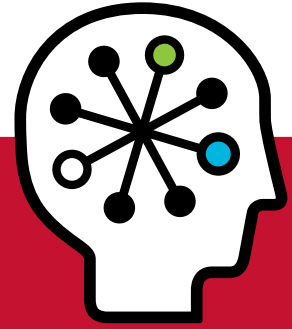




HP Smart Array controller

Family data sheet



With data storage requirements growing rapidly, choosing a high-capacity storage solution that meets your performance and availability demands is crucial. In addition, scalability, data reliability and accessibility are important. To fulfil these needs and improve your storage utilisation, look to the HP Smart Array controllers.

Designed to enhance server uptime and maintain flexibility for future growth, HP Smart Array controllers blend reliability of the SCSI protocol with the performance advantages of serial architecture. In addition, the HP Smart Array controller family includes a standard toolset that you can use to configure array controllers, expand an existing array configuration by adding disk drives, or reconfigure an array by extending volume sizes. You can also make use of enterprise-class features such as online RAID level migration and online capacity expansion to make alterations to the storage system without taking it offline.

With support for more than 2TB of total storage, HP Smart Array controllers can help you meet the requirements of a broad range of storage area network (SAN) applications. Moreover, giving you extensive choices for server and storage deployment, these controllers provide high levels of flexibility and also bring an unparalleled return on investment.

HP Smart Array controllers are supported on most current-generation HP ProLiant servers and select HP BladeSystem servers. View a complete, up-to-date list of supported servers: ftp://ftp.hp.com/pub/c-products/servers/proliantstorage/arraycontrollers/SA_Compatibility_Marketing_OTT.pdf

HP Smart Array P212 controller

With the HP Smart Array P212, you can make use of basic RAID functionality and the option to upgrade with the 256MB battery-backed write cache (BBWC) for RAID 5, 5+0. Additional upgrade path to RAID 6 (ADG), 6+0 and other enhancement features are also available through a software licence key for the Smart Array Advanced Pack (SAAP).

The HP Smart Array (SA) P212 is an entry-level PCIe SAS RAID controller. The low-profile, half-height card has 8 ports and utilises DDR2-533 memory. The SA-P212 is ideal for RAID 0/1, 1+0 and can be upgraded with the 256MB BBWC module for RAID 5, 5+0. RAID 6 (ADG), 6+0 and other feature enhancements can be achieved with a software licence key for the Smart Array Advanced Pack.

Key features

- 4 internal ports/4 external ports of 6Gb/s SAS/3Gb/s SATA
- x8 PCI-Express 2.0 I/O connector
- DDR-2/533 memory
- 256MB cache and battery kit for BBWC upgrade options
- Smart Array Advanced Pack for RAID 6 (ADG), 6+0 and other enhancement features

HP Smart Array P410 controller

HP provides you the Smart Array P410, a PCI Express 2.0 (PCIe) Serial Attached SCSI (SAS) RAID controller.

The HP Smart Array P410 delivers basic RAID functionality with an upgrade path to RAID 6, 6+0. It provides uncompromising reliability, scalability and a rich set of features that can meet your specific storage needs.

Available with entry-grade features, the SA-P410 is ideal for small to medium-size business environments as well as enterprise environments. The low-profile, half-height card has eight 6Gb/s SAS/3Gb/s SATA ports. It supports two internal connections using the controllers x4 wide SAS ports and utilises DDR2-533 memory.

The SA-P410/256 supports RAID 0, 1, 1+0, 5 and 5+0. Moreover, it can be upgraded with the 512MB BBWC or the 512MB or 1G flash-backed write cache (FBWC) modules and Smart Array Advanced Pack by adding the licence key for enabling RAID 6 and 6+0, and other feature enhancements.

Key features

Combining the latest in I/O slot technology and the Smart Array controller architecture, the HP SA P410 comes with performance features that you can rely on.

- 8 internal ports of 6Gb/s SAS/3Gb/s SATA
- x8 PCI-Express 2.0 I/O connector
- Performance memory architecture, with 256MB DDR-2/533 RAM standard
 - 512MB BBWC or FBWC upgrade option
 - 1G FBWC upgrade option
- Smart Array Advanced Pack upgrade option

HP Smart Array P411 controller

The HP Smart Array P411 controller is an external connect card that delivers mission-critical reliability in an easy-to-use RAID solution.

The HP SA-P411 controller is also a low-profile, half-height card that has 8 external ports and utilises DDR2-533 memory. It is ideal for RAID 0, 1, 1+0, 5 and 5+0 and can be upgraded with the 512MB BBWC or 512MB or 1G FBWC modules and Smart Array Advanced Pack through a licence key for enabling RAID 6 and 6+0 and other feature enhancements.

Key features

- 8 external ports of 6Gb/s SAS/3Gb/s SATA
- x8 PCI-Express 2.0 I/O connector
- DDR-2/533 memory
 - 512MB BBWC or FBWC upgrade option
 - 1G FBWC upgrade option
- Smart Array Advanced Pack upgrade option

HP Smart Array P812 controller

The HP Smart Array P812 is a PCI-Express, high performance SAS RAID card. It has 16 external ports,

The HP Smart Array P812 provides superior RAID performance, while delivering high levels of connectivity, reliability and many advanced features.

8 internal ports and uses the 1G Flash Backed Write Cache (FBWC) module. This controller supports up to 108 drives and ships standard with the Smart Array Advanced Pack licence key. It provides many advanced features such as RAID 6, 6+0, drives erase, video on demand and performance optimisation for the enterprise environment.

Key features

- 16 external ports/8 internal ports of 6Gb/s SAS/3Gb/s SATA
- x8 PCI-Express 2.0 I/O connector
- DDR-2/800 memory
 - 1G FBWC standard
- Smart Array Advanced Pack licence key standard

Key benefits

The HP SA-P212, P410, P411 and P812 are part of a modular set of Smart Array solutions that provide scalability and offer significant benefits that can help you make better use of your storage environment.

Availability

The HP Smart Array controllers deliver increased server uptime by providing advanced storage functionality through the following features:

- **Online RAID Level Migration (between any RAID level) with BBWC/FBWC:** This allows you to easily migrate to a new fault-tolerance (RAID) level without disrupting system operation or causing data loss.
- **Online Stripe-Size Migration:** With online stripe-size migration, it becomes easy to change the stripe size of an existing logical drive using the Array Configuration Utility (ACU). This can be done without taking the system offline.

- **Online Capacity Expansion with BBWC/FBWC:** This feature enables you to increase drive capacity – delivering expandability and upgradeability. Now, you can upgrade to larger hard drives and all the stored data can be seamlessly moved to these drives while the server is online.
- **Logical Drive Capacity Extension with BBWC/FBWC:** This enables you to increase the size of existing logical drives online.
- **Global Online Spare:** This facilitates automatic rebuilds after a drive failure and reduces the risk of data loss.
- **Pre-failure Warranty:** HP Systems Insight Manager (SIM) not only reports when a drive is going to fail but also allows replacement of failing drives prior to actual failure. For complete details, consult the HP Support Center or refer to your HP Server documentation.

Flexibility

High flexibility can help you reduce the cost and complexity of your storage system. This makes it easier to meet your application requirements for performance and capacity.

- Supports SAS and SATA disk drives – giving you the flexibility to mix and match these drives in the same enclosure.

Manageability

Designed for ease-of-use, the Smart Array controllers come with the following features:

- **Online drive flash:** With the SA controllers, you no longer need to take storage offline when updating disk firmware. This is possible with Online Drive Flashing, which allows you to download an updated HDD firmware image to the controller and update all of your SAS HDDs the next time you reboot the server.
- **Remote monitoring and configuration:** With HP ACU and SIM, remote monitoring and configuration is easy, giving you greater control over your storage environment.
- **Mirror splitting and recombining:** Mirror Splitting allows you to divide one or more RAID 1 or RAID 1+0 logical drives into two identical new arrays with RAID 0 logical drives. It now becomes easy to replicate a configuration or build backup before performing a risky operation. Moreover, using the ACU, it is also possible to recombine a split mirrored array.

Fault prevention

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

- **Self Monitoring Analysis and Reporting Technology (S.M.A.R.T.)** – first developed at HP – detects possible hard disk failure, allowing replacement of the component even before 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, providing data integrity.

Fault recovery

The HP Smart Array controllers reduce downtime, reconstruct data and facilitate a quick recovery from drive failure.

- **Online spares:** Up to two spare drives can be installed prior to drive failure. If a failure occurs, recovery begins with an online spare and data is reconstructed automatically.

Note: Online spares can only be used with RAID level 1, 1+0 and 5.

Consistency and upgradeability

HP Smart Array products utilise the same configuration, diagnostic and management tools – including ACU, Array Diagnostic Utility (ADU) and HP Insight Manager – for storage and RAID management. This consistency lowers the cost of ownership by reducing training and technical expertise necessary to instal and maintain your server storage solution.

- GUI-based configuration, management and diagnostic software tools facilitate simplified storage management.
- Common data format between generations of products provides investment protection for your HP storage solution.
- Data migration occurs between servers and external storage enclosures.
- Full-size and low-profile brackets ship with the controller for flexibility.
- Data compatibility between models of Smart Array controllers allows you to easily upgrade to future Smart Array SAS products for higher performance, capacity and availability.

Note: All available features are standard across the HP SA-P212, P410, P411 and P812 and span up with flexible, full upgradeability with cache, BBWC, FBWC and the HP Smart Array Advanced Pack.

Ideal environment

The HP Smart Array controllers are well suited for SAS-based servers and storage enclosures where high performance is crucial.

Typical uses include:

- File/Print
- General purpose applications
- Domain controller
- Application servers
- Dedicated applications

Financial services

HP Financial Services provides innovative financing and financial asset management programmes to help you cost-effectively acquire, manage and ultimately retire your HP solutions. For more information on these services, please contact your HP sales representative or visit: www.hp.com/go/hpfinancialservices

For more information

To learn more about the HP Smart Array controllers, please contact your local HP representative or visit: www.hp.com/products/smartarray

HP Services

When you buy HP ProLiant and BladeSystem servers, Smart Array controllers, storage and management software, it is also a good time to think about services.

Simplify implementation and support of your server solution

To streamline installation and enhance ongoing support, HP recommends the following set of service offerings.

Installation and Startup services

HP Services offers complete installation and implementation support – including global roll-out capabilities – to get your HP server-based solution up and running rapidly, with minimal business disruption. Options encompass all server options and storage for inclusion in the server, Microsoft and Linux operating software plus Insight Control software management solutions.

Hardware support

You can cover all the options installed in your server with a single convenient service package.

HP Care Pack services for HP ProLiant and BladeSystem servers as well as storage systems provide support for all HP-branded hardware options qualified for inclusion in your server at the time of purchase or afterwards. Any additional HP-qualified option installed within the server is covered at the same service level and for the same period as the server.

For more information visit:

www.hp.com/services/proliant
www.hp.com/services/bladesystem

Technical specifications
HP Smart Array P212
HP Smart Array P410
HP Smart Array P411
HP Smart Array P812


Data compatibility	Yes, future SAS Smart Array controllers	Yes, future SAS Smart Array controllers	Yes, future SAS Smart Array controllers	Yes, future SAS Smart Array controllers
Instant upgrades to other Smart Array controllers	Yes, SAS Smart Array controllers	Yes, SAS Smart Array controllers	Yes, SAS Smart Array controllers	Yes, SAS Smart Array controllers
Consistent software management tools	Yes	Yes	Yes	Yes
PCI bus	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8	PCIe 2.0 x8
PCI peak data transfer rate	2Gb/s	2Gb/s	2Gb/s	4Gb/s
SCSI protocol support	6Gb/s SAS/3Gb/s SATA	6Gb/s SAS/3Gb/s SATA	6Gb/s SAS/3Gb/s SATA	6Gb/s SAS/3Gb/s SATA
SCSI peak data transfer rate	6Gb/s per port	6Gb/s per port	6Gb/s per port	6Gb/s per port
Channels	8 SAS ports	8 SAS ports	8 SAS ports	24 SAS ports
Connectors (External/Internal)	1/1	0/2	2/0	4/2
Drives supported (Max)	32	64	64	108
Cache	0MB RAM, with available 256MB and BBWC upgrade	256MB DDR2- RAM, with available BBWC upgrade, 512MB BBWC and 512MB or 1G FBWC upgrades	256MB DDR2- RAM, with available BBWC upgrade, 512MB BBWC and 512MB or 1G FBWC upgrades	1G FBWC
RAID support	0, 1, 1+0, Optional 5, 5+0, 6 (ADG), 6+0	0, 1, 1+0, 5, 5+0. Optional 6 (ADG), 6+0	0, 1, 1+0, 5, 5+0. Optional 6 (ADG), 6+0	0, 1, 1+0, 5, 5+0, 6 (ADG), 6+0
Online spare support	Yes	Yes	Yes	Yes
BBWC enabler	Optional	Optional	Optional	No
I/O slot type	PCI-Express 2.0	PCI-Express 2.0	PCI-Express 2.0	PCI-Express 2.0
Flash Backed Write Cache (FBWC) enabler	No	Optional	Optional	Standard
QuickSpec URL	http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html	http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html	http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html	http://h18000.www1.hp.com/products/quickspecs/13558_div/13558_div.html

For information about HP Smart Array Advanced Pack, visit: http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html


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