Family data sheet

HP ProLiant Gen8 Smart Array Controllers

Increased performance, data availability, and storage capacity

February 2014

With data storage requirements growing along with government regulations for protecting sensitive data, your storage solution needs to meet a variety of needs. HP ProLiant Gen8 Smart Array Controllers improve your storage utilization and performance while delivering the scalability, reliability, and accessibility you require. Adding HP Secure Encryption helps you deal with data privacy challenges.

Reliability meets performance

Designed to enhance server uptime and maintain flexibility for future growth, HP Smart Array Controllers blend the reliability of SCSI with the performance advantages of serial architecture. In addition, the HP Smart Array controller family includes HP Smart Storage Administration (HP SSA), which is an advanced utility that allows you to perform many complex configuration tasks via a GUI, command line interface, or scripting.

The addition of HP SSA can help you configure array controllers, expand an existing array configuration by adding 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 disrupting the current workload.

With support for more than 432 TB[1] of total storage, HP Smart Array Controllers can help you meet the requirements of a broad range of applications. Moreover, by giving you extensive choices for server and storage deployment, these controllers provide high levels of flexibility and return on investment.

Key benefits

HP Smart Array Controllers are part of a modular set of HP Smart Array solutions that provide scalability and offer significant benefits that can help you make better use of your storage environment. Key benefits for your organization include:

Data protection
Keeps data available and server running while a failed drive is being replaced with HP Smart Array Controllers' fault tolerance features.

- Advanced Data Guarding (RAID 6) allocates two sets of parity data across drives. This level of fault tolerance can withstand a double drive failure without downtime or data loss. It requires a minimum of four drives.

- Advanced Data Mirroring (RAID 1) creates redundant copies of the data using three drives. This level of fault tolerance can withstand a double drive failure within a RAID 1 Advanced Data Mirroring (ADM) volume without downtime or data loss.

Data security
Protects sensitive, mission-critical data with encryption supported on HP Smart Array P430, P431, P830, P731m, and P230i controllers.

- HP Secure Encryption encrypts the data on the drives and keeps it from being deciphered without access to the data encryption key.

Use storage more effectively

Modular HP Smart Array solutions provide scalability and offer significant benefits that can help you make better use of your storage environment.

Data security

HP Secure Encryption is a simple, secure, key-based local and remote encryption solution that protects data at rest.

[1] 432 TB is derived using the P822 controller on a DL380x Gen8 server with a configuration of 12 LFF internal drives multiply by 4 TB HDD and 12 LFF multiply by 4 TB HDD in a total of eight D2600 Disk enclosures.

Top features

Data protection

Data security

Availability

Flexibility

Manageability

Fault prevention

Fault recovery

Consistency and upgradeability

Availability

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

- **Dual domain**—Creates redundant pathways for external drives from servers to storage devices. The redundant paths created by these configurations reduce or eliminate single points of failure within the storage network.
- **Online RAID-level migration (between any RAID level)**—Allows you to easily migrate to a new fault-tolerance (RAID) level without disrupting system operation.
- **Online stripe-size migration**—Enables easily changing the stripe size of an existing logical drive using the HP SSA, without taking the system offline.
- **Online capacity expansion**—Enables you to seamlessly increase capacity for your array while the server is still online, preserving maximum uptime.
- **Logical drive capacity extension with flash-backed write cache (FBWC)**—Enables you to increase the size of existing logical drives online.
- **Global online spare**—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 for replacement prior to failure.

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.

- **Mix and match drives**—Support for Serial Attached SCSI (SAS) and Serial ATA (SATA) drives gives you the flexibility to mix and match these drives in the same enclosure.
- **Your choice of brackets**—Full-size and low-profile brackets ship with the controller for added flexibility.

Manageability

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

- **Online drive flash**—Stage drive firmware updates for the next server reboot by downloading an updated drive firmware image to the HP Smart Array Controller and updates all your SAS hard disk drives (HDDs) the next time you reboot the server.
- **Remote monitoring and configuration**—With HP SSA 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 10 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 critical operation, as well as making it 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:

- **Predictive spare activation**—Moves data to an alternate device before failures occur to
  eliminate downtime and safeguard valuable data

- **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 before
  catastrophic failure occurs

- **Dynamic sector repairing**—Continually performs background surface scans on the drives
  during inactive periods and automatically remaps bad sectors, providing data integrity

Fault recovery
The HP Smart Array Controllers featuring RAID options and Advanced Data Mirroring (see the
technical specifications table on page 12 for more details) to 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 does
  occur, recovery begins with an online spare and data is reconstructed automatically, reducing
  the risk of additional drive failures, which could result in data loss.[2]

Consistency and upgradeability
HP Smart Array products utilize the same configuration, diagnostic, and management
tools—including HP SSA and HP Insight Manager—for storage and RAID management.

- **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 compatibility between models of HP Smart Array controllers**—Allows you to easily
  upgrade from an existing "just a bunch of disks" to future Smart Array SAS products for higher
  performance, capacity, and availability

[2] Online spares can only be used with RAID level 1,
10, and 5.

HP Smart Array Controller family

HP Smart Array P222 Controller—Advanced RAID functionality with standard 512 MB FBWC

The HP Smart Array P222 is a PCIe 3.0 low-profile, half-height, SAS RAID controllers with both internal and external ports. Tape drives are supported on this controller.

Key features
- Internal port:
  - 1 x 4 mini–SAS (four total SAS 6 Gb/s physical links)
- External port:
  - 1 x 4 mini–SAS (four total SAS 6 Gb/s physical links)
- x8 PCIe 3.0
- 512 MB FBWC (up to 3.2 GB/s maximum cache bandwidth)
- RAID 0, 1, 10, 5, 50, 6, 60, and RAID 1 ADM
- Dual domain
- Heal Array
- Advanced capacity expansion
- Offline/online mirror split
- Video on demand (VOD) performance optimization
- Move or delete individual logical unit numbers (LUNs)
- HP solid state drives (SSDs) Smart Path

HP Smart Array P430 and P420 Controllers—Advanced RAID functionality for uncompromising reliability, scalability, and a rich feature set to meet your specific storage needs

HP Smart Array P430 and P420 Controllers are PCIe 3.0 low-profile, half-height, SAS RAID controllers with internal ports.

Key features
- Internal port (P430):
  - 1 x 8 double-wide (eight total SAS 12 Gb/s capable physical links)
- Internal ports (P420):
  - 2 x 4 mini-SAS (eight total SAS 6 Gb/s physical links)
- x8 PCIe 3.0
- FBWC (P430)
  - 2 GB FBWC (up to 12.8 GB/s maximum cache bandwidth) or 4 GB FBWC (up to 14.9 GB/s maximum cache bandwidth)
- FBWC (P420)
  - 1 GB or 2 GB FBWC (up to 10.6 GB/s maximum cache bandwidth)
- RAID 0, 1, 10, 5, 50, 6, 60, and RAID 1 ADM
- Heal Array
- Advanced capacity expansion
- Offline/online mirror split
- VOD performance optimization
- Move or delete individual LUNs
- HP SSD Smart Path

Upgrade options
- HP Secure Encryption (optional for P430)
- HP SmartCache

Ideal environment

HP Smart Array Controllers are well-suited for SAS-based server and storage enclosures where high performance is critical. Typical uses include:

- File or print
- Domain controller
- Application servers—Mail, database, Web, and the cloud

HP Smart Array P431 and P421 Controllers—External connect cards that delivers
mission-critical reliability in an easy-to-use RAID solution

The HP Smart Array P431 and P421 Controllers are PCIe 3.0 low-profile, half-height, SAS RAID
controllers with external ports. These controllers can also support tape drives.

Key features
- External ports (P431):
  – 2 x 4 mini-SAS HD (eight total SAS 12 Gb/s capable physical links)
- External ports (P421):
  – 2 x 4 mini-SAS (eight total SAS 6 Gb/s physical links)

- x8 PCIe 3.0
- FBWC (P431)
  – 2 GB FBWC (up to 12.8 GB/s maximum cache bandwidth) or 4 GB FBWC (up to 14.9 GB/s
    maximum cache bandwidth)
- FBWC (P421)
  – 1 GB or 2 GB FBWC (up to 10.6 GB/s maximum cache bandwidth)
- RAID 0, 1, 10, 5, 50, 6, 60, and RAID 1 ADM
- Dual domain
- Heal Array
- Advanced capacity expansion
- Offline/online mirror split
- VOD performance optimization
- Move or delete individual LUNs
- HP SSD Smart Path

Upgrade options
- HP Secure Encryption (optional for P431)
- HP SmartCache

HP Smart Array P731m and P721m Controllers—PCIe 3.0 mezzanine card, direct-attached
SAS storage for HP ProLiant Gen8 BladeSystem servers

The HP Smart Array P731m and P721m Controllers support external zoned direct attached
and shared SAS storage. These controllers can also support tape drives. The HP Smart Array
P731m controller with the 512 MB FBWC and P721m Controller with the 512 MB FBWC are
for connectivity to the P2000 G3 or MSA 2040 storage. The P731m Controller with 2 GB
FBWC and the P721 Controller with 2 GB FBWC are for connecting to the D2600, D2700, or
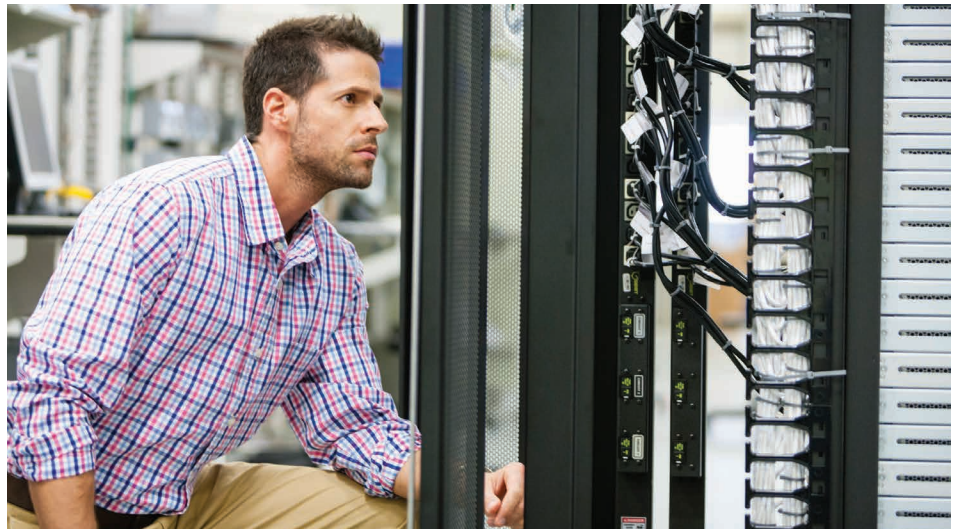D6000 enclosures.

Key features

• 4 x 2 ports to support up to four 6 Gb/s SAS switches (eight total SAS 6 Gb/s physical links)

• x8 PCIe 3.0

• FBWC (P731m)

  – 2 GB FBWC (up to 12.8 GB/s maximum cache bandwidth)

  – 512 MB FBWC (up to 6.4 GB/s maximum cache bandwidth)

• FBWC (P721m)

  – 2 GB FBWC (up to 10.6 GB/s maximum cache bandwidth)

  – 512 MB FBWC (up to 6.4 GB/s maximum cache bandwidth)

• RAID 0, 1, 10, 5, 50, 6, 60, and RAID 1 ADM

• Dual domain

• Heal Array

• Advanced capacity expansion

• Offline/online mirror split

• VOD performance optimization

• Move or delete individual LUNs

• HP SSD Smart Path

• HP SmartCache

Upgrade options

HP Secure Encryption (optional for P731m)

Supported by HP ProLiant Gen8 servers

HP Smart Array Controllers are supported on
our new HP ProLiant Gen8 servers—tower,
rack-mount, and HP BladeSystem servers.

HP Smart Array P822 Controller—A high-performance 24-port SAS RAID controller with
PCIe 3.0 for high levels of reliability for HP servers

The HP Smart Array P822 Controller is a PCIe 3.0 full-height, half-length, SAS RAID controller
with both internal and external ports. This controller supports up to 227 hard drives and also
supports tape drives.

Key features
• External ports:
  − 4 x 4 mini-SAS (16 total SAS 6 Gb/s physical links)
• Internal ports:
  − 2 x 4 mini–SAS (8 total SAS 6 Gb/s physical links)
• x8 PCIe 3.0
• 2 GB FBWC (up to 10.6 GB/s maximum cache bandwidth)
• RAID 0, 1, 10, 5, 50, 6, 60, and RAID 1 ADM
• Dual domain
• Heal Array
• Advanced capacity expansion
• Offline/online mirror split
• VOD performance optimization
• Move or delete individual LUNs
• HP SmartCache
• HP SSD Smart Path

HP Smart Array P830 Controller—A scalable SAS RAID controller for connecting a total
of 16 internal drives spanning two separate drive cages

The HP Smart Array P830 Controller is a full-height, half-length, 12 Gb/s SAS capable, PCIe 3.0,
RAID controller. It features 16 physical SAS/SATA lanes each supporting 12 Gb/s or 6 Gb/s SAS or
SATA protocol. Advanced storage functionality, such as Advanced Data Mirroring and Advanced
Data Guarding makes it easier to protect the data.

Key features
• 2 x 8 double-wide internal ports (16 total SAS 12 Gb/s capable physical links)
• x8 PCIe 3.0
• 4 GB FBWC (up to 14.9 GB/s maximum cache bandwidth)
• RAID 0, 1, 10 ,5, 50, 6, 60, and RAID 1 ADM
• Recovery ROM protects against ROM corruption
• Heal Array
• Advanced capacity expansion
• Offline/online mirror split
• VOD performance optimization
• Move or delete individual LUNs
• HP SSD Smart Path
• HP SmartCache

Upgrade options
HP Secure Encryption

HP Secure Encryption

HP Secure Encryption is a Smart Array controller-based data encryption solution for ProLiant Gen8 servers that protects sensitive, mission-critical data. This is an enterprise-class encryption solution for data at rest on any bulk storage attached (with the exception of tape or external arrays such as P2000 and MSA 2040) to the supported HP Smart Array Px3x family of controllers. The solution is available for both local and remote deployments. Many companies under government regulations require that sensitive data must be secured and not compromised. HP Secure Encryption provides encryption for data at rest—an important component for complying with government regulations like HIPAA and Sarbanes-Oxley both of which have data privacy requirements.

Benefits
• Data on the cache module of the HP Smart Array Px3x controllers, as well as the attached bulk storage is encrypted.

• Any HDD or SSD in the Smart Drive portfolio for HP Gen8 servers is supported.

• Easily scales with your business data growth. Local Key Management Mode provides a simple key management solution, using just HP SSA, Smart Array Px3x controllers, and Smart Array firmware v 1.50 or later. Remote Key Management Mode allows for the central management and secure key storage for all HP Secure Encryption related keys. The HP Enterprise Secure Key Manager 3.1 scales to more than 25,000 attached servers and millions of associated keys.

• Single interface of the HP Smart Storage Administrator also manages the cryptographic features of HP Secure Encryption.

HP Secure Encryption orderable part numbers:

HP Secure Encryption No Media Svr E-LTU (Global except China) D8S85AAE

HP Secure Encryption No Media Flexible License (China only) D8S84A

For more information, please visit: hp.com/go/hpsecureencryption

HP Smart Storage Administrator

HP Smart Storage Administrator offers a single interface that quickly sets up, configures, and manages a host's HP Smart Arrays and other storage devices, such as host bus adapters and SAS switch devices. It is the replacement for the existing HP Array Configuration Utility, with an updated design to enhance the HP ProLiant server storage experience, being phased in for industry standard products, and will expose new features and functionality for various HP Smart Storage initiatives as they come online. For more information please visit hp.com/go/hpssa.

HP SmartCache

HP SmartCache is a controller-based read caching solution in a direct attach storage environment that caches the most frequently accessed data ("hot" data) onto lower latency SSDs to dynamically accelerate application workloads. HP SmartCache is available as an option on the P-series HP Smart Array controllers either embedded on HP ProLiant Gen8 servers or on the standup controllers of HP Smart Array P430, P431, P420, P421, and P222 Controller models. HP SmartCache is included and does not require the purchase of a license on the HP Smart Array P830, P822, P731m/4 GB, P731m/2 GB, and P721m/2 GB Controller models.

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

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

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 through the same management tool for HP Smart Array—the HP SSA.

HP SmartCache orderable part numbers[3]

Physical—D7S26A	Electronic—D7S27AAE	Flexible—D7S27A

For more information, please visit: hp.com/go/smartcache

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[3] HP SmartCache (requires 1 GB FBWC min.; HP ProLiant supported HDDs and SSD)

HP SSD Smart Path

The HP SSD Smart Path feature included in the Smart Array software stack improves SSD read
performance. The Smart Array driver chooses the optimum path to access each SSD. With up
to 3.5X 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 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® Windows® Server 2008

• Microsoft Windows Server 2008 R2

• Microsoft Windows Server 2012

• Red Hat® Enterprise Linux 6.1, 6.2, 6.3, 6.4, and 6.5

• SUSE Linux Enterprise Server 11 (SP1, SP2, SPA)

• VMware ESXi 5.0 update 3

• VMware vSphere 5.1 update 2 and vSphere 5.5

For more information, please visit: hp.com/go/hpssa

Technical specifications

	HP Smart Array P222	HP Smart Array P420	HP Smart Array P430
Part number(s)	631667-B21	631670-B21 (1 GB FBWC) 631671-B21 (2 GB FBWC)	698529-B21 (2 GB FBWC) 698530-B21 (4 GB FBWC Kit)
Form factor	PCI-Express Low Profile	PCI-Express Low Profile	PCI-Express Low Profile
I/O slot type	PCI-Express 3.0	PCI-Express 3.0	PCI-Express 3.0
Number of PCI links	Eight	Eight	Eight
PCI link rate	8 Gb/s	8 Gb/s	8 Gb/s
Storage protocol support	SAS and SATA	SAS and SATA	SAS and SATA
SAS/SATA peak data transfer rate	6 Gb/s	6 Gb/s	6 Gb/s supported 12 Gb/s capable[8]
Number SAS/SATA links	Eight	Eight	Eight
SAS/SATA connectivity	1 x 4 port internal and 1 x 4 port mini-SAS external	2 x 4 ports mini-SAS internal	1 x 8 port double-wide internal
Expander support	Yes	Yes	Yes
Drives supported (max)[4]	Up to four internal; 200 drives external	60 internal	27 internal
I/O cache technology	3.2 GB/s	10.6 GB/s	12.8 GB/s (2 GB) or 14.9 GB/s (4 GB Kit)
Cache size	512 MB	1 GB or 2 GB	2 GB or 4 GB
Cache data width	40 bit	72 bit	72 bit
Online spare support	Yes	Yes	Yes
RAID support[5]	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM
Software management[6]	HP SSA, SIM, ORCA, ADU	HP SSA, SMH, SIM, ORCA	HP SSA, SMH, SIM, ORCA
Warranty	Three years parts only	Three years parts only	Three years parts only
HP Secure Encryption license	Not supported	Not supported	Supported
HP SmartCache license[7]	Not supported	Required unless an SAAP 2.0 license has been installed	Required unless an SAAP 2.0 license has been installed
HP SAAP 2.0 license	No longer available. HP Smart Array P222, P420, and P421 customers who previously purchased/installed an SAAP 2.0 license can enter that license key to enable HP SmartCache without the need to purchase a separate HP SmartCache license.		
HP Array Configuration Utility	Supported, but will no longer be updated for new features after July 2013. Please upgrade to HP SSA.		

Technical specifications (continued)

	HP Smart Array P421	HP Smart Array P431	HP Smart Array P822
Part number(s)	631673-B21 (1 GB FBWC) 631674-B21 (2 GB FBWC)	698531-B21 (2 GB FBWC) 698532-B21 (4 GB FBWC)	615418-B21
Form factor	PCI-Express Low Profile	PCI-Express Low Profile	PCI-Express standard-height, half-length
I/O slot type	PCI-Express 3.0	PCI-Express 3.0	PCI-Express 3.0
Number of PCI links	Eight	Eight	Eight
PCI link rate	8 Gb/s	8 Gb/s	8 Gb/s
Storage protocol support	SAS and SATA	SAS and SATA	SAS and SATA
SAS/SATA peak data transfer rate	6 Gb/s	6 Gb/s supported 12 Gb/s capable[8]	6 Gb/s
Number SAS/SATA links	Eight	Eight	Eight
SAS/SATA connectivity	2 x 4 ports mini-SAS external	2 x 4 ports mini-SAS HD external	2 x 4 ports mini-SAS internal; 4 x 4 ports external
Expander support	Yes	Yes	Yes
Drives supported (max)[4]	200 external	200 external	27 internal; 200 external
I/O cache technology	10.6 GB/s	12.8 GB/s (2 GB) 14.9 GB/s (4 GB)	12.8 GB/s
Cache size	1 GB or 2 GB	2 GB or 4 GB	2 GB
Cache data width	72 bit	72 bit	72 bit
Online spare support	Yes	Yes	Yes
RAID support[5]	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM
Software management[6]	HP SSA, SMH, SIM, ORCA	HP SSA, SMH, SIM, ORCA	HP SSA, SMH, SIM, ORCA
Warranty	Three years parts only	Three years parts only	Three years parts only
HP Secure Encryption license	Not supported	Supported	Not supported
HP SmartCache license[7]	Required unless an SAAP 2.0 license has been installed	Required unless an SAAP 2.0 license has been installed	Standard, license is not required
HP SAAP 2.0 license	No longer available. HP Smart Array P222, P420, and P421 customers who previously purchased/installed an SAAP 2.0 license can enter that license key to enable HP SmartCache without the need to purchase a separate HP SmartCache license.		
HP Array Configuration Utility	Supported, but will no longer be updated for new features after July 2013. Please upgrade to HP SSA.		

Technical specifications (continued)

	HP Smart Array P830	HP Smart Array P721m	HP Smart Array P731m
Part number(s)	698533-B21	650072-B21 (2 GB FBWC) 655636-B21 (512 MB FBWC)	698535-B21 (2 GB FBWC) 698536-B21 (512 MB FBWC)
Form factor	PCI-Express full-height, half-length	Type B Mezzanine	Type B Mezzanine
I/O slot type	PCI-Express 3.0	PCI-Express 3.0	PCI-Express 3.0
Number of PCI links	Eight	Eight	Eight
PCI link rate	8 Gb/s	8 Gb/s	8 Gb/s
Storage protocol support	SAS and SATA	SAS and SATA	SAS and SATA
SAS/SATA peak data transfer rate	6 Gb/s supported 12 Gb/s capable[8]	6 Gb/s	6 Gb/s supported 12 Gb/s capable[8]
Number SAS/SATA links	16	8	8
SAS/SATA connectivity	2 x 8 ports double-wide internal	4 x 2 ports	4 x 2 ports
Expander support	Yes	Yes	Yes
Drives supported (max)[4]	16 internal	227 external	227 external
I/O cache technology	14.9 GB/s	10.6 GB/s	12.8 GB/s
Cache size	4 GB	512 MB or 2 GB	2 GB
Cache data width	72 bit	72 bit	72 bit
Online spare support	Yes	Yes	Yes
RAID support[5]	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM	0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM	1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM
Software management[6]	HP SSA, SMH, SIM, ORCA, VSM	HP SSA, SMH, SIM, ORCA, VSM	HP SSA, SMH, SIM, ORCA, VSM
Warranty	Three years parts only	Three years parts only	Three years parts only
HP Secure Encryption license	Supported	Not supported	Supported
HP SmartCache license[7]	Standard, license is not required	Standard, license is not required (P721m/2 GB model only)	Standard, license is not required (P731m/2 GB model only)
HP SAAP 2.0 license	No longer available. HP Smart Array P222, P420, and P421 customers who previously purchased/installed an SAAP 2.0 license can enter that license key to enable HP SmartCache without the need to purchase a separate HP SmartCache license.		
HP Array Configuration Utility	Supported, but will no longer be updated for new features after July 2013. Please upgrade to HP SSA.		

[4] The maximum number of drives supported is dependent on the server the controller attaches to or the external storage box it attaches to. Please refer to the server QuickSpecs or to the external storage box to determine the maximum number of drives it can support.
[5] RAID 5, 50, 6, and 60 require a minimum of 512 MB FBWC to run.
[6] HP Smart Storage Administrator (HP SSA); HP Systems Insight Manager; HP Option ROM Configuration for Arrays (ORCA); Array Diagnostic Utility (ADU).
[7] Requires a minimum of 1 GB FBWC; HP ProLiant Gen8 supported HDDs and SSDs.
[8] Requires 12 Gb/s infrastructure to experience the increased performance.

Customize your IT lifecycle management from acquisition of new IT, management of existing assets, and removal of unneeded equipment.
hp.com/go/hpfinancialservices

Resources

To learn more about the HP Smart Array Controllers visit:
hp.com/go/smartarray

For information about HP Smart Array Advanced Pack visit:
hp.com/go/SAAP

For information about HP SmartCache visit:
hp.com/go/SmartCache

For information about HP SSD Smart Path visit:
hp.com/go/ssdsmartpath

For information about HP ProLiant visit:
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For information about HP Storage visit:
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HP Factory Express

HP Factory Express provides customization and deployment services along with your storage and server purchases. You can customize hardware to your exact specifications in the factory—helping to speed deployment. Visit: hp.com/go/factoryexpress

Customer technical training

Gain the skills you need with HP ExpertOne training and certification from HP. With HP ProLiant training, you will accelerate your technology transition, improve operational performance, and get the best return on your HP investment. Our training is available when and where you need it, through flexible delivery options and a global training capability. Visit: hp.com/learn/proliant

HP 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 offer complete installation and implementation support—including global rollout capabilities—to get your HP 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 HP 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 HP BladeSystem servers, as well as HP 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.

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4AA2-4101ENW, February 2014, Rev. 8