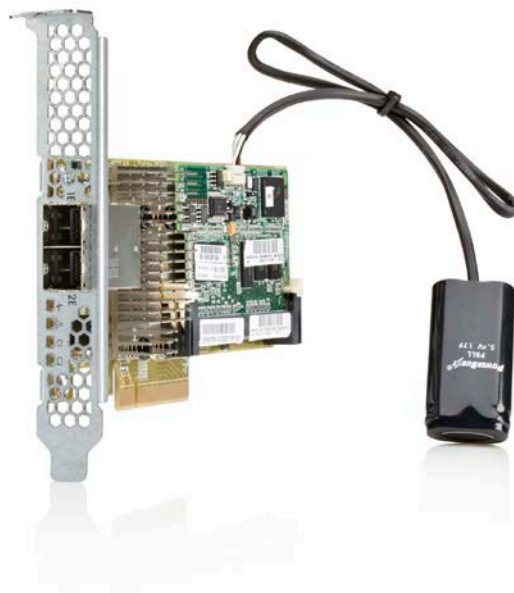


Overview

HPE Smart Array P431 Controller

The HPE Smart Array P431 Controller is a low profile, PCIe x8, 12Gb/s capable Serial Attached SCSI (SAS) RAID controller that provides enterprise class storage performance, increased external scalability, and data protection for select HPE ProLiant Gen8 rack and tower servers. It features eight external physical links and delivers increased server uptime by providing advanced storage functionality, including online RAID level migration (between any RAID levels) with flash back write cache (FBWC), global online spare, and pre-failure warning. Data compatibility between HPE Smart Array Controllers means customers can easily upgrade to future Smart Array Controllers.



What's New

- HPE Smart Array P431 with 4GB Flash Backed Write Cache module kit
- HPE Secure Encryption is supported on the P431 as an option
- 12Gb/s SAS performance when used on a DL580 Gen8 with the MSA 2040 Storage or the D3000 Enclosures

Models

HPE Smart Array P431 Controller HP Smart Array P431/2GB FBWC 12Gb 2-ports Ext SAS Controller

698531-B21

Standard Features

Key Features

- Storage interface (SAS/SATA)
 - 8 physical links across 2 x4 external ports
 - 12Gb/s SAS, 6Gb/s SATA technology
 - Mix-and-match SAS and SATA drives to the same controller
 - Support for SAS tape drives, SAS tape autoloaders and SAS tape libraries
- 2 GiBytes or 4 GiBytes Flash-Backed Write Cache (FBWC)
- PCI Express Gen3 x8 link
- RAID 0, 1, 10, 5, 50, 6, 60, 10 ADM (Advanced Data Mirroring)
- Legacy and UEFI boot operation
- Up to 200 physical drives
- Up to 64 logical drives
- HPE SmartCache (optional license)
- HPE Secure Encryption (optional license)
- FIPS 140-2 validation complete (certificate #2506)
- HPE SSD Smart Path
- VMware Virtual SAN certified
- Rapid Parity Initialization (RPI)
- Rapid rebuild
- Drive Erase
- Performance Optimization-Degraded Reads and Read Coalescing
- Power Efficiency
- Seamless upgrades to and from other HPE Smart Array controllers
- Recovery ROM to protect against controller ROM corruption
- Low-profile standard PCI Express plug-in card
 - Ships with a full size and a low profile bracket
 - Dimensions (excluding bracket): 7.5 in x 9.5 in x 2.25 in (19.05 cm x 24.13 cm x 5.72 cm)

Ports

- External: 8 SAS/SATA physical links across 2 x4 ports

Performance

- 12Gb/s SAS (1200 MB/s theoretical bandwidth per physical lane)
- 6Gb/s SATA (600 MB/s theoretical bandwidth per physical lane)
- PCI Express Gen3 x8 link width
- 4 GiBytes 72-bit wide DDR3-1866MHz Flash Back Write Cache provides up to 14.9GB/s maximum cache bandwidth
- 2 GiBytes 72-bit wide DDR3-1600MHz Flash Backed Write Cache provides up to 12.8GB/s maximum cache bandwidth
- Read ahead caching
- Write-back caching

Online Management Features

- Online array expansion
- Online capacity expansion
- Online logical drive extension
- Online RAID level migration
- Online stripe size migration
- Online mirror split, recombine, and rollback
- Online active drive replacement
- Online drive firmware upgrade
- Online and high performance offline Rapid Parity Initialization (RPI)
- Unlimited global online spares assignment
- User selectable expand and rebuild priority
- User selectable RAID level and stripe size
- User selectable read and write cache sizes

Standard Features

- Supports Predictive Spare Activation
-

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) was first developed by HPE which detects possible hard disk failure before it occurs, allowing replacement of the component 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, ensuring data integrity.
 - Smart Array Cache Tracking monitors integrity of controller cache, allowing pre-failure preventative maintenance.
 - Environment Tracking for External Storage System: Monitors fan speed and cabinet temperature of Modular Smart Array Enclosures and HPE Disk Enclosures.
-

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.
-

HPE SSD Smart Path

The HPE 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, HPE SSD Smart Path chooses the optimum path to the SSD and accelerates reads for all RAID levels and RAID 0 writes. HPE SSD Smart Path requires updated firmware, drivers, and configuration utility available at:

<http://www.hp.com/go/hpssa>. HPE SSD Smart Path is ideal for read intensive workloads and is included as a base feature on HPE Smart Array P-series controllers. The following operating systems are supported by the HPE SSD Smart Path feature.

HPE SmartCache

The HPE SmartCache 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 HPE SmartCache architecture is flexible and supports any HPE ProLiant Gen8 supported HDD for bulk storage and any HPE ProLiant Gen8 supported SSD as an accelerator. HPE SmartCache is deployed and managed using the HPE Smart Storage Administrator (HPE SSA). HPE SmartCache is an optional license (see Related Options for more information on the license).

For more information please visit: <http://www.hpe.com/servers/smartcache>

HPE Secure Encryption

HPE Secure Encryption is a Smart Array controller-based data encryption solution for ProLiant Gen9 servers that protects sensitive, mission critical data. This is an enterprise-class encryption solution for data at rest on any bulk storage attached to the HPE Smart Array controllers including data on the cache memory of the controller. HPE Secure Encryption is an optional license per server requiring encryption enablement (see Related Options for more information on the license).

The solution is available for both local and remote key management mode deployments. Local Key Management Mode is focused on single server deployment where there is one Master key per controller that is managed by the user. Remote Key Management Mode is for enterprise wide deployments from just a few servers to thousands of servers.

Standard Features

For more information please visit <http://www.hp.com/go/hpsecureencryption>

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 HPE Support Center or refer to your HPE 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 HPE System level to which this product attaches.

Compatibility

Server Support

HPE ProLiant DL360e Gen8
 HPE ProLiant DL360p Gen8
 HPE ProLiant DL380e Gen8
 HPE ProLiant DL380p Gen8
 HPE ProLiant DL385p Gen8
 HPE ProLiant DL388e Gen8

HPE ProLiant DL560 Gen8
 HPE ProLiant DL580 Gen8
 HPE ProLiant DL580 Gen9
 HPE ProLiant ML350e Gen8
 HPE ProLiant ML350p Gen8

Disk Enclosure Support

HPE D2600 Disk Enclosure
 HPE D2700 Disk Enclosure
 HPE D3600 Disk Enclosure
 HPE D3700 Disk Enclosure

HPE D6000 Disk Enclosure
 HPE MSA 2040 SAN Storage

Operating Systems

Microsoft Windows Server 2008 R2
 Microsoft Windows Server 2012 / 2012 R2
 Red Hat Enterprise Linux 5 / 6 / 7
 SUSE Linux Enterprise Server 11 / 12
 VMware ESXi 5.0 / 5.1
 VMware vSphere 5.5 / 6.0

NOTE: For more information on HPE'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 and certification information, please visit:

<http://h18004.www1.hp.com/products/servers/linux/hplinuxcert.html>

Storage Management Software Suite

HPE Smart Storage Administrator (HPE SSA)

Comprehensive management for HPE Smart Storage products with advanced scripting and diagnostic features and simplified and intuitive interface and functionality. For more information please visit:

<http://www.hpe.com/servers/ssa>

HPE Systems Insight Manager

Powerful server and server options/storage manager tool with configuration/diagnostic utilities

HPE Storage Management Utility

Offers the simplest method for configuring the storage system via Initial System Configuration Wizard

Service and Support

Service and Support

HPE Technology Services

Capitalizing on HPE ProLiant server and HPE 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 Hewlett Packard Enterprise infrastructure hardware and software best - the experienced professionals at HPE Services.

Protect your business beyond warranty with HPE Care Pack Services

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

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

Recommended HPE Care Pack Services for your HPE product

Optimized Care

3-Year HPE 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.

<https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855EEE.pdf>

HPE Installation of ProLiant Add On Options Service

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

Standard Care

3-Year HPE 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 HPE's vast global resources.

<https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855EEE.pdf>

HPE Installation of ProLiant Add On Options Service

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

Related Services

HPE 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 HPE Proactive Care Support.

HPE Proactive Select Service

Provides a flexible way to purchase HPE 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.

<https://www.hpe.com/h20195/V2/GetPDF.aspx/4AA2-3842ENN.pdf>

Service and Support

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

Insight Online/Insight Remote Support

HPE Insight Remote Support provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. This comes at no additional cost with your HPE 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>.

HPE Support Center

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

The HPE 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.

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

NOTE: The HPE Support Center Mobile App is subject to local availability

Parts and materials

Hewlett Packard Enterprise will provide HPE-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 HPE due to malfunction.

For more information

To learn more on services for HPE ProLiant servers, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized ServiceOne Channel Partner. Or visit: <http://www.hp.com/services/proliant>

Related Options

HPE SmartCache	<p>HPE SmartCache No Media 24x7 Technical Support 1-server LTU D7S26A</p> <p>Single-Server License Used to purchase a license for one server. Contains one license per server, a printed license entitlement certificate, end user license agreement, and license key installation card delivered 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 HPE Software Technical Support Services.</p> <p>HPE SmartCache No Media 24x7 Technical Support Flexible LTU D7S27A</p> <p>Flexible-Quantity License Used to purchase multiple licenses with a single activation key. Contains license(s) for a customer defined quantity of servers, a license entitlement certificate for the quantity of licenses purchased, end user license agreement, and license key installation card delivered 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 HPE Software Technical Support Services.</p> <p>HPE SmartCache No Media 24x7 Technical Support E-LTU D7S27AAE</p> <p>Flexible-Quantity Electronic License Used to purchase multiple licenses with a single activation key. Contains license(s) for a customer defined quantity of servers, a license entitlement certificate for the quantity of licenses purchased, end user license agreement, and license key installation information delivered 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 HPE Software Technical Support Services.</p> <p>For more information please visit: http://www.hpe.com/servers/smartcache</p>
HPE Secure Encryption	<p>HP Secure Encryption per Svr Entitlement C9A82AAE</p> <p>NOTE: HPE Secure Encryption licensing is based on the number of servers requiring encryption for direct attached storage.</p> <p>For more information visit: http://www.hp.com/go/hpsecureencryption</p>
HPE External Cable Options	<p>External Cable Options to be used with MSA 2040 Storage</p> <p>HP External 0.5m (1ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable 691968-B21</p> <p>HP External 1.0m (3ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable 716195-B21</p> <p>HP External 2.0m (6ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable 716197-B21</p> <p>HP External 4.0m (13ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable 716199-B21</p> <p>External Cable Options to be used with D2000 and D6000 Disk Enclosures</p> <p>HP 0.5m External Mini SAS High Density to Mini SAS Cable 691971-B21</p> <p>HP 1.0m External Mini SAS High Density to Mini SAS Cable 716189-B21</p> <p>HP 2.0m External Mini SAS High Density to Mini SAS Cable 716191-B21</p> <p>HP 4.0m External Mini SAS High Density to Mini SAS Cable 716193-B21</p> <p>HP 6.0m External Mini SAS High Density to Mini SAS Cable 733045-B21</p>

Summary of Changes

Date	Version History	Action	Description of Change
2-Sep-2016	From Version 4 to 5	Changed	Standard Features, Compatibility and Related Options were revised.
10-Jun-2014	From Version 3 to 4	Added	HPE D3000 Disk Enclosures was added to Related Options.
		Changed	What's New section was updated. Standard Features was revised. Updates made to HPE External Cable Options.
		Removed	HPE Smart Array P431/4GB FBWC 12Gb 2-ports Ext SAS Controller was removed from Models overview.
18-Apr-2014	From Version 2 to 3	Changed	Related Options and Technical Specifications were revised.
18-Feb-2014	From Version 1 to 2	Changed	Changes made to the following Sections Overview Service And Support Related Options Technical Specifications



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