QuickSpecs

Overview

HPE Smart Array P431 Controller

The HPE Smart Array P431 Controller is a low profile, PCIe3 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.

HPE Smart Array P431 Controller

Models

HPE Smart Array P431/4GB FBWC 12Gb 2-ports Ext SAS Controller (Recommended)	698532-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
	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)
	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
	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
	Supports Predictive Spare Activation

Standard Features

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: **https://www.hpe.com/us/en/product-catalog/detail/pip.5409020.html**. 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. For more information please visit **https://www.hpe.com/us/en/product-catalog/detail/pip.6532260.html**

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 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, please visit our Support Matrix at: **http://www.hpe.com/info/ossupport**

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

HPE Support Services	Protect your business beyond warranty with HPE Support Services HPE Pointnext provides a comprehensive portfolio including Advisory and Transformational, Professional, and Operational Services to help accelerate your digital transformation. From the onset of your transformation journey, Advisory and Transformational Services focus on designing the transformation and creating a solution roadmap. Professional Services specializes in creative configurations with flawless and on-time implementation, and on-budget execution. Finally, operational services provides innovative new approaches like Flexible Capacity and Datacenter Care, to keep your business at peak performance. HPE is ready to bring together all the pieces of the puzzle for you, with an eye on the future, and make the complex simple.
Recommended Support	**HPE Proactive Care* with 24x7 coverage, three year Support Service** HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice. This Service combines three years proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your HPE servers. **https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf** **HPE Proactive Care* with 6 hour call-to-repair commitment, three year Support Service** HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice. This Service combines three years' proactive reporting and advice with our highest level of hardware support - HPE's 24x7, six hour hardware call-to-repair. HPE is the only leading manufacturer who makes this level of coverage available as a standard service offering for your most valuable servers. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your HPE servers. **https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf** *HPE Proactive Care and HPE Proactive Care Advanced require that the customer connect their devices to make the most of these services and receive all the deliverables.
HPE Education Services	Keep your IT staff trained making sure they have the right skills to deliver on your business outcomes. Book on a class today and learn how to get the most from your technology investment. **http://www.hpe.com/ww/learn**
HPE Support Center	The HPE Support Center is a personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers. Learn more **http://www.hpe.com/support/hpesc** HPE'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. HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Support Service or HPE contractual support agreement. *HPE Support Center Mobile App is subject to local availability

Service and Support

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 quick-specs, 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 Hewlett Packard Enterprise due to malfunction.
Related Services	**HPE Server Hardware Installation** Provides for the basic hardware installation of HPE branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. **https://www.hpe.com/h20195/V2/GetPDF.aspx/5981-9356EN.pdf** **HPE Installation and Startup Service** provides for the installation and startup of HPE technology including BladeSystems, C-Class enclosure, HPE ProLiant c-Class and Integrity server blades, storage blades, SAN switch blades, HPE Virtual Connect modules (Ethernet and Fibre Channel), Ethernet network interconnects, and InfiniBand, as well as the installation of one supported operating system type (Windows® or Linux). **NOTE:** This controller is covered under the HPE Service Contract applied to the HPE ProLiant Server. No separate HPE support services need to be purchased. • Warranty and Support Services will extend to include HPE options configured with your server or storage device. The price of support service is not impacted by configuration details. HPE sourced options that are compatible with your product will be covered under your server support at the same level of coverage allowing you to upgrade freely. Installation for HPE options is available as needed. To keep support costs low for everyone, some high value options will require additional support. Additional support is only required on select high value workload accelerators, fibre switches, InfiniBand and UPS batteries over 12KVA. See the specific high value options that require additional support **HERE**.
Recommended Option	This controller is a Recommended Option. Offering the best combination of performance, value and availability, Recommended Options have been selected by HPE experts to provide the right technology for a range of workloads and market segments.
Additional Service Information	**http://www.hpe.com/services**

Related Options

HPE SmartCache	HPE Smart Array SR SmartCache (Single Key/Single Server) LTU	D7S26A

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.

	HPE Smart Array SR SmartCache (Single Key/Multiple Servers) LTU	D7S27A

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.

	HPE Smart Array SR SmartCache (Single Key/Multiple Servers) E-LTU	D7S27AAE

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.

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

HPE Secure Encryption	HPE Secure Encryption per Svr Entitlement	C9A82AAE

NOTE: HPE Secure Encryption licensing is based on the number of servers requiring encryption for direct attached storage.
For more information visit: **https://www.hpe.com/us/en/product-catalog/detail/pip.6532260.html**

HPE External Cable Options	**External Cable Options to be used with MSA 2040 Storage**	
	HPE External 0.5m (1ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable (Extended)	691968-B21
	HPE External 1.0m (3ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable (Recommended)	716195-B21
	HPE External 2.0m (6ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable (Recommended)	716197-B21
	HPE External 4.0m (13ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable (Extended)	716199-B21
	External Cable Options to be used with D2000 and D6000 Disk Enclosures	
	HPE 0.5m External Mini SAS High Density to Mini SAS Cable (Extended)	691971-B21
	HPE 1.0m External Mini SAS High Density to Mini SAS Cable (Recommended)	716189-B21
	HPE 2.0m External Mini SAS High Density to Mini SAS Cable (Recommended)	716191-B21
	HPE 4.0m External Mini SAS High Density to Mini SAS Cable (Extended)	716193-B21

Summary of Changes

Date	Version History	Action	Description of Change
04-Jun-2018	Version 7	Changed	Model, Compatibility, Service and Support and Related Options were updated.
23-Oct-2017	Version 6	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
2-Sep-2016	Version 5	Changed	Standard Features, Compatibility and Related Options were revised.
10-Jun-2014	Version 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	Version 3	Changed	Related Options and Technical Specifications were revised.
18-Feb-2014	Version 2	Changed	Changes made to the following Sections Overview Service And Support Related Options Technical Specifications
10-Sep-2013	Version 1	New	Initial version

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