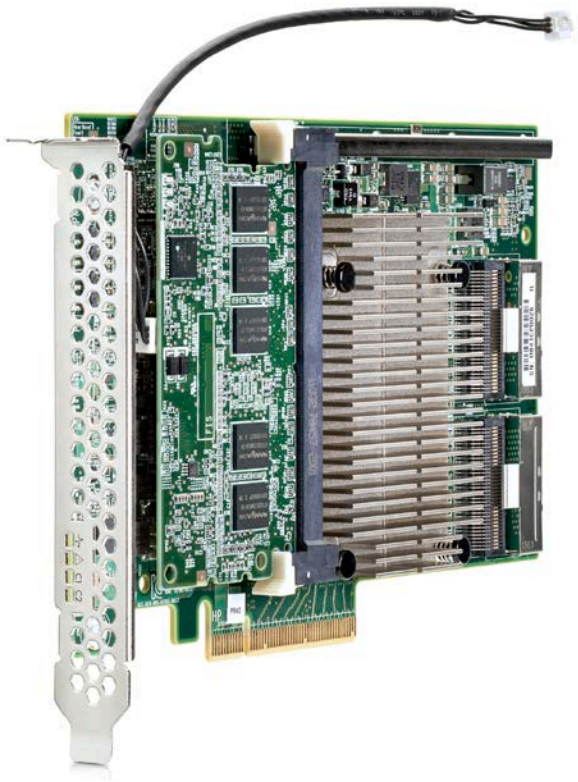
Overview

HPE Smart Array P840 Controller

The HPE Smart Array P840 Controller is a full height, PCIe3 x8, 12Gb/s SAS RAID controller that provides enterprise-class storage performance, increased internal scalability, and data protection for HPE ProLiant Gen9 rack and tower servers. It features 16 internal physical links and delivers increased server uptime by providing advanced storage functionality, including online RAID level migration between any RAID levels with FBWC, global online spare, and pre-failure warning. This controller supports 16 drives without need for the SAS Expander Card providing point to point connectivity to SSDs for lower latency. This controller has transportable FBWC allowing the data in the cache to be migrated to a new controller.

The Gen9 controllers support the HPE Smart Storage Battery that allows multiple Smart Array controllers to be supported, resulting in simple upgrade process.



Models

HPE Smart Array P840 Controller	HP Smart Array P840/4GB FBWC 12Gb 2-ports Int SAS Controller	726897-B21

NOTE: HPE Smart Array P840/4GB FBWC controller option kit does not include the HPE Smart Storage Battery the backup power source necessary to protect the data on the Flash-backed Write Cache. HPE Smart Storage Battery is an item that has to be purchased separately if this is the first P-series Smart Array controller on your Gen9 server.

Standard Features

Key Features

- Storage interface (SAS/SATA)
  - 16 physical links across 2 x8 internal 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)
- RAID or HBA mode
- Legacy and UEFI boot operation
- Up to 200 physical drives
- Up to 64 logical drives
- HPE SmartCache (license included)
- HPE Secure Encryption (optional license)
- 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
- Full-height, half-length standard PCI Express plug-in card
  - Dimension (excluding bracket): 6.6 in x 4.4 in x 0.6 in (16.8 cm x 11.1 cm x 1.5 cm)

Ports

- Internal: 16 SAS/SATA physical links across 2 x8 port

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 DDR3-1866 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

Standard Features

- User selectable read and write cache sizes
- 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 first developed at HPE 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.

Fault Recovery

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

- Recovery ROM: This feature provides unique redundancy that protects from a ROM image corruption. A new version of firmware can be flashed to the ROM while the controller maintains the last known working version of firmware. If the firmware becomes corrupt, the controller will revert back to the previous version of firmware and continue operating. This reduces the risk of flashing firmware to the controller.
- 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 corrects against single bit data and address corruption.

HPE SmartCache

The HPE SmartCache feature is a controller-based read and write 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 Gen9 supported HDD for bulk storage and any HPE ProLiant Gen9 supported SSD as an accelerator. HPE SmartCache is deployed and managed using the HPE Smart Storage Administrator (HPE SSA). HPE SmartCache license comes standard with the P840 controller.

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 on please visit: **http://www.hpe.com/servers/secureencryption**

HPE SSD Smart Path

The HPE SSD Smart Path feature included in the Smart Array software stack improves Solid State Disk

Standard Features

(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.hpe.com/servers/ssa**. HPE SSD Smart Path is ideal for read intensive workloads and is included as a base feature on HPE Smart Array P-series controllers.

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 DL80 Gen9
HPE ProLiant DL180 Gen9
HPE ProLiant DL360 Gen9
HPE ProLiant DL380 Gen9
HPE ProLiant DL560 Gen9
HPE ProLiant ML110 Gen9
HPE ProLiant ML150 Gen9
HPE ProLiant ML350 Gen9
Apollo 4500

Operating Systems

Microsoft Windows Server
Microsoft Windows Hyper-V Server
VMware vSphere ESXi
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Oracle Solaris
Oracle Linux
Canonical Ubuntu
CentOS
Wind River
Citrix XenServer

NOTE: For a complete and up-to-date list of certified and supported OS versions for HPE Smart Array controllers, please refer to the HPE Smart Array Operating System Support Matrix at: **http://www.hpe.com/h20195/v2/GetPDF.aspx/4AA6-6550ENW.pdf**

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

Service and Support

HPE Technology Services

Capitalizing on HPE ProLiant server and HPE BladeSystem capabilities require 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 optimal satisfaction with 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

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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

Service and Support

	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** **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. *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 Channel Partner. Or visit: **http://www.hp.com/services/proliant**.

Related Options

HPE Secure Encryption	HP Secure Encryption per Svr Entitlement **NOTE:** HPE Secure Encryption licensing is based on the number of servers requiring encryption for direct attached storage. For more information visit: **http://www.hp.com/go/hpsecureencryption**	C9A82AAE
HPE Smart Storage Battery	HP 96W Smart Storage Battery with 145mm Cable for DL/ML/SL Servers **NOTE:** HPE 96W Smart Storage Battery provides backup power for up to 16 HPE Smart Array controllers or other devices.	727258-B21
HPE Cable Options	For a list of SAS cables for this controller, please refer to the HPE Smart Storage Cables compatibility matrix. **http://www.hpe.com/h20195/v2/GetPDF.aspx/4AA5-4154ENW.pdf**	

Summary of Changes

Date	Version History	Action	Description of Change
19-Aug-2016	From Version 2 to 3	Changed	Overview, Standard Features, Compatibility, and Related Options were revised.
01-Dec-2014	From Version 1 to 2	Added	Added note to endorse the HPE Smart Array P840/4GB FBWC controller option kit does not include the HPE Smart Storage Battery. HPE Cable Options and HPE Smart Storage Battery were added to Related Options section.



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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.

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