

Overview

HPE Smart Array P542D Controller

The HPE Smart Array P542D Controller is a PCI-Express (PCIe) 3.0 mezzanine, 12Gb/s Serial Attached SCSI (SAS) RAID controller that supports internal and direct attached storage. It provides enterprise-level reliability, connectivity, and performance for HPE Synergy compute and storage modules, and HPE ProLiant XL270d server through its support of the latest SCSI technology and advanced RAID capabilities. The controller supports 2GB flash-backed write cache (FBWC) to maximize data retention in case of a power failure. It features eight external physical links and eight internal physical links within four ports to deliver increased compute module uptime by providing advanced storage functionality, including online RAID level migration with FBWC, global online spare, and pre-failure alert.



Models

HPE Smart Array P542D/2GB FBWC 12Gb Mezzanine SAS Controller	759557-B21
HPE Smart Array P542D/2GB Controller for ProLiant XL270d Gen9 Server	851508-B21

Kit Contents

HPE Smart Array P542D/2GB FBWC 12Gb Mezzanine SAS Controller 759557-B21

The Smart Storage Battery and SAS cable are not included with this HPE Smart Array P542D Controller (759557-B21). The Smart Storage Battery is required by the Smart Array P542D Controller when configured in RAID mode. Only one Smart Storage Battery is required per Synergy Compute Module, thus you can use the Smart Storage Battery that was included with the Smart Array P240nr controller. The SAS cable is only required when attaching to the internal compute SAS/NVMe backplane.

HPE Smart Array P542D/2GB Controller for ProLiant XL270d Gen9 Server 851508-B21

The Smart Storage Battery and SAS cable for the internal drives on ProLiant XL270d server are included with this HPE Smart Array P542D Controller (851508-B21).

Standard Features

Key Features

- Storage interface (SAS/SATA)
 - 16 physical links 2 x4 internal ports and 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 Flash-Backed Write Cache (FBWC)
- PCI Express Gen3 x8 link
- RAID 0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM
- RAID or HBA mode
- Legacy and UEFI boot operation
- Up to 71 physical drives
- Up to 64 logical drives
- HPE SmartCache (optional license)
- HPE Secure Encryption (optional license)
- HPE SSD Smart Path
- Rapid rebuild

Ports

- **Internal:** 8 SAS/SATA physical links across 2 x4 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
- 2 GiBytes 72-bit wide DDR3-1866MHz 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
- Supports Predictive Spare Activation
- Pre-Failure Alerts

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 Hewlett Packard Enterprise detects possible hard disk failure before it occurs, allowing replacement of the component before failure occurs.
- Dynamic Sector Repairing continually performs background surface scans on the hard disk drives during inactive periods and automatically remaps bad sectors, ensuring data integrity.

Standard Features

- 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 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 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 server supported HDD for bulk storage and any server supported SSD as an accelerator. HPE SmartCache is an optional license (see **Related Options** for more information on the license). HPE SmartCache is deployed and managed using the HPE Smart Storage Administrator (HPE SSA).

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 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 P542D controller 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 <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 (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. Please note, FBWC must be disabled for HPE SSD Smart path to be operational.

Compatibility

Server Support

HPE Synergy 480 Gen9 Compute Modules
HPE Synergy 620 Gen9 Compute Modules
HPE Synergy 660 Gen9 Compute Modules
HPE Synergy 680 Gen9 Compute Modules

HPE ProLiant XL270d Gen9

Operating System Support

Microsoft Windows Server
Microsoft Windows Hyper-V Server
VMware vSphere ESXi
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)

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 Servers and Compute Modules and Servers for OS, and latest listing of software drivers available for your server, 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

Parts and materials

HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered

Service and Support

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 HPE 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. Fully integrated into the ProLiant management and security experience, Recommended Options provide the best fit with timely availability.

Additional Service Information

<http://www.hpe.com/services>

Related Options

HPE Smart Storage Battery	<p>HPE Smart Storage Battery with 260mm Cable Kit P01367-B21</p> <p>NOTE: The Smart Storage Battery and SAS cable are not included with the HPE Smart Array P542D Controller option kit (759557-B21) for Synergy Compute Module. The Smart Storage Battery is required by the Smart Array P542D Controller when configured in RAID mode. Only one Smart Storage Battery is required per Synergy Compute Module, thus you can use the Smart Storage Battery that was included with the Smart Array P240nr controller. The SAS cable is only required when attaching to the internal compute SAS/NVMe backplane.</p> <p>NOTE: The Smart Storage Battery is included with the HPE Smart Array P542D Controller for ProLiant XL270d option kit (851508-B21).</p>
HPE Smart Array SAS Cable	<p>HPE Compute Module Smart Array P542D SAS Cable 815173-B21</p> <p>NOTE: The Smart Array SAS cable is not included with the HPE Smart Array P542D/2GB FBWC controller option kit. The SAS cable is only required when attaching to the internal Synergy compute backplane.</p> <p>NOTE: The Smart Array SAS Cable is included with the HPE Smart Array P542D Controller for ProLiant XL270d option kit (851508-B21).</p>
HPE Secure Encryption	<p>HPE Smart Array Secure Encryption/Data at Rest Encryption/per Server Entitlement E-LTU Q2F26AAE</p> <p>NOTE: HPE Secure Encryption licensing is based on a per compute module entitlement which covers all Smart Array controllers installed in the compute module. For more information visit: http://www.hpe.com/servers/secureencryption</p>
HPE SmartCache	<p>HPE Smart Array SR SmartCache (Single Key/Single Server) LTU D7S26A</p> <p>NOTE: This part number can be used to purchase a single license or to order multiple licenses with a unique activation key per server. Customer will receive a printed license entitlement certificate 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 Smart Array SR SmartCache (Single Key/Multiple Servers) LTU D7S27A</p> <p>NOTE: This part number can be used to purchase a single license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate 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>HPE Smart Array SR SmartCache (Single Key/Multiple Servers) E-LTU D7S27AAE</p> <p>NOTE: This part number can be used to purchase multiple licenses with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24x7 HPE Software Technical Support Services.</p> <p>For more information please visit: http://www.hpe.com/servers/smartcache.</p>

Service and Support

Environment friendly Products and Approach - End-of life Management and Recycling Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs** in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **Hewlett Packard Enterprise web site**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
5-Feb-2018	Version 7	Changed	Replaced Secure Encryption SKU C9A82AAE with Q2F26AAE. Updated Service and Support. Replaced HPE Smart Storage Battery SKU
23-Oct-2017	Version 6	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
13-Feb-2017	Version 5	Changed	HPE Datacenter Care-Infrastructure Automation (DC-IA) content was revised.
07-Oct-2016	Version 4	Changed	Standard Features and Compatibility sections were revised.
15-Aug-2016	Version 3	Changed	Overview, Standard Features, Compatibility, Service and Support, Related Options, and Technical Specifications were revised.
31-Mar-2016	Version 2	Changed	Overview, Compatibility, Related Options, and Technical Specifications were revised.
01-Dec-2015	Version 1	New	Initial version.



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