

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.
- Smart Array Cache Tracking monitors integrity of controller cache, allowing pre-failure

Standard Features

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

Service and Support

NOTE: This option is covered under the HPE Support Service(s) applied to the main product. No separate HPE Support Service(s) need to be purchased.

HPE Technology Services offers you a rich portfolio of consulting and support services designed to add value to our core products and solutions. We have the know-how and experience to put technology to work for you. We work closely with you, as your strategic partner, leveraging our full services portfolio to make sure that everything works to help optimize your enterprise.

Choose from services aligned to our product offerings and lifecycle. From proactive onsite services to innovative support when your products are connected to Hewlett Packard Enterprise, you choose the precise level of attention and support your business demands.

HPE Technology Services for HPE Servers

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Support Services

HPE support services offer complete care and support expertise with committed response choices that are designed to meet your IT and business needs.

HPE Foundation Care services offer scalable reactive support-packages for HPE Synergy and software. You choose the type and level of service that is most suitable for your IT and business needs.

HPE Proactive Care keeps your system stable and reliable helping to prevent problems and reduce outages through proactive service management and enhanced technical response.

Advise, transform, integrate, support, automate, and flex

HPE Technology Services helps you get the most out of what you have today and transition to HPE Synergy, a composable infrastructure, at your pace and from wherever you are on the journey.

Start with the HPE Transformation Workshop to ensure that your business and IT organizations collaborate, define the topline strategy for composable, software-defined, cloud-ready infrastructure and kick-start your projects confidently. This workshop clarifies your business requirements and the issues that IT and operations teams must resolve in order to meet these requirements. A detailed executive briefing or high-level report summarizes the strategies, high-level plan and functional requirements.

HPE Modernization and Migration Services helps you choose the right platform for the right workload at the right cost and evolve your IT infrastructure, processes and organization taking advantage of “on-hybrid infrastructure” innovations such as composable, converged, software-defined, technologies. Hewlett Packard Enterprise experts advise, transform, integrate and implement for platform refresh, datacenter consolidation virtualization, migration and automation projects.

HPE Flexible Capacity is a pay per use model for on premise infrastructure. This offers needed HPE Synergy capacity in the datacenter, plus a buffer of additional capacity. As HPE Synergy will be a dynamic environment, this provides enough room to grow your environment, but only pay for actual metered use. Technology transitions and refresh can be built in, infrastructure and services are billed monthly, enabling you to align costs to business use.

Related Options

HPE Datacenter Care-Infrastructure Automation (DC-IA) is an extension to HPE Datacenter Care and delivers enterprise-grade support, advice, guidance and best practices for infrastructure automation. The DC-IA Center of Excellence (CoE) is staffed with highly trained experts who have specific expertise on integrating Chef with HPE OneView.

Choose the right support to maximize uptime, free up your resources, and achieve improved value—as you get the most out of the existing IT assets while accelerating time-to-revenue.

Deploy and integrate **HPE Synergy First Frame Installation and Startup** - Provides for hardware installation (HPE Synergy Compute Modules, Storage Modules, Virtual Connect modules, Interconnect Link Modules, Frame Link Modules, and HPE Synergy D3940 Storage Modules) and software startup for the first frame of your HPE Synergy deployment. Additional frames can be added using the HPE Synergy Additional Frame Installation and Startup Service.

HPE Synergy Additional Frame Installation and Startup Service - Add additional frames to your HPE Synergy First Frame Startup service or expand your existing HPE Synergy Infrastructure.

HPE Education Services Training your IT staff is critical to help drive the value of HPE Synergy with increased efficiencies and better business outcomes. Training is key to the transformation and management of HPE Synergy.

Parts and Materials Hewlett Packard Enterprise will provide Hewlett Packard Enterprise-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 HDD or SSD drives replaced by Hewlett Packard Enterprise due to malfunction.

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.

Enhancements to warranty services are available through Care Pack services.

For more information, visit HPE Care Pack Services at: <http://www.hpe.com/services>

Related Options

HPE Smart Storage Battery	<p>HPE Smart Storage Battery with 260mm Cable Kit 782958-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>HP Secure Encryption per Svr Entitlement C9A82AAE</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 SmartCache No Media 24x7 Technical Support 1-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 SmartCache No Media 24x7 Technical Support Flexible 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 SmartCache No Media 24x7 Technical Support 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>

Related Options

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.

http://www8.hp.com/us/en/hpe/hp-information/livingprogress/environmentalprogress/product-recycling.html#.V-IPA_krKiM

The EU WEEE directive (2002/95/EC) 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.

http://www8.hp.com/us/en/hpe/hp-information/livingprogress/environmentalprogress/product-recycling.html#.V-IPA_krKiM

Summary of Changes

Date	Version History	Action	Description of Change
13-Feb-2017	From Version 4 to 5	Changed	HPE Datacenter Care-Infrastructure Automation (DC-IA) content was revised.
07-Oct-2016	From Version 3 to 4	Changed	Standard Features and Compatibility sections were revised.
15-Aug-2016	From Version 2 to 3	Changed	Overview, Standard Features, Compatibility, Service and Support, Related Options, and Technical Specifications were revised.
31-Mar-2016	From Version 1 to 2	Changed	Overview, Compatibility, Related Options, and Technical Specifications were revised.



Sign up for updates



© Copyright 2017 Hewlett Packard Enterprise Development LP. The information contained herein is subject to change without notice. The only warranties for Hewlett Packard Enterprise products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Hewlett Packard Enterprise shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft and Windows are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries.

c04835068 - 15458 - Worldwide - V5 - 13-February-2017