HPE D6020 Disk Enclosure

Finding it difficult to keep up with the growth in unstructured data? Looking for a cost-effective high capacity storage option?

Reduce cost and footprint for your HPE ProLiant servers and BladeSystems storage expansion needs with the HPE D6020 Enclosure.

With the 12 Gb/s SAS HPE D6020 Disk Enclosure, Hewlett Packard Enterprise extends and redefines direct-attached storage for ProLiant servers and BladeSystems, combining the simplicity and cost-effectiveness of direct-attached storage without sacrificing flexibility or performance. The D6020, designed for data-intensive environments is a storage enclosure for dense, cost-effective external storage expansion for massive data capacity applications, at low $/GB. The HPE D6020 can be used not only as a standalone Direct Attach Enclosure, but can also be used for expansion in storage applications like Microsoft Storage Space, Luster, Cloud Backup, Data Protection or Big Data environments (Unstructured and Structured)

The D6020 can be directly connected to ProLiant Gen9 servers using the Smart Array P441, and the P841 Controllers using a standard 2M SAS cable/ The HPE D6020 also supports the HPE H241 Host Bus Adapter (HBA). HPE ProLiant Gen10 server direct connectivity is supported with the E208e-p SR Gen10 Controller and the HPE Smart Array P408e-p SR Gen10 Controller.

Use the D6020 as part of a straight-forward in-rack 6 Gb/s SAS implementation that delivers high-density, low-cost external zoned direct attach storage for HPE BladeSystem servers. Easily configure storage on the fly with easy to use management software.

Three enclosures can be daisy-chained together to provide support for up to 210 drives. Up to six D6020 storage devices can be supported off a single BladeSystem enclosure. 12Gb/s host connectivity enables higher performance, eases configuration/ deployment and broadens supported features of a D6020 using HPE Smart Array P741m controller and 6 Gb/s SAS BL switches.

The HPE Apollo A4520 supports six (6) D6020 enclosures per A4520 (3 per node).

Overview

HPE D6020 Disk Enclosure -Front View

HPE D6020 Disk Enclosure -Rear View

1. Power Supply
2. Power On Button
3 UID Status Panel
4. Fan Module
5 Primary I/O Module
6. SAS Connector

What's New

Adding a new SKU for the 12TB bundle.

Adding support for HPE ProLiant Gen10 servers with HPE Gen10 Smart Array Controllers

- HPE Smart Array E208e-p SR Gen10 Controller
- HPE Smart Array P408e-p SR Gen10 Controller
- HPE Smart Array P408e-m SR Gen10 Controller

At A Glance

- 5U rackmount form factor
- Supports seventy (70) 3.5" LFF Universal hot-pluggable SAS, SAS (Midline) MDL or Solid State drives
- 1+2 daisy-chaining allows support for up to 210 drives
- Two pull-out drive drawers support hot plug large form factor dual-ported SAS, SAS MDL and Solid State drives in just 5U of rack space (35 hot-plug drives per drawer)
- Introducing support for Solid State Drives

Overview

- 12 Gb/s direct connect to ProLiant Gen9 servers using the HPE Smart Array P441 and P841 Controllers using a standard 2M SAS cable; Single and Dual Domain environments.

NOTE: Please refer the QuickSpecs for appropriate Smart Array Controller to check more on the compatible servers and Disk Enclosures.

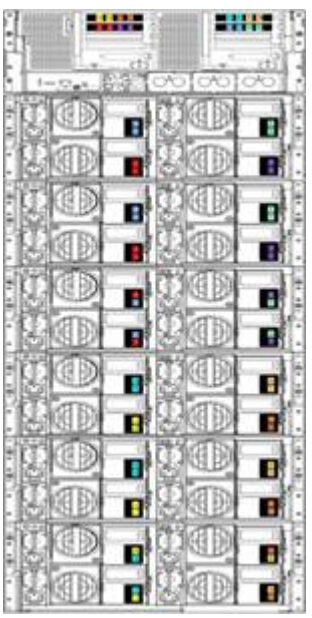
- 12 Gb/s direct connect to ProLiant Gen10 servers using the HPE Smart Array E208e-p SR Gen10 Controller, HPE Smart Array P408e-p SR Gen10 Controller and the HPE Smart Array P408e-m SR Gen10 Controller..The D6020 also supports the HPE H241 Host Bus Adapters

NOTE: Please follow the link below to download the latest Firmware for your HBA and/or Smart array controller. **Here**

- 12 Gb/s front-end SAS connectivity using 6 Gb/s SAS BL switches in the interconnect bays, and HPE Smart Array P741m controllers in each BladeSystem.

NOTE: D6020 support requires Blade switch firmware to be 3.0.8.0 or higher.

- Using the Virtual SAS Manager (VSM) in the HPE SAS BL switch, assign or 'zone' D6020 drive bays directly to BladeSystem server bay
- Additional option kit with two dual-port I/O modules is added for SAS drives, creating a dual-domain environment. A single BladeSystem enclosure supports up to six D6020's externally. 3-0-0 warranty
- Microsoft Storage Spaces can be enabled with the H241 HBA, or the HPE P741m Smart Array Controller (in the HBA mode) and Gen9 servers. (Requires: Windows 2012 R2 driver: HPCISSS3 63.8.0.64, H241 Firmware: 3.56, D6020 Firmware: 2.92(A)
- The HPE Apollo A4520 supports six (6) D6020 enclosures per A4520 (3 per node).



Apollo 4520 with 3xD6020 cabling diagram

loyment Guide

For detailed deployment information, see the HPE direct connect external SAS storage for HPE BladeSystem deployment guide. Select Manuals under Resources for HPE D6020 Disk Enclosure: **https://www.hpe.com/us/en/product-catalog/storage/disk-enclosures/pip.hpe-d6020-disk-enclosure.1009024698.html**

Overview

Models

Supported HPE Smart Array Controllers, Host Bus Adapters and SAS Blade Switches

HPE Smart Array P441 Features

- The SA-P441 Controller supports up to 200 physical drives
- The SA-P441 Controller supports the MSA2040 (Shared storage), HPE D3600 Disk Enclosure and HPE D3700 Disk Enclosure (up to 8 daisy-chained in dual-domain configuration). Seamless upgrades to current or next-generation HPE high performance and high capacity Serial Attached SCSI Smart Array controllers.
- 12Gb/s SAS technology delivers high performance and data bandwidth and contains full compatibility with 6Gb/s SATA technology
- PCI Express Gen3 x8 link width delivers high performance and data bandwidth up to 8GT/s theoretical maximum bandwidth
- 4 GiBytes Flash Backed Write Cache kit (FBWC) provides read-ahead caching and write back caching with indefinite write cache data retention in the case of unexpected power outage
- Supports legacy and UEFI boot operation on Gen9 servers
- Standard on the P441 are RAID 6, RAID 60, RAID 1 ADM, Capacity Expansion, mirror split, recombine, and rollback in Online Mode, Drive Erase, Performance Optimization-Degraded Reads and Read Coalescing, Move/Delete any individual LUNS
- The HPE SSD Smart Path feature included in the Smart Array software stack improves SSD reads for all RAID levels and RAID 0 write operations by optimizing the path to each SSD attached to the controller
- The HPE SmartCache feature (HPE Smart Cache license is required on P441) 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
- HPE Secure Encryption is a Smart Array controller-based data encryption solution for ProLiant Gen9 servers that protects sensitive, mission-critical data.
- Mix-and-match SAS and SATA hard drives lets you deploy drive technology as needed to fit your computing environment
- Software consistency on most current shipping Smart Array products: HPE Smart Storage Administrator (HPE SSA), HPE Systems Insight Manager, and HPE Intelligent Provisioning. The HPE Smart Storage Administrator configures and manages a host of Smart Array controllers and other storage devices using a single interface. It replaces the HPE Array Configuration Utility (ACU) with an updated design and configuration enhancements
- Low-profile PCI Express form factor - ships with a full size (attached) and a low profile bracket for deployment flexibility based on slot availability
- Rapid rebuild
- HBA or RAID mode
- Power efficiency
- For more information see: **HPE Smart Array P441 Controller (QuickSpecs/c04346300.pdf)**

HPE Smart Array P841 Features

- The SA-P841 Controller supports up to 200 physical drives
- PCI Express Gen3 x8 link width delivers high performance and data bandwidth up to 8GT/s theoretical maximum bandwidth
- 4 GiBytes Flash Backed Write Cache kit (FBWC) provides read ahead caching and write back caching with indefinite write cache data retention in the case of unexpected power outage

Overview

- Supports legacy and UEFI boot operation on Gen9 servers
- Standard on the P841 are RAID 6, RAID 60, RAID 1 ADM, Capacity Expansion, mirror split, recombine, and rollback in Online Mode, Drive Erase, Performance Optimization-Degraded Reads and Read Coalescing, Move/Delete any individual LUNS
- The HPE SSD Smart Path feature included in the Smart Array software stack improves SSD reads for all RAID levels and RAID 0 write operations by optimizing the path to each SSD attached to the controller
- The HPE SmartCache feature (HPE Smart Cache license is not required on P841) 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.
- Optional HPE Secure Encryption is a Smart Array controller-based data encryption solution for ProLiant Gen9 servers that protects sensitive, mission-critical data.
- PCIe form factor - Full height, half-length card
- Rapid rebuild
- HBA mode
- Power efficiency capabilities

For more information see:
https://www.hpe.com/us/en/product-catalog/servers/smart-array-controllers-and-smart-host-bus-adapters.hits-12.html

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HPE Smart Array E208e-p SR Gen10 Controller

- Storage interface (SAS/SATA)
- 8 SAS lanes across 2 x4 external Mini-SAS HD ports
- 12Gb/s SAS, 6Gb/s SATA technology
- Mix-and-match SAS and SATA drives to the same controller
- Support for SAS tape drives
- PCI Express 3.0 x8 link
- RAID 0, 1, 5, 10
- Mixed Mode (RAID logic drives and HBA physical drives simultaneously)
- Legacy and UEFI boot operation
- UEFI System Utilities (storage configuration)
- Up to 238 physical drives
- Up to 64 logical drives
- HPE Smart Array SR Secure Encryption (optional license)
- HPE SSD Smart Path
- Rapid Parity Initialization (RPI)
- Rapid rebuild
- Drive Sanitize
- Performance Optimization-Degraded Reads and Read Coalescing
- Power efficiency
- Seamless upgrades from HPE Smart Array Software RAID
- Seamless upgrades to HPE Smart Array P-class Controllers

HPE Smart Array P408e-p SR Gen10 Controller

- Storage interface (SAS/SATA)
- 8 SAS lanes across 2 x4 external Mini-SAS HD ports
- 12Gb/s SAS, 6Gb/s SATA technology

Overview

- Mix-and-match SAS and SATA drives to the same controller
- Support for SAS tape drives, SAS tape autoloaders and SAS tape libraries
- 4 GB Flash-Backed Write Cache (FBWC)
- PCI Express 3.0 x8 link
- RAID 0, 1, 5, 6, 10, 50, 60, 1 ADM, 10 ADM (Advanced Data Mirroring)
- Mixed Mode (RAID logic drives and HBA physical drives simultaneously)
- Legacy and UEFI boot operation
- UEFI System Utilities (storage configuration)
- Up to 238 physical drives
- Up to 64 logical drives
- HPE Smart Array SR SmartCache (optional license)
- HPE Smart Array SR Secure Encryption (optional license)
- HPE SSD Smart Path
- Rapid Parity Initialization (RPI)
- Rapid rebuild
- Drive Sanitize
- Performance Optimization-Degraded Reads and Read Coalescing
- Power efficiency
- Seamless upgrades from HPE Smart Array S-class and E-class controllers
- FIPS 140-2 Level 1 Implementation Under Test (expected validation complete in 2018)

HPE Smart Array P408e-m SR Gen10 Controller

- Storage interface (SAS/SATA)
- 8 SAS lanes across an external SAS port
- 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 GB Flash-Backed Write Cache (FBWC)
- PCI Express 3.0 x8 link
- RAID 0, 1, 5, 6, 10, 50, 60, 1 ADM, 10 ADM (Advanced Data Mirroring)
- Mixed Mode (RAID logic drives and HBA physical drives simultaneously)
- Legacy and UEFI boot operation
- UEFI System Utilities (storage configuration)
- Up to 238 physical drives
- Up to 64 logical drives
- HPE Smart Array SR SmartCache (optional license)
- HPE Smart Array SR Secure Encryption (optional license)
- HPE SSD Smart Path
- Rapid Parity Initialization (RPI)
- Rapid rebuild
- Drive Sanitize
- Performance Optimization-Degraded Reads and Read Coalescing
- Power efficiency
- Seamless upgrades from HPE Smart Array S-class and E-class controllers
- FIPS 140-2 Level 1 Implementation Under Test (expected validation complete in 2018

HPE Smart Array P741m Feature

Overview

Eight (8) 12Gb/s SAS physical links distributed equally across 4 external 2x ports to support up to four 6Gb/s SAS Switches

12Gb/s SAS technology delivers up to 1200 MB/s theoretical bandwidth per physical lane

6Gb/s SATA technology delivers up to 600 MB/s theoretical bandwidth per physical lane for directly attached SATA drives.

RAID 0, 1, 10, 5, 50, 6, 60, 1 ADM, 10 ADM

P741m can support HBA mode which enables deployment of Software-Defined Storage such as Microsoft Storage Spaces and VMWare VSAN

HPE Smart Cache feature (HPE Smart Cache license is not required on P741m) 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.

HPE SSD Smart Path feature included in the Smart Array software stack improves SSD read for all RAID levels and RAID 0 write operations by optimizing the path to each SSD attached to the controller

HPE Secure Encryption, available as an option, is a Smart Array controller-based data encryption solution for ProLiant Gen9 servers that protects sensitive, mission-critical data is supported as an option

PCI Express Gen3 x8 link

4 GiBytes Flash Backed Write Cache (FBWC) provides read-ahead caching and write back caching with indefinite write cache data retention in the case of unexpected power outage.

For more information see:
https://www.hpe.com/us/en/product-catalog/servers/smart-array-controllers-and-smart-host-bus-adapters.hits-12.html

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HPE H241 Host Bus Adapter

SAS technology delivers high performance and data bandwidth up to 12Gb/s per physical link

Mix-and-match SAS and SATA hard drives; deploy drive technology as needed

PCIe 3.0 x8 (8GB/s bandwidth)

Enables deployment of Software-Defined Storage such as Microsoft Storage Spaces for the D3000 enclosures with Gen9 servers

For more information see: **HPE H241 Smart Host Bus Adapter (QuickSpecs/c04346305.pdf)**

6Gb SAS BL Switch

- Hot Pluggable 6Gb/s SAS Switch for HPE c-Class BladeSystem
- Sixteen internal blade bay ports containing 2x 6Gb/s SAS links
- Eight external Mini-SAS ports containing 4x 6Gb/s SAS links
- Use the embedded Virtual SAS Manager GUI or CLI interface to zone switch ports or drive bays to server bays.
- Supported by c3000 and c7000 c-Class BladeSystem enclosures

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Overview

Supported Servers

HPE BladeSystem Servers (For supported servers, refer to the QuickSpecs of the supported controller below)
NOTE: For Information on Supported Operating Systems, see the following Smart Array QuickSpecs:
P741m:
https://www.hpe.com/us/en/product-catalog/servers/smart-array-controllers-and-smart-host-bus-adapters.hits-12.html
P408e-m: **https://www.hpe.com/h20195/v2/GetDocument.aspx?docname=a00008197enw**

HPE ProLiant Gen9 DL and ML servers that support HPE Smart Array Controllers P441, P841 and the H241 HBA
(For supported servers, refer to the QuickSpecs of the Smart Array Controllers and HBA listed below)
P441: **HPE Smart Array P441 Controller (QuickSpecs/c04346300.pdf)**
P841:
https://www.hpe.com/us/en/product-catalog/servers/smart-array-controllers-and-smart-host-bus-adapters.hits-12.html
H241: **HPE H241 Smart Host Bus Adapter (QuickSpecs/c04346305.pdf)**

HPE Smart Array
For latest information on **HPE Smart Array Gen10 Controllers for HPE ProLiant DL, ML and Apollo Servers** please refer to their
QuickSpecs. (E208i-a,E208i-p,E208e-p,P408i-a,P408i-p,P408e-p,P816i-a)

Storage Software

Microsoft Windows 2012, Storage Spaces:
Software-Defined Storage implementation, included in Microsoft Windows 2012 R2 software
Microsoft Storage Spaces can be enabled with the H241 HBA, or the HPE P741m Smart Array Controller (in the HBA mode) and Gen9 servers. (Requires: Windows 2012 R2 driver: HPCISSS3 63.8.0.64, H241 Firmware: 4.56, D6020 Firmware).

Common Slot Power Supply

The HPE D6020 Enclosure uses the 1200W Common Slot Power Supply

Hewlett Packard Enterprise Common Slot Power supplies meet multiple Energy Efficiency Initiatives:

- 1200W, 94%: Climate Savers Computing Initiative PLATINUM and ECOS Consulting 80PLUS PLATINUM

NOTE: The 80 PLUS program is a unique forum that unites electric utilities, the computer industry, and consumers in an effort to bring energy-efficient technology solutions to the marketplace. 80 Plus independently tests power supply efficiency and publicly posts the results on 80Plus.org.

Standard Features

Key Features

High density, low-cost SAS storage for BladeSystem and ProLiant DL/ML servers

- 70 LFF Universal SAS, SAS MDL or Solid State drives in 5U form factor.
- Two pull-out drive drawers support hot plug large form factor dual-ported SAS, SAS MDL or Solid State drives in just 5U of rack space.
- 1+2 expansion allows up to three (3) D6020 which can be cascaded for a maximum of 210 drives.
- Each pull-out drive drawer is supported by a redundant set of hot-plug power supplies and redundant hot-plug fans. Straight forward SAS architecture provides zoned direct attach storage for BladeSystem servers; just a Smart Array P741m controller in the Blade server, a dual or single 6 Gb/s SAS BL switches in the chassis connected to an D6020.
- Connect directly to selected ProLiant Gen9 servers with the Smart Array P441, or the P841 Controllers using a standard 2M SAS cable; Single and Dual Domain environments. No zoning.
- 12 Gb/s direct connect to ProLiant Gen10 servers using the HPE Smart Array E208e-p SR Gen10 Controller, HPE Smart Array P408e-p SR Gen10 Controller and the HPE Smart Array P408e-m SR Gen10 Controller.
- HPE HBA H241 is also supported.
- The HPE Apollo A4520 supports six (6) D6020 enclosures per A4520 (3 per node).

Build BladeSystem server storage on the fly

- D6020 drive bays are assigned or 'zoned' to individual blade bays using SAS 2.0 zoning capabilities. Use the Virtual SAS Manager (VSM) in the 6 Gb/s SAS BL switch to dynamically assign up to 100 drives to specific BladeSystem servers, without complex configuration or re-cabling. Drives zoned to each server appear as local storage to that server. This allows complete flexibility to reconfigure quickly and easily without moving cables.
- With zoned direct-attached storage capabilities; server administrators can build local storage on the fly according to their configuration requirements.
- Quickly deploy and expand capacity by configuring additional drive bays to a P741m Smart Array Controllers without moving a single cable.

HPE reliability

Familiar Smart Array technology of the Smart Array Controllers enables support for RAID levels

- Keeps data available and server running while a failed drive is being replaced; two fault tolerance configurations are supported for the internal connections including:
- RAID 0 (striping) provides no extra data protection.
- RAID 1 (mirroring) protects against failure of one drive.
- RAID 1+0 (mirroring and striping) protects against failure of one drive (and failure of particular multiple drives).
- RAID 5 (distributed data guarding) protects against failure of one drive.
- RAID 6 with ADG (Advanced Data Guarding): This is the highest level of fault tolerance.
- RAID 50 (RAID 5+0) protects against failure of one drive (and failure of particular multiple drives).
- RAID 60 (RAID 6+0) allows administrators to split the RAID 6 storage across multiple external boxes.
- RAID 1 ADM (Advanced Data Mirroring) allows customers to create mirrored RAID set using 3 identical hard drives.

Product Technology

Standard Features

SAS
12 Gb/s SAS

Modular Chassis
5U, 70 Large Form Factor Universal SAS, SAS MDL or Solid State drive bays

Drives available
Serial Attached SCSI (SAS) enterprise-class drives designed for high volume 24x7 usage. SAS Midline (MDL) are usually reserved for archival of data as they are both relatively inexpensive and are available in very large capacities. The D6020 can accommodate SAS, SAS MDL and Solid State drives within the same enclosure.
SAS drive performance can be approximately 30% greater than SAS MDL performance on sequential host IO. SAS performance excels in sequential lower latency response time and random IO per second transaction performance due to higher rpm disk speeds yielding lower seek times.
Solid State drive support with integrated "wear gauge" helps improve application performance and allows customers to reduce their operating costs by reducing footprint and power consumption.

Scalability
Up to 70 SAS, SAS MDL or Solid State 3.5" hot-plug hard drives can be supported per D6020, or up to 210 drives when three D6020’s are daisy-chained together.
A single BladeSystem enclosure supports up to six D6020’s externally.

RAID
12 Gb/s SAS

Common Slot Power supplies
5U, 70 Large Form Factor Universal SAS, SAS MDL or Solid State drive bays
Serial Attached SCSI (SAS) enterprise-class drives designed for high volume 24x7 usage. SAS Midline (MDL) are usually reserved for archival of data as they are both relatively inexpensive and are available in very large capacities. The D6020 can accommodate both SAS, SAS MDL and Solid State drives within the same enclosure. SAS drive performance can be approximately 30% greater than SAS MDL performance on sequential host IO. SAS performance excels in sequential lower latency response time and random IO per second transaction performance due to higher rpm disk speeds yielding lower seek times. Solid State drive support wit integrated "wear gauge" helps improve application performance and allows customers to reduce their operating costs by reducing footprint and power consumption.

Fans
Includes four redundant hot-plug fans

Configuration and Management Tools
SAS BL switch for use with BladeSystem servers: Use the Virtual SAS Manager (VSM) to dynamically assign drive bays in the D6020 to each BladeSystem server bay, without complex configuration or re-cabling. This allows complete flexibility to reconfigure quickly and easily without moving cables. Smart Array Controller: Array Configuration Utility (ACU) provides configuration and management of hard drives, and supports online

Standard Features

array capacity expansion, logical drive extension, assignment of online spares and RAID or stripe size migration.

Management/Health Utilities

Active hardware management using HPE SIM: Manage the array with the highly refined HPE Systems Insight Manager. Smart Components are available to easily update firmware. A convenient Integrated Management Log records hundreds of events and stores them in an easy-to-view format.

Service and Support

Warranty

3-0-0 warranty
Three-year parts exchange, next business day delivery
NOTE: The warranties of the hard drive options purchased for the D6020 are different for SAS hard drives, SAS Midline (MDL) hard drives and Solid State drives.
SAS hard drive options have a three-year warranty and SAS MDL hard drive options have a one year warranty.
Solid State Drives have a three-year warranty.

Warranty Upgrade Options

- Response - Upgrade on-site response from next business day to same-day 4-hour response or 6 Hour Call To Repair
- Coverage - Extend hours of coverage from next business day to 9 hours x 5 days to 24 hours x 7 days
- Duration Select duration of coverage for a period of 1, 3, 4 or 5 years

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Service and Support

Protect your business beyond warranty with HPE Support Services
HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Our integrated portfolio of services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. HPE Support Services enable you to choose the right service level, length of coverage and response time as you purchase your new storage solution, giving you full entitlement for the support for need for your IT and business.

Connect your devices

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%[1] reduction in downtime, near 100%[2] diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to Hewlett Packard Enterprise support.
1- IDC
2 - HPE CSC reports 2014 - 2015

Service and Support

Recommended Support Services

Optimized Care

HPE Proactive Care* with 6-hour call-to-repair commitment, three-year Support Service

HPE Proactive Care gives customers an enhanced call experience plus helps prevent problems and maintains IT stability by utilizing tailored, proactive reports with recommendations and advice when your products are connected to Hewlett Packard Enterprise. This Service combines three years' proactive reporting and advice with our highest level of hardware support - The Hewlett Packard Enterprise 24x7, six-hour hardware call-to-repair. Hewlett Packard Enterprise is the only leading manufacturer who makes this level of coverage available as a standard service offering for your most valuable storage systems.
https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf

Standard Care

HPE Proactive Care* with 24x7 coverage, three-year Support Service

HPE Proactive Care gives customers an enhanced call experience plus helps preventing problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice when your products are connected to Hewlett Packard Enterprise. This Service combines three years' proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem.
https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf

NOTE:*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.

Basic Care

HPE Foundation Care 24x7, three-year Support Service

HPE Foundation Care 24x7 gives you access to Hewlett Packard Enterprise 24 hours a day, seven days a week for assistance on resolving issues. This service includes need-based Hardware onsite response within four hours. Simplify your support experience and make Hewlett Packard Enterprise your first call to help resolve hardware or software problems.
http://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en

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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.

More Information

http://www.hpe.com/services

Configuration Information

Step 1: HPE D6020 Disk Enclosure

Model Description	Part Number
HPE D6020 Enclosure with Dual I/O Modules	K2Q28A
NOTE: Base model for SAS, SAS Midline (MDL) and Solid State drives. Add K2Q23A when using dual-ported SAS drives to create a dual-domain environment.	
NOTE: Includes four hot-plug power supplies for n+2 redundancy and four hot-plug fans for n+1 redundancy.	
HPE D6020 Dual I/O Module Option Kit	K2Q23A
NOTE: Add K2Q23A option kit to K2Q28A when using dual-ported SAS drives to create a dual-domain environment.	
HPE D6020 w/35 6TB 12G SAS 7.2K LFF (3.5in) Dual Port Midline HDD 210TB Bundle	K2Q26A
NOTE: Includes D6020 with (35) 6TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.	
HPE D6020 w/70 6TB 12G SAS 7.2K LFF (3.5in) Dual Port Midline HDD 420TB Bundle	K2Q27A
NOTE: Includes D6020 with (70) 6TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.	
HPE D6020 w/35 8TB 12G SAS 7.2K LFF (3.5in) Dual Port Midline HDD 280TB Bundle	P8Y56A
NOTE: Includes D6020 with (35) 8TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans	
HPE D6020 w/70 8TB 12G SAS 7.2K LFF (3.5in) Dual Port Midline HDD 560TB Bundle	P8Y57A
NOTE: Includes D6020 with (70) 8TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.	
HPE D6020 w/35 10TB 12G SAS 7.2K LFF (3.5in) Midline HDD 350TB Bundle	Q1H90A
NOTE: Includes D6020 with (35) 10TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.	
HPE D6020 w/70 10TB 12G SAS 7.2K LFF (3.5in) Midline HDD 700TB Bundle	Q1H91A
NOTE: Includes D6020 with (70) 10TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.	
HPE D6020 w/70 12TB 12G SAS 7.2K LFF (3.5in) Midline HDD 840TB Bundle	R0P69A
NOTE: Includes D6020 with (70) 12TB LFF Midline SAS drives, (4) dual port I/O modules, redundant power supplies and redundant fans.	

Step 2: Choose Supported Options

HPE ProLiant G9 servers	Part Number
HPE Smart Array P741m/2GB FBWC 12Gb 4-ports Ext Mezzanine SAS Controller	762782-B21
HPE Smart Array P841/4GB FBWC 12Gb 4-ports Ext SAS Controller	726903-B21
HPE ProLiant Gen10 servers	
HPE Smart Array E208e-p SR Gen10 (8 External Lanes/No Cache) 12G SAS PCIe Plug-in Controller	804398-B21
HPE Smart Array P408e-p SR Gen10 (8 External Lanes/4GB Cache) 12G SAS PCIe Plug-in Controller	804405-B21
HPE Smart Array P408e-m SR Gen10 (8 External Lanes/2GB Cache) 12G SAS Mezzanine Controller	804381-B21
HPE H241 12Gb 2-ports Ext Smart Host Bus Adapter	726911-B21

Configuration Information

HPE 6Gb SAS Switch Single Pack for HPE BladeSystem c-Class	BK763A
HPE 6Gb SAS Switch Dual Pack for HPE BladeSystem c-Class	BK764A

NOTE: Please follow the link below to download the latest Firmware for your HBA and/or Smart array controller.
http://h20566.www2.hpe.com/hpsc/swd/public/detail?sp4ts.oid=1008531195&swItemId=MTX_f5c0fb4f202640e494b3df1eea&swEnvOid=4064

Step 2b - SAS Cable

Cables to be used for connecting D6020 with the HPE Smart Array P441, P841, P741m and H241 HBA (HD connector)	**Part Number**
HPE External 1.0m (3ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716195-B21
HPE External 2.0m (6ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716197-B21

Step 3 - D6020 Drive Options

12G 3.5" SAS Midline (MDL) Drives	**Part Number**
HPE 12TB SAS 12G Midline 7.2K LFF (3.5in) ST 1yr Wty Helium 512e Digitally Signed Firmware HDD	881783-B21
HPE 10TB SAS 12G Midline 7.2K LFF (3.5in) ST 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09151-B21
HPE 8TB SAS 12G Midline 7.2K LFF (3.5in) ST 1yr Wty 512e Digitally Signed Firmware HDD	858384-B21
HPE Special Delivery Request/Equipment	864262-B21
HPE 4TB SAS 7.2K LFF ST 512e Spl HDD	864259-B21
HPE Special Delivery Request/Equipment	864256-B21

12G 3.5" SAS Solid State Drives (SSD) in Converter carriers	**Part Number**
HPE D6020 400GB 12G SAS Mixed Use LFF (3.5in) Converter Carrier 3yr Wty Solid State Drive	P8Y58A
HPE D6020 800GB 12G SAS Mixed Use LFF (3.5in) Converter Carrier 3yr Wty Solid State Drive	P8Y55A
HPE D6020 1.6TB 12G SAS Mixed Use LFF (3.5in) Converter Carrier 3yr Wty Solid State Drive	P8Y54A

Step 4: Choose Rack Options

Choose HPE Rack 10000 series Cabinets for the D6020
The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.
NOTE: A D6020 fully loaded with drives weighs 320lbs.
NOTE: Hewlett Packard Enterprise has not tested or validated the D6020 with any third-party racks. Before installing the D6020 in a third-party rack, be sure to properly scope the limitations of the rack. Before proceeding with the installation, consider the following:

Configuration Information

- You must fully understand the static and dynamic load-carrying capacity of the rack and be sure that it can accommodate the weight of the D6020.
- If the D6020 is not sitting atop a Blade c-Class enclosure or another D6020, D6000 or MDS600 in a 3rd party rack, then install a 1U tray (part no P19450-B21) beneath the D6020 to ensure proper support
- Be sure sufficient clearance exists for cabling, installation and removal of the enclosure, actuation of the rack doors, and full articulation of the drive drawers

NOTE: Please note that while configured as CTO, a maximum of four D6020 is supported in a 42u standard rack (AF002A) and five in a 42u deep rack (AF092A). The 47U deep rack (AF094A) will also be limited to a maximum of five D6020 for CTO config. But additional D6020 can still be ordered as BTOs. Customers can then install them into racks at the customer site for a maximum of six D6020 per rack. The quantity of D6020 units supported in a rack is dependent upon the other components configured in the rack relative to the rack weight limit.

Technical Specifications

Input Power (per power supply)

Rated Line Voltage	90 to 132 VAC 180 to 264 VAC
Rated Input Frequency	47 to 63 Hz
Rated Input Current	10A (at 100 VAC), 7.8A (at 200VAC)
Rated Input Power	@ 100VAC, 70 drives x 2TB-7.2K = 1050W @ 100VAC, 70 drives x 600GB-15K = 1650W

Temperature and humidity ranges

Operating Temperature	50° to 95° F (10° to 35° C) **NOTE:** Maximum Rated 10°C per/hr (50°F/hr)
Storage Temperature	-22° to 140° F (-30° to 60° C) **NOTE:** Maximum Rated 20°C/hr (68°F/hr)
Operating Humidity	10% to 90% relative humidity (Rh), 28º C (82.4º F) maximum wet bulb temperature, non-condensing
Non-Operating Humidity	5% to 95% relative humidity (Rh), 38.7º C (101.66º F) maximum wet bulb temperature, non-condensing

Physical

Length	89.12 cm
Width	44.7 cm (17.6 in)
Height	22.1 cm (8.7 in)
Chassis	72.58 kg (160 lb) with no hard drives installed
Weight	145 kg (320 lb) with hard drives installed

Power Consumption at 208VAC (maximum)

Drive Type	**Typical**	**Service Position Maximum** (drawers being pulled out causing all fans to go to full speed
7200 RPM SAS MDL	1035W (3532 Btu/hr)	1470W (5021 Btu/hr)
10K 400G SAS	940W	1340W
15K SAS	1280W	1710W

NOTE: Input Power and Heat Dissipation specifications are maximum values and apply to worst-case conditions at full rated power supply load. The power/heat dissipation for your installation will vary depending on the equipment configuration.

NOTE: Temperature ratings shown are for sea level. An altitude derating of 1°C per 300 m (1.8°F per 1,000 ft.) to 3048 m (10,000 ft.) is applicable. No direct sunlight allowed. The upper limit may be limited by the type and number of options installed.

NOTE: Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

NOTE: The "service position maximum" column is the test result with the drawers open.

Upgradeable Firmware	Offline
Disk Drives and Enclosure Protocol Support	HPE 3.5" SAS and SAS MDL 6 Gb/s

I/O Module	
Connector Type	External mini-HD SAS connector
Number of Ports	Two

Summary of Changes

Date	Version History	Action	Description of Change
02-Dec-2019	Version 14	Changed	Added a new SKU for 1U support shelf
03-Sep-2019	Version 13	Changed	Drive descriptions were updated.
02-Apr-2019	Version 12	Changed	Family Information and Configuration Information sections were updated.
04-Feb-2019	Version 11	Changed	Added new 12TB Bundle sku. Overview and Configuration Information sections were updated.
15-Oct-2018	Version 10	Changed	SKU description updated in the Configuration Information section and images were updated in Overview section
01-Oct-2018	Version 9	Changed	Minor corrections and added support for P408e-m controller Overview, Features and Benefits,, Family Information and Configuration Information sections were revised.
11-Jun-2018	Version 8	Changed	Updated the list of supported drives and added a note.
18-Dec-2017	Version 7	Changed	Configuration Information section was revised.
25-Sep-2017	Version 6	Changed	Changes made to the entire document.
07-Aug-2017	Version 5	Changed	Changes made to the Configuration information.
27-Mar-2017	Version 4	Changed	Changes made to the Configuration information, Family Information and Overview Sections.
28-Nov-2016	Version 3	Changed	Changes made to the entire document.
17-Jun-2016	Version 2	Changed	Changed made to the Overview, Family Info and Configuration Info Sections.
07-Jun-2016	Version 1	New	New QuickSpecs

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

Hewlett Packard Enterprise

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