Overview

HPE 3PAR StoreServ 8000 Storage

The HPE 3PAR StoreServ 8000 Storage offers flexible enterprise Tier 1 storage at a midrange price. HPE 3PAR StoreServ 8000 Storage delivers the performance advantages of a purpose-built, flash-optimized architecture without compromising resiliency, efficiency, or data mobility. The new HPE 3PAR Gen5 Thin Express ASIC provides silicon-based hardware acceleration of thin technologies, including inline deduplication, to reduce acquisition and operational costs by up to 75% without compromising performance. With unmatched versatility, performance, and density, HPE 3PAR StoreServ 8000 Storage gives you a range of options that support true convergence of block and file protocols, all-flash array performance, and the use of spinning media to further optimize costs. HPE 3PAR StoreServ 8000 Storage offers rich, Tier-1 data services, quad-node resiliency, seamless data mobility between systems, high availability through a complete set of persistent technologies, and simple and efficient data protection with a flat backup to HPE StoreOnce Backup appliances. Four models are available: 8200, 8400, 8440, and 8450. You can start small and grow without painful upgrades down the road. Enjoy the timeless 3PAR experience. Start small and seamlessly migrate to a new system or upgrade for greater scalability.

NOTE: For more information about the value of HPE 3PAR StoreServ 8000 Storage refer to the **HPE 3PAR StoreServ 8000 Datasheet**.
HPE 3PAR StoreServ 8000 is storage made effortless.

HPE 3PAR StoreServ 8000 Storage
(2-Node Storage Base)

HPE 3PAR StoreServ 8000 Storage
(4-Node Storage Base)

What's New

HPE 3PAR 8000 2p 32Gb FC Adapter
For high performance Fibre Channel host connectivity
HPE 3PAR 8000 Node Conversion Kits
3PAR 8000 Node Conversion Kits provides current 3PAR customers a way to upgrade to more performance capable 3PAR models without requiring data migration or repurchasing capacity. Protect existing investments and scale your 3PAR 8000 system to meet your on-going business requirements.

Host OS Support
Citrix® XenServer® | HP-UX® | IBM® AIX® | Microsoft® Windows® Server, including Microsoft® Hyper-V™ | Apple Mac OS
OpenVMS* | Oracle® Linux® (UEK and RHEL compatible kernels) | Oracle® Solaris | Ubuntu | VMware vSphere™
Red Hat® Enterprise Linux® | Red Hat® Enterprise Virtualization
SUSE® Linux Enterprise | SUSE® Linux Virtualization | IBM Virtualization | Oracle VM
For the latest information on supported operating systems refer to Single Point of Connectivity Knowledge for HPE Storage Products (SPOCK): **http://www.hpe.com/storage/spock**

Standard Features

Summary	8200	8400	8440	8450
Number of Controller Nodes	2	2 or 4	2 or 4	2 or 4
HPE 3PAR Gen5 ASICs	2	2 or 4	2 or 4	2 or 4
Processors	2 x 6-core 2.2 GHz	2-4 x 6-core 2.2 GHz	2-4 x 10-core 2.4 GHz	2-4 x 10-core 2.4 GHz
Total Cache	832 GiB	1664 GiB	8384 GiB	384 GiB
Flash Cache (optional)	768 GiB	1536 GiB	8000 GiB	Not Applicable
On-Node Cache	64 GiB	128 GiB	384 GiB	384 GiB
Total Cache per node pair	832 GiB	832 GiB	4192 GiB	192 GiB
Flash Cache per node pair	768 GiB	768 GiB	4000 GiB	Not Applicable
On-Node Cache per node pair	64 GiB	64 GiB	192 GiB	192 GiB
Maximum Host Ports	12 ports	24 ports	24 ports	24 ports
32Gb/s Fibre Channel Host Ports[1]	0 - 4 ports	0 - 8 ports	0 - 8 ports	0 - 8 ports
16Gb/s Fibre Channel Host Ports	4 - 12 ports	4 - 24 ports	4 - 24 ports	4 - 24 ports
10Gb/s iSCSI Host Ports	0 - 4 ports	0 - 8 ports	0 - 8 ports	0 - 8 ports
10Gb/s FCoE Host Ports	0 - 4 ports	0 - 8 ports	0 - 8 ports	0 - 8 ports
1Gb/s Ethernet Adapter	0 - 8 ports	0 - 16 ports	0 - 16 ports	0 - 16 ports
10Gb/s Ethernet Adapter	0 - 4 ports	0 - 8 ports	0 - 8 ports	0 - 8 ports
Maximum Initiators Supported	2048	4096	4096	4096
Built-in 1GbE Ports[2]	2	2 - 4	2 - 4	2 - 4
2U Controller Node Drive Capacity	24	24	24	24
Number of Hard Disk Drives	6 – 240	6 – 576	6 – 960	Not Applicable
Number of Solid State Drives	6 – 120	6 – 240	6 – 480	6 – 480
Max Raw Capacity (approx.)[3]	1000 TiB[4]	2400 TiB	4000 TiB	3351 TiB
Max Raw Capacity (SSD only)	838 TiB	1676 TiB	3351 TiB	3351 TiB
Usable File Capacity[5]	2 – 256 TiB	2 – 512 TiB	2 – 512 TiB	2 – 512 TiB
Capacity Details	**8200**	**8400**	**8440**	**8450**
RAID Levels	RAID 0, 1, 5, 6			
RAID 5 Data to Parity Ratios	2:1 - 8:1			
RAID 6 Data to Parity Ratios	4:2, 6:2, 8:2, 10:2, 14:2			
Drive Capacities (SSDs)[6]	920GB SSD, 1.92TB SSD, 3.84TB SSD, 7.68TB SSD, 15.36TB SSD			
Drive Capacities (HDD)	300 15K SAS[7], 600 15K SAS 600 10K SAS, 1200 10K SAS, 1800 10K SAS 2000 7.2K NL[8], 4000 7.2K NL, 6000 7.2K NL, 8000 7.2K NL			Not Applicable
Number of Add-on Drive Enclosures[9]	0 - 9 enclosures	0 - 22 enclosures	0 - 38 enclosures	0 - 18 enclosures

NOTE: Specifications are subject to change without notice.

[1]32Gb FC host support requires 3PAR OS 3.3.1 Technology Release (TR) 05. Check HPE Spock for latest supported 3PAR software and connectivity.

[2]Two built-in 1GbE ports per node pair can be used for Remote Copy (RCIP).

[3] Maximum raw capacity currently supported with any and all drive types. The minimum supported raw capacity is equal to 6 * Min drive size available.

[4] For storage capacity, 1 GiB = 230 bytes and 1 TiB = 1,024 GiB

[5] Usable file capacity supported for HPE 3PAR File Persona

[6] SSDs are Solid State Drives

[7] SAS drives are Serial Access SCSI Drives

[8] NL drives are Nearline (7200 RPM) Enterprise SAS drives

[9] Each Drive Enclosure holds up to 24 drives in 2U for small form factor (2.5”) drives and 4U for large form factor (3.5”) drives

Standard Features

All-Inclusive Single-System Software
The All-Inclusive Single-System Software is included as part of the array and offers all the software titles necessary to run a single HPE 3PAR Storage array. (Previously available Simplified spindle software licensing SKUs are listed in the **QS version 29**)

HPE 3PAR Operating System Software
The HPE 3PAR Operating System Software Suite gives you everything you need to get up and running quickly and efficiently. It is the foundation software of HPE 3PAR StoreServ Storage, combining advanced virtualization capabilities with simple storage management, high efficiency, and world class performance.

HPE 3PAR Virtual Copy
HPE 3PAR Virtual Copy software protects and shares data affordably with rapid recovery using reservation-less, non-duplicative, copy-on-write snapshots.

HPE 3PAR Adaptive Optimization
HPE 3PAR Adaptive Optimization improves storage utilization by enabling cost-optimized storage tiering.

HPE 3PAR Dynamic Optimization
HPE 3PAR Dynamic Optimization delivers the required service levels for the lowest possible cost throughout the data lifecycle.

HPE 3PAR Priority Optimization
HPE 3PAR Priority Optimization assures service levels with QoS controls for mission critical applications.

HPE 3PAR Virtual Domains and Virtual Lock
With HPE 3PAR Virtual Domains and HPE 3PAR Virtual Lock software, you can segregate access and deliver robust storage services for different applications and user groups with additional security attached to the retention of storage volumes.

HPE 3PAR Online Import
HPE 3PAR Online Import Software is the first do-it-yourself data migration tool for enterprise Storage Area Networks. Unlike traditional block migration approaches, Online Import Software enables customers to migrate storage volumes from HPE EVA Storage, EMC, Hitachi, IBM Storage to HPE 3PAR StoreServ Storage systems online and without complex planning or dependency on extra tools.

HPE 3PAR File Persona Software
This software enables rich set of file protocol services, core file data services and an Object Access API to extend the spectrum of primary storage workloads natively addressed by HPE 3PAR StoreServ 8000 Storage. With this solution, the architectural benefits of HPE 3PAR StoreServ 8000 Storage can be extended to use cases such as: home directories and user shares; content management and collaboration; data preservation and governance; and custom cloud applications.

HPE Recovery Manager Central (RMC) for VMWare vSphere, MS SQL, Oracle and more
Protect your business critical applications without impacting performance using HPE RMC software. With this automated, non-intrusive software, the simplicity and performance of local and remote snapshots can be combined with the reliability and cost effective retention of deduplicated backups to protect any application data stored on 3PAR arrays. Based on your RTO objectives, retain the space-efficient snapshots on the 3PAR array itself or offload them to a StoreOnce Backup system using fast, efficient, Express Protect Backups. Based on your RPO objectives, generate as many application-consistent recovery points as desired for VMware VMs, MS SQL and Oracle databases or automate the protection workflow for any application data on 3PAR using the RMC REST API SDK.
NOTE: RMC for Oracle is supported for Oracle running on RHEL and OL platforms.

HPE 3PAR Remote Copy
HPE 3PAR Remote Copy offers simple and cost effective data protection for efficient multi-tenant disaster recovery.

Standard Features

HPE 3PAR Recovery Manager for Hyper-V (RM-H)
Protect your Microsoft Hyper-V environment with HPE 3PAR Recovery Manager for Microsoft Hyper-V and the HPE 3PAR VSS Provider software, included in this software bundle. By leveraging HPE 3PAR Virtual Copy software, RM-H enables administrators to non-disruptively create space-efficient, application-consistent, point-in-time snapshots to protect and recover Hyper-V Virtual Hard Disks (VHDs) and individual VMs.

HPE 3PAR Recovery Manager for Exchange (RM-E)
Protect your Microsoft Exchange environment with HPE 3PAR Recovery Manager for Microsoft Exchange and the HPE 3PAR VSS Provider software, included in this software bundle. By leveraging HPE 3PAR Virtual Copy software, RM-E enables administrators to non-disruptively create space-efficient, application-consistent, point in time snapshots to protect and recover Exchange databases and mailboxes.

HPE 3PAR Recovery Manager for Oracle (RM-O)
Protect your Oracle environment running on Solaris, HP-UX or IBM AIX platforms with HPE 3PAR Recovery Manager for Oracle. By leveraging HPE 3PAR Virtual Copy software, RM-O enables Oracle administrators to non-disruptively create space-efficient, application-consistent, point-in-time snapshots to protect and recover Oracle databases and instances. For Oracle environments running on RHEL or Oracle Linux, please refer to RMC for Oracle above.

HPE Smart SAN for 3PAR HPE Smart SAN for HPE 3PAR makes end-to-end SAN configuration and management simple and automatic reducing the probability of errors through tSAN automation. It is an application embedded in the SAN components (array, hosts and switches) that enables the 3PAR to automate configuration for settings and policies across the SAN. Smart SAN features enable customers to automate peer zoning, resulting in the creation of fewer zones, and enables configuration of zones in minutes, not hours.

HPE StoreFront Remote SaaS Portal
The HPE StoreFront Remote SaaS Portal provides proactive tools and integrated data collection from the HPE 3PAR StoreServ Storage arrays that call home to deliver unique insights and analytics all in one dashboard. Identify capacity and performance issues early through intuitive capacity and performance trend analysis and forecasting. These valuable analytics help maximize asset utilization and optimize the datacenter with recommendations and remedial actions when issues arise. Users can log into **http://www.storefrontremote.com** to claim their arrays and get access for free.

All-inclusive Multi-system software
The All-inclusive Multi-system software is an optional software suite that includes Peer Motion, Remote Copy, Peer Persistence, and Cluster Extension.

HPE 3PAR Peer Motion
HPE 3PAR Peer Motion enables load balancing at will wherein, movement of data and workloads between arrays is initiated without impacting applications, users or services.

HPE 3PAR Peer Persistence
HPE 3PAR Peer Persistence software enables HPE 3PAR StoreServ systems located at metropolitan distances to act as peers to each other, presenting a nearly continuous storage system to VMware vSphere hosts connected to them.

HPE 3PAR Cluster Extension
HPE 3PAR Cluster Extension Software offers rapid automated protection against application downtime from fault, failure, or site disaster. CLX integrates with the Windows OS clustering software and HPE 3PAR Remote Copy to automate failover and failback between sites

Service and Support

Warranty
3 Year, On-site Warranty Service for hardware components. 7x24 4-hour remote response with next business day on-site response. The warranty on all HPE 3PAR StoreServ 8000 Solid State Drives is 5 years, parts only. Please refer to the HPE 3PAR StoreServ 8000 Drives section for the complete list of SSD SKUs. The warranty on all other HPE 3PAR StoreServ 8000 drives (SAS performance and Nearline SAS) is 3 years, parts only. Hewlett Packard Enterprise warrants only that the Software media will be free of physical defects for a period of ninety (90) days from delivery.
For more information about Hewlett Packard Enterprise's Global Limited Warranty and Technical Support, visit:
http://www.hpe.com/storage/warranty

NOTE: All currently available HPE 3PAR StoreServ SSDs carry a five-year warranty offering unconditional replacement in case of drive failure, media wear-out, or both.
NOTE: For Storage Base SKUs and Drive SKUs the warranty only covers the HW and not the All-inclusive software that is included with the same SKUs.
NOTE: Node Conversion Kits will include its own warranty and will be eligible for its own support contract. The original capacity will retain its existing warranty and support entitlement.

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 down time, 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]HP CSC reports 2014 - 2015

Optimized Care
HPE Proactive Care Advanced* - 24x7 coverage, three year Support Service
This services helps achieve a higher return on your product investment with personalized support from a local assigned Account Support Manager who will share best practice advice and personalized recommendations designed to help improve availability and performance to increase stability and reduce unplanned downtime. Leverage your system's ability to connect to Hewlett Packard Enterprise for pre-failure alerts, automatic call logging and parts dispatch. For business critical incidents, this service offers critical event management to reduce mean time to resolution. This recommendation provides 24x7 coverage with four-hour response for hardware and collaborative support that offers two-hour callback for supported software issues. Collaborative software management is included with independent software vendors unless you have your software support from Hewlett Packard Enterprise where we own all cases from start through to resolution.
https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA5-3259ENW.pdf

Standard Care
HPE Proactive Care* with 24x7 coverage, three year Support Service + 20 services credits for 1st year
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

Service and Support

Basic 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

HPE 3PAR SSD Support

3PAR SSD Extended Replacement Program

Provides for the post warranty replacement of eligible HPE 3PAR SSDs under active HPE support coverage in the event the SSD has reached its maximum usage limit based upon the HPE 3PAR SSD Life-Left reading.

http://h20195.www2.hpe.com/V2/GetPDF.aspx/a00000122ENW.pdf

HPE Services Support Credits

Services Support Credits offer flexible services and technical skills to meet your changing IT demands. With a menu of service that is tailored to suit your needs, you get additional resources and specialist skills to help you maintain peak performance of your IT. Offered as annual credits, you can plan your budgets while proactively responding to your dynamic business.

*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.

Related Services

HPE 3PAR StoreServ 8000, 9000 and 20000 Storage Installation and Startup Service Hewlett Packard Enterprise provides onsite deployment of your HPE 3PAR StoreServ 8000 and 20000 Storage arrays into your storage environment.

http://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA5-8035ENW.pdf

HPE 3PAR All-inclusive Multi-system Software Installation and Startup Service

This service, which provides installation and startup for the HPE 3PAR Remote Copy, Peer Motion, and Peer Persistence functionality of HPE 3PAR All-inclusive Multi-system Software in your storage environment, is designed to help you get HPE 3PAR All-inclusive Multi-system Software up and running quickly and to provide a demonstration of the product's key features using sample or test data only

http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA6-6385ENW.pdf

HPE 3PAR All-inclusive Single-system Software Installation and Startup Service Complementing your new HPE 3PAR All-inclusive Single-system software, this service provides the necessary activities required to help you deploy Adaptive Optimization, Dynamic Optimization, File Persona, Priority Optimization, System Reporter, Virtual Copy, and an overview of Virtual Domain and Virtual Lock. For Virtual Copy, the service provides a demonstration of the product's key features using sample or test data only

https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA6-6549ENW.pdf

HPE 3PAR 8000, 9000 and 20000 Software Installation and Startup Service

Designed to provide a smooth startup, this service provides deployment of individual HPE 3PAR 8000, 9000 and 20000 storage software features, helping to ensure proper installation in your storage environment as well as helping you increase the benefit from your storage investment.

http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA5-8036ENW.pdf

HPE 3PAR Controller Node Conversion Service

Provides deployment of HPE 3PAR 8000 Controller Node Conversion Kits helping maximize your current investment in 3PAR storage.

http://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA5-8035ENW.pdf

Service and Support

HPE 3PAR Peer Persistence Software Installation and Startup Service
Provides implementation of the HPE 3PAR Peer Persistence Software feature. The service is designed to help get HPE 3PAR Peer Persistence up and running quickly and to provide a demonstration of the product's key features using sample or test data only.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-2772ENW.pdf

HPE Storage Transformation Workshop
Explore data management to business-aligned visions, covering cloud, object, end to end data protection and BC/DR.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-9541ENW.pdf

HPE 3PAR StoreServ Data Migration
Proven methodology, expertise and tools to help you migrate data across your data center or around the globe.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA5-3759ENW.pdf

HPE Storage Modernization Service
Modernize your storage environment to take better advantage of physical or virtualized server environments, all flash, cloud, and object storage solutions.
http://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA5-8498ENW.pdf

Data Profiling Service
Let TS Consulting assess your current file storage and identify redundant, obsolete and trivial data – simplifying your transformation to 3PAR and reducing migration costs.

HPE StoreServ Integration Service
Integrate your new HPE 3PAR StoreServ system so that it is agile, performs effectively, and scales to rapid growth.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-9254ENW.pdf

HPE StoreServ Online Import Quick Start Service
Choose the most effective, appropriate methods for configuring and migrating to a HPE 3PAR platform.
http://h20195.www2.hpe.com/v2/getpdf.aspx/4AA6-0422ENW.pdf

HPE EVA to 3PAR Acceleration Service - The HPE EVA to HPE 3PAR Acceleration Service provides customers with OPEX and CAPEX savings as a result of your journey from HPE EVA to HPE 3PAR StoreServ. This service provides customers with an alternative DIY ("do-it-yourself") data migration option with guidance from TS Consulting Storage migration specialists.

HPE SAN Deployment Service
Hewlett Packard Enterprise delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-8527EN.pdf

HPE Data Replication Solution Service for 3PAR Virtual Copy
This service enables snapshots and mirroring to facilitate data restores, minimize downtime for backups, perform application testing and support data mining use with decision-support tools.
http://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA3-8107ENW.pdf

Service and Support

HPE Data Replication Solution Service for 3PAR Remote Copy
HPE Data Replication Solution Service for 3PAR Remote Copy Software configures real-time data mirroring between local and remote 3PAR storage systems to safeguard critical business information.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA3-8627ENW.pdf

HPE 3PAR Adaptive Optimization Policy Implementation Service
Provides analysis, recommendations, and implementation of HPE 3PAR Adaptive Optimization policies to enable storage tiering using data collected from the HPE 3PAR Storage system over time.
https://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-3393ENW.pdf

HPE Storage Virtual Volume Design and Implementation Service
When redeploying an HPE Storage array, the HPE Virtual Volume Design and Implementation Service provides the necessary activities required to design and implement a new virtual volume configuration.

HPE Thin Volume Conversion Service
Provides evaluation and execution of conversion from standard to thin provisioned virtual volumes for HPE 3PAR Storage. A service specialist advises the customer on HPE 3PAR Thin Provisioning best practices, provides evaluation of potential disk capacity savings if target virtual volumes are converted, and plans and implements thin conversion processing. The service leverages 3PAR thin provisioning capabilities to help optimize storage capacity, reduce cost, increase agility and maintain performance
https://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-3393ENW.pdf

HPE Performance Analysis Service for HPE Disk Arrays
The service provides data collection, detailed I/O analysis and enhancement recommendations for HPE 3PAR StoreServ Storage disk arrays, HPE EVA P6000 Storage disk arrays and HPE XP Storage disk arrays. HPE Performance Analysis Service for HPE Storage Disk Arrays provides a single engagement concerning the performance of a single HPE Storage disk array.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/5982-6668EN.pdf

HPE Data Sanitization Storage and Server Services
These services provide the skilled resources and tools to help your organization address the need to protect data when your organization is retiring systems, upgrading storage and servers, returning leased equipment, or redeploying data storing devices. Using specialized software techniques, an HPE service specialist or authorized service partner will help ensure that data cannot be reconstructed or retrieved from hard disk media in your server and storage devices. These services offer you a smart alternative or augmentation to physical hardware destruction by executing procedures to remove data from disk media.
https://www.hpe.com/h20195/v2/GetPDF.aspx/5981-9510EN.pdf

HPE 3PAR Performance and Capacity Trending Service
HPE 3PAR Performance and Capacity Trending Service provides data collection, analysis, and reports with key performance and capacity metrics for your HPE 3PAR StoreServ array. Through this service, you will receive a specified number of reports describing long-term trends in performance and capacity usage, and have the option to purchase additional reports. You will also receive briefing sessions highlighting The Hewlett Packard Enterprise findings and recommendations.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA5-8792ENW.pdf

HPE 3PAR Health Check Service
The HPE 3PAR Health Check service is delivered as a single engagement, providing data collection, analysis, report creation, and a briefing session concerning the performance of a single HPE 3PAR StoreServ Storage System. This health check service is best for HPE 3PAR StoreServ Storage Systems that have been installed and are in normal production mode. It can also be used to establish a baseline for future reference to improve the effective use of your storage system.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-3404ENW.pdf

Service and Support

HPE 3PAR Storage Rebalance Service
The HPE 3PAR Rebalance Service helps balance data across an HPE 3PAR StoreServ Storage array to take advantage of the capabilities of the array architecture. The service provides analysis, planning, and implementation of data movement and/or physical movement of drive magazines within the array.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-0280ENW.pdf

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.

Configuration Information

Customer Self Installation (CSI)

Customers have the option of self-installing HPE 3PAR StoreServ 8000 Storage system. The Customer Self Installation option is available for HPE 3PAR StoreServ 8000 Storage systems that meets the following criteria:

- 2-node configuration (8200, 8400 2N, 8440 2N, 8450 2N)
- Maximum of 4 additional drive enclosures
- Single rack (the physical Service Processor can be in a separate rack)
- CTO configurations (factory integrated)
- BTO configurations (field integrated) without additional host adapters

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Customer technical profile

In order to successfully install the HPE 3PAR StoreServ 8000 Storage system the installer should:

- Have a good understanding and knowledge of Storage Area Networks, Fiber Channel fundamentals and a basic understanding of TCP/IP and other networking protocols (DNS/NTP).
- Have a good understanding of server virtualization technology, in particular of Hypervisors such as VMware ESXi and Microsoft Hyper-V.
- Be able to maintain and install server hardware and Microsoft Windows and/or Linux OS.
- Have experience creating Storage LUNs, presenting/exporting LUNs to a server and formatting the LUNs to make them usable for applications.
- Be able to troubleshoot hardware and software issues using logs and documentation.
- If the installer doesn't meet the profile or is not comfortable with the self-installation process, Hewlett Packard Enterprise recommends engaging the Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Channel Partner to purchase HPE deployment services.

Customer responsibilities

The Customer will:

- Ensure that the host and SAN environment is supported and compliant with HPE recommendations and best practices. Host and SAN Implementation Guides are available at **https://support.hpe.com/hpesc/public/home**. Support Matrix are available on SPOCK (HP Storage Single Point of Connectivity Knowledge) **http://www.hpe.com/storage/spock**.
- Resolve any problems with their SAN and host environment, prior to installing the HPE 3PAR StoreServ 8000 Storage.

Customer Self Installation documentation

Prior to installing the HPE 3PAR StoreServ 8000 Storage system, the installer should thoroughly review the following documentation.

- HPE 3PAR StoreServ 8000 Storage Self-Install Guide: **http://www.hpe.com/support/3PAR8000CSI**
- HPE 3PAR StoreServ 8000 Storage Series Cabling Configuration Guide: **http://www.hpe.com/support/3PAR8000Cabling**
- HPE 3PAR StoreServ 8000 Storage Installation video:**http://www.hpe.com/support/3PAR8000CSIVideo**
- Forum on HPE 3PAR StoreServ 8000 Self-Install: **http://www.hpe.com/forum/3PAR8000CSIHELP**

The Customer Self Installation option is available only for initial installs, not for upgrades. Customer Self Upgrade (CSU) is optional for HPE 3PAR OS software. Customer Self Repair (CSR) information is available at this link:

https://support.hpe.com/hpsc/doc/public/display?docId=emr_na-c05133912

NOTE: Customers performing a self-install (according to rules identified above) will not void their warranties and will be fully supported.

NOTE: Node conversion kits are not available for Customer Self Installation (CSI)

Configuration Information

Step 1 - Choose a Base configuration

HPE 3PAR StoreServ 8000 configurations start with the selection of the Base. The Base includes controller nodes, bays for small form factor drives, PCIe slots for host adapter cards, and All-inclusive Single-system Software. All HPE 3PAR StoreServ 8000 models have 12Gbps SAS backend.

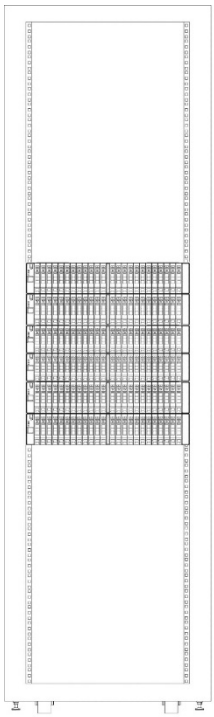
HPE 3PAR StoreServ 8000 Base Configurations

Factory Integrated in HPE rack	
HPE 3PAR 8200 2N+SW Storage Base	K2Q35B
HPE 3PAR 8400 2-node Storage Base with All-inclusive Single-system Software	H6Y95B
HPE 3PAR 8400 4-node Storage Base with All-inclusive Single-system Software	H6Z01B
HPE 3PAR 8440 2N+SW Storage Base	H6Y97B
HPE 3PAR 8440 4N+SW Storage Base	H6Y98B
HPE 3PAR 8450 2-node Storage Base with All-inclusive Single-system Software	H6Z17B
HPE 3PAR 8450 4-node Storage Base with All-inclusive Single-system Software	H6Z23B
Factory Integrated in HPE rack in a Storage Centric Configuration	
HPE 3PAR 8200 2N+SW Storage Cent Base	K2Q37B
HPE 3PAR 8400 2N+SW Storage Cent Base	H6Z12B
HPE 3PAR 8400 4-node Storage Base with All-inclusive Single-system Software for Storage Centric Rack	H6Z03B
HPE 3PAR 8440 2-node Storage Base with All-inclusive Single-system Software for Storage Centric Rack	H6Z09B
HPE 3PAR 8440 4N+SW Storage Cent Base	H6Z14B
HPE 3PAR 8450 2-node Storage Base with All-inclusive Single-system Software for Storage Centric Rack	H6Z20B
HPE 3PAR 8450 4-node Storage Base with All-inclusive Single-system Software for Storage Centric Rack	H6Z25B
Field Integrated	
HPE 3PAR 8200 2N+SW Storage Field Base	K2Q36B
HPE 3PAR 8400 2N+SW Storage Field Base	H6Y96B
HPE 3PAR 8400 4N+SW Storage Field Base	H6Z02B
HPE 3PAR 8440 2N+SW Storage Field Base	H6Z07B
HPE 3PAR 8440 4N+SW Storage Field Base	H6Z13B
HPE 3PAR 8450 2-node Storage Field Integrated Base with All-inclusive Single-system Software	H6Z18B
HPE 3PAR 8450 4-node Storage Field Integrated Base with All-inclusive Single-system Software	H6Z24B

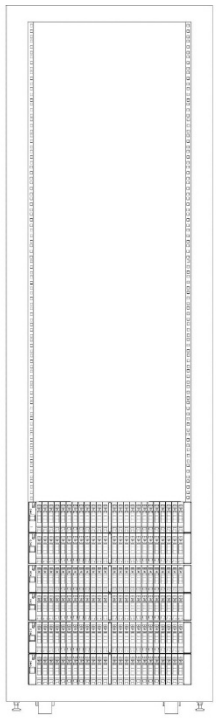
- A minimum of one (1) configuration base must be ordered for each array.
- The HPE 3PAR StoreServ 8000 base configuration includes (2 or 4) controller nodes, (24) small form factor drive bays per node pair, (4) built-in 16 Gb/sec FC ports per node pair, (4) 16Gb shortwave FC SFP per node pair, (2) PCIe adapter slots for host adapter cards per node pair (one slot per node), (2) 2m SAS cables per node pair, (1) mounting rail kit per node pair, and power cords.
- The HPE 3PAR StoreServ 8000 2-node base configuration also includes (2) 1U rack filler panels to reserve 2U of rack space above the 2-node Storage Base for a future upgrade to a 4-node configuration
- All base configurations include (1) built-in 1GbE port for management and (1) 1GbE port for Remote Copy over IP, per node.
- All Storage Base SKUs are loaded with All-inclusive Single-system Software.
- The Storage Centric rack versions of HPE 3PAR StoreServ 8000 are for CTO (factory Configure-To-Order) only. With a Storage Centric configuration, the storage system gets placed in the center of the rack so that future expansion of that storage system becomes easier.
- In Storage Centric configurations, non-3PAR components, with the exception of certain StoreFabric Storage Networking switches, if added to the same order, get placed in a separate rack.

Configuration Information

The following diagrams show a HPE 3PAR StoreServ 8000 4N Storage System in Storage Centric and non-Storage Centric configurations



StoreServ 8000 (4-node Storage system in a storage centric configuration in a HPE Intelligent Series Rack)



StoreServ 8000 (4-node Storage system in a non-storage centric configuration in a HPE Intelligent Series Rack)

HPE 3PAR StoreServ 8000 Upgrade Controller Node Pair

Use the HPE 3PAR StoreServ 8000 Upgrade Node Pair to convert an existing previously installed HPE 3PAR StoreServ 8000 2-node Storage Base into a 4-node configuration.

HPE 3PAR 8400 Upgrade Node Pair with All-inclusive Single-system Software	H6Z06B
HPE 3PAR 8440 Upgrade Node Pair with All-inclusive Single-system Software	H6Z08B
HPE 3PAR 8450 Upgrade Node Pair with All-inclusive Single-system Software	H6Z19B

- H6Z06B is used to upgrade a HPE 3PAR StoreServ 8400 2-node Storage Base into a 4-node configuration.
- H6Z08B is used to upgrade a HPE 3PAR StoreServ 8440 2-node Storage Base into a 4-node configuration.
- H6Z19B is used to upgrade a HPE 3PAR StoreServ 8450 2-node Storage Base into a 4-node configuration.
- One (1) pair of controller nodes beyond the base configuration is supported on the 3PAR StoreServ 8000.
- The 3PAR StoreServ 8000 Upgrade Node Pair includes (2) controller nodes, (24) small form factor drive bays, (4) built-in 16 Gb/sec FC ports, (4) 16Gb shortwave FC SFP, (2) PCIe adapter slots for host adapter cards (one slot per node), (2) 2m SAS cables, (4) node link cables, (1) mounting rail kit, and power cords
- The upgrade node pair includes (2) built-in 1GbE ports for management and (2) 1GbE ports for Remote Copy over IP.
- All Upgrade Node Pair SKUs are loaded with All-inclusive Single-system Software.

Configuration Information

HPE 3PAR StoreServ 8000 Node Conversion Kits

Use the HPE 3PAR StoreServ 8000 Controller Node Conversion Kit to convert an existing, installed, HPE 3PAR StoreServ 8000 node pair to realize greater scalability, and higher performance with no other hardware changes. This will be a data-in-place node conversion where all hardware including drives, and enclosures will remain in place.

HPE 3PAR StoreServ 8400 2-node Conversion Kit	R0P07A
HPE 3PAR StoreServ 8440 2-node Conversion Kit	R0P08A
HPE 3PAR StoreServ 8440 4-node Conversion Kit	R0P09A
HPE 3PAR StoreServ 8450 2-node Conversion Kit	R0P10A
HPE 3PAR StoreServ 8450 4-node Conversion Kit	R0P11A

- R0P07A is used to upgrade HPE 3PAR StoreServ 8200 2N Storage Base into HPE 3PAR 8400 2N+SW Storage Field Base (H6Y96B)
- R0P08A is used to upgrade HPE 3PAR StoreServ 8200 2N or 8400 2N Storage Base into HPE 3PAR 8440 2N+SW Storage Field Base (H6Z07B)
- R0P09A is used to upgrade a HPE 3PAR StoreServ 8400 4N Storage Base into HPE 3PAR 8440 4N+SW Storage Field Base (H6Z13B)
- R0P10A is used to upgrade a HPE 3PAR StoreServ 8200 2N or 8400 2N Storage Base into HPE 3PAR 8450 2N+SW Storage Field Base (H6Z18B)
- R0P11A is used to upgrade a HPE 3PAR StoreServ 8400 4N Storage Base into HPE 3PAR 8450 4N+SW Storage Field Base (H6Z24B)
- The number of controller nodes in the Conversion Kit must match the number of controllers of the original 3PAR StoreServ 8000 System
- The 3PAR StoreServ 8000 Conversion Kit includes (2) controller nodes and bezel labels.
- Controller Node Conversion Kits do not include HBAs, or NICs.
- Node Conversion requires original system to be licensed for All-inclusive Transition LTU SKU

NOTE: All 3PAR 8000 Conversion Kits require 3PAR OS 3.2.2 MU6 and P139. Systems utilizing File Persona, Encryption, & Asynchronous streaming replication are not currently eligible for node conversion.

HPE 3PAR StoreServ 8000 -48VDC Power Cooling Module

Use the HPE 3PAR StoreServ 8000 -48VDC Power Cooling Module (PCM) to install the HPE 3PAR StoreServ 8000 Storage Base in a DC power environment. The DC PCM is supported on any HPE 3PAR 8000 model.

HPE 3PAR 8000 -48VDC Power Cooling Module	P9M65A

Each enclosure (base enclosure or drive enclosure) needs two DC PCMs installed

NOTE: The DC PCM is supported on 3PAR OS 3.3.1 MU2 or later.

The following DC Breaker Panel can be ordered with DC PCM as an option

E-T-A S541 2x16 Output DC Breaker Panels	G2H95A

The following DC Power Cable Kits can be ordered with the DC PCM as an option.

E-T-A 6001 2x1.5m 3PAR 48VDC Cables	Q9N55A
E-T-A 6011 2x2.3m 3PAR 48VDC Cables	Q9N56A
E-T-A 6011 2x3.0m 3PAR 48VDC Cables	Q9N57A

Each enclosure (base enclosure or drive enclosure) needs one DC Power Cable Kit
These DC Power Cable Kits are only compatible with the DC Breaker Panel G2H95A at the source end

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Configuration Information

Step 2 - Choose Host Adapter

Host adapters can be ordered separately to be installed in the field or they can be factory configured into controller nodes. Host adapter cards provide the array with additional FC ports, with 10Gb/s iSCSI/FCoE ports, or with 1GbE/s and 10Gb/s Ethernet ports. The additional FC ports can be used for connection to hosts or used to connect to other HPE 3PAR StoreServ Storage systems in a Remote Copy relationship. The iSCSI/FCoE ports permit host connection in iSCSI and FCoE environments. The Ethernet ports can be used only with the HPE 3PAR File Persona Software for File services connectivity.

HPE 3PAR StoreServ 8000 Host Adapters

HPE 3PAR StoreServ 8000 2-port 32Gb Fibre Channel Adapter	Q2P66A
HPE 3PAR StoreServ 8000 4-port 16Gb Fibre Channel Adapter	H6Z00A
HPE 3PAR StoreServ 8000 2-port 10Gb iSCSI/FCoE Adapter	H6Z10A
HPE 3PAR StoreServ 8000 4-port 1Gb Ethernet Adapter	H6Z05A
HPE 3PAR StoreServ 8000 2-port 10Gb Ethernet Adapter	E7Y70A
HPE 3PAR StoreServ 8000 4-port 16Gb Fibre Channel/10Gb NIC Combo Adapter	N9Z18A
HPE 3PAR StoreServ 8000 4-port 10Gb iSCSI/10Gb NIC Combo Adapter	N9Z19A

- 32Gb FC host support requires 3PAR OS 3.3.1 Technology Release T05 or later. Check HPE Spock for latest supported 3PAR software and connectivity
- The host adapter cards are optional because the Storage Base products and the Upgrade Controller Node Pair include built-in FC ports.
- Ethernet Adapters (H6Z05A, E7Y70A) can only be used with the HPE 3PAR File Persona Software.
- The 32Gb/s Fiber Channel Adapter includes (2) 32Gb/s shortwave FC SFP+. The 16Gb/s Fiber Channel Adapter (H6Z00A) includes (4) 16Gb/s shortwave FC SFP+. The 10Gb/s iSCSI/FCoE Adapter (H6Z10A) includes (2) 10Gb/s shortwave SFP+. The 10Gb/s Ethernet Adapter (E7Y70A) includes (2) 10Gb/s SR SFP+. The FC/NIC Combo Adapter includes (2) 16Gb/s shortwave FC SFP+ and (2) 10Gb/s SR SFP+. The iSCSI/NIC Combo Adapter includes (4) 10Gb/s shortwave SFP+.
- Each node in a node pair (a node pair is composed of the two controller nodes in a single 2U enclosure) must have the same number and type of adapters: FC, iSCSI/FCoE, Ethernet, and Combo adapters may not be intermixed in a node pair.
- The 4 ports of the FC adapter can be individually configured to connect to a host or to a remote array in an RC configuration.
- The two ports of the iSCSI/FCoE adapter can be individually configured as iSCSI or FCoE. The iSCSI/NIC Combo Adapter (N9Z19A) does not support FCoE.
- The two NIC ports of the combo adapters (N9Z18A, N9Z19A) can be used either for File Persona or for RCIP. Only one 10GbE port per card can be used for RCIP. If the card is used for RCIP it cannot be used for File Persona.

Adapter Configurations permitted on HPE 3PAR StoreServ 8000 2-node systems

	2-node Storage Base		Upgrade Node Pair	
Configuration	**Node 0**	**Node 1**	**Node 2**	**Node 3**
A	Empty	Empty	Empty	Empty
B	FC	FC	FC	FC
C	iSCSI/FCoE	iSCSI/FCoE	iSCSI/FCoE	iSCSI/FCoE
D	Ethernet	Ethernet	Ethernet	Ethernet

Configuration Information

Adapter Configurations permitted on HPE 3PAR StoreServ 8000 4-node systems

Configuration	Node 0	Node 1	Node 2	Node 3
A	Empty	Empty	Empty	Empty
B	FC	FC	Empty	Empty
C	iSCSI/FCoE	iSCSI/FCoE	Empty	Empty
D	Ethernet	Ethernet	Empty	Empty
E	Empty	Empty	FC	FC
F	Empty	Empty	iSCSI/FCoE	iSCSI/FCoE
G	Empty	Empty	Ethernet	Ethernet
H	FC	FC	iSCSI/FCoE	iSCSI/FCoE
I	iSCSI/FCoE	iSCSI/FCoE	FC	FC
J	FC	FC	Ethernet	Ethernet
K	Ethernet	Ethernet	FC	FC
L	iSCSI/FCoE	iSCSI/FCoE	Ethernet	Ethernet
M	Ethernet	Ethernet	iSCSI/FCoE	iSCSI/FCoE
N	FC	FC	FC	FC
O	iSCSI/FCoE	iSCSI/FCoE	iSCSI/FCoE	iSCSI/FCoE
P	Ethernet	Ethernet	Ethernet	Ethernet

NOTE: If the configuration includes Remote Copy over Fibre Channel it is recommended that optional Fiber Channel HBAs are purchased as the built in ports will not offer sufficient connectivity.

NOTE: Ethernet Adapters can be used only with the HPE 3PAR File Persona Software for File services connectivity

NOTE: Combo Adapters can be used in any of the configurations listed in the tables above with the restriction that each node in a node pair needs to have the same number and type of adapters. Combo adapters are supported on 3PAR OS 3.3.1 MU2 or later.

Step 3 - Choose Drive Enclosures

Add drive enclosures to expand the configuration and to add large form factor drives to the configuration. Drive enclosures can be ordered separately for installation in the field, or they can be factory configured in a rack. Drive enclosures are optional. Because the Storage Base products and the Upgrade Node Pair include small form factor drive bays, the minimum configuration does not require any additional drive enclosures. For larger configurations, attach drive enclosures. Each drive enclosure includes 24 drive bays. The two drive enclosure types can be intermixed in a single array. The HPE 3PAR StoreServ 8200 supports up to nine (9) added drive enclosures. The HPE 3PAR StoreServ 8400 supports up to twenty-two (22) added drive enclosures. The HPE 3PAR StoreServ 8440 supports up to thirty-eight (38) added drive enclosures. The HPE 3PAR StoreServ 8450 supports up to eighteen (18) added drive enclosures.

Configuration Information

HPE 3PAR StoreServ 8000 SFF(2.5in) SAS Drive Enclosure

HPE 3PAR StoreServ 8000 LFF(3.5in) SAS Drive Enclosure

Drive Enclosures

HPE 3PAR StoreServ 8000 SFF(2.5in) SAS Drive Enclosure	H6Z26A
HPE 3PAR StoreServ 8000 LFF(3.5in) SAS Drive Enclosure	H6Z27A
HPE 3PAR StoreServ 8000 SFF(2.5in) Field Integrated SAS Drive Enclosure	E7Y71A
HPE 3PAR StoreServ 8000 LFF(3.5in) Field Integrated SAS Drive Enclosure	E7Y72A

- Each drive enclosure includes 24 drive bays, (2) IO modules, (2) 1m SAS cables, (1) mounting rail kit, and power cables.
- The 2U SAS drive enclosure provides 24 SFF drive bays arranged in a single row.
- The 4U drive enclosure provides 24 LFF drive bays, arranged in four (4) columns of six (6) slots each.
- Drive enclosures are connected in daisy chains from the SAS ports of the controller nodes.
- The best practice is to balance the drive enclosures across the SAS ports, remembering that the controller node enclosures include (24) drives attached to the SAS port labeled DP-1.
- The best practice when including LFF and SFF drive enclosures in the same array is to arrange them in the rack so that all of the 2U enclosures that belong to one node pair are together and all of the 4U enclosures for that node pair are together. When connecting the backend SAS cables, intermix the 2U and 4U SAS enclosures on each SAS port.
- With a four node configuration, the best practice is to attach the same number of drive enclosures and drive types to each node pair.
- To achieve highest availability in multi-enclosure configurations, configure a minimum of two (2) enclosures per node pair for RAID 1, a minimum of four (4) enclosures per node pair if RAID 5 is included, and a minimum of three (6) enclosures per node pair if RAID 6 is included. Include enclosures containing node pairs in the count with the 2U SAS enclosures.
- Drive bays that are not filled with a drive must be covered with a drive blank to preserve proper air flow.
- If future capacity upgrades are expected, include enough Drive Enclosures so that there are some empty bays in each enclosure after all drives are added.

Configuration Information

Step 4 - Choose Drives

Drives are orderable at the time the array is purchased, or can be added in the future when additional capacity is required. HPE 3PAR StoreServ 8000 drives are sold as single drives. Note that these drives are only compatible with the HPE 3PAR StoreServ 8000 SAS Drive Enclosures.

HPE 3PAR StoreServ 8000 SAS Drives

HPE 3PAR SSDs

HPE 3PAR 8000 920GB SAS SFF (2.5in) SSD with All-inclusive Single-system	R0P66A
HPE 3PAR 8000 1.92TB+SW SFF SSD	K2P89B
HPE 3PAR 8000 3.84TB+SW SFF SSD	K2P91B
HPE 3PAR 8000 7.68TB+SW SFF SSD	P9L83B
HPE 3PAR 8000 15.36TB SAS SFF (2.5in) SSD with All-inclusive Single-system Software	P9M59B

HPE 3PAR SAS HDDs (Performance HDDs)

HPE 3PAR 8000 300GB SAS 15K SFF (2.5in) HDD with All-inclusive Single-system Software	K2P97B
HPE 3PAR 8000 600GB+SW 15K SFF HDD	K2P98B
HPE 3PAR 8000 600GB+SW 10K SFF HDD	K2P99B
HPE 3PAR 8000 1.2TB+SW 10K SFF HDD	K2P93B
HPE 3PAR 8000 1.8TB+SW 10K SFF HDD	K2P94B

HPE 3PAR NL SAS HDDs

HPE 3PAR 8000 2TB+SW 7.2K SFF HDD	M0S92B
HPE 3PAR 8000 4TB+SW 7.2K LFF HDD	K2P87B
HPE 3PAR 8000 6TB+SW 7.2K LFF HDD	K2P96B
HPE 3PAR 8000 8TB SAS 7.2K LFF (3.5in) HDD with All-inclusive Single-system Software	P9B44B

- For each drive type installed in the array, the minimum recommended initial quantity is eight (8) drives per node pair for SSD and SAS performance HDDs, and twelve (12) drives per node pair for Nearline HDDs.
  NOTE: 8 drives support RAID 1 and RAID 5. For RAID 6 choose 12 drives.
- The minimum number of SSDs for Adaptive Flash Cache (AFC) is two (2).
- Minimum upgrade quantity is 4 drives per node pair or 2 drives per enclosure, whichever is larger. Best practice is to run Autonomic Rebalance (also known as tunesys) after adding the drives.
- RAID 6 is strongly recommended for all drive types, SSDs and HDDs (both Fast Class and Nearline).
- All node enclosures must contain either zero (0) or an even number of the same type of drives (FC, NL, SSD).
- All drive enclosures must contain an even number of drives, with a minimum of two.
- A best practice is to add equal numbers of drives to all enclosures compatible with the drive type being added.
- With a four node configuration, the best practice is to attach the same number and type of drives to each node pair.
- Small Form Factor (SFF)-specific configuration practices
- SFF drives may be loaded into the Storage Base enclosures, the Upgrade Node Pair enclosure and the 2U SAS drive enclosure.
- SFF drives must be loaded in pairs of identical drives, beginning with the leftmost slot, slot 0, and filling to the right, leaving no empty slots between drives.
- Large Form Factor (LFF)-specific configuration practices
  - LFF drives may be loaded into the 4U SAS drive enclosure.
  - LFF drives must be loaded in pairs of identical drives starting at the bottom of a column, leaving no empty slots between drives in the column.
  - Intermixing SSDs and spinning media in a LFF drive enclosure is allowed as long as each drive type is installed in even pairs in the same column.
  - It is permitted to have empty columns between columns containing drives. Different columns do not have to contain the same number of drives.
  - An all LFF drive configuration is permitted, leaving the Storage Base Enclosure empty.

Configuration Information

HPE 3PAR FIPS Encrypted SSD/HDD	
HPE 3PAR 8000 920GB+SW SFF FE SSD	K2P90B
HPE 3PAR 8000 1.92TB+SW SFF FE SSD	K2R27B
HPE 3PAR 8000 3.84TB+SW SFF (2.5in) FE SSD	M0T66B
HPE 3PAR 8000 7.68TB+SW SFF FE SSD	P9L84B
HPE 3PAR 8000 15.36TB+SW SAS SFF (2.5in) FE SSD	P9M60B
HPE 3PAR 8000 600GB+SW 15K SFF FE HDD	K2P92B
HPE 3PAR 8000 1.2TB+SW 10K SFF FE HDD	K2P85B
HPE 3PAR 8000 4TB+SW 7.2K LFF FE HDD	N9Y05B
HPE 3PAR 8000 6TB+SW SAS 7.2K LFF (3.5in) FE HDD	K2P86B
HPE 3PAR 8000 8TB+SW 7.2K LFF FE HDD	P9B45B
HPE 3PAR TAA Compliant FIPS Encrypted SSD/ HDD	
HPE 3PAR 8000 1.92TB SDD FE TAA SSD +SW	R3R45A
HPE 3PAR 8000 1.2TB 10K SFF FE TAA HDD +SW	R3R46A
HPE 3PAR 9000 8TB 7.2 LFF FE TAA HDD +SW	R3R47A
HPE 3PAR Encryption License	
HPE 3PAR 8200 Data Encryption LTU	L7B67A
HPE 3PAR 8200 Data Encryption E-LTU	L7B67AAE
HPE 3PAR 8400 Data Encryption LTU	L7B91A
HPE 3PAR 8400 Data Encryption E-LTU	L7B91AAE
HPE 3PAR 8440 Data Encryption LTU	L7C15A
HPE 3PAR 8440 Data Encryption E-LTU	L7C15AAE
HPE 3PAR 8450 Data Encryption LTU	L7C39A
HPE 3PAR 8450 Data Encryption E-LTU	L7C39AAE

- An encrypted HPE 3PAR StoreServ array, i.e. any HPE 3PAR StoreServ array that has the HPE 3PAR Data Encryption license activated or intended to be activated, must have only self-encrypted drives installed.
- A non-encrypted HPE 3PAR StoreServ array can have a mix of encrypted and non-encrypted drives.
- Customers have option to turn on encryption, non-disruptively, at any time, even after data has been written to the system.
- FIPS 140-2 Validated Self-Encrypting Drives (SEDs) have been certified by the U.S. National Institute of Standards and Technology (NIST) and Canadian Communications Security Establishment (CSE) as meeting the Level 2 security requirements for cryptographic modules as defined in the Federal Information Processing Standards (FIPS) 140-2 Publication
- Strengthen the DAR solution with an optional FIPS 140-2 Level-2 validated external key manager. Supports KMIP 1.1 for key management communications
- Supports HPE Enterprise Secure Key Manager 4.0 and SafeNet KeySecure k460 and k150 centralized key management
- A data encryption license (LTU) is required to enable encryption on the array. One encryption license is required for each encrypted array.
- Once encryption is enabled on the HPE 3PAR StoreServ Storage, it cannot be disabled.
- The local key manager is included in the HPE 3PAR OS. There is not a separately orderable part number for the local key manager.
- TAA compliance is established by procuring only the SSDs and HDD with Country of Origin listed in the TAA Designated Countries and establishing documentation for Country of Origin verification. https://gsa.federalschedules.com/resources/taa-designated-countries/

Configuration Information

Step 5 - Choose Service Processor Implementation

The HPE 3PAR Service Processor remotely monitors the HPE 3PAR StoreServ 8000 and enables remote servicing of the array. The key capabilities of the Service Processor are to:

- Enable rapid, proactive responses to issues
- Provide a secure communication channel between the customer's data center and HPE 3PAR Central for:
  - Remote Online Software Upgrade --Upgrade software with no application disruption
  - Remote Diagnostics --Maintain key diagnostic information centrally on a historical basis
  - Remote Serviceability--Provide fast predictive response and remediation

Each HPE 3PAR StoreServ 8000 requires its own Service Processor. The Service Processor functions as the communication interface between a customer's IP network and HPE 3PAR Central by managing all service-related communications. The Service Processor leverages the industry-standard HTTP over Secure Sockets Layer (HTTPS) protocol to secure and encrypt data communication. The Service Processor can be deployed either as a virtual Service Processor (VSP) or a physical Service Processor.

Virtual Service Processor

A virtual Service Processor is included free with the base HPE 3PAR Operating System. The virtual Service Processor can be installed on a customer-provided VMware or Microsoft Hyper-V system that meets the following specifications:

- Virtualization operating system
  - VMware ESXi 5.0/5.1/5.5/6.0
  - Microsoft Hyper-V 2008R2/2012/2012 R2
- Server features
  - 2 GB RAM (minimum for the VSP Virtual Machine)
  - 256 GB free disk space (minimum for the VSP Virtual Machine)
    NOTE: VSP storage must not reside on the array it is managing.
  - DVD ROM or DVD RW
  - 1 Gb Ethernet port
  - For VSP on VMware, the server must be listed in the VMware Compatibility Guide
  - For VSP on Hyper-V, the server must be listed on the Windows Server Catalog

Physical Service Processor

The physical Service Processor is a dedicated storage appliance located within the storage rack providing close proximity to the HPE 3PAR StoreServ 8000 Storage. The physical Service Processor is fully supported and maintained by HPE Services. The physical Service Processor has serial port connectivity that provides maintenance access for trouble shooting capabilities.

If a VMware server is not available to run the virtual Service Processor, the physical Service Processor is the alternative choice for remote monitoring and remote service. The physical Service Processor is available in two version: with Single Power Supply and with Redundant Power Supply.

Service Processor

HPE 3PAR StoreServ SPS Service Processor	Q2S14A
HPE 3PAR StoreServ RPS Service Processor	Q2S13A
HPE 3PAR StoreServ DC RPS Service Processor	Q2S15A
The following DC Power Cable Kits can be ordered along with DC RPS Service Processor Q2S15A	
E-T-A 6101 2x1.5m Proliant 48VDC cables	Q9N58A
E-T-A 6111 2x2.3m Proliant 48VDC cables	Q9N59A
E-T-A 6121 2x3.0m Proliant 48VDC cables	Q9N60A

Each DC RPS Service Processor requires one DC Power Cable Kit
These DC Power Cable Kits are only compatible with DC Breaker Panel G2H95A at the source end.

Configuration Information

HPE 3PAR Policy Server

HPE 3PAR Policy Server works to implement customer-configurable remote service access policies. Installed on a customer-provided host, Policy Server provides the customer with ultimate flexibility and control to allow or deny outbound communication or remote service connections to and from an HPE 3PAR StoreServ Storage system. Policy Server also serves as the centralized point for collecting and storing audit logs of all diagnostic data transfers and authorized remote service connections to and from all configured HPE 3PAR Storage systems. HPE 3PAR Policy Server provides the

- The customer has complete control over policy administration.
- A centralized policy administration for all HPE 3PAR Storage systems is provided.
- A centralized audit log to facilitate security audits is provided.
- Up to 100 3PAR systems can be managed with a single 3PAR Policy Server license
- Policy Server 6.1.5 can be run on a Virtual Machine. For the latest information on supported hypervisors, refer to Single Point of Connectivity Knowledge for HPE Storage Products (SPOCK): **http://www.hpe.com/storage/spock**

HPE 3PAR Policy Manager Software LTU	TE400B

Step 6 - Choose Cables for host connection and remote copy connection

Cables are required on the HPE 3PAR StoreServ 8000 Storage for drive enclosure connections and for host connectivity. Copper SAS cables are required for connecting the drive enclosures to the nodes on the same rack and for daisy chaining between adjacent drive enclosures. Storage Base products, the Upgrade Node Pair and the Drive Enclosures all include Copper SAS cables. SAS Active Optical Cables are required if an HPE 3PAR StoreServ 8000 needs to be expanded into an adjacent rack, to connect drive enclosures in adjacent racks to the nodes in the base rack. OM4 Fiber Cables are required for host connectivity, Remote Copy and Peer Motion. The copper 1GbE cables are used for Remote Copy over IP and for connection to the Management Port.

Cables

External Mini-SAS Cables	
HPE External 2.0m (6ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716197-B21
SAS Active Optical Cables	
HPE 10m Mini SAS High Density Active Optical Cable	E7V95A
HPE 25m Mini SAS High Density Active Optical Cable	E7V96A
OM4 Cables	
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A
Copper 1GbE cables	
HPE 4.3m/14ft CAT5 RJ45 M/M Ethernet Cable	C7536A
HPE 7.6m/25ft CAT5 RJ45 M/M Ethernet Cable	C7537A
HPE 15.2m/50ft CAT5 RJ45 M/M Ethernet Cable	C7542A
Optical splitters	
HPE Multi Fiber Push On to 4 x Lucent Connector 5m Cable	K2Q46A
HPE Multi Fiber Push On to 4 x Lucent Connector 15m Cable	K2Q47A

Configuration Information

Direct Attach Copper Cables*

HPE FlexNetwork

HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

HPE ARUBA

Aruba 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281D
Aruba 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283D
Aruba 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285D

Broadcom

HPE B-series SFP+ to SFP+ Active Copper 1.0m Direct Attach Cable	AP818A
HPE B-series SFP+ to SFP+ Active Copper 3.0m Direct Attach Cable	AP819A
HPE B-series SFP+ to SFP+ Active Copper 5.0m Direct Attach Cable	AP820A

Cisco

HPE StoreFabric C-series 3M Passive Copper SFP+ Cable	K2Q21A
HPE StoreFabric C-series 5M Passive Copper SFP+ Cable	K2Q22A
HPE C-series SFP+ to SFP+ Active Copper 7.0m Direct Attach Cable	QK701A
HPE C-series SFP+ to SFP+ Active Copper 10.0m Direct Attach Cable	QK702A

HPE BladeSystem

HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 3m Direct Attach Copper Cable	487655-B21
HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 5m Direct Attach Copper Cable	537963-B21

NOTE: External Mini SAS Cable is only available as part of a BTO upgrade configuration
NOTE: DAC cable support for 3PAR 8000 platforms requires HPE 3PAR OS version 3.2.2 MU3 or higher. J9285D, AP818A, AP819A, AP820A, QK701A, QK702A, 487655-B21, 537963-B21, 487658-B21 require HPE 3PAR OS version 3.3.1 or higher.
NOTE: DAC cables are supported for 10GbE speeds with iSCSI, FcoE, and File protocols.
NOTE: Direct Connect between the host and storage is not supported with DAC cables, they require the use of a switch.
NOTE: For the latest information refer to Single Point of Connectivity Knowledge for HPE Storage Products (SPOCK).

Step 7 - Choose Racking Options

The HPE 3PAR StoreServ 8000 is compatible with most industry standard 4-post EIA 19 inch racks with square mounting holes, including the HPE Intelligent Series Rack and the HPE 10000 G2 Series Rack. The HPE 3PAR StoreServ 8000 can be factory configured and shipped in a rack or shipped without a rack for field integration into an existing rack. The rack used for factory integration is the HPE Intelligent Series Rack.

HPE Rack and Rack Options

Factory Integration

Select a rack to house your HPE 3PAR StoreServ 8000.
NOTE: The HPE Intelligent Series Rack is the only series supported for factory configuration.

Configuration Information

Primary Configuration Rules

The HPE 3PAR StoreServ 8000 will be configured into an HPE Intelligent Series Rack with the appropriate power distribution units (PDUs). If other products such as servers or back-up products are included in the cab, a different PDU will be added (if required) or can be chosen from a list of appropriate offerings shown in the configuration tool. The HPE Intelligent Series Rack must be purchased for factory configuration. Additional 3PAR StoreServ 8000 controller node enclosures and drive enclosures may be ordered for multiple subsystem integration at the factory. The 3PAR StoreServ 8000 is also supported in HPE 10000 G2 Series racks for field installation. When calculating available U-space, assume that no space will be placed between the mounted components. For redundancy, order PDUs in quantities of two. Refer to the Configuration and User Guide in the Information Library at the Rack Solutions webpage.

HPE Intelligent Series Racks

NOTE: The number of components that will fit in a rack varies and is determined by the interior U-space of the rack.

HPE 42U 600mmx1075mm G2 Enterprise Shock Rack	P9K38A
HPE G2 Rack 42U 1075mm Side Panel Kit	P9L15A
HPE 42U 600mmx1200mm G2 Enterprise Shock Rack	P9K40A
HPE G2 Rack 42U 1200mm Side Panel Kit	P9L16A
HPE 36U 600mmx1075mm G2 Kitted Advanced Shock Rack with Side Panels and Baying	P9K06A
HPE 42U 600mmx1075mm G2 Kitted Advanced Shock Rack with Side Panels and Baying	P9K08A
HPE 42U 600mmx1200mm G2 Kitted Advanced Shock Rack with Side Panels and Baying	P9K10A

NOTE: For more information on rack options, see: **http://www.hpe.com/products/rackoptions**.

PDUs

NOTE: For more information on PDUs, see:
https://www.hpe.com/us/en/product-catalog/servers/power-distribution-units.html

Branding Kit

HPE 3PAR G2 Rack 42U Branding Kit	Q9D29A

NOTE: The branding kit is an optional SKU available for G2 42U racks. It adds to the rack a storage specific branding consisting of a silver/green door panel and a yellow “Storage” element.

Non-HPE rack and power requirements

The Storage Bases, the Upgrade Node Pair, and the Drive Enclosures include mounting rails that are compatible with industry standard 4-post EIA 19 inch racks with square mounting holes. For detailed information on determining compatibility of a non-HPE rack, please review the information included in the HPE 3PAR StoreServ 8000 Site Planning Guide

Step 8 - Choose Software

Hewlett Packard Enterprise provides an extensive selection of features for HPE 3PAR StoreServ Storage. All of the features available on the HPE 3PAR StoreServ 20000 Storage system are also available on the HPE 3PAR StoreServ 8000 Storage system, the result of a common architecture that spans from small and medium businesses to the largest global enterprise. For convenient ordering, the 3PAR StoreServ 8000 includes as part of the array and drives the All-Inclusive Single-System Software which includes: OS Suite, Virtual Copy, Adaptive Optimization, Dynamic Optimization, Priority Optimization, Virtual Domains, Virtual Lock, Online Import, File Persona, Recovery Manager Central (RMC), and Smart SAN. Additional software can be purchased ordering the All-inclusive Multi-system software, a frame license that includes Peer Motion, Remote Copy, Peer Persistence, and Cluster Extension.
For more information regarding HPE 3PAR 8000 software SKUs see:
http://h20195.www2.hpe.com/v2/GetPDF.aspx/c04199812.pdf

Configuration Information

Step 9 - Choose File Controller

Add optimized, secure, and reliable Microsoft-powered file services to your 3PAR 8000 with one or more pre-configured HPE Storage Performance File Controllers. Augmenting a 3PAR 8000 with a file controller or highly-available file controller cluster creates a unified block/file solution for your Microsoft environment that maximizes your total storage investment. Each HPE Storage File Controller is built on HPE ProLiant DNA and Microsoft Windows Storage Server 2016, and can serve thousands of concurrent users and multiple diverse workloads while providing a straightforward and familiar management experience for IT generalists or storage administrators.

HPE Storage Perf File Controller Q9D44A

NOTE: HPE Storage File Controllers have 4 x 1GbE ports and are pre-configured with Windows Storage Server 2016, which includes a software iSCSI initiator. Other array connections require adding at least one HBA or Ethernet adapter plus cables.
NOTE: For two-node clusters, an Ethernet interconnect cable is required. For three- or more node clusters, a network switch plus one Ethernet cable per node is required.

For more information about configuring and connecting an HPE Storage File Controller, please visit: **https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=a00047729enw**

Technical Specifications

Physical Dimensions	Width in/mm	Depth in/mm	Height in/mm/U	Weight lb/kg
36U 1075mm Intelligent Series Rack	23.54/597.9	44.3/1125.2	68.84/1748.6	428/195
42U 1075mm Intelligent Series Rack	23.54/597.9	44.3/1125.2	79/2006.6	451/205
42U 1200mm Intelligent Series Rack	23.54/597.9	51.19/1300.2	79/2006.6	531/241
47U 1075mm Intelligent Series Rack	23.54/597.9	44.3/1125.2	88.53/2248.7	483/220
HPE 3PAR StoreServ 8200 2N Storage Base (no host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	47.7/21.6
HPE 3PAR StoreServ 8200 2N Storage Base (with two host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	48.7/22.1
HPE 3PAR StoreServ 8400 2N Storage Base (no host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	47.7/21.6
HPE 3PAR StoreServ 8400 2N Storage Base (with two host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	48.7/22.1
HPE 3PAR StoreServ 8400 4N Storage Base (no host adapters, no drives)	19/483	26.6/676.1*	6.925/175.9/4	97.8/44.4
HPE 3PAR StoreServ 8400 4N Storage Base (with four host adapters, no drives)	19/483	26.6/676.1*	6.925/175.9/4	99.8/45.3
HPE 3PAR StoreServ 8440 2N Storage Base (no host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	47.7/21.6
HPE 3PAR StoreServ 8440 2N Storage Base (with two host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	48.7/22.1
HPE 3PAR StoreServ 8440 4N Storage Base (no host adapters, no drives)	19/483	26.6/676.1*	6.925/175.9/4	97.8/44.4
HPE 3PAR StoreServ 8440 4N Storage Base (with four host adapters, no drives)	19/483	26.6/676.1*	6.925/175.9/4	99.8/45.3
HPE 3PAR StoreServ 8450 2N Storage Base (no host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	47.7/21.6
HPE 3PAR StoreServ 8450 2N Storage Base (with two host adapters, no drives)	19/483	26.6/676.1*	3.46/87.95/2	48.7/22.1
HPE 3PAR StoreServ 8450 4N Storage Base (no host adapters, no drives)	19/483	26.6/676.1*	6.925/175.9/4	97.8/44.4
HPE 3PAR StoreServ 8450 4N Storage Base (with four host adapters, no drives)	19/483	26.6/676.1*	6.925/175.9/4	99.8/45.3
HPE 3PAR StoreServ 8000 SFF(2.5in) SAS Drive Enclosure (without drives)	19/483	24.8/630.7	3.46/87.95/2	33.5/15.2
HPE 3PAR StoreServ 8000 LFF(3.5in) SAS Drive Enclosure (without drives)	19/483	24.9/631.4	6.89/175/4	42.9/19.5
SFF SAS drive with carrier	0.78/19.9**	896/227.7	3.42/86.85**	0.7/0.32 (varies by type)
LFF SAS drive with carrier	4.36/110.84**	8.67/220.26	1.18/30.0**	1.9/0.86 (varies by type)
Service Processor				37.48/17

Technical Specifications

Power Requirements	
Input Voltage	
AC PCM option	100 to 240 VAC (50 to 60 Hz)
DC PCM option	-40 to -72 VDC

Refer to the HPE Power Advisor online tool for power consumption, heat loading, and circuit sizing information:
https://paonline56.itcs.hpe.com

Environmental Specifications[4]	
Operating Temperature	41° to 104° F (5° to 40° C) - Reduce rating by 1° F for each 1000 ft altitude (1.8° C/1,000 m)
Shipping Temperature	-30° to 60°C (-22 to 140°F). Maximum rate of change is 20°C/hr (36°F/hr)
Operating Altitude (ft/m) max.	10,000 ft / 3,048 m
Shipping Altitude (ft/m) max.	40,000ft/ 12,192 m
Humidity	10% to 90% non-condensing
Shipping Humidity	10% to 90% non-condensing
Operating Vibration	0.25 G, Sine, 5-500 Hz; 0.25 GRMS, Random 5-500 Hz
Non-operating Vibration	0.5 G, 5 - 500 Hz, Sine; 0.5 GRMS, Random, 5-500Hz
Operating Shock	5G, 11ms, half-sine
Non-operating Shock	10 G, 11ms, half-sine
Maximum Air Flow	Storage Base and Upgrade Node Pair - 109 CFM per enclosure 8000 SFF(2.5in) SAS Drive Enclosure - 105 CFM 8000 LFF(3.5in) SAS Drive Enclosure - 109 CFM

Electromagnetic Compatibility	CISPR 22:2008/ EN55022:2010 Class A CISPR 32 Edition 2.0/EN55032:2010 Class A CISPR 24:2010/ EN 55024:2010 IEC 61000-3-2: 2013/ EN 61000-3-2: 2014 IEC 61000-3-3:2013/ EN 61000-3-3: 2013 AS/NZS CISPR22: 2009 +A1:2010 Class A CNS 13438:2006 Class A 47 CFR Part 15 Subpart b Class A ICES-003 Issue 5 Class A V-3/2014.04 RRA Notice No. 2014-8 (2014.06.23) & 2014-37 (204.06.23) Class A RRA Notice No. 2014-9 (2014.06.23) & 2014-38 (2014.06.23)

Fan Speed (RPM)	8200/8400 2N Storage Base	8400 4N Storage Base	8440 2N Storage Base	8440 4N Storage Base	8000 2U SAS Drive Enclosure	8000 4U SAS Drive Enclosure
Minimum	63.8	67.2	72	74	62.6	61.3
Maximum	93.4	96.5	93	97	85.4	88

Acoustics Sound pressure level measured per ISO 7779 specs during normal operating fan conditions, from a minimum of 3,000 RPM to a maximum of 10,000 RPM

Technical Specifications

Safety

- IEC 60950-1:2005 (2nd Edition); +A1:2009 +A2:2013
- IEC 62368-1 (2nd Edition)
- EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013
- EN 62368-1 (2nd Edition)
- EN 62479:2010
- CNS 14336-1 2nd Edition
- UL 60950-1-07 2nd Ed. +A1:2011 +A2:2014
- UL 62368-1
- CAN/CSA C22.2 No. 60950-1-07 +A1:2011 +A2:2014
- CAN/CSA-C22.2 NO. 62368-1-14

NOTE: [4] Specifications are subject to change without notice.

Certifications / Markings

- cTUVus Mark
- TUV GS-mark (EN 60950)
- CE Mark
- FCC Class A
- IC Class A
- VCCI Class A
- BSMI Class A
- BIS
- KCC
- EACRCM
- EU WEEE
- China RoHS
- EU RoHS
- Ukraine
- EPA Energy Star

Summary of Changes

Date	Version History	Action	Description of Change
07-Oct-2019	Version 32	Changed	Overview and Configuration Information sections were updated.
15-Jul-2019	Version 31	Changed	Configuration Information section was updated.
10-Jun-2019	Version 30	Changed	Configuration Information updated and Appendix section removed.
04-Feb-2019	Version 29	Changed	Configuration Information section was updated.
07-Jan-2019	Version 28	Changed	Added 8xxx node conversion kits Overview, Service and Support, Customer Self Installation, Configuration Information sections were updated Added 32Gb FC. 32GB FC HBA 400GB SSD replaced by 920GB SSD
26-Nov-2018	Version 27	Changed	Overview, Customer Self Installation, Service and Support and Configuration Information sections were updated.
01-Oct-2018	Version 26	Changed	Updated links to supporting documentation. Obsolete SKUs were removed
02-Jul-2018	Version 25	Changed	Configuration Info updated; Virtualization OS updated; Updated DAC Cable SKU; and Updated DC Cable info.
11-Jun-2018	Version 24	Changed	SKU number for the HPE 3PAR G2 Rack 42U Branding kit was updated.
04-Jun-2018	Version 23	Added	New HPE 3PAR G2 Rack 42U Branding Kit was added.
07-May-2018	Version 22	Changed	New Service Processors were added. Typo Correction; DC Cable Option Update.
02-Apr-2018	Version 21	Removed	Removed HPE PDU Pivot Kit Section
05-Mar-2018	Version 20	Removed	What's New section was removed.
05-Feb-2018	Version 19	Changed	Rack List and Virtualization OS were updated.
		Removed	Removed EOL drive SKUs.
08-Jan-2018	Version 18	Removed	Removed SFP+ 7m DAC cable; updated Racks Lists.
25-Sep-2017	Version 17	Changed	Updated 256 TiB per node pair capacity for File Persona. Added G2 Enterprise racks.
12-Jun-2017	Version 16	Changed	Fixed typos.
08-May-2017	Version 15	Changed	Changes made to the Configuration Information Section.
27-Mar-2017	Version 14	Changed	Added DC PCM and Combo Host Adapters. Updated list of supported DAC cables. Updated the Environmental Specifications section.
17-Feb-2017	Version 13	Changed	Changes made throughout the QuickSpecs.
13-Feb-2017	Version 12	Changed	Added new drives (15.36TB SSD) Added all-inclusive software licensing SKUs (base and drive). Updated list of DAC cables. Removed RCIP port usage for File Persona.
28-Nov-2016	Version 11	Changed	Added new drives (7.68TB FE SSD and 15.36TB FE SSD). Updated SSD descriptions.
15-Aug-2016	Version 10	Changed	Added DAC cables support. Other edits.
07-Jun-2016	Version 9	Changed	Added new drives (7.68TB SSD, 8TB NL FE HDD). Added Smart SAN.
15-Apr-2016	Version 8	Changed	Updated SSD descriptions.
08-Apr-2016	Version 7	Changed	Fixed typos.
31-Mar-2016	Version 6	Changed	Added new drives (2TB NL FE HDD, 8TB NL HDD) Added CSI section. Added optical splitter cables (K2Q46A, K2Q47A).
16-Feb-2016	Version 5	Changed	Changes made throughout the QuickSpecs
04-Dec-2015	Version 4	Changed	Added HPE 3PAR StoreServ 8200 Converged File/Block Starter Kit. Added new drives (400GB SSD, 3.84TB FE SSD, 4TB NL FE HDD).
02-Oct-2015	Version 3	Added	Added The HPE StoreFront Remote SaaS Portal.
28-Sep-2015	Version 2	Changed	Changes made throughout the QuickSpecs.
24-Aug-2015	Version 1	New	New QuickSpecs.

Summary of Changes

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