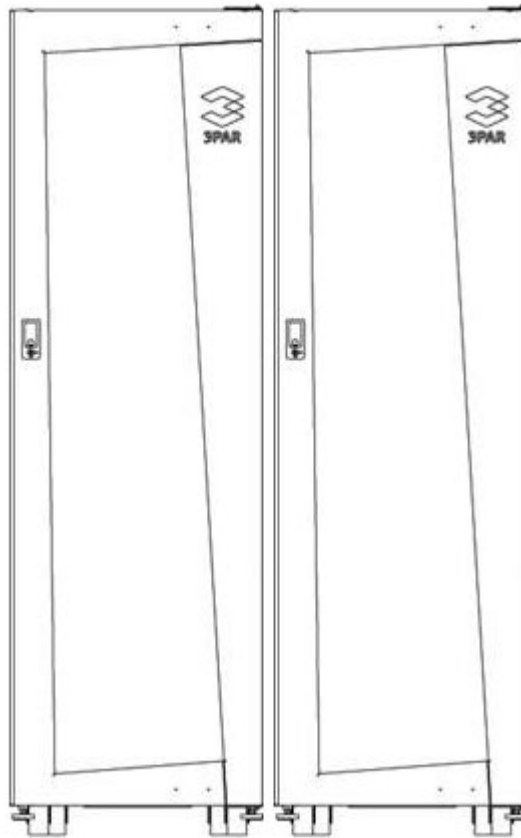## Overview

HPE 3PAR StoreServ 10000 Storage

HPE 3PAR StoreServ 10000 Storage is the platinum standard for Tier 1 storage to meet the need of hybrid and private cloud and ITaaS environments delivering autonomic, efficient, multi-tenant, and federated storage. Achieve six nines availability with the same trusted and proven architecture chosen by 3 out of 4 of the world's largest managed service providers (MSPs). Double VM density on your physical servers through a flash-optimized architecture designed to deliver the necessary I/O performance and workload agility to remove storage as a bottleneck in virtualized environments. Deliver uncompromising QoS for even the most demanding workloads. Use of unique thin technologies reduces acquisition and operational costs by up to 50% while autonomic management features improve administrative efficiency by up to tenfold.

HPE 3PAR StoreServ 10000 Storage

What's New

Overview

Summary	Block Storage			File Storage
	10400 (Old)	10400 (New)	10800	HPE StoreServ File Controller V213
Number of Controller Nodes	2 or 4	2 or 4	2, 4, 6, or 8	Up to 8
HPE 3PAR Gen4 ASICs	4 or 8	4 or 8	4, 8, 12 or 16	Not Applicable
Management Processors	4 - 8 Quad-Core 2.83 GHz	4 - 8 Quad-Core 2.83 GHz	4 - 16 Quad-Core 2.83 GHz	1 - 16 four-core 2.4 GHz
Total Cache	1.51 - 3.2 TiB	2.2 - 4.4 TiB	2.2 - 8.8 TiB	None
Total Flash Cache (optional)	1.5 - 3 TiB	2 - 4 TiB	2 - 8 TiB	None
Total On-Node Cache	96 - 192 GiB	192 - 384 GiB	192 - 768 GiB	None
Maximum Host Ports	96 ports	96 ports	192 ports	4 - 128
8Gb/s Fibre Channel Host Ports[1]	0 - 96 ports	0 - 96 ports	0 - 192 ports	Not Applicable
16Gb/s Fibre Channel Host Ports[1]	0 - 48 ports	0 - 48 ports	0 - 96 ports	Not Applicable
10Gb/s iSCSI Host Ports[10]	0 - 16 ports	0 - 16 ports	0 - 32 ports	Not Applicable
10Gb/s FCoE Host Ports[11]	0 - 48 ports	0 - 48 ports	0 - 96 ports	Not Applicable
1GbE/10GbE Network Ports	Not Applicable	Not Applicable	Not Applicable	4 - 128
Built-in Remote Copy (RCIP) Ports[14]	2 - 4 ports	2 - 4 ports	2 - 8 ports	None
Number of Drives	16^2 - 960 drives	16^2 - 960 drives	16^2 - 1,920 drives	2
Raw Capacity (approx.)[3]	4.84 - 1600 TiB[4]	4.84 - 1600 TiB[4]	4.84 - 3200 TiB[4]	2x450GB for O/S mirror

Overview

Capacity Details			
RAID Levels	RAID 0, 1, 5, MP[5]		RAID 0, 1, 5, 6[12]
RAID 5 Data to Parity Ratios	2:1 - 8:1		2:1 - 8:1[12]
RAID 6 Data to Parity Ratios	4:2, 6:2, 8:2, 10:2, 12:2, 14:2		4:2, 6:2, 8:2, 10:2, 12:2, 14:212
Drive Capacities (approximate GB4) (RAID levels, parity ratios, and drive capacities all mixable within the same Storage System)	480 SSD[6], 920 SSD[6], 1920 SSD[6] 300 15K FC, 600 15K FC, 300 15K SAS[7], 600 15K SAS[7], 450 10K SAS[7], 600 10K SAS[7], 900 10K SAS[7], 1200 10K SAS[7], 1800 10K SAS[7], 2000 7.2K SAS NL[8], 4000 7.2K SAS NL[8], 6000 7.2K SAS NL[8]		Not Applicable
Number of Drive Chassis (Each Drive Chassis holds up to 40 drives in 4U)	2[9] - 24 chassis	2[9] - 48 chassis	Not Applicable

NOTE: Support for SAS drives on HPE 3PAR StoreServ 10000 Storage is currently available with HPE 3PAR OS version 3.1.2 and later versions.

NOTE: Native FCoE support is available only for limited host configurations. Please check with your regional manager for more details

NOTE: A dedicated CNA is required for FCoE host connectivity

NOTE: The 1600TB and 3200 TB maximum raw capacity limits for the HPE 3PAR StoreServ 10400 and 10800 Storage respectively are applicable only to systems running HPE 3PAR OS version 3.1.3 or later

NOTE: Specifications are subject to change without notice

[1] Each port is full bandwidth 8 Gbit/s or 16 Gbit/s Fibre Channel capable as aplicable2 Recommended minimum is 32 drives which results in a 9.6 TB minimum raw capacity.

[3] Maximum raw capacity currently supported with any and all drive types

[4] For storage capacity, 1 GiB = 2^{30} bytes and 1 TiB = 1,024 GiB

[5] RAID MP is HPE 3PAR Fast RAID 6 Technology

[6] SSDs are Solid State Drives

[7] SAS drives are Serial Access SCSI Drives

[8] NL drives are Nearline (7.2k) disks

[9] Recommended minimum is 4 drive chassis per pair of controller nodes

[10] Each port is full bandwidth 10 Gbit/s iSCSI capable

[11] Each port is full bandwidth 10 Gbit/s FCoE capable

[12] Applies to the array storage assigned to 3PAR StoreServ File Controller for file services

[13] For details, please refer to the 3PAR StoreServ File Controller v2 section in this document

[14] Two built-in 1-GbE RCIP ports per node pair; maximum of 8 usable; RCFC works out of the FC Host ports

Overview

Host OS Support

Citrix® XenServer® | HPE-UX® | IBM® AIX®

Microsoft® Windows® Server, including Microsoft® Hyper-V™

OpenVMS* | Oracle® Linux® (UEK and RHEL compatible kernels) | Oracle® Solaris

Red Hat® Enterprise Linux® | Red Hat® Enterprise Virtualization

SUSE® Linux® Enterprise | Ubuntu | VMware vSphere™

For latest information on supported operating systems refer to Single Point of Connectivity Knowledge for HPE Storage Products (SPOCK): http://www.hpe.com/storage/spock

Features

Get Thin and Stay Thin

The revolutionary, zero-detect capable HPE 3PAR Gen4 ASIC is a hyper-efficient storage optimization engine designed to power "fat-to-thin" volume conversions in silicon while preserving superior performance levels. Fat-to-thin volume conversions boost capacity utilization by removing allocated but unused space from traditional, "fat" storage volumes.

With the HPE 3PAR Gen4 ASIC's built-in, hardware-based zero-detection capabilities, migration of "fat" volumes from other storage platforms to new "thin" volumes on HPE 3PAR StoreServ Storage is achieved with the greatest speed possible and without the application disruption of software-based implementations. The HPE 3PAR Gen4 ASIC's enables the automatic migration of data from sparsely used pages to enable 128MB regions to be reclaimed for re-use by other volumes. With conversions taking place at the hardware level, more parallel memory transactions are possible and system performance is not impacted like it is with software-based approaches to volume optimization. Thin Built In capabilities within HPE 3PAR StoreServ 10000 Storage also power the ongoing, automated optimization of thin provisioned volumes on HPE 3PAR StoreServ Storage, so thin volumes stay thin.

Building Block for Cloud Computing

Building a converged infrastructure to support cloud and self-service computing models requires a high degree of virtualization that places new demands on storage. With their distinct architectural advantages, thin hardware capabilities, and superior performance, HPE 3PAR StoreServ 10000 Storage is purpose-built to meet the demands of highly virtualized environments. HPE 3PAR StoreServ 10000 Storage gives enterprises and service providers the agility to respond quickly to changing business needs while maintaining the resiliency that "always-on" businesses demand.

Software

Start Thin. HPE 3PAR Thin Provisioning Software	HPE 3PAR Thin Provisioning Software improves storage system efficiency and optimizes capacity utilization system-wide. It does this by addressing the problem of capacity over-allocation through eliminating the need to dedicate storage capacity on a per-application basis. Since its introduction, HPE 3PAR Thin Provisioning Software has given HPE 3PAR StoreServ Storage clients the ability to meet Green IT targets and reduce capacity purchases. Thin Provisioning makes this possible by cutting SAN costs, floor space requirements, and energy expenses by up to 75% and decreasing administration time by up to 90%. It does this by allowing organizations to purchase only the disk capacity they actually need, only as they actually need it through eliminating the need for up-front capacity allocation and dedicating resources to individual applications. This prevents clients from paying to power, house, and cool disks that they may not need for months or years to come, or may never actually need.
Get Thin. HPE 3PAR Thin Conversion Software	With HPE 3PAR Thin Conversion Software, a technology refresh no longer requires a terabyte-for-terabyte replacement, but instead offers the opportunity to eliminate 70-80% of the legacy capacity in a client's storage environment, simply and rapidly. Leveraging the zero-detection capability built into the HPE 3PAR ASIC, the new Gen4 ASIC combined with HPE 3PAR Thin Conversion Software, still effectively and rapidly "thin" a heterogeneous data center to one-quarter of its original size or less while preserving service levels, and without impacting production workloads. The new ASIC enables the automatic migration of data from sparsely used pages to enable 128MB regions to be reclaimed for re-use by other volumes, driving efficient use of space beyond what was available with the Gen3 ASIC. This solution not only makes a technology refresh more affordable, but it reduces up-front capital costs as well as ongoing operational and environmental costs associated with powering, cooling, and housing storage equipment. It also provides space and power consumption relief for data centers approaching maximum density. In an ideal world, all storage volumes would start thin using HPE 3PAR Thin Provisioning Software. But in some cases, starting thin has not been an option, particularly when it comes to data stored on legacy arrays from traditional storage vendors. HPE 3PAR Thin Conversion Software uses a virtualization mapping engine for space reclamation called the HPE 3PAR Thin Engine, together with the unique hardware capabilities of the HPE 3PAR Gen4 ASIC to extend the benefits of thin provisioning to existing storage volumes. In tandem with the HPE 3PAR Gen4 ASIC, Thin Conversion enables inline, wire speed "fat-to-thin" conversions compatible with any host volume. HPE 3PAR Utility Storage is the only storage platform to offer this built-in, hardware-accelerated, fat-to-thin conversion capability. With HPE 3PAR Thin Conversion Software, clients can rapidly and non-disruptively shrink storage footprint, reduce storage TCO, and meet Green IT targets.
Stay Thin. HPE 3PAR Thin Persistence Software and Thin Copy Reclamation	To realize the ultimate efficiency and cost-saving benefits of starting thin or getting thin, storage also needs to stay thin. An industry first, HPE 3PAR Thin Persistence Software ensures that thin volumes on the array stay as lean and efficient as possible. Thin Persistence Software accomplishes this by using the HPE 3PAR Thin Engine with the system's built-in zero-detect capability to reclaim unused space associated with deleted data. With Thin Persistence, space reclamation on HPE 3PAR arrays takes place simply, quickly, and without disruption to production workloads.

Software

Thin Copy Reclamation is an HPE 3PAR Operating System Software feature that performs a similar function to HPE 3PAR Thin Persistence Software, but uses the HPE 3PAR Thin Engine to reclaim unused space from thin copies (virtual copy snapshots and remote copies) rather than thin volumes.

On average, HPE 3PAR StoreServ Storage clients already purchase 60% less capacity than with traditional storage arrays. With HPE 3PAR Thin Persistence and Thin Copy Reclamation, customers can improve this average capacity savings by another 10% for a total savings of up to 70%. Volumes and snapshots can now stay thin to help sustain Green IT targets, defer the cost of purchasing raw capacity to handle new data growth, and keep costs down without the need to purchase special host-based software or retaining professional services.

HPE 3PAR Peer Motion Software

HPE 3PAR Peer Motion Software is a non-disruptive, do-it-yourself data migration tool for enterprise Storage Area Networks. With Peer Motion, HPE 3PAR StoreServ Storage customers can load balance I/O workloads across systems at will, perform technology refresh seamlessly, cost-optimize asset lifecycle management, and lower technology refresh capital expenditure. Unlike traditional block migration approaches, Peer Motion enables customers to migrate storage volumes between any HPE 3PAR StoreServ Storage online, non-disruptively, and without complex planning or dependency on extra tools. Peer Motion leverages HPE 3PAR Thin Built In™ technology to power the simple and rapid conversion of inefficient, "fat" volumes on source arrays to more efficient, higher-utilization "thin" volumes on the destination HPE 3PAR StoreServ Storage. To ensure a simple and fool-proof data migration and data mobility for workload balancing experience, orchestration of all stages of data mobility is available via either 3PAR Management Console or 3PAR Peer Motion CLI, which is an easy to use, scriptable command line interface tool,

HPE 3PAR Online Import Software

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 either HPE EVA Storage, EMC CX4 or EMC VNX Storage to HPE 3PAR StoreServ Storage systems online and without complex planning or dependency on extra tools.

HPE 3PAR Express Writes

HPE 3PAR Express Writes is a write acceleration feature built in to HPE 3PAR OS version 3.2.1 and later to optimize CPU utilization and, depending on workload, deliver greater throughput, up to 30 percent more IOPS, and 20 percent reduced latency[1]. All currently supported HPE 3PAR StoreServ Storage HBAs and hosts also support the HPE 3PAR Express Writes feature, and its benefits extend to both spinning drives and flash-based media.

[1]Based on a random, 100 percent write workload with an 8K block size.

HPE 3PAR StoreServ Data Encryption

The HPE 3PAR StoreServ Data Encryption enables the encryption for all the data that is stored on the internal drives of the 3PAR StoreServ Storage. The 3PAR StoreServ Data Encryption solution encrypts and decrypts all data written to and read from the media automatically. The 3PAR StoreServ Data Encryption solution encrypts the data so that data cannot be read off a drive that is removed from the 3PAR StoreServ

Software

Storage. In the event of a failure of the drive or the theft of a drive, the proper authentication key is required to be entered to gain access to the data stored within the drive. This method of encryption allows the user the comfort knowing all data contained on the drive is protected against internal and external risks

HPE Storage Management Pack for Microsoft System Center	The HPE Management Pack for Systems Center Operations Manager provides seamless integration with Microsoft Systems Center Operations Manager and now System Center Essentials by integrating predefined discovery and state monitoring policies, event processing rules and tasks, and diagram and topology views for the storage system. For more information: http://h18000.www1.hpe.com/products/quickspecs/14249_div/14249_div.html HPE Storage Management Pack can be downloaded free from the following website: https://h20392.www2.hpe.com/portal/swdepot/displayProductInfo.do?productNumber=SCOM
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.

Service and Support, HP Care Pack, and Warranty Information

Warranty	3 Year, On-site Warranty Service. 7x24 4-hour remote response with next business day on-site response	
	The warranty on the following HPE 3PAR StoreServ 10000 Solid State Drives is 5 years, parts only:	
	HP 3PAR StoreServ 10000 4x480GB 6G SAS MLC Solid State Drive Magazine	E7W56A
	HP 3PAR StoreServ 10000 4x920GB 6G SAS MLC Solid State Drive Magazine	E7W26A
	HP 3PAR StoreServ 10000 4x1.92TB 6G SAS SFF(2.5in) cMLC Solid State Drive Magazine	E7Y61A
	HP 3PAR StoreServ 10000 4x1.92TB 6G SAS SFF(2.5in) cMLC Solid State Drive Magazine	K0F38A
	HP 3PAR StoreServ 10000 4x920GB 6G SAS FIPS Encrypted MLC Solid State Drive Magazine	E7Y53A
	HP 3PAR StoreServ 10000 4x480GB 6G SAS MLC SSD Upgrade Magazine	E7W57A
	HP 3PAR StoreServ 10000 4x920GB 6G SAS MLC SSD Upgrade Magazine	E7W27A
	HP 3PAR StoreServ 10000 4x1.92TB 6G SAS SFF(2.5in) cMLC Solid State Drive Upgrade Magazine	E7Y62A
	HP 3PAR StoreServ 10000 4x1.92TB 6G SAS SFF(2.5in) cMLC Solid State Drive Upgrade Magazine	K0F39A
	HP 3PAR StoreServ 10000 4x920GB 6G SAS FIPS Encrypted MLC Solid State Drive Upgrade Magazine	E7Y54A
	The warranty on all other HPE 3PAR StoreServ 10000 drives (FC, SAS, SSD and NL SAS) is 3 years, parts only.	
	HPE 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 HP's Global Limited Warranty and Technical Support, visit: http://www.hpe.com/products/storageworks/warranty	

NOTE: SSDs have a limited number of writes that can occur before reaching the SSD's write endurance limit. This limit is generally high enough so wear out will not occur during the expected service life of an HPE 3PAR StoreServ under the great majority of configurations, IO patterns, and workloads. HPE 3PAR StoreServ tracks all writes to SSDs and can report the percent of the total write endurance limit that has been used. This allows any SSD approaching the write endurance limit to be proactively replaced before they are automatically spared out. An SSD has reached the maximum usage limit once it exceeds its write endurance limit. Following the SSD warranty period, SSDs that have exceeded the maximum usage limit will not be repaired or replaced under Hewlett Packard Enterprise support contracts.

Service and Support	Technology Services for increased uptime, productivity and ROI
	TRUST Hewlett Packard Enterprise storage technology experts for every level of service and support. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HPE Storage Systems' capabilities requires a service

Service and Support, HP Care Pack, and Warranty Information

partner who understands your increasingly complex environment. Team with the people who know Hewlett Packard Enterprise infrastructure hardware and software best-the experienced professionals at HPE Services.

Protect your business beyond warranty
Warranty protects against manufacturer defects, however warranty uplifts, such as HPE Care Pack Services protect the business-by reducing downtime risks and providing operational consistency for mission-critical and standard business computing.

What HPE Storage Technology Services can do for you
HPE Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HPE storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services.

Choose the right level of support, deployment and integration services
Hewlett Packard Enterprise support recommendations are designed to help you enhance technology operations and lower risk-and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs-Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only Hewlett Packard Enterprise brings together deep expertise, proactive and business critical support and a strong partner network-plus, a full set of infrastructure services designed to power a Converged Infrastructure.

Optimized Care - delivers best performance and stability through deployment and proactive management practices	HPE Critical Service-Designed for environments where downtime cannot be tolerated, Hewlett Packard Enterprise monitors your environment around-the-clock, 365 days a year. We implement improvement projects to mitigate risks and reduce incidents. If outages do occur, they are addressed immediately with access to our dedicated critical support escalation resources. http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA0-1613ENW.pdf Additional Option : HPE Data Sanitization Service
Standard Care - maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support	HPE 24x7 Proactive Service-This is the right choice for environments where some downtime is acceptable. Hewlett Packard Enterprise helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year. http://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-9842EN.pdf Additional Option : HPE Data Sanitization Service, 20 HPE Proactive Select Credits / year
Basic Care - Minimum recommended support	HPE 24 X 7 Proactive Service-This is the right choice for environments where some downtime is acceptable. Hewlett Packard Enterprise helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year.

Service and Support, HP Care Pack, and Warranty Information

http://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-9842EN.pdf
Additional Option : HPE Data Sanitization Service , 10 HPE Proactive Select Credits / year

Implement right from the start	Whichever level of care you select, it includes: HPE 3PAR StoreServ Storage Installation and Startup Service - Hewlett Packard Enterprise installs and tests your hardware and software onsite, including configuration. We deliver a custom tailored storage deployment, properly integrated into your environment. http://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA3-2345ENW.pdf
3PAR Remote Support Tools	Support Recommendations include fully integrated remote supported - core design and fabric of 3PAR industry benchmark remote support systems. Site-specific data used both proactively and reactively with real-time monitoring and information extraction tools. http://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA3-4141ENW.pdf
Additional services to meet your needs	HPE Storage Transformation Workshop - Explore data management transformation journey to business-aligned visions, aligning your specific situation and Hewlett Packard Enterprise's experiences. http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-9541ENW.pdf HPE 3PAR StoreServ Data Migration - Proven expertise and tools help you migrate data across your data center or around the globe. HPE 3PAR StoreServ Data Migration Service data sheet - US English (A4) HPE Storage Modernization Service - Modernize your storage to take better advantage of physical or virtualized server environments.. http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA3-4620ENW.pdf 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 EVA to 3PAR Acceleration Service - The HPE EVA to 3PAR Acceleration Service can help guide you or even execute data migration activities on your behalf that can not only optimize, but provide OPEX and CAPEX savings as a result of your journey from EVA to 3PAR. This service provides customers with an alternative DIY ("do-it-yourself") data migration option with guidance from TS Storage migration specialists. With the help of migration experts, this service allows customers to execute an EVA to 3PAR data migration at their own pace and lowered cost. http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA4-4234ENW.pdf 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 Storage Virtual Volume Design and Implementation Service - When

Service and Support, HP Care Pack, and Warranty Information

redeploying an HPE StorageWorks Disk Array, the HPE Virtual Volume Design and Implementation Service provides the necessary activities required to design and implement a new virtual volume configuration.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA2-3764ENN.pdf

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 Hewlett Packard Enterprise 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.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/4AA2-3842ENW.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 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/4AA4-3225ENW.pdf

HPE 3PAR Storage Rebalance Service - The HPE 3PAR Rebalance Service helps balance data across your HPE 3PAR StoreServ Storage 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

Get connected and get back to business
HPE Storage Technology Services provide the path to get your HPE Storage solutions and your business connected to HP. Once connected, our experts are able to scan your system and run health checks, then use that data to create personalized reports and recommendations for actions to take to prevent problems and downtime.

For more information   http://www.hpe.com/services/storage
To learn more on HPE Storage Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner

HPE Care Pack Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:
- Services for customers purchasing from Hewlett Packard Enterprise or an enterprise reseller are quoted using Hewlett Packard Enterprise order configuration tools.
- Customers purchasing from a commercial reseller can find HPE Care Pack

Service and Support, HP Care Pack, and Warranty Information

Services at: http://www.hpe.com/go/lookuptool

Configuration

HPE 3PAR StoreServ 10000 Base Configurations

HP 3PAR StoreServ 10400 32GB Control/64GB Data Cache Rack Configuration Base	E7W33A
HP 3PAR StoreServ 10400 32GB Control/64GB Data Cache Rackmount Config Base	E7W48A
HP 3PAR StoreServ 10800 32GB Control/64GB Data Cache Rack Configuration Base	QW979A

- A minimum of one (1) configuration base must be ordered
- The base configuration includes two Controller Nodes, one 2-meter Cabinet, service processor
- The Rackmount Configuration Base (E7W48A) includes two Controller Nodes, rackmount kit (for backplane, controllers and service processor), service processor. A rackmount kit must be ordered separately for each drive chassis (see Drive section below). These rackmount kits are strictly for new installations into non-HPE 3PAR racks.
- The 10400 and 10800 base configurations include total cache: 64GB control / 128GB data
- The base configuration and node configurations, shown in the section below, have built-in Gigabit Ethernet ports for management and Remote Copy over IP
- The base configurations do not include adapters (beyond embedded ports), drive chassis, drives, cables or expansion cabinets. These are to be ordered separately
- The base configuration and expansion rack PDUs are selected based on the Country and three phase selection option.
- PDUs can be NEMA which stands for the National Electrical Manufacturers Association or IEC which stands for the International Electrotechnical Commission
    - NEMA and IEC PDUs differ from each other based on Ampere ratings and the plug types used. Generally, NEMA based PDUs are used in North America and IEC based PDUs are used everywhere else. There are exceptions, e.g., NEMA based PDUs are used in Japan, Taiwan and Philippines.
    - The NEMA PDU SKUs used are 252663-D74 for single phase and AF511A for three phase
    - The IEC PDU SKUs used are 252663-B33 for single phase and AF518A for three phase
    - Refer to http://h18006.www1.hpe.com/products/quickspecs/11041_div/11041_div.html for detailed specifications regarding these PDUs

HPE 3PAR StoreServ 10000 Controller Node Configurations

HP 3PAR StoreServ 10400 2.8GHz 32GB Control/64GB Data Cache Controller Node	E7W34A
HP 3PAR StoreServ 10800 2.8-GHz 32GB Control/64GB Data Cache Controller Node	QR638C
HP 3PAR StoreServ 10400 2.8-GHz 16GB Control/32GB Data Cache Upg Controller Node	QR603C
HP 3PAR StoreServ 10400 2.8GHz 32GB Control/64GB Data Cache Upgr Controller Node	E7W35A
HP 3PAR StoreServ 10800 2.8-GHz 32GB Control/64GB Data Upg Controller Node	QR640C

- One (1) pair of Controller Nodes beyond the base configuration is supported on the 10400
- One (1), two (2) and three (3) pairs of Controller Nodes beyond the base configuration is supported on the 10800
-

Configuration

- There are two 10400 Controller Nodes available - one that includes total cache: 32GB control / 64GB data and another that includes total cache: 64GB control / 128GB data.
- The 10800 Controller Nodes includes total cache: 64GB control / 128GB data
- The node configurations and base configuration, shown in the section above, have built-in Gigabit Ethernet ports for management and Remote Copy over IP

NOTE: The two different controller nodes cannot be mixed within a 10400 system. Care must be taken to ensure the appropriate upgrade node is purchased while performing a node field upgrade for an existing 10400 system. The following table indicates the 10400 base configuration SKUs that correspond to each of the controller nodes available:

10400 Base Configuration SKU	Upgrade Controller Node
QR584A, QR632A, QR633A, QR632C, QR584C, QR633C, QW978A	QR603C
E7W33A, E7W48A	E7W35A

HPE 3PAR StoreServ 10000 Disk Adapters

HP 3PAR 10000 4-port 8Gb Fibre Channel Adapter	QR591A
HP 3PAR 10000 4-port 8Gb Fibre Channel Upgrade Adapter	QR608A

- Two (2) required per node or four (4) per node pair
- Disk Adapters must be ordered in addition to the base configurations and controller node configurations

HPE 3PAR StoreServ 10000 Host Adapters

HP 3PAR 10000 4-port 8Gb Fibre Channel Adapter	QR591A
HP 3PAR 10000 4-port 8Gb Fibre Channel Upgrade Adapter	QR608A
HP 3PAR StoreServ 10000 2-port 16Gb Fibre Channel Adapter	E7X48A
HP 3PAR StoreServ 10000 2-port 16Gb Fiber Channel Upgrade Adapter	E7Y67A
HP 3PAR 10000 2-port 10Gb Converged Network Adapter Card	QR630A
HP 3PAR 10000 2-port 10Gb Upgrade Converged Network Adapter Card	QR610A

- QR630A and QR610A enable 10Gb/s iSCSI through a CNA

HPE 3PAR StoreServ 10000 Drive Chassis

HP 3PAR StoreServ 10000 40-disk Drive Chassis	QR592C
HP 3PAR StoreServ 10000 40-disk Upgrade Drive Chassis	QR609C
HP 3PAR 10000 40-disk Drive Chassis Rack-mount Kit	QR598A

- When ordering E7W48A, one QR598A must be ordered for each QR592C ordered
- When adding Drive Chassis to a system with QR633C or E7W48A, one QR598A must be ordered for each QR609C ordered

HPE 3PAR StoreServ 10000 Drives

HPE 3PAR SAS HDDs		
	HP 3PAR StoreServ 10000 4x300GB 6G 15K SFF SAS Drive Magazine	QW902A
	HP 3PAR StoreServ 10000 4x600GB 6G SAS 15K SFF(2.5in) Drive Magazine	K0F30A
	HP 3PAR StoreServ 10000 4x450GB 6G 10K SFF SAS Drive Magazine	QW903A

Configuration

HDDs

	HP 3PAR StoreServ 10000 4x600GB 6G SAS 10K SFF(2.5in) Drive Magazine	K2Q30A
	HP 3PAR StoreServ 10000 4x900GB 6G 10K SFF SAS Drive Magazine	QW905A
	HP 3PAR StoreServ 10000 4x1.2TB 6G 10K SFF SAS Drive Magazine	E7X50A
	HP 3PAR StoreServ 10000 4x1.8TB 6G SAS 10K SFF(2.5in) Drive Magazine	K0F36A
	HP 3PAR StoreServ 10000 4x300GB 6G 15K SFF SAS Drive Upgrade Magazine	QW908A
	HP 3PAR StoreServ 10000 4x600GB 6G SAS 15K SFF(2.5in) Drive Upgrade Magazine	K0F31A
	HP 3PAR StoreServ 10000 4x450GB 6G 10K SFF SAS Drive Upgrade Magazine	QW909A
	HP 3PAR StoreServ 10000 4x600GB 6G SAS 10K SFF(2.5in) Drive Upgrade Magazine	K2Q29A
	HP 3PAR StoreServ 10000 4x900GB 6G 10K SFF SAS Drive Upgrade Magazine	QW911A
	HP 3PAR StoreServ 10000 4x1.2TB 6G 10K SFF SAS Drive Upgrade Magazine	E7X51A
	HP 3PAR StoreServ 10000 4x1.8TB 6G SAS 10K SFF(2.5in) Drive Upgrade Magazine	K0F37A

HPE 3PAR SSDs		
	HP 3PAR StoreServ 10000 4x480GB 6G SAS 5 Year Warranty Solid State Drive Magazine	E7W56B
	HP 3PAR StoreServ 10000 4x920GB 6G SAS 5 Year Warranty Solid State Drive Magazine	E7W26B
	HP 3PAR StoreServ 10000 4x1.92TB 6G SAS SFF(2.5in) Solid State Drive Magazine	E7Y61A
	HP 3PAR StoreServ 10000 4x480GB 6G SAS 5 Year Warranty SSD Upgrade Magazine	E7W57B
	HP 3PAR StoreServ 10000 4x920GB 6G SAS 5 Year Warranty SSD Upgrade Magazine	E7W27B
	HP 3PAR StoreServ 10000 4x1.92TB 6G SAS SFF(2.5in) Solid State Drive Upgrade Magazine	E7Y62A

HPE 3PAR FC HDDs		
	HP 3PAR StoreServ 10000 4x300GB 4Gb FC 15K Drive Magazine	QR621C
	HP 3PAR StoreServ 10000 4x600GB 4Gb FC 15K Drive Magazine	QR622C
	HP 3PAR StoreServ 10000 4x300GB 4Gb FC 15K Drive Upgrade Magazine	QR626C
	HP 3PAR StoreServ 10000 4x600GB 4Gb FC 15K Drive Upgrade Magazine	QR627C

HPE 3PAR NL HDDs		
	HP 3PAR StoreServ 10000 4x2TB 6G 7.2K SAS Drive Magazine	QW907A
	HP 3PAR StoreServ 10000 4x4TB 6G SAS 7.2K Nearline Drive Magazine	E7W12A
	HP 3PAR StoreServ 10000 4x6TB 6G SAS 7.2K Nearline LFF(3.5in) Drive Magazine	K0F40A
	HP 3PAR StoreServ 10000 4x2TB 6G 7.2K LFF SAS Drive Upgrade Magazine	QW913A
	HP 3PAR StoreServ 10000 4x4TB 6G SAS 7.2K Nearline Drive Upgrade Magazine	E7W13A
	HP 3PAR StoreServ 10000 4x6TB 6G SAS 7.2K Nearline LFF(3.5in) Drive Upgrade Magazine	K0F41A

HPE 3PAR FIPS 140-2 Encryption HDDs		
	HP 3PAR StoreServ 10000 4x600GB 6G SAS 15K SFF(2.5in) FIPS Encrypted Drive Magazine	K0F32A
	HP 3PAR StoreServ 10000 4x450GB 6G SAS 10K FIPS Encryption Drive Magazine	C8R62B
	HP 3PAR StoreServ 10000 4x900GB 6G SAS 10K FIPS Encryption Drive Magazine	C8R63B
	HP 3PAR StoreServ 10000 4x2TB 6G SAS 7.2K Nearline FIPS Encryption Magazine	E7V81A
	HP 3PAR StoreServ 10000 4x4TB 6G SAS 7.2K Nearline FIPS Encryption Magazine	E7W14A
	HP 3PAR StoreServ 10000 4x920GB 6G SAS FIPS Encrypted Solid State Drive Magazine	E7Y53A
	HP 3PAR StoreServ 10000 4x1.92TB 6G SAS FIPS Encrypted SFF(2.5in) Solid State Drive Magazine	K0F38A

Configuration

HP 3PAR StoreServ 10000 4x600GB 6G SAS 15K SFF(2.5in) FIPS Encrypted Drive Upgrade Magazine	K0F33A
HP 3PAR StoreServ 10000 4x450GB 6G SAS 10K FIPS Encryption Drive Upgr Magazine	C8R65B
HP 3PAR StoreServ 10000 4x900GB 6G SAS 10K FIPS Encryption Drive Upgr Magazine	C8R66B
HP 3PAR StoreServ 10000 4x2TB 6G SAS 7.2K Nearline FIPS Encryption Upgr Magazine	E7V82A
HP 3PAR StoreServ 10000 4x4TB 6G SAS 7.2K Nearline FIPS Encryption Upgr Magazine	E7W15A
HP 3PAR StoreServ 10000 4x920GB 6G SAS FIPS Encrypted Solid State Drive Upgrade Magazine	E7Y54A
HP 3PAR StoreServ 10000 4x1.92TB 6G SAS FIPS Encrypted Solid State Drive Upgrade Magazine	K0F39A

HPE 3PAR Encryption License	HP 3PAR StoreServ 10400 Data at Rest Encryption LTU	BC981A
	HP 3PAR StoreServ 10400 Data at Rest Encryption E-LTU	BC981AAE
	HP 3PAR StoreServ 10800 Data at Rest Encryption LTU	BC982A
	HP 3PAR StoreServ 10800 Data at Rest Encryption E-LTU	BC982AAE

NOTES:
- All drives within a 3PAR StoreServ encrypted array must be self-encrypted devices. There cannot be a mixture of encrypted drives and non-encrypted drives within the same encrypted array.
- 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.

HPE 3PAR Cables

OM4 Cables	HP Premier Flex LC/LC LSZH 50/125u OM4 MM 1.6mm Zipcord Short-boot 4M Cable	H6Z34A
	HP Premier Flex LC/LC LSZH 50/125u OM4 MM 1.6mm Zipcord Short-boot 6M Cable	H6Z35A
	HP Premier Flex LC/LC LSZH 50/125u OM4 MM 1.6mm Zipcord Short-boot 10M Cable	H6Z36A
	HP Premier Flex LC/LC LSZH 50/125u OM4 MM 1.6mm Zipcord Short-boot 25M Cable	H6Z38A
	HP Premier Flex LC/LC LSZH 50/125u OM4 MM 1.6mm Zipcord Short-boot 50M Cable	H6Z40A
	HP Premier Flex LC/LC LSZH 50/125u OM4 MM 1.6mm Zipcord Short-boot 100M Cable	H6Z41A

Configuration

> **NOTE:** OM3 cables have been discontinued on HPE 3PAR StoreServ 10000 Storage. All host and backend connections should be configured with OM4 cables

Direct Attach Copper Cables	**HPE 3COM**	
	HP X240 10G SFP+ SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HP X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HP X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HP X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C
	HPE ProCurve	
	HP X242 SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
	HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
	HP X242 SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285B
	HP X242 SFP+ to SFP+ 10m Direct Attach Copper Cable	J9286B
	HP X242 SFP+ to SFP+ 15m Direct Attach Copper Cable	J9287B
	Brocade	
	HP B-series SFP+ to SFP+ Active Copper 1.0m Direct Attach Cable	AP818A
	HP B-series SFP+ to SFP+ Active Copper 3.0m Direct Attach Cable	AP819A
	HP B-series SFP+ to SFP+ Active Copper 5.0m Direct Attach Cable	AP820A
	Cisco	
	HP 7m C-series Passive Copper SFP+ Cable	QK701A

> **NOTE:** The Direct Attach Support is available only for iSCSI protocol.
> **NOTE:** Direct Attach Copper support is available only with HPE 3PAR OS version 3.1.3 and later

HPE 3PAR StoreServ 10000 optional Cabinets

HP 3PAR StoreServ 10000 2-Meter Expansion Rack	QW982A
HP 3PAR 10400 Standalone Rackmount kit	QR678A

NOTES:
- QR678A can only be ordered as an upgrade part to a system containing QW978A only
- The strict use of QR678A is for relocating either QW978A to a non-HPE 3PAR rack.
- When ordering QR678A, one QR598A must be ordered for each QR592C ordered
- When adding Drive Chassis to a system with QR678A, one QR598A must be ordered for each QR609C ordered

HPE 3PAR StoreServ File Controller

With HPE 3PAR StoreServ File Controller you get an efficient, bulletproof, and effortless way to provide file storage from HPE 3PAR StoreServ Storage. 3PAR StoreServ File Controller saves you time and money by supporting hundreds to thousands of concurrent users and diverse file workloads .It also has non-intrusive data deduplication that provides an average 50-60% in space savings. It provides security through features such as built-in encryption, sophisticated access controls, online snapshots, and the ability to run endpoint protection

Configuration

and backup software onboard so that data is protected at rest and in flight.

HPE 3PAR StoreServ File Controllers are clustered file gateway configurations with transparent failover and online rolling maintenance updates that deliver continuous availability of data to users, servers, and applications. With a straightforward and consistent management experience, it also provides robust capabilities for demanding 24 x 7 file storage environments.

See the HPE 3PAR StoreServ File Controller QuickSpecs for more information on specifications and options at: http://www8.hpe.com/h20195/v2/GetHtml.aspx?docname=c04164475

Power Cord		
	HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord	AF556A
	HP C13 - GB-1002 CN 250V 10Amp 1.83m Power Cord	AF557A
	HP C13 - IRAM -2073 AR 250V 10A 2.5m Power Cord	AF558A
	HP C13 - Nema 5-15P TH/PH 250V 10Amp 1.83m Power Cord	AF559A
	HP C13 - KSC- 8305 KR 250V 10Amp 1.83m Power Cord	AF560A
	HP C13 - CNS-690 TW 110V 13Amp 1.83m Power Cord	AF561A
	HP C13 - IS-1293 IN 240V 6Amp LV 2.0m Power Cord	AF562A
	HP C13 - AS3112-3 AU 250V 10Amp 2.5m Power Cord	AF569A
	HP C13 - SEV 1011 CH 250V 10Amp 1.83m Power Cord	AF565A
	HP C13 - DK-2.5A DK 250V 10Amp 1.83m Power Cord	AF566A
	HP C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord	AF568A
	HP C13 - SI-32 IL 250V 10Amp 1.83m Power Cord	AF564A
	HP C13 - CEI-23-50 IT/CL 250V 10Amp 1.83m Power Cord	AF571A
	HP C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	AF572A
	HP C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord	AF570A
	HP C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord	AF567A
	HP C13 - NBR-14136 BR 250V 10Amp 1.83m Power Cord	AF591A

Storage Networking Options

Fibre Channel Host Bus Adapters		
	Brocade Fibre Channel HBAs	
	HP 81B 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AP769B
	HP 82B 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AP770B
	Emulex Fibre Channel HBAs	
	HP 81E 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AJ762B
	HP 82E 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ763B
	QLogic Fibre Channel HBAs	
	HP 81Q 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AK344A

Configuration

HP 82Q 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ764A

Fibre Channel Switches

HPE B-series

8 Gb Fibre Channel Switches

HP 8/8 Base (0) e-port SAN Switch	AM866B
HP 8/8 (8) Full Fabric Ports Enabled SAN Switch	AM867B
HP 8/24 Base (16) Full Fabric Ports Enabled SAN Switch	AM868B

16 Gb Fibre Channel Switches

HP SN3000B 16Gb 24-port/12-port Active Fibre Channel Switch	QW937A
HP SN3000B 16Gb 24-port/24-port Active Fibre Channel Switch	QW938A
HP SN6000B 16Gb 48-port/24-port Active Fibre Channel Switch	QK753B
HP SN6000B 16Gb 48-port/48-port Active Fibre Channel Switch	QR480B
HP SN6000B 16Gb 48-port/24-port Active Power Pack+ Fibre Channel Switch	QK754B
HP SN6000B 16Gb 48-port/48-port Active Power Pack+ Fibre Channel Switch	QR481B
HP StoreFabric SN6500B 16Gb 96/96 Power Pack+ FC Switch	C8R42A
HP StoreFabric SN6500B 16Gb 96/96 FC Switch	C8R43A
HP StoreFabric SN6500B 16Gb 96/48 Power Pack+ FC Switch	C8R44A
HP StoreFabric SN6500B 16Gb 96/48 FC Switch	C8R45A

Extension and Embedded Switches

HP 1606 FCIP 4-pt Enabled 8Gb FC 2-pt Enabled 1GbE Base Switch	AP862B
HP 1606 FCIP 16-pt Enabled 8Gb FC 6-pt Enabled 1GbE Full Switch	AP863B
HP 1606 FCIP 16-pt Enabled 8Gb FC 6-pt Enabled 1GbE Power Pack+ Switch	AP864B
Brocade 8/12c SAN Switch for BladeSystem c-Class	AJ820B
Brocade 8/24c SAN Switch for BladeSystem c-Class	AJ821B
Brocade 8/24c Power Pack+ SAN Switch for BladeSystem c-Class	AJ822B
Brocade 16Gb/16 SAN Switch for BladeSystem c-Class	C8S45A
Brocade 16Gb/28 SAN Switch for BladeSystem c-Class	C8S46A
Brocade 16Gb/28 SAN Switch Power Pack+ for BladeSystem c-Class	C8S47A

HPE H-series

HP 8/20q Fibre Channel 8-ports Active Switch	AQ233B

NOTE: 8 device ports active, upgradeable to 20 device ports active

HP 8Gb Simple SAN Connection Kit	AK241B

NOTE: 8 device ports active, upgradeable to 20 device ports active

HP 8/20q Fibre Channel Switch	AK242B

NOTE: 16 switch ports active, upgradeable to 20 device ports active

HP SN6000 Stackable 8Gb 24-port Single Power Fibre Channel Switch	AW575B

NOTE: 20 device ports active/4 stacking (ISL) ports active

HP SN6000 Stackable 8Gb 24-port Dual Power Fibre Channel Switch	AW576B

NOTE: 20 device ports active/4 stacking (ISL) ports active

Configuration

HP SN6000 Stackable 12-port Single Power FC Switch	BK780B

NOTE: 8 device ports/4 stacking (ISL) ports active, upgradeable to 20 device ports active

HPE C-series

HP SN6000C 8Gb 16-port Fibre Channel Switch	AW585A
HP SN6000C 8Gb 32-port Fibre Channel Switch	AW586A
Cisco MDS 8/12c Fabric Switch for HP BladeSystem c-Class	AW563A
Cisco MDS 8/24c Fabric Switch for HP BladeSystem c-Class	AW564A
Cisco MDS 9222i Multiservice with 0 SFP Transceiver Modular Fabric Switch	AG851B

For additional details on SAN infrastructure components and options and storage compatibility information, please visit: http://hpe.com/go/san or select from the part numbers below.

Technical Specifications

Physical Specifications
2-Meter Cabinet

Dimensions (width x height x depth)	23.6 x 76.5 x 36 in	60 x 194.3 x 91.3 cm
Service Clearance (front and back)	Front/Rear: 36 in / 30 in	Front/Rear: 91.4 cm / 76.2 cm
Weight (not populated)	472.1 lb	214.1 kg
Maximum Weight (fully populated)	1,919.8 lb	870.8 kg
Maximum Weight per Leveling Foot	480 lb	217.7 kg
Maximum Load per Leveling Foot	200 lb/sq in	14 kg/sq cm

Component Weights

10400 Base Configuration[1]	693.9 lb	314.7 kg
10800 Base Configuration[1]	786.9 lb	356.9 kg
2 Controller Nodes (fully populated)	133 lb	60.4 kg
Drive Chassis (fully populated)	180 lb	81.6 kg
Service Processor	20.8 lb	9.4 kg

Supported Host FC Connections

FC Connector Type from Storage System to Host Port	LC to LC
FC Cable Core Diameter	OM3 / OM4
Connector Boot Length	standard

Power and Heat
Single Phase Power Supply Requirements

Input Voltage (VAC)	220 (200 - 240)
Frequency (Hz)	50 - 60
Circuit Breaker Maximum	30 A per PDU[6] (de-rated to 24 A)
Power Connectors for 2-Meter Cabinet	(4) L6-30P with 1+1 redundant or (4) IEC 60309-32A (332P6S) with 1+1 redundant
Power Receptacles	(4) L6-30R with 1+1 redundant or (4) IEC 60309 with 1+1 redundant

Three Phase Power Supply Requirements
NEMA (North America, Taiwan, Philippines & Japan)

Input Voltage (VAC)	200 - 240 p-p
Frequency (Hz)	50 - 60
Circuit Breaker Maximum	48 A per PDU (de-rated to 27.71 A per phase)
Power Connectors for 2-Meter Cabinet	(2) IEC 309, 3-pole, 4-wire, BLUE, gnd clocked to 3:00 with 1+1 redundant

Technical Specifications

Power Receptacles	(2) Hubbell HBL460C9W or equivalent

IEC (International)

Input Voltage (VAC)	200 - 240 p-n; 380 - 415p-p
Frequency (Hz)	50 - 60
Circuit Breaker Maximum	32 A per phase per PDU
Power Connectors for 2-Meter Cabinet	(2) IEC 309, 4-pole, 5-wire, RED, gnd clocked to 6:00 with 1+1 redundant
Power Receptacles	(2) Hubbell C532C6S or equivalent

Maximum Potential Power Draw per 2-Meter Cabinet

Watts per Cabinet	9,984 watts / 34,075 BTU/h

Actual Power Draw / Heat Dissipation

Service Processor	350 watts / 1,193 BTU/h
Drive Chassis (without Drive Magazines)	200 watts / 683 BTU/h

	Transactional[3] (watts / BTU/h)	Idle (watts / BTU/h)
4 x 480-GB SSD Drive Magazine	22 / 74.8	8.8 / 29.9
4 x 920-GB SSD Drive Magazine	22 / 74.8	8.8 / 29.9
4 x 1920-GB SSD / Encryption Drive Magazine	32.4 / 110.55	8.8 / 30
4 x 300-GB 15K SFF SAS Drive Magazine	39 / 132	34 / 117
4 x 600-GB 15K SFF SAS / Encryption Drive Magazine	29.2 / 100.4	28 / 96
4 x 450-GB 10K SFF SAS / Encryption Drive Magazine	27.2 / 92.8	22 / 75.1
4 x 600-GB 10K SFF SAS / Encryption Drive Magazine	29.6 / 100.8	25.2 / 84.4
4 x 900-GB 10K SFF SAS / Encryption Drive Magazine	29.2 / 99.6	22.4 / 76.4
4 x 1.2-TB 10K SFF SAS Drive Magazine	32.8 / 111.6	26 / 88.7
4 x 1.8-TB 10K SFF SAS / Encryption Drive Magazine	30 / 102.4	29.2 / 99.2
4 x 300-GB 15K FC Drive Magazine	75 / 256	57 / 195
4 x 600-GB 15K FC Drive Magazine	76 / 258	65 / 222
4 x 2-TB LFF SAS / Encryption Drive Magazine	46.4 / 158	26.4 / 89.6
4 x 4-TB LFF SAS / Encryption Drive Magazine	52.4 / 178.4	36.4 / 124.4
4 x 6-TB LFF SAS Drive Magazine	57.2 / 195	47.6 / 162.8
Controller Node Pair	1,315 / 4,487	990 / 3,378
Example Full Cabinet Configuration (4-Node 10400; 4 Drive Chassis, 160 600-GB drives,1 service processor)	6,787 / 23,184	5,697 / 20,400

Technical Specifications

Environmental Specifications

Temperature (°F/°C), 0 - 3,000 ft / 0 - 914.4 m	50 - 104°F / 10 - 40°C
Temperature (°F/°C), 3,000 - 10,000 ft / 914.4 m - 3,048 m	50 - 95°F / 10 - 35°C
Altitude (ft/m) max.	10,000 ft / 3,048 m
Humidity (%), Non-condensing	20 - 80%
Raised Floor	Recommended
Emissions / RFI / EMI	FCC Class A, EN55022 Class A,EN55024: 1998, VCCI Class A
Safety	CE Mark, C-TUVus Mark, TUV GS Mark, CB Scheme with all country deviations
Energy Consumption Efficiency[5] (Japan Green Law)	0.011
Operating Vibration	0.25 G, Sine, 5-500 Hz, 0.1 Grms, Random 10-100Hz
Non-operating Vibration	0.5 G, 5 - 500 Hz, Sine

NOTE: Specifications are subject to change without notice.

[1] Includes 2-meter rack and two controller nodes (fully populated)

[2] Maximum, Up to 10 drive magazines (40 drives) of any combination of SAS, FC or NL and up to 8 SSD magazines (32 SSD drives) per Drive Chassis

[3] Under maximum load

[4] Includes power and heat dissipation specifications for the Service Processor as follows: 317 Watts, 1082 BTU/hr,
100 - 240 VAC Input Voltage, 50 - 60 Hz Frequency, and (1) IEC-320 Power Receptacle

[5] Japan Green Law statement of compliance: The energy consumption efficiency value has been calculated per requirements for Category-N Magnetic Disk Drive Units by dividing the power consumption, measured according to the definition in the Law Concerning the Rational Use of Energy, by the storage capacity defined in the Energy Conservation Law. The efficiency value is based on a host-maximized 10800 configuration using 600GB drives.

[6] Power Distribution Unit

Summary of Changes

Date	Version History	Action	Description of Change
01-Dec-2015	From Version 36 to 37	Changed	Changes made throughout the QuickSpecs.
02-Oct-2015	From Version 35 to 36	Added	Added the HPE StoreFront Remote SaaS Portal
26-Jun-2015	From Version 34 to 35	Changed	Changes made to the Overview Section
05-Jun-2015	From Version 33 to 34	Changed	Changes made to the What´s New and Technical Specifications Sections.
01-Jun-2015	From Version 32 to 33	Changed	Changes made to the Configuration, Service and Support , Technical Specs and Overview Sections
		Deleted	Removed all the File Controller Section since it now has its own QS.
03-Apr-2015	From Version 31 to 32	Deleted	Remove QR633C SKU
30-Mar-2015	From Version 30 to 31	Changed	Changes made to the Warranty and Configuration Sections.
		Added	1.92TB cMLC and 600GB 15K SAS FIPS added
09-Feb-2015	From Version 29 to 30	Changed	Changes made on the Service and Support and Technical Specifications Sections
01-Dec-2014	From Version 28 to 29	Changed	Changes made throughout the QuickSpecs.
29-Sep-2014	From Version 27 to 28	Changed	Changes made throughout the QuickSpecs.
22-Aug-2014	From Version 26 to 27	Changed	Removed this entire bullet: "Encrypted and non-encrypted drives can be mixed in a non-encrypted array"
20-Aug -2014	From Version 25 to 26	Changed	Changes made to the Overview section.
18-Aug-2014	From Version 24 to 25	Changed	Configuration and Technical Specifications were revised
10-Jun-2014	From Version 23 to 24	Changed	Updated the Overview section , table and Configuration section
01-may-2014	From Version 22 to 23	Changed	Updated some main specification summary table footnote numbers, and updated Configuration as well.
23-apr-2014	From Version 21 to 22	Changed	Formatting correction made.
11-apr-2014	From Version 20 to 21	Changed	Overview image, Warranty, and Configuration were revised.
31-mar-2014	From Version 19 to 20	Changed	Warranty, HPE 3PAR StoreServ 10000 Drives, HPE 3PAR Cables, and Power and Heat were revised.
17-jan-2014	From Version 18 to 19	Changed	Part numbers for the HPE 3PAR SSDs were revised in Configuration.
11-dec-2013	From Version 17 to 18	Changed	Changes made in the Overview chart only.
09-dec-2013	From Version 16 to 17	Changed	Configuration and Technical Specifications were revised.
19-aug-2013	From Version 15 to	Changed	Model descriptions were revised in HPE 3PAR

Summary of Changes

	16		StoreServ 10000 Host Adapters, HPE 3PAR Cables, and Fibre Channel Switches in Configuration Brocade 16Gb/16 and 16Gb/28 SAN Switches for HPE BladeSystem c-Class and Brocade 16Gb/28 SAN Switch Pwr Pk+ for HPE BladeSystem c-Class were added to Fibre Channel Switches in Configuration HPE 8/40 Base and Power Pack+ (24) Full Fabric Ports Enabled SAN Switches were removed from Fibre Channel Switches in Configuration
10-jun-2013	From Version 14 to 15	Changed	Service and Support: Updated note in The Service and Support section. Technical Specifications: Updated Actual Power Draw/Heat Dissipation and NOTES section.
		Added	Overview: Added HPE StoreServ File Controller information. Software: Added HPE 3PAR StoreServ Data Encryption section.Configuration: Added C8R67A and C8R68A to the HPE 2PAR SSDs, HPE 3PAR Encryption HDDS and HPE 3PAR Encryption License sections.
08-mar-2013	From Version 13 to 14	Added	Configuration: Added Storage Networking Options
		Changed	Overview: Updated What's New section with- Increase in maximum raw capacity supported in the HPE 3PAR StoreServ 10000 Storage: 1.1 PB on HPE 3PAR StoreServ 10400, 2.2 PB on HPE 3PAR StoreServ 10800 and Updated Summary section.
19-feb-2013	From Version 10 to 11	Changed	Changes made throughout the Configuration and Technical Specifications sections to add the new design cabinets that support HPE Standard single phase and three phase PDUs.
17-dec-2012	From Version 9 to 10	Changed	Changes made throughout the QuickSpecs. Note that the title has changed.
24-aug-2012	From Version 8 to 9	Changed	Changes made to link in Software section.
04-jun-2012	From Version 7 to 8	Changed	Changes made throughout the QuickSpecs to reflect the new title change.
14-may-2012	From Version 6 to 7	Changed	Changes made within the Configuration section only.
06-apr-2012	From Version 5 to 6	Changed	URL was revised for HPE Storage Management Pack.
26-mar-2012	From Version 3 to 5	Changed	Changes made throughout the QuickSpecs.
13-feb-2012	From Version 2 to 3	Changed	Changes made within the Summary and Configuration sections.
14-nov-2011	From Version 1 to 2	Changed	HPE P10000 3PAR Base Configurations, HPE P10000 3PAR Host Adapters and HPE P10000 3PAR Drive Chassis were revised in Configuration Total Cache and 10Gb/s iSCSI Host Ports were

Summary of Changes

			added to the Overview chart NetApp Data ONTAP was removed from Host OS Support

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