

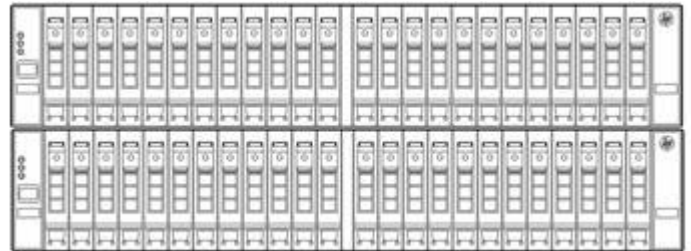
### Overview

HP 3PAR StoreServ 7000 Storage offers enterprise Tier 1 storage at a midrange price. Spend less time managing storage, get more features for less money, and do it all without sacrificing performance or future scalability. HP 3PAR StoreServ 7000 Storage provides high performance and guarantees to double your virtual machine density. With hardware assisted thin storage it is the only platform that guarantees a 50% reduction in capacity requirements. HP 3PAR StoreServ is also the first product family with a common architecture that meets SMB needs and spans to the largest global enterprise giving you access to the same features as the world's largest service providers. You can start small and grow without painful upgrades down the road.

HP 3PAR StoreServ 7000 is storage made effortless.



**HP 3PAR StoreServ 7200 Storage**



**HP 3PAR StoreServ 7400 Storage**

### What's New

- Increased scalability limits for the HP 3PAR StoreServ 7200 and 7400
  - HP 3PAR StoreServ 7200 now supports up to a maximum of 240 drives and 9 add-on drive enclosures
  - Max raw capacity limit for HP 3PAR StoreServ 7200 increased to 400TB
  - Max raw capacity limit for HP 3PAR StoreServ 7400 increased to 1100TB
- New drives available on the HP 3PAR StoreServ 7000 Storage
  - New 480GB and 920GB MLC Solid State Drives
  - New 450/900GB 10K FIPS 140-2 validated Data-At-Rest self-encrypting drives
  - New 2/4TB 7.2K Nearline FIPS 140-2 validated Data-At-Rest self-encrypting drives

Summary	Block Storage		File Storage
	3PAR StoreServ 7200	3PAR StoreServ 7400	3PAR StoreServ File Controller <sup>8</sup>
Number of Controller Nodes	2	2 or 4	Upto 8
HP 3PAR Gen4 ASICs	2	2 or 4	Not Applicable
Processors	2 four-core 1.8 GHz	2 - 4 six-core 1.8 GHz	1 - 16 four-core 2.4 GHz
Cache	24 GB	32 - 64 GB	None
Maximum Host Ports	12 ports	24 ports	4 - 128
Fibre Channel Host Ports	4 - 12 ports	4 - 24 ports	Not Applicable
10Gb/s iSCSI Host Ports	0 - 4 ports	0 - 8 ports	Not Applicable
1GbE/10GbE Network Ports	Not Applicable	Not Applicable	4 - 128
Maximum Initiators Supported	512	512 or 1024	Not Applicable
2U Controller Enclosure SAS Drive Capacity	24	24	Not Applicable
Number of Disk Drives	81 - 240 <sup>10</sup> drives	8 <sup>1</sup> - 480 drives	2

### Overview

Number of Solid State Drives	8 <sup>1</sup> - 120	8 <sup>1</sup> - 240	None
Raw Capacity (approx.) <sup>2</sup>	1.2 - 400 TB <sup>3,9</sup>	1.2 - 1100 TB <sup>3,9</sup>	2x450GB for O/S mirror

Capacity Details	3PAR StoreServ 7200	3PAR StoreServ 7400	3PAR StoreServ File Controller
RAID Levels	RAID 0, 1, 5, 6	RAID 0, 1, 5, 6	RAID 0, 1, 5, 6 <sup>7</sup>
RAID 5 Data to Parity Ratios	2:1 - 8:1	2:1 - 8:1	2:1 - 8:1 <sup>7</sup>
RAID 6 Data to Parity Ratios	4:2, 6:2, 8:2, 10:2, 14:2	4:2, 6:2, 8:2, 10:2, 14:2	4:2, 6:2, 8:2, 10:2, 14:2 <sup>7</sup>
Drive Capacities (approximate GB <sup>3</sup> ) (RAID levels, parity ratios, and drive capacities all mixable within the same Storage System)	100 SSD <sup>4</sup> , 200 SSD <sup>4</sup> , 400 SSD <sup>4</sup> , 480 SSD <sup>4</sup> , 920 SSD <sup>4</sup> 300 15K SAS, 450 10K SAS, 600 10K SAS, 900 10K SAS, 1000 7.2K NL, 2000 7.2K NL <sup>5</sup> , 3000 7.2K NL <sup>5</sup> , 4000 7.2K NL <sup>5</sup>	100 SSD <sup>4</sup> , 200 SSD <sup>4</sup> , 400 SSD <sup>4</sup> , 480 SSD <sup>4</sup> , 920 SSD <sup>4</sup> 300 15K SAS, 450 10K SAS, 600 10K SAS, 900 10K SAS, 1000 7.2K NL, 2000 7.2K NL <sup>5</sup> , 3000 7.2K NL <sup>5</sup> , 4000 7.2K NL <sup>5</sup>	Not Applicable
Number of Add-on Drive Enclosures (Each Drive Enclosure holds up to 24 drives in 2U for small form factor drives and 4U for large form factor drives)	0 - 9 <sup>10</sup> enclosures	0 - 18 enclosures	Not Applicable

<sup>1</sup> The minimum drive quantity is permitted as long as the total raw capacity is at least 1.2 TB.

<sup>2</sup> Maximum raw capacity currently supported with any and all drive types.

<sup>3</sup> For storage capacity, 1 GB = 1,000,000,000 bytes and 1 TB = 1,000 GB.

<sup>4</sup> SSDs are Solid State Drives.

<sup>5</sup> NL drives are 7200 RPM Enterprise SAS drives.

<sup>7</sup> Applies to the array storage assigned to 3PAR StoreServ File Controller for file services

<sup>8</sup> For details, please refer to the 3PAR StoreServ File Controller section in this document.

<sup>9</sup>The 400TB and 1100 TB maximum raw capacity limits for the HP 3PAR StoreServ 7200 and 7400 Storage systems respectively are applicable to systems running HP 3PAR OS version 3.1.3 or later. For HP 3PAR StoreServ 7200 and 7400 systems running HP 3PAR OS versions prior to 3.1.3, the applicable limits are 250TB and 864TB respectively

<sup>10</sup>The 240 drive maximum limit for the number of drives (and 9 add-on enclosures) for the 3PAR StoreServ 7200 Storage System is applicable to systems running HP 3PAR OS version 3.1.3 or later. For HP 3PAR StoreServ 7200 systems running HP 3PAR OS versions prior to 3.1.3, the applicable limits is 144 drives (and 5 add-on drive enclosures)

**NOTE:** Specifications are subject to change without notice.

### Host OS Support

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

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

Open VMS | Oracle® Linux® (UEK and RHEL compatible kernels) | Oracle® Solaris

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

SUSE® Linux Enterprise | VMware vSphere™, Ubuntu

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

### Standard Features

#### Efficient

Get thin and stay thin - Thin technologies unique to the HP 3PAR StoreServ family can reduce capacity requirements by 50%. Purchase only what you need, as you need it so you can focus resources on growing your business, not maintaining your storage. Additionally, the HP 3PAR ASIC with Thin Built In features an efficient, silicon-based zero-detection mechanism. This unique hardware capability gives HP 3PAR StoreServ Storage the power to remove allocated but unused space without impacting performance.

Data center virtualization - Increase virtualization return on investment. Double virtual machine density on your physical servers, spend up to 90 percent less time managing your storage, and support your virtualization deployment with 50 percent less storage capacity. HP 3PAR StoreServ is built from the ground up to deliver performance that exceeds the demands of virtualized data centers along with transformative levels of simplicity, agility, and efficiency.

Service levels - With policy-based autonomic sub-LUN tiering, you can balance the cost of capacity and the cost of performance and put the right data on the right storage tier at the right time.

Do more with less - With HP 3PAR StoreServ Storage you can purchase up to 75 percent less capacity-meaning less equipment to house, fewer disks to power and cool, less hardware to retire after it has reached its end of life, and a reduced carbon footprint.

#### Autonomic

It's like breathing-you don't even have to think about it. Simplify, automate, and expedite storage management by handling storage provisioning, tiering, and change management autonomously-intelligently, at a sub-system level, and without administrator intervention.

SmartStart Software - software designed to get you off to a quick start with your new HP 3PAR StoreServ 7000 system.

Common architecture - Access the same features as the world's largest service providers with a common architecture that meets SMB needs and spans to the largest global enterprise.

#### Resilient

Secure multi-tenancy - Consolidate with confidence. Achieve higher service levels for more users and applications with less infrastructure. HP 3PAR StoreServ Storage is designed to support massive consolidation by supporting mixed workloads and secure administrative segregation of users, hosts, and application data. Deliver higher performance levels, greater availability, and next-generation functionality to multiple user groups and applications from a single storage system.

Scalable - HP 3PAR StoreServ 7000 provides affordable entry pricing and unique, non-disruptive scalability to four nodes.

High Availability - Featuring the same mesh-active architecture as all HP 3PAR StoreServ products, HP 3PAR StoreServ 7000 offers the highest levels of data availability and protection for the midrange. Intelligent data striping across all available enclosures provides HA Cage, the ability to maintain availability even when a whole drive enclosure fails. HP 3PAR Persistent Cache in four node configurations eliminates performance impacts that result from unplanned component failures, making it a must-have for maintaining service levels in the virtual data center—a feature that you can't get from any other midrange storage platform.

Storage federation - Meet the needs of today's data center with the ability to move data and workloads between arrays without impact to applications, users, or services. Simply and non-disruptively shift data between any model HP 3PAR StoreServ system without additional management layers or appliances.

### Standard Features

Storage federation on HP 3PAR StoreServ Storage can also help you improve availability in clustered VMware environments.

Mixed workload - Mixed workload support serves transactional and throughput-intensive workloads from a single device. The purpose-built HP 3PAR ASIC delivers mixed workload support to alleviate performance concerns and cut traditional array costs. Transaction- and throughput-intensive workloads run on the same storage resources without contention, thereby cutting array purchases in half.

Data at Rest 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 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.

### 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

HP 3PAR StoreServ 7000 drive (SSD, SAS performance and Nearline) warranty is 3 years, parts only.

HP 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.hp.com/products/storageworks/warranty>

#### Service and Support

##### Services to accelerate time to results

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

Choose from services aligned to our storage product offerings and lifecycle. From mission-critical onsite services to innovative web-based remote support, you choose the precise level of attention and support your business demands.

**Discover, plan, and design Choose from a rich portfolio of services to make the most of 3PAR StoreServ 7000 Storage (EOS Storage Centric / Saturn - PL 4A), so you can efficiently and affordably consolidate, manage, and extract value from unstructured data.**

**Start here to understand your data protection options.** Next, develop a methodical plan and design the optimal 3PAR StoreServ 7000 Storage (EOS Storage Centric / Saturn - PL 4A) that addresses your unique technology requirements.

**HP Storage Efficiency Analysis** - HP Storage Efficiency Analysis (SEA) combine tool-based fact gathering and HP's expertise for a quick path to identify immediate issues and their resolution, and helps customer realize the benefits of HP Storage Technology <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-6727ENW.pdf>

**HP Storage Impact Analysis** - - This service provides assessment service to analyze your current storage and evaluate the impact of change to the infrastructure. It is ideal for customers looking to achieving top utilization of your storage technology and assessing the likely impact of data growth and future projects that require storage. <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-1174ENW.pdf>

**HP Storage Modernization service** Storage Modernization helps customers seamlessly position themselves to integrate the latest technological advancements in storage effectively. It helps clients modernize, reduce costs, and improve quality of service through the execution of process and technology changes to achieve demand management. <http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-4620ENW.pdf>

#### Deploy and integrate

**Implement 3PAR StoreServ 7000 Storage (EOS Storage Centric / Saturn - PL 4A) correctly-right from the start-so you can count on reduced risk and accelerated deployment, while implementing a best-practice configuration from day one.**

### Service and Support, HP Care Pack, and Warranty Information

**HP 3PAR StoreServ Storage Installation and Startup Service** - Onsite installation and testing installs and tests HP 3PAR StoreServ Storage, including configuration and deployment, properly integrated into your environment

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-2568ENW.pdf>

**HP 3PAR Software Installation and Startup Service** - Support for deployment of licensed HP 3PAR software products into operation

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-2569ENN.pdf>

**HP Storage Data Migration Service** - End-to-end data migration service providing seamless discovery, assessment, planning, and design, completely customizable to your organization's storage area network (SAN) or network attached storage (NAS) environment and using innovative software to help you migrate to HP storage quickly and efficiently

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-0774ENW.pdf>

**HP EVA to HP 3PAR StoreServ Acceleration Service** - An alternative to do-it-yourself data migration options with guidance from our storage migration specialists, designed to help you execute an HP EVA to HP 3PAR StoreServ Storage data migration at your own pace and with lowered cost

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-4234ENW.pdf>

**HP Data Replication Solution Service** - Configuration of real-time data mirroring or snapshot capabilities of 3PAR Remote Copy and 3PAR Virtual Copy to safeguard your critical business information

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-9431ENW.pdf>

**HP Enhanced Implementation Service for SANs** - Complete design and implementation service for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components

**HP 3PAR Adaptive Optimization Policy Implementation Service** - Analysis, recommendations, and implementation of HP 3PAR Adaptive Optimization policies to enable storage tiering using data collected from your HP 3PAR storage over time

**HP Storage Virtual Volume Design and Implementation Service** - Activities your organization needs to design and implement a new LUN, virtual volume, or virtual disk (Vdisk) configuration

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-0774ENW.pdf>

**HP Proactive Select** - A flexible way to purchase services to fit your environment with an extensive menu of HP Proactive Select event and technical services, such as onsite firmware upgrades, health checks, assessments, and education

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENW.pdf>

**HP Thin Volume Conversion Service** - Evaluation and execution of conversion from standard to thin provisioned volumes for HP 3PAR StoreServ Storage for when you are looking to optimize the utilization of HP 3PAR StoreServ Storage by improving capacity utilization and performance

<http://h20195.www2.hp.com/V2/GetPDF.aspx/c01658303.pdf>

**HP 3PAR StoreServ Health Check** - Assessment of the overall health and supportability of your HP 3PAR StoreServ Storage

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA4-3404ENW.pdf>

**HP Performance Analysis Service** - Data collection, detailed input/output (I/O) analysis, and enhancement

### Service and Support, HP Care Pack, and Warranty Information

recommendations to improve HP 3PAR StoreServ Storage disk array performance, stability, and availability by identifying potential problems and understanding the possible solutions that will help avoid them

**HP 3PAR Rebalance Service** - Planning and coordinating activities led by HP Storage Services professionals to deliver a successful disk array rebalance, including creation and implementation of a rebalance service plan, verification tests to confirm product functionality, and an orientation session to review changes made to the system

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA4-0280ENW.pdf>

**HP 3PAR Storage Assessment Service** - Assessment check based on a point-in-time snapshot of system configuration, capacity, supportability, and interoperability for a single HP 3PAR Storage, ideal when you are experiencing rapid growth or need to establish a baseline understanding of your current HP 3PAR StoreServ environment

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA4-0280ENW.pdf>

### Operate and support

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

**HP Critical Service** - Proactive activities and 24x7 monitoring of your environment-ideal for when uninterrupted uptime is essential

**HP Proactive Care 24x7** - Hardware and software support services designed specifically for your technology with rapid access to Advanced Solution Center Specialists plus firmware and software management and best practice advice <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

**HP Proactive Care Personalized Support** - An option-if you have HP Proactive Care- to bring increased personalization of the Proactive Care support experience through the assignment of an Account Service Manager (ASM) who provides IT best practice advice to help address IT issues and projects.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-3446ENW.pdf>

**HP Education Services** - Comprehensive training for new, as well as experienced, storage administrators designed to expand your skills and keep you up to speed with the latest storage and virtualization technology from HP Storage. <http://education.hp.com/curr-storsan.htm>

**Optimized Care**- delivers best performance and stability through deployment and proactive management practices

**Choose from three levels of operate and support care**

**HP Critical Service**

**Additional options - 10 HP Proactive Select credits per year, per array**

**Standard Care** - maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support

**HP Proactive Care 24x7-Plus, 20 credits per year per array**

**Additional options - HP Proactive Care Personalized Support (once per Proactive Care support new environment), an additional day of HP Personalized Support, and 10 additional HP Proactive Select credits per year, per array**

### Service and Support, HP Care Pack, and Warranty Information

**Basic Care** - Minimum recommended support

**HP Proactive Care 24x7, plus 10 HP Proactive Select credits per year, per array**

**Additional options - HP Proactive Care Personalized Support (once per Proactive Care support new environment), an additional day of HP Personalized Support, and 10 additional HP Proactive Select credits per year, per array**

**Remote Support Automation**

HP Automation provides 24x7 coverage, proactive problem prevention, accurate problem diagnosis and faster problem resolution, as well as interactive support portals and tools. This is an integral, and cost-free, part of your HP support relationship and we are continually investing in additional cutting-edge capabilities to make it better.

**For more information**

[www.hp.com/services/storage](http://www.hp.com/services/storage)

To learn more on HP Storage Services, please contact your HP sales representative or HP Authorized Channel Partner

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at: [www.hp.com/go/lookuptool](http://www.hp.com/go/lookuptool)



### Configuration Information

#### Step 1 - Choose a Base configuration

HP 3PAR StoreServ 7000 configurations start with the selection of the Base. The Base includes controller nodes, bays for small form factor drives, and PCIe slots for host adapter cards. SAN Kits are also considered base configurations. The SAN Kits simplify ordering for SAN configurations with the array and extend the switch warranty to 3-years by including switches with an HP 3PAR StoreServ 7000 Storage Base.

#### HP 3PAR StoreServ 7000 Base Configurations

HP 3PAR StoreServ 7200 2-node Storage Base	QR482A
HP 3PAR StoreServ 7400 2-node Storage Base	QR483A
HP 3PAR StoreServ 7400 4-node Storage Base	QR485A
HP 3PAR StoreServ 7200 2-node Storage Base for Storage Centric Rack*	E7W49A
HP 3PAR StoreServ 7400 2-node Storage Base for Storage Centric Rack*	E7W50A
HP 3PAR StoreServ 7400 4-node Storage Base for Storage Centric Rack*	E7W51A
HP 3PAR StoreServ 7200 8Gb H-series Base System SAN Kit	QR488A
HP 3PAR StoreServ 7200 16Gb Virtualization Base System SAN Kit	QR489A
HP 3PAR StoreServ 7400 16Gb Virtualization Base System SAN Kit	QR510A

- A minimum of one (1) configuration base must be ordered.
- The HP 3PAR StoreServ 7200 base configuration includes (2) controller nodes, 24 GB of cache, (24) small form factor drive bays, (4) built-in 8 Gb/sec FC ports, (4) 8Gb shortwave FC SFP, (2) PCIe adapter slots for host adapter cards - one slot per node, (4) 2m SAS cables, (1) mounting rail kit, and power cords.
- The HP 3PAR StoreServ 7400 2-node base configuration includes (2) controller nodes, 32 GB of cache, (24) small form factor drive bays, (4) built-in 8 Gb/sec FC ports, (4) 8Gb shortwave FC SFP, (2) PCIe adapter slots for host adapter cards - one slot per node, (4) 2m SAS cables, (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, (1) mounting rail kit, and power cords.
- The HP 3PAR StoreServ 7400 4-node base configuration includes (4) controller nodes, 64 GB of cache, (48) small form factor drive bays, (8) built-in 8 Gb/sec FC ports, (8) 8Gb shortwave FC SFP, (4) PCIe adapter slots for host adapter cards - one slot per node, (8) 2m SAS cables, (4) node link cables, (2) mounting rail kits, and power cords.
- The HP 3PAR StoreServ 7200 8Gb H-Series Base System SAN Kit includes the QR482A HP 3PAR StoreServ 7200 2-node Storage Base, (2) BK780B HP SN6000 Stackable 8 Gb/s 8 Active Port Single Power Supply FC Switches and (4) TA821A 4-port FC Switch Upgrade LTUs. Each switch comes with serial cable, mounting rail kits, power cords, and SAN Connection Manager software entitlement. Also included is a 3 year warranty for the switches.  
**NOTE:** Requires optical transceivers and switch cabling which must be supplied separately.
- The HP 3PAR StoreServ 7200 16Gb Virtualization Base System SAN Kit includes the HP 3PAR StoreServ 7200 2-node Storage Base and (2) QK753B HP SN6000B 16 Gb/s 48-port/24-port Active FC Switches - dual power. Each switch comes with rack mount kit (including rails, mounting hardware, and plenum), RJ-45 serial cable with adaptor for RJ-45 to DB9, power cords, and SAN Network Advisor DVD. Also included is a 3 year warranty for the switches.

### Configuration Information

**NOTE:** Requires optical transceivers and switch cabling which must be supplied separately.

- The HP 3PAR StoreServ 7400 16Gb Virtualization Base System SAN Kit includes the HP 3PAR StoreServ 7400 2-node Storage Base and (2) QK753B HP SN6000B 16 Gb/s 48-port/24-port Active FC Switches -dual power. Each switch comes with rack mount kit (including rails, mounting hardware, and plenum), RJ-45 serial cable with adaptor for RJ-45 to DB9, power cords, and SAN Network Advisor DVD. Also included is a 3 year warranty for the switches.

**NOTE:** Requires optical transceivers and switch cabling which must be supplied separately.

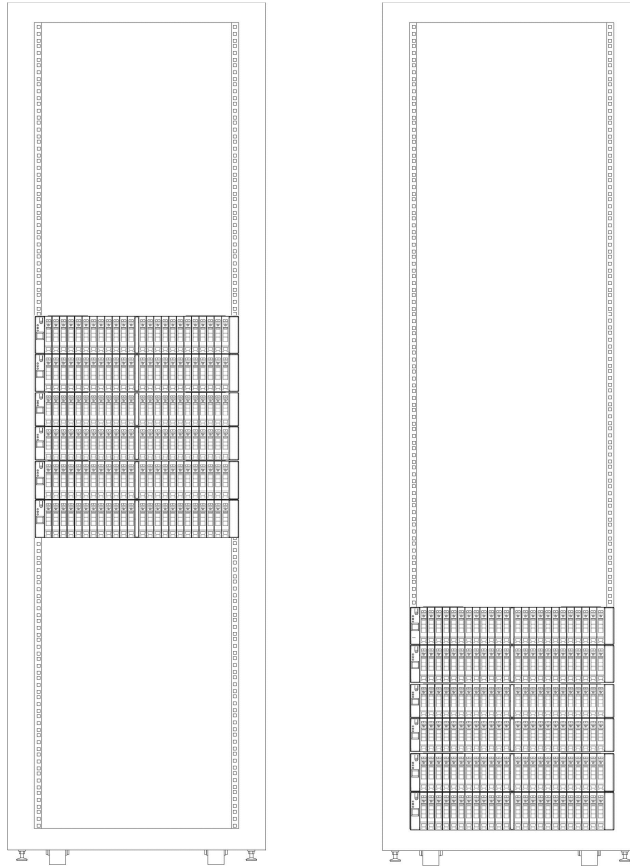
- All base configurations include built-in Gigabit Ethernet ports for management and Remote Copy over IP.

#### \*Storage Centric Configuration

- The Storage Centric rack versions of HP 3PAR StoreServ 7200 and 7400 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.

The following diagrams show a HP 3PAR StoreServ 7400 4-node Storage System in Storage Centric and non-Storage Centric configurations

### Configuration Information



### HP 3PAR StoreServ 7400 Upgrade Controller Node Pair

Use the HP 3PAR StoreServ 7400 Upgrade Node Pair to convert an existing previously installed HP 3PAR StoreServ 7400 2-node Storage Base into a 4-node configuration.

#### HP 3PAR StoreServ 7400 Upgrade Node Pair

QR484A

- Used to upgrade the QR483A HP 3PAR StoreServ 7400 2-node Storage Base to a 4-node configuration.
- One (1) pair of controller nodes beyond the base configuration is supported on the 3PAR StoreServ 7400.
- The 3PAR StoreServ 7400 Upgrade Node Pair includes (2) controller nodes, 32 GB of cache, (24) small form factor drive bays, (4) built-in 8 Gb/sec FC ports, (4) 8Gb shortwave FC SFP, (2) PCIe adapter slots for host adapter cards - one slot per node, (4) 2m SAS cables, (4) node link cables, (1) mounting rail kit, and power cords
- The upgrade node pair includes built-in Gigabit Ethernet ports for management and Remote Copy over IP.

### 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 or with 10Gb/sec iSCSI/FCoE ports. The additional FC ports can be used for connection to hosts or used to connect to other HP 3PAR StoreServ Storage systems in a Remote Copy relationship. The iSCSI/FCoE ports permit host connection in iSCSI and FCoE environments.

#### HP 3PAR StoreServ 7000 Host Adapters

HP 3PAR StoreServ 7000 4-port 8Gb/sec Fibre Channel Adapter

QR486A

HP 3PAR StoreServ 7000 2-port 10Gb/sec iSCSI/FCoE Adapter

QR487A

- Used in the Storage Base products (QR482A, QR483A, and QR485A) and the Upgrade Node Pair (QR484A).
- Because the Storage Base products and the Upgrade Node Pair include built-in FC ports, the host adapter cards are optional.
- QR486A and QR487A include one adapter card each. Adapters must be purchased in pairs.
- The QR486A includes (4) 8 Gb/s shortwave FC SFPs and the QR487A includes (2) 10 Gb/s SFPs.
- 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 and iSCSI/FCoE 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 by the user as iSCSI or FCoE.

**Permitted Adapter Configurations**

Product	Nodes	A*	B*	C*	D	E	F*	G	H*	I*
QR482A	Node 0 Node 1	Empty Empty	FC FC	iSCSI/FCoE iSCSI/FCoE						
QR483A	Node 0 Node 1	Empty Empty	FC FC	iSCSI/FCoE iSCSI/FCoE						
QR484A	Node 2 Node 3	Empty Empty	FC FC	iSCSI/FCoE iSCSI/FCoE						
QR485A	Node 0 Node 1 Node 2 Node 3	Empty Empty Empty Empty	FC FC Empty Empty	iSCSI/FCoE iSCSI/FCoE Empty Empty	Empty Empty FC FC	Empty Empty iSCSI/FCoE iSCSI/FCoE	FC FC iSCSI/FCoE iSCSI/FCoE	iSCSI/FCoE iSCSI/FCoE FC FC	FC FC FC FC	iSCSI/FCoE iSCSI/FCoE iSCSI/FCoE iSCSI/FCoE

\* Factory default configurations for given quantities of adapters.

**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.

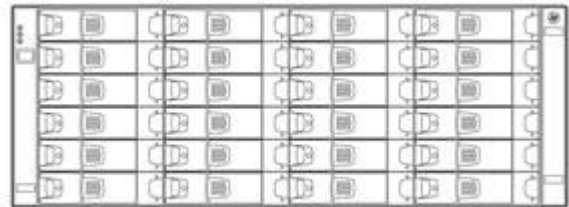
### Configuration Information

#### 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 HP 3PAR StoreServ 7200 supports up to five (5) added drive enclosures. The HP 3PAR StoreServ 7400 supports up to nine (9) added drive enclosures per node pair. The two drive enclosure types can be intermixed in a single array.



**HP M6710 2.5 inch 2U SAS Drive Enclosure**



**HP M6720 3.5 inch 4U SAS Drive Enclosure**

#### Drive Enclosures

HP M6710 2.5 inch 2U SAS Drive Enclosure

QR490A

HP M6720 3.5 inch 4U SAS Drive Enclosure

QR491A

- Each drive enclosure includes 24 drive bays, (2) IO modules, (2) 1m SAS cables, (1) mounting rail kit, and power cables.
- The M6710 2U drive enclosure provides 24 SFF drive bays arranged in a single row.
- The M6720 4U drive enclosure provides 24 LFF drive bays, arranged in four (4) columns of six (6) slots each.
- Minimum of zero (0) drive enclosures, maximum of five (5) attached to QR482A.
- Minimum of zero (0) drive enclosures, maximum of nine (9) attached to QR483A.
- Minimum of zero (0) drive enclosures, maximum of (18) attached to QR485A.
- 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 M6710 and M6720 enclosures on each SAS port.
- With a four node configuration, the best practice is to attach the same number of drive enclosures 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 (3) enclosures per node pair if RAID 6 is included. Include enclosures containing node pairs in the count with the M6710 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. Unlike other HP 3PAR StoreServ Storage systems where drives are sold in magazines of four, HP 3PAR StoreServ 7000 drives are sold as single drives. Note that these drives are only compatible with the M6710 and M6720 drive enclosures.

#### HP 3PAR StoreServ 7000 SAS Drives

<b>HP 3PAR SSDs</b>	HP M6710 100GB 6G SAS SFF (2.5-inch) SLC Solid State Drive	QR502A
	HP M6710 200GB 6G SAS SFF (2.5-inch) SLC Solid State Drive	QR503A
	HP M6720 100GB 6G SAS LFF (3.5-inch) SLC Solid State Drive	QR506A
	HP M6720 200GB 6G SAS LFF (3.5-inch) SLC Solid State Drive	QR507A
	HP 3PAR StoreServ M6710 400GB 6Gb SAS SFF(2.5-inch) MLC Solid State Drive	QR504A
	HP 3PAR StoreServ M6720 400GB 6Gb SAS LFF(3.5-inch) MLC Solid State Drive	QR508A
	HP 3PAR StoreServ M6710 480GB 6G SAS SFF(2.5in) MLC Solid State Drive	E7W54A
	HP 3PAR StoreServ M6720 480GB 6G SAS LFF(3.5in) MLC Solid State Drive	E7W55A
	HP 3PAR StoreServ M6710 920GB 6G SAS SFF(2.5in) MLC Solid State Drive	E7W24A
	HP 3PAR StoreServ M6720 920GB 6G SAS LFF(3.5in) MLC Solid State Drive	E7W25A

<b>HP 3PAR SAS HDDs (Performance HDDs)</b>	HP M6710 300GB 6G SAS 15K rpm SFF (2.5-inch) Hard Drive	QR492A
	HP M6710 450GB 6G SAS 10K rpm SFF (2.5-inch) Hard Drive	QR494A
	HP M6710 900GB 6G SAS 10K rpm SFF (2.5-inch) Hard Drive	QR496A
	HP 3PAR StoreServ M6710 600GB 6Gb SAS 10K SFF(2.5-inch) HDD	C8R72A

<b>HP 3PAR NL SAS HDDs</b>	HP M6720 2TB 6G SAS 7.2K LFF (3.5-inch) Nearline Hard Drive	QR499A
	HP M6720 3TB 6G SAS 7.2K LFF (3.5-inch) Nearline Hard Drive	QR500A
	HP 3PAR StoreServ M6720 4TB 6G 7.2K LFF(3.5-in) SAS Nearline Hard Drive	H6Z87A
	HP 3PAR StoreServ M6710 1TB 6Gb SAS 7.2K SFF(2.5-inch) Nearline HDD	QR498A

- For each drive type installed in the array, the minimum recommended initial quantity is
  - SSD and SAS performance HDDs - eight (8) drives\* per node pair
  - Nearline HDDs - twelve (12) drives per node pair
- 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 Nearline drives.
- All node enclosures must contain either zero (0) or an even number of drives. All drive enclosures must contain an even number of drives, with a minimum of two.
- Minimum raw capacity is 1.2TB per node pair.
- 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

### Configuration Information

- Node Pair enclosure and the M6710 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 M6720 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. Columns of drives in the M6720 enclosure must be of the same type (SSD or NL) and, for HDDs, the same rotational speed. Drives of different types may not be mixed in a single 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.
- SSD specific configuration practices
  - SSD-only configurations are permitted.
  - Maximum of 120 SSDs per node pair.
  - The SFF and LFF SSDs allow the user to create SSD volumes that stripe across SFF and LFF enclosures.
- \* 8 drives support RAID 1 and RAID 5. For RAID 6 choose 12 drives.

### HP 3PAR Encryption SSD/HDD/LTU

HP 3PAR StoreServ M6710 400GB 6Gb SAS SFF(2.5-in) MLC Encrypt Solid State Drive	C8R57A
HP 3PAR StoreServ M6710 450GB 6Gb SAS 10K SFF(2.5-inch) Encryption HDD	C8R59A
HP 3PAR StoreServ M6710 450GB 6G SAS 10K SFF(2.5in) FIPS Encryption Hard Drive	C8R59B
HP 3PAR StoreServ M6710 900GB 6Gb SAS 10K SFF(2.5-inch) Encryption HDD	C8R60A
HP 3PAR StoreServ M6710 900GB 6G SAS 10K SFF(2.5in) FIPS Encryption Hard Drive	C8R60B
HP 3PAR StoreServ M6710 1TB 6Gb SAS 7.2K SFF(2.5-inch) Nearline Encryption HDD	C8R58A
HP 3PAR StoreServ M6720 2TB 6G SAS 7.2K LFF(3.5in) Nearline FIPS Encryption HDD	H6Z84A
HP 3PAR StoreServ M6720 4TB 6G SAS 7.2K LFF(3.5in) Nearline FIPS Encryption HDD	H6Z86A
HP 3PAR StoreServ 7200 Data at Rest Encryption LTU	BC983A
HP 3PAR StoreServ 7200 Data at Rest Encryption E-LTU	BC983AAE
HP 3PAR StoreServ 7400 Data at Rest Encryption LTU	BC984A
HP 3PAR StoreServ 7400 Data at Rest Encryption E-LTU	BC984AAE

#### 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 array.
- Self-encrypted drives are only supported on new 3PAR StoreServ 7000 Storage systems. Encryption is not supported on existing 3PAR systems that are already deployed in customer use.
- \* 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 in the future with software upgrade to FIPS

### Configuration Information

- validated local key manager, or optional FIPS validated external key manager.
- 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 HP 3PAR StoreServ Storage, it cannot be disabled.
- The local key manager is included in the HP 3PAR OS. There is not a separately orderable part number for the local key manager.

---

## Step 5 - Choose Service Processor Implementation

The HP 3PAR Service Processor monitors the HP 3PAR StoreServ 7000 and enables remote monitoring and remote servicing of the array. The key capabilities of the Service Processor is to:

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

Each HP 3PAR StoreServ 7000 requires its own Service Processor. The Service Processor functions as the communication interface between a customer's IP network and HP 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.

### Virtual Service Processor

The Service Processor can be deployed either as a virtual Service processor or a physical Service Processor. A virtual Service Processor (VSP) is included free with the 3PAR Base Operating System. The virtual Service Processor can be installed on a VMware system that is provided by the customer before installation that meet the following specifications:

- VMware vSphere 4.1 and above
- Server listed in VMware Compatibility Guide and with the following features
  - 1GB RAM (minimum for the vSP Virtual Machine)
  - 320GB free disk space (**NOTE: Virtual SP storage must not reside on the array it is managing.**)
  - DVD ROM or DVD RW
  - 1Gb Ethernet port

The customer must provide any hardware required to host the remote support software when deploying a Virtual Service Processor. For scheduled service calls, the customer shall make the Virtual Service Processor available to HP for remedial activities at the agreed-upon time. The customer is responsible for maintaining the appropriate HP 3PAR Remote Support Technology with a secure connection to HP and any passwords required to access the local network and Virtual Service Processor. The customer is responsible for providing all necessary resources in accordance with the HP 3PAR Service Processor Release Notes in order to enable the delivery of the service and options. Please contact a local HP representative for further details on requirements, specifications, and exclusions.

### Physical Service Processor

If a physical Service Processor is desired, order the following product:

HP 3PAR 7000 Service Processor

QR516B

The physical Service Processor is a dedicated storage appliance located within the storage rack providing close proximity to the HP 3PAR StoreServ 7000 Storage. The physical Service Processor is fully supported and maintained by HP 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



### Configuration Information

remote service.

#### HP 3PAR Policy Server

HP 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 HP 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 HP 3PAR Storage systems. HP 3PAR Policy Server provides the following benefits:

- The customer has complete control over policy administration.
- A centralized policy administration for all HP 3PAR Storage systems is provided.
- A centralized audit log to facilitate security audits is provided.

HP 3PAR Policy Manager Software LTU

TE400B

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

The optical cables listed below support 8 Gb/s FC and 10 Gb/s iSCSI/FCoE for host connect (FC and iSCSI/FCoE) and for Remote Copy connections (FC only). The copper 1GbE cables are used for Remote Copy over IP and for connection to the Management Port.

#### Cables

##### FC and 10GbE

HP 3PAR 4m 50/125 (LC-LC) Fiber Cable	QL281B
HP 3PAR 6m 50/125 (LC-LC) Fiber Cable	QR631A
HP 3PAR 10m 50/125 (LC-LC) Fiber Cable	QL266B
HP 3PAR 25m 50/125 (LC-LC) Fiber Cable	QR593A
HP 3PAR 50m 50/125 (LC-LC) Fiber Cable	QL267B
HP 3PAR 100m 50/125 (LC-LC) Fiber Cable	QL268B
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
HP Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A

##### 1GbE

HP 4.3m/14ft CAT5 RJ45 M/M Ethernet Cable	C7536A
HP 7.6m/25ft CAT5 RJ45 M/M Ethernet Cable	C7537A
HP 15.2m/50ft CAT5 RJ45 M/M Ethernet Cable	C7542A

##### Direct Attach Copper Cables\*

HP X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
HP X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B

\*HP 3PAR StoreServ 7000 Storage supports Direct Attach Cables only with HP ProCurve and HP 3COM switches. The Direct Attach Support is also available only for the iSCSI protocol.

### Step 7 - Choose Racking Options



### Configuration Information

The HP 3PAR StoreServ 7000 is compatible with most industry standard 4-post EIA 19 inch racks with square mounting holes, including the HP Intelligent Series Rack and the HP 10000 G2 Series Rack. The HP 3PAR StoreServ 7000 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 HP Intelligent Series Rack.

### HP Rack and Rack Options

#### Factory Integration

Select a rack to house your HP 3PAR StoreServ 7000.

**NOTE:** The HP Intelligent Series Rack is the only series supported for factory configuration.

#### Primary Configuration Rules

The HP 3PAR StoreServ 7000 will be configured into an HP 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 HP Intelligent Series Rack must be purchased for factory configuration. Additional 3PAR StoreServ 7000 controller node enclosures and drive enclosures may be ordered for multiple subsystem integration at the factory.

The 3PAR StoreServ 7000 is also supported in HP 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.

#### HP 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.

HP 647 1075mm Shock Intelligent Series Rack

BW912A

HP 47U 1075mm Side Panel Kit

BW915A

HP 642 1075mm Shock Intelligent Series Rack

BW904A

HP 42U 1075mm Side Panel Kit

BW906A

HP 636 1075mm Shock Intelligent Series Rack

BW896A

HP 36U 1075mm Side Panel Kit

BW898A

For more information on the HP rack offerings, please see the following URL:

<http://h18004.www1.hp.com/products/servers/platforms/rackandpower.html>.

For more information on rack options, see: <http://www.hp.com/products/rackoptions>.

For more information on PDUs, see:

<http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/pdu.html>.

#### HP PDU Pivot Kit

HP EVA PDU Pivot Kit

AG730A

Used to reclaim 2U of space in an HP Intelligent Series Rack with HP 3PAR StoreServ 7000 configurations. This kit allows the PDUs to be placed in the back of the rack without requiring any rack U space.

**NOTE:** The use of the PDU Pivot Kit is strongly recommended and is the default option when orders are configured, as it will save 2U of valuable rack space.

**NOTE:** OD1 will appear after this part number to indicate factory integration where appropriate.

#### Performance Optimized Data Centers

HP 3PAR StoreServ 7000 Storage is qualified for use in HP Performance Optimized Data Centers. Go to [www.hp.com/go/POD](http://www.hp.com/go/POD) for more information.



### Configuration Information

**Non-HP 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-HP rack, please review the information included in the HP 3PAR StoreServ 7000 StoreServ 7000 Site Planning Guide

### Expansion Options

HP provides a variety of SAS cable kits to allow expansion of the HP3PAR StoreServ 7000. Note that the Storage Base products, the Upgrade Node Pair and the Drive Enclosures all include SAS cables. Most configurations will not require a SAS expansion cable kit.

<b>SAS expansion cable kit</b>	HP 6 Meter Expansion Cable Kit	AP879A
	If an HP 3PAR StoreServ 7000 needs to be expanded into an adjacent rack, one 6 meter SAS expansion cable kit is required for every node pair that must access drive enclosures in the expansion rack. Each 6 meter SAS expansion cable kit contains four 6 meter SAS cables.	
	HP 2 Meter Expansion Cable Kit	AW566A
	If an HP 3PAR StoreServ 7000 needs to be expanded within the same rack, but the new drive enclosure must be located some distance from the nearest existing drive enclosure within the same rack, one or two 2 meter SAS expansion cable kits is needed, depending on configuration. Each 2 meter SAS expansion cable kit contains two 2 meter SAS cables.	
	HP 1 Meter SAS Expansion Cable Kit	QR514A
	The 1 meter SAS expansion cable kit is provided for cases where a shorter SAS cable is required. Each 1 meter SAS expansion cable kit contains two 1 meter SAS cables.	
	<b>NOTE:</b> The 2-node Storage Bases and Upgrade Node Pair come with four 2 meter SAS cables each and the 4-node Storage Base comes with eight 2 meter SAS cables. The Drive Enclosures come with two 1 meter SAS cables each.	

### Step 8 - Choose Software

HP provides an extensive selection of features for HP 3PAR StoreServ Storage. All of the features available on the HP 3PAR StoreServ 10000 Storage system are also available on the HP 3PAR StoreServ 7000 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 7000 provides the features in Suites.

Two types of software licensing methods are employed with the HP 3PAR StoreServ 7000. Some software titles are licensed per system; other titles are licensed by drive. With system-based licensing one license covers the whole array, independent of configuration or capacity. Drive-based licensing, in contrast, is licensed per installed drive. A software title with drive-based licensing includes two Licenses to Use (LTU), a Base LTU that enables the software feature for the system and a Drive LTU that licenses the use of one drive. For each software title, purchase one Base LTU per title per array, and one Drive LTU, up to a cap, for every drive, that is installed in the array, independent of drive type. For the HP 3PAR StoreServ 7200 the Drive LTUs cap at 48. For the HP 3PAR StoreServ 7400 the Drive LTUs cap at 168. After reaching the cap, you do not need to purchase any more Drive LTUs for that title.

For more information regarding HP 3PAR software see <http://h18006.www1.hp.com/storage/solutions/3par/software.html>.

### HP 3PAR 7000 Operating System Software Suite (Required)

**HP 3PAR OS SW Suite -** HP 3PAR 7000 Operating System Software Suite is the foundation software of HP 3PAR

### Configuration Information

#### 3PAR Operating System, System Setup, and Management Software

StoreServ 7000 Storage, combining advanced virtualization capabilities with simple storage management, high efficiency, and world class performance. The included comprehensive thin provisioning capabilities allow your storage to start thin, get thin and stay thin. System Tuner and Autonomic Rebalance help maintain high performance over time. Migrating your existing data from HP EVA and 3PAR systems to HP 3PAR StoreServ 7000 is easy with the included 180 day Online Import license. HP 3PAR SmartStart Software, included in the suite, guides you through the configuration of the service processor, HP 3PAR StoreServ Storage and the application hosts - making storage setup quick and easy. HP 3PAR 7000 Operating System Software Suite is a required purchase. It uses drive-based licensing. For more information see <http://h18006.www1.hp.com/storage/software/3par7000/oss/index.html>.

HP 3PAR 7200 Operating System Software Suite Base LTU	BC745A
HP 3PAR 7200 Operating System Software Suite Base E-LTU	BC745AAE
HP 3PAR 7200 Operating System Software Suite Drive LTU	BC746A
HP 3PAR 7200 Operating System Software Suite Drive E-LTU	BC746AAE
HP 3PAR 7400 Operating System Software Suite Base LTU	BC773A
HP 3PAR 7400 Operating System Software Suite Base E-LTU	BC773AAE
HP 3PAR 7400 Operating System Software Suite Drive LTU	BC774A
HP 3PAR 7400 Operating System Software Suite Drive E-LTU	BC774AAE

### HP 3PAR 7000 Replication Software Suite

#### HP 3PAR 7000 Replication Software Suite - Local Replication, Remote Replication and Transparent Failover

The HP 3PAR Replication Software Suite offers automatic replication, transparent failover and Point-in-Time (PIT) copies enabling seamless disaster recovery for critical data. These features provide an agile, efficient and simple solution to protect against the unpredictable. This suite is ideal for virtualized data centers demanding data availability and business continuity 24x7. HP 3PAR 7000 Replication Software Suite consists of HP 3PAR Remote Copy Software, HP 3PAR Peer Persistence Software and HP 3PAR Virtual Copy Software, which are also available separately. Replication Software Suite uses drive-based licensing. For more information see <http://h18006.www1.hp.com/storage/software/3par7000/drs/index.html>.

**NOTE:** The Peer Persistence feature provides transparent failover in VMware cluster environments and requires the Remote Copy feature as a prerequisite.

HP 3PAR 7200 Replication Software Suite Base LTU	BC747A
HP 3PAR 7200 Replication Software Suite Base E-LTU	BC747AAE
HP 3PAR 7200 Replication Software Suite Drive LTU	BC748A
HP 3PAR 7200 Replication Software Suite Drive E-LTU	BC748AAE
HP 3PAR 7400 Replication Software Suite Base LTU	BC775A
HP 3PAR 7400 Replication Software Suite Base E-LTU	BC775AAE
HP 3PAR 7400 Replication Software Suite Drive LTU	BC776A
HP 3PAR 7400 Replication Software Suite Drive E-LTU	BC776AAE

**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

### HP 3PAR 7000 Security Software Suite

**HP 3PAR 7000 Security** HP 3PAR 7000 Security Software Suite provides secure administrative segregation of



### Configuration Information

#### Software Suite

users and hosts, allowing individual user groups and applications to confidently share a 3PAR StoreServ 7000 system. It also allows you to secure volumes and copies so they cannot be deleted, even by a 3PAR StoreServ 7000 user with the highest level privileges. When coupled with reservationless, non-duplicative, read-only virtual copies (snapshots), the Virtual Lock feature enables you to retain frozen, point-in-time copies of your data to assist internal data retention and simplify compliance with internal governance procedures. HP 3PAR 7000 Security Software Suite consists of HP 3PAR Virtual Domains Software and HP 3PAR Virtual Lock Software, which are also available separately. Security Software Suite uses drive-based licensing. For more information see <http://h18006.www1.hp.com/storage/software/3par7000/ss/index.html>.

HP 3PAR 7200 Security Software Suite Base LTU	BC751A
HP 3PAR 7200 Security Software Suite Base E-LTU	BC751AAE
HP 3PAR 7200 Security Software Suite Drive LTU	BC752A
HP 3PAR 7200 Security Software Suite Drive E-LTU	BC752AAE
HP 3PAR 7400 Security Software Suite Base LTU	BC779A
HP 3PAR 7400 Security Software Suite Base E-LTU	BC779AAE
HP 3PAR 7400 Security Software Suite Drive LTU	BC780A
HP 3PAR 7400 Security Software Suite Drive E-LTU	BC780AAE

#### HP 3PAR 7000 Data Optimization Software Suite

##### HP 3PAR 7000 Data Optimization Software Suite - Rebalance, Redistribute, and Refresh

The HP 3PAR 7000 Data Optimization Software Suite makes sure that data is on the right storage asset at the right time. This suite rebalances, redistributes and refreshes storage non-disruptively with features that provide autonomic storage tiering and dynamic data mobility, reducing cost and increasing agility. HP 3PAR 7000 Data Optimization Software Suite consists of HP 3PAR Dynamic Optimization Software, HP 3PAR Adaptive Optimization Software and HP 3PAR Peer Motion Software (providing federation capability for data mobility), which are also available separately. Data Optimization Software Suite uses drive-based licensing. For more information see <http://h18006.www1.hp.com/storage/software/3par7000/dos/index.html>.

**NOTE:** The Adaptive Optimization feature requires HP 3PAR Reporting Software Suite as a prerequisite.

HP 3PAR 7200 Data Optimization Software Suite Base LTU	BC749A
HP 3PAR 7200 Data Optimization Software Suite Base E-LTU	BC749AAE
HP 3PAR 7200 Data Optimization Software Suite Drive LTU	BC750A
HP 3PAR 7200 Data Optimization Software Suite Drive E-LTU	BC750AAE
HP 3PAR 7400 Data Optimization Software Suite Base LTU	BC777A
HP 3PAR 7400 Data Optimization Software Suite Base E-LTU	BC777AAE
HP 3PAR 7400 Data Optimization Software Suite Drive LTU	BC778A
HP 3PAR 7400 Data Optimization Software Suite Drive E-LTU	BC778AAE

#### HP 3PAR 7000 Data Optimization Software Suite v2

##### Ensure Quality of Service with dynamic data mobility

The HP 3PAR Data Optimization Software Suite v2 combines capabilities that provide autonomic storage tiering and dynamic data mobility with assured quality of service. Adaptive Optimization provides highly reliable, non-disruptive, cost-optimized storage tiering at the sub-volume level to deliver the right QoS to the right data at the right time on a large scale and Dynamic Optimization delivers it at the volume level. Peer Motion

### Configuration Information

software enables seamless technology refresh and cost-optimized asset lifecycle management, and lowers technology refresh capital expenditure. Priority Optimization software allows customers to ensure quality of service on HP 3PAR StoreServ Storage Systems. With Priority Optimization, customers can guarantee service levels in multi-tenant environments

The Data Optimization Suite v2 bundles the following products:

- HP 3PAR Adaptive Optimization
- HP 3PAR Dynamic Optimization
- HP 3PAR Peer Motion
- HP 3PAR Priority Optimization

For more information see

<http://h18006.www1.hp.com/storage/software/3par7000/dos/index.html>

Models		
	HP 3PAR 7200 Data Optimization Software Suite V2 Base LTU	BD268A
	HP 3PAR 7200 Data Optimization Software Suite V2 Base E-LTU	BD268AAE
	HP 3PAR 7200 Data Optimization Software Suite V2 Drive LTU	BD269A
	HP 3PAR 7200 Data Optimization Software Suite V2 Drive E-LTU	BD269AAE
	HP 3PAR 7400 Data Optimization Software Suite V2 Base LTU	BD270A
	HP 3PAR 7400 Data Optimization Software Suite V2 Base E-LTU	BD270AAE
	HP 3PAR 7400 Data Optimization Software Suite V2 Drive LTU	BD271A
	HP 3PAR 7400 Data Optimization Software Suite V2 Drive E-LTU	BD271AAE
	HP 3PAR 7450 Data Optimization Software Suite V2 Base LTU	BD272A
	HP 3PAR 7450 Data Optimization Software Suite V2 Base E-LTU	BD272AAE
	HP 3PAR 7450 Data Optimization Software Suite V2 Drive LTU	BD273A
	HP 3PAR 7450 Data Optimization Software Suite V2 Drive E-LTU	BD273AAE

### HP 3PAR Reporting Software Suite

#### HP 3PAR Reporting Software Suite - Historical Performance and Capacity Management Tool

The HP 3PAR Reporting Software Suite includes System Reporter, a historical performance and capacity management tool for storage reporting, monitoring, and troubleshooting. Also included is 3PARInfo, a command line tool that allows you to view HP 3PAR StoreServ Storage configuration information. Reporting Software Suite uses system-based licensing. For more information see

<http://h18006.www1.hp.com/storage/software/3par7000/rs/index.html>.

	HP 3PAR 7200 Reporting Software Suite LTU	BC767A
	HP 3PAR 7200 Reporting Software Suite E-LTU	BC767AAE
	HP 3PAR 7400 Reporting Software Suite LTU	BC795A
	HP 3PAR 7400 Reporting Software Suite E-LTU	BC795AAE

### HP 3PAR Application Software Suite for Oracle

#### HP 3PAR Application Software Suite for Oracle - Application Protection

The HP 3PAR Application Software Suite for Oracle provides everything you need for protecting Oracle databases, including Recovery Manager for Oracle and Oracle Space Reclamation capabilities. Recovery Manager for Oracle is an extension to 3PAR Virtual Copy that intelligently creates, manages, and presents time-consistent snapshot images of Oracle® databases for rapid application recovery, near-continuous data protection, data sharing, and non-disruptive backup. Application Software Suite for Oracle uses system-based licensing. For more information see

### Configuration Information

<http://h18006.www1.hp.com/storage/software/3par7000/as-oracle/index.html>.

**NOTE:** HP 3PAR Virtual Copy Software is a prerequisite, purchased independently or in the HP 3PAR Replication Software Suite.

HP 3PAR 7200 Application Software Suite for Oracle LTU	BC771A
HP 3PAR 7200 Application Software Suite for Oracle E-LTU	BC771AAE
HP 3PAR 7400 Application Software Suite for Oracle LTU	BC799A
HP 3PAR 7400 Application Software Suite for Oracle E-LTU	BC799AAE

### HP 3PAR Application Software Suite for SQL

#### HP 3PAR Application Software Suite for SQL - Application Protection

The HP 3PAR Application Software Suite for SQL protects Microsoft® SQL databases with Recovery Manager for Microsoft® SQL and the 3PAR VSS Provider software. 3PAR Recovery Manager for Microsoft® SQL Server is an extension to 3PAR Virtual Copy that eases costs and administration by providing rapid, affordable online recovery of Microsoft® SQL Server databases from multiple, highly granular point-in-time snapshots. Quickly recover a database to a known point in time, speeding up a variety of operations including rapid recovery of the production SQL server. Application Software Suite for SQL uses system-based licensing. For more information see <http://h18006.www1.hp.com/storage/software/3par7000/as-sql/index.html>.

**NOTE:** HP 3PAR Virtual Copy Software is a prerequisite, purchased independently or in the HP 3PAR Replication Software Suite.

HP 3PAR 7200 Application Software Suite for Microsoft SQL LTU	BC770A
HP 3PAR 7200 Application Software Suite for Microsoft SQL E-LTU	BC770AAE
HP 3PAR 7400 Application Software Suite for Microsoft SQL LTU	BC798A
HP 3PAR 7400 Application Software Suite for Microsoft SQL E-LTU	BC798AAE

### HP 3PAR Application Software Suite for Exchange

#### HP 3PAR Application Software Suite for Exchange - Application Protection

The HP 3PAR Application Software Suite for Exchange provides you the essentials for protecting your Microsoft Exchange data, including Recovery Manager for Exchange and the VSS Provider software. Recovery Manager for Exchange is an extension to 3PAR Virtual Copy that intelligently creates and manages snapshots that can be used to quickly restore Exchange instances or databases (or non-disruptively back them up to tape) for near-continuous data protection. Application Software Suite for Exchange uses system-based licensing. For more information see <http://h18006.www1.hp.com/storage/software/3par7000/as-exchange/index.html>.

**NOTE:** HP 3PAR Virtual Copy Software is a prerequisite, purchased independently or in the HP 3PAR Replication Software Suite.

HP 3PAR 7200 Application Software Suite for Microsoft Exchange LTU	BC769A
HP 3PAR 7200 Application Software Suite for Microsoft Exchange E-LTU	BC769AAE
HP 3PAR 7400 Application Software Suite for Microsoft Exchange LTU	BC797A
HP 3PAR 7400 Application Software Suite for Microsoft Exchange E-LTU	BC797AAE

### HP 3PAR Application Software Suite for Microsoft Hyper-V

#### HP 3PAR Application Software Suite for Hyper-V - Application Protection

The HP 3PAR Application Software Suite for Hyper-V provides you the essentials for protecting your Microsoft Hyper-V environment, including Recovery Manager for Hyper-V and the VSS Provider software. Recovery Manager for Hyper-V is an extension to 3PAR Virtual Copy that intelligently creates and manages snapshots that can be used to

### Configuration Information

quickly restore Hyper-V VMs for near-continuous data protection. Application Software Suite for Hyper-V uses system-based licensing.

**NOTE:** HP 3PAR Virtual Copy Software is a prerequisite, purchased independently or in the HP 3PAR Replication Software Suite.

HP 3PAR 7200 Application Software Suite for Hyper-V Media LTU	BD178A
HP 3PAR 7400 Application Software Suite for Hyper-V Media LTU	BD179A
HP 3PAR 7200 Application Software Suite for Hyper-V E-LTU	BD178AAE
HP 3PAR 7400 Application Software Suite for Hyper-V E-LTU	BD179AAE

### HP 3PAR Application Software Suite for VMware

#### HP 3PAR Application Software Suite for VMware - Application Protection

The HP 3PAR Application Software Suite for VMware provides everything you need to make your VMware environment more agile and efficient—including Recovery Manager for VMware, Host Explorer for VMware, VASA support, and three essential plug-ins: the VMware Site Replication Manager (SRM) Adapter, the 3PAR VAAI plug-in, and the 3PAR management plug-in for VMware View. Application Software Suite for VMware uses system-based licensing. For more information see <http://h18006.www1.hp.com/storage/software/3par7000/as-vmware/index.html>.

**NOTE:** HP 3PAR Virtual Copy Software is a prerequisite, purchased independently or in the HP 3PAR Replication Software Suite.

HP 3PAR 7200 Application Software Suite for VMware LTU	BC768A
HP 3PAR 7200 Application Software Suite for VMware E-LTU	BC768AAE
HP 3PAR 7400 Application Software Suite for VMware LTU	BC796A
HP 3PAR 7400 Application Software Suite for VMware E-LTU	BC796AAE

### HP Cluster Extension Software

#### HP Cluster Extension Software- High Availability

HP Cluster Extension Software (CLX) offers protection against application downtime from fault, failure, or site disaster by extending a local cluster between data centers over metropolitan distance. CLX reinstates critical applications at a remote site within minutes or seconds after an adverse event. CLX integrates with the OS clustering software (such as MS Cluster Service in Windows) and the remote mirroring software on storage (such as HP Continuous Access software on P6000 EVA/P9000 and HP 3PAR Remote Copy Software on HP 3PAR systems) to automate failover and failback between sites. This dual integration enables the cluster service to verify the status of the storage as well as the server cluster; thus allowing the correct failover and failback decisions to be made which minimize downtime, and accelerates recovery without human intervention. Thus the Cluster Extension Software can help customers achieve 'zero' RPO and RTO in minutes or seconds. For more information, including how Cluster Extension Software is licensed, see <http://h18006.www1.hp.com/storage/software/ces/index.html>.

## Step 9 - Choose Options for Storage Networking

HP's comprehensive portfolio of Storage Area Network infrastructure products and solutions are designed to meet a range of storage networking needs from small and mid-sized businesses to the largest corporate enterprises. HP StoreFabric storage networking SAN Solutions deliver scalability, performance, and broad interoperability required for critical data and applications.



### Configuration Information

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

<b>Fibre Channel Host Bus Adapters</b>	<b>Brocade Fibre Channel HBAs</b>	
	HP 81B 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AP769B
	HP 82B 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AP770B
	<b>Emulex Fibre Channel HBAs</b>	
	HP 81E 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AJ762B
	HP 82E 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ763B
	<b>QLogic Fibre Channel HBAs</b>	
	HP 81Q 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AK344A
	HP 82Q 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ764A
	<b>Fibre Channel Switches</b>	<b>HP B-series</b>
<b>8 Gb Fibre Channel Switches</b>		
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
HP 8/80 Base (48) Full Fabric Ports Enabled SAN Switch		AM871B
HP 8/80 Power Pack+ (48) Full Fabric Ports Enabled SAN Switch		AM872B
<b>16 Gb Fibre Channel Switches</b>		
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
<b>8 Gb and 16 Gb Director Switches</b>		
HP SN8000B 8-Slot Power Pack+ SAN Backbone Director Switch		QK710B
HP SN8000B 4-Slot Power Pack+ SAN Director Switch		QK711B
HP SN8000B 4-Slot SAN Director Switch		QK712B
HP DC SAN Backbone Director Switch		AK857C
HP DC04 SAN Director Switch		AR478B
HP DC04 Power Pack+ SAN Director Switch		AR479B
<b>FCoE, Extension and Embedded Switches</b>		
HP 1606 FCIP 16-pt Enabled 8Gb FC 6-pt Enabled 1GbE Full Switch		AP863B
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 Power Pack+ Switch		AP864B
Brocade 16Gb/16 SAN Switch for BladeSystem c-Class	C8S45A	

### Configuration Information

	Brocade 16Gb/28 SAN Switch for BladeSystem c-Class	C8546A
	Brocade 16Gb/28 SAN Switch Power Pack+ for BladeSystem c-Class	C8547A
	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
	<b>HP H-series</b>	
	HP 8/20q Fibre Channel 8-ports Active Switch	AQ233B
	<b>NOTE:</b> 8 device ports active, upgradeable to 20 device ports active	
	HP 8Gb Simple SAN Connection Kit	AK241B
	<b>NOTE:</b> 8 device ports active, upgradeable to 20 device ports active	
	HP 8/20q Fibre Channel Switch	AK242B
	<b>NOTE:</b> 16 switch ports active, upgradeable to 20 device ports active	
	HP SN6000 Stackable 8Gb 24-port Single Power Fibre Channel Switch	AW575B
	<b>NOTE:</b> 20 device ports active/4 stacking (ISL) ports active	
	HP SN6000 Stackable 8Gb 24-port Dual Power Fibre Channel Switch	AW576B
	<b>NOTE:</b> 20 device ports active/4 stacking (ISL) ports active	
	HP SN6000 Stackable 12-port Single Power FC Switch	BK780B
	<b>NOTE:</b> 8 device ports/4 stacking (ISL) ports active, upgradeable to 20 device ports active	
	<b>HP C-series</b>	
	HP SN8000C 13-Slot Supervisor 2A Fabric 3 Director Switch	QW927A
	HP SN8000C 6-Slot Supervisor 2A Director Switch	AE388C
	HP SN8000C 9-Slot Supervisor 2A Director Switch	AE389C
	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 9124 8-ports Active Fabric Switch	AG646A
	Cisco MDS 9124 16-ports Active Fabric Switch	AG647A
	Cisco MDS 9222i Multiservice with 0 SFP Transceiver Modular Fabric Switch	AG851B
	HP Intelligent Infrastructure Analyzer Software v2 LTU	TC472A
	HP Intelligent Infrastructure Analyzer Software v2 E-LTU	TC472AAE
	An online monitoring and diagnostic solution intended to manage the physical layer of a Storage Area Network (SAN) consisting of HP B-series and/or H-series Fibre Channel switches and directors. It uses industry-standard protocols (such as SNMP, SMI-S, Telnet) to monitor the physical layer across the SAN and to diagnose changes/events in Small Form-factor Pluggable (SFP) transceiver states/characteristics. It also presents the SAN topology, inventory and diagnostic information to the user in real-time.	
<b>HP Intelligent Infrastructure Analyzer Software (IIAS)</b>		
	HP 3PAR StoreServ 7000 Storage supports direct attach with HP Virtual Connect FlexFabric. Please refer to SPOCK for HP Virtual Connect information.	
<b>HP Virtual Connect</b>	<a href="http://h20272.www2.hp.com/index.aspx">http://h20272.www2.hp.com/index.aspx</a>	
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
<b>PremierFlexOM4 cable options</b>	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A

### Configuration Information

	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A
<b>OM3 FC LC-LC cables options</b>	HP LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
	HP LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
	HP LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
	HP LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
	HP LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
	HP LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
	HP LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A

### Step 10 - Data Migration

HP provides several ways to migrate your data from older arrays. Peer Motion provides federation with other 3PAR arrays, which includes the ability to migrate data to HP 3PAR StoreServ 7000 Storage (Peer Motion is part of the HP 3PAR 7000 Data Optimization Software Suite). Peer Motion Software is also available as a standalone license.

<b>HP 3PAR Peer Motion Software</b>	HP 3PAR 7200 Peer Motion Software Base LTU	BC761A*
	HP 3PAR 7200 Peer Motion Software Drive LTU	BC762A*
	HP 3PAR 7400 Peer Motion Software Base LTU	BC789A*
	HP 3PAR 7400 Peer Motion Software Drive LTU	BC790A*

\* Insert AE at the end of a part number for an electronic LTU (eg. XXXXBAE). E-Delivery should be ordered with any Standalone or Upgrade software order.

Online Import allows you to easily migrate data from EVA arrays to the HP 3PAR StoreServ 7000, a 180-day Online Import license is built into the HP 3PAR 7000 Operating System Software Suite. Additional licenses are available to order.

<b>HP 3PAR Online Import Software</b>	HP 3PAR 7200 Online Import Software 180 day LTU	BD191A*
	HP 3PAR 7400 Online Import Software 180 day LTU	BD192A*

\* Insert AE at the end of a part number for an electronic LTU (eg. XXXXBAE). E-Delivery should be ordered with any Standalone or Upgrade software order.

In addition HP supports the MPX200.

### HP MPX200 Multi-protocol and Heterogeneous Data Migration

The HP MPX200 Multiprotocol Router provides support for HP 3PAR StoreServ 7000 and 10000 as well as 3PAR F/T, including 1GbE iSCSI and 10GbE iSCSI and FCoE target support. MPX200 iSCSI provides an alternative option for HP 3PAR storage systems if you don't want to dedicate native iSCSI ports on your array. The MPX200 also facilitates the sharing of iSCSI/FCoE connectivity simultaneously for HP 3PAR storage systems from the same MPX200. For Data Migration the MPX200 provides high performance migration from P6000/EVA to HP 3PAR storage systems and simplifies Data Migration from third party storage such as IBM and EMC to HP 3PAR. The MPX200 is an ideal solution enabler for HP 3PAR customers. <http://www.hp.com/go/mpx200>

### Configuration Information

<b>MPX200 Multifunction Router</b>	HP MPX200 1GbE Base Multifunction Router	AP771B
	HP MPX200 Multifunction Router 1GbE Upgrade Blade	AP772B
	HP MPX200 10-1GbE Base Multifunction Router	AP773B
	HP MPX200 Multifunction Router 10-1GbE Upgrade Blade	AP774B
<b>FCIP Software</b>	HP MPX200 Half Chassis FCIP License	TA766A
	HP MPX200 Full Chassis FCIP License	TA767A
<b>Data Migration Software</b>	HP MPX200 1TB Full Chassis Data Migration License	TA762A
	HP MPX200 5TB Full Chassis Data Migration License	TA763A
	HP MPX200 Full Chassis 1 Array Data Migration License	TA764A

### Step 11- File Controller (For detailed specifications, please refer to File Controller section)

These models come with factory-installed drives and the Microsoft Windows Storage Server 2012 Standard Edition operating system pre-installed

#### Choose a Pre-configured Model

		<b>Part Number</b>
<b>HP 3PAR StoreServ File Controller</b>		C8S69A
<b>Specifications</b>	Operating System	Microsoft Windows Storage Server 2012, Standard
	Processor	Intel® Xeon® E5-2609 (2.40GHz/4-core/10MB/80W) Processor
	Memory	16 GB (4 x 4GB)
	Storage Controller	Smart Array P420i with 1 GB FBWC Controller with internal SAS port for O/S drives)
	Internal Storage	2 x 450GB 6G SAS 10K 2.5" ENT hot-plug SFF HDDs (O/S mirror)
	Expansion Slots	3 x PCIe (6 with option PCIe Riser)
	Network Ports	4 x 1GbE
	Form Factor	2U Rack

#### Add a second processor

Intel® Xeon® E5-2609 (2.40GHz/4-core/10MB/80W) Processor Kit	662252-B21
--	------------

#### Add More Memory

**NOTE:** HP recommends that you add the same type memory to the product that is shipped standard with the product.

**NOTE:** HP memory from previous generation servers are not fully compatible with Smart Memory features in Gen8 Servers.

##### Registered DIMMs (RDIMMs)

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647893-B21
---	------------

### Configuration Information

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** PC3L is a low voltage memory.

See the HP ProLiant Gen 8 QuickSpecs for information on memory configurations.  
[http://h18004.www1.hp.com/products/quickspecs/14212\\_na/14212\\_na.html](http://h18004.www1.hp.com/products/quickspecs/14212_na/14212_na.html)

### Add additional options

**NOTE:** Multifunction Server Adapters support the installed Microsoft Windows Server Scalable Networking Pack, which enables TCP Chimney offload, Receive-side Scaling (RSS), and Network Direct Memory Access (NetDMA) features.

#### HP Networking

##### Gigabit Ethernet adapters

HP NC112T PCI Express Gigabit Server Adapter	503746-B21
HP NC365T 4-port Ethernet Server Adapter	593722-B21
HP Ethernet 1Gb 4-port 331T Adapter	647594-B21
HP Ethernet 1Gb 2-port 361T Adapter	652497-B21
HP Ethernet 1Gb 2-port 332T Adapter	615732-B21

##### 10 Gigabit Ethernet Adapters

**NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

**NOTE:** Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.

HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP Ethernet 10Gb 2-port 530SFP Adapter	652503-B21
HP Ethernet 10Gb 2-port 560SFP+ Adapter	665249-B21
HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21

#### HP Optical Drives

HP 12.7mm Slim SATA DVD-ROM JackBlack Optical Drive	652232-B21
HP 12.7mm Slim SATA DVD-RW JackBlack Optical Drive	652235-B21

#### HP I/O Expansion Options

HP DL380p/385p/560 Gen8 3 Slot PCI-E Riser Kit	653206-B21
--	------------

**NOTE:** When populating the second optional riser slot, the second processor must be installed.

#### HP Security

HP Trusted Platform Module Option	488069-B21
-----------------------------------	------------

**NOTE:** The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: [www.hp.com/go/TPM](http://www.hp.com/go/TPM).

**NOTE:** The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

HP 3PAR StoreServ File Controller is designed and optimized for connection to 3PAR StoreServ Storage and uses HBAs, rather than additional Storage Controllers.

**NOTE:** HBAs are not included standard. HBA selection is left as your choice based on existing SAN infrastructure.

#### HP Fibre Channel

##### Storage Fibre Channel HBA



### Configuration Information

**NOTE:** For the complete listing of Fibre Channel Host Bus Adapters for Windows 2000, Windows Server 2003 and Linux, please see: <http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>

#### Brocade Fibre Channel HBAs

HP 82B 8Gb 2-port PCIe Fibre Channel Host Bus Adapter AP770B

#### Emulex Fibre Channel HBAs

HP 82E 8Gb 2-port PCIe Fibre Channel Host Bus Adapter AJ763B

HP SN1000E 16Gb 2-port PCIe Fibre Channel Host Bus Adapter QR559A

HP StoreFabric SN1000Q 16GB 2-port PCIe Fibre Channel Host Bus Adapter QW972A

#### QLogic Fibre Channel HBAs

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

#### Converged Network Adapter

HP CN1100E Dual Port Converged Network Adapter BK835A

HP CN1000Q Dual Port Converged Network Adapter BS668A

### Add a Power Cord

The HP 3Par StoreServ File Controller comes standard with at least one rack (IEC-IEC) PDU power cord. If you wish to use wall outlet power instead, you can choose a country- or region-specific power cord.

<b>3Par StoreServ File Controller</b>	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

### Technical Specifications

#### HP 3PAR StoreServ 7000 Product Dimensions, and Weight

Physical Dimensions	Height in/mm/U	Width in/mm	Depth in/mm	Max Weight lb/kg
42U Intelligent Series Rack	79.0/2006.6	23.5/597.8	42.7/1125.2	243/110 (empty)
HP 3PAR StoreServ 7200 2-node Storage Base (no host adapters, no drives)	3.46/87.95/2	19/483	26.6/676.1*	47.7/21.6
HP 3PAR StoreServ 7200 2-node Storage Base (with two host adapters, no drives)	3.46/87.95/2	19/483	26.6/676.1*	48.7/22.1
HP 3PAR StoreServ 7400 2-node Storage Base (no host adapters, no drives)	3.46/87.95/2	19/483	26.6/676.1*	47.7/21.6
HP 3PAR StoreServ 7400 2-node Storage Base (with two host adapters, no drives)	3.46/87.95/2	19/483	26.6/676.1*	48.7/22.1
HP 3PAR StoreServ 7400 4-node Storage Base (no host adapters, no drives)	6.925/175.9/4	19/483	26.6/676.1*	97.8/44.4
HP 3PAR StoreServ 7400 4-node Storage Base (with four host adapters, no drives)	6.925/175.9/4	19/483	26.6/676.1*	99.8/45.3
HP M6710 2.5 inch 2U SAS Drive Enclosures (without drives)	3.46/87.95/2	19/483	24.8/630.7	33.5/15.2
HP M6720 3.5 inch 4U SAS Drive Enclosures (without drives)	6.89/175/4	19/483	24.9/631.4	42.9/19.5
SFF SAS drive with carrier	3.42/86.85**	0.78/19.9**	896/227.7	0.7/0.32 (varies by type)
LFF SAS drive with carrier	1.18/30.0**	4.36/110.84**	8.67/220.26	1.9/0.86 (varies by type)

\* includes length of ejector handles

\*\* includes RFI clips

### Technical Specifications

#### Power Requirements

Input Voltage (VAC)

100 - 240 VAC

Frequency (Hz)

50 - 60

Component	Idle (watts / BTU/hr)	Transactional (watts / BTU/hr)
<b>Node Pair (7200 or 7400), no drives, no add-on host adapters</b>	<b>236 / 803</b>	<b>398 / 1357</b>
<b>4-port 8Gb/sec Fibre Channel Adapter</b>	<b>24 / 81.7</b>	<b>32.6 / 111</b>
<b>2-port 10Gb/sec iSCSI/FCoE Adapter</b>	<b>34 / 115.8</b>	<b>40 / 136.4</b>
<b>HP M6710 2.5 inch 2U SAS Drive Enclosure, no drives</b>	<b>150 / 512 (average)</b>	<b>150 / 512 (average)</b>
<b>HP M6720 3.5 inch 4U SAS Drive Enclosure, no drives</b>	<b>164 / 559 (average)</b>	<b>164 / 559 (average)</b>
<b>300GB 15K Small Form Factor HDD</b>	<b>6.2 / 21.1</b>	<b>8.0 / 27.3</b>
<b>450GB 10K Small Form Factor HDD</b>	<b>3.7 / 12.6</b>	<b>6.3 / 21.5</b>
<b>600 GB 10K Small Form Factor HDD</b>	<b>4.1/14</b>	<b>6.3/21.5</b>
<b>900GB 10K Small Form Factor HDD</b>	<b>4.8 / 16.4</b>	<b>6.2 / 21.1</b>
<b>1 TB 7.2k Small Form Factor HDD</b>	<b>2.95/21.2</b>	<b>3.84/</b>
<b>2TB 7.2K Large Form Factor NL HDD</b>	<b>7.5 / 25.6</b>	<b>10.6 / 36.1</b>
<b>3TB 7.2K Large Form Factor NL HDD</b>	<b>8.5 / 28.9</b>	<b>11.8 / 40.2</b>
<b>100GB SLC SSD</b>	<b>1.4 / 4.8</b>	<b>3.9 / 13.3</b>
<b>200GB SLC SSD</b>	<b>1.4 / 4.8</b>	<b>3.9 / 13.3</b>
<b>400GB MLC SSD</b>	<b>2.2 / 7.5</b>	<b>3.7 / 12.6</b>

#### Environmental Specifications

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	32° to 140° F (0° to 60° C)
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, 0.1 Grms, Random 10-100Hz
Non-operating Vibration	0.5 G, 5 - 500 Hz, Sine
Operating Shock	2 G, 11ms, half-sine
Non-operating Shock	10 G, 11ms, half-sine
Maximum Air Flow	Storage Base and Upgrade Node Pair - 109 CFM per enclosure M6710 Drive Enclosure - 105 CFM M6720 Drive Enclosure - 109 CFM
Electromagnetic Compatibility	CISPR 22:2008/ EN55022:2010 Class A CISPR 24:2010/ EN 55024:2010



### Technical Specifications

IEC 61000-3-2:2005/ EN 61000-3-2:2006 +A1:2009 +A2:2009

IEC/ EN 61000-3-3:2008

AS/NZS CIPSR 22: 2009 Class A

CNS 13438:2006 Class A

47 CFR Part 15 Subpart b Class A

ICES-003 Issue 4 Class A

V-3/2012.04 Class A

RRA Notice No. 2011-24 (2011.12.23) Class A

RRA Notice No. 2011-25 (2011.12.23)

#### Acoustics

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

Fan Speed (RPM)	7200/7400 2 node Base	7400 4 node Storage Base	M6710 2.5" 2U SAS Drive Enclosure	M6720 3.5" 4U SAS Drive Enclosure
Minimum	63.8	67.2	62.6	61.3
Maximum	93.4	96.5	85.4	88

#### Safety

IEC 60950-1:2005 (2nd Edition)

EN 60950-1:2006 +A11:2009

EN 62479:2010

CNS 14336-1 2nd Edition

UL 60950-1 2nd Ed.

CAN/CSA C22.2 No. 60950-1

#### Certifications / Markings

cTUVus Mark

TUV T-mark (EN 60950)

CE Mark

FCC Class A

IC Class A

VCCI Class A

BSMI Class A

KCC

GOST-R

C-Tick

WEEE

China RoHS

EU RoHS

**NOTE:** Specifications are subject to change without notice.

### Overview

### HP 3PAR StoreServ File Controller

HP 3PAR StoreServ File Controller is a new converged storage capability on the HP 3PAR StoreServ Storage platform. It adds support for file services to the 3PAR StoreServ. The HP 3PAR StoreServ File Controller is designed to deliver efficient, secure, and highly available file capability that supports hundreds to thousands of concurrent users.

### What's New

- 3PAR File Services capability for HP 3PAR StoreServ Storage.
- Wizard-based easy clustering for ease of deployment.

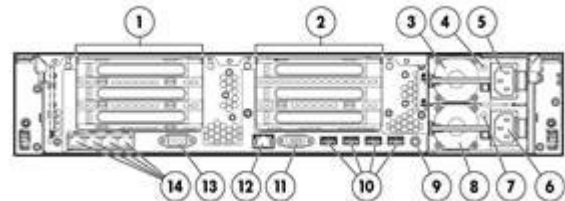
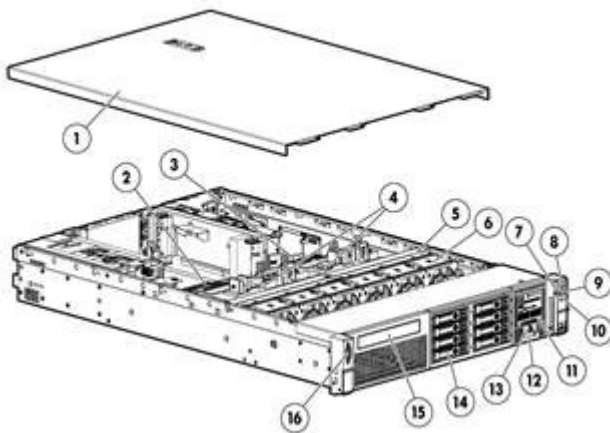
### HP 3Par StoreServ File Controller

The HP 3PAR StoreServ File Controller sets the standard for performance and expandability for file services for the 3PAR StoreServ platform. It leverages the 3PAR StoreServ Storage data services and extends the benefits to file workloads. Please refer to the respective sections for details on the data services.

### Models

HP 3PAR StoreServ File Controller

C8S69A



#### Front View:

1. Quick removal access panel
2. Second Intel Processor
3. First Intel Processor
4. 24 DIMM slots: DDR3 Registered (RDIMM), Load Reduced (LRDIMM), or Unbuffered (UDIMM) memory
5. Air Baffle
6. Hot-plug fans, full N+1 redundancy
7. Health LED
8. Power On /Standby button and system power LED button

#### Rear View:

1. PCIe 3.0 Slots 1, 2, 3-PCIe 2.0 top to bottom
2. N/A
3. Power supply 1
4. Power supply 1 Power LED
5. Power supply 1 Power connection (with Intelligent PDU communication)
6. Power supply 2 Power connection (with Intelligent PDU communication)
7. Power supply 2 Power LED
8. Power supply 2

### Overview

- 9. USB connector
- 10. Unit ID LED
- 11. Systems Insight Display
- 12. Asset Tag
- 13. USB connector
- 14. Drive Bays
- 15. Optional Slim Optical Bay (SATA DVD-RW /ROM Optical Drive)
- 16. Video connector
- 9. Unit ID LED/Button
- 10. USB connectors (4)
- 11. Video connector
- 12. iLO connector
- 13. Serial connector
- 14. FlexibleLOM ports (Shown: 4 ports 1Gb each /Optional: 2 ports 10Gb each)

### Features and Benefits

**Efficient: Save money and time** The HP 3PAR StoreServ File Controller supports thousands users concurrently accessing their files. Non intrusive variable chunk de-duplication delivers an average 50-60% space savings, and included evaluation tool facilitates capacity planning.

Consolidate multiple diverse file protocols (NFS: v2, v3, v4.1 | SMB: 2.0, 2.1, 3.0 | WebDAV | FTP/FTPS | HTTP/HTTPS) as well as IT services (e.g. print, DNS, DHCP) in a single platform.

Hosted BranchCache reduces your branch office WAN usage by automatically caching frequently accessed headquarter datacenter files.

Straightforward and consistent management experience that provides storage management for both file and block based workloads.

**Secure: Protect your data and organization always** Built in file system encryption and optional BitLocker Drive Encryption secures data at rest while SMB Encryption protects data in flight. File Classification Infrastructure facilitates sophisticated access controls and support for Active Directory Rights Management Services protects files no matter where they go.

Online snapshots enable users to directly recover files and prior file versions.

Broad support for onboard endpoint protection (antivirus) software eliminates the need to purchase additional external infrastructure.

Broad support for agent-based data protection enhances the ability to meet backup and recovery SLAs.

**Highly Available: Prevent User and Organization disruption** Turnkey clustered controller configurations with transparent failover for SMB and NFS provide continuous availability.

Cluster aware updates enable online maintenance.

File system online self healing, online verification, and precise and rapid repair massively reduce downtime from file corruption.

HP Active Health System, mirrored OS disks, RAID for data disks, redundant fans and power, and advanced memory protection maximize uptime.

Three year onsite parts and labor warranty for the system, and one year of software telephone support.

### Standard Features

#### Operating System

Microsoft Windows Storage Server 2012, Standard Edition

- Windows Storage Server 2012 (WSS2012) includes a robust range of file serving and storage capabilities. It addresses heterogeneous file workload environments and enables more efficient storage utilization. It allows for a flexible mix of configurations and includes advanced data management tools. WSS2012 leverages your Windows Server management skill sets and tools including Active Directory, PowerShell and System Center.
- SMB 3.0: Leverage high performance continually available file shares to deliver feature-rich storage for continuously available file services, business-critical applications and virtual servers using advanced new functionality.
- New VHDX Standard: Deploy larger capacity virtual storage that can grow to 16 terabytes, is more resilient against corruption, and provides more efficient usage of new 4 KB sector hard disks with the new VHDX virtual storage standard.
- Live Storage Migration: Maintain maximized service-level availability even while moving virtual machine storage between host servers independent of the actual virtual machine.
- SMB Multi-channel: Enable aggregation of network bandwidth and network fault tolerance when multiple paths are available between SMB clients and file servers.
- NFS v4.1: For Windows Storage Server 2012, Server for NFS has been updated to support continuous availability. These improvements make it possible to reliably store and run VMware ESX on a virtual machine that is running Windows Server 2012 by using the NFS protocol to share files. Additional improvements in failover clustering take advantage of better resilience to hardware and software outages that may afflict individual cluster nodes. At the same time, failover clustering isolates VMware ESX hypervisor hosts from intermittent glitches during failovers.
- Data Deduplication: Data deduplication enables Windows Storage Server 2012 to store more data in less physical space and achieve storage efficiency that is significantly higher than was possible in previous releases of Windows Storage Server that used Single Instance Storage (SIS) or NTFS file system compression. Data deduplication uses variable size chunking and compression, which deliver optimization ratios of 2:1 for general file servers and up to 20:1 for virtualization data. Evaluate your savings with the Deduplication Evaluation Tool.  
Volume Shadow Copy Service: Creates point-in-time copies (snapshots) of files and folders at predetermined time intervals that can then be accessed from client computers.
- VSS for Remote SMB File Shares: Leverage proven Volume Shadow Copy Service (VSS) to offload snapshot and backup operations to remote storage from VSS hardware providers within Hyper-V virtual machines.
- Hosted Branch Cache: Using client/server architecture, Windows 7 and above client computers can cache content on the local network via the Hosted Cache running on the 3PAR StoreServ File Controller. Other clients who need the same content retrieve it directly from the Hosted Cache.
- DFS Namespaces: Enables you to group shared folders that are located on different servers into one or more logically structured namespaces. Each namespace appears to users as a single shared folder with a series of subfolders. However, the underlying structure of the namespace can consist of numerous file shares that are located on different servers and in multiple sites.
- Distributed File System Replication (DFS-R): Enables you to efficiently replicate folders (including those referred to by a DFS namespace path) across multiple servers and sites. DFS Replication uses a compression algorithm known as remote differential compression (RDC). RDC detects changes to the data in a file, and it enables DFS Replication to replicate only the changed file blocks instead of the entire file.
- File Server Resource Manager (FSRM): File Server Resource Manager is a set of features that allow you to manage and classify data that is stored on file servers. File Server Resource Manager includes the following features:
  - Storage reports: Storage reports are used to help you identify trends in disk usage and how

### Standard Features

- your data is classified. You can also monitor a selected group of users for attempts to save unauthorized files.
- File Classification Infrastructure: File Classification Infrastructure provides insight into your data by automating classification processes so that you can manage your data more effectively. You can classify files and apply policies based on this classification. Example policies include dynamic access control for restricting access to files, file encryption, and file expiration. Files can be classified automatically by using file classification rules or manually by modifying the properties of a selected file or folder.
- File Management Tasks: File Management Tasks enables you to apply a conditional policy or action to files based on their classification. The conditions of a file management task include the file location, the classification properties, the date the file was created, the last modified date of the file, or the last time the file was accessed. The actions that a file management task can take include the ability to expire files, encrypt files, or run a custom command.
- Quota management: Quotas allow you to limit the space that is allowed for a volume or folder, and they can be automatically applied to new folders that are created on a volume. You can also define quota templates that can be applied to new volumes or folders.
- File screening management: File screens help you control the types of files that user can store on a file server. You can limit the extension that can be stored on your shared files. For example, you can create a file screen that does not allow files with an MP3 extension to be stored in personal shared folders on a file server.
- Initial Configuration Tasks Wizard: Simplifies and accelerates new device deployment by presenting basic system settings on your first boot.
- Server Manager
- Print Management Console: Manage multiple printers (license for unlimited printer support) from a single console, whether locally or over the WAN
- Unlimited Client Access Licenses (CALs) included

### Processor / Cache Memory Intel® Xeon® E5-2609 (2.40GHz/4-core/10MB/80W) Processor

---

<b>Memory</b>	Type	DDR3 Registered (RDIMM) standard
	Standard	16GB (4 x 4GB)
	DIMM Sockets	24

---

<b>Network Controller</b>	NIC Ports	4
	Controller	HP Ethernet 1Gb 4-port 331FLR Adapter

---

### Standard Features

#### HP 3PAR StoreServ File Controller

##### Expansion Slots

Primary Riser (Standard)	Expansion Slots #	Technology	Bus Width**	Connector Width	Bus Number*	Form Factor	Notes
	1	PCIe 3.0	X16	X16	7	Full Length, Full Height Slot	Proc 1
	2	PCIe 3.0	X8	X8	10	Half Length, Full Height Slot	Proc 1
	3	PCIe 2.0	X4	X8	13	Half Length, Full Height Slot	Chipset

\* Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number

\*\* Indicates the number of physical electrical lanes running to the connector.

**NOTE:** When populating the second optional riser slot, the second processor must be installed.

**NOTE:** All slots support up to 150w PCIe cards, but an additional Power Cord Option is required (PN 669777-B21). See Option Section below for offering.

PCIe Riser (Optional 3-slot)	Expansion Slots #	Technology	Bus Width**	Connector Width	Bus Number*	Form Factor	Notes
	4	PCIe 3.0	X16	X16	16	Full Length, Full Height Slot	Proc 2
	5	PCIe 3.0	X8	X8	20	Half Length, Full Height Slot	Proc 2
	6	PCIe 3.0	X4	X8	23	Half Length, Full Height Slot	Proc 2

\* Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number

\*\* Indicates the number of physical electrical lanes running to the connector.

**NOTE:** When populating the second optional riser slot, the second processor must be installed.

**NOTE:** All slots support up to 150w PCIe cards, but an additional Power Cord Option is required (669777-B21). See Option Section below for offering

#### Storage Controller

**NOTE:** HP 3PAR StoreServ File Controller includes a storage controller designed for internal drives housing the O/S mirror only; an HBA is required to address connectivity to the 3PAR StoreServ Storage array.

Controller(s)	HP Smart Array P420i/1GB with FBWC
RAID	Needed for internal drive mirror only

#### Storage

Hard Drives	
Internal	Eight 2.5" (Small Form Factor) hot-plug bays <ul style="list-style-type: none"> <li>2 x 450GB 6G SAS 15K SFF HDDs for O/S mirror</li> </ul>
External	3PAR StoreServ Storage using Fibre Channel

### Standard Features

**Power Supply** 2 x 460 Watts Platinum

---

**Power Cords** **NOTE:** The HP 3PAR StoreServ File Controller is primarily connected to PDU's in data center racks so they now ship standard with only a PDU 6-foot C-14 to C13 power cord (142258-001). If a user wishes to power a system using a 110V receptacle see Power Cord option section for more options.

---

**System Fans** (4) (N+1 redundancy standard)

---

**Form Factor** 2U Rack form factor

---

**Host Bus Adapter (HBA) Support** HP 3PAR StoreServ File Controller is designed to be connected to a HP 3PAR StoreServ Storage array by adding a recommended Fibre Channel HBA.



### 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.

HP warrants only that the Software media will be free of physical defects for a period of ninety (90) days from delivery.

**Services Included with the Product** One year of HP Software Support, standard 9x5 business hours (software advisory and remedial software telephone support, new version license rights, and media and documentation distribution service).

---

#### For increased uptime, productivity and ROI-HP Care Pack packaged services for Storage

These days, you need to get the most out of your storage investment-you can't afford not to. When you buy HP storage products and solutions, it's also a good time to think about what levels of service and support you may need. To help take the worry out of deploying, designing, maintaining, and managing your environment, we've designed a portfolio of service options that are as: flexible, reliable and scalable as your storage. Unlike storage-only vendors, we take a holistic approach to your entire environment, bridging storage, servers, blades, software and network infrastructures with our HP Care Pack packaged services for Storage.

#### Protect your business beyond the warranty

When it comes to robustness and reliability, standard warranties on today's computing equipment have matured just as the technologies have matured. Good news on some fronts-but also a source of potential problems and subsequent consequences that come from depending on standard warranties alone. Standard warranty protects against product defects and some causes of downtime- but not the business. By using a standard approach to warranty uplifts, such as HP Care Pack Services, you can reduce downtime risks and be more certain of operational consistency for both mission-critical and standard business computing. Simply put, HP Care Pack Services normalize the warranty of combined products - helping you proactively guard against unplanned downtime.

#### Extending warranties with HP Care Pack Services

For cost-effective upgrading or extending your standard warranty, HP Care Pack Services offer a suite of standard reactive hardware and software support services that are sold separately, or combined as with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition, with HP Proactive Select we offer an innovative approach to service delivery that gives you the flexibility to acquire the specific proactive services you need today, then add services as your needs evolve. HP Proactive Select offers a broad set of technical or per-event type service options - including server, storage, and network, SAN device, and software, environment, installation and education services. Services that you can mix and match depending on your specific requirements, from preliminary planning and equipment delivery to installation, configuration, integration, and testing, through every level of ongoing support. Our HP Care Pack packaged services for Storage assures help when you need it most. And for many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

#### HP Storage Services: Offering reliability, flexibility and value-just like your storage

HP Storage Services offers a full spectrum of customer care, from technology support to complex migrations to complete completely managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education offers flexible, comprehensive training on storage networking, disk storage systems, and storage software to help your IT staff get the most out of your investments. And HP Financial solutions extend innovative financing and asset management programs to cost-effective buy, manage and eventually retire your older equipment.

HP Storage Services, the trusted business technology experts who manage your technology in action, because when technology works, business works. <http://www.hp.com/hps/storage>

**NOTE:** Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.

### Service and Support, HP Care Pack, and Warranty Information

- Customers purchasing from a commercial reseller can find HP Care Pack Services at <http://www.hp.com/go/lookuptool>

---

#### Recommended HP Care Pack Services for optimal satisfaction with your HP product.

##### Recommended Services **3-Year HP Support Plus 24**

For a higher return on your storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

- Improve uptime with responsive hardware and software services
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP software at a predictable cost
- Increase customer satisfaction-with no interoperability gaps

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EN.pdf>

##### **HP Installation and Startup Service for 3PAR StoreServ File Controller**

For smooth startup, HP Installation and Startup Service provides for deployment of your HP 3PAR StoreServ File Controller while helping you establish readily available access to and management of your critical data and applications. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

- System installation and setup by a HP technical specialist
- Reduced implementation time and cost
- Verification prior to installation that all service prerequisites are met
- Availability of an HP service specialist to answer basic questions related to this service during the orientation session
- Potential expansion of the number of shares and hosts

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-6112ENL.pdf>

##### **HP Proactive Select Service**

HP Proactive Select Service improves your IT performance and manageability through the use of cost effective flexible services. HP provides technical expertise and best practices to accelerate ROI of your technology investment. Selectable proactive services span a wide range of technology and process services - a flexible way to purchase proactive services that fit your particular environment and situation.

HP Proactive Select Service is technology agnostic and purchased in addition to your choice of underlying reactive support.

- Access to a list of flexible and customizable proactive service activities
- Enhance customers' in-house IT team with complementary assistance from HP
- Improved time to solution
- Reduce business risk and project costs by accessing HP specialists
- Simplify IT operational procedures by leveraging HP best practices

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-3842ENN.pdf>

### Service and Support, HP Care Pack, and Warranty Information

---

#### Optional HP Care Pack Services that will enhance your HP product experience.

##### Optional Services

##### HP Data Migration Service for Windows

For customers who need to safely migrate Windows data within their TCP/IP networks with minimal impact to their operations:

You have a need to migrate data between Windows servers within your TCP/IP network. Or you have a need to migrate storage for your Windows servers. Or both. And you need to accomplish these migrations efficiently while minimizing risk at the same time.

HP Data Migration Service for Windows offers you a cost competitive and convenient way to accommodate data migration triggered by a need to refresh or consolidate storage, or to create different storage tiers. This service offers a migration cost in line with the costs of storage products in small and medium-sized storage environments. The service is delivered via a skilled HP service specialist with special consideration for data availability, integrity, and ongoing operational performance during the transfer process.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-4734ENW.pdf>

---

##### eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

##### Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: <http://www.hp.com/support>

---

##### Customer Technical Training

Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online.

[www.hp.com/learn/storage](http://www.hp.com/learn/storage)

---

##### HP Services Awards

HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit:

<http://h20219.www2.hp.com/services/cache/433028-0-0-225-121.html>

---



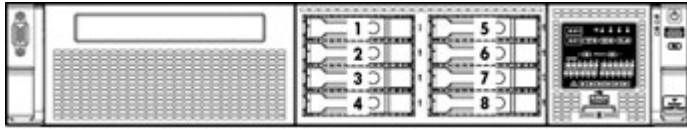
### Service and Support, HP Care Pack, and Warranty Information

---

#### **Additional Services Information**

For more information about HP Care Pack Services for Storage, please visit:  
<http://www.hp.com/hps/storagelf> you have specific questions, contact your local HP representative.  
Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

### Storage



1-8

Eight 3.5" (LFF) hot plug hard drive bays (File Controller ships with only two SAS drives for OS)

### Technical Specifications

<b>3PAR StoreServ File Controller</b>				
<b>System Unit</b>	<b>Dimensions</b> (H x W x D) (with bezel)	SFF Drives: 3.44 x 17.54 x 27.50 in (8.73 x 44.55 x 69.85 cm)		
	<b>Weight</b> (approximate)	Maximum (all hard drives, power supply, and processor installed)	61.00 lb (27.66 kg)	
		Minimum (one hard drive, power supply, and processor installed)	41.0 lb (18.59 kg)	
	<b>Input Requirements</b> (per power supply)	Rated Line Voltage	100 to 120 VAC 200 to 240 VAC	
		Rated Input Current	For 1200 W Power Supply: 10 A (at 100 VAC), 4.9 A (at 200 VAC) For 750 W Power Supply: 8.9 A (at 100 VAC), 4.3 A (at 200 VAC) For 460 W Power Supply: 5.5 A (at 100 VAC), 2.6 A (at 200 VAC)	
		Rated Input Frequency	50 to 60 Hz	
		Rated Input Power	For 1200 W Power Supply: 930 W (at 100 VAC), 1348 W (at 200 VAC) For 750 W Power Supply: 857 W (at 100 VAC), 824 W (at 200 VAC) For 460 W Power Supply: 526 W (at 100 VAC), 505 W (at 200 VAC)	
	<b>BTU Rating</b>	Maximum	For 1200 W Power Supply: 3530 BTU/hr (at 100 VAC), 4600 BTU/hr (at 200 VAC) For 750 W Power Supply: 2925 BTU/hr (at 100 VAC), 2812 BTU/hr (at 200 VAC) For 460 W Power Supply: 1794 BTU/hr (at 100 VAC), 1725 BTU/hr (at 200 VAC)	
	<b>Power Supply Output</b> (per power supply)	Rated Steady-State Power	For 1200 W Power Supply: 800 W (at 100 VAC), 900 W (at 120 VAC), 1200 W (at 200 to 240 VAC) For 750 W Power Supply: 750 W (at 100 to 120 VAC),	

### Technical Specifications

		750 W (at 200 to 240 VAC) For 460 W Power Supply: 460 W (at 100 to 120 VAC), 460 W (at 200 to 240 VAC)
	Maximum Peak Power	For 1200 W Power Supply: 800 W (at 100 VAC), 900 W (at 120 VAC), 1200 W (at 200 to 240 VAC) For 750 W Power Supply: 750 W (at 100 to 120 VAC), 750 W (at 200 to 240 VAC) For 460 W Power Supply: 460 W (at 100 to 120 VAC), 460 W (at 200 to 240 VAC)
<b>System Inlet Temperature</b>	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
<b>Relative Humidity</b> (non-condensing)	Operating	10% to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-operating	5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
<b>Altitude</b>	Operating	3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
<b>Acoustic Noise</b>	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). The listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels. <b>NOTE:</b> The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.	
	<b>Idle</b>	

### Technical Specifications

		LWAd	4.1 B
		LpAm	25 dBA
	<b>Operating</b>		
		LWAd	4.3 B
		LpAm	27 dBA
<b>Emissions Classification (EMC)</b>	FCC Rating		Class A
	Normative Standards		CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1
	<p><b>NOTE:</b> Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.</p> <p><b>NOTE:</b> The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.</p>		

#### HP iLO 4 On System Management

#### Architecture

PCI Express based health and remote management ASIC

#### Processor

Embedded ARM processor core operating at 400MHz

#### Upgradeability

Firmware upgradeable via Flash ROM

#### Video Support

1920 x 1200 (16 bpp) DVR max resolution

#### Interfaces

P iLO Dedicated\* Network connection (10/100/1000 Mb/s) on rack, tower and SL systems

\*Optional Module on some servers

HP iLO Shared Network connection (10/100/1000 Mb/s) on rack, tower and SL systems

HP iLO network connection to blades (100 Mb/s) to Onboard Administrator (with 10/100/1000 Mb/s uplink) on blade systems

#### Memory

16 MB Flash

256 MB DDR 3 with ECC (112 MB after ECC and video)

#### Operating System Support

For information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase from HP, please visit our OS Support Site at: <http://www.hp.com/go/ossupport>

#### Client System Support

For information on Client System Support, please visit the HP iLO Feature Comparison Site at: [www.hp.com/go/compareilo](http://www.hp.com/go/compareilo)

#### Client Browser Support

Microsoft Internet Explorer 9

**NOTE:** For customers using Protected Mode, please use the Java based version of Integrated Remote Console.

Microsoft Internet Explorer 8

**NOTE:** For customers using Protected Mode, please use the Java based version of Integrated Remote Console.

Microsoft Internet Explorer 7



### Technical Specifications

	Firefox Extended Support Release (ESR) 10 (on supported Windows and Linux systems)
	Firefox 3.6 (on supported Windows and Linux systems)
<b>Command Line Support</b>	Secure Shell and serial port access
	Secure Socket Layer
	Secure Shell version 2
<b>Security</b>	Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface
	AES encryption of video
	RC4 encryption of video
<b>Directory Support Services</b>	Active Directory v1.0 (Windows 2003)
<b>Driver Support</b>	HP ProLiant iLO 4 Management Controller Driver Package
<b>Management protocols supported</b>	SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML

---

<b>HP Smart Array P420i Controller</b>	<b>Dimensions</b>	Embedded
	<b>Disk Drive and Enclosure Interface - Transfer rate</b>	6Gb/s SAS (Serial Attached SCSI) 3Gb/s SATA (Serial ATA)
	<b>SAS Connectors</b>	2 internal 4X connectors
	<b>Cache Memory Speed</b>	512MB FBWC - DDR3-1333MHz with 40-bit wide bus, 1GB or 2GB FBWC DDR3-1333MHz with 72-bit wide bus
	<b>Server Interface</b>	x8 PCIe 3.0 provides 8GB/s maximum bandwidth
	<b>SAS Speed</b>	(8) 6Gb/s SAS links provide 4.8GB/s maximum bandwidth
	<b>Cache Memory</b>	Zero Memory RAID has no cache memory 40-bit 256MB ECC protected cache (battery upgrade available) 72-bit 512MB BBWC or 72-bit 512MB and 1G FBWC
	<b>Logical Drives Supported</b>	Zero Memory, Up to 2 logical volumes (8SFF or 4LFF physical drives) Up to 64 logical drives with cache
	<b>Host Memory Addressing</b>	64-bit, supporting greater than 4GB server memory space

---

### Technical Specifications

<b>HP Ethernet 1Gb 4-port 331FLR Adapter</b>	<b>HP Flexible Network Technology</b>	HP Flexible Network Technology consists of replaceable network solutions to meet the customers require now or in the future.	
	<b>Network Interface</b>	10Base-T/100Base-TX/1000Base-TX	
	<b>Compatibility</b>	IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3ad 1000Base-TX IEEE 802.1p 100Base-TX IEEE 802.1q 100Base-TX	
	<b>Data Transfer Method</b>	PCI Express, four lanes (x4)	
	<b>Controller</b>	BCM5719	
	<b>Network Transfer Rate</b>	10Base-T (Half-Duplex)	10 Mb/s
		10Base-T (Full-Duplex)	20 Mb/s
		100Base-TX (Half-Duplex)	100 Mb/s
		100Base-TX (Full-Duplex)	200 Mb/s
		1000Base-TX (Half and Full-Duplex)	2000 Mb/s
	<b>Connector</b>	Two RJ-45	
	<b>Cable Support</b>	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)

---

<b>Environment-friendly Products and Approach</b>	<b>End-of-life Management and Recycling</b>	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> . To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
---	---	--

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

---

© Copyright 2013 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

For drives, 1 TB = 1 trillion bytes. Actual formatted capacity is less.





## Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>