Overview

HP StorageWorks P4000 G2 SAN Solutions deliver enterprise functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, scale and maintain, HP P4000 SANs ensure that crucial business data remains available. The innovative approach to storage provides unique double fault protection across the entire SAN, reducing vulnerability without driving up costs the way traditional SANs can.

Product Overview
Your storage needs are growing. You need a SAN for virtualized servers, and you want your next investment to have a long term payoff.

The HP StorageWorks P4000 G2 SAN Solutions are optimized for database and email applications, as well as virtualized servers. With a pay-as-you-grow, all-inclusive pricing model and intuitive storage management software, the SAN is perfect for the budget-minded.

Do high availability and disaster recovery seem out of your reach? The P4000 eliminates single points of failure across the SAN with an innovative approach to data availability, reducing risk without driving up costs.

Unsure that current storage can meet your future needs? Built on a storage clustering architecture, the HP P4000 SAN allows you to scale capacity and performance linearly without incurring downtime or performance bottlenecks, or forcing expensive upgrades.

Need creative ways to stretch your IT budget? Reservationless thin provisioning substantially increases your storage efficiency, making you look like a rock star.

HP StorageWorks P4000 G2 SANs Models At a Glance:
- Family of highly scalable, easy to use storage solution with superior HA and DR capabilities
- Consolidate storage for Windows and Linux environments, and for server virtualization environments
- Rack mount chassis form factor for Starter, Virtualization, Multi-site and Scalable Capacity SAN Solutions
- Based on HP StorageWorks SAN/iQ storage software
- Models with SAS or MDL SAS drives
- Software included support for
    - Network RAID Synchronous Replication
    - Snapshot with Built In Application Integration
    - Remote Copy Asynchronous Replication with Bandwidth Throttling
    - Multi-Site HA/DR Solution Synchronous Replication
    - Online Volume Migration and Software Upgrades
    - Self-Healing Storage
- Storage Controllers: minimum of 2 per SAN, a cluster of 3 Storage systems provides triple redundancy
- Network RAID Levels (per volume) 0, 5, 6, 10, 10+1, and 10+2 protect against double disk, system, and site failures
- Hardware RAID Levels 10, 5, 6
- Hardware Availability features
    - Hot-plug hard drives and redundant power
    - ECC memory
    - Integrated storage controller w/ battery-backed DDR2 cache
    - Hyper-redundant clustered storage
- HP ProLiant Integrated Lights-Out 2 Remote Management

Overview

	MDL SAS Starter SAN	SAS Starter SAN	Virtualization SAN	Multi-Site SAN	Scalable Capacity SAN	Custom Solution Storage Systems
Number of drives	16 - 256	16 - 256	24 - 384	48 - 384	60 - 384	Varies
Starting Capacity	16.0 TB MDL SAS	7.2 TB 15K SAS	10.8 TB 15K SAS	21.6 TB 15K SAS	60.0 TB MDL SAS	Varies
Dual Active/Active Controllers	Included	Included	Included	Included	Included	Requires 2 Nodes
Dual Active/Active Site Failover				Included		
SAN/iQ, all features	Included	Included	Included	Included	Included	Included
3 Yrs 9x5 Software Support	Included	Included	Included	Included	Included	1 yr 9x5 Software Support
3 Yrs Hardware Maintenance On-Site, Next Business Day	Included	Included	Included	Included	Included	1 yr Hardware Maintenance On-Site, NBD
Customer Self Installable	Included	Included	Included	Included	Included	Included
Windows Solution Pack	Included	Included	Included	Included	Included	Included
P4000 Replication for Remote Offices	Optional	Optional	Included (VSA 10 license pack)	Included (VSA 10 license pack)	Optional	Optional
Multi-Site HA/DR Solution	Included	Included	Included	Included	Included	Included

Features and Benefits

All inclusive feature set enables enterprise functionality at an affordable price

- **Storage Clustering simplifies scalability**
  Storage Clustering allows a customer to consolidate multiple storage nodes into pools of storage. All available capacity and performance is aggregated and available to every volume in the cluster. As storage needs increase the HP P4000 can scale performance and capacity on-line.
- **Network RAID delivers new levels of data availability**
  Network RAID protects multiple copies of data across a cluster of storage nodes, eliminating any single point of failure in the HP P4000 SAN. Applications have continuous data availability in the event of a power, network, disk, controller, or entire storage node failure.
- **Thin Provisioning reduces costs by increasing storage efficiency**
  Thin Provisioning allocates space only as data is actually written without requiring pre-allocation of storage. This raises the overall utilization and efficiency of the HP P4000 SAN and ultimately increases the ROI.
- **Snapshots simplify data protection**
  Snapshots create thinly provisioned, instant point-in-time copies of data on a per-volume basis. Built in application integrated snapshots enable automated quiescing for Microsoft VSS enabled applications. Administrators can access HP P4000 SAN snapshots to recover individual files/folders from the volume, and rollback an entire volume or sets of volumes to a prior state.
- **Remote Copy reduces costs for disaster recovery**
  Remote Copy replicates snapshots between HP P4000 SANs at primary and remote locations. Copies are thinly provisioned with no space reservation required at the remote location. Remote Copy enables centralized backup and disaster recovery on a per-volume basis.

Superior availability and disaster recovery

- **Data remains available during site failures**
  HP P4000 SANs protect multiple copies of data across a cluster of storage nodes, eliminating any single point of failure in the SAN. Applications have continuous data availability in the event of a power, network, disk, controller, or entire storage node failure.
- **Integrated replication for disaster recovery**
  HP P4000 SANs include integrated replication at no additional cost that simplifies management with simple failover and failback.
- **Change configurations without incurring downtime**
  Administrators can add capacity, increase performance, grow and migrate volumes between HP P4000 SAN clusters on the fly with no application downtime.

Scalable Performance

- **Purchase only what you need today**
  Avoid up-front cost and the potential performance constraints. Purchase only what's needed today, then grow the performance, capacity, and redundancy of your HP P4000 SAN online as storage requirements evolve. Buying storage only when needed simplifies planning and relieves budget pressures.
- **Scale performance and capacity simultaneously**
  Each time a storage node is added to the HP P4000 SAN, the capacity, performance, and redundancy of the entire storage solution increases.
- **Avoid disruptive upgrades**
  Add resources to the HP P4000 SAN non-disruptively as capacity and performance requirements increase. Applications remain online during maintenance events for best in class availability.

Easy to manage SANs for virtualized environments

- **Centralized Management Console**

Features and Benefits

Multiple data centers and sites can be managed from an all inclusive "single pane-of-glass." All of the HP P4000 SAN features are managed from the Centralized Management Console (CMC) for simple, easy-to-manage storage.
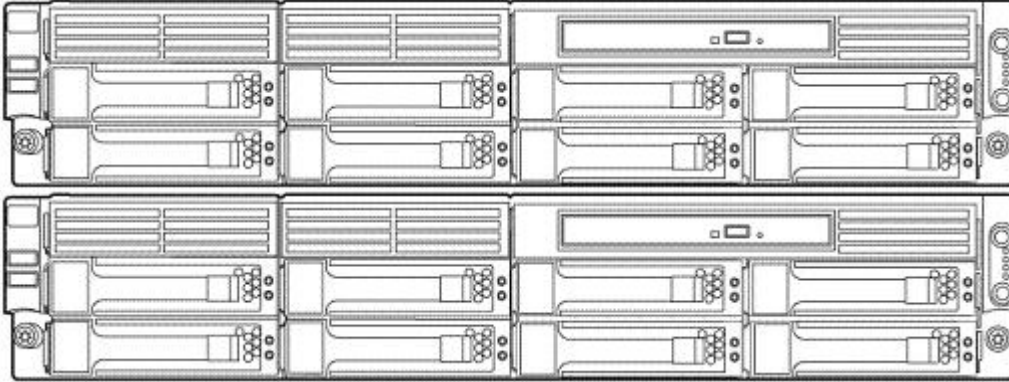
- **Business continuance with integrated HA and DR**
  Every HP P4000 SAN includes integrated synchronous and asynchronous replication at no additional cost. This approach reduces costs and simplifies management of high availability/fault tolerant and disaster recovery storage solutions.
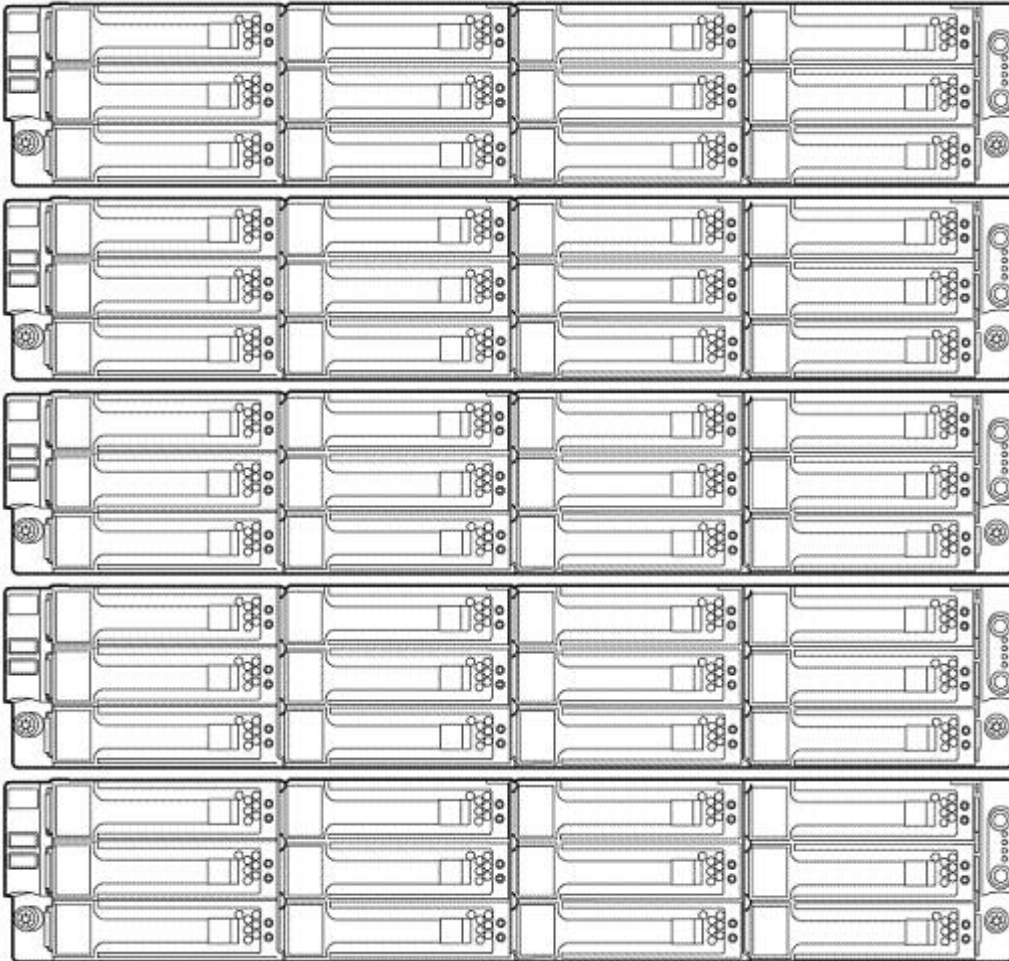
Family Information

Models

HP StorageWorks P4300 G2 SAN Solutions

HP StorageWorks P4500 G2 SAN Solutions

Family Information

The P4000 SANs are bundle configurations that provide High Availability, Scalable Performance and Enterprise Features for any budget. Each P4000 SAN includes hardware, software, and 3yrs support to get you up and running in one swift motion.

HP StorageWorks P4300 G2 MDL SAS Starter SAN Solution

HP StorageWorks P4300 G2 16TB MDL SAS Starter SAN Solution   BK715A
MDL SAS Starter SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Solution Pack for Microsoft Windows

MDL SAS Starter SAN Hardware:

- Dual redundant, active-active storage controllers
- 16 MDL SAS Drives, 1TB, 7,200 RPM
- 12 GB RAM
- Redundant hot swap power supplies
- 1024 MB battery backed cache
- Support for RAID 5, 6, 10
- 4 1Gbit NICs
- iLO2 Management
- Integrated DVD/CD-Rom

MDL SAS Starter SAN Services:

- 3 years 9x5 software phone support & software updates
- 3 years hardware maintenance on-site, next business day
- Customer Self Installable

Expansion Option: HP StorageWorks P4300 G2 8TB MDL SAS Storage System   BK719A

HP StorageWorks P4300 G2 SAS Starter SAN Solution

HP StorageWorks P4300 G2 7.2TB SAS Starter SAN Solution   BK716A
SAS Starter SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Solution Pack for Microsoft Windows

SAS Starter SAN Hardware:

- Dual redundant, active-active storage controllers
- 16 SAS Drives, 450GB, 15,000 RPM
- 8 GB RAM
- Redundant hot swap power supplies
- 1024 MB battery backed cache
- Support for RAID 5, 6, 10
- 4 1Gbit NICs

Family Information

- iLO2 Management
- Integrated DVD/CD-Rom

SAS Starter SAN Services:

- 3 years 9x5 software phone support & software updates
- 3 years hardware maintenance on-site, next business day
- Customer Self Installable

Expansion Option: HP StorageWorks P4300 G2 3.6TB SAS Storage System   BK718A

HP StorageWorks P4500 G2 Virtualization SAN Solution	HP StorageWorks P4500 G2 10.8TB SAS Virtualization SAN Solution	AX696A

Virtualization SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Solution Pack for Microsoft Windows
- P4000 Replication for Remote Offices (VSA DR for 10 remote sites)

Virtualization SAN Hardware:

- Dual redundant, active-active storage controllers
- 24 450 GB 15K SAS disk drives
- 8 GB RAM
- Redundant hot swap power supplies
- 1,024 MB battery backed cache
- Support for RAID 5, 10, 6
- 4 1Gbit NICS
- iLO2 Management
- Integrated DVD/CD-Rom

Virtualization SAN Services:

- 3 years 9x5 software phone support & software updates
- 3 years hardware maintenance on-site, next business day
- Customer Self Installable

Expansion Option: HP StorageWorks P4500 G2 5.4TB SAS Storage System   AX700A

HP StorageWorks P4500 G2 Multi-Site SAN Solution   HP StorageWorks P4500 G2 21.6TB SAS Multi-Site SAN Solution   AX697A

Multi-site SAN Software:

- Dual active/active site failover
- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Solution Pack for Microsoft Windows

Family Information

- P4000 Replication for Remote Offices (VSA DR for 10 remote sites)

Multi-site SAN Hardware:

- Dual redundant active-active controllers
- 48 450 GB 15K SAS disk drives, 24 per site
- 16 GB RAM
- Redundant hot swap power supplies
- 2,048 MB battery backed cache
- Support for RAID 5, 10, 6
- 8 1Gbit NICs, 4 per site
- iLO2 Management
- Integrated DVD/CD-Rom

Multi-site SAN Services:

- 3 years 9x5 software phone support & software updates
- 3 years hardware maintenance on-site, next business day
- Customer Self Installable

Expansion Options:

HP StorageWorks P4500 G2 5.4TB SAS Storage System	AX700A
HP StorageWorks P4500 G2 10.8TB SAS Virtualization SAN Solution	AX696A

HP StorageWorks P4500 G2 Scalable Capacity SAN Solution	HP StorageWorks P4500 G2 60TB MDL SAS Scalable Capacity SAN Solution	BK717A

Scalable Capacity SAN Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Solution Pack for Microsoft Windows

Scalable Capacity SAN Hardware:

- Five redundant active-active scalable controllers
- 60 1TB 7.2K MDL SAS disk drives
- 20 GB RAM
- Redundant hot swap power supplies
- 2,560 MB battery backed cache
- Support for RAID 5, 10, 6
- 10 1Gbit NICs
- iLO2 Management
- Integrated DVD/CD-Rom

Scalable Capacity SAN Services:

- 3 years 9x5 software phone support & software updates
- 3 years hardware maintenance on-site, next business day
- Customer Self Installable

Expansion Option: HP StorageWorks P4500 G2 12TB MDL SAS Storage System	AX703A

Family Information

HP StorageWorks P4000 G2 Spare Components	HP 2U Redundant Fan Kit	516009-B21
	HP 750W CS HE Power Supply Kit	512327-B21
	HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD	461137-B21
	HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21

HP StorageWorks P4000 G2 Storage System Custom Solutions

The P4000 G2 Storage System Custom Solutions are single SKU bundle configurations. P4000 G2 Storage System Custom Solutions include the following:

P4000 G2 Storage System Software:

- SAN/iQ Storage Clustering
- SAN/iQ Network RAID
- SAN/iQ Thin Provisioning
- SAN/iQ Snapshots
- SAN/iQ Remote Copy (asynch rep)
- SAN/iQ Multi-Site/DR Solution (synch rep)
- SAN/iQ Solution Pack for Microsoft Windows

P4300/P4500 Storage System Hardware:

- 15K SAS or 7.2K MDL SAS HDDs
- 4GB RAM (6GB for P4500 G2 models with HDDs larger than 750GB)
- Redundant hot swap power supplies
- 512 MB battery backed cache
- Support for RAID 5, 6, 10
- Dual port 1Gbit NIC
- iLO2 Management
- Integrated DVD/CD-Rom

P4300/P4500 Services:

- 1 year 9x5 software phone support & software updates
- 1 year hardware maintenance on-site, next business day
- Customer Self Installable

HP StorageWorks P4300 G2 Storage System	HP StorageWorks P4300 G2 2.4TB SAS Storage System: 8 SAS Drives, 300 GB, 15,000 RPM	AX698A
	HP StorageWorks P4300 G2 3.6TB SAS Storage System: 8 SAS Drives, 450 GB, 15,000 RPM	BK718A
	HP StorageWorks P4300 G2 6TB MDL SAS Storage System: 8 MDL SAS Drives, 750 GB, 7,200 RPM	AY456A
	HP StorageWorks P4300 G2 8TB MDL SAS Storage System: 8 MDL SAS Drives, 1TB, 7,200 RPM	BK719A
HP StorageWorks P4500 G2	HP StorageWorks P4500 G2 3.6TB SAS Storage System:12 SAS Drives, 300GB, 15,000 RPM	AX699A

Family Information

Storage System	HP StorageWorks P4500 G2 5.4TB SAS Storage System:12 SAS Drives, 450GB, 15,000 RPM	AX700A
	HP StorageWorks P4500 G2 9TB MDL SAS Storage System: 12 MDL SAS Drives, 750GB, 7,200 RPM	AX702A
	HP StorageWorks P4500 G2 12TB MDL SAS Storage System:12 MDL SAS Drives, 1TB, 7,200 RPM	AX703A

HP StorageWorks P4000 G2 Spare Components	While HP StorageWorks P4000 G2 Storage Systems have everything you need to be up and running, the following spare kits are available for purchase.	
	HP 2U Redundant Fan Kit	516009-B21
	HP 750W CS HE Power Supply Kit	512327-B21
	HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD	461137-B21
	HP 750GB 3G SAS 7.2K 3.5" DP MDL HDD	461135-B21
	HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21
	HP 300GB 3G SAS 15K 3.5" DP ENT HDD	416127-B21

HP StorageWorks P4000 G2 SANs Product Information:

Overview	
Server Compatibility	Supports most HP ProLiant servers including HP ProLiant DL, MLHP ProLiant c-Class Blade Servers
Industry Standard x86/x64 servers support	● Supports most multi-vendor industry standard 32-bit and 64-bit Intel and AMD based servers. HP requires the Third-Party Server to be logo'd and listed on the Microsoft Windows Server Catalog. ● Refer to the Microsoft website: http://www.microsoft.com/windows/catalog/server/ ● HP StorageWorks Division recommends that the Third-Party Server Vendor is an active member of TSANet. Refer to the TSANet website for details: www.tsanet.com
OS Support	● Microsoft Windows Server 2003 R2 - all editions, x86/x64 ● Microsoft Windows Server 2008 - all editions, x86/x64 ● Microsoft Windows Server 2008 R2 - all editions ● VMware ESX/ESXi 3.5 ● VMware vSphere ESX / ESXi Server 4 ● VMware Site Recovery Manager ● RedHat Enterprise Linux AS 4.6 / 4.7 / 4.8 ● RedHat Enterprise Linux 5.0 / 5.1 / 5.2 / 5.3 / 5.4 ● Novell NetWare 6.5 ● SUSE Linux Enterprise Server 9 / 10 / 10.1 / 10.2 / 11 ● Fedora 6 / 8 / 9 / 10 / 11 ● Solaris 10 ● HP-UX 11i v1 (11.11) / v2 (11.23) / v3 (11.31) ● IBM AIX 5L / 6.1 ● Citrix XenServer 5.0 / 5.5 ● Apple OS X 10.5 / 10.6
Interconnects	● 2ea 1 GbE iSCSI, optional upgrade to 10 GbE

Management	● The Centralized Management Console supports
	   ○ Windows XP
	   ○ Windows Vista
	   ○ Windows 7
	   ○ Windows Server 2003 R2
	   ○ Windows Server 2008

Family Information

	○ Windows Server 2008 R2 ○ SUSE Linux Enterprise 10 ○ RedHat Enterprise Linux 4 / 5 ○ Fedora Core 6 ○ Fedora 6/8/9 ○ HP-UX 11i v1 (11.11) / v2 (11.23) / v3 (11.31) ● HP ProLiant Integrated Lights-Out 2 Remote Management ● Baseboard Mgmt Controller IPMI 2.0

HP StorageWorks P4000 G2 All Inclusive Software

Product Features

Storage Clustering

- SAN/iQ Storage Clustering allows a customer to create pools of storage by consolidating storage nodes on the network into clusters. Storage Clustering provides online scalability, both within a volume and across the entire storage pool. All available physical capacity is aggregated and available to the volumes created on the SAN.
- In order to scale capacity and/or performance, the IT administrator simply adds nodes to the storage cluster. SAN/iQ software automatically redistributes the data for optimal data availability and performance. All the capacity, processing power, and bandwidth included in each node are aggregated into the entire SAN, ensuring an increase in performance as the SAN grows. To make the process even easier, HP P4000 SANs let IT administrators expand volumes and add storage nodes online, without taking the volumes offline or causing application downtime.
- For increased access to hardware, customers can install storage nodes anywhere on the IP network. Within a facility, storage nodes in a cluster can be spread out between the server room and a network closet. A single cluster can also be spread across physical sites or data centers to eliminate the risk of data loss from a site or data center failure.
- Customers can use SAN/iQ Storage Clustering to implement different tiers of storage in their SAN. For instance a storage cluster of SAS-based storage nodes can be implemented for performance while a storage cluster of MDL SAS-based storage nodes is implemented for higher density, all managed from a single interface.

Network RAID

- SAN/iQ Network RAID protects multiple copies of data across a cluster of storage nodes, eliminating any single point of failure in the SAN. Applications have continuous data availability in the event of a power, network, disk, controller, or entire storage node failure.
- SAN administrators can manage redundancy on a per-volume basis to optimize storage utilization and match the data protection of the volume to the application data on that volume. Customers choose from Network RAID level 0, 5, 6, 10, 10+1, or 10+2 to protect data across the storage nodes, only allocating additional storage space for data that warrants additional protection. For increased protection, Network RAID can also be integrated into environments where application servers are clustered, enabling true, seamless, geo-cluster solutions that provide both application and storage clustering across geographies.

Thin Provisioning

- Most SAN vendors place the provisioning burden on SAN administrators, asking them to predict how much space will be needed in the future for volumes, snapshots and remote copies, and what the SAN's expected growth rate will be. That information is required because most storage provisioning models call for pre-allocation of storage space on the SAN. Errors in estimation are inevitable, and can be expensive or cause snapshots and backups to fail. Worse yet, if administrators over-allocate storage, it is nearly impossible to reclaim that unused space.
- HP P4000 SANs do not require pre-allocation of storage space. SAN/iQ software manages all the storage allocations underneath a given volume, and the Thin Provisioning feature allocates space only as data is actually written to that volume. SAN/iQ Thin Provisioning allows customers to purchase only the storage needed today and then add more storage to the clusters as application data grows. This raises the overall utilization and efficiency of the SAN and ultimately increases the ROI associated with the SAN.

Snapshots

- Snapshots create instant point-in-time copies of data on a per-volume basis. Snapshots can be

created in a variety of ways to meet business or application requirements. Administrators can create them manually ad-hoc, on a scheduled or scripted basis, or via the Microsoft VSS framework, and can then access these point-in-time snapshots to recover individual files or folders from the volume, or rollback an entire volume. Unlike most SAN vendors that require a snapshot reserve, SAN/iQ Snapshots are always thin provisioned for efficiency, only consuming storage space on the SAN for the data written to the snapshot, eliminating any upfront space reservation or guesswork that could lead to snapshot and backup job failures.

- Built into the SAN and Centralized Management Console, application integrated snapshots provide automated quiescing for Microsoft VSS enabled applications without additional software or hardware requirements. Set's of VSS snapshots are easily created, scheduled, and recovered using the CMC.

Remote Copy

- SAN/iQ Remote Copy lets customers replicate thin provisioned snapshots between primary and remote locations. Because remote copies are thin provisioned no space reservation at the remote location is required. Remote Copy is used for centralized backup and disaster recovery and can be set up on a per-volume basis. Remote copies placed on a recurring schedule allow customers to achieve point-in-time asynchronous replication of the data between locations, sites, or data centers.
- Integrated into the SAN/iQ Remote Copy software is intelligent bandwidth management ensuring that the data traffic can be sent across shared WAN links without adversely impacting other network traffic. Administrators simply set the bandwidth limit for remote copies between the two sites and the SAN/iQ software holds that limit.
- A failover/failback wizard is also included with Remote Copy for step-by-step, easy to execute disaster recovery procedures when needed most.
- Remote-Copy leverages application integrated snapshots to enable Microsoft VSS applications to be replicated in a quiesced state, providing faster application recovery.

Performance Management

- The SAN/iQ Performance Management System is designed from the ground up to make it easy to obtain the performance metrics that customers need, when they need them. One click of the mouse and the Performance Monitor is up and running in the Centralized Management Console (CMC) so there is no external software to install. The monitor provides a short list of relevant statistics and counters, letting administrators obtain performance metrics rolled up to their preferred level of abstraction.
- The SAN/iQ Performance Monitor provides performance information on a per-application server/virtual machine, logical volume, snapshot, storage cluster, and storage node basis, so there's no wading through irrelevant statistics in search of pertinent information. The Performance Monitor's graphical user interface is simple and elegant, and each statistic includes a detailed explanation of what it means for SAN performance.

SmartClone Technology

- SAN/iQ SmartClone technology instantly replicates data volumes and data sets into virtual copies or "clones" without requiring additional storage space. Each volume clone lets administrators save time and space in a variety of environments and applications, from server and desktop provisioning, to boot-from-SAN provisioning, to the rapid copying of production data into test and development environments.
- SmartClone technology is based on the space-efficient SAN/iQ Thin Provisioning architecture, and the volume clones can be used without limitation along with all other SAN/iQ features like Network RAID, Thin Provisioning, Snapshot, and Remote Copy. The feature works by taking any volume or snapshot and making one or many clones in an instant. The cloning function makes a permanent, read/write volume on the SAN, pointing back to the original volume's blocks instead

Software

of duplicating the blocks. By managing each clone as a pervasive volume, SmartClone eliminates any requirement for a volume, snapshot, or any of its predecessors to exist after the clone has been created, and also eliminates the need to run de-duplication software, because there are no duplicate blocks. The clone shares the original volume's blocks and uses copy-on-write semantics. SmartClone technology reduces storage costs and increases overall storage efficiency. Administrators can store "gold-master" system images on the SAN for virtual desktop and boot-from-SAN implementations, and quickly provision test environments using real production data. To simplify management, administrators can view all of the relationships between clones, volumes, and snapshots graphically in the Control Management Console.

- SmartClone technology leverages application integrated snapshots to enable Microsoft VSS applications to be cloned in a quiesced state, providing easier application testing and recovery.

Centralized Management Console

- The entire HP P4000 SAN is managed from the SAN/iQ Centralized Management Console (CMC). An administrator simply connects via the IP network to the storage nodes. Multiple data centers and sites of storage can be managed from a "single pane-of-glass" no matter where the nodes are physically located. The CMC also includes an integrated Performance Monitor providing administrator with detailed, real-time metrics and the ability to export statistics. All of the SAN/iQ features are managed from the CMC for simple, easy-to-manage storage.

HP StorageWorks P4000 G2 Related Software

HP StorageWorks P4000 G2 Virtual SAN Appliance Software (VSA)

- The HP StorageWorks P4000 Virtual SAN Appliance Software (VSA) is a VMware SVA Certified SAN/Storage device and Virtual Appliance that provides complete SAN functionality for VMware Infrastructure without external SAN hardware. By virtualizing the internal disk capacity of the server running VMware ESX, the VSA Software eliminates the need for external shared storage required to implement the advanced features of VMware Infrastructure.
- Multiple VSA's running on multiple VMware ESX hosts create a clustered pool of storage with the ability to replicate data across the hosts allowing volumes to stay on-line in the event of a server failure
- Small to medium businesses and remote office customers can lower their IT infrastructure costs and enable higher levels of protection for business critical systems without the purchase of additional hardware.
- VSA Software deployed at remote sites are managed as virtual storage nodes using the same Centralized Management Console used to manage your HP StorageWorks P4000 G2 SANs.
- 1 year 9x5 software phone support and software upgrades included

NOTE: For more information visit: www.hp.com/go/vsa

HP StorageWorks P4000 Unified NAS Gateway*

Stretch your HP StorageWorks P4000 G2 SAN Solution investment by adding file and print services with a P4000 Unified NAS Gateway. Unified NAS Gateway are optimized file and print server solutions that are built on industry-standard HP ProLiant servers and come with Microsoft Windows Storage Server 2008 operating system pre-installed. Since they're Windows-based, network and active directory integration is easy, your tools and data protection applications run right on the box, and management has a familiar look and feel. Like many Network Attached Storage (NAS) devices, they support heterogeneous file serving environments and are pre-configured to install in minutes.

A P4000 Unified NAS Gateway is a file server gateway that adds IP-based services to your P4000. In addition to providing file and print services , all of your important client and server data can be managed, scaled, and protected on a P4000 SAN solution.

HP StorageWorks P4000 1-node Unified NAS Gateway Node*   AW588A

Software

HP StorageWorks P4000 1-node Unified NAS Gateway Node*   AW589A

HP StorageWorks X9000 Network Storage Systems

Are you faced with a hard-to-manage data explosion? The exponential growth of unstructured data can lead to rampant infrastructure costs. To gain control of file-based data, a new storage solution that scales affordably, seamlessly and with zero downtime is required.

The HP StorageWorks X9000 Network Storage Systems scale-out beyond traditional network attached storage in both capacity and performance. Designed to be extremely scalable, flexible, and cost-efficient, X9000 Network Storage Systems deliver excellent performance and a modular storage infrastructure to accommodate unprecedented storage growth and performance. Central management allows the administrator to manage not just terabytes but multi-petabyte environments at the highest density possible from HP. The pay-as-you-grow architecture and an all-inclusive feature set reduces storage over-provisioning or expensive add-ons. X9000 is the platform for customers designing the next generation data center.

X9000 Network Storage System Family of Products
Large enterprises and scale-out environments that need to seamlessly serve, store and scale terabytes to multi-petabytes of unstructured data.

- **X9300 Network Storage Gateway** - A flexible, scale-out solution that brings feature rich gateway file services to HP MSA, EVA, P4000 or 3rd party arrays or SANs for those customer experiencing considerable unstructured data growth.
- **X9320 Network Storage System** - Highly available, scale-out storage solution that allows customers to add a performance-based system quickly and easily into their environment for file data workloads.
- **X9720 Network Storage System** - A turn-key, highly dense scale-out NAS appliance designed for those customers with extreme capacity needs looking for an affordable architecture that offers low $/GB and scales from sub-hundred terabytes to multi-petabytes.

NOTE: For more information visit: www.hp.com/go/X9000

Backup Options

Creating and end-to-end IP SAN storage solution

When combining a HP P4000 SAN Solution with the HP StorageWorks D2D Backup System, users can create an affordable end-to-end IP SAN storage solution that is both easy to implement an easy to maintain. From entry-level solutions for a remote or branch office to mid-range solutions that scale for multiple sites, HP D2D Backup Systems provide the optimal balance of affordability, manageability, and reliability to handle the data protection needs of your HP StorageWorks SAN Solution.

HP StorageWorks D2D4112 Backup System

The HP StorageWorks D2D Backup Systems provide price leading disk-based data protection for small or medium-sized data centers and distributed environments. Automate and consolidate the backup of multiple servers onto a single, rack-mountable device. Improve reliability by reducing errors caused by media handling. With 1.5 to 18 TB of usable capacity and speeds of up to 720 GB/hour you can significantly reduce your backup window and restore time. The D2D Backup Systems feature HP Dynamic deduplication allowing you to retain more data on disk for longer and enabling low bandwidth replication for cost-effective off-site backup and recovery. Included as standard on all D2D systems, support for both virtual tape library and NAS (CIFS/NFS) targets offers the ease of use and flexibility needed to integrate into your current IT environment.

*Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

Software

The HP StorageWorks D2D4112 Backup System is focused on the needs of mid-sized data centers and used as a replication target device for remote and branch offices, the 2U D2D4112 series delivers a scalable solution from 9 to 18 TB of useable capacity using a simple and cost effective 2U capacity upgrade and speeds of up to 720 GB/hour*. These devices automate the daily backup of multiple distributed servers through the flexibility of virtual tape library and NAS (CIFS and NFS) targets for backup applications.

*Actual performance is dependent upon data set type, compression levels, number of data streams, number of devices emulated and number of concurrent tasks, such as housekeeping or replication.

For more information on HP D2D Backup Systems, please go to: www.hp.com/go/d2d.

Service and Support, HP Care Pack, and Warranty Information

Warranty	- All HP StorageWorks P4000 product have a s 1-1-1 factory warranty (1 year parts exchange, 1 year labor and 1 year onsite, next business day response) - The HP StorageWorks P4000 G2 SAN Solutions (MDL SAS Starter SAN, SAS Starter SAN, Virtualization SAN, Multi-site SAN, Scalable Capacity SAN) have additional HW and SW bundled services, at no extra charge, that provide for an effective warranty support coverage for HW and SW of 3 years (3 years parts exchange, 3 years labor and 3 years onsite, next business day response). - The HP StorageWorks P4000 G2 Storage Systems have additional bundled HP Software Support, at no extra charge, that provides for an effective warranty support coverage for HW and SW of 1 year (1 year parts exchange, 1 year labor and 1 years onsite, next business day response).
Services Included with the Product	- The HP StorageWorks P4000 G2 SAN Solutions (MDL SAS Starter SAN, SAS Starter SAN, Virtualization SAN, Multi-site SAN, Scalable Capacity SAN) come bundled with 2 additional years of HW support (parts, labor, onsite). These SAN Solutions also include three years of basic HP Software Support (standard 9x5 business hours phone support, software technical support and software product and documentation updates). These bundled services provide, at no extra costs, for basic next business day, HW + SW support for 3years for the SAN Solution products. - The HP StorageWorks P4000 G2 Storage Systems, and the P4000 software LTU products, come bundled, at no extra cost, with 1 year of basic HP Software Support (standard 9x5 business hours phone support (software technical support and software product and documentation updates).

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

Service and Support, HP Care Pack, and Warranty Information

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.
- 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 Support   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

Recommended Deployment   HP Installation and Startup for HP P4000 SAN Solutions

For smooth startup and better business outcomes, HP Installation and Startup for HP P4000 SAN Solutions - provides installation and configuration of your product. In today's new era of business technology - 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.

- Shorten your time-to-results
- Minimize downtime during installation and startup
- Mitigate risks to critical business processes
- Cost-effectively obtain specialized expertise for complex deployment-related tasks
- Be confident storage solutions are configured and deployed to deliver high performance and availability

http://h20195.www2.hp.com/v2/getpdf.aspx/4aa2-4817enw.pdf

Service and Support, HP Care Pack, and Warranty Information

Related HP Care Pack Services that will enhance your HP product experience.

Related Services

HP Proactive Select Service

For customers who need to improve IT performance and manageability through the use of cost effective flexible proactive services:

Proactive Select - increased flexibility, minimal complexity -- Select what works for you - your package Delivery planning + Proactive Service Credits

- Credits are used to redeem proactive services
- Three 'predefined' service credit levels - 30, 60,180 credits
- Additional credits available
- Available in 1,3, 4 & 5 year packages
  Reactive
- Utilize existing reactive services products - ranging from Next Day, through 24x7, to 6 Hour Call to Repair

http://h20195.www2.hp.com/v2/getpdf.aspx/4aa2-3842enn.pdf

HP Entry Storage 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 Entry Storage 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

Service and Support, HP Care Pack, and Warranty Information

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

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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. http://h10076.www1.hp.com/education/curr-storsan.htm

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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.htm
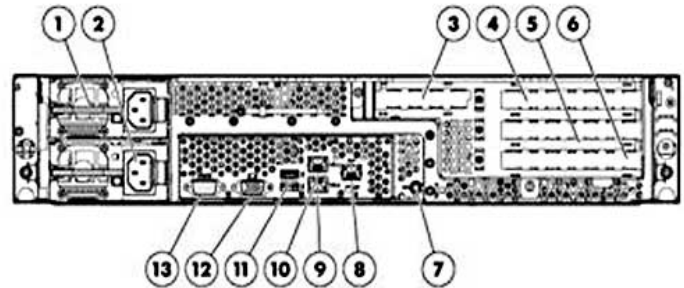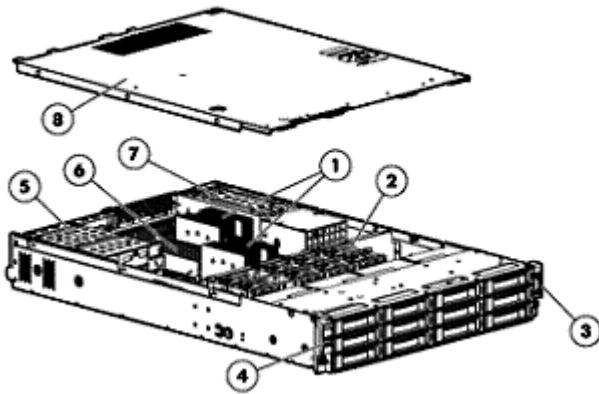

Additional Services Information

For more information about HP Care Pack Services for Storage, please visit:
http://www.hp.com/hps/storage

If 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

Configuration Information

HP StorageWorks P4300 / P4500 G2 Storage System

Front View:

1. Two (2) Quad-Core Intel® Xeon® 5520 processors
2. Non-Hot Plug, Redundant fans
3. Front UID LED/switch
4. Two (2) Front USB 2.0 ports
5. Twelve (12) DDR3 Unbuffered or Registered DIMM memory slots
6. PCI Cage
7. Two (2) Climate Saver/80 PlusGold 750W Redundant Power supplies
8. Access panel

Rear View:

1. Secondary Climate Saver/80 PlusGold 750 Watt Power Supply
2. Primary Climate Saver/80 PlusGold 750 Watt Power Supply
3. Low Profile x16 PCI-E Gen2 slot
4. Integrated CD-ROM (P4500 model in rear / P4300 model in front)
5. Full height/full-length PCI Express Gen2 x8 slot
6. Full height/full-length PCI Express Gen2 x8 slot
7. Rear UID LED/switch - Unit Identification LED to assist in rack storage maintenance
8. iLO 2 out of band management port (RJ-45)
9. GbE LAN port for NIC 2 (RJ-45)
10. GbE LAN port for NIC 1 (RJ-45)
11. Two (2) Rear Panel USB 2.0
12. VGA Port
13. Serial Port

Step 1 - P4000 Base Configuration
Choose a SAN that best fits your needs

SAN Configuration	Model Description	Part Number
	HP StorageWorks P4300 G2 16TB MDL SAS Starter SAN Solution	BK715A
	HP StorageWorks P4300 G2 7.2TB SAS Starter SAN Solution	BK716A
	HP StorageWorks P4500 G2 10.8TB SAS Virtualization SAN Solution	AX696A
	HP StorageWorks P4500 G2 21.6TB SAS Multi-Site SAN Solution	AX697A
	HP StorageWorks P4500 G2 60TB MDL SAS Scalable Capacity SAN Solution	BK717A
	HP StorageWorks P4500 G2 3.6TB SAS Storage System	AX699A

Configuration Information

HP StorageWorks P4500 G2 5.4TB SAS Storage System	AX700A
HP StorageWorks P4500 G2 9TB MDL SAS Storage System	AX702A
HP StorageWorks P4500 G2 12TB MDL SAS Storage System	AX703A
HP StorageWorks P4300 G2 2.4TB SAS Storage System	AX698A
HP StorageWorks P4300 G2 3.6TB SAS Storage System	BK718A
HP StorageWorks P4300 G2 6TB MDL SAS Storage System	AY456A
HP StorageWorks P4300 G2 8TB MDL SAS Storage System	BK719A

Factory Racked Solutions All factory racked P4300 / P4500 G2 SAN Solutions and Storage Systems should use the following part numbers:

Model Description	Part Number
HP StorageWorks P4300 G2 16TB MDL SAS Starter SAN Solution	BK715A#0D1
HP StorageWorks P4300 G2 7.2TB SAS Starter SAN Solution	BK716A#0D1
HP StorageWorks P4500 G2 10.8TB SAS Virtualization SAN Solution	AX696A#0D1
HP StorageWorks P4500 G2 21.6TB SAS Multi-Site SAN Solution	AX697A#0D1
HP StorageWorks P4500 G2 60TB MDL SAS Scalable Capacity SAN Solution	BK717A#0D1
HP StorageWorks P4500 G2 3.6TB SAS Storage System	AX699A#0D1
HP StorageWorks P4500 G2 5.4TB SAS Storage System	AX700A#0D1
HP StorageWorks P4500 G2 9TB MDL SAS Storage System	AX702A#0D1
HP StorageWorks P4500 G2 12TB MDL SAS Storage System	AX703A#0D1
HP StorageWorks P4300 G2 2.4TB SAS Storage System	AX698A#0D1
HP StorageWorks P4300 G2 3.6TB SAS Storage System	BK718A#0D1
HP StorageWorks P4300 G2 6TB MDL SAS Storage System	AY456A#0D1
HP StorageWorks P4300 G2 8TB MDL SAS Storage System	BK719A#0D1

China Specific Solutions All P4300 / P4500 G2 SAN Solutions and Storage Systems ordered for sale in China should use the following part numbers:

Model Description	Part Number
HP StorageWorks P4300 G2 CN 16TB MDL SAS Starter SAN Solution	BK715AC
HP StorageWorks P4300 G2 CN 7.2TB SAS Starter SAN Solution	BK716AC
HP StorageWorks P4500 G2 CN 10.8TB SAS Virtualization SAN Solution	AX696AC
HP StorageWorks P4500 G2 CN 21.6TB SAS Multi-Site SAN Solution	AX697AC
HP StorageWorks P4500 G2 CN 60TB MDL SAS Scalable Capacity SAN Solution	BK717AC
HP StorageWorks P4500 G2 CN 3.6TB SAS Storage System	AX699AC
HP StorageWorks P4500 G2 CN 5.4TB SAS Storage System	AX700AC
HP StorageWorks P4500 G2 CN 9TB MDL SAS Storage System	AX702AC
HP StorageWorks P4500 G2 CN 12TB MDL SAS Storage System	AX703AC
HP StorageWorks P4300 G2 CN 2.4TB SAS Storage System	AX698AC
HP StorageWorks P4300 G2 CN 3.6TB SAS Storage System	BK718AC
HP StorageWorks P4300 G2 CN 6TB MDL SAS Storage System	AY456AC
HP StorageWorks P4300 G2 CN 8TB MDL SAS Storage System	BK719AC

Configuration Information

China Specific Factory Racked Solutions	All factory racked P4300 / P4500 G2 SAN Solutions and Storage Systems ordered for sale in China should use the following part numbers:	

Model Description	Part Number
HP StorageWorks P4300 G2 CN 16TB MDL SAS Starter SAN Solution	BK715AC#0D1
HP StorageWorks P4300 G2 CN 7.2TB SAS Starter SAN Solution	BK716AC#0D1
HP StorageWorks P4500 G2 CN 10.8TB SAS Virtualization SAN Solution	AX696AC#0D1
HP StorageWorks P4500 G2 CN 21.6TB SAS Multi-Site SAN Solution	AX697AC#0D1
HP StorageWorks P4500 G2 CN 60TB MDL SAS Scalable Capacity SAN Solution	BK717AC#0D1
HP StorageWorks P4500 G2 CN 3.6TB SAS Storage System	AX699AC#0D1
HP StorageWorks P4500 G2 CN 5.4TB SAS Storage System	AX700AC#0D1
HP StorageWorks P4500 G2 CN 9TB MDL SAS Storage System	AX702AC#0D1
HP StorageWorks P4500 G2 CN 12TB MDL SAS Storage System	AX703AC#0D1
HP StorageWorks P4300 G2 CN 2.4TB SAS Storage System	AX698AC#0D1
HP StorageWorks P4300 G2 CN 3.6TB SAS Storage System	BK718AC#0D1
HP StorageWorks P4300 G2 CN 6TB MDL SAS Storage System	AY456AC#0D1
HP StorageWorks P4300 G2 CN 8TB MDL SAS Storage System	BK719AC#0D1

HP StorageWorks P4000 G2 Spare Components	While HP StorageWorks P4000 G2 Storage Systems have everything you need to be up and running, the following spare kits are available for purchase.	

HP 2U Redundant Fan Kit	516009-B21
HP 750W CS HE Power Supply Kit	512327-B21
HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD	461137-B21
HP 750GB 3G SAS 7.2K 3.5" DP MDL HDD	461135-B21
HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21
HP 300GB 3G SAS 15K 3.5" DP ENT HDD	416127-B21

Step 2 - Options

P4000 Upgrade Options	HP StorageWorks P4000 G2 10G BASE-CX4 Upgrade Kit	BK849A
	NOTE: Use this kit to upgrade *HP StorageWorks P4000 G2 Storage Systems (current model)* to 10 GbE, and connect to a 10 GbE iSCSI network. It has 2 x 10GbE CX4 ports per kit. One kit is needed for a Storage System, 2 kits are needed for a SAS Starter SAN / SATA Starter SAN / Virtualization SAN, 4 kits are needed for a Multi-Site SAN, and 5 kits are needed for a Scalable Capacity SAN.	
	HP LeftHand P4000 10G BASE-CX4 Upgrade Kit	AT022A
	NOTE: Use this kit to upgrade *HP LeftHand P4000 Storage Systems (previous model)* to 10 GbE, and connect to a 10 GbE iSCSI network. It has 2 x 10GbE CX4 ports per kit. One kit is needed for a Storage System, 2 kits are needed for a SAS Starter SAN / SATA Starter SAN / Virtualization SAN, and 4 kits are needed for a Multi-Site SAN	

Configuration Information

HP StorageWorks P4000 Virtual SAN Appliance Software	HP StorageWorks P4000 Virtual SAN Appliance Software for VMware ESX Server Stock LTU	TA688AB
	HP StorageWorks P4000 Virtual SAN Appliance Software for VMware ESX Server LTU	TA688AA
	HP StorageWorks P4000 Virtual SAN Appliance Software for VMware ESX Server E-LTU	TA688AAE

Step 3 - Other P4000 SANs Options

Description

Two 6' Highline (IEC-IEC) power cord ships standard per P4000 Storage System
NOTE: HP P4000 Storage Systems servers no longer ship standard with NEMA power cords (P/N 163719-002) that allow connection to 110V US wall outlets in a home or office. HP P4000 Storage Systems are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a HP P4000 Storage Systems using a 110V receptacle (NEMA-15), the NEMA power cord (AF556A) must be ordered separately.

If customers require a power cord, they can check the power cord matrix for the appropriate cord. Please see the UPS and PDU cable matrix's on the Power Protection page under Power Cords that lists cable descriptions, requirements, and specifications for UPS and PDU units at the new HP Power Cord Link @ HP.com. Use the following new link: www.hp.com/products/powercords

NOTE: Rack models ship standard with IEC cables.

Step 4 - Choose Supported Options For iSCSI Infrastructure

Select each required option with quantities specified.
The P4000 SANs supports industry standard Gigabit and 10 Gigabit (CX4) Ethernet components from various manufacturers that conform to IEEE 802.3ab (1000base-T) standards.

Description with Parts Shipped:

For details on standard Gigabit Ethernet components (including Gigabit Ethernet switches, Network Interface cards and Ethernet cables) from HP http://welcome.hp.com/country/us/en/prodserv/networking.html

Step 5 - Choose Rack Options

Select each required option with quantities specified.

Rack Airflow Requirements	Rack 10000 G2 series Cabinets
	The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling

Configuration Information

that can lead to thermal damage.

Rack Kit
HP P4000 G2 rack models have fixed rails which provide support for racks with round mounting holes and tool-free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 26" - 36".

Telco Rack Support
Support for all 2 and 4 post Telco racks and threaded hole racks requires an additional option kit from Rack Solutions. The Rack Solutions brackets can be purchased at: www.hp.com/go/rackandpower.

NOTE: Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.

NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html

NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.

Technical Specifications

	MDL SAS Starter SAN	SAS Starter SAN	Virtualization SAN	Multi-Site SAN	Scalable Capacity SAN	P4300 Storage System	P4500 Storage System
Dimensions	4U			8U	10U	2U	
	6.9 x 17.64 x 28.23 in (17.52 x 44.80 x 71.71 cm)			13.8 x 17.64 x 28.23 in (35.04 x 44.80 x 71.71 cm)	17.25 x 17.64 x 28.23 in (43.8 x 44.80 x 71.71 cm)	3.45 x 17.64 x 28.23 in (8.76 x 44.80 x 71.71 cm)	
Weight	76 lbs/ 34.46 kg		90 lbs/ 40.82 kg	180 lbs/ 81.64 kg	225 lbs/ 102.05 kg	38.0 lbs/ 17.23 kg	45.0 lbs/ 20.41 kg
Power/Cooling	Redundant Hot-Plug Common Slot Power Supplies						
	Auto-switching universal 115/220 Volts						
	5.3 belsA-weighted						
@115V	1.86 Amp	2.32 Amp	2.93 Amp	2.93 Amp	2.2 Amp	1.86 Amp	2.2 Amp
	1418 BTU/hr	1760 BTU/hr	2248 BTU/hr	4996 BTU/hr	4205 BTU/hr	709 BTU/hr	841 BTU/hr
	416 watts	524 watts	658 watts	1316 watts	1230 watts	208 watts	246 watts
@220V	1.01 Amp	1.25 Amp	1.45 Amp	1.45 Amp	1.18 Amp	1.01 Amp	1.18 Amp
	1394 BTU/hr	1788 BTU/hr	2214 BTU/hr	4428 BTU/hr	4130 BTU/hr	697 BTU/hr	826 BTU/hr
	408 watts	516 watts	648 watts	1296 watts	1210 watts	204 watts	242 watts
Environmental	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude Derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 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).				
	Relative Humidity (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.				
	Altitude		Operating 3050 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).				

Technical Specifications

Environment-friendly Products and Approach	End-of-life Management and Recycling	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: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green 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.