QuickSpecs

HP P6000 Enterprise Virtual Array

Overview

The HP P6000 Enterprise Virtual Array (EVA) is an enterprise class virtual storage array family for midsized customers at an affordable price. With built in virtualization, P6000 EVA is designed to improve capacity utilization and be easy to manage, which lowers the cost of ownership compared to traditional arrays. These arrays have high performance, scale easily, and are highly reliable and available. P6000 EVA is a trusted platform for enterprise application consolidation with solutions for Microsoft Exchange and SQL, Oracle, and SAP. It also offers integration with virtual server platforms from VMware, Microsoft and more, plus broad operating systems support.

The HP P6000 EVA family is the next generation of EVA with two new models: P6300 EVA and P6500 EVA. The P6000 EVA family supports Serial Attached SCSI (SAS) disk drives with a wide range of Small Form Factor (SFF) SAS drives, Large Form Factor (LFF) SAS drives, or combinations of both, to better match customer storage capacity, performance, power, and availability needs. The P6000 EVA models are available with Fibre Channel host ports only, or Fibre Channel and 1Gb/s iSCSI host ports, or Fibre Channel and 10Gb/s iSCSI/FCoE host ports. P6000 EVA is also very energy efficient, with high efficiency power supplies for both the controllers and disk drive enclosures, with temperature sensing, self-adjusting variable speed fans.
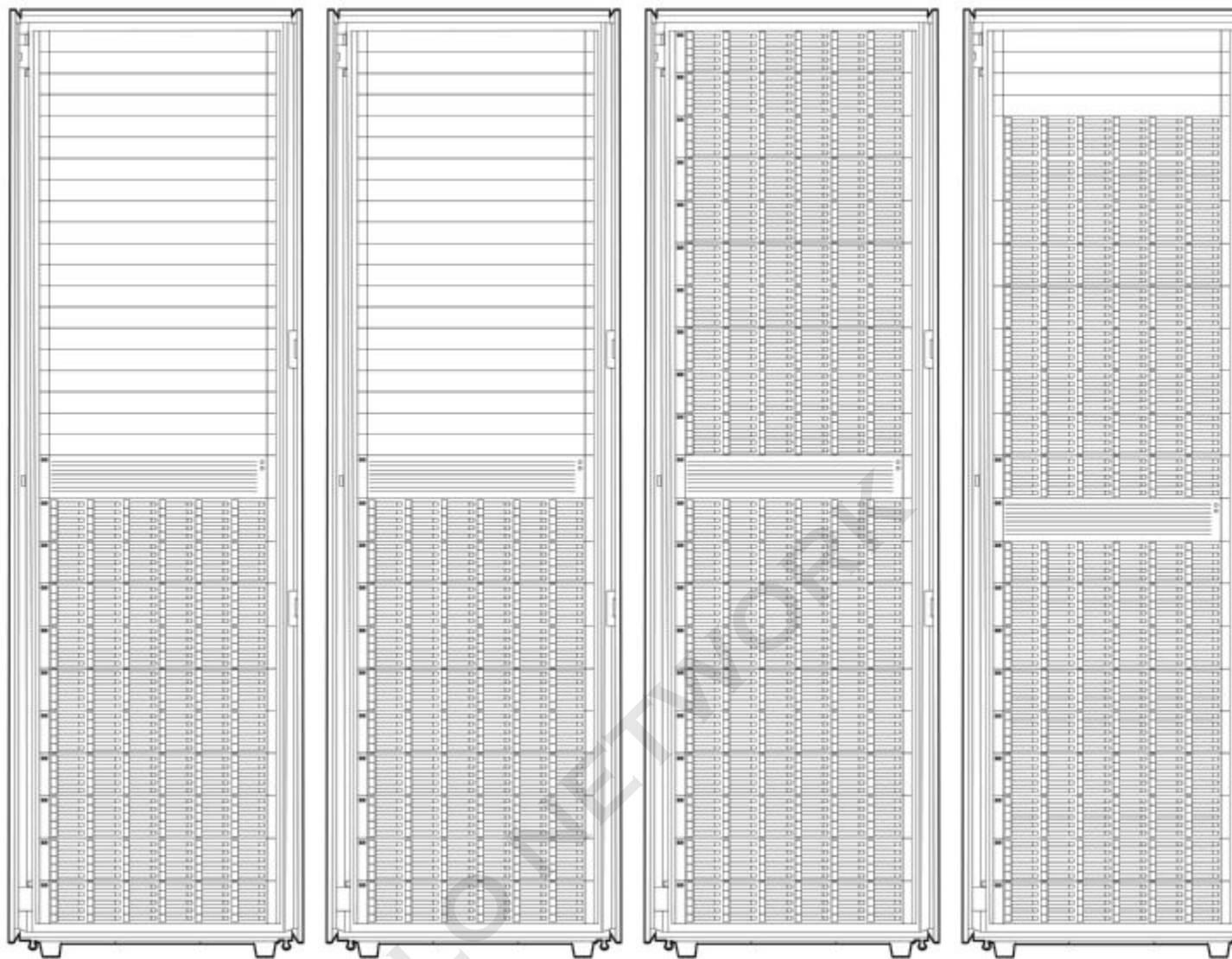
HP P6000 Command View now includes Thin Provisioning, which helps reduce the storage capacity required, to help reduce the number of disks needed, and thus reduce power and cooling costs. P6000 EVA also offers robust local and remote replication capabilities with HP P6000 Business Copy and HP P6000 Continuous Access software. P6000 Business Copy now also support Dynamic LUN and RAID migration, where in one step, the user can change the characteristics of an existing LUN, such as size, RAID type, disk type while the host I/O operation is active. This feature is useful, for example, to move data to more space efficient storage tiers or to move a heavily accessed LUN to a different disk group to improve performance.

P6300 EVA Combo Kits and Starter Kits are also available to help midsize customers with limited storage administration resources in affordable packages that are simple to order, simple to deploy, and simple to manage. The kits are available for both factory configuration and for field installation.

QuickSpecs

HP P6000 Enterprise Virtual Array

Overview

P6300 EVA 2C10D	**P6300 EVA 2C10D**	**P6500 EVA 2C20D**	**P6500 EVA 2C18D**
with 120 LFF drives	with 250 SFF drives	with 240 LFF drives	with 450 SFF drives

These drawings are informational only. The actual configuration may differ depending on the number of disk enclosures chose and the components being racked with the P6000 EVA.

The P6300 EVA can support up to 10 drive enclosures for a total of 120 LFF disks or 250 SFF disks. Combinations of LFF al SFF drive enclosures, up to 10 drive enclosures, can be supported

The P6500 EVA can support up to 20 LFF drive enclosures for a total of 240 LFF disks or 18 SFF drive enclosures for a total 450 SFF disks. (Combinations of LFF and SFF drive enclosures, up to 20 drive enclosures, and up to 450 disks, can be supported.

What's New

The new P6000 EVA family supports:

- 8Gb/s Fibre Channel host ports
- Native 1Gb/s iSCSI host ports
- Native 10Gb/s iSCSI/FCoE host ports
- 3 new P6300 EVA dual controllers (available in Combo or Starter Kits)

QuickSpecs

HP P6000 Enterprise Virtual Array

Overview

- ○ P6300 EVA dual controller with eight 8Gb/s FC host ports
- ○ P6300 EVA dual controller with four 8Gb/s FC host ports and eight 1Gb/s iSCSI host ports
- ○ P6300 EVA dual controller with four 8Gb/s FC host ports and four 10Gb/s iSCSI/FCoE host ports
- 3 new P6500 EVA dual controllers (available in two different rack mounting configurations)
  - ○ P6500 EVA dual controller with eight 8Gb/s FC host ports
  - ○ P6500 EVA dual controller with four 8Gb/s FC host ports and eight 1Gb/s iSCSI host ports
  - ○ P6500 EVA dual controller with four 8Gb/s FC host ports and four 10Gb/s iSCSI/FCoE host ports
    ----
  - ○ P6500 EVA dual controller with eight 8Gb/s FC host ports - Storage Centric mounted
  - ○ P6500 EVA dual controller with four 8Gb/s FC host ports and eight 1Gb/s iSCSI host ports - Storage Centric mounted
  - ○ P6500 EVA dual controller with four 8Gb/s FC host ports and four 10Gb/s iSCSI/FCoE host ports - Storage Centric mounted
- 2 new SAS drive enclosures:
  - ○ M6625, 25 Small Form Factor (SFF) drives
  - ○ M6612, 12 Large Form Factor (LFF) drives
- 6Gb/s SAS drives:
  - ○ Small Form Factor (SFF) or 2.5-inch form factor drives
    - ▪ 146GB 15K rpm 6Gb/s SAS
    - ▪ 300GB 10K rpm 6Gb/s SAS
    - ▪ 450GB 10K rpm 6Gb/s SAS
    - ▪ 600GB 10K rpm 6Gb/s SAS
    - ▪ 500GB 7.2K rpm mid-line 6Gb/s SAS
  - ○ Large Form Factor (LFF) or 3.5-inch form factor drives
    - ▪ 300GB 15K rpm 6Gb/s SAS
    - ▪ 450GB 15K rpm 6Gb/s SAS
    - ▪ 600GB 15K rpm 6Gb/s SAS
    - ▪ 2TB 7.2K rpm mid-line 6Gb/s SAS
- More total capacity:
  - ○ P6300 EVA - up to 10 SFF and/or LFF drive enclosures
    - ▪ Up to 120 LFF drives or
    - ▪ Up to 250 SFF drives or
    - ▪ Combinations of SFF or LFF drives in respective enclosures up to 10 enclosures
  - ○ P6500 EVA - up to 18/20 drive enclosures
    - ▪ Up to 450 SFF drives (18 enclosures)
    - ▪ Up to 240 LFF drives (20 enclosures) or
    - ▪ Combinations of SFF or LFF drives in respective enclosures up to 20 enclosures or 450 drives, whichever limit is reached first
- Six P6300 EVA Combo Kits, each available as factory integrated kits or field installed kits
  - ○ With P6300 EVA dual FC controllers, one SFF drive enclosure, P6000 Command View/ABM and a P6300 Command View LTU
  - ○ With P6300 EVA dual FC/1GbE controllers, one SFF drive enclosure, P6000 Command View/ABM and a P6300 Command View P6300 LTU
  - ○ With P6300 EVA dual FC/10GbE controllers, one SFF drive enclosure, P6000 Command View/ABM and a P6300 Command View LTU
  - ○ With P6300 EVA dual FC controllers, one LFF drive enclosure, P6000 Command View/ABM and a P6300 Command View LTU
  - ○ With P6300 EVA dual FC/1GbE controllers, one LFF drive enclosure, P6000 Command View/ABM and a P6300 Command View LTU
  - ○ With P6300 EVA dual FC/10GbE controllers, one LFF drive enclosure, P6000 Command View/ABM and a P6300 Command View LTU
- Two new P6300 EVA Starter Kits, each available as factory integrated kits or field installed kits:
  - ○ with P6300 EVA dual controllers, one SFF drive enclosure, eight 300GB 10K 6Gb/s 2.5-inch SAS drives, P6000 Command View/ABM and a P6300 Command View LTU
  - ○ with P6300 EVA dual controllers, one SFF drive enclosure, eight 600GB 10K 6Gb/s 2.5-inch SAS drives, P6000 Command View /ABM and a P6300 Command View LTU
- New Thin Provisioning software and Dynamic Capacity Management software, supporting the P6000 EVAs and previous EVA models, included with P6000 Command View

QuickSpecs

HP P6000 Enterprise Virtual Array

Overview

- Enhanced Large LUN support including the ability to shrink and grow a LUN greater than 2TB integrated with Business Copy and thin provisioning
- Improved performance with 8Gb/s FC host ports, 6Gb/s SAS device ports, and support for more total capacity
- New version of P6000 Command View with P6000 EVA support as well as the previous EVA models. P6000 Command View runs on the Array Based Management (ABM) module of the P6000 EVA and EVA4400 or as a server based application on a management server.
- P6000 Business Copy and P6000 Continuous Access now support P6000 EVA along with previous EVA models.
- New version of P6000 SmartStart supports the easy installation of the P6000 EVA and EVA4400
- Management of up to 1023 virtual disks (256 per HBA) for the P6300 EVA and up to 2047 virtual disks for the P6500 EVA, with LUNs ranging in size from 1GB to 32TB per Virtual disk, in 1GB increments

QuickSpecs

HP P6000 Enterprise Virtual Array

Product Highlights

	P6300 EVA	P6500 EVA
Controller Model	HSV340	HSV360
Virtual Controller Software (XCS)	XCS v10.0 (or later version)	XCS v10.0 (or later version)
Management Software	P6000 Command View v9.4 (or later version)	P6000 Command View v9.4 (or later version)
Application Environment	Oracle, SAP, Microsoft Exchange, SQL	Oracle, SAP, Microsoft Exchange, SQL
Local Data Replication - HP Business Copy EVA	Yes	Yes
Remote Data Replication - HP Continuous Access EVA	Yes	Yes
P6000 Command View, Server Based Management (SBM), management and configuration support	Up to 16 EVAs	Up to 16 EVAs
P6000 Command View, Array Based Management (ABM), management and configuration support	Per EVA	Per EVA
Thin Provisioning EVA	Yes	Yes
Application block and file storage	Yes	Yes
O/S Support	HP-UX HP OpenVMS Windows 2003 Windows 2008 Windows Server 2008 HyperV Windows Server 7 Sun Solaris Linux IBM AIX VMware Apple Mac OSX Citrix Xen	HP-UX HP OpenVMS Windows 2003 Windows 2008 Windows Server 2008 HyperV Windows Server 7 Sun Solaris Linux IBM AIX VMware Apple Mac OSX Citrix Xen
RAID supported	Vraid 0, Vraid 1, Vraid 0+1, Vraid 5, Vraid 0+5, Vraid 6, & Cross Vraid Snaps	Vraid 0, Vraid 1, Vraid 0+1, Vraid 5, Vraid 0+5, Vraid 6, & Cross Vraid Snaps
LUN size	Up to 32TB	Up to 32TB
Number of controllers	2	2
Cache (per controller pair)	4GB	8GB
Battery Back-up Cache	Yes, up to 96 hours	Yes, up to 96 hours
Host Connectivity	Fibre Channel, iSCSI, FCoE, and Direct Connect Fibre Channel	Fibre Channel, iSCSI, FCoE, and Direct Connect Fibre Channel
Number of Hosts Supported (Single Path/Dual Path)	512/256	512/256
Host Ports (per controller pair)	8 FC host ports, or 4 FC host ports and 8 1Gb iSCSI host ports, or 4FC host ports and 4 10Gb iSCSI/FCoE host ports	8 FC host ports, or 4 FC host ports and 8 1Gb iSCSI host ports, or 4FC host ports and 4 10Gb iSCSI/FCoE host ports
Host Port Speed	8Gb/s FC 1Gb/s iSCSI 10Gb/s iSCSI/FCoE	8Gb/s FC 1Gb/s iSCSI 10Gb/s iSCSI/FCoE

QuickSpecs

HP P6000 Enterprise Virtual Array

Product Highlights

Device Connectivity	Redundant SAS lanes from each controller to each SAS drive enclosure for redundant paths to dual drive lanes	Redundant SAS lanes from each controller to each SAS drive enclosure for redundant paths to dual drive lanes
Device SAS Lanes (per controller pair)	8	16
Device SAS Port Speed	6Gb/s	6Gb/s
Device Path Aggregate Bandwidth	24Gb/s	48Gb/s
Device shelves	1 to 10	1 to 18/20
Drives per SFF enclosure	25	25
Drives per LFF enclosure	12	12
Drive types (mixed in any enclosure, by physical SFF or LFF size)	High Performance Enterprise 10K rpm and 15K rpm SAS drives and 7.2K rpm Mid-line SAS drives	High Performance Enterprise 10K rpm and 15K rpm SAS drives and 7.2K rpm Mid-line SAS drives
Supported disks, minimum	8 SAS Enterprise 8 SAS Mid-line	8 SAS Enterprise 8 SAS Mid-line
Supported disks, maximum	120 LFF 250 SFF Or combinations of LFF and SFF up to 10 enclosures	240 LFF 450 SFF Or combinations of LFF and SFF up to 20 enclosures and/or up to 450 disks
Capacity	1.1 to 240TB	1.1 to 480TB
Drive capacities and speeds, Small Form Factor (SFF)	146GB 15K rpm SFF SAS 300GB 10K rpm SFF SAS 450GB 10K rpm SFF SAS 600GB 10K rpm SFF SAS 500GB 7.2K rpm mid-line SFF SAS	146GB 15K rpm SFF SAS 300GB 10K rpm SFF SAS 450GB 10K rpm SFF SAS 600GB 10K rpm SFF SAS 500GB 7.2K rpm mid-line SFF SAS
Drive capacities and speeds, Large Form Factor (LFF)	300GB 15K rpm LFF SAS 450GB 15K rpm LFF SAS 600GB 15K rpm LFF SAS 2TB 7.2K rpm mid-line LFF SAS	300GB 15K rpm LFF SAS 450GB 15K rpm LFF SAS 600GB 15K rpm LFF SAS 2TB 7.2K rpm mid-line LFF SAS
Read I/O Requests per Second (IOPs)	35,000	61,000
Maximum throughput (MB/s)*	1700	1700
Drive Interface (per controller)	Four 6Gb/s SAS lanes per controller in redundant paths to each dual ported drive	Eight 6Gb/s SAS lanes per controller in redundant paths to each dual ported drive
Variable Speed Redundant Blowers	Yes	Yes
Environmental Monitoring Unit	Monitors Power and Temperature	Monitors Power and Temperature
Regulatory approvals	UL, CSA, TUV, FCC, CE MARK, CTICK, BSMI, VCCI	UL, CSA, TUV, FCC, CE MARK, CTICK, BSMI, VCCI
Fibre Channel Switches & Directors	Optical Switches and Directors: http://h18006.www1.hp.com/storage/saninfrastructure/switches.html	

* More P6300/P6500 EVA performance information is available at: www.hp.com/go/P6000 EVA, Resource Library.

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HP P6000 Enterprise Virtual Array

Product Highlights

P6000 EVA Additional Capabilities

- Easy to install and configure in just a few hours (for a factory configured unit) with the SmartStart configuration utility*
- Support for dual-ported 6Gb/s SFF and LFF SAS 10K and 15K rpm enterprise disk drives, dual-ported 6Gb/s SFF and LFF SAS Mid-line disk drives
- Array management flexibility with optional deployments of:
  - Array Based Management with Command View/ABM
  - Server Based Management with Command View/SBM
- Support for Direct Attach connection to Windows, HP-UX, and Linux servers, without the need for SAN switches, with Command View/ABM
- SAN support for the native iSCSI/FCoE option and the MPX200 multi-protocol router with Windows and Linux, Apple Mac OS X, Microsoft Windows, Sun Solaris, VMware.
- Management of up to 1024 virtual disks (256 per HBA) for the P6300 EVA and up to 2048 virtual disks for the P6500 EVA, with LUNs ranging in size from 1GB to 32TB per Virtual disk, in 1GB increments
- Dynamic Capacity Management support to expand (in 1GB increments) and shrink LUNs up to 32TB
  NOTE: Requires Host Operating System Support.
- Virtual disk data load leveling (non-disruptive background activity)
- Distributed sparing of disk capacity
- Redundant SAS connections from each controller to dual disk lanes
- Support for remote replication between P6000 EVAs, EVA4400/6400/8400s, EVA4100/6100/8100s and EVA4000/6000/8000s
- Migration support via remote replications between P6000 EVAs, EVA4400/6400/8400s, EVA4100/6100/8100s, EVA4000/6000/8000s and migration support only to older EVA3000/5000s
- Dual redundant controller operation for increased fault tolerance
- High availability with hot plug drives, power supplies, fans, and industry failover software
- Multiple Bus Failover Support using industry popular multiple path software
  NOTE: Requires native OS multi-pathing support.
- Battery-Back-Up for controller cache memory
- Asynchronous Disk Swap (hot swap)
- Clustered Server Support
- Mirrored Write-Back Cache Support
- Read-Ahead and Adaptive Read Caching Support
- Support for local replication between Vraid types using Vsnap or Snapclone within a disk group or using Snapclone across disk groups (and Cross Vraid Snapshot and Snapclone)
- Online XCS software upgrade capability
- Online drive firmware upgrade capability
- Multi-Vendor Platform Support
- Controller Password Protection for Configuration Control
- Selective Storage Presentation and SAN-based Data Zoning (through switches).
- Monitor and control health, P6000 EVA end-to-end SAN performance and monitoring, storage utilization and reporting for all key P6000 EVA and SAN infrastructure including servers, storage, HP MSA, HP EML E-series tape, HP ProLiant Storage Servers (NAS), HBAs, switches, applications and monitor the entire backup from a single interface with HP Storage Essentials

*For more information on P6000 SmartStart see:
http://h18000.www1.hp.com/products/storageworks/evasmartstart/relatedinfo.html?jumpid= reg_R1002_USEN

QuickSpecs

HP P6000 Enterprise Virtual Array

Product Highlights

P6000 EVA Product Packaging

P6000 EVA packaging consists of:

- a 2U FC dual HSV340 controller assembly for the P6300 EVA;
- a 2U FC dual HSV360 controller for the P6500 EVA;
- a 2U 12-LFF bay Model M6612 SAS drive enclosure; and
- a 2U 25-SFF bay Model M6625 SAS drive enclosure

P6000 EVA configurations allow a wide range of configuration options, including flexible factory rack-mounting options in either a standard 42U cabinet (based on the HP 10000 G2 Series Rack) or a choice of 42U extended and 36U and 22U height.

The P6300 EVA is available in pre-configured Combo Kit or Starter Kit configurations only?. For more information on these kits see the Configuration Section, Step 1.

Designed for No-Single-Point-of-Failure

The P6000 EVA family's redundant architecture and value added software is designed to eliminate single-points-of-failure from server to storage in clustered or single server configurations with multi-pathing.

HP P6000 SmartStart configuration utility

P6000 EVAs is easily installable in a few to several hours, depending on the complexity of the configuration, using HP P6000 SmartStart configuration utility.. For Windows 2003 and 2008 application servers, SmartStart software installs HBA drivers, Multi-pathing I/O (MPIO) drivers, the Storage System Scripting Utility (SSSU) for Windows, P6000 Command View and optionally, installs P6000 Command View on a Windows Server 2003 management server and helps provision the storage.

Installation and Startup

The P6300 EVA is designed to be Customer Self Installable. The larger and more complex P6500 EVA includes Installation and Startup (I&S) Services included in the purchase price

For complex P6300 EVA environments, an optional Installation & Start-up service is available.

Below are descriptions of the I&S services available:

- For factory configured, factory racked P6300 EVA orders and when final installation of just the pre-configured P6300 EVA hardware at the customer site is required, purchase the Basic I&S service when needed.
- For factory configured, factory racked orders, without an existing P6000 Command View management server, purchase the P6000 Command View Installation and Startup Service. This service includes LUN design and implementation, HP Insight Remote Support software, and customer orientation training.
- For P6000 Continuous Access configurations, purchase the HP Data Replication Solution Service- Continuous Access.
- For Replication Solutions Manager, purchase the HP Data Replication Solution Service - Continuous Access EVA or Business Copy EVA.

NOTE: Customers who have completed the necessary training or who have gained the necessary experience with these environments may decide to not purchase the recommended Installation and Startup services. However some installation and startup services are required.

HP requires the purchase of Installation & Startup services when using:

- Storage Essentials purchase the Storage Essentials Solution Service.
- Continuous Access, purchase the HP Data Replication Solution Service Continuous Access EVA.

NOTE: A comprehensive list of Installation & Start-up services can be found at: www.hp.com/hps/storage

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HP P6000 Enterprise Virtual Array

Product Highlights

Remote Replication Solutions
(Software and hardware options)

HP P6000 Continuous Access provides disaster tolerant replication across a Fibre Channel SAN. P6000 Continuous Access performs real-time replication between P6000 EVA of the current and earlier generations. P6000 Continuous Access provides the highest level of FC SAN data protection to customers in order to meet disaster tolerant business continuity implementation goals. Through the use of MAN/WAN Fibre Channel SAN extensions, P6000 Continuous Access provides 24x7 protections against disaster like scenarios, in campus, metro or continental networks. Thus, enabling business protection against unforeseen events. For additional information about P6000 Continuous Access visit:
http://h18006.www1.hp.com/storage/software.html

HP Disaster Tolerant Solution for mySAP Business Suite on EVA offers a business continuance solution for SAP environments, where data integrity and value added functionality are high priorities. Best practices for implementing remote mirroring of an SAP database as part of an overall data protection strategy with SAP applications can be found at:
http://h71028.www7.hp.com/erc/downloads/4aa1-5683Enw.pdf.

The HP IP Distance Gateway (mpx110) provides SAN over WAN connectivity for protecting and replicating data between EVA systems. By connecting islands of SANs over WANs, the IP Distance Gateway enables CA replication (Asynchronous and Synchronous), SAN device sharing, data migration and other long distance data services. At the core of providing long distance data services is the ability to copy, move and replicate data locally and over long distances. However, SANs have limited distance capabilities (10km) and IT managers need to share, protect and move data over greater distances than 10km, routers and switches that link SANs over IP WANs is the weapon of choice for most IT managers.

The IP Distance Gateway uses the FCIP (Fibre Channel Internet Protocol) standard to extend SAN connectivity over the WAN.

- Low Cost SAN over WAN Connectivity
- High Performance with data compression and load balancing
- Support for FCIP for SAN extension
- Bridges SANs for all FC Fabrics
- Supports two Ethernet and two Fibre Channel ports
- Concurrent FC and IP traffic in High Availability mode
- Integrated management with HP mpx Manager
- Supports High Availability Options
- Fabric and Direct Attach support

http://h18006.www1.hp.com/storage/disk_storage/index.html

Local Replication Solutions
(Software options)

HP P6000 Business Copy is a local replication application for the P6000 EVA family. It incorporates Virtually Capacity-free Snapshot (Vsnaps), standard snapshots and Snapclone capabilities. P6000 Business Copy creates point-in-time copies of storage volumes, called Business Continuance Volumes (BCVs) using the snapshot and cloning capabilities of the array firmware and provides multi-array local mirror management. This product is indispensable for critical data center operations such as non-disruptive backups, frequent snapshots of high value databases, and data mining. The bottom line benefits include improved disk capacity utilization and increased business continuity, data availability, and productivity savings. Additional features include licensing based on replicated (not total raw) capacity and a new improved management interface.

QuickSpecs

HP P6000 Enterprise Virtual Array

Product Highlights

Replication Management

P6000 EVA local and remote replication is managed with HP Replication Solutions Manager, a graphical user interface and scripting environment, that greatly simplifies storage management by creating, running, and managing storage replication jobs using controller based snapshots, clones and remote mirroring.

With HP Replication Solutions Manager users easily can manage both remote and local replication across the full P6000 EVA product family. By virtually removing the complexity associated with both small and large replication environments, point-in-time copies and remote replication are managed and configured with just a few mouse clicks. To assist the user, Information on the replication environment is presented in a variety of views, including an interactive topology manager that allows each user to select their viewing preference. In addition, HP Replication Solutions Manager provides a scripting interface for additional flexibility. HP Replication Solutions Manager is included as part of the P6000 Command View media kit.

Application Integration with Oracle

As an alternative to HP P6000 Business Copy, the user can simply replicate an Oracle database using HP Replication Solutions Manager (RSM). RSM provides a graphical interface to view the components of the database to be replicated, and allow selection of a specified database. The replication manager will automatically suspend the Oracle application, and take a point in time copy (local or remote) of all associated array virtual disks. The replication manager will provide the option to restart the original Oracle database after the replicas have been initiated on the array. The user will be able to utilize the replication manager to present the replica to another host.

Thin Provisioning

HP P6000 Thin Provisioning provides the ability to create a vdisk such that the operating system sees more capacity available than is physically allocated by the array. As the OS writes data to the vdisk, the firmware will automatically allocate more space up to the size of the vdisk.

The following are some of the benefits of thin provisioning. It allows customers to:

- Purchase only the storage capacity and performance actually needed today
- Take advantage of ongoing storage price reductions by delaying purchases until capacity is needed
- Save power and cooling costs immediately
- Reduce stress by reducing the need to anticipate and justify expenses for resources that might never be needed
- Increase array capacity online, without any impact to the server/application
- Increase storage utilization and return on investment immediately (Stop paying for storage that is never used)
- Use virtual storage with your virtual machines
- Never extend a File System (FS) again - make the Vdisk larger than needed the first time
- Easily shrinking the thin provisioned Vdisk

Capacity Management

HP EVA Dynamic Capacity Management Software is a comprehensive software solution that automates storage provisioning and improves capacity utilization on the HP Enterprise Virtual Array (EVA) family. Designed for the enterprise market, EVA Dynamic Capacity Management Software uses advanced automation to automatically "right-size" the file system and storage volumes to ensure the highest levels of capacity utilization are achieved while reducing ongoing storage administration needs. For more information about DCM, please see the following:
http://h18000.www1.hp.com/products/storage/software/eva_dcm/index.html

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HP P6000 Enterprise Virtual Array

Product Highlights

Application Solutions   P6000 EVA provides outstanding solutions for customers running Oracle, Exchange, SAP environments and those customers who are deploying virtual server technologies like VMware. Here are descriptions of two such solutions:

- Oracle E-Business Suite (EBS)

Designed to support the global economy (as well as mid-market companies with complex requirements), Oracle® E-Business Suite (EBS) on the HP BladeSystem server and the HP EVAs help users think globally to make better decisions; work globally to be more competitive; and manage globally to lower costs, enhance security and increase performance. This right-sized, affordable business technology is built on a unified architecture with a single Oracle Database-providing a comprehensive, integrated set of business management and planning applications that allow organizations to manage their end-to end operations.

organizations to manage their end-to end operations.

- Microsoft Exchange 2010

Whether your company is large, small, or mid-sized, improving communication is critical. E-mail is the leading tool for business communication, and the productivity gains from workplace collaboration can be enormous. But managing all that information can be a challenge. A unified messaging solution that runs on HP P6000 EVA along with HP ProLiant servers and Microsoft® Exchange Server 2010 enables your employees to effectively share information across your organization, with customers, suppliers, and partners.

For additional information on application solutions for the P6000 EVA, please go to: www.hp.com/go/p6000.

P6000 EVA with HP Storage Essentials Storage Resource Management Software Suite   HP Storage Essentials Enterprise Suite and HP Storage Essentials Standard Edition SRM Software integrate with HP Systems Insight Manager to provide end-to-end advanced server and storage management capabilities. HP Storage Essentials SRM Suite software features a base management console and an expanding portfolio of value-add plug-in software to assist in managing EVA in heterogeneous SANs across the enterprise.

HP Storage Essentials Suite delivers integrated heterogeneous and multivendor functionality for network (Arrays, DAS, SAN, NAS, HBAs, switches) management, storage resource management, reporting, business application and backup monitoring, capacity metering, provisioning and application infrastructure monitoring.

http://h18006.www1.hp.com/products/storage/software/e-suite/index.html

QuickSpecs

Product Highlights

HP Standard Edition SRM Software and P6000 EVA	HP Storage Essentials Standard Edition Storage Resource Management Software and Systems Insight Manager with P6000 Command View / SBM software provides a total solution that allows midsize businesses with limited IT staff to see the big picture (storage-servers-infrastructure) thereby reducing SAN complexity by not having to depend on Excel spreadsheets or whiteboards to track and manage SAN storage and infrastructure. It supports Windows and Linux servers with small to medium HP storage based SANs including HP P6000 EVA, HP P2000, HP NAS, HP EML Tape, HBAs and fabric devices. HP Standard Edition SRM Software unified server and storage tool-set automates complex and manual storage process and tasks with auto discovery, visualization and topology mapping for quick device identification, integrated NAS and SAN management, business application monitoring including Oracle, Microsoft SQL, Sybase, InterSystems Caché, Microsoft Exchange Server and SAP Adaptive Computing Controller (ACC) environments path dependency identification, and end-to-end EVA SAN performance monitoring and analysis. For more information on HP Storage Essentials SRM Standard Edition Software visit: http://h18006.www1.hp.com/products/storage/software/std-suite/index.html

HP Storage Essentials SRM Performance Pack Software and P6000 EVA (end-to end P6000 EVA SAN Performance Management)	HP Storage Essentials SRM Performance Pack Software combined with Storage Essentials SRM Enterprise Edition Software monitors performance along the complete path of business applications through underlying storage area networks (SAN) components, including host server, host bus adapter (HBA), fabric switch and P6000 EVA. A unified and simplified interface helps administrators increase efficiency, troubleshoot performance bottlenecks faster, and quickly visualize the big performance picture of their P6000 EVA storage, hosts and SAN infrastructure with real-time monitoring, historical trend analysis and trend extrapolation. The SRM Performance Pack Software can be ordered separately on a per P6000 EVA basis for existing Storage Essentials SRM Enterprise Edition customers, and for Storage Essentials SRM Standard Edition customers the SRM Standard Edition LTU includes licensing to monitor up to 3 P6000 EVAs. For more information on HP Storage Essentials SRM Standard Edition Software visit: http://h18006.www1.hp.com/products/storage/software/std-suite/index.html

P6000 EVA with HP Systems Insight Manager Software	HP SIM, HP Systems Insight Manager, is the foundation for HP's unified server-storage strategy - it is packaged as value add software with P6000 EVA, it is a management application and it is derived from the heritage of Compaq Insight Manager, HP Toptools, and HP Servicecontrol. HP SIM runs on HP Windows, Linux, and HP-UX and provides discovery and identification, fault management, security administration, asset reporting, and centralized configuration management across heterogeneous servers, storage and infrastructure. HP SIM is easily extensible, integrating other HP management products and value-add plug-ins such as the ProLiant Essentials, Integrity Essentials, and Server Essentials. HP SIM relies on industry standards like SMI-S, SNMP, SSH, WBEM, and WMI to detect and report heterogeneous device attributes. HP SIM may also be configured to launch array specific applications for configuration, reporting and replication. For more information on HP Systems Insight Manager see: http://h18013.www1.hp.com/products/servers/management/hpsim/index.html?jumpid=go/hpsim.

Single-pathing (Single HBA per host)	Single-pathing (or single HBA per host) support is provided for all supported operating systems (but may be version dependent). Use of single-pathing, which does not offer a redundant path option, should be used with care. Failure of the single HBA will result in loss of access for that host until the HBA is replaced.

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Product Highlights

Enclosure Capacity
P6000 EVAs provides high density disk storage solutions. P6000 EVA (HSV340 or HSV360) dual controllers occupy 2U of space. The 12-LFF bay M6612 SAS disk enclosure and the 25-SFF bay M6625 SAS disk enclosures each occupy 2U of space. The P6300 EVA supports to up to 120 LFF SAS disks in 12U of rack space or up to 250 SFF SAS disks in 12U of rack space. The P6500 EVA supports up to 240 LFF SAS disks in 42U of rack space or up to 450 SFF SAS disks in 38U of rack space.

15K rpm Drive Support
The P6000 EVAs support 15K rpm dual-ported 6Gb/s SAS disk drives. This includes the 146GB 15K SFF and the 300/450/600GB 15K LFF drives. The P6000 EVAs support single or mixed drive capacities and types (high performance and Mid-line SAS) within an enclosure. HP recommends using the same drive type (the same capacity) within a disk group because virtualization allocates space proportionate to the highest capacity drive within the group. A minimum of eight high performance SAS drives are required in a configuration using high performance drives.

10K rpm Drive Support
P6000 EVA also supports 10K rpm dual-ported 6Gb/s SAS disk drives. This includes the 300GB/450GB/600GB 10K LFF drives. The P6000 EVAs support single or mixed drive capacities and types (high performance and Mid-line) within an enclosure. HP recommends using the same drive type (the same capacity) within a disk group because virtualization allocates space proportionate to the highest capacity drive within the group. A minimum of eight high performance SAS drives are required in a configuration using high performance drives.

NOTE: 10K rpm disk drives draw less power than their 15K rpm counterparts. So these disk drives are good choices for customers looking to cut their power requirements and who do not need the performance of 15K rpm disk drives.

7.2K Mid-line Drive Support
The P6000 EVA also supports 7.2K dual ported 6Gb/s mid-line SAS drives. This includes the 500GB 7.2K SFF 6Gb/s mid-line SAS and the 2TB 7.2K LFF 6Gb/s mid-line SAS drives. AP6000 EVA supports a full configuration of mid-line disk drives and can be configured with any combination of mid-line and high performance disk drives; total raw capacity varies based upon the redundancy (Vraid) selected. A minimum of eight mid-line SAS drives are required in a configuration using mid-line SAS drives.

Mid-line SAS drives are designed for lower duty cycle applications such as near on-line data replication for back-up. These drives should not be used as a replacement for P6000 EVA high performance, standard duty cycle, SAS drives. Doing so could shorten the life of the drive.

QuickSpecs

Product Highlights

Fibre Channel Technology

P6000 EVA models are enabled for 8Gb/s FC Switched Fabric and are compatible with 8Gb/s, 4Gb/s, or 2Gb/s FC Switched Fabric SANs. They can co-exist in the same FC SAN with EVA3000/5000 or EVA4x00/6x00/8x00 FC storage solutions and many other SAN devices. Direct Connection from P6000 EVA to servers is also supported.

P6000 EVA takes advantage of the benefits of Fibre Channel (FC) in distance, performance and connectivity. The use of optical Fibre cabling allows distances between connected segments of a SAN to be up to 500 meters @ 2Gb/s using short wave multi-mode and OM3 cables, up to 384 meters @ 4Gb/s and OM3 cables, and up to 150 meters @ 8Gb/s and OM3 cables, and up to 10 kilometers (6.21 miles) @ 8Gb/s or 4Gb/s when using long wave transceivers. Storage Area Networks (SANs) can be constructed using FC switches/directors for fabric connectivity. HP SAN H-Series, B-series and C-series switches and directors provide exceptional connectivity while increasing the effective bandwidth of the network. Supported SAN features include Zoning for communication isolation and Inter-Switch Links (hops) up to 10 km.

For more information on specific support specifications see the following SAN Infrastructure URL: http://h18006.www1.hp.com/storage/saninfrastructure/switches.html

Transfer Speeds

The P6000 EVAs have 8Gb/s FC host ports per HSV340 or HSV360 controller pair. The models have:

- FC only, have 8 FC ports, four for each controller.
- FC and 1Gb/s iSCSI (1GbE), have four FC ports, two for each controller, and eight 1Gb/s iSCSI ports, four for each controller.
- FC and 10Gb/s iSCSI/FCoE (10GbE) have four FC ports, two for each controller, and four 10Gb/s iSCSI/FCoE ports, two per controller.

The HSV340 and HSV360 controllers are compatible with 8Gb/s, 4Gb/s and 2Gb/s FC switches, HBAs, servers and other storage solutions.

Each P6000 EVA controller pair interfaces with the M6612 and M6625 drive enclosures via 6Gb/s SAS connections. With two SAS device connectors per controller and dual SAS I/O modules per drive enclosure, each controller has two connections to each SAS drive A and B port. So each controller has two redundant paths to each SAS enclosure I/O module and two redundant paths to each drive in each enclosure.

High Availability/ Fault Tolerance/ Hot pluggable support

All P6000 EVA models are configured with dual HSV controllers that operate in a redundant mode. Each controller has either four redundant FC paths; or two redundant FC paths and four redundant 1Gb/s iSCSI paths; or two redundant FC paths and two redundant 10Gb/s iSCSI/FCoE paths. In the event of a path failure, the alternate paths to the controller can be utilized with the use of multi-path software in the Operating System.

Each P6300 EVA controller has two SAS connectors, each carrying two SAS signals. With the P6300 EVA, one SAS cable, carrying two redundant SAS signals, connects to one SAS I/O module on a drive enclosure; and the second SAS cable, carrying two more redundant SAS signals, connects to the other SAS I/O module of a drive enclosure. For the P6300 EVA, up to ten drive enclosures can be connected in a SAS daisy-chain arrangement with a controller pair. At the end of the daisy chains, each chain is then connected to the second P6300 EVA controller.

Each P6500 EVA controller has two SAS connectors, each carrying four SAS signals. A Y-SAS cable is used to split the signals into two branches, each with two SAS signals. One branch of the Y-cable, carrying two redundant SAS signals, connects to one SAS I/O module on a drive enclosure; the second branch of the Y-cable goes to a SAS I/O module on a second drive enclosure. Similarly, a second Y-SAS cable, carrying two more redundant SAS signals per branch, connects to the other SAS I/O module of each of the two drive enclosures. For the

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Product Highlights

P6500 EVA, up to twenty LFF SAS drive enclosures or eighteen SFF SAS drive enclosures or combinations of LFF and SFF SAS enclosures (up to 20 enclosures as long as a 450 drive count is not exceeded) can be connected in a SAS daisy-chain arrangement with a controller pair. At the end of the daisy chains, each chain is then connected to the second P6500 EVA controller, again using Y-SAS cables.

Within the SAS drive enclosures, one I/O module connects to one port of each SAS drive in the enclosure; and the other I/O module connects to the second port of each SAS drive. The HSV340 and HSV360 controllers also have dual redundant hot plug power supplies and dual redundant hot plug blowers. Each controller has hot plug cache batteries to maintain cache contents for up to 96 hours in case of a total power failure.

The M6612 and M6625 SAS drive enclosures have dual redundant hot plug SAS I/O modules that allow the controllers to distribute I/Os between the two modules and provides redundant paths should either I/O module become unavailable. The enclosure also has dual redundant hot plug power supplies and dual hot plug blowers. Environmental Monitoring Unit (EMU) functionality is built into the I/O modules in the enclosures and monitors and reports the condition of the power supplies and fans.

The SAS and mid-line SAS disk drives have dual SAS lanes which can be redundantly accessed by each controller. The drives are hot plug. The drives can be configured, using redundant Vraid 1, Vraid 5, or Vraid 6 protection so that a drive failure will not cause loss of data. Optional virtual sparing can be configured so that a drive failure will trigger an automatic rebuild of the Vraid 1, Vraid 5, or Vraid 6 protection using the virtual spare drive(s).

All EVAs have dual redundant power distribution. Two independent power cords distribute power through two Power Distribution Units (PDUs) to each side of the EVA cabinets, to each power supply of the controllers and to each power supply of the drive enclosures. Each cabinet power cord can be connected to independent power sources. For maximum availability, a customer should provide redundant power from independent power circuit breakers, independent power lines from the power company and even independent power companies. Battery -backed UPS (Uninterruptible Power Supplies) or independent power generators can also be deployed.

EVA Manageability

HP P6000 Command View provides the capability to manage P6000 EVA family in a SAN or direct connect Fibre Channel host attach configuration. HP P6000 Command View / SBM software runs on a variety of server configurations using Windows Server 2003, Windows Server 2008 Enterprise Edition or Standard Edition. See the Command View QS at: www.hp.com/go/commandview for a list of servers that support Command View.

The powerful P6000 Command View/SBM provides an easy mechanism to manage up to 16 EVA units in a SAN configuration. Industry leading security enhancements in Command View now allows administrators to take advantage of Windows domains and local groups. Command View integrates with Windows Active Directory to authorize and authenticate users. In addition, all user actions and events that change system state are logged. Administrators can now use the audit logging capabilities to see who did what and when. The P6000 Command View media kits and license are required with all P6000 EVA models. HP P6000 Command View requires a License to use (LTU) for each array.

P6000 Command View / ABM is also available for P6000 EVA. It runs on the P6000 EVA's ABM module and does not require a management server. It manages only the P6000 EVA that it is running on. It supports Command View functions as well as Business Copy functions, but not Continuous Access functions.

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HP P6000 Enterprise Virtual Array

Product Highlights

Performance	Fibre Channel host connections provide up to 800MB/s bandwidth for each 8Gb/s path.
	Dual mirrored port write caching capability between the controller pair, with battery backed cache, maintains optimal availability while assuring data integrity in the event of a failure.
	Each HSV340 or HSV360 controller has four Fibre Channel host ports (eight FC ports in a redundant pair of controllers), or two Fibre Channel host ports and four 1Gb/s iSCSI ports (four FC ports and eight iSCSI ports), or two Fibre Channel host ports and eight 10Gb/s iSCSI/FCoE ports (four FC ports and four iSCSI/FCoE ports) in a redundant pair of controllers, assuring the availability of bandwidth for the most demanding applications.
	In addition, 4GB of cache per HSV340 controller pair and 8GB of cache per HSV360 controller pair helps ensure high performance.
Servers Supported - Single and Clustered	HP servers (HP-UX, ProLiant, ProLiant Storage Servers, AlphaServers)
	X86 servers
	Dell servers
	Sun servers
	IBM servers
	Apple XApple Servers (PowerPC and Intel)
P6000 EVA Required Software	P6000 EVAs ship with XCS v10.x factory installed on new P6000 EVA models. The base XCS license for P6000 EVA is contained in the hardware shipment. XCS v10.x also supports the EVA4400/6400/8400 arrays. XCS v10.x controller media download is available from HP.com. These downloads are available for upgrades of existing P6000 EVA installations or for EVA4400/6400/8400. The P6000 EVA Release Notes and Upgrading Product software Guide are also available from the same location.
	NOTE: Review the Release Notes and Upgrading Product Software documentation and compatibility requirements of all installed Array Integrated Software completely before upgrading.
	HP P6000 Command View is required software for P6000 EVA. HP P6000 Command View requires a License to use (LTU) for each array.
	Install and configure P6000 Command View / SBM and P6000 EVA with HP P6000 SmartStart Storage. Order this media kit when ordering P6000 EVA.
P6000 EVA Software Selector	The following matrix will assist in identifying some of the complimentary HP software products can be used along with the P6000 EVA to support various business applications. Please see your Sales Representative, or go to: http://www.hp.com for more information on these valuable HP software products.
	Just click on the product name and you will be linked to the product specification URL.

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HP P6000 Enterprise Virtual Array

Product Highlights

	Device and Configuration Management	Backup Solutions	Business Continuity/ Local Mirroring	Disaster Recovery/ Remote Mirroring	Storage Resource Management	Unified Server and Storage Management	Application Integration
HP P6000 Command View with Thin Provisioning	X (Required)						
HP P6000 SmartStart	X						
HP P6000 Business Copy		X					X
HP P6000 Continuous Access				X			
P6000 Dynamic Capacity Manager	X						
HP Storage Essentials Suite (Heterogeneous, multivendor)	X End to end provisioning (hosts, infrastructure, storage)	X End to end backup monitoring/ reporting			X Discovery, topology, monitoring, events, applications, NAS/SAN, File monitoring, reporting, Performance, monitor host clusters		X monitor applications and associated storage/infrastructure (Oracle, Microsoft Exchange Server, Sybase, Microsoft SQL, InterSystems Cache' database and SAP ACC)
HP Storage Essentials Standard Edition SRM Software (Small to medium HP Storage-based SANs)	Discovery, topology	X Backup monitoring/ reporting			X monitoring, events, applications, NAS/SAN, File monitoring, reporting, EVA Performance, monitor host clusters	X	X (Oracle, Exchange, Sybase, MS SQL)
HP Data Protector		X	X				X
HP Systems Insight Manager	In-context launch of CV EVA, SAN discovery, monitoring, asset, config., security					X (Included with EVA)	

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HP P6000 Enterprise Virtual Array

Product Highlights

EVA and Value-added Software Compatibility

Model P6300/P6500 EVAs	XCS Software	HP P6000 Command View*	HP Continuous Access EVA**	HP Business Copy EVA**	HP Replication Solution Manager (RSM)***
	P6300/P6500 EVAs v10.x (XCS v10.x) or later	P6000 Command View/SBM v9.4 (or later version) or P6000 Command View/ABM v9.4 (or later version)	Continuous Access EVA v9.4 (or later version)	Business Copy EVA v9.4 (or later version)	Replication Solution Manager v5.3 (or later version)

*HP P6000 Command View is required software. HP P6000 Command View requires an Unlimited License to use (LTU) for each array. If the EVA does not have the proper licensed capacity it will be in violation of the End User License Agreement (EULA).

**HP Continuous Access EVA and HP Business Copy EVA requires an Unlimited License to use (LTU) for each array. If the EVA does not have the proper licensed capacity it will be in violation of the End User License Agreement (EULA).

***HP Replication Solutions Manager Software provides a powerfully simple graphical user interface (GUI) to create, manage and configure local and remote replication on the entire EVA family. The RSM Software provides a centralized management interface that integrates with HP Business Copy EVA Software and HP Continuous Access EVA Software for local and remote replication, resulting in a unique, cost effective disaster recovery solution.

Operating Systems, Cluster and High Availability Compatibility

Operating System	Versions Supported		Cluster Server or High Availability Software	HA Versions Supported	Failover Software
Microsoft Windows 2003/32-bit	All Editions - See SPOCK for details	R2, SP2 R2, SP2	Microsoft Cluster Server (MSCS) (2003)	Windows Server 2003	Full featured MPIO, available from HP (2003, 2008) and Microsoft DSM from Microsoft (2008) See SPOCK for details
Microsoft Windows 2003/x64	All Editions - See SPOCK for details	R2, SP2 R2, SP2	Windows Failover Clusters (MFCS)(2008)	Windows Server 2008	
Microsoft Windows 2003/IA64	All Editions - See SPOCK for details	R2, SP2 R2, SP2	Veritas Storage Foundation & HA Solutions for Windows	See SPOCK for details	
Microsoft Windows 2008 32-bit, x64	All Editions - See SPOCK for details	SP1, SP2, R2			
Microsoft Windows 2008 IA64	All Editions - See SPOCK for details	SP1, SP2, R2			
HP-UX	11i v2 (Integrity) 11i v3 (Integrity)		HP ServiceGuard A11.19 HP ServiceGuard A11.20 Veritas Storage Foundation & HA Solutions	11.16 11.17 11.18 11.19	HP-UX 11.iv3 has OS native multi-path, pvlinks native in HP-UX, and Veritas DMP
Linux	Red Hat EL Advanced Server 4.7, 4.8, 5.4, 5.5 (IA32, IA64 & x86_64) SUSE/SLES10 (IA32, IA64 & x64)		RHEL Clustering SLES HA Extensions	See SPOCK for versions	QLogic Failover driver, available from HP (RHEL 4 only), Emulex

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	SP3 (includes Open Enterprise Server Linux) SUSE/SLES11 SP1(IA32, IA64 & x64)- (Includes Open Enterprise Server Linux, Oracle Enterprise Linux V4, 5)	VERITAS Storage Foundation & HA Solutions		MultiPulse available from HP (RHEL 4.7 and 4.8), and Native Device Mapper and Documentation
Apple Mac OS X	10.5 10.6	N/A	N/A	ATTO FC HBA driver
HP OpenVMS	Alpha: 8.3, 8.4 Integrity: 8.3, 8.3-1H1, 8.4	HP OpenVMS Clusters	8.3 8.3-1h1 8.4	Native in OS
Sun Solaris	9 (SPARC) 10.3 (SPARC & x86)	SunCluster VERITAS Storage Foundation & HA Solutions	3.2 See SPOCK for versions	MPxIO for Solaris, Native in OS Veritas DMP
IBM AIX	5.3 6.1	HACMP PowerHA VERITAS Storage Foundation & HA Solutions	Native in OS See SPOCK for versions	MPIO for IBM AIX, Native in OS Veritas DMP
VMware	ESX Server 4.0, 4.1	Native HA MSCS Clustering**	See SPOCK for versions	See SPOCK for versions
Xen	Citrix XenServer 5.6	Citrix	Native HA SGLX	See SPOCK for versions Native Device Mapper MPIO (Citrix)

NOTE: For the latest support information on hardware, operating systems and high availability, failover and cluster software, check HP's Single Point of Connectivity Knowledge (SPOCK).

Racking Guidelines and Power Distribution

Power Distribution Units (PDUs) are configured according to the voltage used in the country when the solution is ordered. These PDUs provide redundant power. They are located in the bottom and back of the cabinet, taking 1U of rack space.

For P6000 EVA, a variety of HP 10000 G2 Series Rack offerings and integration options are available. P6000 EVA configurator tools utilize a 42U HP 10000 G2 Series Rack as the standard recommendation and will provide a 200 - 240V PDU and country specific power cords. However, P6000 EVA configurations can be customized to meet a wide variety of customer needs. The height, width (including the 800mm wide rack) and types of rack and PDUs can be modified based upon the specific customer need. If other devices, such as servers, switches or back-up devices are to be installed with the array, this can be specified and the cabinets and PDUs can be modified to support the configuration. P6000 EVA also supports 22U and 36U racks. The 47U rack is also supported, but not factory configured, because of the cabinet height, which creates shipping difficulties. It must be assembled on site.

For more information on the HP rack offerings, please see the following URL:
http://h18004.www1.hp.com/products/servers/proliantstorage/racks/index.html

Other PDUs, besides the 200 - 240 V single-phase default PDU, are also supported. This includes 100 - 127 volt single-phase, 200 - 240 volt three-phase, and 380 - 415 volt three-phase PDUs. Monitored PDUs are also supported.

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NOTE: When 1200mm deep cabinets are used, the power cords that come with the P6000 EVA controllers and drive enclosures are not long enough to reach to the power strip locations in the deep cabinets. One pair of longer power cords,142257-006 (black) and AF573A (gray), is needed for each P6000 EVA controller or drive enclosure, either factory installed or field installed.

For more information on PDU support, please see the following URL:
http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/pdu.html

NOTE: When adding additional devices to existing racks ensure that the installed PDUs will support the new power requirements.

Total Cost of Ownership

The unique virtual architecture allows up to twice the normal effective capacity utilization of traditionally architected storage offerings. And with Virtually Capacity-Free Snapshot (Vsnap), significant duplicate capacity requirements can be eliminated resulting in fewer/smaller storage acquisitions.

P6000 EVA is a high density disk storage solution. Additionally, the unique virtual architecture allows up to twice the normal effective capacity utilization of traditionally architected storage offerings. And with the virtually Capacity-Free Snapshot (Vsnap), mid-line SAS disk drives and the ability to change Vraid types, significant amount of duplicate capacity requirements can be eliminated, resulting in fewer/smaller storage acquisitions.

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HP P6000 Enterprise Virtual Array

Service and Support, HP Care Pack and Warranty Information

Warranty and Services Included with the Product

P6000 EVA comes with HP's 3-year Global Limited Warranty and Technical Support, which includes 3 years 9x5 hardware support, with next business day (NBD) response. HP's warranty and support features:

- Online Business Support Center and IT Resource Center
- Remote Support
- Technical Phone Support
- Customer Self Repair (see list below)
- Software Limited Warranty
- On-site Warranty Service

P6000 EVA SAS and midline SAS drives are 3 years, parts only.

Online Support
HP online support capabilities include a variety of self-help tools, troubleshooting assistance, and access to the patch database, firmware/software update packages and documentation. Register with the HP Business Support Center and the IT Resource Center to receive product specific and proactive notifications for P6000 EVA.. For more information go to: www.hp.com/support or: www.itrc.hp.com.

Remote Support
HP designed P6000 EVA with support capability to facilitate remote monitoring and email notification of array errors/events. To take full advantage of HP's remote support solutions and maximize the service delivery experience, these features must be enabled at time of installation. Additional fault monitoring software is included in the P6000 EVA software media kit.

Technical Phone Support
24x7 telephone technical support is available to assist with Hardware warranty related troubleshooting and issue resolution. Call HP warranty support: 1-800-474-6836. Qualified technical resources will be your first point of contact to assist with your service request.

Customer Self Repair (customer installed replacement parts)
HP designed P6000 EVA to enable the highest degree of Customer Self Repair and parts replacements. This feature enables maximum support flexibility, while minimizing unit down time. Customer Self Repair parts come with step by step instructions with additional assistance available online or by phone.

Required Customer Self-Repair (Replacement) Parts List:

- Hard disk drives with drive firmware code load.
- Controller enclosure power supply.
- Controller enclosure fan.
- Controller cache battery.
- Controller management module
- Disk enclosure power supply.
- Disk enclosure fan.
- Bezels.

Optional Customer Self-Repair Parts List:

- Controller module.
- Controller cache memory (DIMM).
- Internal enclosure boards and cables
- Fiber channel Transceivers.
- Fiber channel transceivers cables.

Part replacement videos can be viewed at: http://hp.com/go/sml. For P6000 EVA, select

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Service and Support, HP Care Pack and Warranty Information

Storage, then EVA Disk Arrays, then HP P6300/P6500 Enterprise Virtual Array, then the particular resource needed.

Software Warranty
If the removable HP Software media on which HP distributes the software proves to be defective in materials or workmanship within 90-days of purchase, return the media to HP for replacement.

On-site Warranty Service
P6000 EVA comes with 3 year on-site warranty support, for those service events not remedied either remotely or through use of customer self-repair replaceable parts. On-site service is made available at HP's discretion and scheduled during standard office hours.

For more information about HP's Global Limited Warranty and Technical Support, visit:
http://h18006.www1.hp.com/products/storageworks/warranty.html

For more information about HP's Global Limited Warranty and Technical Support, visit:
ftp://ftp.compaq.com/pub/products/storageworks/warranty/en_321708-008.pdf

HP warrants the HP 10000 G2 Series Rack according to the standard rack product warranty. Please refer to product specification for further details:
http://h18004.www1.hp.com/products/servers/proliantstorage/racks/index.html

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HP Care Pack Services Packaged server and storage services for increased uptime, productivity and ROI
When you buy HP server and storage products and solutions, it's also a good time to think about what levels of support you may need. Our portfolio of service options reduce deployment and management worries while helping you get the most out of your server and storage investments. We take a holistic approach to your environment, bridging servers, blades, storage, software and network infrastructures with our packaged HP Care Pack Services for servers and storage.

Protect your business beyond warranty
When it comes to robustness and reliability, standard computing equipment warranties have matured along with technology. Good news that can also create problems stemming from depending on standard warranties designed to only protect against product defects and some downtime causes. Using a standard approach to warranty uplifts, such as HP Care Pack Services, helps reduce downtime risks and provides operational consistency for mission-critical and standard business computing.

HP Care Pack Services: Upgrading or extending standard server and storage warranties cost effectively
HP Care Pack Services offer a standard reactive hardware and software support services suite sold separately, or combined with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of integrated proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition with HP Proactive Select, you can acquire the specific proactive constancy and technical services. HP Proactive Select menu offers a broad set of service options that you can mix and match depending on your specific requirements. Proactive service options include offers for server, storage, network, SAN device, software, environment and education services.

HP server and storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education Services offer flexible, comprehensive training on to help your IT staff get the most out of your server and storage investments. HP Financial solutions extend innovative financing and cost-effective asset management programs-from purchase to equipment retirement.
Learn more: www.hp.com/services/servers and www.hp.com/services/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

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Service and Support, HP Care Pack and Warranty Information

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.

3-Year HP Critical Service	HP Critical Service (CS) provides a complete support solution designed for businesses that run essential mission-critical applications, which cannot tolerate downtime without a significant business impact. This 3-year, comprehensive service provides the right combination of proactive and reactive support designed to improve availability and performance across your IT infrastructure. With fewer interruptions and less downtime, you will lower costs and gain competitive advantages in the marketplace. HP Critical Service provides highly-trained professionals with world-class skills and a commitment to understand both your enterprise technology requirements and your business objectives. In today's new era of business technology, technology must produce thousands of business outcomes. Today's HP Technology Services portfolio helps customers manage their technology in action-because when technology works, business works.

- Boost business productivity through increased availability and decrease business losses caused by IT downtime
- Reduce risk and improve efficiency by proactively managing changes across the environment with no interoperability gaps
- Resolve complex problems quickly through direct access to HP Services expertise and support from a team familiar with business and technology infrastructure
- Free IT staff to focus on strategic business issues and increase customer satisfaction

http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1613EEE

HP EVA 6300 Disk Array Installation and Startup Service	For an efficient start, HP P6300 EVA Disk Array Installation and Startup Service - provides deployment of your P6300 EVA Disk Array, P6000 Command View and remote support tools into your storage environment to help get you up and running quickly. In today's new era of business technology, technology must produce thousands of business outcomes. Today's HP Technology Services portfolio helps customers manage their technology in action-because when technology works, business works.

- Installation and startup by an HP technical specialist
- Availability of an HP service specialist to answer basic questions during delivery
- Delivery of the service at a mutually convenient scheduled time
- Verification prior to installation that all service prerequisites are met
- Customer orientation session

http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA1-8183ENW.pdf

HP Enhanced Implementation Service for SANs	HP Enhanced Implementation Service for SANs - For customers who are building a new SAN or expanding their existing one, we offer the HP Enhanced Implementation Service for SANs. This provides complete design and implementation services for Fibre Channel, FCOE, FCIP, SAS and iSCSI SAN connectivity components.

- Ensures optimal SAN connectivity tailored to your specific environment.
- Allows your IT resources to stay focused on their core tasks and priorities
- Reduces implementation time, impact and risk to your storage environment
- Helps ensure a successful implementation for complex deployments by providing HP project management

http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=5981-8527EN&cc=us&lc=en

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Service and Support, HP Care Pack and Warranty Information

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

3-Year HP Proactive 24 As an alternative to our recommended support level, for customers who want enhanced operational effectiveness and proactive problem identification:

HP Proactive 24 Service (P24) integrates hardware and software support to help you improve the stability and operational effectiveness of your IT environment. An HP Account Manager acts as your primary point of contact to ensure that HP meets your support needs effectively.

P24 provides the maximum value when multiple technologies in the environment (e.g. servers, storage, SAN and the network), are all covered. It provides an environment-wide view and consistent support of all of these components which affect stability of your key applications.

Choose P24 when you want to:

- enhance operational effectiveness with proactive problem identification and recommendations from HP
- partner with technical experts who help coordinate support, provide hands-on assistance, and share knowledge with your staff
- rapidly access support and expertise spanning your environment
- obtain personalized services tailored to your business environment and critical success factors
- anticipate necessary change - and execute it correctly the first time
- efficiently manage infrastructure resources to meet your performance objectives

http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1614ENUC

3-Year HP Support Plus 24

As an alternative to our recommended support level, for customers who need access to responsive 24x7 hardware and software support plus software updates on HP and selected third party products:

HP Support Plus 24 helps you increase performance and availability with comprehensive, consistent hardware and software services. Working with your IT team, HP Services engineers deliver onsite hardware support and over-the-phone software support around-the-clock 365 days per year. Service coverage encompasses HP products and selected multivendor hardware and software.

In addition, this convenient HP Care Pack packaged service makes software updates available to you at substantial savings.

Choose Support Plus 24 when you need to:

- Improve uptime with responsive hardware and software services available anytime
- Cost-effectively obtain expert 24x7 multivendor hardware and software support
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP and selected third-party software at a predictable cost
- Take advantage of subscription savings on software updates

http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EEE

HP Proactive Select Service

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

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.

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

QuickSpecs

HP P6000 Enterprise Virtual Array

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

HP Insight Remote Support software delivers secure remote monitoring and support for your HP Servers and Storage, 24 X 7, so you can spend less time solving problems and more time focused on your business. You can have your systems remotely monitored for hardware failure using secure technology that's been proven at thousands of companies around the world. In many cases, you can avoid problems before they occur.

Customer Technical Training

HP Education Services
In today's cost-conscious business environment, IT professionals, developers, consultants and users face an interesting challenge: how to keep up with the latest technologies and expand important skills while delivering profitable results on current projects. To help address this challenge, HP offers innovative training solutions that help keep you up-to-date on virtualization, server, storage, Insight Control, Citrix, Microsoft® and open source/Linux-related topics-while spending less time away from business-critical activities.

HP Services Awards

HP Technology 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.

Additional Services Information

To learn more on HP ProLiant servers, HP BladeSystem servers and HP storage products, please contact your HP sales representative or HP Authorized Channel Partner. Or visit www.hp.com/services/proliant or www.hp.com/services/bladesystem or http://www.hp.com/hps/storage

QuickSpecs

HP P6000 Enterprise Virtual Array

Configuration Information and Configuration Rules

Step 1 – Hardware
P6300 EVA Combo Kits

P6300 EVA Configurations start with the selection of one of the P6300 Combo Kit choices below or by selecting one of the P6300 EVA Starter Kits below.

P6300 EVA Combo Kits come with a dual HSV300 controller (FC only, or FC/1GbE, or FC/10GbE), one SFF or one LFF drive enclosure, P6000 Command View /ABM (Array Based Management software - installed on the controller Management Module) and a P6300 Unlimited P6000 Command View LTU (License To Use). Any of the available P6000 EVA SAS or mid-line SAS disk drives, SFF drives with SFF enclosures and LFF drives with LFF enclosures, can be used with the combo kits.

Order combo kits factory integrated into a rack or field installed into a rack. Additional SFF or LFF drive enclosures, up to a maximum configuration of ten drive enclosures, and additional disk drives can be ordered with the combo kits. SFF and LFF enclosures and drives can be mixed in a P6300 EVA.

P6300 EVA Dual FC Controller, SFF enclosure and Command View Combo Factory Integrated Kit	**HP P6300 EVA Dual FC Controller, SFF enclosure and Command View Combo Factory Integrated Kit**	QK739A#0D1

- One 2U P6300 EVA Dual FC Controller with two HSV340 array controller modules, each with four 8Gb/s FC host ports. Also included are eight 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6625 25-SFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Factory Integration. It requires the #0D1option.
NOTE: 8 SFF drives must be ordered with this factory integrated kit.

P6300 EVA Dual FC Controller, SFF enclosure and Command View Combo Field Installed Kit	**HP P6300 EVA Dual FC Controller, SFF enclosure and Command View Combo Field Installed Kit**	QK740A

- One 2U P6300 EVA Dual FC Controller with two HSV340 array controller modules, each with four 8Gb/s FC host ports. Also included are eight 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6625 25-SFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6300 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Field Installation. It cannot be installed in the Factory.

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HP P6000 Enterprise Virtual Array

Configuration Information and Configuration Rules

P6300 EVA Dual FC/1GbE Controller, SFF enclosure and Command View Combo Factory Integrated Kit	**HP P6300 EVA Dual FC/1GbE Controller, SFF enclosure and Command View Combo Factory Integrated Kit**	**QK741A#0D1**

- One 2U P6300 EVA Dual FC/1GbE (1Gb/s iSCSI) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6625 25-SFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed and restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed and restore CD

NOTE: This kit is only for Factory Integration. It requires the #0D1 option.
NOTE: 8 SFF drives must be ordered with this factory integrated kit.

P6300 EVA Dual FC/1GbE Controller, SFF enclosure and Command View Combo Field Installed Kit	**HP P6300 EVA Dual FC/1GbE Controller, SFF enclosure and Command View Combo Field Installed Kit**	**QK742A**

- One 2U P6300 EVA Dual FC/1GbE (1Gb/s iSCSI) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6625 25-SFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed and restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed and restore CD

NOTE: This kit is only for Field installation. It cannot be installed in the Factory.

P6300 EVA Dual FC/10GbE Controller, SFF enclosure and Command View Combo Factory Integrated Kit	**HP P6300 EVA Dual FC/10GbE Controller, SFF enclosure and Command View Combo Factory Integrated Kit**	**QK743A#0D1**

- One 2U P6300 EVA Dual FC/10GbE (10Gb/s iSCSI/FCoE) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6625 25-SFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed with restore CD

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Configuration Information and Configuration Rules

NOTE: This kit is only for Factory Integration. It requires the #0D1option.
NOTE: 8 SFF drives must be ordered with this factory integrated kit.

P6300 EVA Dual FC/10GbE Controller, SFF enclosure and Command View Combo Field Installed Kit	**HP P6300 EVA Dual FC/10GbE Controller, SFF enclosure and Command View Combo Field Installed Kit**	**QK744A**

- One 2U P6300 EVA Dual FC/10GbE (10Gb/s iSCSI/FCoE) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6625 25-SFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Field installation. It cannot be installed in the Factory.

P6300 EVA Dual FC Controller, LFF enclosure and Command View Combo Factory Integrated Kit	**HP P6300 EVA Dual FC Controller, LFF enclosure and Command View Combo Factory Integrated Kit**	**QK745A#0D1**

- One 2U P6300 EVA Dual FC Controller with two HSV340 array controller modules, each with four 8Gb/s FC host ports. Also included are eight 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6612 12-LFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed and restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed and restore CD

NOTE: This kit is only for Factory Integration. It requires the #0D1option.
NOTE: 8 LFF drives must be ordered with this factory integrated kit.

P6300 EVA Dual FC Controller, LFF enclosure and Command View Combo Field Installed Kit	**HP P6300 EVA Dual FC Controller, LFF enclosure and Command View Combo Field Installed Kit**	**QK746A**

- One 2U P6300 EVA Dual FC Controller with two HSV340 array controller modules, each with four 8Gb/s FC host ports. Also included are eight 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6612 12-LFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6300 Command View/ABM installed and restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)

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Configuration Information and Configuration Rules

- XCS v10.x Firmware installed and restore CD

NOTE: This kit is only for Field Installation. It cannot be installed in the Factory.

P6300 EVA Dual FC/1GbE Controller, LFF enclosure and Command View Combo Factory Integrated Kit	**HP P6300 EVA Dual FC/1GbE Controller, LFF enclosure and Command View Combo Factory Integrated Kit**	**QK747A#0D1**

- One 2U P6300 EVA Dual FC/1GbE (1Gb/s iSCSI) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6612 12-LFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed and restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Factory Integration. It requires the #0D1option.
NOTE: 8 LFF drives must be ordered with this factory integrated kit.

P6300 EVA Dual FC/1GbE Controller, LFF enclosure and Command View Combo Field Installed Kit	**HP P6300 EVA Dual FC/1GbE Controller, LFF enclosure and Command View Combo Field Installed Kit**	**QK748A**

- One 2U P6300 EVA Dual FC/1GbE (1Gb/s iSCSI) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6625 25-SFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6300 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU (which also includes a Thin Provisioning Unlimited LTU and a Dynamic Capacity Manager Unlimited LTU)
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Field installation. It cannot be installed in the Factory.

P6300 EVA Dual FC/10GbE Controller, LFF enclosure and Command View Combo Factory Integrated Kit	**HP P6300 EVA Dual FC/10GbE Controller, LFF enclosure and Command View Combo Factory Integrated Kit**	**QK749A#0D1**

- One 2U P6300 EVA Dual FC/10GbE (10Gb/s iSCSI/FCoE) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6612 12-LFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately

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- A P6300 Unlimited Command View LTU
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Factory Integration. It requires the #0D1option.
NOTE: 8 LFF drives must be ordered with this factory integrated kit.

P6300 EVA Dual FC/10GbE Controller, LFF enclosure and Command View Combo Field Installed Kit	**HP P6300 EVA Dual FC/10GbE Controller, LFF enclosure and Command View Combo Field Installed Kit**	**QK750A**

- One 2U P6300 EVA Dual FC/10GbE (10Gb/s iSCSI/FCoE) Controller with two HSV340 array controller modules, each with two 8Gb/s FC host ports. Also included are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables and XCS firmware license
- One 2U M6612 12-LFF bay SAS HDD enclosure, with mounting hardware, power cords and SAS interconnect cables
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- A P6300 Unlimited Command View LTU
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Field installation. It cannot be installed in the Factory.

P6300 EVA Starter Kits

P6300 EVA Starter Kits are complete solutions with a dual controller, one SFF enclosure, eight disk drives, P6000 Command View /ABM (Array Based Management software - installed on the controller Management Module) and a P6300 Unlimited Command View LTU. The starter kits can be ordered to be factory integrated into a rack or they can be ordered to be field installed into a rack. Additional SFF or LFF drive enclosures, up to a maximum configuration of ten drive enclosures, and additional disk drives can be ordered with the starter kits.

P6300 EVA Factory Integrated Starter Kit with (8) 300GB 10K SFF drives	**HP P6300 EVA (8) 300GB 10K SFF SAS Factory Integrated Starter Kit**	**AP889A#0D1**

- P6300 EVA Dual Controller array FC
- M6625 25-SFF bay SAS HDD enclosure
- Eight 300GB 10K RPM SFF SAS disk drives
- P6000 Command/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Factory Integration. It requires the #0D1option.

P6300 EVA Field Installed Starter Kit with (8) 300GB 10K SFF drives	**HP P6300 EVA (8) 300GB 10K SFF Field Installed Starter Kit**	**AP890A**

- P6300 EVA Dual Controller array FC
- M6625 25-SFF bay SAS HDD enclosure
- Eight 300GB 10K RPM SFF SAS disk drives
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU
- XCS v10.x Firmware installed with restore CD

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Configuration Information and Configuration Rules

	NOTE: This kit is only for Field Installation. It cannot be installed in the Factory.	
P6300 EVA Factory Integrated Starter Kit with (8) 600GB 10K SFF drives	**HP P6300 EVA (8) 600GB 10K SFF SAS Factory Integrated Starter Kit**	**AP891A#0D1**

- P6300 EVA Dual Controller array FC
- M6625 25-SFF bay SAS HDD enclosure
- Eight 600GB 10K RPM SFF SAS disk drives
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU
- XCS v10.x Firmware installed with restore CD

	NOTE: This kit is only for Factory Integration. It requires the #0D1option.	
P6300 EVA Field Installed Starter Kit with (8) 600GB 10K SFF drives	**HP P6300 EVA (8) 600GB 10K SFF SAS Field Installed Starter Kit**	**AP892A**

- P6300 EVA Dual Controller array FC
- M6625 25-SFF bay SAS HDD enclosure
- Eight 600GB 10K RPM SFF SAS disk drives
- P6000 Command View/ABM installed with restore CD
  NOTE: P6000 SmartStart software, containing P6000 Command View/SBM software, either on a CD or an e-copy, if needed, can be ordered separately
- P6300 Unlimited Command View LTU
- XCS v10.x Firmware installed with restore CD

NOTE: This kit is only for Field Installation. It cannot be installed in the Factory.

P6500 EVA Controllers

P6500 EVA configurations start with the selection of one of the P6500 EVA controller choices below.

NOTE: The #0D1 option for the following controllers must be ordered if the controllers are to be configured in cabinets in the factory. If the controllers are to be installed in the field, #0D1 is not included.

P6500 EVA Dual Controller Array, Fibre Channel	**HP P6500 EVA Dual Controller Fibre Channel Array** One 2U controller enclosure with two HSV360 controller modules, each with four 8Gb/s FC host ports. Also included with each controller enclosure are eight 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables, and XCS firmware license. Order one unit for each P6500 EVA array configuration.	AJ938A AJ938A#0D1
P6500 EVA Dual Controller Array, Fibre Channel and 1GbE	**HP P6500 EVA Dual Controller Fibre Channel and 1GbE Array** One 2U Controller Enclosure with two HSV360 controller modules, each with two 8Gb/s FC host ports and four 1GbE (1Gb/s iSCSI) ports. Also included with each controller enclosure are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables, and XCS firmware license. Order one unit for each P6500 EVA array configuration.	AJ939A AJ939A#0D1
P6500 EVA Dual Controller Array, Fibre Channel and 10GbE (iSCSI/FCoE) Array	**HP P6500 EVA Dual Controller Fibre Channel and 1GbE Array** One 2U Controller Enclosure with two HSV360 controller modules, each with two 8Gb/s FC host ports and two 10GbE (10Gb/s iSCSI/FCoE) ports. Also included with each controller enclosure are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables, and XCS firmware license. Order one unit for each P6500 EVA array configuration.	AP718A AP718A#0D1

Storage Centric P6500 For the following Storage Centric Rack versions of the P6500 EVA controllers

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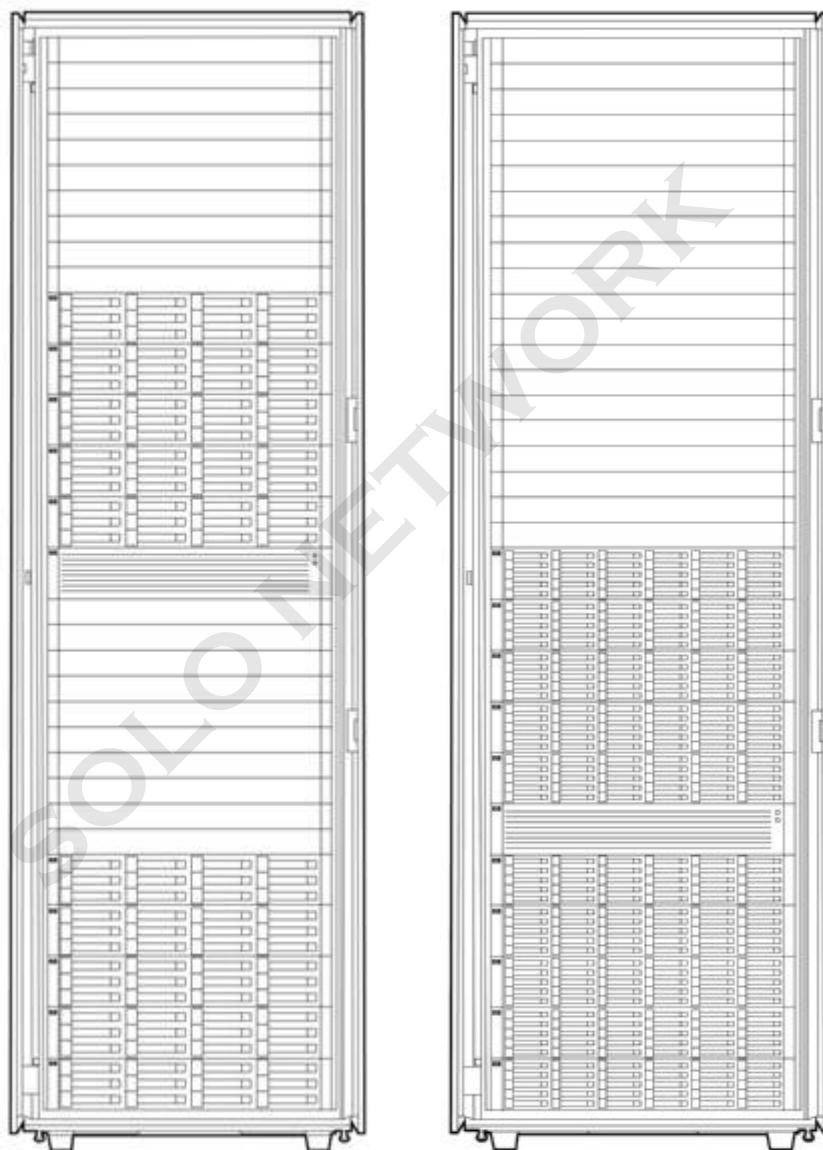
Configuration Information and Configuration Rules

EVA controllers

(for CTO (factory Configure-To-Order) only), the controllers will be located in a central rack location so that future expansion of the arrays, by adding drive enclosures, will be easy.

In the Storage Centric configurations, other non-EVA components are not permitted in CTO orders, but can be added in the field.

In Non-Storage Centric configurations, other non-EVA components can be added for CTO orders. They can also be added in the field.

The following drawings show example configurations for a P6500 EVA 2C10D in Storage Centric and non-Storage Centric configurations.

P6500 EVA 2C10D
Storage Centric Configuration

P6500 EVA 2C10D
Non-Storage Centric Configuration

NOTE: The following Storage Centric Controllers can only be ordered with #0D1 to be mounted in a cabinet in the factory.

P6500 EVA Dual Controller Array, Fibre Channel	**HP P6500 EVA Dual Controller Fibre Channel Array for Storage Centric Rack**	AP893A#0D1
	One 2U controller enclosure with two HSV360 controller modules, each with	

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Configuration Information and Configuration Rules

for Storage Centric Rack	four 8Gb/s FC host ports. Also included with each controller enclosure are eight 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables, and XCS firmware license. Order one unit for each P6500 EVA array configuration. **NOTE:** The Storage Centric rack configuration, for CTO only, will result in the controller assembly being placed in the middle of the rack cabinet to allow for easy expansion of the P6500 EVA in the future. The MPX200 Multi Function router, The MPX110 IP Distance Gateway and X series servers used as EVA Management Servers can be added. Other non-EVA components are not permitted in CTO orders, but can be added in the field.

P6500 EVA Dual Controller Array, Fibre Channel and 1GbE for Storage Centric Rack	**HP P6500 EVA Dual Controller Fibre Channel and 1GbE Array for Storage Centric Rack** One 2U Controller Enclosure with two HSV360 controller modules, each with two 8Gb/s FC host ports and four 1GbE (1Gb/s iSCSI) ports. Also included with each controller enclosure are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables, and XCS firmware license. Order one unit for each P6500 EVA array configuration. **NOTE:** The Storage Centric rack configuration, for CTO only, will result in the controller assembly being placed in the middle of the rack cabinet to allow for easy expansion of the P500 EVA in the future. The MPX200 Multi Function router, The MPX110 IP Distance Gateway and X series servers used as EVA Management Servers can be added. Other non-EVA components are not permitted in CTO orders, but can be added in the field.	AP894A#0D1
P6500 EVA Dual Controller Array, Fibre Channel and 10GbE (iSCSI/FCoE) Array for Storage Centric Rack	**HP P6500 EVA Dual Controller Fibre Channel and 10GbE Array for Storage Centric Rack** One 2U Controller Enclosure with two HSV360 controller modules, each with two 8Gb/s FC host ports and two 10GbE (10Gb/s iSCSI/FCoE) ports. Also included with each controller enclosure are four 8Gb/s SFPs, mounting hardware, power cords, SAS interconnect cables, and XCS firmware license. Order one unit for each P6500 EVA array configuration. **NOTE:** The Storage Centric rack configuration, for CTO only, will result in the controller assembly being placed in the middle of the rack cabinet to allow for easy expansion of the P6500 EVA in the future. The MPX200 Multi Function router, The MPX110 IP Distance Gateway and X series servers used as EVA Management Servers can be added. Other non-EVA components are not permitted in CTO orders, but can be added in the field.	BK760A#0D1

Drive Enclosures

Drive enclosures can be ordered separately to be installed in the field or they can be factory configured in racks. At least one drive enclosure is required with each P6300 EVA Dual Controller and at least two drive enclosures are required with each P6500 EVA Dual Controller for factory configuration. Drive enclosures can be ordered for factory configuration without controllers for expansion beyond one cabinet. See below for more on expansion options.

M6612 3.5-inch SAS Drive Enclosure	**HP M6612 3.5-inch SAS Drive Enclosure** Select M6612 3.5-inch SAS drive enclosures to expand P6300 EVA configurations up to ten enclosures or to expand a P6500 EVA configuration up to twenty enclosures. SFF and LFF drive enclosures can be mixed in a P6000 EVA. When mixed, up to twenty drive enclosures can be supported in a P6500 EVA, but with a maximum combined drive count of 450 disk drives. **NOTE:** A minimum of 8 disk drives per high performance SAS type or Mid-line	**AJ832A** **AJ832A#0D1**

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Configuration Information and Configuration Rules

SAS drive type are required per P6300/P6500 EVA when using those drive types.

M6625 2.5-inch SAS Drive Enclosure	**HP M6625 2.5-inch SAS Drive Enclosure**	**AJ840A** **AJ840A#0D1**

Select M6625 2.5-inch SAS drive enclosures to expand P6300 EVA configurations up to ten enclosures or to expand a P6500 EVA configuration up to eighteen enclosures.

2.5-inch (SFF) and 3.5-inch (LFF) drive enclosures can be mixed in a P6000 EVA. When mixed, up to twenty drive enclosures can be supported in a P6500 EVA, but with a maximum combined drive count of 450 disk drives.

NOTE: A minimum of 8 disk drives per high performance SAS type or mid-line SAS drive type are required per P6000 EVA when using those drive types.

SAS Disk Drives

Drives are orderable at the time the array is purchased, or can be added in the future when additional capacity is required. Use these SKUs whenever ordering hard disk drives for the P6000 EVA, either for factory integration or when adding additional capacity. Note that these SKUs apply ONLY to the P6000 EVA models and cannot be used with other prior generation EVA models.

HP SAS and mid-line SAS Drives	**NOTE: A minimum of eight (8) high performance SAS or mid-line SAS drives are required per P6000 EVA.**	
LFF (3.5-inch) SAS Drives	HP M6612 300GB 6 G SAS 15K 3.5-inch HDD	AP870A
	HP M6612 450GB 6 G SAS 15K 3.5-inch HDD	AP871A
	HP M6612 600GB 6 G SAS 15K 3.5-inch HDD	AP872A
	HP M6612 2TB 6 G SAS 7.2K 3.5-inch HDD	AW590A
SFF (2.5-inch) SAS Drives	HP M6625 146GB 6 G SAS 15K 2.5-inch HDD	AP877A
	HP M6625 300GB 6 G SAS 10K 2.5-inch HDD	AP875A
	HP M6625 450GB 6 G SAS 10K 2.5-inch HDD	AW612A
	HP M6625 600GB 6 G SAS 10K 2.5-inch HDD	AW611A
	HP M6625 500GB 6 G SAS 7.2K 2.5-inch HDD	AP878A

NOTE: #0D1 will appear after the drive part numbers to indicate factory integration where appropriate. #0D1 is used only when the drive enclosures and drives are being factory integrated in a rack.

Disk drive (3.5-inch) Bulk Pack shipping	**Disk drive (3.5-inch) Bulk Pack Shipping**	519137-B21 (Americas only))

Customers ordering disk drives that are not factory configured have the option of getting the drives shipped in a bulk pack package in quantities of 10 drives per package.

NOTE: All drives ordered with a disk drive bulk pack option must be the same drive type per bulk pack. One bulk pack must be ordered for each 10 drives. The drive part numbers must be entered directly after the bulk pack part number.
NOTE: Quantities of disk drives ordered that are not multiples of 10 will be shipped in individual drive shipping packages.
NOTE: The bulk pack shipping option is for the Americas region only.
NOTE: 0D1 will appear after the disk drive part number to indicate that the drives are linked to the bulk pack.

Disk drive	**Disk drive (2.5-inch) Bulk Pack Shipping**	590171-B21

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(2.5-inch) Bulk Pack shipping	Customers ordering disk drives that are not factory configured have the option of getting the drives shipped in a bulk pack package in quantities of 10 drives per package.	(Americas only)

NOTE: All drives ordered with a disk drive bulk pack option must be the same drive type per bulk pack. One bulk pack must be ordered for each 10 drives. The drive part numbers must be entered directly after the bulk pack part number.
NOTE: Quantities of disk drives ordered that are not multiples of 10 will be shipped in individual drive shipping packages.
NOTE: The bulk pack shipping option is for the Americas region only.
NOTE: 0D1 will appear after the disk drive part number to indicate that the drives are linked to the bulk pack.

FC SFPs and FC Cables

EVA Loopback Connector
HP P6000 EVA Loopback Connector
Contains one Loopback connector. The loopback connector is used when a P6000 EVA FC host port is not cabled to a switch or HBA (for direct connect)
NOTE: All EVA FC host ports must be filled with either a cable or loopback connector.

SFPs
The P6000 EVA controllers come with 8Gb SFPs in each FC port.

The following tables show the distances available with various cables and transceivers.

8Gb Transceivers	**Distance-Maximum**	**OM2 Cable**	**OM3 Cable**	**PremierFlex Cable**
	8Gb performance	50 meters	150 meters	150 meters
	4Gb performance	150 meters	380 meters	380 meters
	2Gb performance	300 meters	500 meters	500 meters
4Gb Transceivers	**Distance-Maximum**	**OM2 Cable**	**OM3 Cable**	**PremierFlex Cable**
	8Gb performance	50 meters	150 meters	150 meters
	4Gb performance	150 meters	380 meters	380 meters
	2Gb performance	300 meters	500 meters	500 meters

PremierFlex OM3+ FC cables (optional) (LC to LC)	0.5m PremierFlex LC/LC Multi-Mode Optical Cable	BK837A
	1m PremierFlex LC/LC Multi-Mode Optical Cable	BK838A
	2m PremierFlex LC/LC Multi-Mode Optical Cable	BK839A
	5m PremierFlex LC/LC Multi-Mode Optical Cable	BK840A
	15m PremierFlex LC/LC Multi-Mode Optical Cable	BK841A
	30m PremierFlex LC/LC Multi-Mode Optical Cable	BK842A
	50m PremierFlex LC/LC Multi-Mode Optical Cable	BK843A
FC cable - OM3 LC-LC type cables	.5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ833A
	1 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ834A
	2 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ835A
	5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ836A
	15 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ837A
	30 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ838A
	50 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ839A

Ethernet Cables and Ethernet SFP

1GbE Ethernet cables
The following Ethernet cables can be used to connect between the EVA 1GbE (1Gb/s iSCSI) connectors and the customer's Ethernet network. Up to 8 are needed. No SFPs are needed.

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	CAT 5e cable, RJ45 to RJ45, M/M 4.3m (14ft)	C7536A
	CAT 5e cable, RJ45 to RJ45, M/M 7.6m (25ft)	C7537A
	CAT 5e cable, RJ45 to RJ45, M/M 7.6m (50ft)	C7542A

NOTE: For more information on the Ethernet cables, see:
http://h18004.www1.hp.com/products/servers/proliantstorage/bcs-rackandpower/data-cables/cat_5_cables.html?jumpid=reg_R1002_USEN
(Up to 8 are needed.)

10GbE Copper Ethernet cables	These copper FC cables can be used to connect 10GbE ports to the customer's iSCSI/FCoE network, if the connection is inside the EVA cabinet. No SFPs are required as SFPs are part of the copper cables.	
	HP BLc SFP+ 3m 10GbE Copper Cable (4 are required for redundancy)	487655-B21
PremierFlex OM3+ FC cables (optional) (LC to LC)	The following FC cables can be used to connect the 10GbE ports to the customer's iSCSI/FCoE network. They are to be used when the connection is outside of the EVA cabinet. Optical Ethernet SFPs (see below) are required.	
	0.5m PremierFlex LC/LC Multi-Mode Optical Cable	BK837A
	1m PremierFlex LC/LC Multi-Mode Optical Cable	BK838A
	2m PremierFlex LC/LC Multi-Mode Optical Cable	BK839A
	5m PremierFlex LC/LC Multi-Mode Optical Cable	BK840A
	15m PremierFlex LC/LC Multi-Mode Optical Cable	BK841A
	30m PremierFlex LC/LC Multi-Mode Optical Cable	BK842A
	50m PremierFlex LC/LC Multi-Mode Optical Cable	BK843A
FC cable - OM3 LC-LC type cables	.5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ833A
	1 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ834A
	2 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ835A
	5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ836A
	15 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ837A
	30 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ838A
	50 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ839A
Optical 10GbE Ethernet SFP	10GbE Short Range Ethernet 10GBase-SR	455883-B21

Choose a Rack and Rack Options

Factory Integration	Start your order by choosing a rack to house your P6000 EVA based on the HP 10000 G2 Series Rack.
	NOTE: The 10000 G2 Series Rack is the only series supported for factory configuration.
Primary Configuration Rules	P6000 EVA will be configured into a 42U HP 10000 G2 Series Rack with the appropriate PDU. 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. HP 10000 G2 Series Rack must be purchased for factory configuration. Additional P6000 EVA controller enclosures and drive enclosures may be ordered for multiple subsystem integration at the factory.
	The 5642 (42U) Rack Cabinet System is supported for field installation. This rack may be purchased along with EVA component pieces for assembly in the field. The HP 5642 rack system is an entry level rack with sufficient features for easy access and ease of use.
	When calculating available U-space, assume that no space will be placed

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	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 10000 Series G2 Racks	**NOTE:** The number of 6000 EVA components that will fit in a rack varies and is determined by the interior U-space of the cab.	
	HP 10642 G2 Shock Universal Rack	AF002A
	HP 10642 G2 with Extension Shock Rack	AF004A
	HP 10636 G2 Shock Universal Rack	AF012A
	HP 10636 G2 with Extension Shock Rack	AF014A
	HP 10622 G2 Pallet Universal Rack	AF021A
	HP Rack 10636 G2 Modular Cooling System (MCS) Shock (42U)	AF098A
	HP 10842 G2 Shock Universal Rack	AF042A
	For more information on the HP rack offerings, please see the following URL: http://h18004.www1.hp.com/products/servers/proliantstorage/racks/index.html	
	For more information on PDUs, see: http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/pdu.html	
HP PDU Pivot Kit (0U PDU option)	Used to reclaim 2U of space in a 10000 G2 Series Rack with P6000 EVA configurations. This kit allows the PDUs to be placed in the back of the rack without requiring any rack U space.	AG730A
	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: 0D1 will appear after this part number to indicate factory integration where appropriate.	
Non-HP rack and power requirements	For detailed information on determining compatibility of a non-HP rack, please review the information included in the P6000 EVA User Guide which can be found at: http://www.hp.com/go/P6000	

Expansion Options

	The P6300/P6500 EVA Dual Controller enclosure can be added on-site into existing EVA configurations (or qualified rack systems), using the P6300 Combo kit, P6300 Starter kit, or P6500 dual controller SKUs listed earlier.	
	Additional SAS drive enclosures, either SFF or LFF, listed earlier, can be ordered to expand a P6000 EVA configuration.	
	Additional hard disk drives can be ordered using the drive SKUs listed earlier.	
6 meter SAS expansion cable kit	If a P6000 EVA needs to be expanded into an adjacent cabinet, one 6 meter SAS expansion cable kit is needed for a P6300 EVA; two 6 meter SAS expansion cable kits are needed for a P6500 EVA. Each 6 meter SAS expansion cable kit contains four 6 meter SAS cables.	AP879A
2 meter SAS expansion cable kit	If a P6000 EVA needs to be expanded within the same cabinet, but the drive enclosure to be added needs to be some distance away from the nearest existing drive enclosure within the same cabinet, one 2 meter SAS expansion cable kit is needed. Each 2 meter SAS expansion cable kit contains four 2 meter SAS cables.	AW566A
	NOTE: The SAS cables that come with each drive enclosure are 0.7m (27.3 in) long.	

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Optional Hardware Accessories

Non-HP Rack installation

For racks other than those specifically stated for use with P6000 EVA,, please visit the P6000 EVA web page for details on rack and power specifications: http://www.hp.com/go/P6000, select P6000 EVA and under Support select Manuals, then select P6000 EVA User Manual.

Due to the wide variety of non-HP racks available, HP does not guarantee that the P6000 EVA components will mount or operate properly in non-HP racks.

Step 2 - EVA Firmware and Software

P6000 EVA XCS Controller Firmware

P6000 EVA models are factory installed with controller firmware XCS v10.0 (or later version).

HP P6000 EVA XCS v10.x controller media download is available from HP.com. These downloads are available as archival media for P6000 EVA from the following link: http://h10010.www1.hp.com/wwpc/us/en/sm/WF04a/12169-304616-304648-304648-304648.html

P6000 Command View (REQUIRED)

P6000 Command View-A P6000 Command View Unlimited Capacity LTU license is required for the P6000 EVA.
Setup and Management
Software

Thin Provisioning is now a feature of P6000 Command View, beginning with v9.4 (or later version).

Two versions of P6000 Command View are available and come packaged together in the media kit:

- HP P6000 Command View /SBM (Server Based Management) v9.4 (or later version) is available to run on Windows Management Servers. It is required if Continuous Access EVA is going to be used with the EVA.
- HP P6000 Command View /ABM (Array Based Management) v9.4 (or later version), also comes installed on the management module of P6000 EVA controllers.

For more information on P6000 Command View, see: http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html.

P6000 SmartStart

SmartStart for EVA - Installation Software

Install and configure P6000 EVA using HP P6000 SmartStart configuration utility, which runs on Windows Server systems. This software installs necessary drivers on Windows Server 2003 and 2008 application servers and P6000 Command View / SBM v9.4 (or later version) on a Windows Server 2003 management server, as well as provisions the storage. During installation, click to accept the terms of the HP P6000 SmartStart* configuration utility End User License Agreement (EULA). No separately orderable LTU is required for HP P6000 SmartStart.

*For more information and ordering information on SmartStart, see: http://h18000.www1.hp.com/products/storageworks/evasmartstart/relatedinfo.html?jumpid= reg_R1002_USEN

Replication Solutions Manager

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Configuration Information and Configuration Rules

Replication Solutions Manager - Local Replication Management Software	Replication Solutions Manager Software integrates with HP P6000 Business Copy Software and HP P6000 Continuous Access software for local and remote replication. See the product URL for ordering information and part numbers: http://h18006.www1.hp.com/products/storage/software/repsolmgr/index.html

P6000 Business Copy

P6000 Business Copy - Local Replication Software	HP P6000 Business Copy is a local replication software product for the EVA family providing Snapshot and clone set-up and management. Business Copy is sold by utilized capacity. For more information, see the Business Copy description earlier in this document. See the product URL for ordering information and part numbers: http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html.

P6000 Continuous Access

P6000 Continuous Access - Remote Replication Software	HP P6000 Continuous Access is a controller-based application that performs real-time replication between HP enterprise virtual arrays. For more information, see Continuous Access description earlier in this document. Please see the product URL for ordering information and part numbers: http://h18006.www1.hp.com/products/storage/software/conaccesseva/index.html.

P6000 Dynamic Capacity Management

P6000 Dynamic Capacity Management Software - Capacity Management	HP P6000 Dynamic Capacity Management Software is a comprehensive software solution that automates storage provisioning and improves capacity utilization on the HP Enterprise Virtual Array (EVA) family. For more information, see the DCM description earlier in this document. See the product URL for ordering information and part numbers: http://h18000.www1.hp.com/products/quickspecs/12815_na/12815_na.html

Multiple Path High Availability Software

Multiple Path High Availability Software	Industry popular multiple path software is supported on P6000 EVAs. This software is used to manage multiple paths between hosts and storage systems. It enables high availability through path management and I/O load balancing. Multiple path support is available for the following Operating Systems:

- HP-UX - HP-UX 11.31 has OS native multi-path, pvlinks native in HP-UX and Veritas DMP
- Windows - Full featured MPIO, v3.00.00 available from HP and Microsoft DSM from Microsoft
- Linux - QLogic Failover driver, available from QLogic /HP, Emulex MultiPulse available from Emulex/HP and Device Mapper v4.0 Enablement Kit from HP
- OpenVMS - native in OS
- AIX - MPIO native in OS
- Solaris - MPxIO native in OS, Veritas DMP available from Veritas
- NetWare - MPIO native in OS
- VMware - MPIO native in OS
- Apple Mac OS X - Included with ATTO HBA driver

For more information on other Multi-Path Options for HP Arrays, see:
http://h18006.www1.hp.com/products/storage/software/multipathoptions/index.html

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Step 3 - P6000 EVA Connectivity Options

HP MPX200 Multifunction Router

The HP MPX200 Multifunction Router provides 1GbE and 10GbE iSCSI/FCoE connectivity to the P6000 EVA and enables modular multi-protocol SAN designs with increased scalability, stability, and ROI on storage infrastructure.

NOTE: The MPX200 Multifunction Router can be used with the Fibre Channel (only) P6000 EVA. MPX200 can also be used with the iSCSI or iSCSI/FCoE versions of P6000 EVA array, but the iSCSI or iSCSI/FCoE host ports of P6000 EVA cannot also be used and must be disconnected.

For more information on the MPX200, see:
http://h18006.www1.hp.com/products/storageworks/mpx200mr/related.html?jumpid=reg_R1002_USEN

HP X3000 G2 Network Storage Gateways

Stretch your P6000 EVA array investment by adding file & print services, iSCSI connectivity, and management hosting with an X3000 G2 Series Network Storage Gateway platform. X Series Network Storage Gateways are optimized file and print server solutions that are built on industry-standard HP ProLiant servers and come with Microsoft Windows Storage Server 2008 R2 operating system pre-installed. Since they're Windows-based, network 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.

An X3000 G2 Network Storage Gateway is a file/iSCSI gateway that adds IP-based services to your Fibre Channel array or SAN. So it not only enhances your P6000 EVA investment with file and print services, but it helps you save even more by enabling tiered (Fibre Channel and iSCSI) block access for application servers. All of your important client and server data can be managed, scaled, and protected on a single P2000 G3 array.

For more information visit: www.hp.com/go/X3000

HP IP Distance Gateway (mpx110)

The HP IP Distance Gateway (mpx110) provides SAN over WAN connectivity for protecting and replicating data between HP P6000 EVA and P9000. By connecting islands of SANs over WANs, the IP Distance Gateway enables continuous access replication, both asynchronous and synchronous, SAN device sharing, data migration and other long distance data services. Providing long distance data services and the ability to copy, move and replicate data, both locally and over long distances. SANs have limited distance capabilities (35km) and IT managers need to share, protect and move data over greater distances than 35km. Routers and switches that link SANs over IP WANs is the primary method for most IT managers. The IP Distance Gateway uses the FCIP (Fibre Channel Internet Protocol) standard to extend SAN connectivity over the WAN.

For more information on the HP IP Distance Gateway, please see:
http://h18006.www1.hp.com/products/storageworks/fcipd_gateway/index.html

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HP P6000 Enterprise Virtual Array

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Step 4 - Other SAN Components and Software

SAN Components

The HP SAN integrates best-in-class storage networking components to deliver a complete connectivity platform for end-to-end network storage solutions. HP's fabric portfolio includes:

- HBAs,
- directors,
- switches,
- SAN extenders,
- NAS heads,
- iSCSI routers, and
- fabric software.

HP SAN Infrastructure components deliver the network storage infrastructure for the Adaptive Enterprise.

For details on SAN infrastructure components and storage compatibility information, please visit: http://hp.com/go/san

Storage Resource Management Software (HP Standard Edition SRM Software)

HP Storage Essentials Standard Edition Storage Resource Management Software allows midsize businesses with limited IT staff to see the big picture thereby reducing SAN complexity. For more information, see the Storage Essentials product description earlier in this document: http://h18006.www1.hp.com/products/software/bto/srmgt/standard/index.html.

VMware Site Recovery Manager

VMware Site Recovery Manager (SRM) is designed to automate the recovery process and the remote replication of HP P6000 Continuous Access EVA with P6000 EVA. The solution provides central management through VMware Virtual Center and enables more frequent testing. This solution also leverages your existing recovery site hardware to reduce operational cost of training. It is a solution that is fully integrated with HP servers, HP Storage and HP Services, providing mid-market customers with a total business continuity solution. For more information: www.hp.com/go/storage/vmware

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	P6000 EVA
Operating Temperature	50° to 95° F (10° to 35° C) - Reduce rating by 1° F for each 1000 ft altitude (1.8° C/1,000 m)
Shipping Temperature	-40° to 150° F (-40° to 66° C)
Humidity	10% to 90% non-condensing
Shipping Humidity	5% to 90% non-condensing
Operating Vibration	Sine 5-10 Hz 0.020" (0.5mm) double amplitude displacement, 10-500 Hz 0.1g, Random 10-500Hz at 0.15 Grms
Non-operating Vibration	Sine 10-150 Hz 0.3g, Random 10-500 Hz at 0.5 Grms
Shipping Vibration (packaged, on shock pallet)	Sine 5-150 Hz 0.5g, Random 0.86 Grms from 5-300 Hz, consisting of 5-100 Hz at 0.0059 g2/Hz and 100-300 Hz at 0.000049 g2/Hz
Operating Shock	5g half-sine 10mSec
Non-operating Shock	8g half-sine 10mSec
Shipping Shock (packaged, on shock pallet)	Horizontal: 10-deg incline at 1m/Sec, Vertical rotational edge 0.15m
Altitude	Up to 8,000 ft (2,400 m)
Air Quality	Not to exceed 500,000 particles per cubic foot of air at a size of 0.5 micron or larger

Power Data (North America/Europe/Japan) **maximum configuration**

NOTE: This power information is for a maximum configuration using the default 208 - 240 Volt single-phase PDUs. Other PDUs may use different plugs, voltages, etc. For more information on PDU support, please see the following URL: http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/pdu.html

AC plug type (quantity 2)	North America - 3 wire NEMA No. L6-30P, 30 Amp (208 to 240V, 50-60Hz 30A)
	Europe - 3 wire, 2 pole IEC 309, 30 amp, (220 to 240V 50Hz 32A) **NOTE:** For other voltages, including 3-phase or 100-127V, see the PDU information for plug types at: http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/pdu.html.
Number of phases	Single (3-phase PDUs are also available)
Rated current	17A @ 200V-240V AC, 60Hz total, 4.25 A per power cord (2 PDUs) 34A @ 100-127V AC, 60/50Hz, 8.5A per power cord (2 PDUs) **NOTE:** The current ratings are for a full 42U cabinet with default PDUs. Different PDUs have different current/power ratings. The cabinet may be full of EVA and other equipment and actual current loads will vary by configurations. For the individual P6300 EVA or P6500 EVA current loads, see the table below.
Nominal Line Voltage	North America - 208V or 230V or 120V Europe - 230V Japan - 206V or 108V Latin America - 208V or 240V
Range Line Voltage	187V to 256V or 90V to 127V
Line Frequency	North America 60 Hz, Europe 50 Hz, Japan 50 or 60 Hz, Latin America 60K or 50Hz

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P6300/P6500 Enterprise Virtual Array Power, Heat and Current

NOTE: This data represents dual controllers and fully populated drive shelves. To determine total configuration power, select the proper controller pair and the number of enclosures with the proper drives and add up the total consumption. NOTE: At idle, the system operates at approx. 15% less power than at typical.		P6000 EVA Dual Controllers		Drive Enclosures			Configurations			
		FC Only	FC and 10GbE	M6612 with 12 LFF drives	M6625 with 25 SFF drives	M6612 or M6625 with no drives	P6300 EVA FC /10GbE 2C10D with 120 15K LFF drives	P6300 EVA FC /10GbE 2C10D with 250 15K SFF drives	P6500 EVA FC 10GbE 2C20D with 240 15K LFF drives	P6500 EVA FC /10GbE 2C18D with 450 15K SFF drives
Typical	Total Unit Wattage @ 230V	95.8	138.7	269.5	223.6	66.0	2992.0	3016.6	5845.3	5059.8
	Total Unit BTU/hour @ 230V	326.5	473.0	919.0	762.4	225.2	10202.8	10286.6	19932.6	19254.0
	Input Current per plug, 230V	0.21	0.30	0.59	0.49	0.2	6.5	6.6	12.7	11.0
	Input Current per plug, 208V	0.23	0.33	0.65	0.54	0.2	7.2	7.3	7.0	12.2
	Input Current per plug, 115V	0.21	0.30	0.60	0.49	0.2	6.6*	6.7*	12.9*	11.2*
	Input Current per plug, 100V	0.24	0.35	0.69	0.57	0.2	7.7*	7.7*	10.0**	13.0**
	In Rush Current (A) per plug, 208V	40	40	30	30	30	220	220	270	260
Failover Mode	Total Unit Wattage @ 230V	31.4	136.5	259.2	213.2	53.8	2887.3	2917.4	5638.2	5059.8
	Total Unit BTU/hour @ 230V	311.7	465.5	883.9	727.1	183.3	9845.8	9948.3	19932.6	17269.7
	Input Current (A), 230V	0.40	0.59	1.13	0.93	0.23	12.6	12.7	24.5	21.2
	Input Current (A), 208V	0.44	0.66	1.25	1.03	0.26	13.9	14.0	13.6	23.5
	Input Current (A), 115V	0.40	0.59	1.14	0.94	0.24	12.7*	12.9*	24.9**	21.5**
	Input Current (A), 100V	0.46	0.68	1.33	1.10	0.28	14.8*	15.0*	19.3**	16.7**

*Using 4 PDUs
** Using 6 PDUs.

For more detailed information on a specific configuration and drives please utilize the EVA Power Calculator at:
http://www.hp.com/servers/powercalculator

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Technical Specifications

P6000 EVA Product Dimensions, Weight and Clearance

Physical Dimensions	Height in/cm	Width in/cm	Depth in/cm	Max Weight lb/kg	Req. Front Clearance in/cm	Req. Rear Clearance in/cm
42U Graphite cab with dual PDUs and pivot kit	78.75/200.03	23.7/60.3	40.2 /102.2	302/137.3	30/76.2	30/76.2
P6000 EVA Dual Controller Array, FC	3.5/8.9	17.6/44.7	24.5/62.3	58.75/26.7	N/A	N/A
P6000 EVA Dual Controller Array, FC and 1GbE or FC and 10GbE	3.5/8.9	17.6/44.7	24.5/62.3	60.25/27.4	N/A	N/A
LFF SAS Drive with carrier*	4.29/10.9	1.065/2.7	7.36/18.7	2.0/0.9	N/A	N/A
SFF SAS Drive with carrier*	2.97/7.6	0.60/1.5	5.34/13.6	0.7/0.3	N/A	N/A
M6612 LFF Drive Enclosure - no drives	3.5/8.89	17.6/44.70	23.75/60.33	38/17.3	N/A	N/A
M6612 LFF Drive Enclosure with 12 drives*	3.5/8.89	17.6/44.70	23.75/60.33	62/28.2	N/A	N/A
M6625 SFF Drive enclosure - no drives	3.5/8.89	17.6/44.70	23.75/60.33	38/17.3	N/A	N/A
M6625 SFF Drive Enclosure with 25 drives*	3.5/8.89	17.6/44.70	23.75/60.33	55/25.0	N/A	N/A
P6300 EVA FC 2C10D with 120 LFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	981/445.9	30/76.2	30/76.2
P6300 EVA FC 2C10D with 250 SFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	916/416.4	30/76.2	30/76.2
P6300 EVA FC & iSCSI 2C10D with 120 LFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	983/446.8	30/76.2	30/76.2
P6300 EVA FC & iSCSI 2C10D with 250 SFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	918/417.3	30/76.2	30/76.2
P6500 EVA FC 2C20D with 240 LFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	1601/727.7	30/76.2	30/76.2
P6500 EVA FC 2C18D with 450 SFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	1360/618.2	30/76.2	30/76.2
P6300 EVA FC & iSCSI 2C20D with 240 LFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	1473/669.5	30/76.2	30/76.2
P6300 EVA FC & iSCSI 2C18D with 450 SFF Drives*	78.75/200.03	23.7/60.3	40.2/102.2	1362/619.1	30/76.2	30/76.2
P6300 Starter Kit with 8 300GB SFF drives	7.0/19.8	17.6/44.7	24.5/62.3	103/46.8	N/A	N/A
P6300 Starter Kit with 8 600GB SFF drives	7.0/19.8	17.6/44.7	24.5/62.3	103/46.8	N/A	N/A

QuickSpecs

HP P6000 Enterprise Virtual Array

Technical Specifications

* Weight will vary somewhat by drive capacity and vendor. The weight shown is with the heaviest drive available.

For hard drives, 1GB = 1 billion bytes (1000^3 or 10^9). Actual usable capacity can be less, based on Vraid types used.