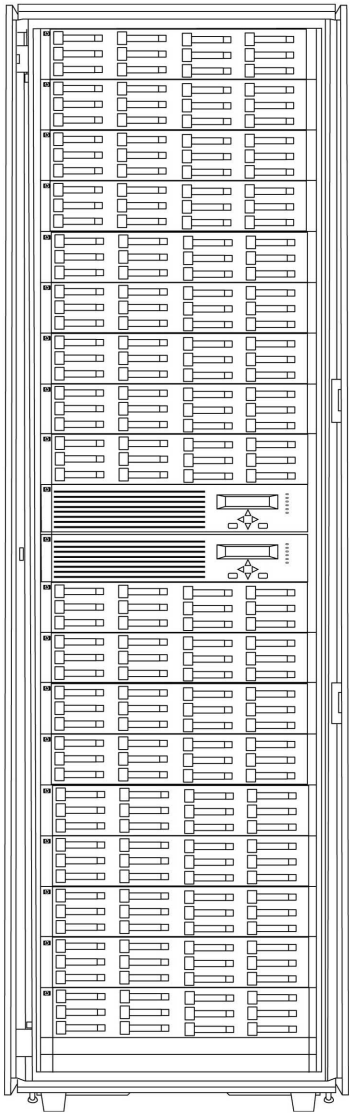
Overview

The HP 6400/8400 Enterprise Virtual Array (EVA) family is an enterprise class storage array system designed to aggregate and automate your array management tasks to manage more storage capacity with fewer resources. The EVA is designed specifically for customers in the business critical, enterprise marketplace and is a scalable, highly available and highly reliable "virtual" array storage solution. The EVA6400/8400 saves time, space and costs compared to traditionally architected storage. It is supported by a powerfully simple suite of management software making it easy for users to provision storage and to achieve the highest level of productivity.

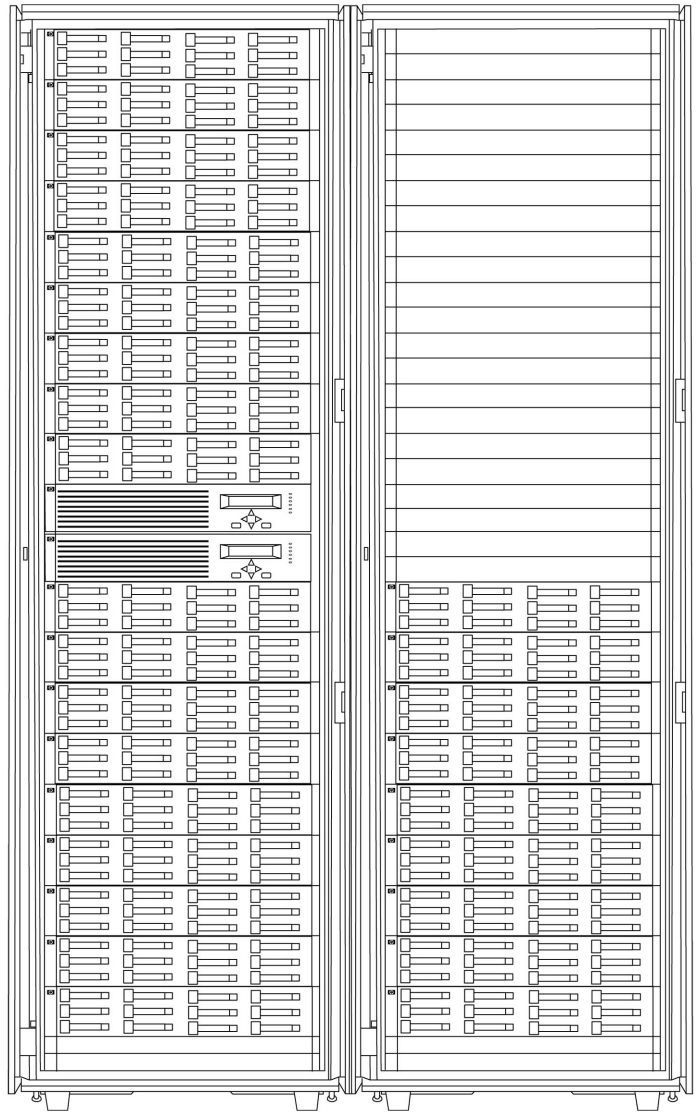
The HP 6400/8400 Enterprise Virtual Array family is designed for the data center where there is a critical need for improved storage utilization and scalability. The EVA meets application specific demands for transaction I/O performance for mid-range and enterprise customers. It provides easy capacity expansion, instantaneous replication and simplified storage administration. The Enterprise Virtual Array combined with HP Command View EVA software provides a comprehensive solution designed to simplify management and maximize performance.

HP offers a full spectrum of complementary HP EVA hardware, software product, solutions and HP services. This includes the EVA4400 for affordable, fast and easy small SAN deployment; the MPX200 Multifunction Router, which provides 1 GbE and 10 GbE iSCSI, FCIP, and 10Gb FCoE (Fibre Channel over Ethernet); Business Copy EVA; Continuous Access EVA; Dynamic Capacity Management; HP Storage Essentials Performance Edition Software for path aware performance management; and solution integration. In addition, the EVA warranty offering provides the base level of service to which you can add appropriate service options. HP Services provide additional offerings up to Critical Service, the support for mission critical environments.

Overview



EVA6400 2C18D



EVA8400 2C27D

These drawings are informational only. The actual configuration may differ depending on the number of disk enclosures chosen and the components being racked with the EVA. The EVA6400 can support up to 18 drive enclosures for a total of 216 disks. The EVA8400 can support up to 27 drive enclosures in two racks for a total of 324 disks.(If a customer has a specific racking requirement they should use the Factory Express option to define the configuration.

What's New

- Support for Command View v10.0 with integrated Single Pane of Glass management, with Performance Advisor software for performance monitoring any EVA except the EVA3000/5000
- Support for a new 2TB FATA drive with XCS controller firmware 10.0 or later
- Support for XCS10.0 controller firmware with support for Thin Provisioning and Dynamic LUN migration
- Enhanced Large LUN support including the ability to shrink and grow a LUN greater than 2TB, integrated with Business Copy and thin provisioning

Product Highlights

	EVA4400	EVA6400	EVA8400
Controller Model	HSV300	HSV400	HSV450
Virtual Controller Software (XCS)	XCS v10.0xx	XCS v10.0xx	XCS v10.0xx
Management Software	Command View EVA v9.4 or v10.0	Command View EVA v9.4 or v10.0	Command View EVA v9.4 or v10.0
Application Environment Support	Oracle, SAP, Microsoft Exchange, SQL	Oracle, SAP, Microsoft Exchange, SQL	Oracle, SAP, Microsoft Exchange, SQL
Virtual Server Technology Support	VMware, Microsoft Hyper-V, Citrix XenServer, RHEL Virtualization and Oracle Virtual Machine	VMware, Microsoft Hyper-V, Citrix XenServer, RHEL Virtualization and Oracle Virtual Machine	VMware, Microsoft Hyper-V, Citrix XenServer, RHEL Virtualization and Oracle Virtual Machine
Local Data Replication -- HP Business Copy EVA	Yes	Yes	Yes
Remote Data Replication -- HP Continuous Access EVA	Yes	Yes	Yes
Command View EVA Array management and configuration support	up to 16 EVAs	up to 16 EVAs	up to 16 EVAs
Application block and file storage	Yes	Yes	Yes
O/S Support*	HP-UX HP OpenVMS Windows 2003 Windows 2008 Windows Server 2008 HyperV Sun Solaris Linux IBM AIX VMware Apple Mac OSX Xen	HP-UX HP OpenVMS Windows 2003 Windows 2008 Windows Server 2008 HyperV Sun Solaris Linux IBM AIX VMware Apple Mac OSX Xen	HP-UX HP OpenVMS Windows 2003 Windows 2008 Windows Server 2008 HyperV Sun Solaris Linux IBM AIX VMware Apple Mac OSX Xen
RAID supported	Vraid 0, Vraid1, Vraid 0+1, Vraid 5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps (SSDs do not support Vraid 0 or Vraid 6)	Vraid 0, Vraid1, Vraid 0+1, Vraid 5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps (SSDs do not support Vraid 0 or Vraid 6)	Vraid 0, Vraid1, Vraid 0+1, Vraid 5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps (SSDs do not support Vraid 0 or Vraid 6)
LUN size	Up to 32TB	Up to 32TB	Up to 32TB
Number of controllers	2	2	2
Cache (per controller pair)	4GB	8GB	14 or 22GB
Battery Back-up Cache	Yes, up to 96 hours	Yes, up to 96 hours	Yes, up to 96 hours
Host Connectivity	Fibre Channel, iSCSI, FCoE, and Direct Connect	Fibre Channel, iSCSI, FCoE, and Direct Connect	Fibre Channel, iSCSI, FCoE, and Direct Connect
Number of Host Supported (Single Path/Dual Path)	256	256	256

Product Highlights

Host Ports (per controller pair)	4 or 2 embedded FC switches with ten 8Gb/s FC SAN ports per controller	8	8
Host Port Speed	4 Gb	4 Gb	4 Gb
Device Connectivity	Redundant FC-AL pairs from each controller to switched JBOD for redundant paths to dual drive ports	Redundant FC-AL pairs from each controller to switched JBOD for redundant paths to dual drive ports	Redundant FC-AL pairs from each controller to switched JBOD for redundant paths to dual drive ports
Device Ports (per controller pair)	4	8	12
Device Port Speed	4 Gb	4 Gb	4 Gb
Device Path Aggregate Bandwidth	16 Gb	32 Gb	48 Gb
Switched device shelves (M6412-A)	1 to 8	2 to 18	3 to 27
Drives per enclosure	12	12	12
Drive types (mixed in any enclosure)	Solid State Drives (SSD), High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)	Solid State Drives (SSD), High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)	Solid State Drives (SSD), High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)
Supported disks, minimum	6 SSD, 8 FC and FATA	6 SSD, 8 FC and FATA	6 SSD, 8 FC and FATA
Supported disks, maximum	8 SSD, 96 FC and FATA	8 SSD, 216 FC and FATA	8 SSD, 324 FC and FATA
Capacity	.4 to 132TB	.4 to 330TB*	.4 to 550TB*
Drive capacities and speeds	72GB SSD 200GB SSD 400GB SSD 300GB 10K rpm 450GB 10K rpm 600GB 10K rpm 300GB 15K rpm 450GB 15K rpm 600GB 15K rpm 1TB FATA 2TB FATA	72GB SSD 200GB SSD 400GB SSD 300GB 10K rpm 450GB 10K rpm 600GB 10K rpm 300GB 15K rpm 450GB 15K rpm 600GB 15K rpm 1TB FATA 2TB FATA	72GB SSD 200GB SSD 400GB SSD 300GB 10K rpm 450GB 10K rpm 600GB 10K rpm 300GB 15K rpm 450GB 15K rpm 600GB 15K rpm 1TB FATA 2TB FATA
JBOD Support (behind XP)	Yes	Yes	Yes
Drive Interface (per controller)	Two 4Gb/s FC-AL ports per controller in redundant pairs, two paths to each dual ported drive	Four 4Gb/s FC-AL ports per controller in redundant pairs, two paths to each dual ported drive	Six 4Gb/s FC-AL ports per controller in redundant pairs, two paths to each dual ported drive
Variable Speed Redundant Blowers	Yes	Yes	Yes
Environmental Monitoring Unit	Monitors Power and Temperature	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	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		

Product Highlights

NOTE: See Operating System, Cluster and High Availability Compatibility matrix for Operating System version detail.
*The maximum single disk group size is 400TB. So two disk groups are required beyond 400TB.

EVA Capabilities

- Support for Command View v10.0 with integrated Single Pane of Glass management, with Performance Advisor software for performance monitoring any EVA except the EVA3000/5000
- New Thin Provisioning software and Dynamic Capacity Management software
- Enhanced Large LUN support including the ability to shrink and grow a LUN greater than 2TB, integrated with Business Copy and thin provisioning.
- Virtualization abilities allow for easy management and excellent capacity utilization
- Scale and re-configure your EVA capacity as your business grows and changes
- Excellent reliability and availability established for the EVA architecture. HP's data shows that most customers are achieving 99.999% availability with the EVA 4x00/6x00/8x00 architecture
- Support for integrated application (block) and file storage solution with EVA file services offerings
- Support for dual-ported 4 Gb/s FC disk drives and 4 Gb/s dual-ported Fibre Attached Technology Adapted (FATA) drives and dual ported Solid State Drives (SSD)
- Support for Direct Attach connection to Windows storage servers without the need for SAN switches.
- Supports up to 2048 LUNs or virtual disks (up to 256 per HBA) ranging in size from 1GB to 32TB per Virtual disk, in 1GB increments.
- Dynamic Capacity Management support to expand LUNs up to 2TB (in 1GB increments) and shrink LUNs 2TB or less.
  NOTE: Requires Host Operating System Support.
- Virtual disk data load leveling (non-disruptive background activity)
- Distributed sparing of disk capacity
- Proactive migration of data from a failing drive into unused space or spare space
- Redundant FC-AL loops from each controller to dual disk ports
- Support for HP Continuous Access EVA remote replication (synchronous and asynchronous).
- Support for remote replications between current EVA generations
- Migration support via remote replications between current and earlier EVA generations
- Support for Data-in-place upgrades from EVA4400 to EVA6400 and EVA8400 or EVA6400 to EVA8400
- Support for HP Business Copy EVA (Snapshot, and Vsnap (virtually capacity free snapshots), Snapclone, MirrorClone and Cross Vraid snapshots and Snapclone).
- Dual redundant controller operation for increased fault tolerance.
- 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
- Hardware based Virtual RAID (Vraid) provides improved RAID performance and the benefits of virtualization to grow and shrink RAID volumes (Vraid0, Vraid1, Vraid 0+1, Vraid5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps)
  NOTE: Vraid0 should be used with care in select application. It provides no data redundancy and can result in data loss. Vraid0 is not supported on SSDs.
- 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

Product Highlights

- Supports connection of up to 256 hosts
- Multi-Vendor Platform Support
- Controller Password Protection for Configuration Control
- Selective Storage Presentation and SAN-based Data Zoning (through switches).
- HP Command View EVA GUI Interface for management and monitoring (manages up to 16 EVAs).
- Monitor and control health, HP EVA end-to-end SAN performance and monitoring, storage utilization and reporting for all key HP EVA and SAN infrastructure including servers, storage, HP MSA, HP EML E-series tape, X Series Network Storage Systems, HBAs, switches, applications and monitor the entire backup from a single interface with HP Storage Essentials SRM Standard Edition Software

Enterprise Virtual Array Product Packaging	The EVA Product Family consists of the EVA4400, EVA6400 and EVA8400. They utilize the 12 bay M6412A disk enclosure and the same family of Fibre Channel disks. These disks consist of dual ported Fibre Channel solid state drives, high performance Fibre Channel disks and Fiber Attached Technology Adapted (FATA) disks.
EVA6400 and EVA8400 Product Packaging	The EVA6400 is designed to address moderate capacity and performance needs ranging (from 2 to 18 drive enclosures, .4 - 216TB). The EVA6400 packaging consists of a 4U FC dual HSV400 controller assembly and 2 to up to a full rack (18) M6412 12-bay FC Drive Enclosures. The EVA8400 is designed to address moderate to large capacity with high performance needs ranging (from 3- 27 drive enclosures, .4 - 324TB). The EVA8400 packaging consists of a 4U FC dual HSV450 controller assembly with either 14GB or 22GB of cache and from 3 to up to a 27 M6412 12-bay FC Drive Enclosures in a two racks. The EVA6400 and EVA8400 configurations allow a wide range of configuration options. The EVA offer 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, 36U and 22U heights). Factory racking options allow the, EVA6400 and EVA8400 to be factory integrated into cabinets with a wide variety of other HP offerings such as servers and tape back-up offerings.
Non-HP Rack installation	For racks other than those specifically stated within the EVA4400/6400/8400 product set, please visit the EVA web page for details on rack and power specifications: http://www.hp.com/go/eva
SAN Infrastructure Components	The HP SAN integrates best-in-class storage networking components to deliver a complete connectivity platform for the Converged Infrastructure with 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.

Product Highlights

Multi-Vendor Platform

The EVA6400/EVA8400 provide support for industry-leading Operating System platforms including:

- HP-UX
- HP OpenVMS
- Windows Server 2003
- Windows Server 2008
- Windows Server 2008 Hyper-V
- Sun Solaris
- Linux
  - Red Hat
  - SUSE/SLES (including Open Enterprise Server)
  - Oracle Enterprise Linux
- IBM AIX
- VMware
- Apple Mac OSX
- Xen
  - Citrix Xen
  - RHEL Virtualization
  - Oracle Virtual Machine

NOTE: See Operating System, Cluster and High Availability Compatibility matrix for Operating System version detail.

Designed for No-Single-Point-of-Failure

The 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.

Remote Replication Solutions
(Software options)

HP Continuous Access provides disaster tolerant replication across a Fibre Channel SAN. Continuous Access EVA performs real-time replication between HP Enterprise Virtual Arrays of the current and earlier generations. Continuous Access EVA 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, Continuous Access EVA provides 24x7 protections against disaster like scenarios, in campus, metro or continental networks. Thus, enabling business protection against unforeseen events.

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. Information on 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

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Product Highlights

Disaster Tolerant Solutions (Software options)

HP Metrocluster with Continuous Access EVA and Continentalclusters are integrated solutions that offer minimal downtime by rapid site recovery with automatic failover of application services (via Serviceguard) and automatic data consistency checking and read/write enabling of remotely mirrored storage in the event of a fault, failure, or disaster recovery.

NOTE: Metrocluster and Continentalclusters will be available following the introduction of the EVA6400/8400. Check the following URL for more information and availability:
http://h71028.www7.hp.com/enterprise/cache/4171-0-0-0-121.html

HP Cluster Extension EVA software is a full-site disaster tolerance solution designed for mid-range storage array implementation. A disaster tolerant solution for Windows 2003 and Linux environments, Cluster Extension EVA integrates, automates, and synchronizes server cluster failover operations with the remote replication management capabilities of HP Continuous Access EVA for a disaster tolerant solution for EVA arrays whether used as primary storage or in a tiered-storage configuration.
http://www.hp.com/go/clxeva

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

Local Replication Solutions (Software options)

The HP Business Copy is a local replication application for the EVA family. It incorporates Virtually Capacity-free Snapshot (Vsnaps), standard snapshots and Snapclone capabilities with an improved user interface to assist the storage administrator. 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.

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, visit:
http://h18006.www1.hp.com/products/storage/software/eva_dcm/index.html.

Product Highlights

Replication Management

HP Business Copy EVA and HP Continuous Access EVA comes complete 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 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.

Thin Provisioning

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

Application Integration with Oracle

As an option to HP Business Copy EVA, the user can simply replicate an Oracle database. HP Replication Solutions Manager will provide 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.

HP Insight Control Storage Module for vCenter

HP Insight Control Storage Module for vCenter is used to reference the stand-alone storage installation and the storage components within the overall plug-in package

Storage Module for vCenter support for the EVA allows customers who are using the VMware vSphere management console, vCenter, to monitor and manage the storage associated with VMware virtual machines. The HP EVA can be added to vCenter, allowing vCenter administrators to list LUN/volume connections, determine the storage attributes associated with virtual machines, and monitor the arrays.

- Monitor the status and health of HP arrays to provide health and status on their EVA
- Manage LUN / volume connections from VMs and ESX servers to the arrays provides the location

and attributes of the EVA within the SAN
- Identifies what storage features are available to allow administrators to match the features available on the EVA to their requirements
- Supports mixed array environments including EVA, P4300/4500, MSA and/or XP

Storage Module for vCenter is downloadable from Software Depot:
http://h20293.www2.hp.com/portal/swdepot/displayProductsList.do?category=NAS

For more information on HP Insight Control Storage Module for vCenter visit: www.hp.com/go/vmware

Application Solutions

The EVA is the ideal solution for customers running Oracle, Microsoft, SAP environments and those customers who are deploying virtual server technologies like VMware, Hyper-V, Xen and Oracle Virtual Machine. HP Enterprise Virtual Arrays (EVA) delivers virtual storage for the midsize customer with enhanced performance, better capacity utilization, and easier management of on-demand storage activities.

For customers, one of the greatest concerns is always database performance. With larger LUNS and Solid State Drives (SSD) built into the HP EVA, customers get industry leading, super fast performance along with the scalability, availability, and ease of management capabilities they have come to expect from HP Storage Solutions. Everything a customer depends on when managing their most critical business asset - business data.

HP has developed an in-depth understanding of Oracle, Microsoft, SAP, and VMware technology by extensive lab-testing best practices with HP EVAs, HP servers, and management software; high availability and disaster recovery solutions; and backup and recovery on the Oracle, Microsoft, and SAP application platforms. As a result, our customers can expect a wide range of operational and business benefits where they can:

- Achieve optimal performance on an Oracle, Microsoft, SAP platforms
- Minimize back-up windows and simplify recovery of their database and/or application
- Significantly improve Exchange messaging recovery points and recovery time
- Get predictable operational results
- Reduce implementation costs and risks
- Gain optimum return on Oracle, Microsoft, and SAP investments

To learn more about specific HP Storage Solutions that are built with Oracle, Exchange, SAP environments in mind, visit the solution sites supporting each of these applications.

HP Storage for Oracle hyperlink to: http://www.hp.com/storage/oracle
HP Storage for Microsoft SQL Server hyperlink to: http://www.hp.com/storage/sqlserver
HP Storage for Microsoft Exchange hyperlink to: http://www.hp.com/storage/exchange
HP Storage for SAP hyperlink to: http://www.hp.com/storage/sap

Product Highlights

EVA with HP Storage Essentials Storage Resource Management Software Suite

HP Storage Essentials Storage Resource Management Software Suite and HP Storage Essentials Performance Edition Software integrate with HP Systems Insight Manager to provide advanced server and storage management capabilities. HP Storage Essentials Suite Software features a base management console and a portfolio of plug-ins to assist in managing EVA 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, capacity metering, provisioning and application infrastructure monitoring.
http://h18006.www1.hp.com/products/storage/software/e-suite/index.html

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HP Storage Essentials Performance Edition (end-to end EVA SAN Performance Management)

HP Storage Essentials Performance 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 Enterprise Virtual Array. A unified and simplified interface, helps EVA administrators increase efficiency, troubleshoot performance bottlenecks faster, and quickly visualize the performance of their EVA storage, hosts and SAN infrastructure with real-time monitoring, historical trend analysis and trend extrapolation.

For more information on HP Storage Essentials Performance Edition Software visit:
http://h18006.www1.hp.com/products/storage/software/e-suite/index.html

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HP 12000 Virtual Library System EVA Gateway

Expanding the power of the HP Enterprise Virtual Array (EVA), the HP 12000 Virtual Library System EVA Gateway accelerates backup performance in complex SAN environments while improving overall reliability. Integrating seamlessly into existing backup applications and processes by emulating popular tape libraries and tape drive formats, the HP VLS12000 EVA Gateway matches the existing data protection environment, removing the need to change backup software or monitoring policies. Additionally, because the VLS EVA Gateway uses HP EVAs as the storage pool, ease of use is maintained throughout the system. By emulating multiple tape drives simultaneously, more backup jobs can be done in parallel resulting in reduced backup times and, because the data resides on disk, single file restores are exceptionally fast.

The HP Virtual Library System EVA Gateway simplifies your SAN environment by providing more virtual devices and leveraging existing switches and HP EVA infrastructure. The result is the ability to vastly increase scale yet reduce the complexity of shared storage while maintaining the manageability of the system. As your environment changes, the HP Virtual Library System EVA Gateway adapts to it - host masking and mapping ensure that only the appropriate hosts have access to the HP Virtual Library System.

The HP Virtual Library System EVA Gateway offers advanced features such as Automigration which allows users to move data under the control of the VLS from the VLS storage to tape or another VLS. The VLS EVA Gateway also supports accelerated deduplication which delivers fast backup performance since the deduplication process does not impact the backup. For more information on the VLS EVA Gateway, please visit the link below:
http://h18006.www1.hp.com/storage/disk_storage/disk_to_disk/vls/12000vls/index.html

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EVA iSCSI/FCoE Connectivity

EVA iSCSI/FCoE support is integrated into the EVA6400 and EVA8400 14/22GB 10GbE iSCSI/FCoE and available through the HP MPX200 Multifunction Router. These powerful solutions provide iSCSI connectivity to an EVA utilizing the EVA's existing Fibre Channel infrastructure. The EVA6400 and EVA8400 10GbE iSCSI offerings come with standard 3 year 9x5 warranty and Installation and Start-up.

Product Highlights

As mid-range and enterprise businesses grow and deploy physical/virtual servers and storage arrays, the amount of information required to manage, share, and protect continues to grow. The HP MPX200 Multifunction Router extends the Fibre Channel (FC) SAN and HP Enterprise Virtual Array (EVA) investment with integrated multi-protocol support, allowing customers to incorporate iSCSI without requiring separate iSCSI storage arrays or additional management costs. The MPX200 offers simultaneous iSCSI and Fibre Channel over IP (FCIP) support or iSCSI and offline data migration support with 10 GbE (iSCSI only), 1 GbE (iSCSI and FCIP) and 8Gb/s FC technology, providing modular multi-protocol SAN designs with increased scalability, stability, ROI and simpler to manage, secure storage solutions for virtualized server environments. MPX 200's enterprise-class high-availability design provides dual hot-plug power supplies and router blades for no single point of failure. MPX200, integrated in same rack, allows customers to connect up to 4 EVA's to a single MPX200, reducing the complexity and cost of iSCSI connectivity to EVA storage arrays. Modular multi-protocol SAN designs using MPX200 increase scalability, stability, and ROI on storage infrastructure.

The MPX200 Multifunction Router enables organizations to integrate low-cost Ethernet connected servers with an EVA storage system by bridging the iSCSI protocol to the Fibre Channel protocol. This capability allows iSCSI servers to leverage shared SAN resources, improving asset utilization and enabling new applications. This integration greatly reduces the cost of connecting servers to centrally managed storage and helps provide a cost-effective solution to introduce utility computing into the enterprise.

An EVA with multi-protocol support also provides network storage at reduced infrastructure costs. Small and medium businesses now have a lower entry point to take advantage of SAN benefits. Large enterprises may also deploy multi-protocol SANs in departments and remote offices.

Key Benefits

- Delivering SAN-like benefits over the Ethernet IP network, the HP MPX200 Multifunction Router enables access to block storage across up to 4 EVA storage systems from an Ethernet IP network.
- Provides customers a flexible and cost effective way to connect stranded servers to existing Fibre Channel storage, increasing return on investment.
- Allows hundreds of servers to be cost effectively connected to the EVA using iSCSI in addition to Fibre Channel. Enterprise-class high availability design provides dual hot-plug power supplies and router blades for no single point of failure.
- Modular software and hardware design enables easy upgrades to enable additional protocols or to add more ports.
- Unmatched performance: 8 Gb/s Fibre Channel, 1 GbE and 10 GbE iSCSI ports deliver best in class performance.
- Advanced installation and configuration wizards allow set up in less than 25 minutes.
- Power efficient: typically dissipates 200W for a dual blade configuration.
- Extend access to FC SANs across Ethernet networks with the virtues of an FC SAN including:
  - Consolidated storage
  - Improved disk utilization
  - Improved IT efficiency
- FCIP for SAN over WAN: MPX200 now includes Fibre Channel over IP (FCIP) functionality enabling customers to do low cost remote data replication over IP networks. Customers can deploy MPX200 to provide iSCSI and FCIP connectivity simultaneously.
- Direct connection to the EVA
- Data Migration: MPX200 can now enable customers to migrate their data between heterogeneous storage arrays (offline) at a very high performance using a very user friendly data migration GUI.

Key Features

- Supports four Ethernet and two Fibre Channel ports
- Increase the flexibility of EVAs by adding integrated iSCSI support
- Delivers the benefits of SAN storage at a significant discount to FC SAN storage
- Concurrent FC and IP traffic is managed with high throughput enabling access for 300-600 iSCSI servers and 4096 LUNS per MPX200 chassis
- Fully integrated EVA and MPX management with Command View EVA
- iSCSI ready for the following operating systems:
  - Microsoft Windows
  - VMware
  - Linux Red Hat
  - Linux SUSE
  - Apple Mac OS X (via iSCSI Initiator from ATTO Technology)
  - Sun Solaris
- Supports High Availability Multi-path Options for Linux, Microsoft Windows, Sun Solaris, and VMware

Fibre Channel over IP (FCIP for SAN over WAN connectivity)

- Supports FCIP for SAN over WAN remote data replication using HP Storage Works Continuous Access EVA software
- 1GbE FCIP routes. Only 1GbE ports can be configured for FCIP routes, even on a 10GbE blade. (10 GbE FCIP future)
- Up to 4 FCIP Routes per MPX200 Chassis
  - High Performance FCIP SAN Extension
  - Software Compression to maximize IP link utilization
- Throttle Bandwidth on FCIP Routes
- Consolidate iSCSI and SAN Extension capabilities into single chassis
  - Save 50% on cables, SFP's and rack space with only one piece of hardware to manage
- Ability to connect to an HP IP Distance Gateway remotely for lower overall cost of the solution
- Support Continuous Access for EVA only with XP support coming in the future
- CLI support only (Command View integration coming soon).

Heterogeneous Data Migration

- Easy to use data migration GUI with intuitive wizards to simplify use
- Supports offline heterogeneous data migration at very high performance
- Configure 255, 8 simultaneous priority based LUNs migrations
- Application performance preservation: Array Bandwidth Throttling capability
- CLI-based tool for powerful scripted use
- Destination Arrays: All MPX200 supported EVA models, MSA and XP arrays
- Source Arrays: All MPX200 supported EVA models, MSA, XP arrays; IBM - DS4300, DS4700; EMC CX3-20, CX3-40, AX4-5, CX500, CX4; HDS - AMS Family, WMS Family

The HP EVA iSCSI Connectivity Option extends the advantages of Fibre Channel SANs into smaller departments and remote locations. This EVA option allows customers to incorporate iSCSI servers within SANs without requiring additional storage arrays or management costs. Use the EVA's Command View software to manage the iSCSI connectivity to the array and mount the iSCSI device in the same rack as the array.

For more information and operating system support:
http://h18006.www1.hp.com/products/storageworks/evaiscsiconnect/index.html

The EVA also supports X Series Network Storage Systems connected as file/print/iSCSI gateways. The HP X1800, X3400, X3800 Network Storage Systems each feature Microsoft's Windows Storage Server 2008

operating system that includes Microsoft iSCSI Software Target as a standard feature. Microsoft iSCSI Software Target leverages existing management expertise and inexpensive Ethernet infrastructure to deliver IP-based block access to an EVA or Fibre Channel SAN. So X Series Network Storage Systems with iSCSI target functionality not only add file and print services to your EVA investment, but they help you save even more by enabling tiered (Fibre Channel and iSCSI) block access for application servers.

In addition, any X Series Network Storage Systems are a perfect platform from which to run Command View EVA. You stretch your investment even further when you host EVA management, file and print services, and iSCSI connectivity all from the same X Series Network Storage Systems gateway solution.

For more information:
http:// www.hp.com/go/X1000
http:// www.hp.com/go/X3000

EVA File Services

File services for the EVA are supported through the use of the EFS Clustered Gateway. Using File services with the EVA eliminates having to manage silos of storage, File Services for the EVA creates a single, integrated storage solution that provides both easy to manage application (block) services and scalable files services.

This solution can serve both block and file data concurrently with high availability and scalable performance. The solution is supported by a powerfully simple suite of management software making it easy for users to achieve high levels of productivity.

File services through the EFS Clustered Gateway supports mid-range and enterprise customers wanting a single storage solution for their block and file data, improved storage utilization, scalable throughput performance to meet application specific demands for consistent high transaction I/O, easy capacity expansion, instantaneous replication, simplified storage administration and high availability. Customers can use this solution to consolidate their individual silos of storage to gain flexibility, reduce IT costs and complexity as compared to traditionally architected storage solutions.

The EVA and file services solution supports both CIFS (windows) and NFS file serving. The components can be factory integrated into the HP EVA6400/8400 arrays. The components required to implement file services on the EVA are:

- Two EFS Clustered Gateway serving nodes
- One Ethernet Switch
- Two 8Gb FC Switches
- Installation and Startup

A file service solution provides the following benefits:

- Integrates and simplifies providing a single storage solution for application (block) and file data delivering high utilization and lower TCO
- Uses a single set of management tools that can be invoked from anywhere, anytime, resulting in a very operationally efficient environment to manage.
- Combines state-of-the-art application (block) data performance and file serving performance, that can scale as needs dictate, offers customer's aggregate performance levels far in excess of traditional file servers and NAS appliances.
- Additional capacity can be added quickly and easily with any combination of high performance Fibre Channel and/or low cost FATA drives.
- Uses state-of-the-art virtualization which improves performance, disk usage and TCO while the

single, shared pool of storage allows for easy dynamic expansion, which automatically distributes data to avoid potential hot spots.
- With fully redundant components such as SAN switches, array controllers, and file serving nodes built into every unit, this solution is perfect for demanding mid-range and enterprise storage applications.

For more information:
http://h18006.www1.hp.com/products/storageworks/efs/index.html?jumpid=reg_r1002_usen
http://h18006.www1.hp.com/products/storageworks

EVA with HP Systems Insight Manager Software

HP SIM is the foundation for HP's unified server-storage strategy - it is packaged as value add software with EVA, it's a management application and 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://www.docs.hp.com/en/netsys.html

Clustered Server and High Availability System Support

Dual and multi-node cluster support is provided for host level fault tolerance and high system availability. See the Operating System, Cluster and High Availability Compatibility table for operating system specific support.

Factory Express

A portfolio of customized factory and deployment solutions from the desktop to the data center. Configure an entire datacenter in a single rack with HP Factory Express.

Configure your entire order including EVAs, Storage Area Network, POD, servers and backup in a rack, AND securely load your data prior to shipment saving time and money by providing a fully configured greener solution.

Factory Express most popular services for server and storage:

- Image Loading
- Asset Tagging & Labeling
- Image Recovery
- Custom System Settings
- 3rd Party Components
- Rack Integration
- Blades Integration

For more information visit: www.hp.com/go/factory-express
http://h71028.www7.hp.com/enterprise/cache/97688-0-0-0-121.html?jumpid=reg_r1002_usen

Product Highlights

Multi-Server Shared Support for Storage Consolidation	Heterogeneous and homogeneous host support provides the ability to share storage between multiple servers. The EVA provides storage access control (i.e. Selective Storage Presentation or LUN masking) assuring that a host cannot access data belonging to a different host. SAN-based zoning is also supported.
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.
Enclosure Capacity	The EVA provides a high density disk storage solution. The EVA6400 and EVA8400 in the 42U HP 10000 G2 Series Rack supports up to 18 2U 12-bay M6412-A FC disk enclosures for a maximum capacity of 216 disk drives and a maximum storage capacity of 216 TB in a single rack. For the EVA8400 an expansion cabinet allows users to expand with another 9 enclosures for a total of up to 27 disk enclosures, providing support for up to 324 disks, and up to 324TB.
Utility Pricing solutions for EVA	HP offers a spectrum of offerings allowing customers to align their payments according to the usage of storage capacity. • For customers requiring assistance in managing their storage infrastructure, Managed Storage Solution (MSS) meets that need while providing the option to acquire storage on a utility model. Customers have the ability to choose other options like Backup/Restore, Data Availability, Local Copy and Remote Copy services. All these capabilities are offered at a $/GB/Month fee. • For customers that want to build and manage their own storage utility, Utility Ready Storage (URS) provides customers with storage that never runs out; priced as the customer uses it; and is easy to procure. URS pricing is based on $/GB/Month of average allocated capacity over the customer's minimum commitment. URS provides a unique opportunity to allow customers access to storage when they need it, permitting them to adapt to their changing business needs. • For customers whose need is best described by predictable growth, Pay per forecast (PPF), offered from HP Financial Services, is an ideal fit. It is a step lease based solution where the payments are structured upfront according to the customer's forecasted growth. • For even further demanding financial needs of customers, HP Financial Services are ready to craft a customized solution for them. NOTE: Support for Utility Ready Storage will be available after the introduction of the EVA6400 and EVA8400. Please contact your local HP representative for further information
Solid State Drive Support	The EVA supports 72GB, 200GB, and 400GB dual ported fibre channel enterprise solid state drives (SSDs). The EVA arrays support mixed drive types (SSDs, high performance, and FATA) within an enclosure. The solid state drives require their own disk group. The minimum number of SSDs supported is 6 and the maximum is 8 per array. NOTE: SSDs support only Vraid 1 and Vraid 5 and some Business Copy features (Snapshots and MirrorClone) for local replication.

Product Highlights

High Performance Fibre Channel Drives (10K 15K rpm) Support

The EVA supports 300 GB, 450 GB, and 600 GB reduced power 10K rpm dual-ported 4 Gb/s FC and 300GB, 450GB and 600GB 15K rpm dual-ported 4 Gb/s FC disk drives. The minimum number of high performance fibre channel drives supported on an EVA is 8.

The EVA arrays will support single or mixed drive capacities and types (solid state drives, high performance and FATA) within an enclosure. HP recommends using the same drive capacity type within a disk group because virtualization allocates space proportionate to the highest capacity drive within the group.

FATA Drive Support

The EVA supports 1TB dual ported 4 Gb/s Fibre Attached Technology Adapted (FATA) disk. An EVA will support a full configuration of FATA disk drives. A minimum of eight FATA drives are required in a configuration.

FATA 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 EVA's high performance, standard duty cycle, Fibre Channel drives. Doing so could shorten the life of the drive.

FATA drives are not recommended in Continuous Access applications as the remote storage location for local data residing on standard higher speed disk drives. Continuous Access tends to perform fairly high duty cycle random writes to the remote disk array. Matching remote FATA drives with local FC drives will impact the performance of your application, and will adversely impact the reliability of the FATA drives.

Fibre Channel Technology

The EVA6400/8400 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 @ 1 Gb/s; 300 meters @ 2 Gb/s using short wave multi-mode cable and up to 10 kilometers (6.21 miles) @ 1 Gb/s when using long wave cable. The EVA6400/8400 are 4 Gb/s enabled on each FC path, but will also support 2 Gb/s FC paths for backwards compatibility. Storage Area Networks (SANs) can be constructed using FC switches/directors for fabric connectivity (currently up to a maximum of 20 FC switches supported).

Fibre Channel Switch/Director Support

Support for up to twenty FC switches operating at 2 Gb/s and 4 Gb/s allow the full benefits of a storage area network (SAN), providing 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 Switch URL: http://h18006.www1.hp.com/storage/saninfrastructure/switches.html

Transfer Speeds

The EVA6400/8400 has four FC host interfaces per HSV400/450 controller; eight for a controller pair. Each controller-to-host interface is 4 Gb/s. The controllers are also compatible with 2 Gb/s, 4 Gb/s and 8 Gb/s FC switches, HBAs, servers and other storage solutions.

Each EVA controller pair interfaces with M6412 drive enclosures through redundant fibre channel arbitrated loops. With 4 per HSV400 for EVA6400 and 6 per HSV450 for EVA8400 device ports and dual FC I/O modules per drive enclosure, each controller can connect to each FC drive A and B port via redundant fibre channel loops. Each controller has a redundant path to each drive.

Easy Installation

Installation and start-up services are part of the EVA6400 and EVA8400 warranty.

Product Highlights

Fault Recovery -- HP Continuous Access EVA for Disaster Tolerance Applications

HP Continuous Access EVA remote copy functionality is available for use with the EVA6400/8400arrays. Continuous Access EVA is a controller-based application that performs real-time replication between HP Enterprise Virtual Arrays. The solution is enhanced to perform remote replication, and deliver high data availability and performance to users on Fibre Channel based campus, metro or continental Storage Area Networks (SANs). For additional information about Continuous Access EVA 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

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High Availability/ Fault Tolerance/ Hot pluggable support

All EVA are configured with dual HSV controllers that operate in a redundant mode. Each controller has four redundant Fibre Channel (FC) host ports. Each EVA6400 and EVA8400 controller has four FC host ports per controller. 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 software or Secure Path software.

EVA6400/8400 device ports connect to the FC I/O module on each drive enclosure via a fibre channel arbitrated loop. Up to nine enclosures can be connected in a redundant FC loop arrangement
The EVA6400, with four fibre channel device ports per HSV400 controller, supports 2 redundant fibre channel loops. Each controller can connect to both ports on up to 216 drives.

The EVA8400, with 6 device ports per HSV450 controller, supports 3 redundant fibre channel loops (6 loops total). Each controller can connect to both ports on up to 324 drives.

The HSV 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 M6412-A FC drive enclosure has dual redundant hot plug FC I/O/Environmental Monitoring Unit (EMU) modules that allow the controllers to distribute I/Os between the two modules and provides redundant paths should either FC I/O module become unavailable and the EMU functionality allows you to monitor and report the condition of the power supplies and fans. . The enclosure also has dual redundant hot plug power supplies and dual hot plug blowers. The enclosure also has a hot plug Environmental Monitoring Unit (EMU) The M6412-A drive enclosure provides point to point connectivity within the enclosure.

The SSD, FC and FATA disk drives have dual FC ports which can be redundantly accessed by each controller. The drives are hot plug. The EVA, as a virtualized array, always provides striping of the drives across the entire disk group. The drives can then be arranged, using redundant Vraid 1, Vraid 5 or Vraid 6 protection, so that a drive failure will not cause loss of data. Note that SSDs support Vraid 1 and Vraid 5. Optional distributed sparing (virtual sparing) can be configured so that a drive failure will trigger an automatic rebuild of the Vraid 1 or Vraid 5 data set into spare space. The EVA sparing protection will utilize available disk space in the disk group and when that is exhausted, the established virtual spare space. This methodology of using unused capacity can give customers the ability to have many disk worth of spare space for maximum data availability, protection and peace of mind.

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 and 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.

Integration

HP EVA6400/8400 models are 4Gb/s FC Switched Fabric "enabled" and can operate on 8Gb/s, 4Gb/s or 2Gb/s FC Switched Fabric SANs. They can co-exist in the same FC SAN with previous generations of EVA, FC storage solutions and many other SAN devices.

EVA Manageability

HP Command View EVA provides the capability to manage the EVA Array family in a SAN or direct connect Fibre Channel host attach configuration. HP Command View EVA software runs on a variety of server configurations using Windows Server 2003. HP X1800, X3400, X3800 Network Storage Systems are the perfect platforms from which to run Command View EVA. HP Network Storage Systems allow you to stretch your investment by combining EVA management, file and print services, and iSCSI connectivity all on the same platform.

The powerful Command View EVA 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 provide an audit trail. The Command View EVA media kits and license are required with all EVA models. HP Command View EVA requires a License to use (LTUs) equal to, or greater than the total raw capacity of each array.

Performance

Fibre Channel host connections provide up to 400MB/s bandwidth for each path. Dual mirrored port write caching capability, with battery backed cache, maintains optimal availability while assuring data integrity in the event of a failure.

Each HSV400 controller (for EVA6400 configurations) has four Fibre Channel host ports (eight ports in a redundant pair of controllers) assuring the availability of bandwidth for the most demanding applications. In addition, up to 4GB of cache per controller pair ensures high performance.

Each HSV450 controller (for EVA8400 configurations) has four Fibre Channel host ports (eight ports in a redundant pair of controllers) assuring the availability of bandwidth for the most stringent applications. In addition, up to 22GB of cache per controller pair ensures high performance.

Product Highlights

Scalability

A storage management server can manage up to 16 EVA controller pairs (EVA4400/6400/8400, EVA4100/6100/8100s), EVA4000/6000/8000 and EVA3000/5000s in any one fabric. An EVA controller pair will support up to 256 host connections (up to 1024 HBAs).

The EVA6400 will scale up to 216 disks in a single rack (216TB using 1TB FATA disk drives, and 130TB using 600 GB high performance disk drives).

The EVA8400 will scale up to 216 disks in a single rack and 324 disk using and expansion rack (130TB and 194TB respectively).

Configure to Order (CTO) options and the HP 10000 G2 Series Racks allow even greater server and device integration, flexibility and scalability for the EVA6400/8400. Data center managers can customize server, storage and back-up configurations as well as use any available cabinet U space to mount Storage Management servers, switches and have the peace of mind that it is built with HP factory precision manufacturing.

EVA as Virtualized Storage behind the P9500 and XP

HP EVA6400/8400 disk arrays can be connected as external storage devices behind HP P9500 and XP disk arrays.

The P9500/XP24000/XP20000 simplifies the management of heterogeneous SAN environments through its ability to support up to 255PB/ 247 PB/ 96 PB respectively of external storage-all configured 'behind' a single P9500/XP. P9000/XP External Storage software uses advanced virtualization technology to allow storage administrators to host P9500/XP Disk Array LUNs on externally attached disk arrays. Any Fibre Channel port from any CHA pair installed in any slot can be used to connect to external storage EVA. With external EVA storage, P9500/XP presents multiple tiers of storage to a wide range of host systems. Instead of seeing a confusing collection of arrays, host systems perceive all the data to be stored inside the P9500/XP disk array. In effect, the P9500/XP disk array becomes the storage controller for a flexible, multi-tiered collection of EVAs with a range of cost and performance capabilities. By configuring EVA storage arrays behind a single P9500/XP24000/XP20000, data can be moved back and forth dynamically across tiers, all of which is invisible to the applications.

The P9500/XP virtualization feature also reduces the total cost of storage ownership by:

- Exploiting common storage management across multiple vendors' systems
- Easily deploying a dual-vendor policy
- Facilitating simpler and lower cost data migrations
- Increasing storage utilization
- Extending the life of legacy storage

For more information please refer to the HP XP External Storage Software web page at: http://h18006.www1.hp.com/products/storage/software/extstxp/index.html or the HP P9000 External Storage Software web page at: http://h18006.www1.hp.com/storage/software/p9000/ess/index.html

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Product Highlights

Servers Supported - Single and Clustered

HP servers (HP-UX, ProLiant, AlphaServers)
X86 servers
Dell servers
Sun servers
IBM servers
Apple XsApple Servers (PowerPC and Intel)
Fujitsu Siemens & Primergy Servers (Bx6x0, Rx and Tx)

EVA Required Software

HP EVA6400/8400 ships with XCS V9.534 factory installed on new EVAs. XCS V9.534 also supports the EVA4400. The base XCS End User License for the EVA is contained in the hardware shipment.

XCS V9.534 controller media download is available from HP.com. These downloads are available for upgrades of existing EVA4400 or as archival media for the EVA6400/8400. The 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. Downgrading the EVA4400 from XCS v9.5 is not supported.

XCS V9.534 is available for download at the "software & drivers" link:
http://h18006.www1.hp.com/products/storageworks/eva/index.html

HP Command View EVA is required software for all EVA models. HP Command View EVA requires a License to use (LTUs) equal to, or greater than the total raw capacity of each array.

NOTE: The minimum supported version of XCS on the EVA6400/8400 is XCS V9.5.

HP EVA Software Selector

The following matrix identifies some of the HP software products that can be used along with the 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.

	EVA 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 Command View EVA	X (Required)						
HP Business Copy EVA		X	X				X
HP Continuous Access EVA				X			
Dynamic Capacity Manager	X						
HP Storage Essentials Suite (Heterogeneous,	X End to end provisioning	X End to end backup			X Discovery, topology,		X monitor applications

multivendor)	(hosts, infrastructure, storage)	monitoring/ reporting			monitoring, events, applications, NAS/SAN, File monitoring, reporting, Performance, monitor host clusters		and associated storage/ infrastructure (Oracle, Microsoft Exchange Server, Sybase, Microsoft SQL, InterSystems Cache' database and SAP ACC)
HP Storage Essentials Performance Edition Software	Discovery, topology				X Discovery, toplogy, EVA performance	X	X (Oracle, Exchange, DB2, Informix, MS SQL)
HP Data Protector		X	X				X
HP Systems Insight Manager	In-context launch of CV EVA, SAN discovery, monitoring, asset, configuration., security					X (Included with EVA)	
HP Cluster Extension EVA				X			
HP Metrocluster with Continuous Access EVA/ Continentalclusters				X			
HP Storage Mirroring				X			
HP System Copy Software for SAP	Automates SAP copy requirements	X	X				X

EVA and Value-added Software Compatibility

Model	XCS Software	HP Command View EVA*	HP Continuous Access EVA**	HP Business Copy EVA**	HP Cluster Extension EVA	HP Replication Solution Manager (RSM)***
EVA4400/6400/8400	XCS v10.0xx	Command View EVA v9.4xx****	Continuous Access EVA	Business Copy EVA	Cluster Extension EVA	Replication Solution Manager v 5.0

*HP Command View EVA is required software for all EVA models. HP Command View EVA requires a License to use (LTUs) equal to, or greater than the total raw capacity of 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 a License to use (LTUs) equal to, or greater than the total usable amount of data being replicated on 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.
****Command View v9.4xx or later is required to support the MPX200.

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	SP1, R2; SP2 SP1, R2; SP2	Microsoft Cluster Server (MSCS) (2003) Microsoft Failover Clusters (MFCS) (2008) Veritas Storage Foundation & HA Solutions for Windows	Windows Server 2003 Windows Server 2008 See SPOCK for details	Full featured MPIO, v3.02/V4.00 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	SP1, R2; SP2 SP1, R2; SP2			
Microsoft Windows 2003/IA64	All Editions- See SPOCK for details	SP1; SP2 ; R2 SP1; SP2;R2			
Microsoft Windows 2008 32-bit, x64* Including Hyper-V	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 v1 (PA-RISC) 11i v2 (PA-RISC & Integrity) 11i v3 (PA-RISC & Integrity)		HP ServiceGuard 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 (IA32, IA64 & x64) Red Hat EL Advanced Server 5.3, 5.4 (IA32, IA64 & x64) SUSE/SLES9 (IA32, IA64 & x64)- SP4 (Includes Open Enterprise Server Linux)		HP ServiceGuard for Linux Veritas Storage Foundation & HA Solutions RedHat Cluster Services	11.18 See SPOCK for versions	QLogic Failover driver, available from HP, Emulex MultiPulse available from HP (RHEL 4.7 and 4.8)and Device

Product Highlights

	SUSE/SLES10 (IA32, IA64 & x64)- SP1, SP2 (Includes Open Enterprise Server Linux) SUSE/SLES11 (IA32, IA64 & x64)- (Includes Open Enterprise Server Linux) Oracle Enterprise Linux V4, 5	Novell HA Extensions		Mapper v4.4.0 Enablement Kit from HP
Apple Mac OS X	10.5 10.6	N/A	N/A	ATTO FC HBA driver
HP OpenVMS	Alpha: 8.2, 8.3 Integrity/Itanium: 8.3, 8.3-1H1,8.4	HP OpenVMS Clusters	8.2 8.2-1 8.3 8.3-1h1 8.4	Native in OS
Sun Solaris	8 (SPARC) 9 (SPARC) 10 (SPARC & x86)	SunCluster Veritas Storage Foundation & HA Solutions	3.2 See SPOCK for versions	MPxIO for Solaris, Native in OS Veritas DMP 5.0
IBM AIX	5.2 5.3 6.1	HACMP Veritas Storage Foundation & HA Solutions	Native in OS See SPOCK for versions	MPIO for IBM AIX, Native in OS Veritas DMP 5.0
VMware	ESX Server 3.0.x, 3.5 and 4.0	MSCS Clustering	See SPOCK for versions	See SPOCK for versions
Xen	Citrix XenServer V4.1, 5.0 and 5.1 RHEL Virtualization V5.2 Oracle Virtual Machine	Citrix HP ServiceGuard for Linux (RHEL and Oracle Virtual Machine)	V5.0 SGLX 11.18	See SPOCK for Guest OS support Native Device Mapper MPIO (Citrix and RHEL)

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.

NOTE: The MPX200 Multifunction Router included in the EVA6400 and EVA8400 10GbE iSCSI is supported on:

- Linux
- Microsoft Windows
- Sun Solaris
- VMware

For MPX 200 operating system version support, see the product user guide available on the Storage Networking product page and the HP SAN Design Reference Guide available at: http://www.hp.com/go/sandesignguide

Cabinet Density

A single 42U EVA cabinet can house up to 216TB of raw capacity (using 1TB FATA disks).
NOTE: Maximum cabinet capacity will vary based available upon U space. The total number of controllers, enclosures supported and other devices.

Product Highlights

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 of the rack, taking 2U of rack space. To reclaim the 2U of rack space required by the PDUs, they may be moved to the rear of the rack using the PDU Pivot Bracket Kit. It is factory or field installable.

For the EVA6400/8400 a variety of HP 10000 G2 Series Rack offerings and integration options are available. The EVA configurator tools utilize a 42U HP 10000 G2 Series Rack as the standard recommendation and will provide a 220/240V PDU and country specific power cords. Both the height 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 EVA; this can be specified and the cabinets and PDUs can be modified to support the configuration. The EVA6400/8400 also supports 22U and 36U racks. The 47U rack is also supported, but not factory configured, because of the cabinet height, which creates shipping limitations. It must be assembled on site.

For more information on configuration and PDU support for the 10000 G2 Series Rack 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.

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

When installing the EVA Enclosures in extended depth racks (AF091A, AF092A, AF094A, or AF097A), 1 each of the longer Power Jumper Cord is required for each EVA Controller or Drive Enclosure on the order.

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.

The EVA has one of the highest density disk storage solutions in the industry. 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), FATA disk drives and the ability to change Vraid types, significant amount of duplicate capacity requirements can be eliminated, resulting in fewer/smaller storage acquisitions.

Warranty and Services Included with the Product

The EVA6400/8400 comes with a 3-year HP's 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

The EVA Fibre Channel hard disk drive (HDD) warranty is 3years, parts only.

For bundled deployment (I&S) service:

Your HP storage product includes deployment which helps you improve the productivity of your technical staff and allows your IT resources to stay focused on their core tasks and business priorities. HP deployment helps ensure that your product is installed smoothly, efficiently, and with minimal disruption of your IT and business operations.

You'll benefit from:

- Specialized expertise for a complex, one-time task
- Reduced implementation time, impact and risk to your storage environment
- Shortened time-to-ROI
- Product knowledge gained during orientation session

For bundled Hardware Support (4-Hour 24x7 Same Day):

Your HP storage product includes world-class round-the-clock hardware support, providing increased equipment availability and productivity through rapid-response onsite and remote support. 24x7 Hardware Support benefits include:

- Prompt service for your storage product
- Easy-to-use onsite services
- Improved hardware performance and uptime
- Increased return on your HP hardware investments

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 the EVA6400/8400. For more information go to: www.hp.com/support or: www.itrc.hp.com.

Remote Support

HP designed the EVA6400/8400 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 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 the EVA6400/8400 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 management module
- Disk enclosure power supply.
- Disk enclosure fan.
- Bezels.

Optional Customer Self-Repair Parts List:

- Controller cache battery.
- 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 the EVA6400/8400, select Storage, then EVA Disk Arrays, then HP EVA6400/8400 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
The HP EVA6400/8400 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:

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.

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 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 Proactive 24

For improved stability, availability, and operational effectiveness, HP Proactive 24 Service (P24) provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year comprehensive hardware and software support solution combines industry leading technical assistance with proactive account services to cover the entire IT infrastructure. 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.

- Enhance operational effectiveness with remote monitoring, proactive problem identification and solution recommendations
- HP technical experts help coordinate support and change management, provide hands-on assistance, and share knowledge with customer's staff
- Rapid access to support expertise from servers to storage to networking

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

Deployment is included with selected HP Storage products

HP deployment is included with selected products and helps ensure a smooth installation with minimal disruption to your IT and business operations. The included deployment will help you improve the productivity of your technical staff and allow your IT resources to stay focused on their core tasks and business priorities. See warranty section for details.

HP Storage Data Migration Service

You need to move your critical enterprise data to your new HP SAN platform. And you need to accomplish that without losing data and without interrupting your ongoing business operations.

HP Storage Data Migration Service helps you minimize the risk of data loss, threats to data integrity, and avoid productivity-sapping performance slowdowns during data transport. A highly experienced HP Services storage specialist works with you to rapidly and securely migrate mission-critical business information across your data center or around the globe - regardless of the complexity of your environment.

- Data layout enhancements during the transfer process can help increase storage array performance
- By engaging HP to perform data migration, customers' IT staff can stay focused on their core tasks and priorities, resulting in less impact to your business
- Professional migration planning that aligns with customer's business needs and implementation that reduces project execution time and risk to the storage environment
- HP's expertise with data migration helps ensure issues are avoided during data migration

http://h20195.www2.hp.com/v2/GetPDF.aspx/5982-4107EN.pdf

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

3-Year HP Critical Service

As an alternative to our recommended support level, for customers who run mission-critical applications and want a comprehensive support solution across their entire IT infrastructure:

HP Critical Service is a comprehensive support solution designed for businesses that run mission-critical applications, which cannot tolerate downtime without a significant business impact. Provides the right combination of proactive and reactive services designed to:

- Improve availability and performance across your IT infrastructure
- Decrease interruptions and reduce downtime
- Improved agility through proactive change management
- 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.

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

HP Performance Analysis for the XP/P9000/EVA Disk Arrays

For customers who need to increase performance, stability and availability of their XP/P9000/EVA arrays: Enhancing the return on your HP Disk Array investment requires informed configuration and management decision-making. That, in turn, calls for an in-depth understanding of the performance level your array is delivering. HP's experienced storage specialists can help.

Capitalize on HP Services XP/P9000/EVA knowledge and know-how.

HP Performance Analysis for the XP/EVA Disk Arrays provides automated data collection, detailed I/O analysis, and expert recommendations for throughput enhancement. It offers a quick, convenient way to:

- Increase XP/P9000/EVA performance, stability, and availability by identifying potential bottlenecks and effective solutions for avoiding them
- Establish a baseline for future performance analysis and change management
- Make sound proactive decisions on XP/P9000/EVA system capacity planning
- Minimize the need for costly reactive upgrades

http://h20195.www2.hp.com/v2/GetPDF.aspx/5982-6668EN.pdf

HP Enhanced Implementation Service for SANs

For customers who are building a new or expanding an existing Fibre Channel, FCOE, FCIP, SAS or iSCSI SAN:

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.

http://h20195.www2.hp.com/v2/GetPDF.aspx/5981-8527EN.pdf

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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.

Service and Support, HP Care Pack, and Warranty Information

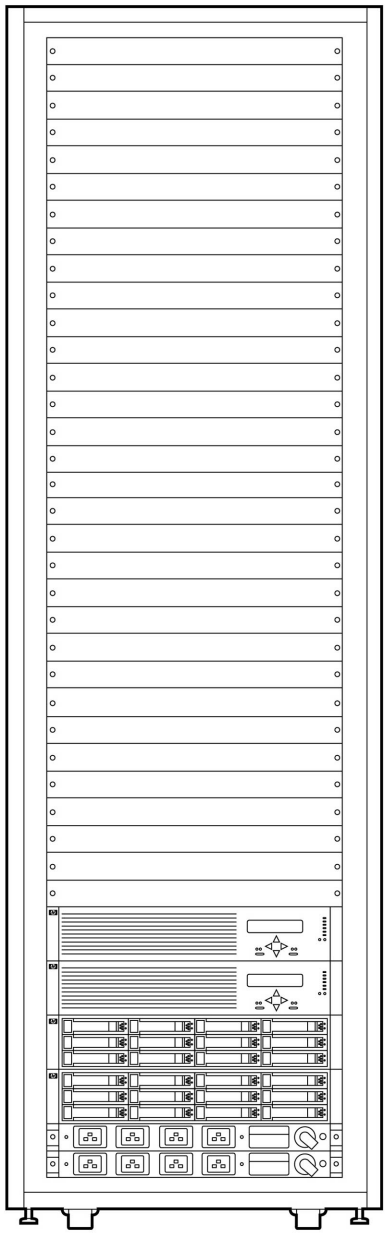
HP Services Awards

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.

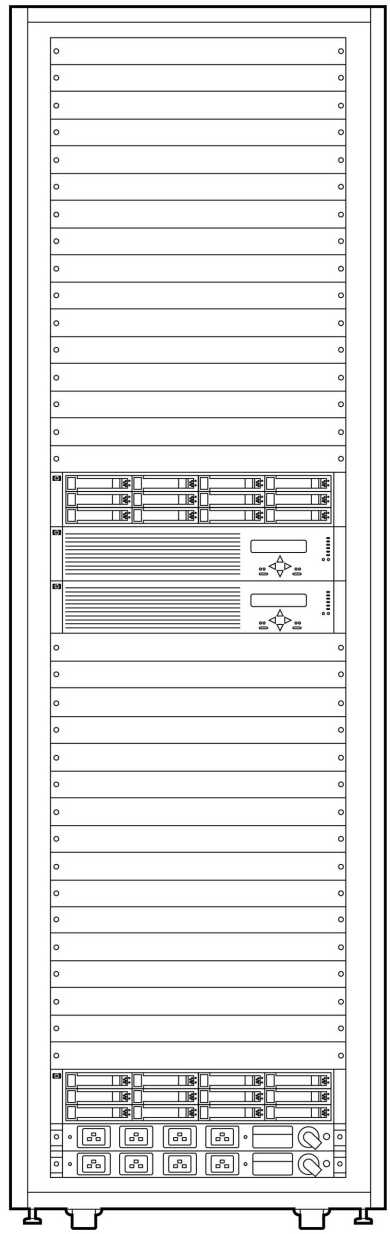
Additional Services Information

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

Step 1 - Choose an EVA Model
Base and Factory-Integration Information

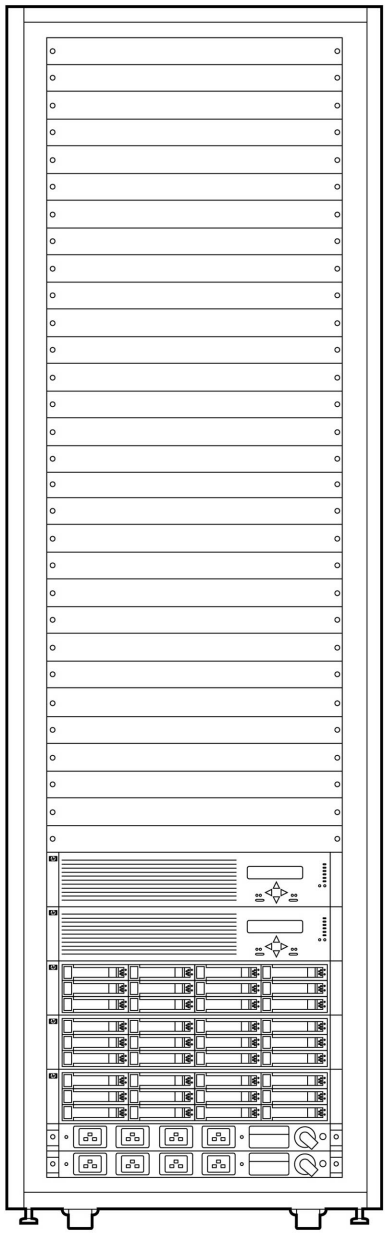


Multiple Product Racking Configuration

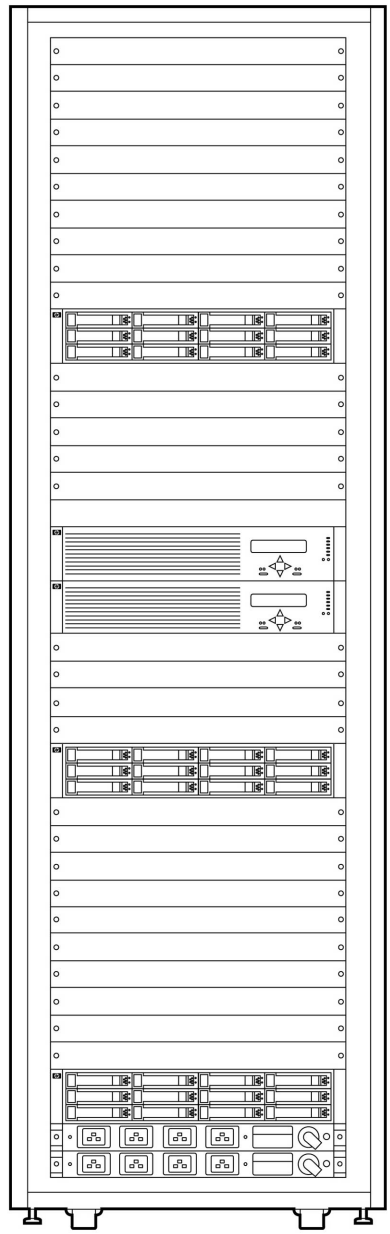


Storage Centric Racking configuration

Enterprise Virtual Array 6400



Multiple Product Racking Configuration



Storage Centric Racking configuration

Enterprise Virtual Array 8400

Models

Enterprise Virtual Array 6400/8400 Independent Components

The following components are available worldwide. The EVA6400 and EVA8400 models are modular and scalable storage solutions designed to have no-single-point-of-failure, which provide disaster tolerance and business continuance support for storage consolidation on heterogeneous SANs.

The EVA6400 and EVA8400 can be factory racked in two different configurations. The EVA can be racked with other devices such as a server or back-up using Rack Builder which will rack from the bottom up in a Multiple Product Racking configuration or in a

	Storage Centric Racking configuration which provides an easy configuration path to expand in the field and supports maximum storage density. Choose the part number that meets your needs. NOTE: All EVA host ports must be filled with either a cable or loopback connector.	
HP EVA6400 Dual Controller Array Storage Centric	HP EVA6400 Dual Controller Array Storage Centric Includes one 4U Controller assembly with two HSV400 controllers mounting hardware cables and controller mounting. Order one unit for each EVA6400 array configuration. The storage centric EVA will be racked so that additional M6412 drive enclosures can be easily added in the field. NOTE: Order this part number when you want to fill out the rack with M6412 storage enclosures.	AP884A
HP EVA6400 Dual Controller Array Multiple Product	HP EVA6400 Dual Controller Array Multiple Product Includes one 4U Controller assembly with two HSV400 controllers mounting hardware cables and controller mounting. Order one unit for each EVA6400 array configuration. NOTE: Order this part number when you want to factory rack the EVA with other products such as servers and back-up devices.	AJ757A
HP EVA8400 14GB Cache Dual Controller Array Storage Centric	HP EVA8400 14GB Cache Dual Controller Array Storage Centric Includes one 4U Controller assembly with two HSV450 controllers mounting hardware cables and controller mounting. Order one unit for each EVA8400 array configuration. The storage centric EVA will be racked so that additional M6412 drive enclosures can be easily added in the field. NOTE: Order this part number when you want to fill out the rack with M6412 storage enclosures.	AP885A
HP EVA8400 14GB Cache Dual Controller Array Multiple Product	HP EVA8400 14GB Cache Dual Controller Array Multiple Product Includes one 4U Controller assembly with two HSV450 controllers mounting hardware cables and controller mounting. Order one unit for each EVA8400 array configuration. NOTE: Order this part number when you want to factory rack the EVA with other products such as servers and back-up devices.	AJ758A
HP EVA8400 22GB Cache Dual Controller Array Storage Centric	HP EVA8400 22GB Cache Dual Controller Array Includes one 4U Controller assembly with two HSV450 controllers mounting hardware cables and controller mounting. Order one unit for each EVA8400 array configuration. The storage centric EVA will be racked so that additional M6412 drive enclosures can be easily added in the field. NOTE: Order this part number when you want to fill out the rack with M6412 storage enclosures.	AP888A
HP EVA8400 22GB Cache Dual Controller Array Multiple Product	HP EVA8400 22GB Cache Dual Controller Array Multiple Product Includes one 4U Controller assembly with two HSV450 controllers mounting hardware cables and controller mounting. Order one unit for each EVA8400 array configuration. NOTE: Order this part number when you want to factory rack the EVA with other products such as servers and back-up devices.	AJ847A

Configuration Information and Configuration Rules

HP EVA6400 FC/FCoE/iSCSI Dual Controller Array Storage Centric	HP EVA6400 Fibre Channel and FC/FCoE/iSCSI host Dual Controller Array Storage Centric Includes (1)4U Controller assembly with (2) HSV400 controllers, MPX200 Multifunction Router (Includes (1) chassis, (1) 10 - 1 GbE blade, redundant power and cooling modules, rail kit, accessory kit, and documentation), mounting hardware cables, controller mounting and pivot hinge Order one unit for each EVA6400 array configuration. NOTE: Order this part number when you want to fill out the rack with M6412 storage enclosures	AW529A
HP EVA8400 14GB FC/FCoE/iSCSI Dual Controller Array Storage Centric	HP EVA8400 14GB Cache Fibre Channel and FC/FCoE/iSCSI host Dual Controller Array Storage Centric Includes (1)4U Controller assembly with (2) HSV450 14GB controllers, MPX200 Multifunction Router (Includes (1) chassis, (1) 10 - 1 GbE blade, redundant power and cooling modules, rail kit, accessory kit, and documentation), mounting hardware cables, controller mounting and pivot hinge Order one unit for each EVA8400 array configuration. NOTE: Order this part number when you want to fill out the rack with M6412 storage enclosures	AW554A
HP EVA8400 22GB FC/FCoE/iSCSI Dual Controller Array Storage Centric	HP EVA8400 22GB Cache Fibre Channel and FC/FCoE/iSCSI host Dual Controller Array Storage Centric Includes (1)4U Controller assembly with (2) HSV450 22GB controllers, MPX200 Multifunction Router (Includes (1) chassis, (1) 10 - 1 GbE blade, redundant power and cooling modules, rail kit, accessory kit, and documentation), mounting hardware cables, controller mounting and pivot hinge Order one unit for each EVA8400 array configuration. NOTE: Order this part number when you want to fill out the rack with M6412 storage enclosures	AW530A
M6412-A FC Drive Enclosures & Accessories	HP M6412-A Fibre Channel Drive Enclosure For factory racking select up to: • A minimum of 1 and up to 8 M6412-A drive enclosures for an EVA4400 (HSV300 and HSV300-S) • A minimum of 2 and up to 18 M6412-A enclosures EVA6400 (HSV400) • A minimum of 3 and up to 18 M6412-A enclosures EVA8400 (HSV450) in a single rack • A minimum of 3 and up to 27 M6412-A enclosures EVA8400 (HSV450) in two racks Drive enclosures may also be: • Ordered for on-site capacity additions to existing EVA4400/6400/8400 configurations. • Ordered for field installation of complete EVA4400/6400/8400 • Installed by HP manufacturing into EVA configurations by ordering the enclosure with the factory integration part number (#0D1). This drive enclosure is compatible with EVA4400/6400/8400 arrays only.	AG638B

The M6412 is a 2U dual-redundant FC Loop 12-bay point to point disk enclosure with mounting hardware, and the necessary copper FC cables for connecting to an HSV Controller pair.

NOTE: An EVA requires a minimum of 8 drives per Fibre Channel or FATA drive type or 6 solid state drives per EVA4400/6400/8400.

The EVA6400/8400 Controller Array can be added on-site into existing EVA configurations (or qualified rack systems), Additional M6412 drive enclosures (AG638B) can be ordered to expand an EVA4400/6400/8400 configuration:

1. Ordered for on-site capacity additions to existing EVA4400/6400/8400 configurations.
2. Ordered for field installation of complete EVA4400/6400/8400 configurations HP cabinets and racks described in Step 3 or into qualified 3rd party rack systems by HP Global Services.
3. Installed by HP manufacturing into EVA configurations by ordering the enclosure with the factory integration part number. Up to eighteen drive enclosures are supported with each pair of HSV400 and up to 27 drive enclosures are supported with each pair of HSV450 controllers. The M6412 is a 2U dual-redundant FC Loop 12-bay switched disk enclosure with mounting hardware, and includes the necessary copper FC cables for connecting to an HSV400/450 Controller pair.

   Order additional hard disk drives using the SKU's listed in Step 5.

Enterprise Virtual Array Racking for Expansion

The EVA customers have the option to mount supported devices in the rack used for EVA8400 expansion.

HP 10642 G2 Shock Universal Rack Power requirements vary based on the equipment to be placed in the rack and the country power supply. Options are:	AF002A
HP PDU Pivot Kit May be used when expanding an existing EVA6400/8400 to reclaim 2U of space in a 10000 G2 Series Rack.	AG730A
Modular PDU 24A Low Volt, NA/JPN	252663-D71 #0D2
Modular PDU 24A HV, NA/JPN	252663-D72 #0D2
Modular PDU 32A HV, INTL	252663-B31 #0D2

NOTE: #0D2 feature code designates the PDUs are mounted horizontally in the bottom of the rack on real rail, above any UPS, and occupies 2U EIA space.

Low voltage PDU 252663-D71 requires additional power distribution module AF500A. (1) AF500A supports 2 PDUs. Each PDU requires a quantity of 2 AF500As.	AF500A

Enterprise Virtual Array Expansion Cabinet Example Configurations for EVA8400			
Expansion Cabinet Components	EVA6400 0C9D	EVA8400 0C9D	Description
AF002A	1	1	EVA 42U HP 10000 G2 Series Rack
252663-XXX	2 (minimum HV) 4 (minimum LV)	2 (minimum HV) 4 (minimum LV)	Country/component requirement specific
AP712A*	2	3	HP EVA8400 Expansion Rack Accessory Kit
AG638B	9	9	M6412-A FC Drive Enclosure
* Use 1 AP712A per each of the first 3 shelves in an expansion rack.			
NOTE: Supports a minimum of 1 up to 9 enclosures in each expansion rack			

EVA4400 Upgrade	EVA6400	EVA8400	SKUs Required
HP EVA6400 Controller Array	Yes	N/A	AJ757A
HP EVA8400 Controller Array	N/A	Yes	AJ758A or AJ847A
HP EVA4400/6400/8400 XCS v9.5xx	Yes	Yes	Download[3]
Command View EVA	Yes	Yes	See URL[1]
Command View Licenses	Yes	Yes	See URL[1]
Business Copy EVA	Yes	Yes	See URL[2]
Business Copy Upgrade license	Yes	Yes	See URL[2]
Continuous Access EVA	Yes	Yes	See URL[2]
Continuous Access EVA Upgrade license	Yes	Yes	See URL[2]
HP Services assessment and upgrade installation	Yes	Yes	See URL[2]

NOTES:

[1] Proper Command View licensing requires a License To Use (LTUs) equal to or greater than the total raw capacity of each array and may be purchased in additive increments of 1TB or Unlimited LTUs). Correct model and capacity licensing is required.

[2] Correct model and capacity licensing is required.
http://h18006.www1.hp.com/storage/software.html
http://www.hp.com/hps/storage/
http://h18006.www1.hp.com/products/storageworks/eva/

[3] XCS comes factory installed on the EVA. Archival or upgrade copies of the firmware may be downloaded at this site.
http://h18006.www1.hp.com/products/storageworks/eva/index.html

NOTE: When upgrading from an EVA4400 with embedded switch a separate switch must be utilized.

Configuration Information and Configuration Rules

EVA6400 Upgrade	EVA8400	SKUs Required
HP EVA8400 Controller Array	Yes	AJ758A or AJ847A
HP EVA4400/6400/8400 XCS v9.5xx	Yes	Download[3]
Command View EVA	Yes	See URL[1]
Command View Licenses	Yes	See URL[1]
Business Copy EVA	Yes	See URL[2]
Business Copy Upgrade license	Yes	See URL[2]
Continuous Access EVA	Yes	See URL[2]
Continuous Access EVA Upgrade license	Yes	See URL[2]
HP Services assessment and upgrade installation	Yes	See URL[2]

NOTES:

[1] Proper Command View licensing requires a License To Use (LTUs) equal to, or greater than the total raw capacity of each array and may be purchased in additive increments of 1TB or Unlimited LTUs). Correct model and capacity licensing is required.

[2] Correct model and capacity licensing is required.
http://h18006.www1.hp.com/storage/software.html
http://www.hp.com/hps/storage/
http://h18006.www1.hp.com/products/storageworks/eva/

[3] XCS comes factory installed on the EVA. Archival or upgrade copies of the firmware may be downloaded at this site.

Step 2 - Choose a Rack - Base and Factory Integration Information

Factory Integration

Start your order by choosing a rack to house your EVA6400/8400 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

Use of the EVA Factory Integration part number is required for component integration. The EVA6400/8400may be configured into a 42U HP 10000 G2 Series Rack with the appropriate PDU for the highest density in a Factory Integrated solution. If other products such as servers or back-up products are included in the cab a different PDU will be specified (if required) or can be chosen from a list of appropriate offerings shown in the configuration tool.

The minimum EVA6400/8400 factory configured rack space required					
EVA	Controller Assembly	PDUs	Minimum number of M6412	M6412 U space	Total U Space
EVA6400	4U	1U	2	4U	9U
EVA8400	4U	1U	3	6U	11U

NOTE: the 1U of space required by the PDU may be reclaimed by using the EVA Pivot Hinge.

HP 10000 G2 Series Rack must be purchased. Additional EVA6400/8400, arrays and drive enclosures may be ordered for multiple subsystem integration at the factory. Additional racks are required to house configurations beyond the U-space of the initial cabinet. Ballast and stabilizers will be offered through the configurator tools for use

when required.

The EVA6400 and EVA8400 array controllers are also available for field installation. HP Global Services or a trained EVA service provider can perform the on-site installation.

When calculating available U-space, assume that no space will be placed between the mounted components. For redundancy, order PDUs in quantities of two. Refer to the Configuration and User Guide in the Information Library at the Rack Solutions webpage.

HP 10000 Series G2 Racks

Please refer to the HP Infrastructure products page for more information on HP racks and rack options:
http://h18004.www1.hp.com/products/servers/platforms/rackandpower.html
*The HP Rack 10622 G2 Shock (22U) is not supported in a Storage Centric racking configuration.

Field Installation

Please refer to the Expansion options (Step 8) - listed in the Configuration Information and Configuration Rules - for details on components available for field installation. These components are useful for adding EVA4400/6400/8400 components to existing storage configurations or into on-site customer-supplied racks.

Non-HP rack and power requirements

For detailed information on determining compatibility of a non-HP rack, please review the information included in the EVA User Guide which can be found at http://www.hp.com/go/eva.
NOTE: Also refer to Step 8 for ordering instructions and components that accommodate on-site installation of EVA4100/6100/8100 subsystems into customer-supplied racks.

Step 3- Firmware and Management Software

Controller Firmware

HP EVA6400/8400 is factory installed with XCS v10.0xx. Separate Media kits and licenses are required to support HP Command View EVA, HP Continuous Access EVA and HP Business Copy EVA.

HP EVA4400/6400/8400 XCS v10.0 controller media download is available from HP.com. These downloads are available as archival media from the following link:
http://h18006.www1.hp.com/products/storageworks/eva/index.html

HP Command View EVA V9.4 or later is mandatory to support the EVA6400/8400 and XCS v10.0xx. An HP Command View License-to-Use (LTU) must be purchased for each EVA controller pair. Each HP EVA must be licensed with the appropriate HP Command View LTU(s) to be in compliance with the End User License Agreement (EULA) and the Command View license monitoring function.

NOTE: HP Command View EVA V9.2 or later is required to support the EVA6400/8400 10GbE iSCSI offerings and the MPX200.
The Command View licensed capacity per EVA must be equal to, or greater than the total raw capacity of each EVA. HP Command View EVA may be purchased in

increments of a 1TB LTU (one or multiple 1TB LTUs based upon the EVA's raw capacity), or an HP Command View Unlimited Capacity LTU may be purchased which will support up to the maximum raw storage capacity of the EVA.

OPTIONAL SOFTWARE: EVA6400/8400 optional software can be found at the following URL: http://h18006.www1.hp.com/storage/software.html

Step 4 - Hard 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 EVA4400/6400/8400, either for factory integration or when adding additional capacity. Note that these SKU's apply ONLY to the EVA4400/6400/8400 and can't be used with other EVA models.

HP FC and FATA Drives

NOTE: A minimum of eight (8) high performance FC or FATA or 6 solid state drives are required per EVA6400/8400.

HP StorageWorks EVA M6412 72GB 4Gb Fibre Channel Dual-port Solid State Drive	AR055A
HP StorageWorks EVA M6412A 200GB 4Gb Fibre Channel 2-port Solid State Drive	AW571A
HP StorageWorks EVA M6412A 400GB 4Gb Fibre Channel 2-port Solid State Drive	AW572A
HP StorageWorks EVA M6412A 450GB 10K Fibre Channel Hard Disk Drive	AP731B
HP StorageWorks EVA M6412A 600GB 10K Fibre Channel Hard Disk Drive	AP732B
HP StorageWorks EVA M6412A 300GB 15K Fibre Channel Hard Disk Drive	AG690B
HP StorageWorks EVA M6412A 450GB 15K Fibre Channel Hard Disk Drive	AG803B
HP StorageWorks EVA M6412A 600GB 15K Fibre Channel Hard Disk Drive	AJ872B
HP StorageWorks EVA M6412A 1TB FATA Hard Disk Drive	AG691B
HP EVA M6412A 2TB FATA Fibre Channel Dual Port Hard Disk Drive*	BV898A

NOTE: 0D1 will appear after this part number to indicate factory integration where appropriate.

- Controller Firmware XCS 10.0xx or later is required to support the 2TB FAA drive

Bulk Pack Shipping Option 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.	519137-B21 (Americas & APJ only)

NOTE: All drives ordered with a disk drive bulk pack option must be the same 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. 0D1 will appear after the disk drive part number to indicate that the drives are linked to the bulk pack. The bulk pack shipping option is for the Americas and APJ regions only.

NOTE: Quantities of disk drives ordered that are not multiples of 10 will be shipped in individual drive shipping packages.

NOTE: Bulk pack is not available for Solid State Drives

Step 5 - Cables and SFPs

Configuration Information and Configuration Rules

HP EVA Loopback Connector

HP EVA Loopback Connector — AJ706A

Contains one Loopback connector. The loopback connector is used when an EVA host port is not cabled to a switch or HBA (for direct connect).

NOTE: All EVA host ports must be filled with either a cable or loopback connector.

FC cable - Copper SFP

The following cables are used with the M6412 drive enclosure but are not necessary for new installations. These cables are for use inside the cab between the controllers and drive enclosures if replacement cables are required

Cable FC Copper SFP .6m	321624-B21
Cable FC Copper SFP 2m	324394-B21

SFPs

The EVA6400 and EVA8400 controllers come with 4Gb 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

NOTE: Before selecting the FC cables to connect between the controllers and the switches, check to see what kind of connectors are on the switches that will be connected to the controllers. The SFP connector can support 8Gb I/Os, 4Gb I/Os, 2Gb I/Os and/or 1Gb I/Os.

NOTE: One of these cables (either LC to SC or LC to LC) or an EVA Loopback connector is required per FC port of each HSV controller.

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

OM3 FC cable - 8Gb/s to 8Gb/s (optional) (LCto LC)

15-meter Multi-mode OM3 LC/LC FC Cable	AJ837A
30-meter Multi-mode OM3 LC/LC FC Cable	AJ838A

OM2 FC cable - 2Gb/s to 2Gb/s (optional) (LCto LC)

2-meter LC-LC Multi-Mode Fibre Cable	221692-B21
5-meter LC-LC Multi-Mode Fibre Cable	221692-B22
15-meter LC-LC Multi-Mode Fibre Cable	221692-B23
30-meter LC-LC Multi-Mode Fibre Cable	221692-B26
50-meter LC-LC Multi-Mode Fibre	221692-B27

FC cable - 1Gb to 2Gb/s (optional) (LC to SC)	FC Short Wave 2-Meter Cable, LC/SC (1Gb to 2Gb)	221691-B21
	FC Short Wave 5-Meter Cable, LC/SC (1Gb to 2Gb)	221691-B22
	FC Short Wave 15-Meter Cable, LC/SC (1Gb to 2Gb)	221691-B23
	FC Short Wave 30-Meter Cable, LC/SC (1Gb to 2Gb)	221691-B26
	FC Short Wave 50-Meter Cable, LC/SC (1Gb to 2Gb)	221691-B27

Optional Software

EVA Storage Management / User Interface

NOTE: Command View v9.2 runs on either a management server or application host running Microsoft Windows, VMware Guest Operating Systems (Windows 2003 and Windows 2008) or the HP OpenView Storage Management Appliance. One management server or application host is required per SAN fabric containing an Enterprise Virtual Array.

An HP Command View License-to-Use (LTU) must be purchased for each EVA controller pair. Each HP EVA must be licensed with the appropriate HP Command View LTU(s) to be in compliance with the End User License Agreement (EULA). The licensed capacity per EVA must be equal to, or greater than the total raw capacity of each EVA. HP Command View EVA may be purchased in increments of a 1TB LTU (one or multiple 1TB LTUs based upon the raw capacity), or an HP Command View Unlimited Capacity LTU may be purchased which will support up to the maximum raw storage capacity of the EVA.

See the HP Command View EVA QuickSpecs for detailed licensing, support and configuration information: http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html

High Availability Software

Industry popular multiple path software is supported on the EVA6400/8400. 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
- Windows - Linux - OpenVMS
- AIX - MPIO
- Solaris - MPxIO
- NetWare VMware Apple Mac OS X Xen

Refer to: http://h18006.www1.hp.com/products/storage/software/multipathoptions/index.html

For operating system version information refer to: SPOCK

EVA6000/8400 10GbE iSCSI support high availability Multi-path options for:

- Linux
- Microsoft Windows
- Sun Solaris
- VMware

Remote Replication Software

HP Continuous Access EVA is a controller-based application that performs real-time replication between HP enterprise virtual arrays. The solution is enhanced to perform remote replication, and deliver high data availability and performance to users on Fibre Channel based campus, metro or continental metro or continental Storage Area Networks (SANs).

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/storage/software.html

Local Replication Software

HP Business Copy EVA is a local replication software product for the EVA family providing Snapshot and clone set-up and management. Business Copy EVA 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://h18000.www1.hp.com/storage/software.html

Capacity Management Software

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. 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_div/12815_div.html

Storage Essentials Performance Edition Software

HP Storage Essentials Performance Edition Software provides path aware performance management for your EVA Disk Array. Performance Edition includes 150 MAPs and one MAL for Oracle, DB2, Informix, SQL Server, or Exchange. For more information, see the Storage Essentials product description earlier in this document.

Storage Essentials Performance Edition Media and License to Use (LTU)

HP Storage Essentials SW Media	T4283DA
HP Storage Essentials Performance Edition 150 MAP LTU	T4661AA

Add on Storage Essentials Suite plug-in products for Storage Essentials Performance Edition

HP Storage Essentials SRM Enterprise Edition 50 MAP LTU	T4284AA
HP Report Optimizer	T9422AA
HP Storage Essentials Provisioning Manager 50 MAP LTU	T4285AA
HP Storage Essentials File System Viewer 1 TB LTU	T4292AA
HP Storage Essentials Database Viewer 1 MAL LTU	T4289AA
HP Storage Essentials Exchange Viewer 1 MAL LTU	T4288AA
HP Storage Essentials Backup Manager 1 TB LTU	T4295AA

VMware Site Recovery Manager

VMware Site Recovery Manager (SRM) is designed to automate the recovery process and the remote replication of HP Continuous Access EVA with Enterprise Virtual Arrays. 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

NOTES:

1. Refer to the HP Storage Essentials Performance Edition Software QuickSpec for product and licensing details: http://h18006.www1.hp.com/products/storage/software/e-suite/index.html

Optional Hardware

File Services and EVA Connectivity Options

The EVA file services and EVA iSCSI offerings provide superior storage consolidation, management and total cost of ownership. The EVA file services offerings support both block and file data concurrently with high availability and scalable performance. The HP MPX200 Multifunction Router and EVA iSCSI Connectivity Option extends the FC SAN investment with integrated multi-protocol support, allowing customers to incorporate iSCSI servers without requiring additional storage arrays or management costs

For information on ordering file services components see:
http://h18000.www1.hp.com/products/quickspecs/12667_div/12667_div.html
http://h18006.www1.hp.com/products/storageworks

HP MPX200 Multifunction Router

HP MPX200 Multifunction Router 1 GbE Base Chassis — AP771A
Includes:

- (1) chassis,
- (1) 1 GbE blade,
- rail kit,
- accessory kit and
- documentation
- Includes redundant power supplies.

HP Storage Works MPX200 Multifunction Router 1 GbE Upgrade Blade. — AP772A
Includes:

- (1) 1 GbE blade
- accessory kit
- documentation

For multi-path (redundant blade for high availability) order both part numbers. The second hardware blade installs into the chassis that is included with AP771A or AP773A.
NOTE: HP recommends use of the same blade option type (1 GbE or 10 - 1GbE) in a common chassis to ensure balanced performance in a redundant configuration.

HP MPX200 Multifunction Router 10 - 1 GbE Base Chassis — AP773A
Includes:

- (1) chassis
- (1) 10 - 1 GbE blade
- rail kit
- accessory kit
- documentation.
- Includes redundant power supplies.

HP Storage Works MPX200 Multifunction Router 10 - 1 GbE Upgrade Blade. Includes: — AP774A

- (1) 10 - 1 GbE blade
- accessory kit
- documentation

For multi-path (redundant blade for high availability) order both part numbers. The second hardware blade installs into the chassis that is included with AP773A or AP771A.
NOTE: HP recommends use of the same blade option type (1 GbE or 10 - 1GbE) in a common chassis to ensure balanced performance in a redundant configuration.

MPX Options and Accessories

Optical FC SFP + Transceivers	8 Gbps Short Range	AJ718A
	4 Gbps Short Range	A7446B
Optical 10GbE SFP+ Ethernet Transceivers	10GbE Short Range Ethernet 10GBase-SR	455883-B21

	EVA Loopback Connector	The loopback connector is used when an available EVA host port is not used. NOTE: All EVA host ports must be filled with either a cable or loopback connector.	AJ706A
MPX200 Multifunction Router 10 - 1 GbE Upgrade Blade	Includes (1) 10 - 1 GbE blade to mount in existing chassis, accessory kit, and documentation. NOTE: For multi-path (redundant blade) support order both part numbers. AP774A installs into the chassis that is included with AP773A or AP771A. HP recommends use of the same blade option type (1 GbE or 10 - 1GbE) in a common chassis to ensure balanced performance in a redundant configuration NOTE: Requires optical FC and 10GbE SFP+ transceivers and cables listed below.	AP774A
HP Storage Works MPX200 Half Chassis FCIP License	Includes (1) license to enable FCIP functionality in one out of two bays (slots) in a MPX200 Chassis. License comes in the form of an entitlement certificate and 1 license key request form.	TA766A
MPX200 Multifunction Router Full Chassis FCIP License	Includes (1) license to enable FCIP functionality for both bays (slots) in a MPX200 Chassis. License comes in the form of an entitlement certificate and 1 license key request form. NOTE: For multi-path (redundant blade for high availability) order this full chassis license.	TA767A
MPX200 Multifunction Router 1 TB Data Migration License	Includes (1) license to migrate 1 TB of data using a MPX200 chassis. License comes in the form of an entitlement certificate and 1 license key request form	TA762A
MPX200 Multifunction Router 5 TB Data Migration License	Includes (1) license to migrate 5 TB of data using a MPX200 chassis. License comes in the form of an entitlement certificate and 1 license key request form	TA763A
MPX200 Multifunction Router 1 Array Data Migration License	Includes (1) license to migrate data from or to a single storage array using a MPX200 chassis. License comes in the form of an entitlement certificate and 1 license key request form NOTE: The MPX200 data migration has a unique fan-in/fan-out licensing model. Using this particular license, data can be migrated from multiple arrays to a single array or from a single array to multiple arrays.	TA764A
MPX200 Multifunction Router 3 Array Data Migration License	Includes (1) license to migrate data from or to three storage array using a MPX200 chassis. License comes in the form of an entitlement certificate and 1 license key request form. Using this license, you can perform three unique migration jobs. NOTE: The MPX200 data migration has a unique fan-in/fan-out licensing model. Using this particular license, data can be migrated from multiple arrays to a single array or from a single array to multiple arrays, three times. i.e. This license can enable three different migration jobs using the same MPX200 Chassis at different times.	TA765A

Configuration Information and Configuration Rules

Optical cables

Distance using short-wave 10GbE at 10GbE or 8 Gbps FC optical transceivers at 2 Gbps, 4 Gbps, and 8 Gbps connection speed:		
10GbE:	OM3 fiber:	300m
	OM2 fiber:	50m
8 Gbps FC:	OM3 fiber:	150 m
	OM2 fiber:	50 m
4 Gbps FC:	OM3 fiber:	380 m
	OM2 fiber:	150 m
2 Gbps FC:	OM3 fiber:	500 m
	OM2 fiber:	300 m

The EVA Connectivity and Back-up offerings

HP 12000 Virtual Library System EVA Gateway	Expanding the power of the HP Enterprise Virtual Array (EVA), the HP 12000 Virtual Library System EVA Gateway accelerates backup performance in complex SAN environments while improving overall reliability. For more information on the VLS EVA Gateway, please visit see: http://h18006.www1.hp.com/storage/disk_storage/disk_to_disk/vls/12000vls/index.html	AH814B
HP IP Distance Gateway SAN over WAN connectivity, enables EVA Continuous Access replication over WAN (Asynchronous and Synchronous)	HP IP Distance Gateway Order this part for all new installations. Includes One unit, shelf, brackets and documentation. HP IP Distance Gateway Includes One unit to mount in existing shelf and documentation For multi-path (dual unit high availability) order both part numbers. This second hardware unit installs into the shelf that ship with AG680A. NOTE: For more information on the IP Distance Gateway: http://h18006.www1.hp.com/storage/disk_storage/index.html	AG680A AG681A

Storage Switches, Routers/Gateways/Multiplexers, Host Bus Adapters, Converged Network Adapters

Please refer to the HP Storage Networking page for more information on networking products:
http://h18006.www1.hp.com/storage/networking/index.html

EVA6400 and EVA8400

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
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	
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)
Number of phases	Single
Rated current	17A @ 200V-240V AC, 60Hz total, 4.25 A per power cord
Nominal Line Voltage	North America - 208 or 230V Europe - 230V Japan - 206V
Range Line Voltage	187 to 256V
Line Frequency	North America 60Hz, Europe 50Hz, Japan 50 or 60 Hz

Enterprise Virtual Array 6400

NOTE: This data represents fully populated drive shelves with 15K rpm disk drives. Other drive types may vary slightly.		EVA 6400				
		2C2D	2C8D	2C12D	2C14D	2C18D
Typical	Total System Watts	746	2284	3309	3821	4847
	Total System BTU/hour	2544	7789	11284	13032	16527
	Input Current (A) per plug 208V	1.9	5.8	8.4	9.7	12.3
	Input Current (A) per plug 230V	1.7	5.2	7.6	8.7	11.1
	Input Current (A) per plug 115V	1.7	5.1	7.4	8.5	10.8
	Input Current (A) per plug 100V	2.0	5.9	8.6	9.9	12.6
	Inrush Current per plug 208V	116	153	178	190	216
Failover	Total System Watts	677	2077	3022	3596	4441
	Input Current (A) at 208V	3.3	10.5	15.3	17.7	22.5
	Input Current (A) at 230V	3.0	9.5	13.8	15.9	20.3
	Input Current (A) at 115V	3.0	9.3	13.5	15.6	19.8
	Input Current (A) at 100V	3.5	10.8	15.7	18.2	23.1

This data represents fully populated drive shelves with 15K rpm disk drives. Other drive types may vary slightly.
For more detailed information on a specific configuration and drives please utilize the EVA Power Calculator at:
http://www.hp.com/servers/powercalculator
NOTE: Typical is described as a system in normal steady state operation. (I.E., both PDUs operating normally, the array reading/writing to disk drives in a production environment)

Enterprise Virtual Array 8400

Technical Specifications

NOTE: This data represents fully populated drive shelves with 15K rpm disk drives. Other drive types may vary slightly.		2C3D	2C9D	2C18D	2C21D*	2C27D*	3D**	9D**
Typical	Total System Watts	1010	2546	4855	5623	7160.7	768	2306
	Total System BTU/hour	3444	8682	16554	19175	24418	2621	7864
	Input Current (A) per plug 208V	2.6	6.4	12.3	N/A	N/A	1.9	5.8
	Input Current (A) per plug 230V	2.3	5.8	11.1	N/A	N/A	1.8	5.3
	Input Current (A) per plug 115V	2.2	5.7	10.8	N/A	N/A	1.7	4.4
	Input Current (A) per plug 100V	2.6	6.6	12.6	N/A	N/A	2.0	5.1
	Inrush Current per plug 208V	122.0	160.0	215	NA	N/A	110.0	153
Failover	Total System Watts	906.5	2323	4453	5162	6580.5	709	2127
	Input Current (A) at 208V	4.6	11.8	22.5	N/A	N/A	3.6	10.8
	Input Current (A) at 230V	4.2	10.6	20.4	N/A	N/A	3.2	9.7
	Input Current (A) at 115V	4.0	10.4	19.8	N/A	N/A	3.2	7.8
	Input Current (A) at 100V	4.7	12.1	23.1	N/A	N/A	3.7	9.1

* Any system over 2C18D requires 2 cabinets; total power is given for both cabinets.
** For line cord current and inrush data for the 2C21D or 2C27D systems use the 2C18D information for the 1st cabinet and the 3D or 9D information for the second cabinet.

Enterprise Virtual Array EVA6400/8400 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
EVA6400/8400 Controller Array	7.0/17.78	17.6/44.70	27.5/69.85	120/54.55	N/A	N/A
M6412-A Drive Enclosure	3.5/8.89	17.6/44.70	23.75/60.33	57/25.86	N/A	N/A
FC or FATA drives for M6412-A	N/A	N/A	N/A	1.9/.86	N/A	N/A
SSD for M6412-A	N/A	N/A	N/A	1.1/.5	N/A	N/A
HP Rack 10642 G2 Shock (42U)	78.7/200	24/59.7	39.691/101.5	253/114.84	30/76.2	30/76.2

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.