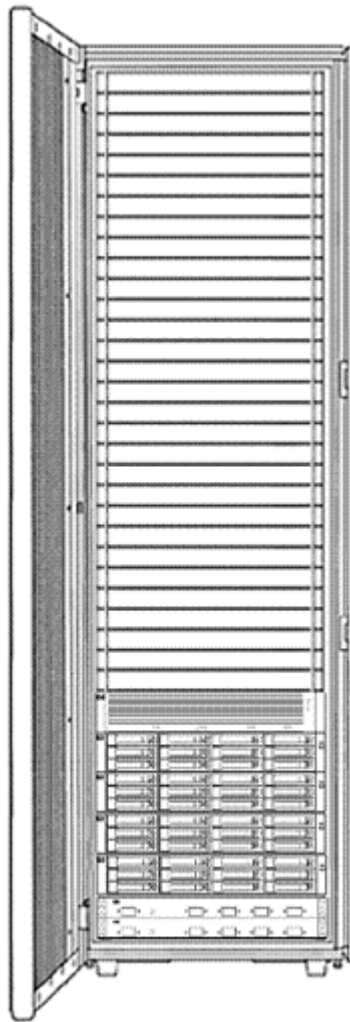*Overview*

The EVA4400 offers an easily deployed enterprise class virtual storage array for midsized customers at an affordable price. With built in virtualization, it is designed to improve capacity utilization and be easy to manage, which lowers the cost of ownership compared to traditional arrays. It has high performance, scales easily, and is highly reliable and available. The availability is built on the EVA4100/6100/8100 architecture that offers 99.999% availability and a dual redundant design. It provides broad operating system support with proven integration with major applications, such as Microsoft Exchange, Oracle and SAP. The EVA4400 has robust local and remote replication capabilities with HP Business Copy EVA and HP Continuous Access EVA software. With HP Command View EVA and HP Dynamic Capacity Management software, management and storage provisioning of the EVA is easy and saves time for customers.

EVA4400 2C4D

NOTE: If a customer has a specific racking requirement they should use the Factory Express option to define the configuration.

QuickSpecs

Overview

What's New

Concurrent with the introduction of the new EVA6400/8400 array models, the EVA4400 is being refreshed with many new features also being introduced with the EVA6400/8400. This includes:

- Vraid 6
- Large LUNs (32TB)
- Solid State Disk Support
- Instant restore from MirrorClone Snapshot
- Command View EVA and Replication Solution Manager support for All EVA generators
- Dynamic Capacity Manager on Linux
- A new version of the M6412 drive enclosure, M6412A, that meets the latest RoHS requirements
- And, only recently, support of Command View EVA / ABM (Array Based Management) for the EVA4400 only

QuickSpecs

Product Highlights

	EVA4400	EVA6400	EVA8400
Controller Model	HSV300	HSV400	HSV450
Virtual Controller Software (XCS)	XCS v9.5	XCS v9.5	XCS v9.5
Management Software	Command View EVA v9.0	Command View EVA v9.0	Command View EVA v9.0
Application Environment	Oracle, SAP, Microsoft Exchange, SQL	Oracle, SAP, Microsoft Exchange, SQL	Oracle, SAP, Microsoft Exchange, SQL
Local Data Replication -- HP StorageWorks Business Copy EVA	Yes	Yes	Yes
Remote Data Replication -- HP StorageWorks Continuous Access EVA	Yes	Yes	Yes
Command View EVA Aarray 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 Novell NetWare VMware Apple Mac OSX Citrix Xen	HP-UX HP OpenVMS Windows 2003 Windows 2008 Windows Server 2008 HyperV Sun Solaris Linux IBM AIX Novell NetWare VMware Apple Mac OSX Citrix Xen	HP-UX HP OpenVMS Windows 2003 Windows 2008 Windows Server 2008 HyperV Sun Solaris Linux IBM AIX Novell NetWare VMware Apple Mac OSX Citrix Xen
RAID supported	Vraid0, Vraid1, Vraid 0+1, Vraid5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps	Vraid0, Vraid1, Vraid 0+1, Vraid5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps	Vraid0, Vraid1, Vraid 0+1, Vraid5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps
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 and Direct Connect	Fibre Channel, iSCSI and Direct Connect	Fibre Channel, iSCSI and Direct Connect
Number of Host Supported (Single Path/Dual Path)	512/256	512/256	512/256
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

Product Highlights

Device Path Aggregate Bandwidth	16 Gb	32 Gb	48 Gb
Switched device shelves (M6412)	1 to 8	2 to 18	3 to 27
Drives per enclosure	12	12	12
Drive types (mixed in any enclosure)	Solid State Disks (SSD), High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)	Solid State Disks (SSD), High Performance Fibre Channel and Fibre Attached Technology Adapted (FATA)	Solid State Disks (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 96TB	.4 to 216TB	.4 to 324TB
Drive capacities and speeds	72GB SSD 400GB 10K rpm 146GB 15K rpm 300GB 15K rpm 450GB 15K rpm 1TB FATA	72GB SSD 400GB 10K rpm 146GB 15K rpm 300GB 15K rpm 450GB 15K rpm 1TB FATA	72GB SSD 400GB 10K rpm 146GB 15K rpm 300GB 15K rpm 450GB 15K rpm 1TB FATA
JBOD Support (behind XP)	Yes	Yes	Yes
I/O Requests per Second (IOPs)	>140,000	TBD	TBD
Maximum throughput (MB/s)*	1550	TBD	TBD
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		

* More EVA4400 performance information is available at: www.hp.com/go/eva4400, Resource Library.

EVA 4400 Capabilities

- Easy to install and configure in just a few hours (for a factory configured unit) with the SmartStart configuration utility*
- Virtualization abilities allow for easy management and excellent capacity utilization
- Start small and increase capacity as the business grows
- Business application and HP BladeSystem integration
- Excellent reliability and availability. HP's data shows that most customers are achieving 99.999% availability with the EVA 4x00/6x00/8x00
- 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 2 Gb/s dual-ported Fibre Attached Technology Adapted (FATA) drives and dual ported Solid State Disks (SSD)
- Array management flexibility with optional deployments of:
  ○ Array Based Management with Command View / ABM
  ○ Server Based Management with Command View / SBM**
- Support for Direct Attach connection to Windows, HP-UX, and Linux servers, without the need for SAN switches, with Command View / ABM
- SAN support for integrated EVA iSCSI Connectivity Option with Windows and Linux, Apple Mac OS X, Microsoft Windows, Sun Solaris, VMware.

Product Highlights

- Management of up to 1024 virtual disks (256 per HBA), for the EVA4400, ranging in size from 1GB to 32TB per Virtual disk, in 1GB increments.
- Dynamic Capacity Management support to expand (in 1GB increments) and shrink LUNs up to 2TB.
  NOTE: Requires Host Operating System Support.
- Virtual disk data load leveling (non-disruptive background activity)
- Distributed sparing of disk capacity
- Redundant FC-AL loops from each controller to dual disk ports
- Support for remote replications between current EVA generations
- Migration support via remote replications between current and earlier EVA generations
- Dual redundant controller operation for increased fault tolerance
- Robust local and remote replication capabilities with Business Copy and Continuous Access EVA
- High availability with hot plug drives, power supplies, fans, and industry failover software
- Multiple Bus Failover Support using industry popular multiple path software.
  NOTE: Requires native OS multi-pathing support.
- Battery-Back-Up for controller cache memory
- Asynchronous Disk Swap (hot swap)
- Clustered Server Support
- Mirrored Write-Back Cache Support
- Read-Ahead and Adaptive Read Caching Support
- Virtual RAID Arrays (Vraid0, Vraid1, Vraid 0+1, Vraid5, Vraid 0+5, Vraid 6 & Cross Vraid Snaps)
- 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
- 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 StorageWorks 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, HP ProLiant Storage Servers (NAS), HBAs, switches, applications and monitor the entire backup from a single interface with HP Storage Essentials

*For more information on SmartStart, for EVA see:
http://h18000.www1.hp.com/products/storageworks/evasmartstart/relatedinfo.html?jumpid=reg_R1002_USEN
** For more information on Command View, see:
http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html

QuickSpecs

HP StorageWorks 4400 Enterprise Virtual Array

Product Highlights

EVA4400 Product Packaging	The EVA4400 packaging consists of a 2U FC dual HSV300 controller assembly and 2U 12-bay Model M6412A FC drive enclosures. (The M6412A drive enclosure is also used by the EVA6400 and EVA8400.) The EVA4400 is also available with an embedded SAN switch for each controller, for a total of two switches per enclosure. This SAN switch is an 8Gb/s, 10 port B-series FC switch for a total of 20 SAN ports per EVA4400 enclosure. EVA4400 configurations allow a wide range of configuration options, including flexible factory rack-mounting options in either a standard 42U cabinet (based on the HP 10000 G2 Series Rack or a choice of 42U extended and 36U and 22U heights). EVA4400 is available in pre-configured Starter Kit configurations. For more information on these kits see: http://h18000.www1.hp.com/products/quickspecs/12894_div/12894_div.html

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Embedded SAN Switch Options

In addition to providing twenty 8Gb/s FC SAN port connectivity, the embedded SAN Switches have optional software components for:

- Adaptive Networking
- ISL Trunking
- Advanced Performance Monitoring
- Fabric Watch
- Extended Fabric

For more information on these software component options, see: http://h18006.www1.hp.com/storage/networking/b_switches/index.html and look for HP StorageWorks B-Series 8/8 SAN Switch information.

Multi-Vendor Platform

The EVA4400 provides support for industry-leading Operating System platforms including:

- HP-UX
- HP OpenVMS
- Windows Server 2003
- Windows Server 2008
- Windows Server 2008 HyperV
- Sun Solaris
- Linux
- IBM AIX
- Novell NetWare
- VMware
- Apple Mac OSX
- Citrix Xen

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.

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Product Highlights

HP SmartStart for EVA configuration utility	The EVA4400 is easily installable in a few to several hours, depending on the complexity of the configuration, using HP SmartStart configuration utility for EVA Storage. For Windows 2003 and 2008 application servers, SmartStart software installs HBA drivers, Multi-pathing I/O (MPIO) drivers, the Storage System Scripting Utility (SSSU) for Windows, Command View EVAperf, installs Command View EVA on a Windows Server 2003 management server and helps provision the EVA4400 storage.

Installation and Startup

For more complex environments, an Installation & Start-up service is recommended or may be required. HP recommends the purchase of the following Installation & Startup services:

- For an EVA4400 into heterogeneous server environments, including installation of controllers, drive enclosures, disk drives, installation of Command View / SBM and HP's Remote Connectivity Support Pack (RSP), purchase the EVA4400 Installation and Startup Service - HA114A1#58D.
- For factory configured, factory racked EVA orders and when final installation of just the pre-configured EVA hardware at the customer site is required, purchase the Basic I&S service - HA113A1#58D.
- For factory configured, factory racked EVA orders, without an existing Command View management server, purchase the Command View Installation and Startup - HA124A1#5AS. This service includes LUN design and implementation, HP Insight Remote Support software, and customer orientation training.
- For Continuous Access configurations, purchase the HP Data Replication Solution Service-Continuous Access.
- For Replication Solutions Manager, purchase the HP Data Replication Solution Service -- Continuous Access EVA or Business Copy EVA.

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

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

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

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

Product Highlights

**Remote Replication
Solutions**
(Software options)

HP StorageWorks Continuous Access provides disaster tolerant replication across a Fibre Channel SAN. Continuous Access EVA performs real-time replication between HP StorageWorks 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. For additional information about Continuous Access EVA visit: http://h18006.www1.hp.com/storage/software.html

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

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

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

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

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

**Local Replication
Solutions**
(Software options)

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

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.
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.
Capacity Management	HP StorageWorks EVA Dynamic Capacity Management Software is a comprehensive software solution that automates storage provisioning and improves capacity utilization on the HP StorageWorks Enterprise Virtual Array (EVA) family. Designed for the enterprise market, EVA Dynamic Capacity Management Software uses advanced automation to automatically "right-size" the file system and storage volumes to ensure the highest levels of capacity utilization are achieved while reducing ongoing storage administration needs. For more information about DCM, please see the following: http://h18000.www1.hp.com/products/storage/software/eva_dcm/index.html
Application Solutions	The EVA4400 is the ideal solution for customers running Oracle, Exchange, SAP environments and those customers who are deploying virtual server technologies like VMware. Here are descriptions of two such solutions:

- JD Edwards

The HP and JD Edwards EnterpriseOne solution leveraging the HP BladeSystem and HP StorageWorks EVA4400, offers a single database and pre-integrated applications that help companies manage the core processes involving finances, people and equipment enabling them to make the best use of information and resources throughout the business. The HP and JD Edwards EnterpriseOne solution provides capabilities across a breadth of business processes, including customer relationship management, enterprise resource planning, supply chain management and supplier relationship management.

- Oracle E-Business Suite (EBS)

Designed to support the global economy (as well as mid-market companies with complex requirements), Oracle® E-Business Suite (EBS) on the HP BladeSystem server and the HP StorageWorks EVA4400 helps users think globally to make better decisions; work globally to be more competitive; and manage globally to lower costs, enhance security and increase performance. This right-sized, affordable business

Product Highlights

technology is built on a unified architecture with a single Oracle Database-providing a comprehensive, integrated set of business management and planning applications that allow organizations to manage their end-to end operations.

For additional tested, industry leading configurations built on the EVA4400 and HP's Blade and Rack Servers, visit: http://h18006.www1.hp.com/products/storageworks/eva4400sb/index.html

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

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

http://h18006.www1.hp.com/products/storage/software/e-suite/index.html |
| **HP Standard Edition SRM Software and EVA** | HP Storage Essentials Standard Edition Storage Resource Management Software and Systems Insight Manager with Command View EVA / SBM software provides a total solution that allows midsize businesses with limited IT staff to see the big picture (storage-servers-infrastructure) thereby reducing SAN complexity by not having to depend on Excel spreadsheets or whiteboards to track and manage SAN storage and infrastructure. It supports Windows and Linux servers with small to medium HP storage based SANs including HP EVA, HP MSA, HP NAS, HP EML Tape, HBAs and fabric devices. HP Standard Edition SRM Software unified server and storage tool-set automates complex and manual storage process and tasks with auto discovery, visualization and topology mapping for quick device identification, integrated NAS and SAN management, business application monitoring including Oracle, Microsoft SQL, Sybase, InterSystems Caché, Microsoft Exchange Server and SAP Adaptive Computing Controller (ACC) environments path dependency identification, and end-to-end EVA SAN performance monitoring and analysis. For more information on HP Storage Essentials SRM Standard Edition Software visit: http://h18006.www1.hp.com/products/storage/software/std-suite/index.html |
| **HP Storage Essentials SRM Performance Pack Software and EVA** (end-to end EVA SAN Performance Management) | HP Storage Essentials SRM Performance Pack Software combined with Storage Essentials SRM Enterprise Edition Software monitors performance along the complete path of business applications through underlying storage area networks (SAN) components, including host server, host bus adapter (HBA), fabric switch and Enterprise Virtual Array. A unified and simplified interface helps EVA administrators increase efficiency, troubleshoot performance bottlenecks faster, and quickly visualize the big performance picture of their EVA storage, hosts and SAN infrastructure with real-time monitoring, historical trend analysis and trend extrapolation.

The SRM Performance Pack Software can be ordered separately on a per EVA basis for existing Storage Essentials SRM Enterprise Edition customers, and for Storage Essentials SRM Standard Edition customers the SRM Standard Edition LTU includes licensing to monitor up to 3 HP EVAs. For more information on HP Storage Essentials SRM Standard Edition Software visit: http://h18006.www1.hp.com/products/storage/software/std-suite/index.html |

Product Highlights

HP StorageWorks 12000 Virtual Library System EVA Gateway

Expanding the power of the HP StorageWorks Enterprise Virtual Array (EVA), the HP StorageWorks 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 will also be able to take advantage of data deduplication when that feature is launched in early 2008. 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 Connectivity

EVA iSCSI Connectivity Option

EVA4400 iSCSI support is available through the EVA4400 iSCSI Connectivity Option. This powerful solution provides iSCSI connectivity to an EVA4400 utilizing the EVA's existing Fibre Channel infrastructure.

The HP StorageWorks EVA4400 iSCSI Connectivity Option extends the advantages of Fibre Channel SANs into smaller departments and remote locations. This EVA4400 option allows customers to incorporate iSCSI servers within SANs without requiring additional storage arrays or management costs. Use the EVA's Command View (/SBM or /ABM) software to manage the iSCSI connectivity to the array and mount the iSCSI device in the same rack as the array. For small-SAN deployment, the EVA4400 Starter Kit with the iSCSI Connectivity Option provides an affordable, robust and highly available simple iSCSI solution for smaller budgets.

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

ProLiant Storage Server Gateways

The EVA also supports select ProLiant Storage Servers (i.e. NAS) connected as iSCSI/file/print gateways. ProLiant DL380 G5 SAN Gateway Storage Servers and SB460c SAN Gateway Storage Servers both feature Microsoft's Windows Unified Data Storage Server 2003 operating system that includes a cluster license and Microsoft iSCSI Software Target standard, while other models offer optional support for Microsoft iSCSI Software Target. ProLiant Storage Servers with iSCSI target functionality not only enable tiered (Fibre Channel and iSCSI) block access for application servers, but they also add file and print services to your EVA solution. In addition, any ProLiant DL380 G5 Storage Server or SB460c SAN Gateway Storage Server is a perfect platform from which to run Command View EVA / SBM. You can greatly enhance the value of your EVA when you host EVA management, file and print services, and

Product Highlights

iSCSI connectivity all from the same ProLiant Storage Server gateway solution.

For more information: http://www.hp.com/go/storageservers

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 consolidate their individual silos of storage to gain flexibility, reduce IT costs and complexity as compared to traditionally architected storage solutions.

The use of EVA and file services supports both CIFS (windows) and NFS file serving. The components can be factory integrated into HP EVA4400 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

ProLiant Storage Server Gateways

Product Highlights

Select ProLiant Storage Servers can be connected to an EVA to add file, print, management, and/or iSCSI services and boost the value of your array investment. ProLiant DL380 G5 SAN Gateway and SB460c SAN Gateway Storage Servers are designed to provide highly-available additional data services to an EVA array or SAN, and both feature Microsoft's Windows Unified Data Storage Server 2003 operating system that includes a cluster license and Microsoft iSCSI Software Target standard. ProLiant Storage Servers can host Command View EVA / SBM as well, making them an affordable and flexible way to add functionality and value to your EVA investment.

For more information: http://www.hp.com/go/storageservers

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 is a management application and it is derived from the heritage of Compaq Insight Manager, HP Toptools, and HP Servicecontrol. HP SIM runs on HP Windows, Linux, and HP-UX and provides discovery and identification, fault management, security administration, asset reporting, and centralized configuration management across heterogeneous servers, storage and infrastructure. HP SIM is easily extensible, integrating other HP management products and value-add plug-ins such as the ProLiant Essentials, Integrity Essentials, and Server Essentials.

HP SIM relies on industry standards like SMI-S, SNMP, SSH, WBEM, and WMI to detect and report heterogeneous device attributes. HP SIM may also be configured to launch array specific applications for configuration, reporting and replication. For more information on HP Systems Insight Manager see: http://www.docs.hp.com/en/netsys.html

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 EVA4400 provides one of the highest density disk storage solutions in its class of product. The EVA4400 can be configured in 18U of rack space with eight 2U 12-bay M6412A FC disk enclosures for a maximum capacity of 96 disk drives and a maximum storage capacity of 96 TB of disk capacity. The EVA4400 supports the HP 10000 G2 series racks.

Solid State Disk Support

The EVA supports 72GB dual ported fibre channel solid state disk drives (SSDs). The EVA arrays will support mixed drive types (solid state disks, high performance and FATA) within an enclosure, The solid state disks require their own disk group. The minimum number of SSDs supported is 6 and the maximum is 8 per array.

SSD are supported with Vraid 5 only. SSDs are supported with Business Copy EVA, but are not currently supported with Continuous Access EVA.

QuickSpecs

Product Highlights

10K rpm Drive Support

The EVA supports the 400GB 10K rpm dual-ported 4 Gb/s FC disk. The EVA4400 will support up to 96 disk drives. The EVA4400 array will support single or mixed drive capacities and types (high performance and FATA) within an enclosure. HP recommends using the same drive type (the same capacity) within a disk group because virtualization allocates space proportionate to the highest capacity drive within the group. A minimum of eight high performance Fibre Channel drives are required in a configuration using high performance drives.

15K rpm Drive Support

The EVA also supports 146GB, 300GB, and 450GB 15K rpm dual-ported 4 Gb/s FC disk drives. The EVA arrays will support single or mixed drive capacities and types (high performance and FATA) within an enclosure. HP recommends using the same drive type (the same capacity) within a disk group because virtualization allocates space proportionate to the highest capacity drive within the group. A minimum of eight high performance Fibre Channel drives are required in a configuration using high performance drives.

FATA Drive Support

The EVA supports 1TB dual ported 4 Gb/s Fibre Attached Technology Adapted (FATA) disks. An EVA will support a full configuration of FATA disk drives. The EVA4400 Starter Kits and the EVA4400 can be configured with any combination of FATA and high performance disk drives; total raw capacity will vary based upon the redundancy (Vraid) selected. A minimum of eight FATA drives are required in a configuration using FATA drives.

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

Please see the following URL for more information on FATA drives, their uses and their benefits:
http://h71028.www7.hp.com/ERC/downloads/5982-7353EN.pdf

Fibre Channel Technology

The EVA4400 models are 4Gb/s FC Switched Fabric enabled and are compatible with 8Gb/s, 4Gb/s or 2Gb/s FC Switched Fabric SANs with XCS v9.0. They can co-exist in the same FC SAN with EVA3000/5000 or EVA4x00/6x00/8x00 FC storage solutions and many other SAN devices. The EVA4400 with embedded switch model is 8Gb/s FC ready with XCS v9.0. The embedded switch is an 8Gb/s, 10 port B-series SAN switch for a total of 20 ports per controller enclosure.

The EVA4400 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, 150 meters @ 4 Gb/s and up to 10 kilometers (6.21 miles) @ 1 Gb/s when using long wave cable. Storage Area Networks (SANs) can be constructed using FC switches/directors for fabric connectivity. HP StorageWorks SAN B-series and C-series switches and directors provide exceptional connectivity while increasing the effective bandwidth of the network. Supported SAN features include Zoning for communication isolation and Inter-Switch Links (hops) up to 10 km.

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

QuickSpecs

Product Highlights

Transfer Speeds

The EVA4400 Starter Kits and EVA4400 have two FC host ports per HSV300 or HSV300-S controller; four for a controller pair. Each controller-to-host interface is 4 Gb/s. The HSV300 and HSV300-S controllers are compatible with 2 Gb/s and 4 Gb/s FC switches (if required), HBAs, servers and other storage solutions.

Each EVA controller pair interfaces with the M6412A drive enclosures. With 2 device ports per controller and dual FC I/O modules per drive enclosure, each controller has two connections to each FC drive A and B port. So each controller has a redundant path to each drive.

Easy Installation

The EVA4400 can ship from the factory fully configured. After unpacking, it can be plugged into power sources, connected to the FC SAN, enabled and configured using HP SmartStart for EVA Storage and Command View EVA and it is ready for use. Installation and start-up services are not required but are available separately.

High Availability/ Fault Tolerance/ Hot pluggable support

All EVA4400s are configured with dual HSV controllers that operate in a redundant mode. Each EVA4400 controller has two FC device ports. For EVA4400, 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 Path software.

On the EVA4400, each port connects to one FC I/O module on a drive enclosure. Up to eight drive enclosures can be connected in a FC loop arrangement with a controller pair and connect to one port of up to 96 drives. With the two FC ports per controller, each controller can connect to both ports on up to 96 disk drives for redundant paths to all 96 drives.

The HSV300 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 FC drive enclosure has dual redundant hot plug FC I/O 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. The enclosure also has dual redundant hot plug power supplies and dual hot plug blowers. Environmental Monitoring Unit (EMU) functionality is built into the I/O module in the enclosure and monitors and reports the condition of the power supplies and fans.

The FC and FATA disk drives have dual FC ports which can be redundantly accessed by each controller. The drives are hot plug. The drives can be configured, using redundant Vraid1 or Vraid5 protection, so that a drive failure will not cause loss of data. Optional virtual sparing can be configured so that a drive failure will trigger an automatic rebuild of the Vraid1 or Vraid5 protection using the virtual spare.

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.

The EVA4400 with embedded switch model also includes two 10 port 8Gb/s FC SAN B-series switches.

Product Highlights

EVA Manageability

HP StorageWorks 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 / SBM software runs on a variety of server configurations using Windows Server 2003. ProLiant DL380 G5 and SB460c SAN Gateway Storage Servers are the perfect companion platforms from which to run Command View EVA / SBM, since they can also add file and iSCSI services to your array, and help you optimize your investment by combining multiple services on a single device or cluster.

The powerful Command View EVA / SBM provides an easy mechanism to manage up to 16 EVA units in a SAN configuration. Industry leading security enhancements in Command View now allows administrators to take advantage of Windows domains and local groups. Command View integrates with Windows Active Directory to authorize and authenticate users. In addition, all user actions and events that change system state are logged. Administrators can now use the audit logging capabilities to see who did what and when. The 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 HSV300 controller has two Fibre Channel host ports (four ports in a redundant pair of controllers) assuring the availability of bandwidth for the most demanding applications. For the Embedded Switch controllers, the host ports are connected internally to the embedded switches and are not available externally. Twenty 8Gb/s SAN ports are available externally for SAN connections.

In addition, up to 4GB of cache per controller pair ensures high performance.

Scalability

A storage management server can manage up to 16 EVA controller pairs (EVA4400, EVA3000s, EVA5000s, EVA4x00s, EVA6x00s and/or EVA8x00s) in any one fabric. An EVA4400 controller pair will support up to 256 multi-path host connections (up to 1024 HBAs).

The EVA4400 will scale up to 96 disks (96TB using 1TB FATA disk drives, and 43.2TB using 450 GB high performance disk drives).

Configure to Order (CTO) options and the HP 10000 G2 Series Racks allow even greater server and device integration, flexibility and scalability for the EVA4400. Data center managers can customize server, storage and back-up configurations as well as using the residual cabinet U space to mount management servers, switches and have the peace of mind that it is built with HP factory precision manufacturing.

Product Highlights

EVA as Virtualized Storage behind the XP	HP Storage Works EVA4400 disk arrays can be connected as external storage devices behind the HP StorageWorks XP family of disk arrays.

The XP24000/XP20000 simplifies the management of heterogeneous SAN environments through its ability to support up to 247 PB/ 96 PB respectively of external storage-all configured 'behind' a single XP. XP External Storage software uses advanced virtualization technology to allow storage administrators to host 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.

Instead of seeing a confusing collection of dissimilar arrays, host systems perceive all the data to be stored inside the XP disk array. In effect, the XP becomes the storage controller for a flexible, multi-tiered collection of storage with a range of cost and performance capabilities. By configuring current or legacy storage systems behind a single XP24000/XP20000, data can be moved back and forth dynamically across tiers, all of which is invisible to the applications.

The XP's 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 XP24000/20000 External Storage web page at:
http://h18006.www1.hp.com/products/storage/software/extstxp/index.html

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Servers Supported – Single and Clustered

HP servers (HP-UX, ProLiant, ProLiant Storage Servers, AlphaServers)

X86 servers

Dell servers

Sun servers

IBM servers

Apple XsApple Servers (PowerPC and Intel)

Product Highlights

EVA Required Software

HP StorageWorks EVA4400 ships with XCS v9.5 factory installed on new EVAs. XCS v9.5 also supports the EVA6400/8400. The base XCS License to use for the EVA is contained in the hardware shipment.. XCS v9.5 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 v9.5 controller media and the EVA4400 Release Notes are also available to download from: http://h18006.www1.hp.com/products/storageworks/eva/index.html

HP StorageWorks Command View EVA is required software for the EVA4400. HP Command View EVA requires a License to use (LTUs) equal to, or greater than the total raw capacity of each array.

Install and configure Command View / SBM and the EVA 4400 with HP SmartStart for EVA Storage. Order this media kit when ordering an EVA4400.

EVA StorageWorks EVA Software Selector

The following matrix will assist in identifying some of the complimentary HP software products 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 SmartStart	X						
HP Business Copy EVA		X					X
HP Continuous Access EVA				X			
Dynamic Capacity Manager	X						
HP Storage Essentials Suite (Heterogeneous, multivendor)	X End to end provisioning (hosts, infrastructure, storage)	X End to end backup monitoring/ reporting			X Discovery, topology, monitoring, events, applications, NAS/SAN, File monitoring, reporting, Performance, monitor host		X monitor applications and associated storage/infrastructure (Oracle, Microsoft Exchange Server, Sybase, Microsoft SQL, InterSystems Cache' database and SAP ACC)

Product Highlights

					clusters		
HP Storage Essentials Standard Edition SRM Software (Small to medium HP Storage-based SANs)	Discovery, topology	X Backup monitoring/ reporting			X monitoring, events, applications, NAS/SAN, File monitoring, reporting, EVA Performance, monitor host clusters	X	X (Oracle, Exchange, Sybase, MS SQL)
HP Data Protector		X	X				X
HP Systems Insight Manager	In-context launch of CV EVA, SAN discovery, monitoring, asset, config., security					X (Included with EVA)	
HP Storage Mirroring				X			

EVA and Value-added Software Compatibility

Model	XCS Software	HP Command View EVA*	HP Continuous Access EVA**	HP Business Copy EVA**	HP Replication Solution Manager (RSM)***
EVA4400	EVA4400 v9.0 (XCS 9.0)	Command View EVA / SBM v8.0 or Command View EVA / ABM v8.1	Continuous Access EVA	Business Copy EVA	Replication Solution Manager v4.0

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

Operating Systems, Cluster and High Availability Compatibility

Operating System	Versions Supported		Cluster Server or High Availability Software	HA Versions Supported	Failover Software
Microsoft Windows 2003/32-bit	Standard Enterprise	SP1, R2; SP2 SP1, R2; SP2	Microsoft Cluster Server	Windows Server 2003	Full featured MPIO, v3.00.00 available

Product Highlights

Microsoft Windows 2003/x64	Standard Enterprise	SP1, R2; SP2 SP1, R2; SP2	(MSCS)	Enterprise Edition Windows 2003 DataCenter Edition (64-bit))*	from HP and Microsoft DSM from Microsoft
Microsoft Windows 2003/IA64	Enterprise DataCenter	SP1; SP2 SP1; SP2			
Microsoft Windows 2008 32-bit, x64*	Standard Enterprise		Veritas Foundation Suite/HA ***	5.0 (Windows 2003)	
Microsoft Windows 2008 IA64*	Enterprise				
HP-UX	11i v1 (PA-RISC) 11i v2 (PA-RISC & Integrity) 11i v3 (PA-RISC & Integrity)		HP ServiceGuard **** Veritas Foundation Suite/HA***	11.14 (11i v1) 11.15 11.16 11.17 5.0 (11iv2)	HP Secure Path 3.0F SP3 for HP-UX 11.23 and prior versions, HP-UX 11.31 has OS native multi-path, pvlinks native in HP-UX and Veritas DMP
Linux	Red Hat EL Advanced Server 4.5, 4.6 (IA32, IA64 & x86_64) RedHat EL Advanced Server 5.0, 5.1 (IA32, IA64 & x86_64) SUSE/SLES9 (IA32, IA64 & x86_64)- SP3, SP4 SUSE/SLES10 (IA32, IA64 & x86_64)- SP1		HP ServiceGuard for Linux**** VERITAS Foundation Suite/HA for Linux***	11.16 5.0 (SLES9& REL4 x86 only)*	QLogic Failover driver, available from QLogic /HP, Emulex MultiPulse available from Emulex/HP and Device Mapper v4.0 Enablement Kit from HP
Apple Mac OS X	Tiger - 10.4.10 minimum Leopard - 10.5		N/A	N/A	ATTO FC HBA driver
HP OpenVMS	Alpha: 7.3-2, 8.2, 8.3 Integrity: 8.2-1, 8.3, 8.3-1H1		HP OpenVMS Clusters	7.3-2 8.2 8.2-1 8.3 8.3-1	Native in OS
Sun Solaris	8 9 10 (SPARC & x86_64)		SunCluster VERITAS Foundation Suite/HA***	3.1 5.0 (9 & 10)	MPxIO for Solaris, Native in OS Veritas DMP 5.0
IBM AIX	5.2 5.3 6.1		HACMP VERITAS Foundation Suite/HA***	Native in OS 5.0 (AIX 5.3)	MPIO for IBM AIX, Native in OS Veritas DMP 5.0
Novell NetWare***	6.5 SP6, SP7		NetWare cluster server	1.8	MPIO for NetWare, Native in OS
VMware	ESX Server 2.5.4, 2.5.5, 3.0.1, 3.0.2, and 3.5		MSCS Clustering**	Windows Server 2003 Enterprise Edition	Windows Server 2003 Enterprise Edition
Citrix	Integrated Citrix XenServer HP Enterprise Citrix Xen Enterprise 4.1.0-7846 Guest Operating Systems Supported				Native Device Mapper MPIO

Product Highlights

		• Red Hat 5.2 • SuSE 10 SP1 • Windows 2003 x64				

*For more specific information on supported versions of Windows 2008, see the OS support matrix at: hp.com
**For more detailed information on Cluster Server Support see the VMware Release Notes
***Follows initial release, check posted Operating Specific Release Notes or software documentation for support.
**** For more specific information on supported versions check posted Operating Specific Release Notes or software documentation for support

Racking Guidelines and Power Distribution	Power Distribution Units (PDUs) are configured according to the voltage used in the country when the solution is ordered. These PDUs provide redundant power. They are located in the bottom and back of the cabinet, taking 1U of rack space. For the EVA4400, 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 200 - 240V PDU and country specific power cords. However, the EVA4400 configurations can be customized to meet a wide variety of customer needs. The height, width (including the 800mm wide rack) and types of rack and PDUs can be modified based upon the specific customer need. If other devices, such as servers, switches or back-up devices are to be installed with the EVA, this can be specified and the cabinets and PDUs can be modified to support the configuration. The EVA4400 also supports 22U and 36U racks. The 47U rack is also supported, but not factory configured, because of the cabinet height, which creates shipping difficulties. It must be assembled on site. For more information on the HP rack offerings, please see the following URL: http://h18004.www1.hp.com/products/servers/proliantstorage/racks/index.html The EVA also supports the 5642 (42U) Rack Cabinet System as a field installed option. For more information on the 5642 rack, please see the following URL: http://h18004.www1.hp.com/products/servers/proliantstorage/racks/5000series/5642/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 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.

QuickSpecs

Family Information

HP Care Pack Services	HP Care Pack Services offer upgraded service levels to extend and expand your standard product warranty with easy to buy, easy to use support packages that help you make the most of your hardware and software investments. They let you choose the support levels that meet your business requirements, from basic to mission-critical. They help you contain total cost of ownership.

HP Care Pack warranty extensions can be purchased along with HP products to cost-effectively upgrade or extend your warranty. For many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

Why purchase an HP Care Pack service?

Your standard warranty protects against product defects. HP Care Pack Services help you guard against unplanned downtime, which can reduce your productivity and profitability. These convenient service packages:

- Protect your investment in HP products
- Provide consistent, predictable levels of support across your entire department or business
- Ease budget planning with fixed-cost support that includes parts and labor
- Give you direct access to proven technical and problem-solving expertise
- Offer a choice of response-time and repair-time commitments
- Deliver prompt, measurable results
- Are available whenever and wherever you do business

HP Care Pack availability may vary by country and product.

Supporting your Adaptive Enterprise journey.

HP Services helps you make the Adaptive Enterprise real for your organization. The breadth, depth, and quality of HP hardware and software support services can help you **improve the performance** of your IT support processes and resolve the complex software and hardware problems that tax user productivity. HP Care Pack services help you **increase IT environment stability**, efficiency, and agility from the desktop to the data center, and improve the productivity of your employees.

Warranty and Services Included with the Product
The EVA4400 comes with a 2-year HP's Global Limited Warranty and Technical Support, which includes 2 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

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 EVA4400. For more information go to: www.hp.com/support or: www.itrc.hp.com.

Family Information

Remote Support

HP designed the EVA4400 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 EVA4400 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 EVA4400, select Storage, then EVA Disk Arrays, then HP StorageWorks 4400 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 EVA4400 comes with 2 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:

Family Information

ftp://ftp.compaq.com/pub/products/storageworks/warranty/en_321708-008.pdf

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

Recommended Services	HP SAN Solution Service	• Quickly realize the benefit of your SAN investment while reducing overall cost of ownership • Fast, expert implementation that guards against unexpected compatibility issues, minimizes disruption to your business and optimizes performance • Provides a fully installed, configured and documented SAN with scalability that allows for additional capacity as your business grows
	HP Critical Services	• Boost business productivity through increased server, storage, networking, and applications availability • Minimize business losses caused by IT downtime • Reduce risk and improve efficiency by proactively managing changes across your IT environment • Resolve complex problems quickly through direct access to HP Services expertise and hands-on assistance • Rapidly access single-source support from a team familiar with your business and technology infrastructure • Free your IT staff to focus on strategic business issues
	HP Proactive 24	• Enhanced operational effectiveness and availability with proactive problem identification and solutions recommendations • Partner with technical experts who help coordinate support, provide hands-on assistance, and share industry best practices and HP know-how with your staff • Rapidly access single-source support spanning your environment from servers to storage to networking • Obtain personalized services tailored to your business environment and objectives • Anticipate necessary change - and execute it correctly the first time • Efficiently manage infrastructure resources to meet your performance objectives
	HP Support Plus 24	• 24x7 4-hr. onsite hardware support • Material and parts included • Work to completion for hardware support • 24x7 2-hr response XCS phone-in assistance • Remote problem diagnosis & support • Escalation management • Software product and documentation updates • License to use and copy software product updates • Software electronic support
	HP Software Maintenance Service	• Improve the productivity of system managers and operators • Improve system performance and reduce downtime due to software defects • Expedite problem resolution through expert-level technical resources • Enjoy consistent service coverage across geographically dispersed sites • Update HP and selected third-party software at a predictable cost

- Take advantage of subscription savings on software updates
- Keep your license compliancy up-to-date

Available HP Care Pack Services

Extend your product warranty with a wide choice of cost-saving support packages.

HP Care Pack Services are sold by HP and HP authorized enterprise and commercial resellers. Services for customers purchasing via direct and enterprise resellers are quoted using HP order configuration tools. Additional information about HP Care Pack Service features and benefits is available at: http://www.hp.com/hps/carepack/services.

Key for HP Care Pack Service availability in the table below:
E = Service available for customers purchasing direct and via enterprise resellers
C = Service available for customers purchasing via commercial resellers
N/A = Service not applicable

HP Care Pack Services Deployment and Per Event Services	Service Available
HP Installation	E/C
HP Installation & Startup	E/C
HP Implementation	E/C
HP StorageWorks EVA Firmware Upgrade Service	E/C

NOTE: For more information about Deployment and Per Event Services for HP Storage, visit: http://www.hp.com/hps/storage/.

HP Care Pack Services Availability Services	1 yr	3 yr	4 yr	5 yr
HP 4 Hr, 24x7 Hardware Support	E/C	E/C	E/C	E/C
HP Next Business Day Hardware Support	E/C	E/C	E/C	E/C
HP Software Support	E/C	E/C	E/C	E/C
HP Software Support 24x7	E/C	E/C	E/C	E/C
HP Support Plus	E/C	E/C	E/C	E/C
HP Support Plus 24	E/C	E/C	E/C	E/C
HP Proactive Essentials 24x7 Unlimited	E/C	E/C	E/C	E/C
HP Proactive 24 Service	E	E	E	E
HP Critical Service	E	E	E	E

NOTE: To find HP Care Pack Services available via HP authorized commercial resellers, visit: http://h30125.www3.hp.com/csn/salesmktg/elfpack/elf_nonlkup_ctrylang.asp?code=elnl

Family Information

Deployment and Per Event Service Descriptions

Availability Assessment for SANs

- Recommendations for reducing or eliminating risks to the availability of your SAN infrastructure. SAN Solution Service
- You get a powerful network storage solution up-and-running quickly and efficiently with minimum disruption and rapid returns on your SAN investment.

Data Migration

- Transfers your critical information to a new or reconfigured storage array in an open systems environment - across a data center or around the world.

Data Replication Solution Service

- Ensures a timely, cost-effective deployment of your data replication solution cuts risk and shortens your time-to-results.

Data Sanitation Service

- Provides a method for removing data from rotational hard disk media preventing sensitive information from being retrieved or re-created. It recommended to remove data during asset retirement, leasing returns, hardware upgrades, or redeployment of storage devices.

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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
HP recommends customers install HP's Insight Remote Support software, (part number RSSWMBASE) from: www.software.hp.com, with every EVA installation. HP Insight Remote Support helps customers reduce costs, save time and ensure maximum system availability by providing remote monitoring, intelligent event diagnosis and the automatic secure submission of hardware event notifications. This technology has been optimized for environments with 1-50 servers (maximum 100) and requires only a shared Windows ProLiant hosting device. It will support HP ProLiant, BladeSystem, Integrity, HP 9000 servers and HP EVA storage devices, and will be available at no extra cost as part of the EVA warranty, HP Care Pack Service or contractual support agreement with HP. For more information access the Insight RS quick start guide at: http://docs.hp.com/en/netsys.html#Insight%Remote%20Support

Family Information

NOTE: If integration with HP Systems Insight Manager (HP SIM) or HP Operations Manager is required, then customers should install the HP Remote Support Pack (RSP), not Insight RS. The RSP solution enhances HP SIM with intelligent event diagnosis and the automatic submission of hardware event notifications securely to HP Support, including acknowledgement and status returns.

Remote Support Pack contains event monitoring and proactive service support, including assessments and analysis for nearly all HP servers, storage, networks and SAN environments plus selected Dell and IBM Windows servers that have a support obligation with HP, including proactive service contracts. The HP contract and warranty entitlement feature of HP SIM requires this plug-in to be installed. More information can be found at: www.hp.com/services/remotesupportpack.

Customer self repair instructions, in seven local languages, are available in the component spare kits (RUs) and the business support center at: www.hp.com. Video based instructions are available under "Customer self repair steps" and printable replacement instructions are listed under "Manuals" at the following location: http://h20000.www2.hp.com/bizsupport/techsupport/home.jsp?&lang=en&cc=us&prodtypeId=12169&prodseriesId=470490&submit.y=9&submit.x=7&lang=en&cc=us

HP Education Services

Training for the Enterprise Virtual Array is now offered as part of HP comprehensive curriculum of HP Storage, Storage Management, and IT Service Management courses. These courses will provide the training required to realize the full potential of your HP EVA Virtual Array storage solutions, optimize your systems and SAN for highest efficiency, and achieve better return on your IT investments.

For more information about HP Education Services for Storage and SAN, visit:
http://education.hp.com/curr-storsan.htm

Awards

J.D. Power Gives HP a Seal of Approval 27-Nov-2005
Good service is a key factor in deciding which computer or printer to buy these days, and Hewlett-Packard hopes a customer service endorsement from J.D. Power and Associates will help boost sales of HP products. HP said this week it is the first company to receive the J.D. Power and Associates Certified Technology Service and Support certification "for providing an outstanding customer service experience." Consumers will soon see the J.D. Power and Associates service mark on product boxes, web sites and advertising for everything from HP PCs and all-in-one devices to HP cameras and fee-based services. To earn the certification, HP performed within the top 20 percent of technology support organizations on a variety of customer service criteria. J.D. Power and Associates found that HP has met or exceeded this new standard for customer satisfaction in supporting its North American customers.
http://www.hp.com/hpinfo/newsroom/press/2005/051116a.html

HP Receives Two Service and Support Industry Awards; Inducted into Association Hall of Fame 14-Apr-2006
HP has received two STAR Awards for Best Practices from the Service & Support Professionals Association (SSPA) and was consequently inducted into the SSPA Hall of Fame for winning its fifth award. The STAR Awards are the only service and support industry award from a professional association dedicated to serving industry professionals. http://www.hp.com/hpinfo/newsroom/press/2006/060414a.html

Family Information

Additional Services Information

For more information about Deployment, Per Event, Consulting and Education services for HP Storage, visit: http://www.hp.com/hps/storage/.

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

For more information about HP Storage Software, services and updates, visit: http://h18006.www1.hp.com/storage/software.html.

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP": http://www.hp.com.

QuickSpecs

Configuration

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

Models

Enterprise Virtual Array 4400 Independent Components	The following components are available worldwide. The EVA4400 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.	
EVA4400 Dual Controller Array	HP StorageWorks 4400 Dual Controller Enterprise Virtual Array One 2U controller enclosure with two HSV300 controller module, mounting hardware, cables, controller mounting. Order one unit for each EVA4400 array configuration.	AG637A
EVA4400 Controller Pair Enclosure with embedded switch	HP StorageWorks EVA4400 Dual Controller Enterprise Virtual Array with Embedded Switch and 8Gb SFPs One 2U Controller Enclosure with two HSV300-S controller modules, mounting hardware, cables, and controller mounting. Each controller module also includes an 8Gb/s 10 port B-series SAN switch, for a total of two switches and 20 ports per controller enclosure. Also included are four 8Gb/s SFPs. per controller enclosure; 8 total. Additional 4Gb/s or 8Gb/s SFPs can be purchased separately. Order one unit for each EVA4400 array configuration. The embedded switches come with full fabric scalability enabled, licenses and docs. The included software has Advanced Fabric OS, Advanced Web Tools and Advanced Zoning. See below for optional switch software.	AG805B
M6412A FC Drive Enclosures & Accessories	HP StorageWorks M6412A Fibre Channel Drive Enclosure Select up to eight M6412A drive enclosures to expand EVA4400 configurations. Drive enclosures may be: 1. Ordered for on-site capacity additions to existing EVA4400 configurations. 2. Ordered for field installation of complete EVA4400 configurations in conjunction with the EVA4400 Starter Kits. 3. 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 arrays only. Up to eight drive enclosures are supported with each pair of HSV300 or HSV300-S controllers. The M6412A is a 2U dual-redundant FC Loop 12-bay disk enclosure with mounting hardware, and the necessary copper FC cables for connecting to an HSV300 or HSV300-S Controller pair.	AG638B AG638A Is being discontinued

NOTE: The M6412A drive enclosure meets the very latest RoHS (Restriction of Hazardous Substance) requirements. The M6412 met an earlier version of the RoHS requirements. They are functionally equivalent otherwise.

NOTE: A minimum of 8 disk drives per Fibre Channel type or FATA drive type are required per EVA4400 when using those drive types; a minimum of 6 Solid State Disks are required per EVA4400 when using those drive types.

Step 2 – Choose File Services and EVA4400 Connectivity Options

Configuration

The EVA File Services and EVA iSCSI Connectivity options provide superior storage consolidation, management and total cost of ownership. The EVA file service offerings support both block and file data concurrently with high availability and scalable performance. The 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. ProLiant Storage Servers are an affordable way to add Windows-powered file, print, iSCSI, and Command View EVA / SBM hosting services to an EVA array or SAN.

Ordering an iSCSI Connectivity Option is easy. The iSCSI Connectivity Option will be factory integrated into EVA4400 configurations. ProLiant Storage Servers can be ordered to be added into an EVA configuration in the field or they can be integrated in the factory.

The EVA iSCSI Connectivity Options supports Windows and Linux environments.

HP StorageWorks iSCSI Connectivity Option	HP StorageWorks EVA4400 iSCSI Connectivity Option Order this part for all new installations. Includes One unit, shelf, brackets, copper FC cables and documentation. Includes one unit to mount in existing shelf and documentation. Includes support for 16 initiators.	AJ713A
	HP StorageWorks EVA4400 iSCSI Connectivity Upgrade Option For multi-path (dual unit high availability) order both part numbers. (The second hardware unit installs into the shelf that ship with AJ713A.)	AJ714A
	HP StorageWorks iSCSI Initiator Upgrade license	T5471A
	Initiator license for additional 32 ports for a total of 48	
	NOTE: For more information on the iSCSI Connectivity Options: http://h18006.www1.hp.com/products/storageworks/evaiscsiconnect/index.html	

HP ProLiant Storage Servers

HP ProLiant Storage Servers, SAN Gateways, and supported Fibre Channel HBAs	HP ProLiant Storage Servers (plus a Fibre Channel HBA) can add file, print, iSCSI, and/or Command View EVA / SBM management services to an EVA or Fibre Channel SAN. SAN Gateway models feature Microsoft's Windows Unified Data Storage Server 2003 operating system that also includes Microsoft iSCSI Software Target and a cluster license for high availability standard (Microsoft iSCSI Software Target is optional for other Storage Server models). In addition, any ProLiant Storage Server connected to an EVA is a recommended platform from which to run Command View EVA / SBM. Increase the value of your SAN/array investment by hosting EVA management, file and print services, and iSCSI connectivity all from the same ProLiant Storage Server gateway solution.	
	HP ProLiant DL380 G5 Base Storage Server NOTE: Microsoft Windows Storage Server 2003 R2 Standard x64 Edition O/S (compatible with Command View EVA / SBM) with file services on a 2U rack form factor platform. For more information, go to: http://h18006.www1.hp.com/products/quickspecs/12559_div/12559_div.html	AG815B
	HP ProLiant DL380 G5 SAN Gateway Storage Server NOTE: Microsoft Windows Unified Data Storage Server 2003 Enterprise x64 Edition O/S (compatible with Command View EVA / SBM) with file, iSCSI, and cluster services on a 2U rack form factor platform. For more information, go to: http://h18006.www1.hp.com/products/quickspecs/12559_div/12559_div.html	AG771B

Configuration

	HP ProLiant SB460c SAN Gateway Storage Server	AN583A
	NOTE: Microsoft Windows Unified Data Storage Server 2003 Enterprise x64 Edition O/S (compatible with Command View EVA / SBM) with file, iSCSI, and cluster services on a blade form factor platform. For more information, go to: http://h18006.www1.hp.com/products/quickspecs/13114_div/13114_div.html	
	Fibre Channel HBA options for DL380 G5 Storage Servers	
	HP StorageWorks FC2142SR 4Gb PCIe HBA	A8002A
	HP StorageWorks FC2242SR Dual Channel 4 Gb PCIe HBA	A8003A
	HP StorageWorks FC1142SR 4Gb PCIe HBA	AE311A
	HP StorageWorks FC1242SR Dual Channel 4 Gb PCIe HBA	AE312A
	HP StorageWorks 81Q PCI-e FC HBA	AK344A
	HP 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A
	HP StorageWorks 81E 8Gb SP PCI-e FC HBA	AJ762A
	HP 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
	Fibre Channel HBA options for the SB460c SAN Gateway Storage Server	
	Emulex Lpe1105 FC Dual Channel 4Gb, PCI-E-to-Fibre Channel Host Bus Adapter	403621-B21
	Qlogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem	403619-B21
HP StorageWorks 12000 Virtual Library System EVA Gateway	Expanding the power of the HP StorageWorks Enterprise Virtual Array (EVA), the HP StorageWorks 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 please visit see: http://h18006.www1.hp.com/storage/disk_storage/disk_to_disk /vls/12000vls/index.html	AH814A
HP StorageWorks IP Distance Gateway SAN over WAN connectivity, enables EVA Continuous Access replication over WAN (Asynchronous and Synchronous)	HP StorageWorks IP Distance Gateway Order this part for all new installations. Includes One unit, shelf, brackets and documentation.	AG680A
	HP StorageWorks 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	AG681A
StorageWorks B-series FC switch options		
Storage Works B-series 8-24 Port SAN Switch Power Pack+ Upgrade LTU	HP B-series 8-24 Port Pwr Pk+ Upgr LTU (Adaptive Networking, Fabric Watch, ISL Trunking, Advanced Performance Monitoring)	T5521A
Optional switch software	HP B 8-31 Port Trunking Switch LTU	324506-B21
	HP B 8-31 Port Extend Fabric Switch LTU	324505-B21
	HP B 8-31 Port Fabric Watch Switch LTU	324504-B21
	HP B 8-31 Adv Perf Monitor Switch LTU	324507-B21
	HP B-series 8-24 Pt Adaptive Network LTU	T5524A
	HP Data Center Fabric Manager Ent Sw	T5542A

Configuration

NOTE: For more information on these software component options, see:
http://h18006.www1.hp.com/storage/networking/b_switches/index.html and look for
HP StorageWorks B-Series 8/8 SAN Switch information.

Step 3 – Choose a Rack – Base and Factory Integration Information

Factory Integration
Start your order by choosing a rack to house your EVA4400 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 EVA4400 will be configured into a 42U HP 10000 G2 Series Rack with the
appropriate PDU. If other products such as servers or back-up products are included
in the cab a different PDU will be added (if required) or can be chosen from a list of
appropriate offerings shown in the configuration tool. HP 10000 G2 Series Rack must
be purchased. Additional EVA4400 controller enclosures and drive enclosures may be
ordered for multiple subsystem integration at the factory. The 5642 (42U) Rack
Cabinet System is supported for field installation. This rack may be purchased along
with EVA component pieces for assembly in the field. The HP 5642 rack system is an
entry level rack with sufficient features for easy access and ease of use.
When calculating available U-space, assume that no space will be placed between
the mounted components. For redundancy, order PDUs in quantities of two. Refer to
the Configuration and User Guide in the Information Library at the Rack Solutions
webpage.

HP 10000 Series G2
Racks
NOTE: The number of subsystems varies and is determined by the interior U-space of
the cab.

HP Rack 10642 G2 Shock (42U)	AF002A
HP Rack 10642 G2 w/Extn Shock (42U)	AF004A
HP Rack 10636 G2 Shock (36U)	AF012A
HP Rack 10636 G2 w/Extn Shock (36U)	AF014A
HP Rack 10622 G2 Shock (22U)	AF021A
HP Rack 10636 G2 Modular Cooling System (MCS) Shock (42U)	AF098A
HP Rack 10842 G2 800mm Wide Shock (42U)	AF042A

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

For PDUs, see:
http://h18004.www1.hp.com/products/servers/proliantstorage/power-
protection/pdu.html

HP PDU Pivot Kit
Used to reclaim 2U of space in a 10000 G2 Series Rack with EVA4400
configurations. This kit allows the PDUs to be placed in the back of the rack without
requiring any rack U space.   AG730A

HP Rack 5642 System for
Field Installation only
5642 (42U) Rack Cabinet System   358254-B21

For more information on this rack, please see:
http://h18004.www1.hp.com/products/servers/proliantstorage/racks/
5000series/5642/index.html

QuickSpecs

Configuration

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.

HP ProLiant Storage Servers and supported Fibre Channel HBAs

Select HP ProLiant Storage Servers (plus a Fibre Channel HBA) add file and print services to an EVA or Fibre Channel SAN. ProLiant DL380 G5 x64 SAN Storage Server and DL585 G2 Storage Server gateways each feature Microsoft's Windows Unified Data Storage Server 2003 operating system that also includes Microsoft iSCSI Software Target and a cluster license standard (Microsoft iSCSI Software Target is optional for other DL380 G5 Storage Server models). In addition, any ProLiant DL380 G5 Storage Server or DL585 G2 Storage Server is a perfect platform from which to run Command View EVA. You stretch your investment even further when you host EVA / SBM management, file and print services, and iSCSI connectivity all from the same ProLiant Storage Server gateway solution.

HP ProLiant DL380 G5 Base Storage Server	AG815A

NOTE: Microsoft Windows Storage Server 2003 R2 Standard x64 Edition O/S

HP ProLiant DL380 G5 1.16TB SAS Storage Server	AG816A

NOTE: Microsoft Windows Storage Server 2003 R2 Standard x64 Edition O/S

HP ProLiant DL380 G5 x64 SAN Storage Server	AG771A

NOTE: Microsoft Windows Unified Data Storage Server 2003 Enterprise x64 Edition O/S

HP ProLiant DL585 G2 Storage Server	AG630A

NOTE: Microsoft Windows Unified Data Storage Server 2003 Enterprise x64 Edition O/S

HP StorageWorks FC2142SR 4Gb PCIe HBA	A8002A
HP StorageWorks FC2242SR Dual Channel 4 Gb PCIe HBA	A8003A
HP StorageWorks FC1142SR 4Gb PCIe HBA	AE311A
HP StorageWorks FC1242SR Dual Channel 4 Gb PCIe HBA	AE312A
HP StorageWorks FC2143 4Gb PCI-X 2.0 HBA	AD167A
HP StorageWorks FC2243 Dual Channel 4Gb PCI-X 2.0 HBA	AD168A
HP StorageWorks FC1143 4Gb PCI-X 2.0 HBA	AB429A
HP StorageWorks FC1243 Dual Channel 4Gb PCI-X 2.0 HBA	AE369A
HP StorageWorks 81E 8Gb PCI-e FC HBA	AJ762A
HP StorageWorks 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
HP StorageWorks 82Q 8Gb Dual-Port PCI-e FC HBA	AJ764A
HP StorageWorks 81Q PCI-e FC HBA	AK344A

Configuration

Step 4 – Firmware and Software

Controller Firmware and Installation and Management Software

HP StorageWorks EVA4400 is factory installed with XCS v9.5. Separate Media kits and licenses are required to support HP Command View EVA, HP Continuous Access EVA and HP Business Copy EVA.

HP StorageWorks EVA4400 XCS v9.5 controller media download is available from HP.com. These downloads are available as archival media for the EVA4400 from the following link: http://h18006.www1.hp.com/products/storageworks/eva/index.html

HP Command View EVA / SBM v8.0 or / ABM v8.1 is mandatory to support the EVA4400 and XCS V9.5. 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.

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. The license to use requirements are the same whether using Command View EVA SBM and/or ABM. One license applies to both.

OPTIONAL SOFTWARE: EVA4400 optional software can be found at the following URL: http://h18006.www1.hp.com/storage/software.html

HP SmartStart for EVA configuration utility

Install and configure the EVA4400 using HP SmartStart for EVA Storage configuration utility, which runs on Windows Server systems. This software installs necessary drivers on Windows Server 2003 and 2008 application servers and Command View EVA / SBM v8.0 on a Windows Server 2003 management server, as well as provisions the storage. During installation, click to accept the terms of the HP SmartStart for EVA* Storage configuration utility End User License Agreement (EULA). No separately orderable LTU is required for HP SmartStart for EVA Storage.

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

Step 5 – 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 EVA 4400, either for factory integration or when adding additional capacity. Note that these SKUs apply ONLY to the EVA4400 and can't be used with other EVA models.

HP StorageWorks FC and FATA Drives

NOTE: A minimum of eight (8) high performance FC or FATA or 6 solid state disks drives are required per EVA4400.

HP StorageWorks 72GB 4Gb dual port FC EVA M6412 SSD	AR055A
HP StorageWorks 400GB 10K FC EVA M6412 Hard Disk Drive	AJ711A
HP StorageWorks 146GB 15K rpm 4Gb dual port FC EVA M6412 Hard Disk Drive	AG556A
HP StorageWorks 300GB 15K rpm 4Gb dual port FC EVA M6412 Hard Disk Drive	AG690A
HP StorageWorks 450GB 15K rpm 4Gb dual port FC EVA M6412 Hard Disk Drive	AG803A
HP StorageWorks 1TB FATA dual port EVA M6412 Enc Hard Disk Drive	AG691A

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

Configuration

Step 6 – Cables and SFPs

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 0 .6m	321624-B21
	Cable FC Copper SFP 2m	324394-B21
8 Gb/s SFP (Small Form- Factor Profile Transceiver)	HP 8Gb Shortwave B-series FC SFP+ 1 Pack for use with EVA4400 embedded switch model	AJ716A
8 Gb/s SFP (Small Form-Factor Profile Transceiver)	HP 8Gb Longwave B-series FC SFP+ 1 Pack for use with EVA4400 embedded switch model.	AJ717A
4 Gb/s SFP (Small Form- Factor Profile Transceiver)	HP 4Gb Short Wave B-series FC SFP 1 Pack for use with EVA4400 embedded switch model.	AJ715A
FC cable – 1 Gb to 2 Gb/s (optional) (LC to SC)	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) is required per FC port of each HSV controller.	
	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
FC cable - OM2 LC-LC type cables	NOTE: SFP - Small Form-Factor Profile on the ports of the EVA4x00/6x00/8x00. One of these cables (LC to LC) is required per FC port used of each HSV controller.	
	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 Cable	221692-B27
FC cable - OM3 LC-LC type cables	.5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ833A
	1 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ834A
	2 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ835A
	5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ836A
	15 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ837A
	30 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ838A
	50 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ839A

Configuration

Step 7 – Management and High Availability Software

EVA Storage
Management /
User Interface

NOTE: Command View / SBM v8.0 runs on either a management server or application host running Microsoft Windows. 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. The license to use requirements are the same whether using Command View EVA / SBM and/or / ABM. One license applies to both.

See the HP StorageWorks 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 EVA4400. This software is used to manage multiple paths between hosts and storage systems. It enables high availability through path management and I/O load balancing. Multiple Path support is available for the following Operating Systems:

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

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

Step 8 – Expansion Options

The EVA4400 Dual Controller Enclosure can be added on-site into existing EVA configurations (or qualified rack systems), using the AG637A SKU. Additional M6412 drive enclosures (AG638A) can be ordered to expand an EVA4400 configuration:

1. Ordered for on-site capacity additions to existing EVA4400 configurations.
2. Ordered for field installation of complete EVA4400 configurations in conjunction with the EVA4400 Starter Kits into the supported 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 eight drive enclosures are supported with each pair of HSV300 or HSV300-S controllers. The M6412A is a 2U dual-redundant FC Loop 12-bay disk enclosure with mounting hardware, and the necessary copper FC cables for connecting to an HSV300 Controller pair.

Order additional hard disk drives using the SKUs listed in Step 5. The EVA4400 supports up to 96 hard disk drives.

NOTE: Minimum of 8 disk drives per Fibre Channel drive type or FATA drive type per EVA4400.

QuickSpecs

Configuration

Step 9 – Optional Components and Software

Remote Replication Software	HP StorageWorks Continuous Access EVA is a controller-based application that performs real-time replication between HP StorageWorks enterprise virtual arrays. For more information, see Continuous Access description earlier in this document. Please see the product URL for ordering information and part numbers: http://h18006.www1.hp.com/storage/software.html
Local Replication Software	HP StorageWorks 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 StorageWorks EVA Dynamic Capacity Management Software is a comprehensive software solution that automates storage provisioning and improves capacity utilization on the HP StorageWorks 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 Resource Management Software (HP Standard Edition SRM Software)

HP Storage Essentials Standard Edition Storage Resource Management Software allows midsize businesses with limited IT staff to see the big picture thereby reducing SAN complexity. For more information, see the Storage Essentials product description earlier in this document.

Standard Edition SRM Media and License to Use (LTU)

HP Storage Essentials Standard Edition SRM Media Kit	T5314AA
HP Storage Essentials Standard Edition SRM LTU	T5315AA

Add on Storage Essentials Suite plug-in licensing available to Standard Edition

HP Storage Essentials NAS Manager 1 TB LTU	T4294AA
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 StorageWorks Continuous Access EVA with StorageWorks 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 Standard Edition SRM Software QuickSpec for product and licensing details: http://h18006.www1.hp.com/products/storage/software/e-suite/index.html
2. Standard Edition SRM LTU contains bundled licensing comprising of Edition 150 MAPs, 3TBs of File System Viewer, NAS Manager, and I MAL for either the Exchange Viewer or the Database Viewer. This is a customer choice.

Optional Hardware Accessories

Non-HP Rack installation   For racks other than those specifically stated within the EVA4400 product set, please visit the EVA web page for details on rack and power specifications: http://www.hp.com/go/eva

Configuration

SAN Components

The HP StorageWorks SAN integrates best-in-class storage networking components to deliver a complete connectivity platform for end-to-end network storage solutions. HP's fabric portfolio includes: HBAs, directors, switches, SAN extenders, NAS heads, iSCSI routers, and fabric software. HP SAN Infrastructure components deliver the network storage infrastructure for the Adaptive Enterprise.

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

Technical Specifications

EVA4400

	EVA4400
Operating Temperature	50° to 95° F (10° to 35° C) - Reduce rating by 1° F for each 1000 ft altitude (1.8° C/1,000 m)
Shipping Temperature	-40° to 150° F (-40° to 66° C)
Humidity	10% to 90% non-condensing
Shipping Humidity	5% to 90% non-condensing
Operating Vibration	Sine 5-10 Hz 0.020" (0.5mm) double amplitude displacement, 10-500 Hz 0.1g, Random 10-500Hz at 0.15 Grms
Non-operating Vibration	Sine 10-150 Hz 0.3g, Random 10-500 Hz at 0.5 Grms
Shipping Vibration (packaged, on shock pallet)	Sine 5-150 Hz 0.5g, Random 0.86 Grms from 5-300 Hz, consisting of 5-100 Hz at 0.0059 g2/Hz and 100-300 Hz at 0.000049 g2/Hz
Operating Shock	5g half-sine 10mSec
Non-operating Shock	8g half-sine 10mSec
Shipping Shock (packaged, on shock pallet)	Horizontal: 10-deg incline at 1m/Sec, Vertical rotational edge 0.15m
Altitude	Up to 8,000 ft (2,400 m)
Air Quality	Not to exceed 500,000 particles per cubic foot of air at a size of 0.5 micron or larger

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

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

EVA4400

	EVA4400
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 Latin America – 208 or 240V
Range Line Voltage	187 to 256V
Line Frequency	North America 60 Hz, Europe 50 Hz, Japan 50 or 60 Hz, Latin America 60K or 50Hz

Technical Specifications

Enterprise Virtual Array 4400

NOTE: This data represents fully populated drive shelves with 450GB 15K rpm disk drives under typical heavy load performance. Other drive types may vary slightly. NOTE: At idle, the system operates at approx. 15% less power than at typical.		2C1D	2C2D	2C3D	2C4D	2C5D	2C6D	2C7D	2C8D
Typical	Total System Wattage without embedded switches	359	615	871	1127	1383	1639	1895	2151
	Total System BTU/hour	1225	2098	2971	3844	4716	5589	6462	7335
	Input Current per plug, 230V	0.8	1.4	2.0	2.5	3.1	3.7	4.3	4.9
	Input Current per plug, 208V	0.9	1.5	2.2	2.8	3.5	4.1	4.7	5.4
	Input Current per plug, 115V	1.6	2.8	4.0	5.2	6.4	7.5	8.7	9.9
	Input Current per plug, 100V	1.9	3.3	4.7	6.0	7.4	8.8	10.1	11.5
	In Rush Current (A) per plug, 208V	70	100	130	149	168	178	188	200
Failover Mode	Input Current (A), 230V	1.5	2.5	3.6	4.7	5.7	6.8	7.9	8.9
	Input Current (A), 208V	1.6	2.8	4.0	5.2	6.4	7.5	8.7	9.9
	Input Current (A), 115V	3.0	5.1	7.3	9.5	11.7	13.8	16.0	18.2
	Input Current (A), 100V	3.5	6.0	8.5	11.0	13.6	16.1	18.6	21.2

Typical	Total System Wattage with embedded switches	441	697	953	1209	1465	1721	1977	2233
	Total System BTU/hour	1504	2377	3250	4123	4996	5869	6742	7615
	Input Current per plug, 230V	1.0	1.6	2.2	2.7	3.3	3.9	4.5	5.0
	Input Current per plug, 208V	1.1	1.7	2.4	3.0	3.7	4.3	5.0	5.6
	Input Current per plug, 115V	2.0	3.2	4.4	5.6	6.7	7.9	9.1	10.3
	Input Current per plug, 100V	2.4	3.7	5.1	6.5	7.8	9.2	10.6	12.0
Failover Mode	Input Current (A), 230V	1.8	2.9	4.0	5.0	6.1	7.2	8.2	9.3
	Input Current (A), 208V	2.0	3.2	4.4	5.6	6.8	7.9	9.1	10.3
	Input Current (A), 115V	3.7	5.4	8.0	10.2	12.4	14.6	16.7	18.9
	Input Current (A), 100V	4.3	6.8	9.4	11.9	14.4	17.0	19.5	22.0

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)
NOTE: For the lower voltages, PDUs may not be able to support the maximum power/current and the power/current may be divided across two or more PDUs.
* Total system wattage would increase by 85 watts with the embedded switch option. Input current would increase as well.

Enterprise Virtual Array EVA4400 Product Dimensions, Weight and Clearance

Technical Specifications

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
EVA4400 2C8D Configuration (42U Graphite cab)	78.75 (200.03)	23.7 (60.3)	40.2 (102.2)	860 (390.09)	30 (76.2)	30 (76.2)
EVA4400 Dual Controller Array	3.5/8.89	17.6/44.70	24.5/62.3	48/21.8	N/A	N/A
M6412A Drive Enclosure	3.5/8.89	17.6/44.70	23.75/60.33	57/25.86	N/A	N/A

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