

HP Modular Network Storage Solutions

ESG2069SG20306



HP Modular Network Storage Solutions

ESG2069SG20306

HP Training

Student guide

© Copyright 2003 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

This is an HP copyrighted work that may not be reproduced without the written permission of HP. You may not use these materials to deliver training to any person outside of your organization without the written permission of HP.

Printed in USA

HP Modular Network Storage Solutions

Student Guide 2

June 2003

HP Restricted



HP
SurePartner
Training

MNS
Crossupdate

HP Modular Network Storage Solutions

Part 10 SAN Integration



SAN Integration Topics

- Definitions
- Infrastructure Devices
- Configurations
 - SAN and Direct Connect
 - Clusters and Non-clusters



Student Notes:

Definition of a Cluster

- For the purposes of discussion, a cluster is a configuration using two or more servers with server fail over capability (Cluster Safe)
 - For HP-UX based configurations, this means running ServiceGuard
 - Windows-based cluster configurations incorporate the following characteristics:
 - Windows Enterprise Edition for NT 4.0
 - Windows 2000 Advanced Server



Just as a precursor to the discussion, here are some terms. Note Service Guard or other clustering solutions are not supported on Linux.

Storage Area Network

- Definition: A dedicated network of servers and storage devices all connected to a fabric supporting block access technologies
 - a fabric is defined as a hardware configuration containing at least one switch, which is responsible for frame routing
- Open SAN is defined as heterogeneous (multiple vendor) servers and OSs, heterogeneous storage/infrastructure components
 - pooled storage access is dependent on a LUN security methodology (zoning, partitioning, or dedicated LUN security) to provide data access by multiple heterogeneous servers
 - multiple server access to common data is available only to homogeneous servers using server coordination software e.g., PV Links in LVM



Essentially a network in which we use a switch, either as fabric or loop. Open SAN is SAN plus other servers/OS's that can see LUNs on the array. In the open SAN, security is required to prevent other OS's from stomping on LUNs.

VA7100 Supported Hubs

- P4459A HP 8 Port Fibre Loop Switch
 - Windows NT 4.0 Advanced Server and Enterprise Edition
 - Windows 2000 Server and Advanced Server
 - Linux Red Hat 6.2 and 7.1
- A4839A/AZ L10 long wave and A3724A/AZ S10 short wave
 - HP-UX 11.0 and 11.i
 - Windows NT 4.0 Advanced Server and Enterprise Edition
 - Windows 2000 Server and Advanced Server
 - Linux Red Hat 6.2 and 7.1
- A3724A/AZ S10 short wave
 - Solaris 2.6, 7 and 8
 - Only with the JNI FCI-1063 and JNI FC64-1063 HBAs



Student Notes:

VA7400 Supported Hubs

- P4459A HP 8 Port Fibre Loop Switch
 - Windows NT 4.0 Advanced Server and Enterprise Edition
 - Windows 2000 Server and Advanced Server
 - Linux Red Hat 6.2 and 7.1
- A4839A/AZ L10 long wave and A3724A/AZ S10 short wave
 - HP-UX 11.0 and 11.i
 - Linux Red Hat 6.2 and 7.1
- A3724A/AZ S10 short wave
 - Solaris 2.6, 7 and 8
 - Only with the JNI FC1-1063 and JNI FC64-1063 HBAs



Student Notes:

HP
SurePartner
Training

VA7410 Supported Hubs

MNS
Crossupdate

- No hubs supported for VA7410 !!



Student Notes:

VA7100/VA7400 Supported Switches

- Brocade Silkworm 2400/2800
 - HP-UX 11.0, 11i
 - Windows NT/2000
 - AIX 4.3.3
 - Red Hat 7.1
 - Solaris
 - Novell Netware 6.0, 5.0, 5.1
- HP FC6164
 - HP-UX 11.0, 11i
 - Windows NT/2000
 - AIX 4.3.3
 - Red Hat 7.1
 - Solaris
- HP FC16b/8b
 - HP-UX 11.0, 11i
 - Windows NT/2000
 - AIX 4.3.3
 - Red Hat 7.1
 - Solaris
 - Novell Netware 6.0, 5.0, 5.1



Student Notes:



VA7100/VA7400 Supported Switches

- HP surestore director FC64
 - HP-UX 11.0, 11i
 - Windows NT/2000
 - AIX 4.3.3
 - Red Hat 7.1
 - Solaris
- HP Storageworks director 2/64
 - HP-UX 11.0, 11i
 - Windows NT/2000
 - Red Hat 7.1
- HP storageworks core switch 2/64
 - HP-UX 11.0, 11i
 - Windows NT/2000
 - Red Hat 7.1



Student Notes:

VA7410 Supported Switches

- Brocade Silkworm 2400/2800
 - Windows NT4 / 2000
 - HP-UX 11.0, 11i
- HP FC16b/8b
 - Windows NT4 / 2000
 - HP-UX 11.0, 11i
- HP surestore director FC64
 - HP-UX 10.20
 - HP-UX 11.0, 11i
- HP Storageworks director 2/64
 - HP-UX 10.20
 - HP-UX 11.0, 11i
- HP storageworks core switch 2/64
 - Windows NT4 / 2000
 - HP-UX 10.20
 - HP-UX 11.0, 11i



Student Notes:

Configuration Assumptions

- HP Command View SDM must be installed
- The VA 7100 may not be daisy-chained
- HA configurations require two paths per host to the storage device



We assume command view is running on one host connected to the array. If a customer wants to run it on another host they should buy another license.

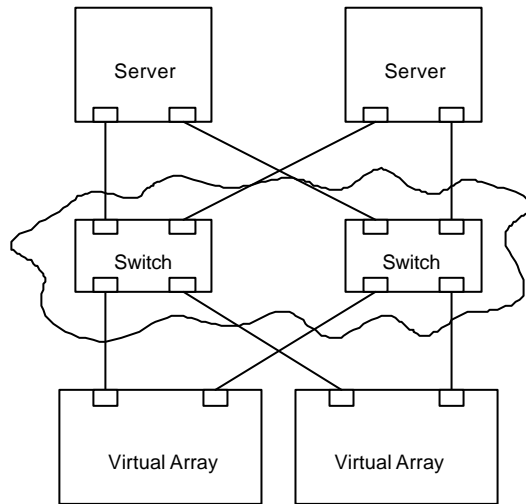
Configuration in Heterogeneous Solutions

- Loop Topology
 - private / public / fabric
- Host ID Table (CLUI only)
 - Node World Wide Name
 - Host Port Behavior
- LUN Security Table (CLUI only)
 - Participant Type
 - Node World Wide Name
 - LUN
 - Permissions



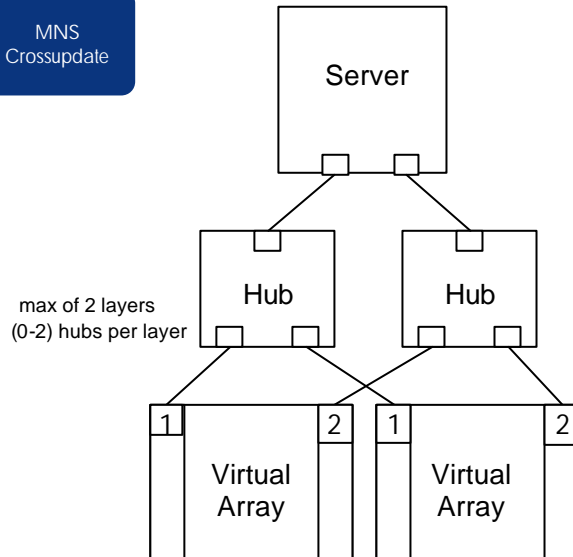
Student Notes:

Typical San



This is a typical SAN- peek into the cloud.

Typical Non-clustered With Path Redundancy

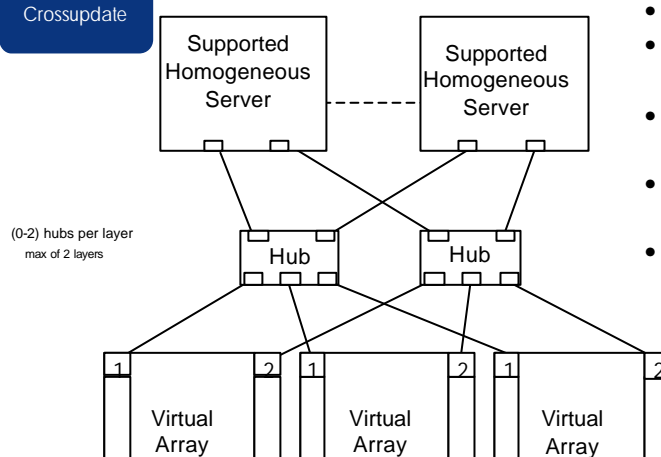


- Dual HBA
- Dual controllers
- Requires multi-path driver
- Device Manager
- Redundancy in storage paths, not host
- Microsoft Windows 2000 and HP-UX supported



Only one server, but it has duplex high availability and fail over connection to the arrays. Means HP-UX with fail over, and Windows 2000 with Auto Path VA. Similar configurations are also supported with switches.

Redundant Cluster

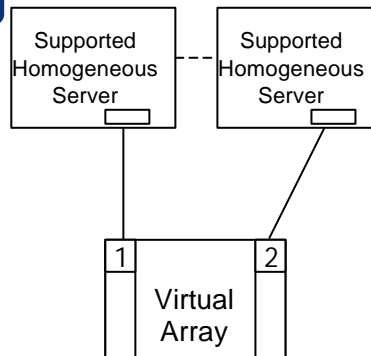


- Dual HBA per server
- Dual controllers
- With and without Hub
- Requires multi-path driver
- SAN Manager recommended
- (S/W must be "Cluster Safe")
- Windows MSCS or ServiceGuard



Dashed line indicates the LAN connection that is usually required for MC service guard and MCSC. This is also supported on NT4.0 with MSCS. Similar configurations are also supported with switches.

MSCS Direct Connect Configuration

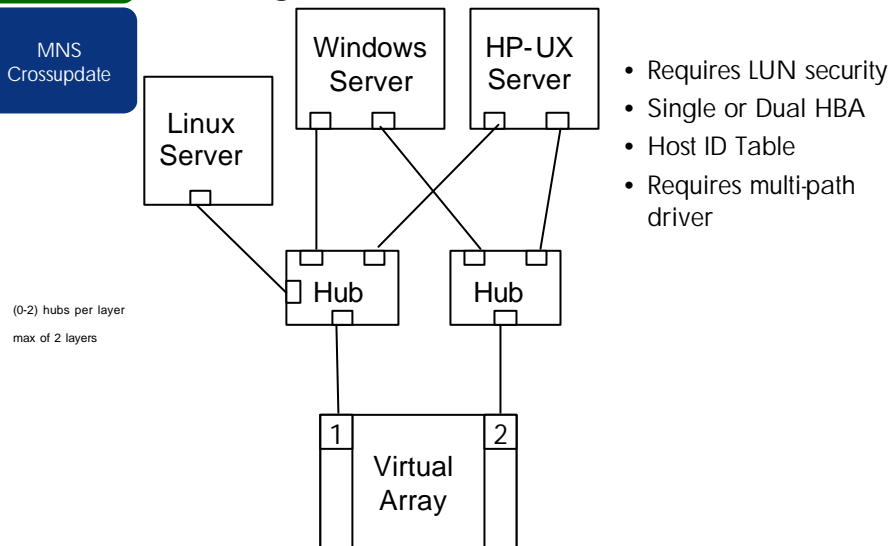


- VA7100 Current HCL listings
 - LXr8500, LT6000r, & LP2000r with the D8602B HBA and W2K in Direct Connection topology.
- Maximum of 16 LUNs per cluster server



Student Notes:

Heterogeneous Non-cluster

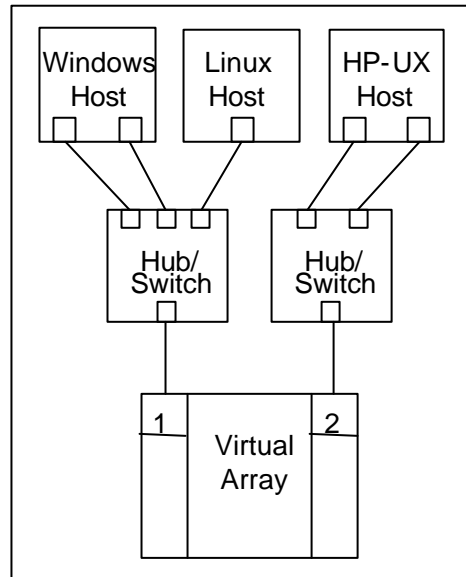


Set each controller to fabric

Set appropriate security for all LUNs

Heterogeneous Attach – Non-SAN Consolidation

- Single or dual host HBAs
- Requires LUN security
Requires fabric login
- 2 hubs or switches
- Dual Controller Arrays with Different Personalities
- Multi-path driver with dual HBAs
- Device Manager
- HP-UX/ Windows / Linux Supported
- PA Risk/ Intel Architecture

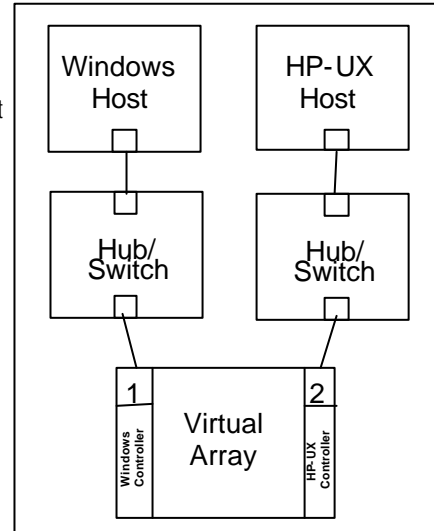


Set each controller to fabric

Set appropriate security for all LUNs

Heterogeneous Attach – by Controller in a SAN

- Single or Dual Host HBAs
- Requires LUN Security Support
- Requires Fabric Login
- 2 Hubs or Switches
- Dual Controller Arrays with Different Personalities
- Multi-path Driver with Dual HBAs
- Device / SAN Manager
- Windows / HP-UX Supported
- PA Risk / Intel Architecture



Set each controller to fabric

Set appropriate security for all LUNs

HP
SurePartner
Training

MNS
Crossupdate

module wrap-up





HP
SurePartner
Training

MNS
Crossupdate

HP Modular Network Storage Solutions

Part 11

Review Questions



Products and features

- Name the three members of the VA family
- How many disks are the minimum / maximum configuration of the VA7100?
- How many disks are the minimum / maximum configuration of the VA7400/VA7410?



Student Notes:

Products and features

- What is the name of the expansion enclosure for the VA7400 / VA7410
- How many host ports does the VA7400 feature?
- How many host ports does the VA7410 feature?



Student Notes:

Products and features

- Which features are array based or host based?
 - Command View SDM
 - Business Copy
 - Secure Manger
 - Enterprise Management
 - AutoPath
 - Virtual Front Panel



Student Notes:

Products and features

- Which features are host based or capacity based licenses?
Command View SDM
Business Copy
Secure Manger
Enterprise Management
AutoPath
Virtual Front Panel



Student Notes:

Products and features

- Which RAID Levels does HP AutoRAID feature ?
- How many RG's does the VA7410 have
- How many WWN's (or server HBA's) are supported to connect to a single VA7400/7410 simultaneously?



Student Notes:

Business Copy

- How many business copies are supported on a VA7100 or 74x0 ?
- What capacity license do you need if you want to create 6 copies of a 75GB LUN?



Student Notes:

Secure Manager

- Where is the array security table residing / modified ?
- What is the default security policy for newly created LUNs?
- To which LUN should no security be applied?



Student Notes:

Auto Path

- Auto Path works as a _____ - _____ ?
- For which operating systems does HP offer AutoPath products
- What is the supported load balancing policy for Microsoft Cluster?



Student Notes:

Optional Configuration Exercise

Student Exercise:

A customer has the following datacenter environment (next slide) and needs a appropriate storage solution

Which components will you propose and why?

Using the config and order guides, create a complete parts list including quantities, part numbers and descriptions



Student Notes:

Customer environment

- 5 Windows 2000 servers**
 - 2 file servers (260 GB and 110 GB)**
 - 1 Exchange cluster (130 GB)**
 - 1 Print server (100 GB)**
 - 1 SQL server (170GB)**
 - 1 Linux Server (apache web server and firewall, 45 GB)**
 - 3 HP-UX CAD Stations B2000 (54 GB each)**
- All servers should be connected to a SAN with a consolidated but performant and secure storage solution, especially the messaging cluster should gain additional availability.**



Student Notes:

HP
SurePartner
Training

MNS
Crossupdate

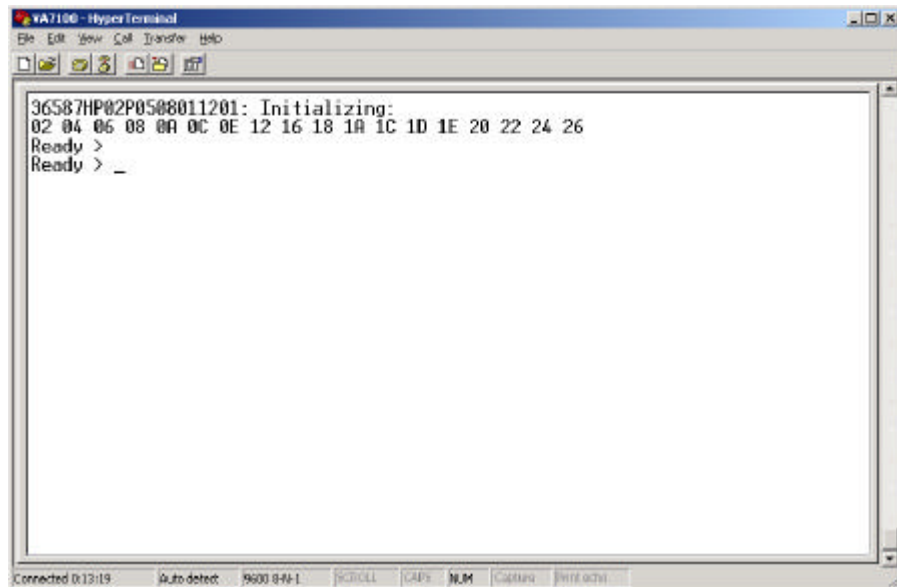
module wrap-up



Lab 1 – VFP – Virtual Front Panel

Configure initial array settings

- a. Together with your instructor, connect the VA to a Terminal via serial connection.
At the command prompt in the terminal or terminal window (e.g. Hyperterminal), press ENTER until you see the VFP prompt with status and > , e.g. “Ready>”



What is displayed in this initialization message?

After successful initialization, you should check the array configuration using

vfpdsp -s

-
- b. Since the default Port Setting is for HP-UX, we probably have to reconfigure to another Operating system type, e.g. Windows 2000:

vfpmgr -os win2k -c 1

This will reconfigure controller 1 to behave correctly for Windows 2000.

Valid arguments for os are depending on VA-model and firmware level:

For VA7100/VA7400 with firmware HP14, HP15 or HP16:

hpux	- HPUX
nt	- Windows NT
win2k	- Windows 2000
linux	- Linux
solaris	- Solaris
aix	- AIX
netware	- Netware
generic	- unsupported OS
tru64	- True64
openVMS	- OpenVMS
mpe	- MPE/ix
solarisCluster	- Solaris Cluster

How are different operating systems enabled to access the VA correctly and simultaneously?

c. LUN Configuration

First make sure that the array is not carrying any Luns be formatting the array:

`vfpmf`

Use the following commands to create LUN's:

```
vfpcfg -L 0 -a 20 -g 1
vfpcfg -L 1 -a 250 -g 1
vfpcfg -L 2 -a 5G -g 1
```

What LUN-numbers did you create?

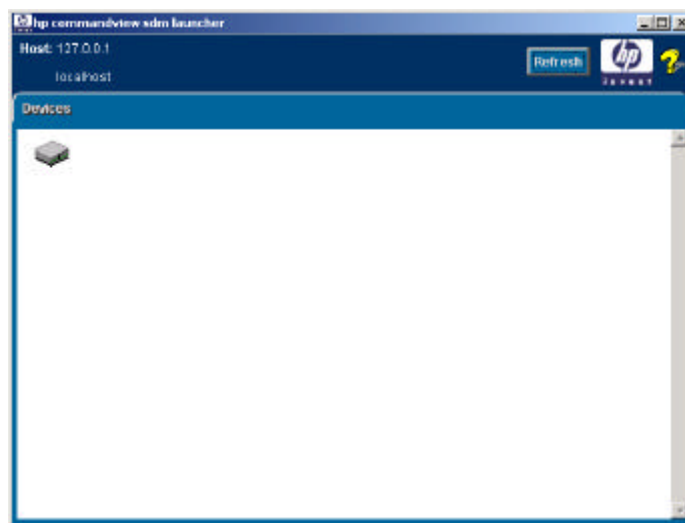
Lab 2 – Command View SDM GUI

At the desktop of the management station you will find the CVSDM Launcher icon. Double click it:



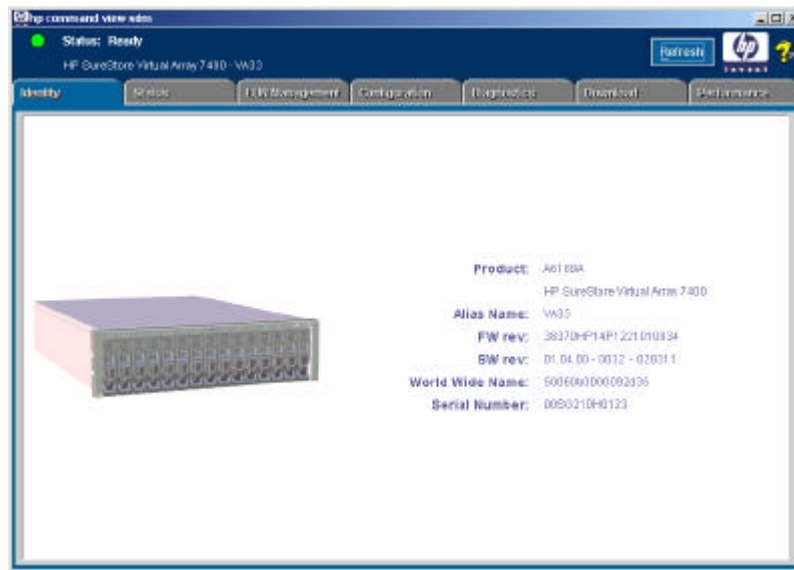
After a few seconds (depending on the PC speed) you should see the CommandView launcher.

NOTE if more than one array is visible and managed within your SAN or Zone, all the arrays will appear here



Now double-click on the array icon.

Command view launches...



Explore the management tabs.

Which tabs are available and what function do they provide?

Tab	Functionality

Now go to LUN Management and create a new LUN, e.g. LUN 4.
How long does it take and why?

Go to the status tab and have a look at the capacity graph.
Watch what is happening if you create another LUN.
What is the benefit for the customer?

At the LUN Management tab, delete the LUNs you have just created.

Lab 3 – Command View User Interface (CVUI) and Command Line User Interface (CVUI)

If you're working on HP-UX or Linux, you might want to do configuration on a command line or text based level or even work with scripts for automating tasks.

The Command View SDM software provides you with two text based interfaces: The CLUI and the CVUI.

The CVUI is a menu based text interface for interactive configuration and management, while the CLUI is a command line interface which is best suited to for creating scripts and provides you therefore the highest flexibility.

Familiarizing with Command View Text Interfaces

- a. Open a command window (Start – Run – “cmd”)
- b. From the command line, run the following command:

```
armdsp -i
```

Display all the available information for your array by using another command option:

```
armdsp -s <array-ID>
```

Now enter another command:

cvui

What do you see?

Navigate through the menus and finally create another LUN

Lab 4 – Setting up Business Copies using the GUI

Open the command View GUI

Choose a existing LUN

On the LUN management tab, go to “Business Copy” and press “Create”

In the Dialog box enter the LUN number for the (new) Business Copy volume and the parent LUN (this is the existing LUN you want to be copied)

Click “OK”

You have successfully created a Business Copy !

Go back to the “Business Copy” tab

Choose the BC Volume

Press “Empty” and “OK”

What have you done with this command?

Go back to the “Business Copy” tab again

Choose the BC Volume

Press “Copy from parent” and “OK”

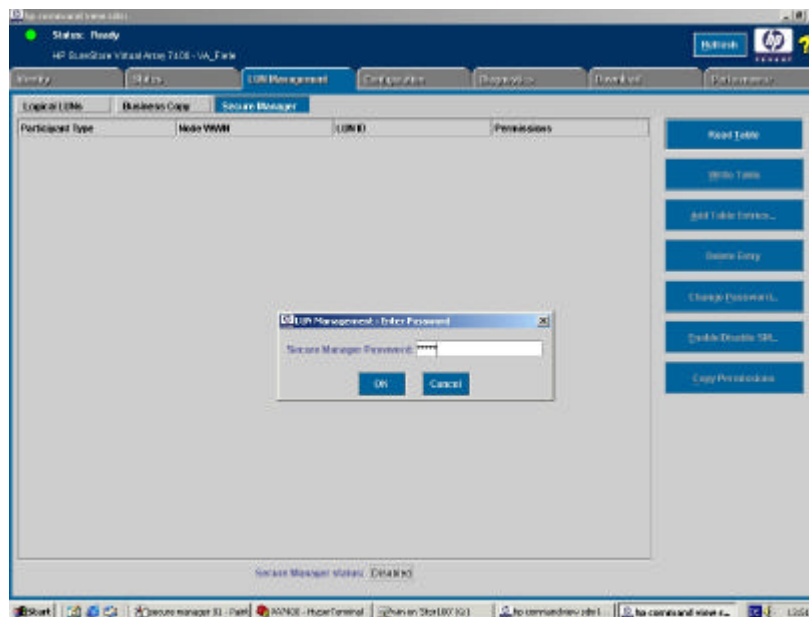
What have you done with this command?

Lab 5 – Secure Manager VA

Using the GUI, make sure the following LUNs are present.

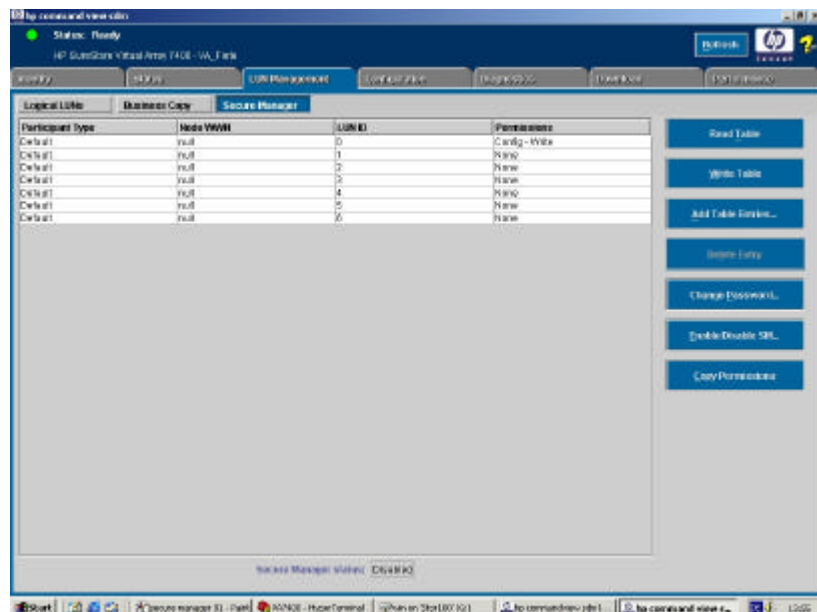
LUN Number	Size
0	20 MB
1	200 MB
2	400 MB
3	800 MB

Go to the “LUN Management” Tab and press the “Secure Manager” button.

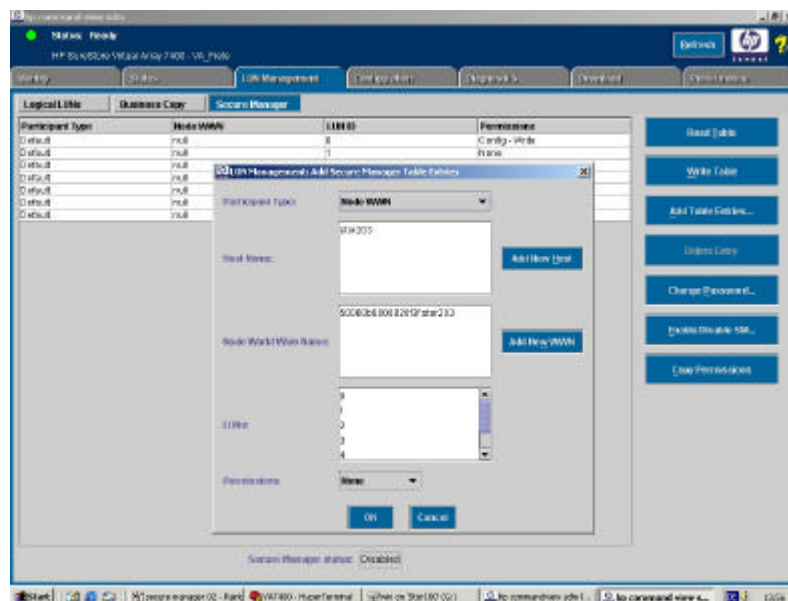


Type in “AUTORAID” and click “OK”

The GUI will display the host security table:



Highlight one of the LUNs and press the button “Add Table Entries...”



In the context window which is showing, press the button “Add New Host” and fill in the name of your local server.

Then highlight LUNs 0 and 3 from the list and change permission to “config-write”.

Press “OK”

A popup window will inform you that the changes have not been written to the VA.

Respond "OK"

Now, click on the "Write Table" button to write the changes to the array.
In the popup window, select to clear the existing table.

Now press "Enable/Disable SM..."

Highlight "Enabled" and enter "AUTORAID" as a password.

Click "OK"

Use disk manager on windows to verify proper work of secure manager.

The LUN's 1 and 2 have vanished.

Lab 6 – AutoPath VA

On the desktop of the management server you will find two icons:

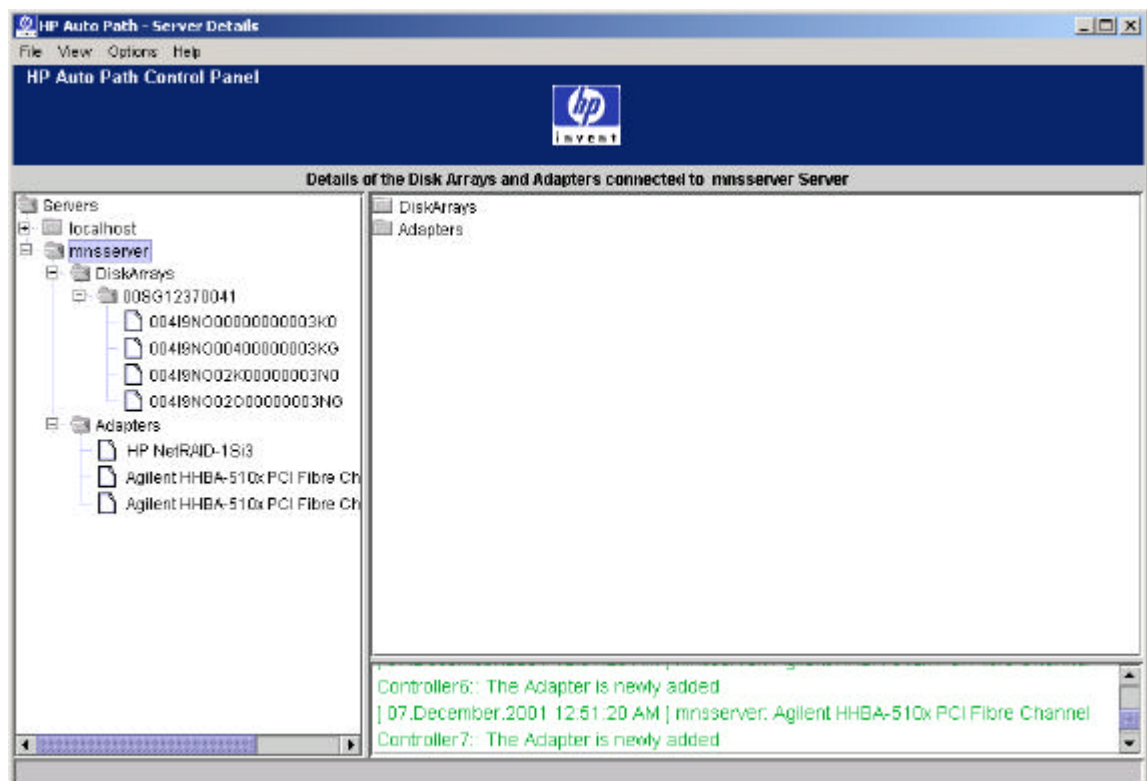


Double click on the „Start HP Auto Path Server“ icon.

This will display a command window. Leave this window open you may minimize this window, but DO NOT close it!)

Double click on „Start HP Auto Path Client“

In the navigation bar, choose your server and expand “Disk Arrays” and “Adapters”.



In the navigation bar, click “Adapters”

In the Auto Path GUI, go to the navigation tree and choose a LUN
Which Load Balance Policy is active?

Highlight one of the two devices.
What type of device is this?

In the right part of the window, go to the “Load Balancing Policy” drop-down-menu. Change the policy to “no load balancing”

The dropdown menu “Preferred Path” becomes active.

Choose “1” and click “Set”

Repeat this also for the second device

4.7.10—HP StorageWorks Virtual Array 7000 Family

Introduction

Note: Due to the rebranding, “HP Surestore Virtual Array” is now “HP StorageWorks Virtual Array.”

The HP StorageWorks VA7000 Family consists of the VA7100 and VA7400 arrays. Where sections are specific to the VA7100 or VA7400 arrays, they are called out. If a section is not specifically called out, it is common to all.

For the latest configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

Overview

VA7100 Overview

The HP StorageWorks Virtual Array 7100 is a disk storage system that holds from four to 15 disk drives. The array has scalable capacities from 72 GB to 270 GB (211 GB usable) with all 18-GB disk drives and from 144 GB to 540 GB (428 GB usable) with all 36-GB disk drives and from 292 GB to 1.1 TB with 73-GB disk drives. Capacities and spindle speeds can also be mixed. The array can be ordered with a single controller for non-redundant data storage, or with dual controllers for redundancy. Each controller has two DIMM slots available to hold NVRAM. The NVRAM is used for read/write caching and for storing array memory maps.

The Virtual Array 7100 can operate in either RAID 1+0 mode or AutoRAID mode, which eliminates the requirement for the system administrator to understand and configure RAID levels. AutoRAID dynamically adapts to the system's workload, optimizing performance and cost. Users will find configuration significantly easier than other array products, since RAID levels don't need to be configured or managed. The VA7100 supports one redundancy group, and all drives belong to that group. Using Virtual Storage Array (VSA) technology, when configured in AutoRAID mode the array controller automatically selects RAID 1+0 (disk striping and mirroring) or RAID 5DP (RAID 5 Double Parity) depending on the usage patterns of the data. RAID 5DP provides superior data redundancy by protecting against the simultaneous failure of two member disks by using independent error correction schemes.

The VA7100 is designed to communicate with multiple hosts and multiple systems, otherwise known as heterogeneous support. Any combination of the supported operating systems—HP-UX, Windows NT, Solaris, AIX, NetWare, Windows 2000, and Linux can be used. Two different protocols, or host port behaviors, are used by the array to communicate with the operating systems: one protocol for Windows/Linux/other and another for HP-UX. The Windows/Linux host port behaviors must be configured in the array for communication to take place with any or all four supported operating systems on a controller. When changing the port protocol to Windows/Linux it does support concurrent operation with Windows/Linux and HP-UX. The VA7100 provides simultaneous access by all of the supported operating systems on a LUN-by-LUN basis. Each LUN operates appropriately given the description of the operating system requirements.

The VA7100 can be configured to utilize an active hot spare feature. An active hot spare is a portion of the disk array capacity reserved to perform a rebuild. This feature requires the use of two additional disk units in the array. An active hot spare ensures that the disk array can maintain data redundancy if one or two disks fails. Until it is needed, the disk array uses the active hot spare storage space as RAID 1+0 capacity, which improves array performance. The active hot spare storage capacity does not sit idle; it is used to increase the disk array performance until the storage is needed.

The chassis will accommodate up to 15 low-profile 3.5-inch hard disk drives loaded from the front. The array requires three EIA units (3U) in height, which allows ten units to be placed in a standard 1.6-meter rack. The rear of the three EIA rack mountable chassis also includes two 1-GB fibre channel controllers, dual power supplies and dual fan modules. The redundant power supply and fan components are combined into a single module. All modules are hot swappable.

The array can be connected to one or more hosts, hubs, or switches via an optical fibre channel (FC) interface with 1 gigabit per second transfer rates. It can be ordered in factory-racked, field-rackable, or desk-side configurations. Factory-racked products are pre-configured in the HP Rack/System E racks. Field-rackable products can be racked in HP racks or in Compaq 9000 racks.

The VA7100 is supported by HP's Instant Support Enterprise Edition (ISEE). HP's online diagnostic and resolution capability securely delivers remote reactive services that quickly resolve problems, proactive service that anticipate and prevent downtime due to computing issues, and value-added services to help monitor, manage and maintain global IT networks. A minimum level hardware support upgrade of same day is required. It is included with the VA for the first year.

VA7400 Overview

The HP StorageWorks Virtual Array 7400 is a fibre channel (FC) disk storage system that supports from ten to 105 disk drives. The VA7400 is comprised of two types of enclosures, each three EIA units high: the virtual array controller enclosure (A6183A/AZ) and the disk system enclosure (A6250A/AZ) also referred to as the disk enclosure or the JBOD (Just a Bunch Of Disks) enclosure. In addition, pre-defined SKUs are available to facilitate integrated arrays. The array consists of one controller enclosure and one to six disk enclosures, with scalable capacities from 181 GB to 1.90 TB (using 18-GB 15k rpm disk drives), 364 GB to 3.82 TB (using 36-GB 10k rpm disk drives), or 720 GB to 7.67 TB (using 73-GB 10k rpm disk drives). Capacities and spindle speeds can also be mixed throughout the array.

Both enclosures include dual power supplies with built-in dual blowers, and accommodate up to 15 low-profile 3.5-inch native fibre channel (FC) disk drives in the front. The controller enclosure also includes dual redundant 2-Gbit/sec FC capable array controller cards and the disk enclosure also includes dual redundant 1-Gbit/sec link controller cards for back-end connections to the controllers. All field replaceable units are hot swappable. The array controller cards, however, must be replaced offline if the OS does not support controller failover.

The VA7400 can operate in either RAID 1+0 mode or AutoRAID mode. These data protection levels are user selectable at the time of initial array installation. Using Virtual Storage Array (VSA) technology, when configured in AutoRAID mode the array controller automatically selects RAID 1+0 (disk striping and mirroring) or RAID 5DP (RAID 5 Double Parity) depending on the usage patterns of the data. This protection scheme eliminates the requirement for the system administrator to understand and configure RAID levels. RAID 5DP provides superior data redundancy by protecting against the simultaneous failure of two member disks by using independent error correction schemes. Users will find configuration significantly easier than other array products, since RAID levels don't need to be configured or managed. The VA7400 supports two redundancy groups, which provides for physical data path separation of the two groups of LUNS.

The VA7400 is architected to communicate with multiple hosts and operating systems, otherwise known as a simultaneous heterogeneous environment. Any combination of the following supported operating systems can be supported simultaneously: HP-UX, Windows NT, Windows 2000, Linux, NetWare, AiX, and Solaris. One host port behavior is initially set in controller firmware, and then heterogeneous support for all other operating systems is enabled through software in a host port behavior table. The controller default host port behavior is set for HP-UX. The VA7x00 products are managed by the HP Command View SDM host-resident software. A one-host license to use for HP StorageWorks Command View SDM is included with each VA7400. Currently HP StorageWorks Command View SDM runs native on HP-UX, Windows NT, Windows 2000 and Red Hat Linux 6.2, 7.1. Installations on any of the other supported operating systems will require a dedicated management station running one of the aforementioned operating systems to be in the data path of the VA7400 (i.e. in the switched fabric).

The VA7400 can be configured to use an active hot spare feature. An active hot spare is a portion of the array capacity reserved to perform a rebuild. This feature requires the use of additional disk drives in the array. Users can select from 0, 1, or 2 active hot spares. An active hot spare ensures that the array can maintain data redundancy if one or two disks fail. Until it is needed, the array uses the active hot spare storage space as RAID 1+0 capacity, which improves array performance. The active hot spare storage capacity does not sit idle; it is used to increase the array performance until the storage it is needed.

The VA7400 can be connected to one or more hosts, hubs, or switches via an optical fibre channel (FC) interface with OS-dependant, 1- or 2-Gbit/sec transfer rates. The default factory setting is 1-Gbit/sec. It can be ordered in factory-racked and field-rackable configurations. Factory-racked products are pre-configured in the HP Rack/System E racks. Field-rackable products can be racked in HP racks or in Compaq 9000 racks.

The VA7400 is supported by HP's Instant Support Enterprise Edition (ISEE). HP's online diagnostic and resolution capability securely delivers remote reactive services that quickly resolve problems, proactive service that anticipate and prevent downtime due to computing issues, and value-added services to help monitor, manage and maintain global IT networks. A minimum level hardware support upgrade of same day is required.

The DS2405 disk enclosure replaces the DS2400, however, the DS2400 will be available for repair and replacement (on the VA7410 only the DS2405 is supported). The HP StorageWorks Command View SDM software (version 1.04 or later) **and** array controller firmware (HP14 or later) is **required** for the DS2405 (HP14 is not supported on VA7410). Earlier version of controller firmware will not recognize the DS2405, and may cause the array to generate a Phantom Enclosure warning state. Additional information is contained in the service note located at <http://snsrver.mayfield.hp.com/products/A6206A>. (**Note:** This is an internal URL.) Additionally, if the disk enclosure being added is a DS2405 Disk System, set the FC Loop Speed switch on each LCC controller to 1 GB/s (refer to the VA7xxx User Guide).

The following rules should be followed when ordering a DS2400/DS2405 disk enclosure:

- If a disk enclosure is ordered with a **new order**—only a DS2405 disk enclosure should be ordered.
- If a disk enclosure is ordered for **replacement or repair**—either a DS2400 or DS2405 can be ordered.
- If a disk enclosure is ordered for **storage expansion**—Either a DS2400 or a DS2405 disk enclosure can be ordered. However, if the customer is running HP13 or lower, a DS2400 should be ordered for expansion or the customer should evaluate a firmware upgrade. If a customer is running HP14 or greater, a DS2405 should be ordered for expansion.

VA7410 Overview

The HP StorageWorks Virtual Array 7410 is a fibre channel (FC) disk storage system that supports from ten to 105 disk drives. The VA7410 is comprised of two types of enclosures, each three EIA units high: the virtual array controller enclosure (A6183A/AZ) and the disk system enclosure (A6214A/AZ) also referred to as the disk enclosure or the JBOD (Just a Bunch Of Disks) enclosure. In addition, pre-defined SKUs are available to facilitate integrated arrays. The array consists of one controller enclosure and one to six disk enclosures, with scalable capacities from 181 GB to 1.90 TB (using 18-GB 15k rpm disk drives), 364 GB to 3.82 TB (using 36-GB 10k rpm disk drives), or 720 GB to 7.67 TB (using 73-GB 10k rpm disk drives). Capacities and spindle speeds can also be mixed throughout the array.

Both enclosures include dual power supplies with built-in dual blowers, and accommodate up to 15 low-profile 3.5-inch native fibre channel (FC) disk drives in the front. The controller enclosure also includes dual redundant 2-Gbit/sec FC capable array controller cards and the disk enclosure also includes dual redundant 1-Gbit/sec link controller cards for back-end connections to the controllers. All field replaceable units are hot swappable. The array controller cards, however, must be replaced offline if the OS does not support controller failover.

The VA7410 can operate in either RAID 1+0 mode or AutoRAID mode. These data protection levels are user selectable at the time of initial array installation. Using Virtual Storage Array (VSA) technology, when configured in AutoRAID mode the array controller automatically selects RAID 1+0 (disk striping and mirroring) or RAID 5DP (RAID 5 Double Parity) depending on the usage patterns of the data. This protection scheme eliminates the requirement for the system administrator to understand and configure RAID levels. RAID 5DP provides superior data redundancy by protecting against the simultaneous failure of two member disks by using independent error correction schemes. Users will find configuration significantly easier than other array products, since RAID levels don't need to be configured or managed. The VA7410 supports two redundancy groups, which provides for physical data path separation of the two groups of LUNS.

The VA7410 is architected to communicate with multiple hosts and operating systems, otherwise known as a simultaneous heterogeneous environment. Any combination of the following supported operating systems can be supported simultaneously: HP-UX, Windows NT, Windows 2000, Linux, AiX, and Solaris (NetWare and MPE/iX are expected to be added 1-3 months after introduction of the VA7410. Contact your HP Sales Representative for more details). One host port behavior is initially set in controller firmware, and then heterogeneous support for all other operating systems is enabled through software in a host port behavior table. The controller default host port behavior is set for HP-UX. The VA7x00 products are managed by the HP Command View SDM host-resident software. A one-host license to use for HP StorageWorks Command View SDM is included with each VA7410. Currently HP StorageWorks Command View SDM runs native on HP-UX, Windows NT, Windows 2000 and Red Hat Linux 6.2, 7.1. Installations on any of the other supported operating systems will require a dedicated management station running one of the aforementioned operating systems to be in the data path of the VA7410 (i.e. in the switched fabric).

The VA7410 can be configured to use an active hot spare feature. An active hot spare is a portion of the array capacity reserved to perform a rebuild. This feature requires the use of additional disk drives in the array. Users can select from 0, 1, or 2 active hot spares. An active hot spare ensures that the array can maintain data redundancy if one or two disks fail. Until it is needed, the array uses the active hot spare storage space as RAID 1+0 capacity, which improves array performance. The active hot spare storage capacity does not sit idle; it is used to increase the array performance until the storage it is needed.

The VA7410 can be connected to one or more hosts, hubs, or switches via an optical fibre channel (FC) interface with OS-dependant, 1- or 2-Gbit/sec transfer rates. The default factory setting is 1-Gbit/sec. It can be ordered in factory-racked and field-rackable configurations. Factory-racked products are pre-configured in the HP Rack/System E racks. Field-rackable products can be racked in HP racks or in Compaq 9000 racks.

The VA7410 is supported by HP's Instant Support Enterprise Edition (ISEE). HP's online diagnostic and resolution capability securely delivers remote reactive services that quickly resolve problems, proactive service that anticipate and prevent downtime due to computing issues, and value-added services to help monitor, manage and maintain global IT networks. A minimum level hardware support upgrade of same day is required.

For the VA7410, the DS2405 disk enclosure replaces the DS2400, however, the DS2400 will be available for repair and replacement. The HP StorageWorks Command View SDM software (version 1.04 or later) **and** array controller firmware (HP14 or later) is **required** for the DS2405. Earlier versions of controller firmware will not recognize the DS2405, and may cause the array to generate a Phantom Enclosure warning state. Additional information is contained in the service note located at <http://snsrver.mayfield.hp.com/products/A6206A> (*note this is an internal URL*). Additionally, if the disk enclosure being added is a DS2405 Disk System, set the FC Loop Speed switch on each LCC controller to 1 GB/s (refer to the VA7xxx User Guide).

The following rules should be followed when ordering a DS2400/DS2405 disk enclosure:

- If a disk enclosure is ordered with a **new order**—only a DS2405 disk enclosure should be ordered.
- If a disk enclosure is ordered for **replacement or repair**—either a DS2400 or DS2405 can be ordered.
- If a disk enclosure is ordered for **storage expansion**—Either a DS2400 or a DS2405 disk enclosure can be ordered. However, if the customer is running HP13 or lower, a DS2400 should be ordered for expansion. If a customer is running HP14 or greater, a DS2405 should be ordered for expansion.

Product Features

The VA7100 array contains one (1) controller and the VA7400 and VA7410 arrays contain two (2) controllers. The array controllers contain the intelligence and functionality required to manage the operation of the entire array. The array functions include:

- Implementing HP Virtual Storage Technology to ensure optimum performance and cost-efficient data storage
- Managing all communication between the host and the disk drives via single or dual controller Fibre Channel arbitrated loops
- Maintaining data integrity by automatically correcting any data errors that occur
- Rebuilding the array in the event of a disk failure
- Monitoring the operation of all hardware components, including the controller itself
- Alerting the host in the event of a component failure

The use of two controllers protects the array against a single controller failure. Both controllers may be active, allowing a possible increase in performance, while providing data redundancy.

Each configured array controller includes the following components:

- One (1) or two (2) Dual Inline Memory Modules (DIMMs), purchased separately if an additional Virtual Array Controller is added
- One (1) Battery
- One (1) Early Warning Switch

Table 4.7.10.1 Performance, Throughput and Capacity

Item	Value
Throughput Host Interface VA7100	100 MB/s FC
Throughput Host Interface VA7400	200 MB/s FC
Throughput Host Interface VA7410	200 MB/s FC
Drive Interface	100 MB/s FC
Disk System Capacity VA7100	1095 GB raw capacity
Disk System Capacity VA7400	7.6 TB GB raw capacity
Disk System Capacity VA7410	7.6 TB GB raw capacity
Storage Controller	High-performance Virtual Array Controller
Disk Drive Capacity	18 GB, 36.4 GB and 73 GB (18GB is for VA7100 and VA7400 only)
Rotational Velocity	10K RPM and 15K RPM
Disk Drive Transfer Rate	10K = 26 MB/s (or better) 15K = 38 MB/s (or better)
Disk Drive Average Seek Time	10K = 4.7 ms (or better) Read, 5.2 ms (or better) Write 15K = 3.6 ms (or better) Read, 4.2 ms (or better) Write
Disk Drive Average Latency	10K = 2.99 ms, 15K = 2.00 ms

Instant Support Enterprise Edition Support (ISEE)

What is Instant Support Commercial

HP Instant Support is a unique combination of web-based self-service diagnostics and knowledge base access and is offered as a free value-added service for HP desktop computers, mobile computers, technical workstations, and PC servers.

ISC Value Proposition

HP Instant Support automates and speeds the resolution of computing problems, freeing customers from time-consuming diagnostic chores and returning them to more productive business-critical tasks.

Links of Interest

- Instant Support Commercial (European server)—
<http://instantsupport.europe.hp.com/motivedocs/hpinstantsupport.html>
- www.hp.com/go/instantsupport
- Instant Support (desktop/printers)—WW Marketing Page <http://www.hp.com/go/instantsupport>
- HPCS eDelivery EMEA—<http://hpsedelivery.europe.hp.com/>
- HP Business Support—<http://h20000.www2.hp.com/bizsupport/index.jsp>
- Troubleshooting Resources—http://www.hp.com/hps/itsol/suppt_troubleshooting.html

Specifications

VA7100 Specifications

Racked Product Physical Specifications

Height	Width	Depth	Net Weight Minimum
5.0 in	17.6 in	26 in	75 lbs
128 mm	448 mm	660 mm	34 kg

Deskside Product Physical Specifications

Height	Width	Depth	Net Weight Minimum
19 in	16.5 in (box (6.5) + base (10))	26 in	105 lbs
483 mm	419 mm	660 mm	47.6 kg

Deskside and Racked Product Electrical Specifications

Parameter	Value
Voltage	100-127 and 200-240 VAC (auto-ranging)
Frequency	50/60 Hz
Current (Maximum)	7.2 Amps RMS (2 power inputs)
Inrush Current (Peak)	36 Amps
Power Consumption	670 Watts
Heat Dissipation	196 BTU
VA Rating (Maximum Configuration)	720 VA

Deskside/Racked Product Environmental Specifications

Parameter	Operating Range	Recommended Range	Non-Operating
Temperature	5° to 35° C	20° C to 25.5° C (68° F to 78° F)	–40° to 70° C
Temperature Gradient	20° C (36° F) per hour	20° C (36° F) per hour	20° C per hour
Relative Humidity (non-condensing)	10% to 80% @ 28° C (wet bulb)	30% to 50% @ 28° C (wet bulb)	10% to 90% @ 28° C (wet bulb)
Shock	4 g, 11 ms half sine	N/A	4 g, 11 ms half sine
Vibration	0.21g rms, 5- to 500-Hz random	N/A	2.09 g rms, 5- to 500-Hz random 0.5-g peak, 5- to 500-Hz swept sine
Altitude	0 ft to 10,000 ft	0 ft to 10,000 ft	0 ft to 15,000 ft
Acoustic (ISO 9296)	8.0 bels	8.0 bels	N/A

Deskside/Racked Product Regulatory Compliance

Parameter	Specification
Radiated and Conducted Emissions	FCC Class A, EN 55022: 1998, CISPR-22: 1997 Level A, and GB9254: 1998
Immunity	EN 55024: 1998/CISPR-24: 1997
Harmonic Current	IEC 61000-3-2: 1998/EN 61000-3-2: 1995 + A14
Voltage Fluctuations and Flicker	IEC 61000-3-3: 1994/EN 61000-3-3: 1995
Product Safety	EN 60950: 1991, Second Edition + A1, A2, A3, and A4 CAN/CSA - C22.2 No. 60950-00, Third Edition UL 1950: Third Edition IEC 60825-1: 1993 + A1/EN 60825-1: 1994 + A11 Class 1 (Laser/LED) GB4943: 1995

VA7400 and VA7410 Controller Enclosure Specifications

Physical Specifications

Height	Width	Depth	Net Weight Max	Shipping Weight Max
5 in	17.6 in	26 in	34 lbs	130.1 lbs
128 mm	448 mm	660 mm	41.8 kg	59.0 kg

Electrical Specifications

Parameter	Value
Voltage (Auto-Ranging)	100-127 VAC, 200-240 VAC
Frequency	50/60 Hz
Current (Maximum; 2 power inputs)	8.2 A @ 100 VAC, 3.6 A @ 200 VAC
Inrush Current (Peak)	36 A
Power Consumption	670 W
Heat Dissipation	196 BTU/hr
VA Rating (Maximum Configuration)	720 VA

Environmental Specifications

Parameter	Operating Range	Recommended Range	Non-Operating
Temperature	5° to 35° C (41° to 95° F)	20° to 25.5° C (68° to 78° F)	-40° to 70° C (-40° to 158° F)
Temperature Gradient	20° C (36° F) per hour	20° C (36° F) per hour	20° C (36° F) per hour
Relative Humidity	15% to 80% @ 28° C (dry bulb)	30% to 50% @ 28° C (dry bulb)	10% to 90% @ 28° C (dry bulb)
Shock	4 g, 11 ms half sine	N/A	4 g, 11 ms half sine
Vibration	0.21 g rms, 5- to 500-Hz random	N/A	2.09 g rms, 5- to 500-Hz random 0.5 g peak, 5- to 500-Hz swept sine
Altitude	0 ft to 10,000 ft (0 to 3,048 m)	0 ft to 10,000 ft (0 to 3,048 m)	0 ft to 15,000 ft (0 to 4,572 m)
Acoustic (ISO 9296)	8.0 bels	8.0 bels	N/A

Regulatory Compliance

Parameter	Specification
Radiated and Conducted Emissions	FCC Class A, EN 55022: 1998, CISPR-22: 1997 Level A, and GB9254: 1998
Immunity	EN 55024: 1998/CISPR-24: 1997
Harmonic Current	IEC 61000-3-2: 1998/EN 61000-3-2: 1995 + A14
Voltage Fluctuations and Flicker	IEC 61000-3-3: 1994/EN 61000-3-3: 1995
Product Safety	EN 60950: 1991, Second Edition + A1, A2, A3, and A4 CAN/CSA - C22.2 No. 60950-00, Third Edition UL 1950: Third Edition IEC 60825-1: 1993 + A1/EN 60825-1: 1994 + A11 Class 1 (Laser/LED) GB4943: 1995

VA7400 Disk Enclosure Specifications

Physical Specifications

Height	Width	Depth	Net Weight Max	Shipping Weight Max
5 in	17.6 in	20 in	84.5 lbs	101.5 lbs
128 mm	448 mm	508 mm	38.3 kg	46 kg

Electrical Specifications

Parameter	Value
Voltage (Auto-Ranging)	100-127 VAC; 200-240 VAC
Frequency	50/60 Hz
Current (Maximum; 2 power inputs)	8.2 A @ 100 VAC, 3.4 A @ 200 VAC
Inrush Current (Peak)	3.92 A @ 269 VAC
Power Consumption	473 W @ 120 VAC, 457 W @ 240 VAC
Heat Dissipation	1443 BTU/hr
VA Rating (Maximum Configuration)	473 VA @ 120 VAC, 457 VA @ 240 VAC

Environmental Specifications

Parameter	Operating Range	Recommended Range	Non-Operating
Temperature	5° to 35° C (41° to 95° F)	20° to 25.5° C (68° to 78° F)	–40° to 70° C (–40° to 158° F)
Temperature Gradient	20° C (36° F) per hour	20° C (36° F) per hour	20° C (36° F) per hour
Relative Humidity (Non-Condensing)	15% to 80% @ 28° C (dry bulb)	30% to 50% @ 28° C (dry bulb)	5% to 95% @ 65° C (149° F)
Shock	4 g, 11 ms (20 low-impulse pulses)	N/A	20 g, 30 ms trapezoidal (non-transport) 1-inch edge drops per side (transport)
Vibration	0.21 g rms, 5- to 500-Hz random	N/A	2.09 g rms, 5- to 500-Hz random 0.5 g peak, 5- to 500-Hz swept sine
Altitude	0 ft to 10,000 ft (0 to 3,048 m)	0 ft to 10,000 ft (0 to 3,048 m)	0 ft to 15,000 ft (0 to 4,572 m)
Acoustic (ISO 9296)	8.0 bels	8.0 bels	N/A

Regulatory Compliance

Parameter	Specification
Radiated and Conducted Emissions	FCC Class A, EN 55022: 1998, CISPR-22: 1997 Level A, and GB9254: 1998
Immunity	EN 55024: 1998/CISPR-24: 1997
Harmonic Current	IEC 61000-3-2: 1998/EN 61000-3-2: 1995 + A14
Voltage Fluctuations and Flicker	IEC 61000-3-3: 1994/EN 61000-3-3: 1995
Product Safety	EN 60950: 1991, Second Edition + A1, A2, A3, and A4 CAN/CSA - C22.2 No. 60950-00, Third Edition UL 1950: Third Edition IEC 60825-1: 1993 + A1/EN 60825-1: 1994 + A11 Class 1 (Laser/LED) GB4943: 1995

Warranty

Included with every VA7100 and VA7400:

- Warranty: 2-year, 8 x 5, same-day, 4-hour on-site response with HP StorageWorks Command View SDM phone-in assistance (PIA)
- First-year same-day hardware support upgrade (this upgraded level of support enables customers to access HP's remote support technology: "HP Instant Support Enterprise Edition (ISEE)."

First-year Remote Support Technology (in order for customer to continue with this service beyond year one, a minimum same-day hardware support contact must be purchased).

Required with Purchase

- VA Family Hardware and Software: Installation service—H4726A
- Pre-installation review
- Hardware installation
- Software enablement
- LUN Design and Implementation
- Customer documentation and orientation
- VA Family Software: 24x7 Phone-in-Assistance (0S6, Support Pack)

Figure 4.7.10.1 VA 7000 Family—Front View



Figure 4.7.10.2 VA7100—Rear View

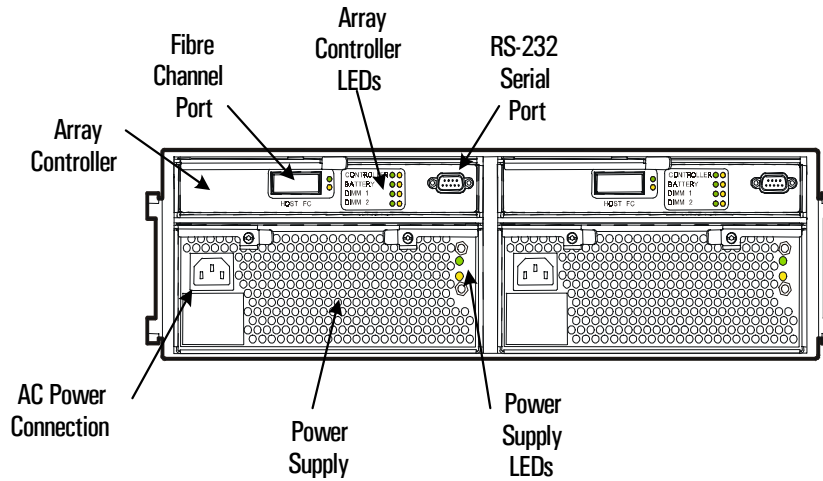


Figure 4.7.10.3 VA7400—Rear View

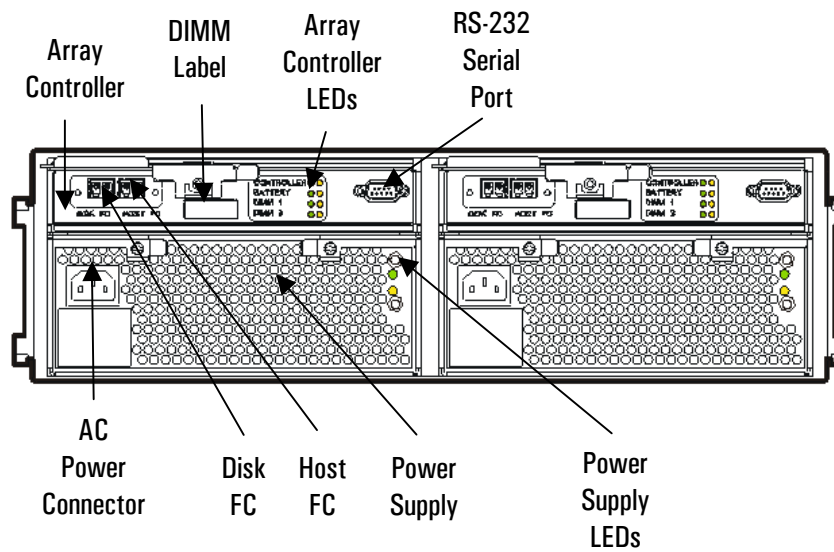


Figure 4.7.10.4 VA7410—Rear View

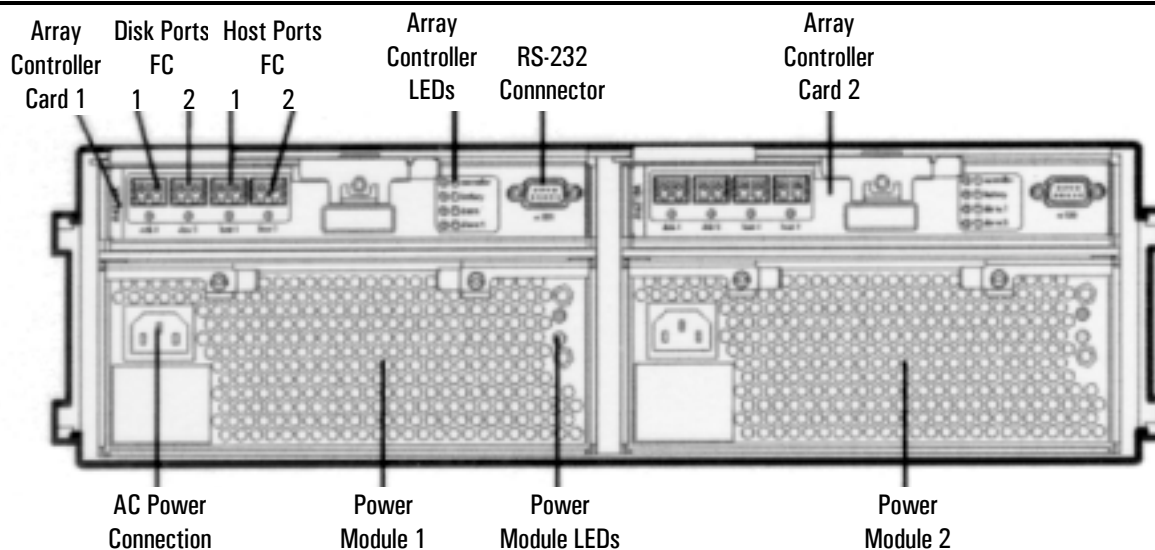


Figure 4.7.10.5 DS2400/DS2405—Rear View

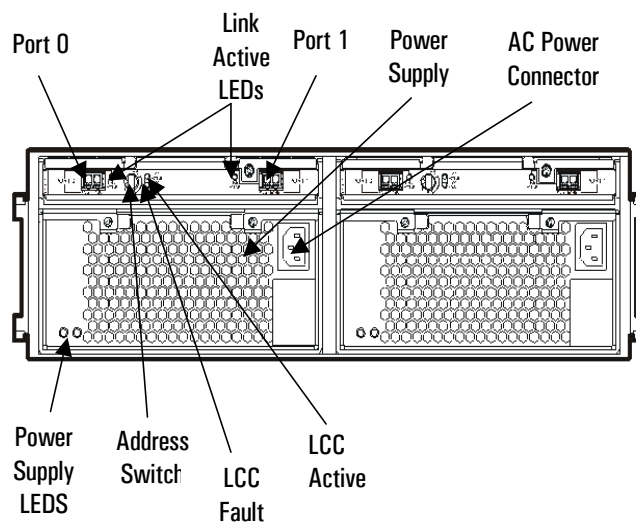
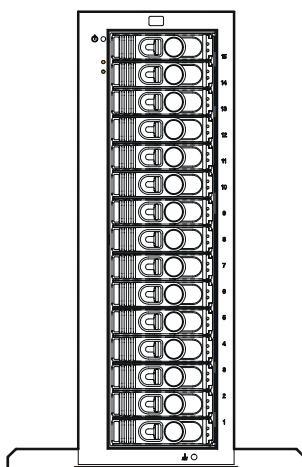


Figure 4.7.10.6 Deskside—VA7100 Only



Hardware Ordering Information

VA7100 Hardware Ordering Information

The following codes define the suffixes on product numbers: A = Field Racked, AE = diskless enclosure (field disk integration), AZ = Factory Racked.

Order drives separately from the Enterprise Module section using the OD1 option for integration. “AE” products are shipped as diskless enclosure only no integration (disks are ordered separately and field installed).

Product Number	Option Number	Description
VA7100 Field RK SKU		
A6261A		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 256-MB Cache
A6262A		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 512-MB Cache
A6263A		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 1024-MB Cache
A6183A		Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Includes filler for controllers and disks.
A6188A	OD1	Virtual Array Controller no memory installed
A6185A	OD1	256-MB Cache for Virtual Array Controller, 1 × 256MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6186A	OD1	512-MB Cache for Virtual Array Controller, 1 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6187A	OD1	2 × 512-MB Cache for Virtual Array Controller, 2 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6191A	OD1	18-GB 15K RPM FC HDD Module
A6192A	OD1	36-GB 10K RPM FC HDD Module
A6193A	OD1	36-GB 15K RPM FC HDD Module
A6194A	OD1	73-GB 10K RPM FC HDD Module
A6203A	OD1	Optical Gigabit Interface Circuit (GBIC)
A3583A	OD1	2-meter FC fibre optic cable M/M multimode SC-SC
A3531A	OD1	16-meter FC fibre optic cable M/M multimode SC-SC
A3735A	OD1	50-meter FC fibre optic cable M/M multimode SC-SC
A3736A	OD1	100-meter FC fibre optic cable M/M multimode SC-SC
C7529A	OD1	2-meter FC fiber optic cable M/M duplex LC-SC
C7530A	OD1	16-meter FC fiber optic cable M/M duplex LC-SC
C7534A	OD1	FC fiber optic coupler F/F SC-SC
C7540A	OD1	FC adapter kit (includes C7529A and C7534A)
VA7100 Factory Rack		
A6261AZ		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 256-MB Cache
A6262AZ		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 512-MB Cache
A6263AZ		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 1024-MB Cache
A6183AZ		Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6188A	OD1	Virtual Array Controller no memory installed
A6185A	OD1	256-MB Cache for Virtual Array Controller, 1 × 256MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6186A	OD1	512-MB Cache for Virtual Array Controller, 1 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6187A	OD1	2 × 512-MB Cache for Virtual Array Controller, 2 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6191A	OD1	18-GB 15K RPM FC HDD Module
A6192A	OD1	36-GB 10K RPM FC HDD Module
A6193A	OD1	36-GB 15K RPM FC HDD Module
A6194A	OD1	73-GB 10K RPM FC HDD Module
A6203A	OD1	Optical Gigabit Interface Circuit (GBIC)
A3583A	OD1	2-meter FC fibre optic cable M/M multimode SC-SC

Product Number	Option Number	Description
A3531A	OD1	16-meter FC fibre optic cable M/M multimode SC-SC
A3735A	OD1	50-meter FC fibre optic cable M/M multimode SC-SC
A3736A	OD1	100-meter FC fibre optic cable M/M multimode SC-SC
C7529A	OD1	2-meter FC fiber optic cable M/M duplex LC-SC
C7530A	OD1	16-meter FC fiber optic cable M/M duplex LC-SC
C7534A	OD1	FC fiber optic coupler F/F SC-SC
C7540A	OD1	FC adapter kit (includes C7529A and C7534A)
VA7100 Modules		
A6183AE		Field upgrade product. Select Virtual Array Controller (one or two) and cache product separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies. This product is shipped without disks or controllers/cache and includes filler for controllers and disks.
A6261AE		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 256-MB Cache
A6262AE		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 512-MB Cache
A6263AE		Predefined SKU - VA7100 with Dual Controller, 2 GBICs, 1024-MB Cache
A6188A		Virtual Array Controller no memory installed
A6185A		256-MB Cache for Virtual Array Controller, 1 × 256MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6186A		512-MB Cache for Virtual Array Controller, 1 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6187A		2 × 512-MB Cache for Virtual Array Controller, 2 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6191A		18-GB 15K RPM FC HDD Module
A6192A		36-GB 10K RPM FC HDD Module
A6193A		36-GB 15K RPM FC HDD Module
A6194A		73-GB 10K RPM FC HDD Module
A6196A		Deskside cabinet for HP StorageWorks VA7100
A6203A		Optical Gigabit Interface Circuit (GBIC)
A3583A		2-meter FC fibre optic cable M/M multimode SC-SC
A3531A		16-meter FC fibre optic cable M/M multimode SC-SC
A3735A		50-meter FC fibre optic cable M/M multimode SC-SC
A3736A		100-meter FC fibre optic cable M/M multimode SC-SC
C7529A	OD1	2-meter FC fiber optic cable M/M duplex LC-SC
C7530A	OD1	16-meter FC fiber optic cable M/M duplex LC-SC
C7534A	OD1	FC fiber optic coupler F/F SC-SC
C7540A	OD1	FC adapter kit (includes C7529A and C7534A)

VA7100 Rail Kits

The following rail kits are needed to mount the VA7100 into the specific racks as listed.

Part Number	Description
A6209A	System/E Rail Kit (RoseBowl 2)
A5672A	Rittal 9K Cabinet Rail Kit
A6244A	HP Original rack rackmount hardware kit
C2791A	Filler panel kit for Rose Bowl 1 rack

VA7400 Hardware Ordering Information

VA7400 Controller Enclosure Hardware Ordering Information

The following codes define the suffixes on product numbers: A = Field Racked, AE = Empty enclosure (no integration), AZ = Factory Racked.

Order drives separately from the Enterprise Module section using the 0D1 option for integration. “AE” products are shipped as diskless enclosure only no integration (disks are ordered separately and field installed).

Product Number	Option	Description
VA7400 Enterprise Field RK SKU		
A6183A		Includes: VA Enclosure, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6264A		VA7400 with Dual Controller 512-MB Cache Includes: VA Enclosure, (2) 2-Gbit/1-Gbit VA Cont Module Assy, (2) DIMM 512-MB, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, ESD Kit, RS-232 cable 9-9 pin, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6265A		VA7400 with Dual Controller 1024-MB Cache Includes: VA Enclosure, (2) 2-Gbit/1-Gbit VA Cont Module Assy, (4) DIMM 512-MB, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, ESD Kit, RS-232 cable 9-9 pin, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6185A		256-MB Cache for Virtual Array Controller, 1 × 256MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6186A		512-MB Cache for Virtual Array Controller, 1 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6187A		2 × 512-MB Cache for Virtual Array Controller, 2 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6191A	0D1	Enterprise Class 18-GB 15K RPM FC HDD (minimum 10) (order separately)
A6192A	0D1	Enterprise Class 36-GB 10K RPM FC HDD (minimum 10) (order separately)
A6193A	0D1	Enterprise Class 36-GB 15K RPM FC HDD (minimum 10) (order separately)
A6194A	0D1	Enterprise Class 73-GB 10K RPM FC HDD (minimum 10) (order separately)
C7524A		Fiber Optic Cable 2-meter LC 50/125 M/M
C7525A		Fiber Optic Cable 16-meter LC Duplex 50/125 M/M
C7526A		Fiber Optic Cable 50-meter LC Duplex 50/125 M/M
C7527A		Fiber Optic Cable 200-meter LC Duplex 50/125 M/M
C7529A		2-meter FC fiber optic cable M/M duplex LC-SC
C7530A		16-meter FC fiber optic cable M/M duplex LC-SC
C7534A		FC fiber optic coupler F/F SC-SC
C7540A		FC adapter kit (includes C7529A and C7534A)
VA7400 Enterprise Factory Rack		
A6264AZ		VA7400 with Dual Controller 512-MB Cache Includes: VA Enclosure, (2) 2-Gbit/1-Gbit VA Cont Module Assy, (2) DIMM 512-MB, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, ESD Kit, RS-232 cable 9-9 pin, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6265AZ		VA7400 with Dual Controller 1024MB Cache Includes: VA Enclosure, (2) 2-Gbit/1-Gbit VA Cont Module Assy, (4) DIMM 512-MB, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, ESD Kit, RS-232 cable 9-9 pin, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6183AZ		Includes: VA Enclosure, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6185A		256-MB Cache for Virtual Array Controller, 1 × 256MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP

Product Number	Option	Description
A6186A		512-MB Cache for Virtual Array Controller, 1 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6187A		2 × 512-MB Cache for Virtual Array Controller, 2 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6191A	OD1	Enterprise Class 18-GB 15K RPM FC HDD (minimum 10) (order separately)
A6192A	OD1	Enterprise Class 36-GB 10K RPM FC HDD (minimum 10) (order separately)
A6193A	OD1	Enterprise Class 36-GB 15K RPM FC HDD (minimum 10) (order separately)
A6194A	OD1	Enterprise Class 73-GB 10K RPM FC HDD (minimum 10) (order separately)
C7524A		Fiber Optic Cable 2-meter LC 50/125 M/M
C7525A		Fiber Optic Cable 16-meter LC Duplex 50/125 M/M
C7526A		Fiber Optic Cable 50-meter LC Duplex 50/125 M/M
C7527A		Fiber Optic Cable 200-meter LC Duplex 50/125 M/M
C7529A		2-meter FC fiber optic cable M/M duplex LC-SC
C7530A		16-meter FC fiber optic cable M/M duplex LC-SC
C7534A		FC fiber optic coupler F/F SC-SC
C7540A		FC adapter kit (includes C7529A and C7534A)
VA7400 Enterprise Modules		
A6183AE		Includes: VA Enclosure, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6264AE		VA7400 with Dual Controller 512-MB Cache Includes: VA Enclosure, (2) 2-Gbit/1-Gbit VA Cont Module Assy, (2) DIMM 512-MB, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, ESD Kit, RS-232 cable 9-9 pin, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6265AE		VA7400 with Dual Controller 1024-MB Cache Includes: VA Enclosure, (2) 2-Gbit/1-Gbit VA Cont Module Assy, (4) DIMM 512-MB, User Guide, Installation Guide, Documentation Map, VA7x00 Documentation CD-ROM, (2) power cord, ESD Kit, RS-232 cable 9-9 pin, HP Command View SDM. Field upgrade product. Select Virtual Array Controller (one or two) and cache and disk options separately (factory installed). Field Installed. Includes enclosure assembly, user manual, and 2 power supplies, filler panels for controllers and disks.
A6185A		256-MB Cache for Virtual Array Controller, 1 × 256MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6186A		512-MB Cache for Virtual Array Controller, 1 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6187A		2 X 512-MB Cache for Virtual Array Controller, 2 × 512MB DIMM, Surestore VAP requires equal cache for both Controllers (if 2nd installed). Order 1 per installed VAP
A6189A		VA7400 Controller (minimum two required for VA7400)
A6186A		512-MB Cache (1 × 512MB) (Order one per VAP)
A6187A		1024-MB Cache (2 × 512MB) (Order one per VAP)
A6191A		Enterprise Class 18-GB 15K RPM FC HDD (minimum 10 per VA7400)
A6192A		Enterprise Class 36-GB 10K RPM FC HDD (minimum 10 per VA7400)
A6193A		Enterprise Class 36-GB 15K RPM FC HDD (minimum 10 per VA7400)
A6194A		Enterprise Class 73-GB 10K RPM FC HDD (minimum 10 per VA7400)
C7524A		Fiber Optic Cable 2-meter LC 50/125 M/M
C7525A		Fiber Optic Cable 16-meter LC Duplex 50/125 M/M
C7526A		Fiber Optic Cable 50-meter LC Duplex 50/125 M/M
C7527A		Fiber Optic Cable 200-meter LC Duplex 50/125 M/M
C7529A		2-meter FC fiber optic cable M/M duplex LC-SC
C7530A		16-meter FC fiber optic cable M/M duplex LC-SC
C7534A		FC fiber optic coupler F/F SC-SC
C7540A		FC adapter kit (includes C7529A and C7534A)

VA7400 Rail Kits

The following rail kits are needed to mount the VA7400 into the specific racks as listed.

Part Number	Description
A6209A	System/E Rail Kit (RoseBowl 2)
A5672A	Rittal 9K Cabinet Rail Kit
A6244A	HP Original rack rackmount hardware kit
C2791A	Filler panel kit for Rose Bowl 1 rack

Disk System Enclosure (DS2400) Hardware Ordering Information

Note: The DS2400 cannot be used with the VA7100

The following codes define the suffixes on product numbers: A = Field Racked, AE = Empty enclosure (no integration), AZ = Factory Racked.

Product Number	Option	Description
DS2400 Disk Enclosure Field Rack		
A6214A		Factory Installed DS2400 Disk Enclosure Includes: Disk Enclosure, Installation Guide, Disk Filler Assy, (2) power cord,
A6214AE		Field Installed DS2400 Disk Enclosure Includes: Disk Enclosure, Installation Guide, Disk Filler Assy, (2) power cord,
A6191A		18-GB 15K RPM Fibre Channel drive add-on
A6191A	OD1	18-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6192A		36-GB 10K RPM Fibre Channel drive add-on
A6192A	OD1	36-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6193A		36-GB 15K RPM Fibre Channel drive add-on
A6193A	OD1	36-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6194A		73-GB 10K RPM Fibre Channel drive add-on
A6194A	OD1	73-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
DS2405 Disk Enclosure Field Rack		
A6250A		Disk System 2405 field rack enclosure (cables are not included and must be ordered separately)
A6250AE		Disk System 2405 field rack enclosure with no disk integration (cables are not included and must be ordered separately)
A6191A		18-GB 15K RPM Fibre Channel drive add-on
A6191A	OD1	18-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6192A		36-GB 10K RPM Fibre Channel drive add-on
A6192A	OD1	36-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6193A		36-GB 15K RPM Fibre Channel drive add-on
A6193A	OD1	36-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6194A		73-GB 10K RPM Fibre Channel drive add-on
A6194A	OD1	73-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
DS2400 Disk Enclosure Factory Rack		
A6214AZ		Factory Installed DS2400 Disk Enclosure Includes: Disk Enclosure, Disk filler assy, (2) power cord, Telluride RBII Rack Rail Kit
A6191A		18-GB 15K RPM Fibre Channel drive add-on
A6191A	OD1	18-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6192A		36-GB 10K RPM Fibre Channel drive add-on
A6192A	OD1	36-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6193A		36-GB 15K RPM Fibre Channel drive add-on
A6193A	OD1	36-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6194A		73-GB 10K RPM Fibre Channel drive add-on
A6194A	OD1	73-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
C7524A	OD1	FC cable 2-meter LC duplex M/M
C7525A	OD1	FC cable 16-meter LC duplex M/M
C7526A	OD1	FC cable 50-meter LC duplex M/M
C7527A	OD1	FC cable 200-meter LC duplex M/M
DS2405 Disk Enclosure Factory Rack		
A6250AZ		Disk System 2405 factory rack enclosure (cables are not included and must be ordered separately)
A6191A		18-GB 15K RPM Fibre Channel drive add-on
A6191A	OD1	18-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6192A		36-GB 10K RPM Fibre Channel drive add-on
A6192A	OD1	36-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)

Product Number	Option	Description
A6193A		36-GB 15K RPM Fibre Channel drive add-on
A6193A	OD1	36-GB 15K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
A6194A		73-GB 10K RPM Fibre Channel drive add-on
A6194A	OD1	73-GB 10K RPM Fibre Channel drive installed into the enclosure (must order minimum quantity 2, maximum = 15)
Disk Enclosure Upgrades		
A6209A		System/E Rail Kit
A5672A		Rittal 9K Cabinet Rail Kit
A6244A		HP Original rack rackmount hardware kit

NOTES: A6183A requires rail kits to be ordered separately.

Cache memory for VAP ordering note: You must order one and only one cache memory option type for each array.

Fiber channel disk module ordering note: You must order at least two (2) but not more than fifteen (15) disk modules per enclosure. The unused slots must contain a disk slot filler panel to insure proper cooling of the array. The factory will include filler panels for any remaining open drive bays.

DS2405 Disk System Accessories

C7524A		2-meter Fibre Channel cable LC 50/125 M/M
C7525A		16-meter Fibre Channel cable LC Duplex 50/125 M/M
C7526A		50-meter Fibre Channel cable LC Duplex 50/125 M/M
C7527A		200-meter Fibre Channel cable LC Duplex 50/125 M/M
C7529A		2-meter Fibre Channel cable LC/SC 50/125 M/M
C7530A		16-meter Fibre Channel cable LC/SC 50/125 M/M
C7540A		Fiber optic adapter kit
C7534A		Fiber optic coupler SC F/F
A6209A		System/E rack rail kit
A6244A		HP Original rack rackmount hardware kit
A6496A		NT/Rittal rack rail kit
A6498A		3U 2-post rail kit

VA7000 Family Racking and Rail Kit Options

Note: Solution interconnect cabling/configuration of the A6264A/AZ and A6265A/AZ will be performed by the factory only when specified via Solution Integration Service Plan 2 (A3142B #002) with Visio Drawing attachment. Otherwise, data cables will ship with the solution, unconnected. (Please refer to <http://www.sisp.hp.com> for information on SISP services.). Not supported under Cronus structure

Note: The VA7100 is not designed to be transported in the RoseBowl 1 or Rittal racks.

HP Rack System/E Products

Part Number	Description	Height	Units
J1500A	HP Rack System/E41	1.96 meters	41U
J1501A	HP Rack System/E33	1.60 meters	33U
J1502A	HP Rack System/E25	1.25 meters	25U
A4900A	HP Rack System/E25	1.25 meters	25U
A4901A	HP Rack System/E33	1.60 meters	33U
A4902A	HP Rack System/E41	1.96 meters	41U

HP Computer Cabinet Products

Part Number	Description	Height	Units
C2785A	Computer Cabinet	1.10 meters	21U
C2786A	Computer Cabinet	1.60 meters	32U
C2787A	Computer Cabinet	1.96 meters	41U

Compaq 9000 Rack Products

Part Number	Description	Height	Units
9122	Rack	1.1 meters	22U
9136	Rack	1.7 meters	36U
9142	Rack	2.0 meters	42U

Support Options Overview

Hardware Support Options

CATS Upfront Support Options for Enterprise; Product Support Packs for Commercial Channel

The following CATS and support pack options are available for the VA7000 Family. The support packs are on the disk system and contain the support pricing for the drives. CATS support, on the other hand, is ordered at the disk level. The following additional rules apply:

Installation and start-up service is required and includes the following on the entire customer order:

- Pre-installation review
- Hardware installation
- Software enablement
- LUN design and implementation
- Customer documentation and orientation
- In order for customers to continue with the benefits of HP Instant Support Enterprise Edition beyond the first year that is included, a minimum level same-day hardware support contract must be purchased.

VA Hardware Universal Product Numbers	Description	Direct (Enterprise) CATS and Options ¹		Indirect (Commercial) Support Packs ¹	
		1-, 2-, and 3-year Support: SD, 24x7, SCS, BCS	Installation and Start-Up (H4726A)	3-Year Support: SD, 24x7	Installation and Start-Up
VA7100 Dual Controllers A6261A/AZ/AE; A6262A/AZ/AE; A6263A/AZ/AE	Covers dual processors, cache, enclosure	8AE	5CM	H7555A/E; H7559A/E	H7550A/E
VA7400 Dual Controllers A6264A/AZ/AE; A6265A/AZ/AE	Covers dual processors, cache, enclosure	8AF	5CP	H7561A/E; H7565A/E	H7551A/E
Disk Enclosures A6214A/AZ/AE; A6183A/AD/AE	Covers enclosure	8AQ	5CA	H7563A/E; H7564A/E	H7558A/E
VA7100 Controller A6188A	Covers processor, cache	803	5CE	H7569A/E; H7553A/E	H7552A/E
VA7400 Controller A6189A	Covers processor, cache	803	5CF	H7567A/E; H7533A/E	H7552A/E
18-GB HDD A6191A	N/A	8AL	5CG	N/A	N/A
36-GB HDD A6913A, A6192A	N/A	8AN	5CH	N/A	N/A
73-GB HDD A6194A	N/A	8AP	5CJ	N/A	N/A

¹ Direct channel (enterprise customers) purchase support on disks individually; support pack customers ("commercial" or indirect) receive coverage on up to 15 disks with purchase of enclosure or dual controller support packs.

Note: CATS is the merger of the Camelot and Licensing 2000 projects into one overall program to "reinvent" HP's upfront and contractual support structures. The internal program name is CATS, which stands for Camelot, Aries, Taurus, Scorpio (LS2K releases). For more information on CATS please see the URL at: <http://internet.fc.hp.com/catscore/channels.htm>

HP Service levels	CATS Support Options-1 Year	CATS Support Options-2 Year	CATS Support Options-3 years	CATS Support Options-4 Year	CATS Support Options-5 Year
Same Day	N/A	N/A	N/A	N/A	N/A
24 hours × 7 days	H4404A/H4405A	H4405J	H4404Y/H4405Y	N/A	N/A
Storage Critical Support VA	H4390A	H4390J	H4390Y	H4390G	H4390H
BCS—4 hour Call-to-Restoration	H4395A	N/A	N/A	N/A	N/A

Hardware and Software—Additional Recommended Services

- TAS—H4399A/H4399J/H4399Y
- SAN Implementation Service for SAN environments—H9273A option 380
- Additional Day ASE Time—H9273A option 311
- Service Guard Implementation—H4810AT
- HP StorageWorks Business Copy VA Implementation (Virtual Array)—H9273A option 3B2

Contractual Support for Enterprise and Commercial Channels

Support Suffixes (SPNs)

- | | |
|-------|-------|
| • 02C | • 07A |
| • 02A | • 07C |
| • 02G | • 07G |
| • 02L | • 07V |
| • 02V | • 07X |
| • 02X | |

Description of Services Offered

The 02x are the post warranty support contractual monthly pricing available after the warranty. The 07x are the upgrade warranty support contractual monthly pricing available during the warranty.

Below are the Service Levels:

Code	Description
02A	On-site 4 hour same day hardware response, Monday - Friday, business hours.
07A	07A is available as a warranty upgrade to an 02A response level
02C	On-site next day hardware response, Monday - Friday, business hours (vary by country).
07C	07C available as a warranty upgrade to an 02C response level
02G	On-site 4 hour same day hardware response, seven days a week, 24 hours a day.
07G	07G available as a warranty upgrade to an 02G response level
02L	On-site scheduled hardware response, Monday - Friday, business hours (vary by country).
02V	On-site six-hour hardware call-to-repair, seven days a week, 24 hours a day. Time begins when the original call to the call center is made. Recovery of operating system and other software are excluded from time commitment. Available only for customer sites up to 50 miles (80 km) from a primary HP Support Response Office.
07V	07V available as a warranty upgrade to an 02V repair level
02X	On-site four-hour hardware call-to-restoration, seven days a week, 24 hours a day. Time begins when the original call to the call center is made. Restoration considered complete when an operating system prompt is re-established and the operating system is restored to the customer's last configuration (or when the operating system is restored to a generic configuration for that operating system configuration). Time commitment does not include time needed for recovery of middleware, application software or data. Available only for customer sites up to 50 miles (80 km) from a primary HP Support Response Office. In order to purchase this level of response, the system must be part of a BCS contract.
07X	07X available as a warranty upgrade to an 02X repair level

Field Replaceable Units (FRUs)

Dual Inline Memory Modules (DIMMs)

Each controller utilizes one or two DIMMs, which contain battery-backed non-volatile RAM (NVRAM). The NVRAM is utilized for read/write caching and to store array memory maps. Because data is spread across all of the disks in the array, the array controller must have a way of determining where each block of data is located. This is accomplished using a logical-to-physical data map stored in NVRAM cache. This data map is vital to managing data; without it, all data in the array is inaccessible.

Both controllers require the same amount of memory as the contents of NVRAM are mirrored between the two controllers. This mirroring process insures that both controllers have exactly the same information in the event of a failure. The controller battery maintains NVRAM contents when normal power is not present. If the battery fails or loses its charge while power is off, the NVRAM contents are lost on that controller. To protect against data loss, the array power/standby switch turns off power to the array and the "Shutdown Operation" copies NVRAM contents to the disk drives in two (2) slots of the array. This allows reconstruction of the data in NVRAM if the original data is lost or corrupted.

***Note:** The process of copying the contents of NVRAM to the two recovery disks makes the disk set independent of its controller. Because all the necessary mapping information is on these disks, it is possible to install a new controller or move the entire disk set to another controller. The new controller will determine that it has a new disk set, and the controller will attach itself to those disks.*

DIMM Sizes and Memory Sizes

Memory size of 512 MB is one 512-MB DIMM per Virtual Array Controller-Physical total of 1024. Memory size of 1024 MB is two 512-MB DIMMs per Virtual Array Controller-Physical total of 2048.

DIMM Memory Size	Number of DIMMs	Memory Size Per Controller
256 MB	1	256 MB
256 MB	2	512 MB
512 MB	1	512 MB
512 MB	2	1024 MB
1024 MB	1	1024 MB
1024 MB	2	2048 MB

Battery

Each array controller includes one battery to supply backup power to the DIMMs in the event of a power failure or if array power is switched off. If power is lost, the battery LED will flash with a 5% duty cycle while it powers the DIMMs. The battery will maintain a charge for 3.5 days. If the battery loses its charge, or if it is removed from the controller, the DIMMs have no power and NVRAM contents are lost. A battery should be replaced when the software indicates a battery failure.

Early Warning Switch

In a dual controller configuration, the NVRAM contents on both controllers are updated constantly. By maintaining a mirror image of the NVRAM, the secondary controller can take over immediately if the primary controller fails. If a dual controller configuration needs to be replaced online, an early warning switch incorporated into the latch detects when the controller is being removed. Releasing the latch disables communication between controllers before power is lost to the controller being removed. This prevents corruption of the NVRAM contents. The remaining controller executes a fast reset in order to assume responsibility for providing access to data previously accessed through the now missing controller.

Disk Drives

The disk drives provide the storage medium for the disk array. A minimum of ten (10) drives are required to operate the disk array. This is because two (2) drives are required for parity in each redundancy group. Different capacity disk modules can be installed in the same array.

Four types of disk drives can be installed in the array and capacities can be mixed within the array:

- 18-GB Low-Profile Fibre Channel 15,000 rpm
- 36-GB Low-Profile Fibre Channel 10,000 rpm
- 36-GB Low-Profile Fibre Channel 15,000 rpm
- 73-GB Low-Profile Fibre Channel 10,000 rpm

Loading Rules

VA7400/VA7410 disk loading rules:

- Ten (10) disk minimum per VA7400/VA7410
- One hundred and five (105) disks maximum
- Four (4) disks minimum for each disk type that is installed, then user can add singles after that.

DS2400/DS2405 (disk enclosure) disk loading rules:

- Two (2) disk minimum
- Fifteen (15) disk maximum per DS2400/DS2405

A new disk can be added at any time, even while the disk array is operating. The array controller will recognize that a new disk has been added and will include the disk in the array configuration automatically if the Auto Include feature is enabled. To make the additional capacity available to the host, a new logical drive must be created, and the resulting drive must be configured into the operating system.

A new DS2405 can be added at any time, even while the disk array is operating. Please refer to the back-end cabling diagrams and the VA74xx user manual for specific procedures. If the disk enclosure being added is a DS2405 Disk System, make sure that HP StorageWorks Command View SDM 1.04 (or later) is used and the array controller firmware is HP14 (or later). Earlier versions of controller firmware will not recognize the DS2405 and may cause the array to generate a Phantom Enclosure Warning. Additional information is contained in the service note located at <http://snsrver.mayfield.hp.com/products/A6206A> (note this is an internal URL). Additionally, if the disk enclosure being added is a DS2405 Disk System, set the FC Loop Speed switch on each LCC controller to 1-GB/s (refer to the VA7xxx User Guide).

Note: Disk drive and controller filler panels must be installed in unused slots to maintain proper cooling within the disk enclosure.

Redundant Power Supply/Fan Modules

The array is shipped with two (2) fully redundant power/fan modules. Each power/fan module contains:

- One load-sharing power supply that works in conjunction with the second power supply. The power supplies share the power load reciprocally; one supply automatically increases its output to compensate for reduced output from the other. If one power supply fails, the other supply delivers the entire load to maintain power for the array. If both power supplies fail, the controller will shutdown the array. Each power supply uses a separate power cord. Both power supplies can be plugged into a common power source, but it is recommended that each supply be plugged into a separate circuit to provide power source redundancy.
- Two (2) internal fan modules provide cooling airflow and maintain the proper operating temperature for the entire array enclosure. If a fan fails, a fan fault will occur and the associated power supply will shut down. The other power supply will continue to operate and its associated fans will continue to cool the array. Also, if one power supply fails, and one or both of its associated fans are operable, they will be powered by the remaining good power supply in cooling the array.

Note: During normal operation, if a failed power supply/fan module is removed, it must be replaced within two minutes to maintain proper cooling of the array. If a power/fan module slot is left empty, the airflow path will be disrupted and the array will overheat.

Midplane

The midplane, internal to the array enclosure, contains the following features for the identification of the array. This information is stored into redundant EEPROMs during the manufacturing process:

Item	Description
World Wide Name (WWN)	The Node WWN is used by the OS drivers to identify the array enclosure.
Default Fibre Channel Loop Addresses	The following default Fibre Channel loop addresses are assigned to array controllers: Array Controller 1: 108 Array Controller 2: 110 The default Fibre Channel loop addresses can be changed using either the Virtual Front Panel (VPF) or the Command Line User Interface (CLUI) included with your HP Command View SDM software.
Product Mode Parameters	Retains various operating parameters
Product Serial Number	Same as the serial number sticker applied to the array
Product ID Number VA7100	Same the product ID number (A6188A)
Product ID Number VA7400	Same the product ID number (A6189A)
Product ID Number VA7410	Same the product ID number (A6218A)

User installed licenses are stored within the Midplane EEPROM. These licenses are associated with a particular product serial number. If the Midplane must be replaced, a special Midplane may be ordered which, will allow the automatic regeneration of product serial number, licenses and product mode parameters. This information will be automatically re-programmed within the new Midplane EEPROMs if the replacement procedure is followed.

LED Status Indications

If a disk drive, controller, battery, DIMM, power supply or fan fails in the enclosure, a fault will be indicated by a fault (amber) LED on the module. Examining the state of the LEDs can localize the nature of the fault.

GBIC (VA7100 only)

A GigaBit Interface Converter (GBIC) is connected to each array controller as a transceiver for data and to convert the data from an optical signal to an electrical signal and vice versa. Each VAP includes a single GBIC. Based on user configurations, additional GBICs may be required. Only the GBICs A6203A (Enterprise) and A6241A (Commercial) are supported with the VA7100. These are Finisar GBICs, which provide readable serial number functionality.

Array Logs

The array logs consist of the following controller logs:

- Events
 - Errors
 - Unexpected conditions
 - Configuration changes
 - Environmental changes
- Fibre Channel Port Statistics
 - Historical fibre channel port information
- Performance
 - Input/Output per second
- Flash
 - Event log stored in flash memory in the event of a loss of battery power

The array logs are stored in two (2) locations:

The Controller(s).

Host operating system: The HP Command View SDM software polls the array controller every 15 minutes and updates a host OS directory located on the host server internal disk drive. These logs contain "Event" data will be commonly accessed by the support entity HP Response Center.

Note: The Fibre Channel Port Statistics log are stored in dynamic memory and will be lost when the array is powered off.

Supported Operating Systems

- HP-UX
- Windows NT
- Windows 2000
- Red Hat Linux
- Sun Solaris (Non-Native - requires a management station)
- AIX (Non-Native - requires a management station)
- NetWare (Non-Native - requires a management station)
- MPE (Non-Native - requires a management station)

For the latest configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

Supported Hardware Devices

For the latest configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

HBA Support

For the latest configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

HBA and Server	HP-UX 10.20	HP-UX 11.00	HP-UX 11i
A6684A	D- and R-Class	D- and R-Class	D- and R-Class
A6685A	K-Class	K-Class	K-Class
A6795A		Servers – A-Class, L-Class, N-Class, and HP Server rp8400 Workstations – C, B, and J-Class	Servers – A-Class, L-Class, N-Class, Superdome, and HP Servers rp7410 and rp8400 Workstations – C, B, and J-Class
A5158A		A-Class, L-Class, N-Class, V-Class, and HP Server rp8400	A-Class, L-Class, N-Class, V-Class, HP Server rp8400, and Superdome

HBA and Server	NT Advanced Server	NT Enterprise Edition	Windows 2000 Server	Windows 2000 Advanced Server	Linux Red Hat 6.2
D8602B	Microsoft listed HCL servers ¹	Microsoft listed HCL servers ¹	Microsoft listed HCL servers ^{1, 2}	Microsoft listed HCL servers ^{1, 2}	
Emulex LP8000/LP9002	Microsoft listed HCL servers ¹	Microsoft listed HCL servers ¹	Microsoft listed HCL servers ^{1, 2}	Microsoft listed HCL servers ^{1, 2}	
Emulex LP8000/LP900 /LP9002					All listed with Linuxcare or RedHat Linux LVM. The server must be running v4.10g/Kernel 2.2.14-5 qlogiclf driver required patches/Kernel 2.2.16-3
QLogic QLA2200F/QLA 2300F	Microsoft listed HCL servers ¹	Microsoft listed HCL servers ¹	Microsoft listed HCL servers ^{1, 2}	Microsoft listed HCL servers ^{1, 2}	
QLogic QLA2200F/QLA 2200F					All listed with Linuxcare or RedHat Linux LVM. The server must be running v4.10g/Kernel 2.2.14-5 qlogiclf driver required patches/Kernel 2.2.16-3

¹ For VA clusters listed on HCL, HP will support servers listed on cluster HCL using HBA/driver combinations to the same VA model as was certified in the cluster configuration.

² VA7000 family clustered solutions are listed at: http://netserver.hp.com/products/high_availability/ms_supported_config.asp

HBA and Server	AIX 4.3.3 (32- and 64-bit)	Solaris 2.6, 2.7, 2.8	Netware
IBM 6227, 6228	RS/6000 PCI based servers only		
Sun 6799A (PCI)		Sun Fire 280R (Solaris 8 only)	
JNI FCE-6460 (PCI)		Sun Fire 280R (Solaris 8 only) Sun Enterprise 220R/250/420R/450 (PCI) Sun Enterprise 3000/3500/4000/4500/5000/5500/ 6000/6500 (PCI and/or Sbus) Sun Enterprise 10000 (PCI and/or Sbus) Ultra 5/10/30/60/80 workstations (PCI only)	
JNI FCE-6410 (PCI)		Sun Fire 280R (Solaris 8 only) Sun Enterprise 220R/250/420R/450 (PCI) Sun Enterprise 3000/3500/4000/4500/5000/5500/ 6000/6500 (PCI and/or Sbus) Sun Enterprise 10000 (PCI and/or Sbus) Ultra 5/10/30/60/80 workstations (PCI only)	
JNI FCI-1063 (PCI)		Sun Enterprise 220R/250/420R/450 (PCI) Sun Enterprise 3000/3500/4000/4500/5000/5500/ 6000/6500 (PCI and/or Sbus) Sun Enterprise 10000 (PCI and/or Sbus) Ultra 5/10/30/60/80 workstations (PCI only)	

HBA and Server	AIX 4.3.3 (32- and 64-bit)	Solaris 2.6, 2.7, 2.8	Netware
JNI FCI-1063 (Sbus)		Sun Fire 280R (Solaris 8 only) Sun Enterprise 220R/250/420R/450 (PCI) Sun Enterprise 3000/3500/4000/4500/5000/5500/ 6000/6500 (PCI and/or Sbus) Sun Enterprise 10000 (PCI and/or Sbus)	
JNI FC64-1063 (Sbus)		Sun Enterprise 220R/250/420R/450 (PCI) Sun Enterprise 3000/3500/4000/4500/5000/5500/ 6000/6500 (PCI and/or Sbus) Sun Enterprise 10000 (PCI and/or Sbus) Ultra 5/10/30/60/80 workstations (PCI only)	
QLogic QLA2200			HP and non-HP servers listed on Novell's "Yes" list provided that the OS/HBA/driver combination is supported by the server HBA vendor

Hub Support

For the latest AutoPath support and configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

Hub	HP-UX 10.20	HP-UX 11.00	HP-UX 11i	NT Advanced Server	NT Enterprise Edition	Windows 2000 Server	Windows 2000 Advanced Server	Linux Red Hat 6.2	AIX 4.3.3 (32- and 64-bit)	Solaris 2.6, 2.7, 2.8	Netware
S10/L10		Yes	Yes	Yes	Yes	Yes	Yes	None		FCI 1063 and FC64-106 3 only	

Switch Support

For the latest AutoPath support and configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

Switches	HP-UX 10.20	HP-UX 11.00	HP-UX 11i	NT Advanced Server	NT Enterprise Edition	Windows 2000 Server	Windows 2000 Advanced Server	Linux Red Hat 6.2	AIX 4.3.3 (32- and 64-bit)	Solaris 2.6, 2.7, 2.8	Netware
Brocade 2400/2800	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Brocade 2800									Yes		
Brocade 3200/3800	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Brocade FC6164	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Brocade FC64	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
InRange FC9000	Yes	No	No								
HP P4459A				Single MSCS cluster only	Single MSCS cluster only	Single MSCS cluster only	Single MSCS cluster only	Single MSCS cluster only			Yes

Supported Disk Drives

Part Number	Description	All Operating Systems
A6191A	18-GB 15K RPM	Yes
A6192A	36-GB 10K RPM	Yes
A6193A	36-GB 15K RPM	Yes
A6194A	73-GB 10K RPM	Yes

Supported Fibre Channel Cables

Product Number	Description	Usage
Optical LC/LC		
C7524A	FC Cable 2-meter LC Duplex 50/125 M/M optical	SFF ¹ (VA7400) to SFF FC Infrastructure (Future 2 GB/s FC)
C7525A	FC Cable 16-meter LC 50/125 LC/LC M/M optical	SFF ¹ (VA7400) to SFF FC Infrastructure (Future 2 GB/s FC)
C7526A	FC Cable 50-meter LC Duplex 50/125 M/M optical	SFF ¹ (VA7400) to SFF FC Infrastructure (Future 2 GB/s FC)
C7527A	FC Cable 200-meter LC Duplex 50/125 optical	SFF ¹ (VA7400) to SFF FC Infrastructure (Future 2 GB/s FC)
LC/SC Adapters		
C7529A	FC Cable 2-meter LC/SC Duplex 50/125 M/M optical	SFF ¹ (VA7400) to existing 1 GB/s FC Infrastructure
C7530A	FC Cable 16-meter LC/SC Duplex 50/125 LC/LC M/M optical	SFF ¹ (VA7400) to existing 1 GB/s FC Infrastructure
C7534A	Fibre Channel SC F/F Extender Optical	Converter for SFF cable to existing large format FC optical cables
C7540A	Fibre Channel Adapter Kit - optical (Includes the C7529A and C7534A)	Kit for existing customer 1 Gbit/sec FC infrastructure

¹ SFF = Small Form Factor

Configuration

Front End and Back End Cabling

Both front-end and back-end cables are Fibre Channel Optical cables.

Figure 4.7.10.7 VA7400 Back End Cabling (Serial Connections)

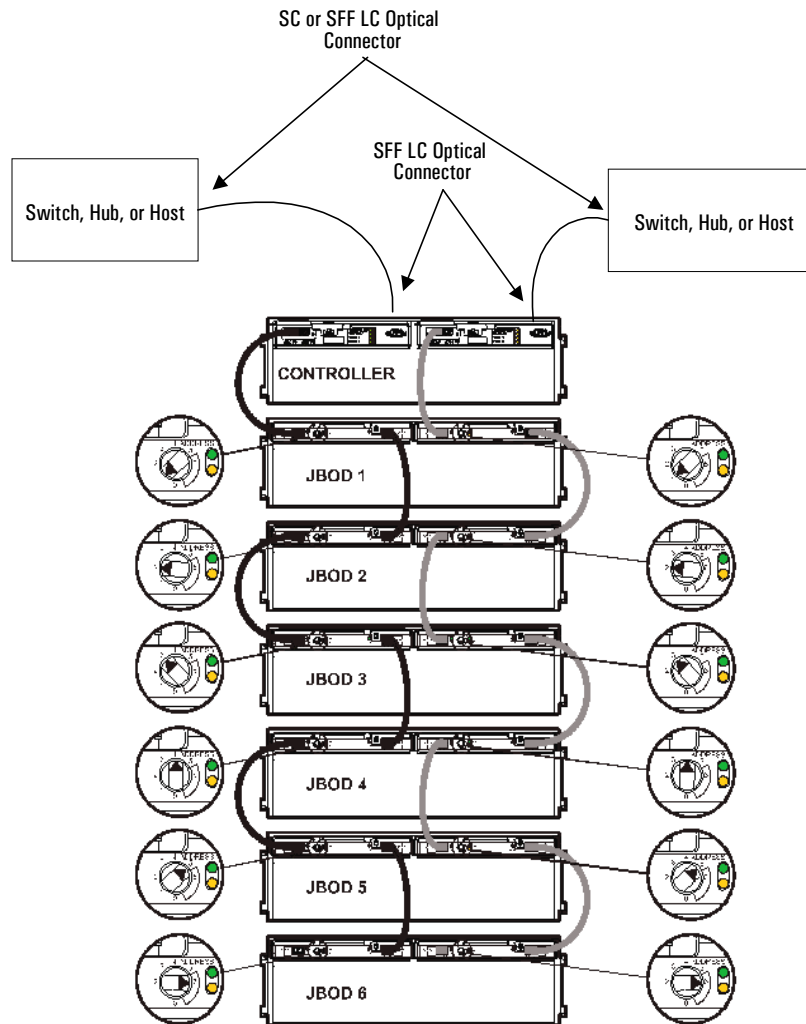
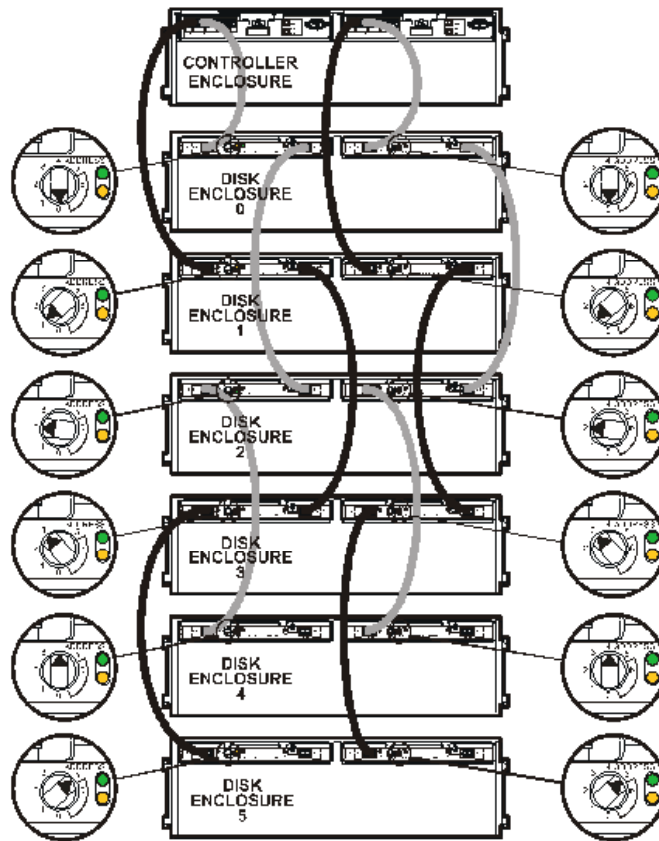


Figure 4.7.10.8 VA7410 Back End Cabling (Serial Connections)



Campus Cluster with Hubs

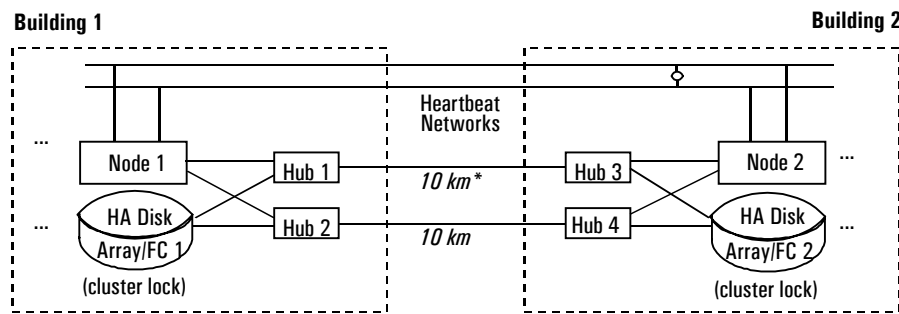
MC/ServiceGuard supports a two data center campus solution using HA Disk Arrays. This solution requires the following:

- Refer to **Figure 4.7.10.9** for campus cluster solutions using HA Fibre Channel Disk Arrays.
- Dual cluster lock disks are required if there are less than six nodes in the cluster.
- To protect against the possibility of a split-cluster (inherent when using dual cluster lock), at least two (three preferred) independent paths between the two data centers must be used for heartbeat and cluster lock I/O. Specifically, the path from the first data center to the cluster lock at the second data center must be different than the path from the second data center to the cluster lock at the first data center. Preferably, at least one of the paths for heartbeat traffic should be different from each of the paths for cluster lock I/O.
- Each building must contain the same number of nodes.
- Currently, Fibre Channel Arbitrated loops are limited to a maximum of four nodes and nine HA Fibre Channel Disk Array devices per loop.
- There can be a maximum of 500 meters between the Fibre Channel hubs in the two data centers. This distance can be increased to 10 kilometers by using a long-wave Fibre Channel port on the hubs.
- Use of MirrorDisk/UX is required to mirror data between the data centers.

Campus Cluster with HP StorageWorks Disk Arrays (Fibre Channel)

HP StorageWorks Disk Arrays with Fibre Channel can be used in a MC/ServiceGuard campus cluster, similar to that configured in a MC/ServiceGuard local cluster. However, data must be replicated between the two buildings of the campus cluster via MirrorDisk/UX.

Figure 4.7.10.9 Campus Cluster



* Unless noted, cable lengths are 2 or 16 meters

High Availability Configurations

HP-UX

The VA7400 is certified for use with HP-UX MC/ServiceGuard installations. In addition, the VA7400 is certified for use as a cluster lock device.

Notes:

- Multiple HP-UX MC/ServiceGuard Clusters connected to the same VA7000 Family array ARE supported.
- An HP-UX MC/ServiceGuard cluster sharing a VA7000 Family array with other HP-UX hosts IS supported.
- An HP-UX MC/ServiceGuard cluster sharing a VA7000 Family array with other non-HP-UX hosts is NOT supported!

Microsoft Operating Systems

For the latest configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

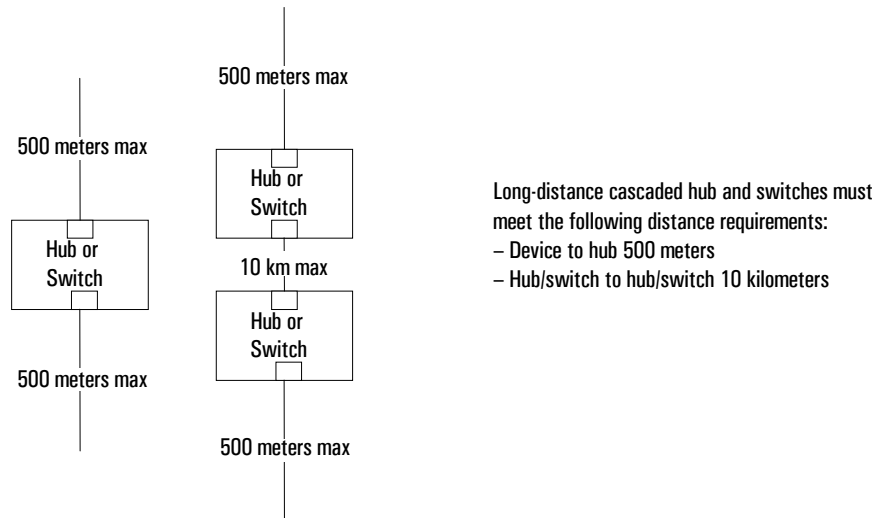
Partnership Website:

- <http://partner.americas.hp.com/>

Long-Distance Configurations

Long-distance topologies are part of the supported configurations, but not specifically represented in this document. Long-distance scenarios may be obtained with the following configurations by replacing host/device connections with any of the combinations of hubs in **Figure 4.7.10.10**. Hubs and switches may be cascaded. Hubs are limited to two layers deep.

Figure 4.7.10.10 Long Distance Configuration



SAN (Storage Area Network) Definitions

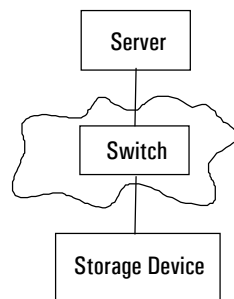
Configurations in this document that include a SAN assume the following definition of a SAN or fabric.

SAN characteristics:

- Utilizes a switch-based topology
- Allows cascaded switches
- Support heterogeneous (multiple vendor) storage
- Switch based
- Heterogeneous server/OS capable
- Fabric login
- Uses LUN Security or zoning
- SAN Manager (management software)

Note: The SAN does not support common data access for heterogeneous servers.

Figure 4.7.10.11 Example of a Minimum SAN



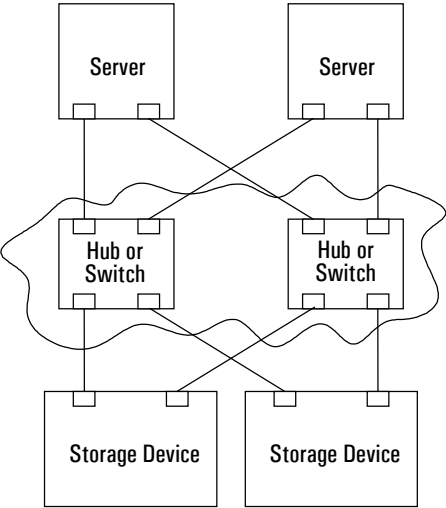
SAN Definitions

SAN (Storage Area Network)—A dedicated network of servers and storage devices all connected to a fabric supporting block access technologies. For the purposes of this document, a fabric is defined as a hardware configuration containing at least one switch, which is responsible for frame routing.

Open SAN—Defined as heterogeneous (multiple vendor) servers and OS', heterogeneous storage, and heterogeneous infrastructure components. At this time, pooled storage access is dependent on a LUN security methodology (zoning, partitioning, or dedicated LUN security) to provide data access by multiple heterogeneous servers. Multiple server access to common data is available only to homogeneous servers using server coordination software (e.g., PV Links in LVM).

Is	Is Not
Switch based Cascaded switches Heterogeneous server/OS capable Heterogeneous (multiple vendor) storage Fabric login LUN Security or zoning SAN Manager (management software)	Hubs only Common Data access for Heterogeneous servers

Figure 4.7.10.12 Example of a Typical SAN



Configuration Drawings

This matrix is a guide to the configurations in this document. It provides representative configurations, not a comprehensive list of all possible configurations. It is a quick reference to the diagrams and supporting information/requirements provided in the following pages.

For each configuration, two types of configurations are represented:

- **Minimum:** This is the absolute minimum configuration.
- **Typical:** Most common usage scenario, with the range of each proposed configuration.

VA7000 Representative Configurations

Figure 4.7.10.13 Lowest Entry Point, non-HA—Minimum Configuration (VA7100 only)

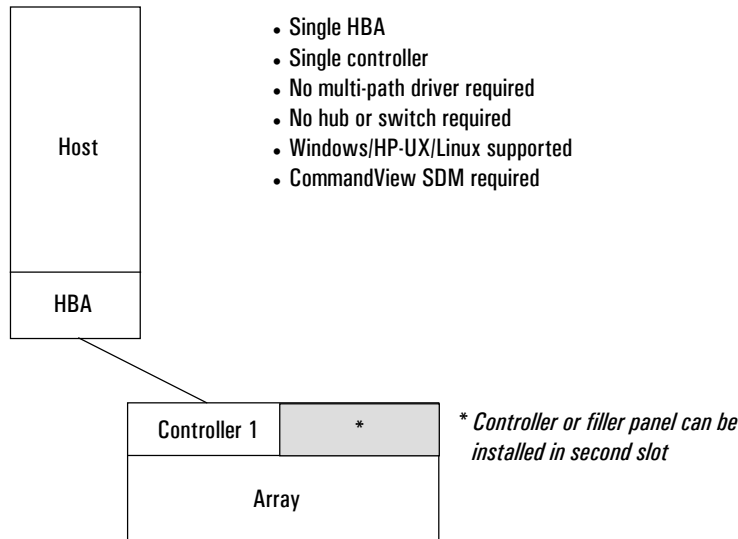


Figure 4.7.10.14 Lowest Entry Point, non-HA—Minimum Configuration (VA7100 only)

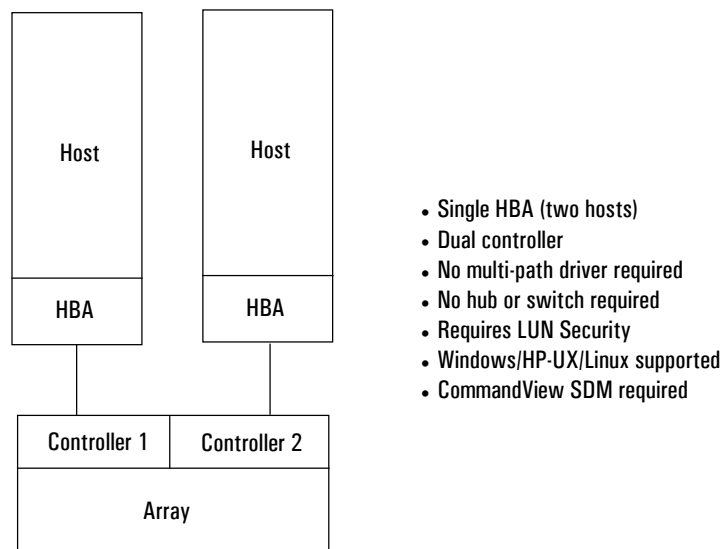


Figure 4.7.10.15 Lowest Entry Point, Non-HA—Minimum Configuration (VA7410 only)

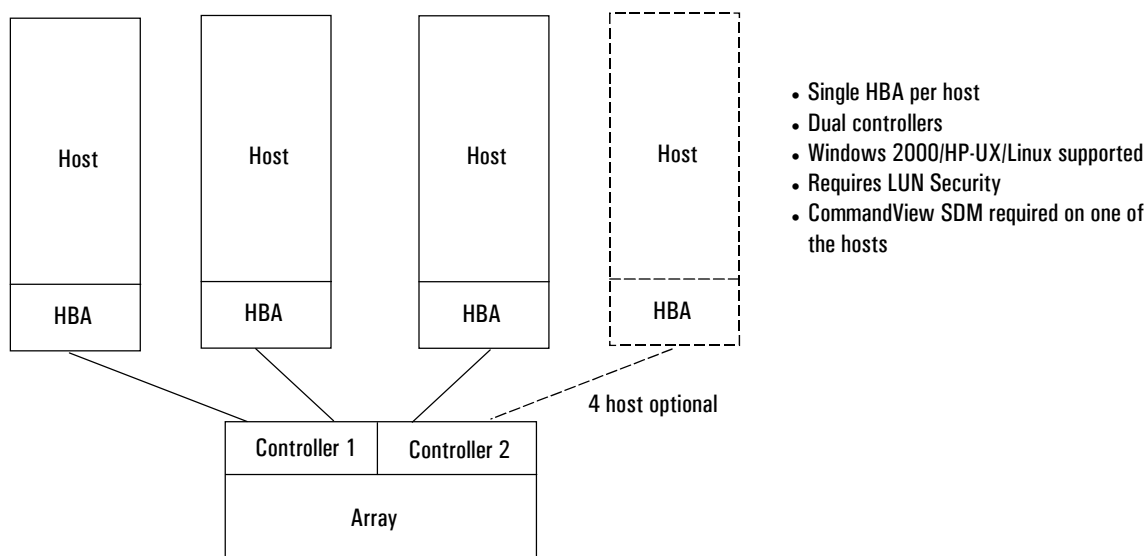


Figure 4.7.10.16 Entry-level, non-cluster with Path Redundancy (All VA arrays)

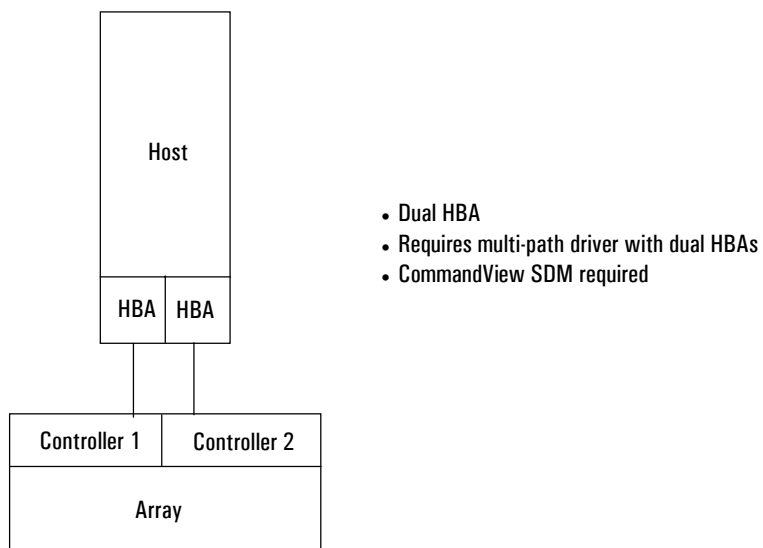


Figure 4.7.10.17 Entry-level Cluster with Path Redundancy—High Availability (VA7410 only)

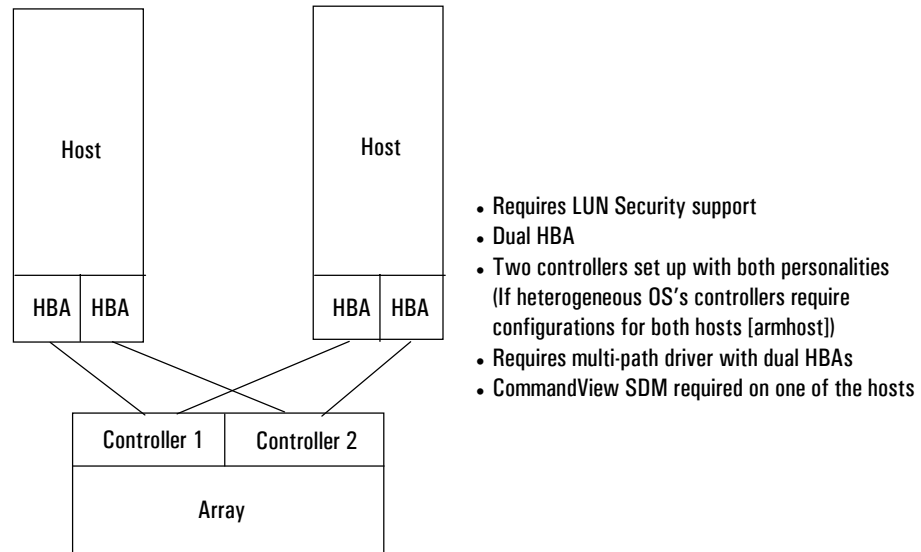


Figure 4.7.10.18 Midrange Non-Cluster (All VA arrays)

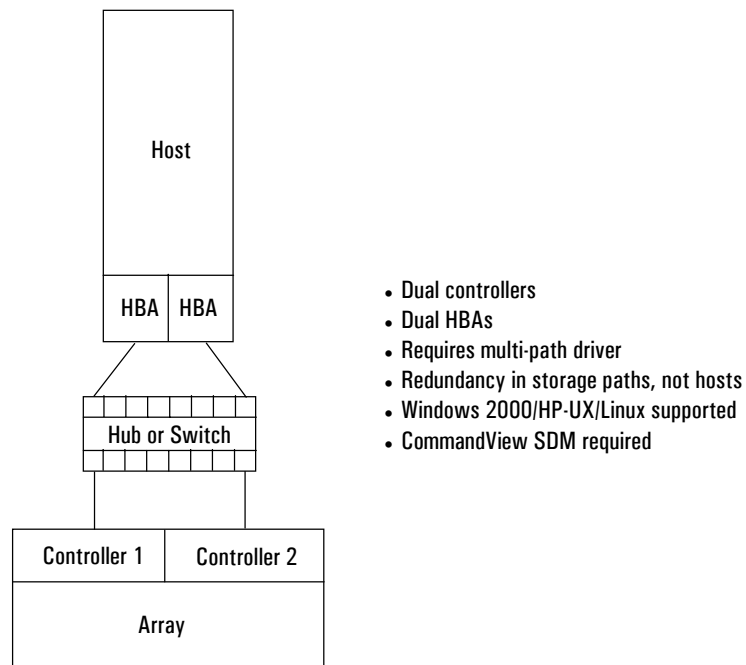


Figure 4.7.10.19 Midrange Non-Cluster (7410 only)

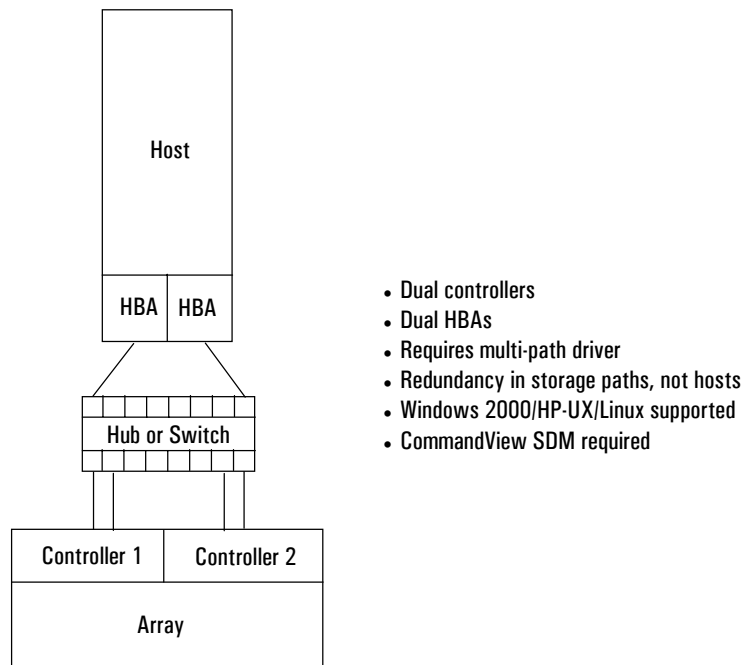


Figure 4.7.10.20 Midrange Non-Cluster with Full Storage Path Redundancy (All VA arrays)

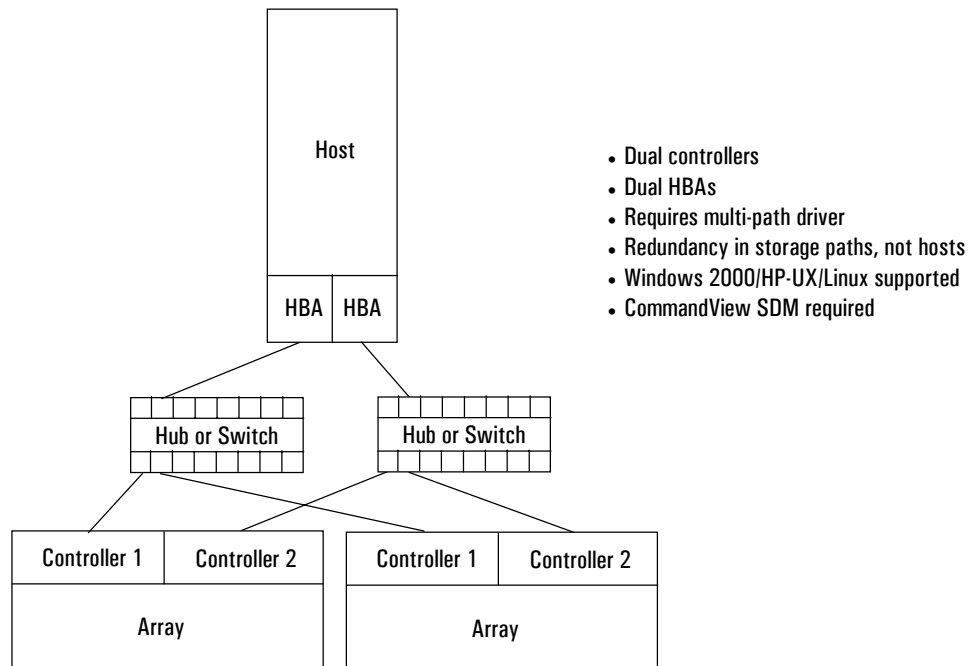


Figure 4.7.10.21 Non-Clustered with Path Redundancy—Typical (VA7410 only)

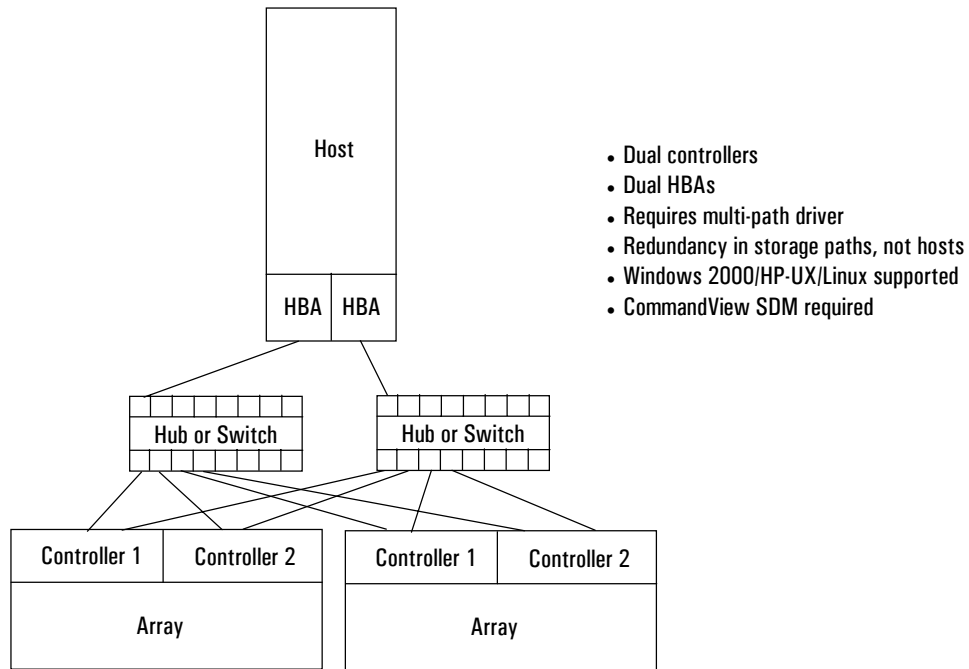


Figure 4.7.10.22 Clustered Configuration—Typical (All VA models)

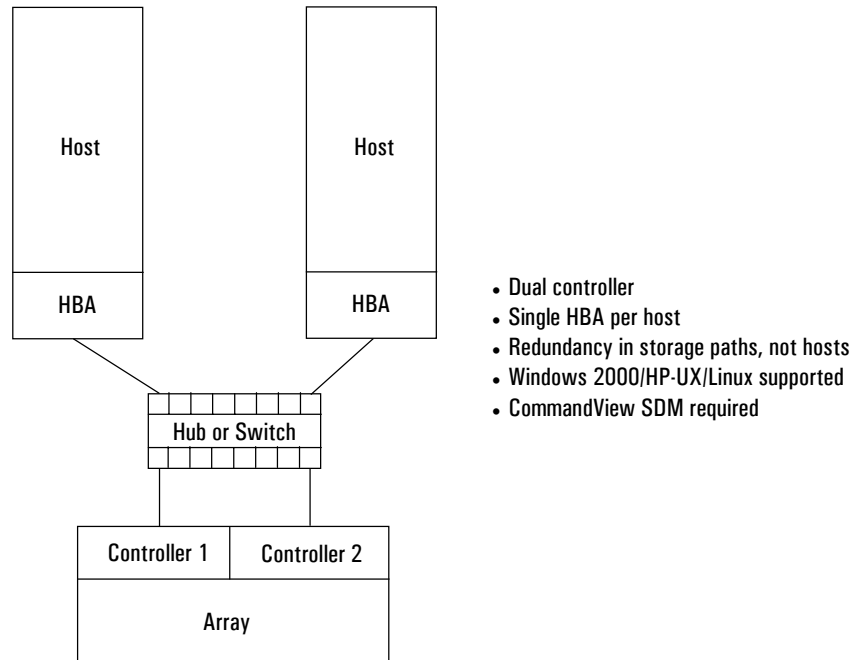


Figure 4.7.10.23 Clustered Configuration—Typical (VA7410 only)

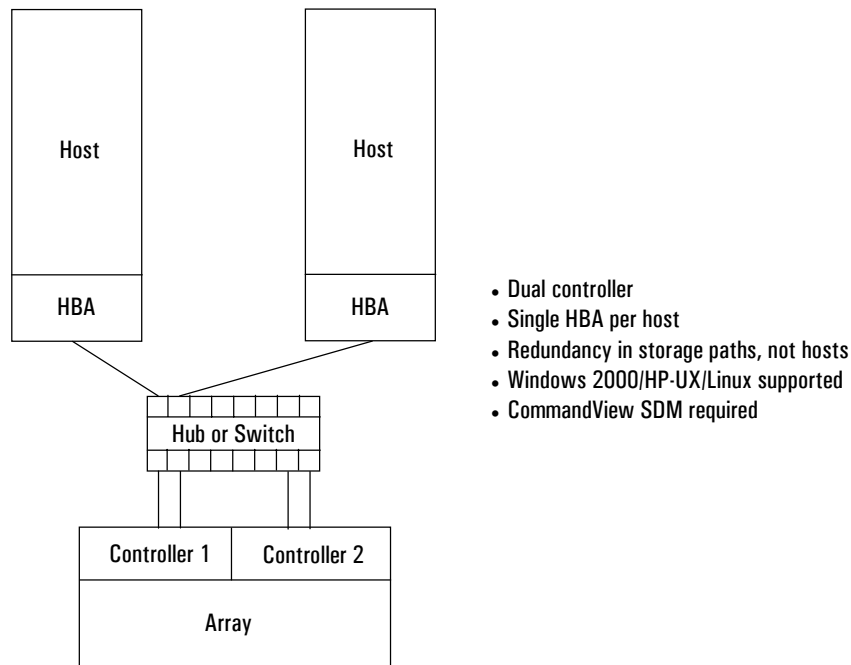


Figure 4.7.10.24 HP-UX MC/ServiceGuard or Windows 2000 Cluster (All VA arrays)

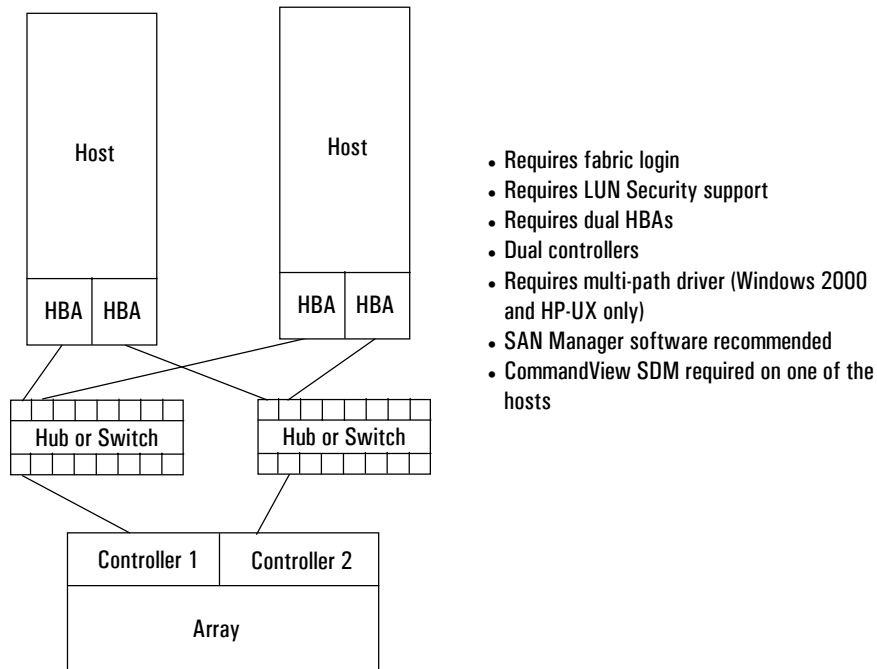


Figure 4.7.10.25 Highly Redundant Clusters (VA7410 only)

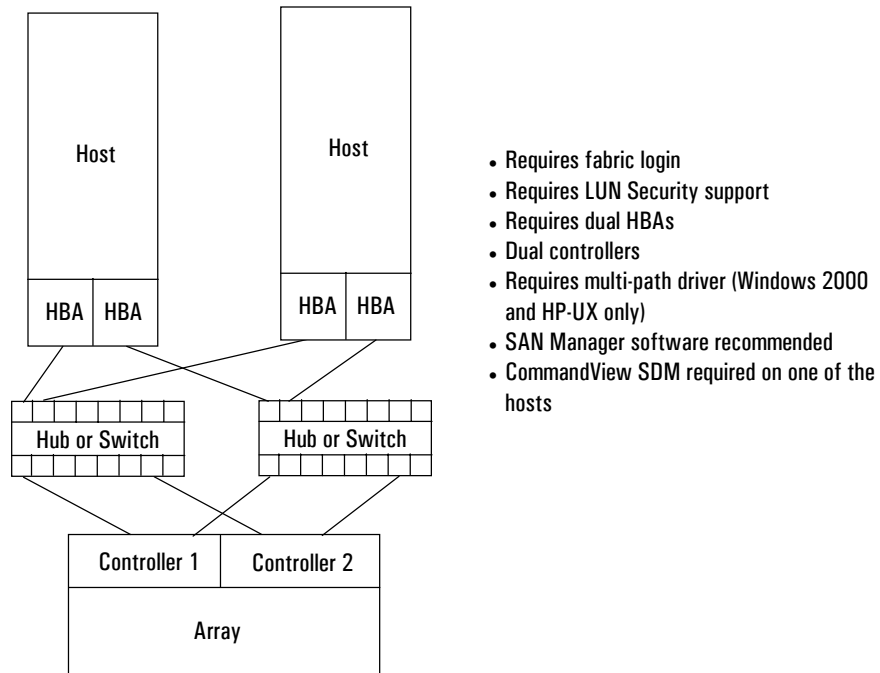


Figure 4.7.10.26 Highly Redundant Clusters—Typical (All VA models)

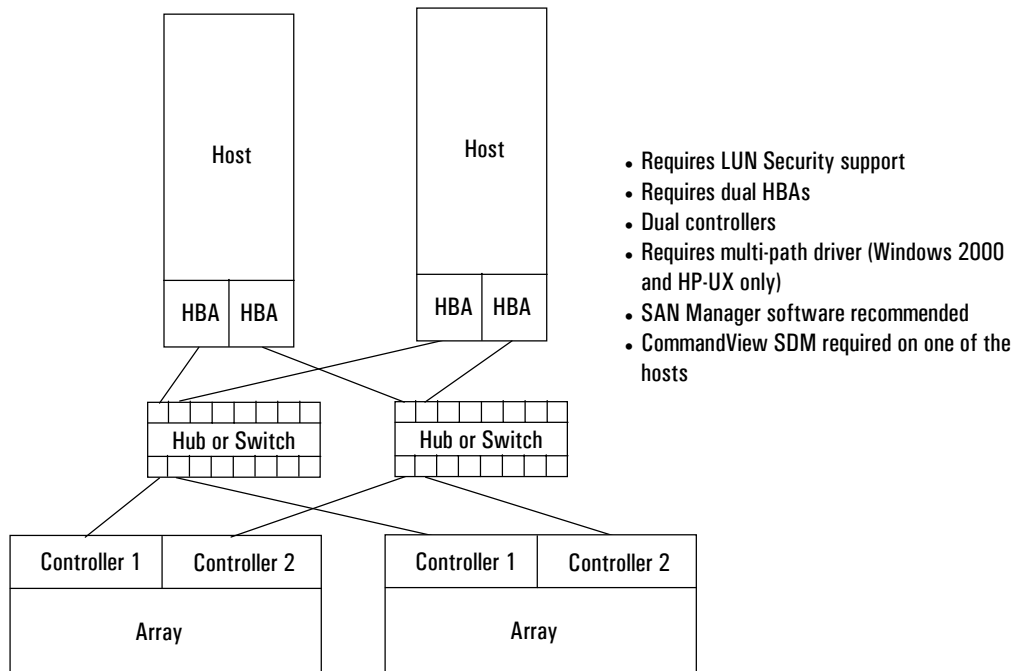
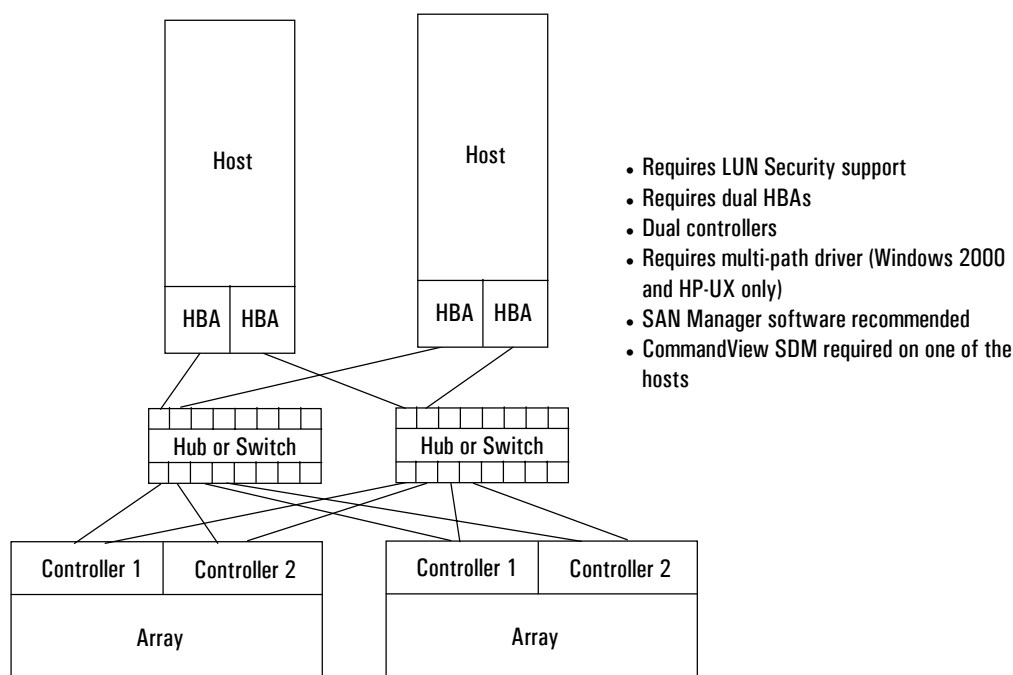


Figure 4.7.10.27 Highly Redundant Clusters—Typical (VA7410 only)



Heterogeneous Cluster (HA) in a SAN

For the latest information, please refer to the NSAS SAN Strategy document on the SPOCK web site show below (note this is an HP internal document):

http://xpslpgrms.corp.hp.com/xp_documentation/os%20stream%20docs/NSAS_SAN_strategy.pdf

Software Product Descriptions

Software Products Reference Chart

The following table lists the software products available for the VA7000 Family. These products are described in detail later in this section.

Software Product	Source	Description
HP StorageWorks Command View SDM	A single host license-to-use and software media kit ships with each VA7x00 Family product.	Allows you to manage, diagnose, and monitor the performance of the array; used in conjunction with value-added software products. Native OS support on HP-UX, Windows NT, Windows 2000, Red Hat Linux, and with a separate management console on Solaris, Novell Netware, IBM AIX, and MPE. Additional host licenses must be purchased for each host running Command View SDM.
HP StorageWorks Integrations Pack (Formerly Smart Plug-Ins)	Sold separately.	Enables HP StorageWorks Command View SDM in HP OpenView NNM for HP-UX, Windows 2000 and Windows NT, also enables HP StorageWorks Command View SDM for HP TopTools, CA-Unicenter-TNG, Tivoli Netview and BMC Patrol. Includes/supports HP SEMI 1.0 for HP modular storage and tape devices.
HP StorageWorks Business Copy VA	Sold separately.	Enables LUN copying within the array, and requires the same physical space to be available in the array as the LUN(s) being copied.
HP StorageWorks Secure Manager VA	Sold separately.	Enables LUNs to be locked into a secure shared environment.
HP StorageWorks Auto Path	Sold separately.	Enables I/O path fail-over in a single server for MSCS Windows 2000, Windows NT (HP-UX and Linux support in future releases) environments.
HP StorageWorks Fast Recovery Solutions	Sold separately.	Allows for recovery of corrupted databases in minutes for Microsoft Exchange 2000 environments. Requires Business Copy Virtual array

Software Products

Product Number	Description
T1001A	HP StorageWorks Command View SDM 1 host License To Use and software media kit. Device management for the HP StorageWorks VA7x00 Family.
T1002A	HP StorageWorks Enterprise Integrations 1 host License To Use and software media kit.
T1003A	HP StorageWorks Secure Manager, 50-GB host License To Use and software media kit. (Required for enablement) (Not combinable - 50 GB max)
T1004A	HP StorageWorks Secure Manager 500-GB License To Use.
T1005A	HP StorageWorks Secure Manager 1-TB License To Use.
T1006A	HP StorageWorks Secure Manager 5-TB License To Use.
T1007A	HP StorageWorks Business Copy VA, 50-GB host License To Use and software media kit. (Required for enablement) (Not combinable - 50 GB max)
T1008A	HP StorageWorks Business Copy VA 500-GB License To Use.
T1009A	HP StorageWorks Business Copy VA 1-TB License To Use.
T1010A	HP StorageWorks Business Copy VA 5-TB License To Use.
T1011A	HP StorageWorks Auto Path for Windows 2000 1-host License To Use and software media kit. (Required for enablement)
T1012A	HP StorageWorks Auto Path for Windows 2000 - 1-host License To Use.
T1013A	HP StorageWorks Auto Path for Windows 2000 - 5-host License To Use.
T1039A	HP StorageWorks Auto Path for Windows NT 4.0 - 1-host License To Use and software media kit. (Required for enablement)
T1040A	HP StorageWorks Auto Path for Windows NT 4.0 - 1-host License To Use.
T1041A	HP StorageWorks Auto Path for Windows NT 4.0 - 5-host License To Use.
T1060A	HP StorageWorks Auto Path for HP-UX 11.0, 11i - 1-host License To Use and software media kit. (Required for enablement)
T1061A	HP StorageWorks Auto Path for HP-UX 11.0, 11i - 1-host License To Use.
T1062A	HP StorageWorks Auto Path for HP-UX 11.0, 11i - 5-host License To Use.
B9550A	HP StorageWorks Fast Recovery Solutions for Microsoft Exchange 2000 1 array based license to use capacity unlimited

HP StorageWorks Command View SDM Software

The HP StorageWorks Command View SDM software is a host or Web-browser based device management application that provides a common user interface for modular networked storage systems.

The HP StorageWorks Command View SDM software monitors and manages modular scaleable storage resources from a single systems management console or remotely via a Web browser with centralized control of their information resources. The HP StorageWorks Command View SDM software launches and configures HP value added software, such as HP StorageWorks Business Copy VA and HP StorageWorks Secure Manager VA. The HP StorageWorks Command View SDM software supports the HP StorageWorks VA 7000 family.

- Integrated device management platform and common user interface for all supported HP modular scaleable storage (arrays and disk systems)
- Java technology for ease of portability for support of new storage devices
- Active Graphic displays and status at glance features provides a comprehensive environment to monitor health and status with the highest efficiency and awareness.
- Common user interface (GUI, CLUI, CVUI and Web browser support) reduces training needs
- Network management and SANs integration for SAN network connectivity and device identification and event reporting to industry leading network management applications such as HP OpenView.
- Heterogeneous support

HP StorageWorks Command View SDM Operating Systems Compatibility

For operating system compatibility, please see “Supported Operating Systems” at the beginning of this section.

HP StorageWorks Command View SDM Software Compatibility

- HP StorageWorks Command View SDM
- HP StorageWorks Integrations Pack
- HP StorageWorks Secure Manager
- HP StorageWorks Business Copy VA

HP StorageWorks Command View SDM Minimum System Requirements

- Requires Internet Explorer 5.0; Netscape 4.74; Java Plug-In 1.3
- Need to add installation requirements for RAM

Operating System	CPU	Memory	Video	Disk Space ²
Windows NT 4.0 Windows 2000	Pentium III 500 MHz	256 MB RAM	1024 × 768 resolution, supports 64,000 colors	60 MB of free disk space Performance Logs (2 months) 16 MB per LUN
HP-UX 11.0/11.i ³	All	256 MB RAM	800 × 600 resolution, supports 64,000 colors	60 MB of free disk space Performance Logs (2 months) 16 MB per LUN
Red Hat Linux 6.2, 7.1	Pentium III 500 MHz	256 MB RAM	1024 × 768 resolution, supports 64,000 colors	60 MB of free disk space Performance Logs (2 months) 16 MB per LUN
Solaris 2.6, 7.0, 8.0 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
Novell Netware 5.0, 5.1 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
IBM AIX 4.3.3 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).

¹ Requires dedicated management console and system requirements compatible with one of the above.

² 30 MB of temporary disk space is required during installation. This space is returned after installation.

³ HP-UX may require additional patches for proper operation.

The VA7x00 family system encompasses all the components within the controller chassis as well as the disks and their enclosures. The VA7x00 family Graphical User Interface (GUI) provides capabilities to retrieve single or multiple component status conditions and modify component states when applicable. The table lists all the components visible to the user. The first column denotes components that have their status queried and displayed by the GUI. The second column denotes components that the user can modify via the GUI.

Note: This is the Command Line User Interface (CLUI) that is used for the VA7000 Family.

Component Device Offerings

Component	GUI provides capabilities to Query State	GUI provides capabilities to Modify State
Main Enclosure	•	•
Batteries	•	
Controllers	•	• ³
DIMMs	•	
Disks	•	•
Fans	•	
GBICs	•	
Power Supplies	•	
Ports	•	
JBODS	•	•
Disks	•	•
Fans	•	
LCC	•	
Power Supplies	•	

³ This does not reflect changing state of the controller, but rather modifying controller parameters.

HP StorageWorks Command View SDM Frequently Asked Questions

What is included with the standalone version of HP StorageWorks Command View SDM?

Each Standalone version of HP StorageWorks Command View SDM includes:

- Software CD
- User's Manual
- One Host License To Use

This is defined as "Installation Authorization for one (1) Server" running any or all of the Command View SDM components listed above.

Support is NOT INCLUDED with the Standalone version of HP StorageWorks Command View SDM. One (1) support option is required with each one (1) Host LTU of HP StorageWorks Command View SDM.

Do I need HP StorageWorks Command View SDM installed on all hosts in a configuration order to access my VA?

You must install HP StorageWorks Command View SDM on at least one (1) host with a fibre channel connection to the VA7400. After your initial installation of HP StorageWorks Command View SDM, it is not necessary to install HP StorageWorks Command View SDM to access data on your VA.

Is HP StorageWorks Command View SDM only required for management/configuration purposes?

HP StorageWorks Command View SDM is only required for configuration and management of your HP VA. After your initial installation of HP StorageWorks Command View SDM, it is not necessary to install HP StorageWorks Command View SDM to access data on your VA.

How many VA's can HP StorageWorks Command View SDM manage at any given time?

HP StorageWorks Command View SDM can manage an unlimited number of VA from a single host, provided that it is physically connected to each VA either directly or through a SAN

HP StorageWorks Integrations Pack

HP StorageWorks Integrations Pack provide customers with a basic level of integration between HP StorageWorks Command View SDM and the leading network and systems management solutions enabling management from a single point—the enterprise management console. Integration is via SNMP (Simple Network Management Protocol) and enables customers to observe, diagnose and react to potential problems in their storage environment before they become serious enough to affect system availability.

HP StorageWorks Integrations Pack Features

- Integration with HP OpenView NNM, HP TopTools, CA Unicenter-TNG, Tivoli Netview, and BMC Patrol
- Includes/supports HP SEMI 1.0 agent for HP modular storage and tape devices
- Plug and play installation
- Automated custom scripts
- Automatic discovery of supported storage devices by the network management application
- Device event communication via SNMP for Windows 2000 and NT 4.0 environments
- Changes in the status of the device are represented via the device icon that can launch the device software for further diagnostics or configuration status.

Notes:

HP StorageWorks Integrations Pack:

- *are only supported on HP StorageWorks Command View SDM for modular networked storage. They are not supported on XP arrays*
- *do not support Red Hat Linux 6.2, 7.1.*

HP StorageWorks Integrations Pack Compatibility

- Supports HP SNMP integration for HP virtual arrays
- Supports HP OpenView Network Node Manager for HP-UX, Windows NT 4.0, and Windows 2000.
- Supports HP TopTools 4.5 and 5.0
- Supports CA Unicenter TNG for HP-UX, NT 4.0, and Windows 2000
- Supports HP StorageWorks VA7x00 Family
- Supports Tivoli Netview
- Supports BMC Patrol
- Supports HP SEMI 1.0 agent for HP modular storage and tape devices

HP StorageWorks Integrations Pack Frequently Asked Questions

What is included with HP StorageWorks Integrations Pack?

Each HP StorageWorks Integrations Pack product includes:

- Software CD
- User's Manual
- One Host License To Use (LTU)

This is defined as "Installation Authorization for one (1) Server" running any or all of HP StorageWorks Integrations Pack components.

Support is not included with this product. One (1) support option is required with each one (1) Host LTU for Enterprise Integrations.

How does HP StorageWorks Command View SDM talk to OpenView Network Node-Manager using the HP StorageWorks Integrations Pack?

HP StorageWorks Command View SDM tracks each connected VA7400 using a unique TCP-IP address. HP StorageWorks Command View SDM gets device information from each virtual array inband through the fibre channel connection and the HP StorageWorks Integrations Pack translate this information to OpenView Network Node Manager over TCP-IP using JVM and standard SNMP commands.

HP StorageWorks Business Copy VA

HP StorageWorks Business Copy VA is an array-based software product that allows customers to create up to 1023 non-disruptive high-performance, local business copies of any active application volume or LUN for the VA7400 within the array while benefiting from full RAID protection for the business copies. These LUN copies can be used by another application or system for a variety of purposes, including batch processing and backup. Create up to 1023 Business Copy LUNs the VA7400. Business Copy VA is fully integrated into and enabled through the HP Command View SDM software interface.

HP StorageWorks Business Copy VA is a vital piece of the Virtual Array Technology and is the key enabler of the virtual array online Backup solution, which is implemented using custom scripting of backup application environments.

HP StorageWorks Business Copy VA Features

- Business critical data can be executed in parallel to enhance efficiency and cost effectiveness.
- Instantly creating point-in-time copies of source LUNs, scheduling backup activities, and maintaining I/O Host performance because all LUN creation and activity is handled directly by the array.
- HP StorageWorks Business Copy VA is fully integrated with Command View SDM.

HP StorageWorks Business Copy VA Operating Systems Compatibility

HP StorageWorks Business Copy VA runs with HP StorageWorks Command View SDM. For operating system compatibility, please see "Supported Operating Systems" at the beginning of this section.

HP StorageWorks Business Copy VA Software Compatibility

- HP StorageWorks Command View SDM
- HP StorageWorks Integrations Pack
- HP StorageWorks Secure Manager
- HP StorageWorks Business Copy VA

HP StorageWorks Business Copy VA Minimum System Requirements

Operating System	CPU	Memory	Disk Space
Windows NT 4.0 Windows 2000	Pentium III 500-MHz	256 MB RAM	45 MB of free disk space.
HP-UX 11.0, 11.i	All	256 MB RAM	60 MB of free disk space.
Red Hat Linux 6.2	Pentium III 500-MHz	256 MB RAM	45 MB of free disk space
HP-UX 10.20 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
Solaris 2.6, 7.0, 8.0 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
Novell Netware 5.0,5.1 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
IBM AIX 4.3.3 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).

¹ Requires dedicated management console and system requirements compatible with one of the above.

Note: HP StorageWorks Business Copy VA supports a custom scripted implementation to automate backup solutions.

HP StorageWorks Business Copy VA Frequently Asked Questions

What is included with HP StorageWorks Business Copy VA Software Media Kit?

Each HP StorageWorks Business Copy VA software media kit includes:

- Software CD
- User's Manual
- 50-GB License To Use (not combinable - 50 GB max)
- 90 days of telephone support

In addition, to cover all capacity-based license-to-use options for HP StorageWorks Business Copy VA, one (1) support option is required.

How does HP StorageWorks Business Copy VA Licensing work?

In order to create HP StorageWorks Business Copy VA LUNs, a license must be obtained. Licensing is sold in quantities of 500 GB, 1 TB and 5 TB. The total size for all HP StorageWorks Business Copy VA LUNs cannot exceed the licensed amount for each virtual array.

HP StorageWorks Business Copy VA licensing is based on the total size of all parent LUNs being copied, not the total array capacity. For example, in an array with total usable capacity of two (2) Terabytes, if you are copying one (1) Terabyte of parent LUN data you must purchase a one (1) Terabyte HP StorageWorks Business Copy VA license.

Note: Licenses cannot span multiple arrays!

Every VA7000 series array contains a 50-GB trial license. This is a permanent capability of the array and is intended to allow the trial of the feature before committing to the purchase. The trial copy can be used for the life of the product. **This trial license is NOT additive.**

HP StorageWorks Secure Manager VA

HP StorageWorks Secure Manager VA is an array-based software product that allows customers to create up to 128 secure World Wide Name connections for the VA7400 on up to 1024 secure LUNs per virtual array. HP StorageWorks Secure Manager VA is fully integrated into and enabled through the HP Command View SDM software interface.

HP StorageWorks Secure Manager VA is a storage software application that allows LUNs to be locked into secure protected volumes by World Wide Names, ensuring that only authorized World Wide Names (WWN) have access to restricted volumes. Permissions for each principal can be configured by volume within the virtual array to read only, read/write, or no access. The HP StorageWorks Secure Manager VA software's supported configurations range from an entry-level single-server direct-connect environment up to a homogeneous or heterogeneous clustered environment.

HP StorageWorks Secure Manager VA Features

- World Wide Names, host, and volume to enhance efficiency and cost effectiveness can secure business critical data in parallel.
- Configure security within the virtual array by changing permissions on volumes and/or World Wide Names (WWN) while the array is online.
- Uses the HP StorageWorks Command View SDM interface for establishing secure volumes.
- HP StorageWorks Secure Manager VA is fully integrated with HP StorageWorks Command View SDM and the VA family of hardware and software products for interoperability across the spectrum of future virtual array storage solutions.
- HP StorageWorks Secure Manager VA supports 128 secure World Wide Names for the VA7400. The HP StorageWorks Secure Manager VA software supports up to 1024 secure LUNs for each VA7400.

HP StorageWorks Secure Manager VA Operating Systems Compatibility

HP StorageWorks Secure Manager VA runs with HP StorageWorks Command View SDM. For operating system compatibility, please see "Supported Operating Systems" at the beginning of this section.

HP StorageWorks Secure Manager VA Software Compatibility

- HP StorageWorks Command View SDM
- HP StorageWorks Integrations Pack
- HP StorageWorks Secure Manager
- HP StorageWorks Business Copy VA

HP StorageWorks Secure Manager VA Minimum System Requirements

Operating System	CPU	Memory	Disk Space
Windows NT 4.0 and Windows 2000	Pentium III 500-MHz	256 MB RAM	45 MB of free disk space.
HP-UX 11.0, 11.1	All	256 MB RAM	60 MB of free disk space.
Red Hat Linux 6.2	Pentium III 500-MHz	256 MB RAM	45 MB of free disk space
HP-UX 10.20	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
Solaris 2.6, 7.0, 8.0 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
Novell Netware 5.0, 5.1 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).
IBM AIX 4.3.3 ¹	Depends on management station (see above).	Depends on management station (see above).	Depends on management station (see above).

¹ Requires dedicated management console and system requirements compatible with one of the above.

HP StorageWorks Secure Manager VA Frequently Asked Questions

What is included with HP StorageWorks Secure Manager VA Software Media Kit?

Each HP StorageWorks Secure Manager VA software media kit includes:

- Software CD.
- User's Manual.
- 50-GB License To Use (LTU).
- 90 days of telephone support.
- In addition, one support option is required for each capacity-based license-to-use option for HP StorageWorks Secure Manager VA.

What does the term “principal” mean when used in HP StorageWorks Secure Manager VA?

“Principal” and “World Wide Name” (WWN) are used interchangeably when describing secure connections for HP Virtual Arrays. All authentications for the VA7400 are based on WWN.

How many secure connections can each VA7400 support?

The VA7400 can support up to 128 secure Node WWN. Each Host Bus Adapter (HBA) uses a single Node WWN, therefore each VA7400 can support up to 1024 secure connections. Remember, for HA configurations, each server requires two HBAs so the largest HA configuration supported for each VA7400 is a 16-node cluster.

Can incremental capacity licenses be add over time?

Yes, licenses are cumulative and additional licenses to may be added as capacity needs grow.

HP StorageWorks Auto Path

HP StorageWorks Auto Path VA is host-based software that provides key data availability and performance. HP StorageWorks Auto Path provides multi-path failover capability of all I/O data paths to the virtual array. HP StorageWorks Auto Path offers completely automatic HBA failover for all supported cluster environments.

For the latest configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

HP StorageWorks Auto Path Features

- Automatic error detection and failover: helps eliminate the need for planned and unplanned downtime.
- Works with Windows 2000 and Microsoft Cluster Server infrastructure.
- Works with Windows NT 4.0 and Microsoft Cluster Server infrastructure
- Works with HP-UX 11.0, 11i and MC/ServiceGuard infrastructure
- Supports the HP VA products that provide maximum performance and scalability.
- Automated configuration
- Management through a graphical user interface

HP StorageWorks Auto Path Operating Systems Compatibility

- Windows 2000
- Windows NT 4.0
- HP-UX 11.0, 11i

HP StorageWorks Auto Path Software Compatibility

- HP StorageWorks Command View SDM
- HP StorageWorks Integrations Pack
- HP StorageWorks Secure Manager
- HP StorageWorks Business Copy VA

HP StorageWorks Auto Path Minimum System Requirements

Operating System	CPU	Memory	Disk Space
Windows 2000, NT 4.0	Pentium III- 500 MHZ	256 MB RAM	45 MB of free disk space.
HP-UX 11.0, 11i	All	256 MB RAM	45 MB of free disk space.

Note: HP StorageWorks Auto Path provides automatic I/O path failover only for Windows 2000, NT 4.0, and HP-UX 11.0, 11i.

All HP software products are covered by a 90-day media defect warranty. All support options are sold separately.

HP StorageWorks Auto Path Frequently Asked Questions

What is included with HP StorageWorks Auto Path?

Each HP StorageWorks Auto Path product includes:

- Software CD
- User's Manual
- One (1) Host License To Use (LTU)

This is defined as "Installation Authorization for one (1) Server" running any or all Auto Path components.

Support is NOT included with this product. One (1) support option is required for each host-based license-to-use option for HP StorageWorks Auto Path.

What environments are available for HP StorageWorks Auto Path on the VA?

HP StorageWorks Auto Path has planned availability of Windows 2000, Windows NT, and HP-UX with Red Hat Linux planned for future availability.

HP StorageWorks Fast Recovery Solutions for Microsoft Exchange 2000

HP StorageWorks Fast Recovery Solutions (FRS) is a tool designed to enable fast recovery of corrupt Exchange 2000 databases. FRS interacts with Windows 2000, Exchange 2000 server and the disk array. The disk array stages recovery ready copies of Exchange 2000 databases. When a catastrophic event occurs, the Exchange administrator initiates the FRS process. This process takes the damaged database offline, removes it and inserts the known good, recovery-ready copy on the production server. This process recovers the known good copy from disk rather than tape providing a full database recovery in minutes not hours.

For the latest configuration information, please refer to the SPOCK website (internal) or the Partnership Website (external):

Spock Website:

- For VA7100 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7100_docs.htm
- For VA7400 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7400_docs.htm
- For VA7410 array: http://xpslpgrms.corp.hp.com/xp_documentation/va7410_docs.htm

Partnership Website:

- <http://partner.americas.hp.com/>

HP StorageWorks Fast Recovery Solutions Features

- Ultra-fast recovery of large Microsoft Exchange 2000 databases.
- Lowest possible downtime during a corruption and database recovery.
- Recovery to the last backup.
- Multiple databases can be recovered simultaneously.

VA7400 Software Ordering Information

HP StorageWorks VA Software Support Products

Product Number	Option	Description
T1001A		HP StorageWorks Command View SDM Software Media Kit with - 1 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
T1002A		HP StorageWorks Integrations Pack for HP StorageWorks Command View SDM One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Secure Manager VA Software Media Kit and 50 GB License To Use (required for enablement) 90-day support included (Not combinable - 50 GB max)
	H4403A/H4405A	N/A
	H4403J/H4405J	Two (2) year software support
	H4403Y/H4405Y	N/A
	H4726A	N/A
T1004A		HP StorageWorks Secure Manager VA 500 GB License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
T1005A		HP StorageWorks Secure Manager VA - 1TB License To Use-One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
T1006A		HP StorageWorks Secure Manager VA - 5 TB License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
T1007A		HP StorageWorks Business Copy VA Software Media Kit and 50 GB License To Use (required for enablement) 90-day support included (Not combinable - 50 GB max)
	H4403A/H4405A	N/A
	H4403J/H4405J	Two (2) year software support
	H4403Y/H4405Y	N/A
	H4726A	N/A
T1008A		HP StorageWorks Business Copy VA 500 GB License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support

Product Number	Option	Description
T1009A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Business Copy VA - 1 TB License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
T1010A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Business Copy VA - 5 TB License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
T1011A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Auto Path for Windows 2000 Software Media Kit and 1 Host License To Use (required for enablement) One software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
T1012A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Auto Path for Windows 2000 - 1 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
T1013A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Auto Path for Windows 2000 - 5 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
T1039A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Auto Path for Windows NT 4.0 Software Media Kit and 1 Host License To Use (required for enablement) One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
T1040A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Auto Path for Windows NT 4.0 - 1 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
T1041A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Auto Path for Windows NT 4.0 - 5 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405J	Three (3) year software support
T1042A	H4726A	Software enablement, installation and customer demonstration service
		HP StorageWorks Auto Path for Windows NT 4.0 - 10 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service

Product Number	Option	Description
T1043A		HP StorageWorks Auto Path for Windows NT 4.0 - 25 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
T1060A		HP StorageWorks Auto Path for HP-UX 11.0,11i Software Media Kit and 1 Host License To Use (required for enablement) One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
T1061A		HP StorageWorks Auto Path for HP-UX 11.0,11i 1 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
T1062A		HP StorageWorks Auto Path for HP-UX 11.0,11i - 5 Host License To Use One (1) software support warranty option required
	H4403A/H4405A	One (1) year software support
	H4403J/H4405J	Two (2) year software support
	H4405Y	Three (3) year software support
	H4726A	Software enablement, installation and customer demonstration service
B9550A		HP StorageWorks Fast Recovery Solutions for Microsoft Exchange 2000 1 Array-based License to Use, capacity unlimited
	H4403A/H4405A	One (1) year software support
	H4405Y	Three (3) year software support

Glossary

Abbreviation	Description
Bps	Bits per second
BE	Back End
CLUI	Command Line User Interface
Cluster	For the purposes of this document, a cluster is a configuration using two or more servers with failover capability. For HP-UX based configurations, this means running ServiceGuard. Windows-based cluster configurations incorporate the following characteristics: <ul style="list-style-type: none"> Windows Enterprise Edition for NT 4.0 Windows Advanced Server Data Center Server for Windows 2000 (currently not released and not defined-this is an issue)
Cluster-Aware	Application is aware of cluster environment, informs the user a cluster exists, and provides additional cluster information
Cluster-Safe	Application does not prevent a MSCS cluster certification and does not create loss of data in a MSCS cluster environment
Cluster-Supported	Application is a transferable resource in a cluster; i.e., if a node in a cluster is taken off-line, the application will failover automatically to another cluster node.
Data Center	Version of Windows 2000 OS that allows clustering of up to four servers.
DR	Design Release
ESI	Enhanced Serial Interface
ESN	Enterprise Storage Network
Fabric Login	The name given to the initialization protocol for a device on the Storage Area Network (SAN) fabric with which it is "logged" into the SAN fabric. The act of "logging" provides the fabric with the required information about the device so that the device can be accessed and allows the device to access any other "fabric" device on the fabric.
FE	Front End
Fsam	Federated Storage Area Management
GB	Gigabyte(s)

Glossary (continued)

Abbreviation	Description
GBIC	Gigabyte Interface Connector; plugged into the Cassini controller to provide the optical interface to the host.
Gbit	Gigabit(s) (Note: HP standard says do not abbreviate as Gb.)
Gbit/sec	Gigabits per second
GHz	Gigahertz
GLM	Gigabyte Link Module; generally associated with the HBA and the optical connection.
GUI	Graphical User Interface
HBA	Host Bus Adapter
HCL	Hardware Compatibility List
Heterogeneous	Dissimilar, differing in structure and quality
JBOD	Storage/RAID Device (just a bunch of disks)
I/O	Input/Output
k	Kilo (prefix meaning 1,024)
K	Kilo (prefix meaning 1,024)
Kbit	Kilobit (1,024 bits) (Note: HP standard says do not abbreviate as Kb.)
KB	Kilobyte (1,024 bytes)
Kbps	Kilobytes per second
LUN	Logical Unit Number (virtual disk)
Mbit	Megabit
Mb/s	Megabits per second
MB	Megabyte(s)
MB/s	Megabytes per second
Windows MSCS	Windows software that coordinates two servers and directs the other server to take over when one fails.
Multi-path aware	Ability to have knowledge of multiple paths to the storage device.
Multi-path driver	Device driver that masks multiple access paths to a physical device. Ability to switch between paths.
RAID	Redundant Array of Independent Disk
Remote Management Capability	Ability to launch management software from a remote location.
RG	Redundancy Group
SAN	Storage Area Network
SCSI	Small Computer Standard Interface
SDM	Storage Device Management
SES	SCSI Enclosure Services
ServiceGuard	HP-UX software that coordinates two servers and directs the other server to take over when one fails.
SFF	Small Form Factor
VA	Virtual Array
VAP	Virtual Array Controller
WHQL	Windows Hardware Quality Lab
WWN	World Wide Name
Windows MSCS	Microsoft Cluster Server - Windows software that coordinates two servers and directs the other server to take over when one fails.

Subchapter 4.1—Fibre Channel Infrastructure and DTCs

	Description	Product #	Opt #	Price
	Fibre Channel for Information Storage Infrastructure Products			
•	HP Brocade 8-Port Fibre Channel Switch (field installable)	A5625A		
•	Power Supply for Brocade 2400 Switch	A5671A		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	HP Brocade 8-Port Fibre Channel Switch (factory integrated)	A5625AZ		
•	Power Supply for Brocade 2400 Switch	A5671A		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	HP Brocade 16-Port Fibre Channel Switch (field installable)	A5624A		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	HP Brocade 16-Port Fibre Channel Switch (factory integrated)	A5624AZ		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	2 Optical SW GBIC's with one 50 meter optical cable	D6980A		
•	2 Optical SW GBIC's with one 100 meter optical cable	D6981A		
•	2 Copper GBIC's with one 3 meter copper cable	D6978A		
•	2 Copper GBIC's with one 5 meter copper cable	D6979A		
•	2 Copper GBIC's with one 10 meter copper cable	D7080A		
•	Fibre Channel 1063 Mbps 10 port shortwave Hub (standalone or field integratable)	A3724A		
	Rack Mount Kit for FC Hub		001	
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	
	100 meter fibre cable		026	
•	Fibre Channel 1063 Mbps 10 port shortwave Hub (racked, factory integrated)	A3724AZ		
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	
	100 meter fibre cable		026	
•	Fibre Channel 1063 Mbps 9 port shortwave, 1 port long-wave Hub (standalone or field integratable)	A4839A		
	Rack Mount Kit for FC Hub		001	
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	
	100 meter fibre cable		026	
•	Fibre Channel 1063 Mbps 9 port shortwave, 1 port long-wave Hub (factory integrated)	A4839AZ		
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	

Description	Product #	Opt #	Price
100 meter fibre cable		0Z6	
• Fibre Channel 1063 Mbps SCSI Multiplexer (factory integrated)	A3308A		
F/W SCSI interface card (4 maximum per SCSI Multiplexer)		003	
Fibre Channel 1063 Mbps interface card (2 maximum per SCSI Multiplexer)		004	
16 meter fibre cable		AFY	
50 meter fibre cable		0Z5	
100 meter fibre cable		0Z6	
• Fibre Channel 1063 Mbps SCSI Multiplexer (racked, factory integrated)	A3511AZ		
F/W SCSI interface card (4 maximum per SCSI Multiplexer)		003	
Fibre Channel 1063 Mbps interface card (2 maximum per SCSI Multiplexer)		004	
16 meter fibre cable		AFY	
50 meter fibre cable		0Z5	
100 meter fibre cable		0Z6	
• Fibre Channel SCSI Multiplexer (including rack kit)	A3511A		
F/W SCSI interface card		003	
Fibre Channel 1063 Mbps interface card		004	
16 meter fibre cable		AFY	
50 meter fibre cable		0Z5	
• F/W SCSI adapter upgrade for SCSI Multiplexer (provides additional F/W SCSI Channel)	A3509A		
• 1063 Mbps Fibre Channel adapter upgrade for SCSI Multiplexer (provides second FC connection)	A3512A		
100 meter fibre cable		0Z6	
Interface Manager			
• HP SureStore Interface Manager for 10/180 & 20/700	A6356A		
Includes card cage, remote management card, redundant power supplies, controller, fans, 2.5 SCSI cable, 10 plug PDU			
• HP SureStore Fibre Channel Interface Ultrium LVDS	A4674A		
2 pack of 2.5M Multimode SCSI cables		001	
• HP SureStore Fibre Channel Interface Ultrium HVDS	A4673A		
2 pack of 2.5M Multimode SCSI cables		001	
Fibre Bridges			
• HP SureStore Bridge FC 4/1 HV	A4688A		
Cable package, four each SCSI 2.5M		001	
Library installation kit including power strip, rackmount hardware, SCSI cable (bridge to controller)		002	
• HP SureStore Bridge FC 2/1 LV	A4689A		
Cable package, two each SCSI 2.5M		001	
Library installation kit including power strip, rackmount hardware, SCSI cable (bridge to controller)		002	
• SCSI Library HVD to LVD Convertor (for LVD bridge support of library robotics interface)	A6324A		
DTCs			
• DTC16TN Telnet Terminal Server with 16 RS-232 Ports	J2060A		
Racking kit for 1.1 or 1.6 meter cabinets		1AC	
Replace eight RJ-45 direct ports with eight DB-25 modem ports		UG5	
Replace RS-232 with 16 RS-423 ports		UG4	
• HP DTC Manager UX media for Servers	J2120A		
CD-ROM certificate		AAU	
HP-UX 10.01		APS	
HP-UX 10.10		APX	
HP-UX 10.20		APZ	
• DTC72MX Communications Server with three available slots	J2070A		
Racking kit for 1.1 or 1.6 meter cabinets		1AC	
Configure with 24 RS-232 direct connect ports with RJ-45 connectors		001	
Configure with 48 RS-232 direct connect ports with RJ-45 connectors		002	
Configure with 72 RS-232 direct connect ports with RJ-45 connectors		003	
Replace eight RJ-45 direct ports with eight DB-25 modem ports		UG5	
Configure with 24 RS-423 direct connect ports with RJ-45 connectors		UG4	
Add X.25 board with RS-232 interface		1CW	
Add X.25 board with V.35 interface		1CX	
Add Telnet Access board		004	

	Description		Product #	Opt #	Price
	Add-On Products for DTC72MX:				
•	24-Port RS-232 Direct Connect Card for DTC72MX with RJ-45 connections		J2076A		
	Replace eight RJ-45 direct ports with eight DB-25 modem ports			UG5	
•	24-Port RS-423 Direct Connect Card for DTC72MX		J2077A		
•	X.25 Board for DTC72MX		J2079A		
	RS-232 Interface			1CW	
	V.35 Interface			1CX	
•	Telnet Access Board for DTC72MX		J2080A		
	Terminal Server for Model 12H with Fibre Channel		A4917A		
	8 Port -for use with 12H and SCSI-FC MUX				
	Accessories for DTC16TN and DTC72MX				
•	Racking Kit for 5 DTC MDPs in 1.1 or 1.6 meter cabinets		J2084A		
•	DTC Connection Accessories		J2085A		
	8-Port RS-232 modem distribution panel with DB-25 connectors			101	
	8-Port direct connect distribution panel with DB-25 connectors			102	
	24-Port direct connect distribution panel with RJ-45 connectors			103	
	8-Port multi-port cable with HP 3-pin connectors			104	

Subchapter 4.2—HP Secure Web Console

	Description		Product #	Opt #	Price
1.0	HP Secure Web Console				
	HP Secure Web Console Note 1: Secure Web Console is integrated into the A-, R-, L-, and N-Class servers and does not need to be ordered with these servers. Note 2: An RS232 cable is required to connect the Secure Web Console to the server. This can be the existing console cable or a new customer supplied cable or it can be ordered from HP. The HP product number is 24542G. For more information, see the Configuration Guide, Chapter 4 Peripherals and Accessories, subchapter 4.2-HP Secure Web console	[]	J3591A		

Subchapter 4.3—HP Uninterruptible Power Supplies

	Description		Product #	Opt #	Price
	HP PowerTrust UPS (Must order option 021 for use with D- and K-Class Servers.)				
•	PowerTrust II-LR 1.4kW/2.0kVA UPS 120V		A1353A		
	Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals				
	Factory Racked			0D1	
	Additional Battery Pack note: maximum 4 additional battery packs for a total of 5			001	
	Field Rack RBII			002	
	Floor standing security brackets			003	
	Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable			25P	
	Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable			25M	
	Replace Standard RS232 cable with RS232 DB9f-DB9m for MS NT Servers (available 6/1/00)			013	
	Replace Standard power cord with 120V straight plug			011	
•	PowerTrust II-LR 1.4kW/2.0kVA UPS 230V		A1354A		
	Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals				
	Factory Racked			0D1	
	Additional Battery Pack note: maximum 4 additional battery packs for a total of 5			001	
	Field Rack RBII			002	
	Floor standing security brackets			003	
	Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable			25P	

Description	Product #	Opt #	Price
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		25M	
Replace Standard RS232 cable with RS232 DB9f-DB9m for MS NT Servers (available 6/1/00)		013	
Replace Standard power cord with Central European 4.5m C19/CEE7		AWT	
Replace Standard power cord with International 4.5m C19/IEC309 plug		AWU	
Replace Standard power cord with International/European C19/unterminated		AW5	
• PowerTrust II-LR 2.1kW/3.0kVA UPS 230V	A1356A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals			
Factory Racked		0D1	
Additional Battery Pack note: maximum 4 additional battery packs for a total of 5		001	
Field Rack RBII		002	
Floor standing security brackets		003	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		25P	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		25M	
Replace Standard RS232 cable with RS232 DB9f-DB9m for MS NT Servers (available 6/1/00)		013	
Replace Standard power cord with Central European 4.5m C19/CEE7		AWT	
Replace Standard power cord with International 4.5m C19/IEC309 plug		AWU	
Replace Standard power cord with International/European C19/unterminated		AW5	
• PowerTrust II-LR Battery Pack	A1357A		
• RS232 Extension Cable DB9f/DB9m	A1358A		
• PowerTrust II-LR SNMP/WEB Card	A1359A		
• PowerTrust II-LR Rack kit for Rosebowl I	A1361A		
• PowerTrust II-LR Rack kit for Rosebowl II	A1362A		
• PowerTrust II-LR Floor standing security brackets	A1363A		
• PowerTrust II-LR/MR RS232 DB-9f/DB-9m cable	A1364A		
• RS232 DB9-DB25 PCI MUX cable	A1365A		
• RS232 DB9-DB25 MDP MUX cable	A1366A		
• PowerTrust II-MR 4.0kW/4.5kVA UPS 230V	A6583A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals. Must choose one Power interface option.			
Factory Racked		0D1	
Additional Battery Pack note: 3 additional battery packs for a max of 4		001	
Field rack for RBII		002	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		004	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		005	
Input/output hardwired		007	
Power interface option, L6-30P plug line cord, w/PDP-2,output, US/Japan		008	
Power interface option, input hardwired w/PDP-2,output, US/Japan		011	
Power interface option, input hardwired w/PDP-1 output,Europe		012	
Power interface option, IC309 30A plug, line cord, w/PDP-1 output,Europe		013	
• PowerTrust II-M4.0kW Battery Pack note: 3 additional battery packs for a max of 4	A6586A		
• PowerTrust II-MR 6.5kW/9kVA UPS 230V	A6584A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals. Must choose one Power interface option.			
Factory Racked		0D1	
Additional Battery Pack Set (2 batteries/set) note: 3 additional battery pack sets for a max of 4		001	
Field rack for RBII		002	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		004	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		005	
Input/output hardwired		007	
Power interface option, 6-50P plug line cord, w/PDP-2,output, US/Japan		009	
Power interface option, IC309 60A plug, line cord, w/PDP-1 output,Europe		010	
Power interface option, input hardwired w/PDP-2,output, US/Japan		011	
Power interface option, input hardwired w/PDP-1 output,Europe		012	
Power interface option, IC309 60A plug, line cord, w/PDP-2 output,US/Japan		014	
• PowerTrust II-MR 8kW/12kVA UPS 230V	A6585A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals. Must choose one Power interface option.			

Description	Product #	Opt #	Price
Factory Racked		0D1	
Additional Battery Pack Set (2 batteries/set) note: 3 additional battery pack set for a max of 4		001	
Field rack for RBII		002	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		004	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		005	
Input/output hardwired		007	
Power interface option, input hardwired w/PDP-2,output, US/Japan		011	
Power interface option, input hardwired w/PDP-1 output,Europe		012	
• PowerTrust II-MR 6.5kW/8kW Battery Pack Set (2 batteries/set)) note: 3 additional battery pack set for a max of 4	A6587A		
• PowerTrust II-MR Input/Output Hardwired cable	A6588A		
• PowerTrust II-MR Rack kit for Rosebowl I	A6601A		
• PowerTrust II-MR Rack kit for Rosebowl II	A6602A		
• Power interface option, L6-30P plug line cord, w/PDP-2,output, US/Japan	A6589A		
• Power interface option, 6-50P plug line cord, w/PDP-2,output, US/Japan	A6590A		
• Power interface option, IC309 60A plug, line cord, w/PDP-1 output,Europe	A6591A		
• Power interface option, input hardwired w/PDP-2,output, US/Japan	A6592A		
• Power interface option, input hardwired w/PDP-1 output,Europe	A6594A		
• Power interface option, IC309 30A plug, line cord, w/PDP-1 output,Europe	A6595A		
• Power interface option, IC309 60A plug, line cord, w/PDP-2 output,US/Japan	A6596A		
• SNMP Card Communication Kit (available June 2001)	A6593A		
• Contact Closure Card Kit w/cable (direct connection w/native NT or remote status connection	A6597A		

Subchapter 4.4—Field Integrated Cabinets

Description	Product #	Opt #	Price
• HP Rack System/E41 (includes side panels, anti-tip feet) Field Integrated Cabinet	A4902A		
Delete Cabinet Side Panels		AXW	
Rear Door (Required – Max 1) (See Chapter 2 for factory integrated cabinet menu).	A5213AZ		
• HP Rack System/E33 (includes side panels, anti-tip feet) Field Integrated Cabinet	A4901A		
Delete Cabinet Side Panels		AXW	
Rear Door (Required – Max 1) (See Chapter 2 for factory integrated cabinet menu)	A5212AZ		
I/O Expansion Option (available only with Corporate Business Server 890, A1828A) Add HP-PB Expansion module with 14 HP-PB expansion slots, lower bus converter, and 10-meter interconnect cable			
• 1.6 m Field Integrated Base Cabinet - High Density D-Class 23" wide Cabinet	A3765A		
(See Chapter 2 for factory integrated cabinet menu) Note: PDUs can be ordered already integrated into the cabinet using the options for the Field Integrated Cabinet (A3765A). PDUs can also be ordered separately using the cabinet accessory menu and installed at the customer's site. Note: One mounting kit (A4838A) is required for each D-Class server integrated into the Field Integrated 23" wide cabinet (A3765A). One mounting kit (A4838A) is also required for each additional D-Class server integrated in the field into the Factory Integrated 23" wide cabinet (A3764A). Note: The Factory Integration product (A4834A) provides the mounting kit and factory integration for each D-Class integrated at the factory into the Factory Integrated 23" wide cabinet. The Mounting Kit product (A4838A) provides the mounting kit for someone to integrate a D-Class server in the field into the Field Integrated 23" wide cabinet or the Factory Integrated 23" wide cabinet. Note: 2 PDUs are required if 3 or 4 servers are integrated into the cabinet			
• Cabinet with capacity to integrate 1 to 4 D-Class servers	A3765A	001	
• Cabinet with capacity to integrate 1 to 2 D-Class servers as well as 15 EIA units of peripherals	A3765A	002	

Description	Product #	Opt #	Price
• 1st 200-240 volts North American power	A3765A	AW4	
• Add 2nd 200-240 volts North American power	A3765A	A5J	
• 1st 200-240 volts International power	A3765A	AW5	
• Add 2nd 200-240 volts International power	A3765A	A5K	
• 1st 240 volts North American UPS PDU	A3765A	A5F	
• 1st 240 volts European UPS PDU	A3765A	A5G	
• 1st 120/240 volts Universal UPS PDU	A3765A	A5H	
• Add 2nd 120/240 volts Universal UPS PDU	A3765A	A5L	
• Mounting kit for integrating one D-Class server in the field into the D-Class 23" wide cabinet	A4838A		
• D-Class deskside front bezel (optional) (only needed to replace the front bezel if moving a D-Class server in the field from a 19" wide cabinet to the 23" wide cabinet)	A4838A	010	
• HP Rack System/E25 (includes side panels, anti-tip feet) Field Integrated Cabinet	A4900A		
Rear Door (Required – Max 1) (See Chapter 2 for factory integrated cabinet menu.)	A5211AZ		
Cabinet Accessories			
• HP side panel kit for Rack System/E41	J1506A		
• HP side panel kit for Rack System/E33	J1507A		
• HP side panel kit for Rack System/E25	J1508A		
• HP Filler Panels for rack System/E Quantity 6	J1514A		
• ADP Rackmount Kit (for rear of cabinet)	C2792A		
• Rackmount kit for A-Class Systems	A5810A		
• Rackmount Kit for D-Class Systems (Only for standard 19" cabinets)	C2805C		
• Rackmount Kit for E-Class Systems	C2803C		
• Field Rackmount Kit for L-Class Systems – HA Slider rails	A5556A		
• Field Rackmount Kit for L-Class Systems – Static rails	A5575A		
• Field Rackmount Kit for L-Class Systems in A189xA cabinets – Static rails	A5562A		
• Rackmount Kit for K-Class Systems	C2804C		
• 14 Kg (30 lbs.) Anti-tip Ballast	C2790A		
• Rackmount Kit for 5 Modem Distribution Panels	J2084A		
• Rackmount Kit for 10 Modem Distribution Panels	J2087A		
• HP Tie Kit for Rack System/E41	J1512A		
• HP Tie Kit for Rack System/E33	J1513A		
Power Distribution Unit: (requires additional power cord except for 30A PDU and no separate installation kit to be ordered)			
<i>19" modular PDU's (no switch):</i>			
• 100-240V, 16A PDU w/ 7-C13, 1-C19 receptacles	E7674A		
• 200-240V, 30A PDU w/ 8-C13, 2-C19 receptacles, N. America (comes w/attached Nema L6-30P power cord)	E7681A		
• 200-240V, 30A PDU w/ 8-C13, 2-C19 receptacles, International (comes w/ attached IEC-309 power cord)	E7682A		
• 200-240V, 60A PDU w/8-C19 receptacles, N. America	E7683A		
• 200-240V, 60A PDU w/8-C19 receptacles, International	E7684A		
<i>To have the switching capability for the above 19" modular PDU's, additional SKU's needs to be ordered:</i>			
• 200-240V switch accessory for 16A PDU's (includes the switch accy. and switch panel)	E7680A		
Power Cords: (to be used to connect the PDU's to the power source- wall or UPS)			
• Power cord w/ 5-20P, 4.5m	E7802A		
• Power cord w/ L6-20P, 4.5m	E7803A		
• Power cord w/ C20 plug, 4.0m	E7804A		
• Power cord w/ L6-30P, 4.5m	E7805A		
• Power cord w/ no plug, 4.5m	E7806A		
• Power cord w/ IEC-309, 4.5m (outside N. America use only)	E7808A		
• Power cord w/ CEE7/7, 4.5m (outside N. America use only)	E7809A		
• Power cord w/ C20 plug, 2.5m	E7798A		
Jumper Cords: (to connect the mounted equipment to the PDU within the rack)			

Description	Product #	Opt #	Price
• 250V Jumper cord w/ C13 to C14, 2.3m	E7742A		
• 125V Jumper cord w/ C13 to Nema 5-15, 2.3m	E7743A		
• Jumper cord w/ C14 to C15, 0.7m	E7807A		

Subchapter 4.5—Add-on Memory and Accessories

Description	Product #	Opt #	Price
A-Class, R-Class, D-Class Memory			
• 128 MB ECC memory module	A3408A		
• 256 MB ECC memory module	A3564A		
• 512 MB ECC memory module	A3717A		
E-Class Memory			
• 16 MB ECC memory module	A2946A		
• 32 MB ECC memory module	A3309A		
• 64 MB ECC memory module	A2948A		
• 128 MB ECC memory module, quantity price break for 4 or more units, \$2,495 ea.	A3131A		
8x7, F, G, H, I-Class Memory			
• 128 MB ECC High Density memory module	A2516A		
K-Class Memory			
• 128 MB high-density ECC memory module	A3027A		
• 256 MB high-density ECC memory module	A3483A		
• 512 MB high-density ECC memory module	A3737A		
T-Class Memory and I/O Accessories			
• 256 MB ECC memory board	A2234A		
• 512 MB ECC memory board	A2588A		
• 768 MB ECC memory board	A2589A		
• 8 GB memory carrier (T600 only; no memory installed)	A3839A		
• 1 GB memory module for T600 (Used with A3839A)	A3832A		
• HP-PB I/O Expansion Module	A1828A		
• HSC bus converter (T600 only)	A3567A		
• HP-PB bus converter (T600 only)	A3568A		
• Dual I/O Bus Converter	A1829A		
Floating-Point Coprocessor Field Upgrades			
• Floating-Point Coprocessor Field Upgrade on HP 9000 F-, G-, H-, I-Class, and 8x7	A2293A		
For HP 9000 Model 10 systems, Model 807S (shipped after 3/15/92)		001	
For HP 9000 Model 20 systems, Model 817S - 827S		003	
For HP 9000 Model 30 systems, Model 837S - 857S		004	
For HP 9000 Model 40 systems, Models 867S - 877S		002	
32 MHz CPU board with Floating-Point Coprocessor for 807S Servers shipped before 3/15/92 without floating-point socket		101	

Subchapter 4.6—Add-on Storage Products for Installation inside the SPU Enclosure

Description	Product #	Opt #	Price
Disk Drives			
Unless otherwise specified, all disk drive products are supported on HP-UX 9.04 and 10.01.			
The following products occupy one half-height slot:			
• 2 GB FWD SCSI-2 low profile or (K-Class only)	A3351A	002	
• 4 GB SE SCSI-2 low profile disk drive	A3352A	002	
• 4 GB FWD SCSI-2 low profile disk drive (K-Class only)	A3353A	002	
Removable Media Drives			
The following products occupy one half-height slot and are single-ended SCSI-2			
• 2.88 MB 3.5" IDE floppy disk drive	A3307A		
For field add-on		002	
• 12x CD-ROM Drive	A3715A		
For field add-on		002	
• 4.0 GB DDS DAT drive + data compression	A3183A		
For field add-on (orderable July 1, 1997)		002	
• 7.0 GB 8 mm tape drive SCSI-2. HP-UX 9.04 required.	A3357A		
Installation kit for F/G/H/I SPU		002	

Subchapter 4.7—Mass Storage

4.7.1—Mass Storage Warranty*

Product Family	U.S. Base Warranty
hp StorageWorks disk system 2100	One-Year, enhanced parts only, return to HP
hp StorageWorks disk system 2300	Three-Year, Next Day Response, On-Site Support
hp StorageWorks disk system 2405	Two-Year, Same Business Day, On-Site Support
hp StorageWorks disk systems HVD10, SC10 and FC10	Three-Year, 3 Day Response, On-Site Support
DLT (Standalone Only) and DDS Tape Drives	Two-Year Total Duration, with Year 1 Next-Day On-Site, Year 2 Unit Exchange
DLT (Library Only)	One-Year, Next Day Support
All Other Mass Storage Products	One-Year, 3 Day Response

*Warranty May Differ Outside the U.S.

4.7.2—StorageWorks disk system 2100

Description	Product #	Opt #	Price
• Disk System 2100 (Field Rack)	A5675A		
• Disk System 2100 (Field Rack – empty enclosure only, disk drives cannot be integrated)	A5675AE		
• Disk System 2100 (Factory Rack)	A5675AZ		
• Disk System 2100 (Desktop)	A5675AD		
• Disk System 2100 (Desktop – empty enclosure only, disk drives cannot be integrated)	A5675AD		
• Disk System 2105, DC Powered (Field Rack)	Y1770A		
Accessories			
• 18GB 10K RPM Ultra3 SCSI	A6537A		
• 36GB 10K RPM Ultra3 SCSI	A6538A		
• 73GB 10K RPM Ultra3 SCSI	A6539A		
• 18GB 15K RPM Ultra3 SCSI	A6540A		
• 36GB 15K RPM Ultra3 SCSI	A6541A		
• HP System E/Rittal Rack Kit	A5679A		
• HP Original Rack Kit	A5680A		

Description	Product #	Opt #	Price
• Two Post Carrier Grade Rack Kit	A6576A		
• Four Post Carrier Grade Rack Kit	A6578A		
• 0.5m 68P HD to 68P HD SCSI Cable	C2978B		
• 1.0m 68P HD to 68P HD SCSI Cable	C2911C		
• 1.5m 68P HD to 68P HD SCSI Cable	C2979B		
• 2.5m 68P HD to 68P HD SCSI Cable	C2924C		
• 5.0m 68P HD to 68P HD SCSI Cable	C7521A		
• 1.0m VHDCI to 68P HD SCSI Cable	C2361B		
• 2.5m VHDCI to 68P HD SCSI Cable	C2362B		
• 5.0m VHDCI to 68P HD SCSI Cable	C2365B		
• 2.0m VHDTS68/HDTS68 LVD/SE Self-terminating cable for V-Class	C7541A		
• 5.0m VHDTS68/HDTS68 LVD/SE Self-terminating cable for V-Class	C7520A		
• SCSI Terminator	C2364A		
• Deskside Pedestal Upgrade Kit (for desktop model only)	A6519A		

4.7.3—StorageWorks disk system 2300

Description	Product #	Opt #	Price
• Disk System 2300 field rack enclosure	A6490A		
• Disk System 2300 field rack enclosure (empty enclosure for stocking – no drive integration)	A6490AE		
• Disk System 2300 factory rack enclosure	A6490AZ		
• Disk System 2300 deskside enclosure	A6490AD		
• Disk System 2300 deskside enclosure (empty enclosure for stocking – no drive integration)	A6490ED		
• Disk System 2300 disk enclosure integrated through select express	A6490AV		
• Redundant controller for HP DS2300	A6491A		
• Redundant controller for HP DS2300 installed in enclosure	A6491A	0D1	
• Redundant controller for HP DS2300 integrated through Select Express	A6491AV		
• 18GB 10K RPM LVD disk module	A6537A		
• 18GB 10K RPM LVD disk module installed in enclosure	A6537A	0D1	
• 18GB 10K RPM LVD disk module integrated through Select Express	A6537AV		
• 36GB 10K RPM LVD disk module	A6538A		
• 36GB 10K RPM LVD disk module installed in enclosure	A6538A	0D1	
• 36GB 10K RPM LVD disk module integrated through Select Express	A6538AV		
• 73GB 10K RPM LVD disk module	A6539A		
• 73GB 10K RPM LVD disk module installed in enclosure	A6539A	0D1	
• 73GB 10K RPM LVD disk module integrated through Select Express	A6539AV		
• 18GB 15K RPM LVD disk module	A6540A		
• 18GB 15K RPM LVD disk module installed in enclosure	A6540A	0D1	
• 18GB 15K RPM LVD disk module integrated through Select Express	A6540AV		
• 36GB 15K RPM LVD disk module	A6541A		
• 36GB 15K RPM LVD disk module installed in enclosure	A6541A	0D1	
• 36GB 15K RPM LVD disk module integrated through Select Express	A6541AV		
• HP System/E Rack Rail Kit	A6209A		
• HP System/E Rack Rail Kit integrated through Select Express	A6209AV		
• HP Original Rack Rail Kit	A6244A		
• NT/Rittal Rack Rail Kit	A6496A		
• NT/Rittal Rack Rail Kit integrated through Select Express	A6496AV		
• 3U 2-post Rack Rail Kit	A6498A		
• 3U 2-post Rack Rail Kit integrated through Select Express	A6498AV		
• SCSI Cable 2M VHDTS68 M/M Multimd	C2373A		
• SCSI Cable 2M VHDTS68 M/M Multimd integrated into enclosure packaging	C2373A	0D1	
• SCSI Cable 5M VHDTS68 M/M Multimd	C2374A		
• SCSI Cable 5M VHDTS68 M/M Multimd integrated into enclosure packaging	C2374A	0D1	
• SCSI Cable 10M VHDTS68 M/M Multimd	C2375A		
• SCSI Cable 10M VHDTS68 M/M Multimd integrated into enclosure packaging	C2375A	0D1	

	Description	Product #	Opt #	Price
•	SCSI Cable 2.5M VHDS68/HDTS68 M/M Multimd	C2362B		
•	SCSI Cable 2.5M VHDS68/HDTS68 M/M Multimd integrated into enclosure packaging	C2362B	OD1	
•	SCSI Cable 5M VHDS68/HDTS68 M/M Multimd	C2365B		
•	SCSI Cable 5M VHDS68/HDTS68 M/M Multimd integrated into enclosure packaging	C2365B	OD1	
•	SCSI Cable 10M VHDS68/HDTS68 M/M Multimd	C2363B		
•	SCSI Cable 10M VHDS68/HDTS68 M/M Multimd integrated into enclosure packaging	C2363B	OD1	
•	SCSI Terminator LVD/SE VHDS68	C2370A		

4.7.4—StorageWorks disk system 2405

	Description	Product #	Opt #	Price
•	Disk System 2405 Field Rackable Enclosure	A6250A		
	Includes DS2405 chassis, 2 power supplies and fans, 2 link controller cards, 2 power cords, disk slot filler panels, user guide and Command View SDM (rackmount kit not included). Accommodates 15 low profile FC disk drives. Cables are not included and must be ordered separately.			
	Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM Version 1.04 or later.		223	
•	18.2GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6191A	OD1	
•	36.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6192A	OD1	
•	36.4GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6193A	OD1	
•	73.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6194A	OD1	
•	Disk System 2405 Factory Racked Enclosure	A6250AZ		
	Includes DS2405 chassis, 2 power supplies and fans, 2 link controller cards, 2 power cords, disk slot filler panels, rackmount kit, user guide and Command View SDM. Accommodates 15 low profile FC disk modules. Cables are not included and must be ordered separately.			
	Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM Version 1.04 or later.		223	
•	18.2GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6191A	OD1	
•	36.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6192A	OD1	
•	36.4GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6193A	OD1	
•	73.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6194A	OD1	
•	Disk System 2405 Empty Enclosure	A6250AE		
	Includes DS2405 chassis, 2 power supplies and fans, 2 link controller cards, 2 power cords, disk slot filler panels, user guide and Command View SDM (rackmount kit not included). Accommodates 15 low profile FC disk modules. Disk drives cannot be integrated.			
	Cables and Accessories			
•	Fibre Channel Cable 2-meter LC Duplex 50/125 M/M	C7524A		
•	Fibre Channel Cable 16-meter LC Duplex 50/125 M/M	C7525A		
•	Fibre Channel Cable 50-meter LC Duplex 50/125 M/M	C7526A		
•	Fibre Channel Cable 200-meter LC Duplex 50/125 M/M	C7527A		
•	Fibre Channel Cable 2-meter LC/SC Duplex 50/125 M/M	C7529A		
•	Fibre Channel Cable 16-meter LC/SC Duplex 50/125 M/M	C7530A		
•	Fiber Optic Coupler SC F/F (for use with C7529A and C7530A)	C7534A		
•	Fiber Optic Adapter Kit (includes C7529A and C7534A)	C7540A		
•	HP System/E Rack Rail Kit	A6209A		
•	HP Original Rack Rail Kit	A6244A		
•	NT/Rittal Rack Rail Kit	A6496A		
•	3U 2-post Rail Kit	A6498A		

4.7.5—StorageWorks disk system HVD10

Note: Effective July 1, 2002, the HVD10 will be discontinued. Customers can continue purchasing the add-on disk drives until July 1, 2003 or while supplies last. Depending on the server, the DS2100, DS2300 or DS2405 is the replacement product for the HVD10.

	Description	Product #	Opt #	Price
•	1-meter HDTS68 (M/M) Multimd	C2911C	OD1	
•	2.5-meter HDTS68 (M/M) Multimd	C2924C	OD1	
•	5-meter HDTS68 (M/M) Multimd	C7521A	OD1	
•	10-meter HDTS68 (M/M) Multimd	C7522A	OD1	
•	20-meter HDTS68 (M/M) Multimd	C7532A	OD1	
•	1-meter VHDS68/HDTS68 (M/M) Multimd	C2361B	OD1	
•	2.5-meter VHDS68/HDTS68 (M/M) Multimd	C2362B	OD1	
•	5-meter VHDS68/HDTS68 (M/M) Multimd	C2365B	OD1	
•	10-meter VHDS68/HDTS68 (M/M) Multimd	C2363B	OD1	
•	5-meter HDTS68 ILT (M/M)	C7554A	OD1	
•	10-meter HDTS68 ILT (M/M)	C7555A	OD1	
•	5-meter VHDS68/HDTS68 HVD ILT (M/M)	C5766A	OD1	
•	10-meter VHDS68/HDTS68 HVD ILT (M/M)	C5767A	OD1	
•	0.5-meter VHDS68/HDTS68 ILT (M/F)	C7519A	OD1	
•	2-meter V cable (68 pin HD) male	C7544A	OD1	
•	2-meter V cable VHDCI/VHDCI/ 68 pin HD	A5607A	OD1	
•	2-meter V cable VHDCI/VHDCI ILT/ 68 pin HD	A5608A	OD1	
•	2-meter V cable 68 pin HD/VHDCI/68 pin HD	A5609A	OD1	
•	2-meter V cable 68 pin HD/VHDCI ILT/68 pin HD	A5610A	OD1	
•	Add on 18.2 GB 10K RPM High Performance Ultra3 SCSI LVD Disk Module	A6272A		
•	Add on 18.2 GB 15K RPM High Performance Ultra3 SCSI LVD Disk Module	A6273A		
•	Add on 36.4 GB 10K RPM High Performance Ultra3 SCSI LVD Disk Module	A6274A		
•	Add on 36.4 GB 15K RPM High Performance Ultra3 SCSI LVD Disk Module	A6275A		
•	HP Rack System /E Rack Rail Accessory Kit	A5251A		

4.7.6—StorageWorks disk system SC10

Note: Effective June 1, 2002, the SC10 will be discontinued. Customers can continue purchasing the add-on disk drives until July 1, 2003 or while supplies last. Depending on the server, the DS2100 or DS2300 is the replacement product for the SC10. Please note that the DC version (Z7536A) is still available.

	Description	Product #	Opt #	Price
•	Z7536A Surestore Disk System SC10, DC Powered, Field Rackable (requires CE installation)	Z7536A		
	Includes 2 DC power supplies, 2 blower modules, 1 Bus Control Card, 2 power cords, 2 Rack Rail Kits and ½ U filler panel. Accommodates 10 Half High or 10 low profile disk modules.			
•	Add on Bus Controller Card	A5273A		
•	Add on 18.2 GB 10K RPM High Performance Ultra3 SCSI LVD Module	A6272A		
•	Add on 18.2 GB 15K RPM High Performance Ultra3 SCSI LVD Module	A6273A		
•	Add on 36.4 GB 10K RPM High Performance Ultra3 SCSI LVD Module	A6274A		
•	Add on 36.4 GB 15K RPM High Performance Ultra3 SCSI LVD Module	A6275A		
•	Add on 73.4 GB 10K RPM High Performance Ultra3 SCSI LVD Disk Module	A6276A		
•	2-meter VHTDS68 (M/M) Multimd	C2373A	OD1	
•	5-meter VHTDS68 (M/M) Multimd	C2374A	OD1	
•	10-meter VHTDS68 (M/M) Multimd	C2375A	OD1	
•	2-meter VHTDS68 LVD/SE ILT (M/M)	A5668A	OD1	
•	5-meter VHTDS68 LVD/SE ILT (M/M)	A5669A	OD1	
•	10-meter VHTDS68 LVD/SE ILT (M/M)	A5670A	OD1	
•	HP Rack System /E Rack Rail Accessory Kit	A5251A		

4.7.7—StorageWorks disk system FC10

Note: Effective April 1, 2002, the FC10 will be discontinued. Customers can continue purchasing the add-on disk drives until September 30, 2002 or while supplies last. The StorageWorks disk system 2405 is the replacement product for the FC10.

Description	Product #	Opt #	Price
• Add on 36GB 10K RPM High Performance Fibre Channel Disk Module	A6485A		
• Add on 73GB 10K RPM High Performance Fibre Channel Disk Module	A6487A		
• Add on 18GB 15K RPM High Performance Fibre Channel Disk Module	A6488A		
• Add on 36GB 15K RPM High Performance Fibre Channel Disk Module	A6486A		
• HP Rack System /E Rack Rail Accessory Kit	A5251A		

4.7.8—Mass Storage Subsystems

Note: Effective January 1, 2002, the HASS will be discontinued. Customers can continue purchasing the 18.2 GB 7200 RPM low profile drive (A5286A) while supplies last. The Surestore Disk System HVD10 or the DS2100 are the replacement products for the HASS.

Description	Product #	Opt #	Price
HP SMART Storage Family of Storage Modules & Enclosure: Factory Racked Tape Products			
• HP SMART Storage Full Height Enclosure, Factory-racked (3 EIA units high)	C4318SZ		
HP SMART Storage DDS-2 Tape Drive		102	
HP SMART Storage DDS-3 Tape Drive		103	
HP SMART Storage DDS-3 Tape Autoloader		104	
HP SMART Storage DDS-4 Tape Drive		110	
HP SMART Storage DDS-4 Tape Autoloader		111	
HP SMART Storage DLT 4000 (HP-UX)		106	
HP SMART Storage DLT 4000 (MPE/iX)		107	
HP SMART Storage DVD-ROM		108	
HP SMART Storage DLT-8000)		109	
.5 68-pin HD to 68-pin HD Cable		001	
.9 m 68-pin HD to 68-pin HD cable		801	
2.5 m 68-pin HD to 68-pin HD cable		802	
5 m 68-pin HD to 68-pin HD cable		803	
1 m VHDCI 68-pin to HD 68-pin cable		811	
2.5 m VHDCI 68-pin to HD 68-pin cable		812	
5.0 m VHDCI 68-pin to HD 68-pin cable		813	
10.0 m VHDCI 68-pin to HD 68-pin cable		814	
1 m 50-pin LD to 68-pin HD cable		821	
2 m 50-pin LD to 68-pin HD cable		822	
1 m 50-pin HD to 68-pin HD cable		825	
2 m 50-pin HD to 68-pin HD cable		827	
WSE 68-pin SCSI terminator		835	
FWD 68-pin SCSI terminator		836	
LVD/SE 68-pin terminator		837	
"Y" Power cable to power two devices from single PDU outlet		850	
10 m 68-pin HD to 68-pin HD V-Class cable		851	
2/3 m V in-line terminator V-Class 68-pin HDM		871	
2/3 m V in-line terminator V-Class 68-pin HDM		873	
5 m 68-pin HD to 68-pin HD V-Class cable		875	
HP SMART Storage Family of Storage Modules and Enclosure: Field Racked Customer Installable/Field Upgrade			
• HP SMART Storage Full- Height Enclosure Field-racked (3 EIA Units)	C4318B		

Description	Product #	Opt #	Price
• HP SMART Storage Half-Height Enclosure Field-racked (2 EIA Units)	C4317A		
• HP SMART Storage 9 GB LVD Disk Drive Field-racked	C6403A		
• .5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage Half Height NSE DVD-ROM Field-racked	C4315A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable (male to male)	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
HP SMART Storage Family of Storage Modules & Enclosures			
Field-Racked Tape Products (*C4318B or C4317A required)			
• HP SMART Storage NSE DDS-2 Tape Drive Field-racked	C6363A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage NSE DDS-3 Tape Drive Field-racked	C6365A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage NSE DDS-3 Tape Autoloader Field-racked	C6367A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 1 m 50-pin HD to 68-pin HD cable (male to male)	C2961A		
• 2 m 50-pin HD to 68-pin HD cable (male to male)	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage (LVD) DDS-4 Tape Drive Field-racked	C6369A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable	C2924C		
• LVD 68-pin SCSI terminator	C2364A		
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68-pin to HD 68-pin cable	C2362B		
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage (LVD) DDS-4 Tape Autoloader	C6371A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable	C2924C		
• LVD 68-pin SCSI terminator	C2364A		
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68-pin to HD 68-pin cable	C2362B		

Description	Product #	Opt #	Price
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage FWD DLT 8000 Drive Field-racked)	C6379A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable (male to male)	C2924C		
• FWD 68-pin SCSI terminator	C2905A		
• HP SMART Storage NSE DLT 4000 (MPE/iX) Field-racked	C6381A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 1 m 50-pin HD to 68-pin HD cable (male to male)	C2961A		
• 2 m 50-pin HD to 68-pin HD cable (male to male)	C2906A		
• Smart WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage FND DLT 4000 (HP-UX) Field-racked	C6383A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable (male to male)	C2924CA		
• FWD 68-pin SCSI terminator	C2905A		
HP SMART Storage Family: Desktop Modules			
• HP SMART Storage Desktop NSE DVD-ROM Drive	C4314A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
HP Smart Storage Desktop Tape Products			
• HP SMART Storage Desktop NSE DDS-2 Tape Drive	C6362A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
• HP SMART Storage Desktop NSE DDS-3 Tape Drive	C6364A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
• HP SMART Storage Desktop DDS-3 Tape Autoloader	C6366A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
• HP SMART Storage Desktop LVD DDS-4 Tape Drive	C6368A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• WSE/NSE 68-pin SCSI terminator	C2972A		
• LVD/SE 68-pin SCSI terminator	C2364A		
• 2 m 68 pin to 50 pin HD SCSI cable	C2906A		

Description	Product #	Opt #	Price
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68-pin to HD 68-pin cable	C2362B		
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage Desktop LVD DDS-4 Tape Autoloader	C6370A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 68 pin to 50 pin HD SCSI cable	C2906A		
• LVD 68-pin SCSI terminator	C2364A		
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68 pin I to HD 68-pin cable	C2362B		
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage Desktop DLT 8000 Drive	C6378A		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable	C2924C		
• FWD Terminator	C2905A		
• HP SMART Storage DLT 4000 (MPE/iX)	C6380A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• HP SMART Storage FND DLT 4000 (HP-UX) (terminator is included)	C6382A		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable)	C2906A		

4.7.9—SureStore Tape Autoloaders and Accessories

Description	Product #	Opt #	Price
DLT Tape Autoloaders			
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – HVDS)	C7145RA		
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – LVDS)	C7145NB		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – HVDS)	C7745RA		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – LVDS)	C7745NB		
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – HVDS) * with remote mgmt card	C7146RA		
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – LVDS) * with remote mgmt card	C7146NB		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – HVDS) * with remote mgmt card	C7746RA		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – LVDS) * with remote mgmt card	C7746NB		
Ultrium Tape Autoloaders			
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – HVDS)	C7147AA		
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – LVDS)	C7147CB		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – HVDS)	C7747AA		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – LVDS)	C7747CB		
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – HVDS) * with remote mgmt card	C7149AA		
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – LVDS) * with remote mgmt card	C7149CB		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – HVDS) * with remote mgmt card	C7748AA		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – LVDS) * with remote mgmt card	C7748CB		
Accessories			
• 1/9 Skins Kit (includes all cosmetic parts – front bezel, chin, enclosure and feet)	C7148A		
• 1/9 Rackmount Kit (Two 1/9 Autoloaders per rack; can be mounted side-by-side)	C7740R		
• 1/9 Remote Management Card Kit	C7749A		
• 1/9 Ultrium HVDS Conversion Kit (converts HVDS DLT or DLT1 autoloader to Ultrium)	C7768A		
• 1/9 Ultrium LVDS Conversion Kit (converts LVDS DLT or DLT1 autoloader to Ultrium)	C7768C		

Description	Product #	Opt #	Price
• 1/9 DLT 6-Slot Removable Magazine (with six pieces of media)	C7742R		
• 1/9 DLT 6-Slot Removable Magazine (empty)	C7741R		
• 1/9 Ultrium 6-Slot Removable Magazine (with six pieces of media)	C7744A		
• 1/9 Ultrium 6-Slot Removable Magazine (empty)	C7743A		
Multimode Cables for Tape Drives			
SCSI Cable 0.5m HDTS 68 pin Male/Male Multimode cable	C2978B		
SCSI Cable 1 m HDTS 68 pin Male/Male Multimode cable	C2911C		
SCSI Cable 1.5m HDTS 68 pin Male/Male Multimode cable	C2979B		
SCSI Cable 2.5m HDTS 68 pin Male/Male Multimode cable	C2924C		
SCSI Cable 5 m HDTS 68 pin Male/Male Multimode cable	C7521A		
SCSI Cable 10 m HDTS 68 pin Male/Male Multimode cable	C7522A		
SCSI Cable 1 m VHDS 68 pin Male/Male Multimode cable	C2361B		
SCSI Cable 2.5 m VHDS 68 pin Male/Male Multimode cable	C2362B		
SCSI Cable 5 m VHDS 68 pin Male/Male Multimode cable	C2365B		
SCSI Cable 10 m VHDS 68 pin Male/Male Multimode cable	C2363B		
SCSI Terminator LVDS/SE HDTS 68 Multimode	C2364A		
SCSI Terminator LVDS/SE VHDS 68 Multimode	C2370A		

4.7.10—SureStore Mid-Range Tape Libraries and Accessories

Description	Product #	Opt #	Price
DLT Tape Libraries			
• HP SURESTORE DLT TAPE LIBRARY 2/20 (RACKMOUNT UNIT - HVDS)	A5583A		
• HP SURESTORE DLT TAPE LIBRARY 2/20 (RACKMOUNT UNIT - LVDS)	A4680A		
Requires 1 or 2 DLT tape drives (not included); includes empty media magazines for 20 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 2/20 (STANDALONE UNIT - HVDS)	A5584A		
• HP SURESTORE DLT TAPE LIBRARY 2/20 (STANDALONE UNIT - LVDS)	A4681A		
Requires 1 or 2 DLT tape drives (not included); includes empty media magazines for 20 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 4/40 (RACKMOUNT UNIT - HVDS)	A5585A		
• HP SURESTORE DLT TAPE LIBRARY 4/40 (RACKMOUNT UNIT - LVDS)	A4682A		
Requires 2 or 4 DLT tape drives (not included); includes empty media magazines for 40 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 4/40 (STANDALONE UNIT - HVDS)	A5586A		
• HP SURESTORE DLT TAPE LIBRARY 4/40 (STANDALONE UNIT - LVDS)	A4683A		
Requires 2 or 4 DLT tape drives (not included); includes empty media magazines for 40 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 6/60 (RACKMOUNT UNIT - HVDS)	A5587A		
• HP SURESTORE DLT TAPE LIBRARY 6/60 (RACKMOUNT UNIT - LVDS)	A4684A		
Requires 2, 4, or 6 DLT tape drives (not included); includes empty media magazines for 60 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 6/60 (STANDALONE UNIT - HVDS)	A5588A		
• HP SURESTORE DLT TAPE LIBRARY 6/60 (STANDALONE UNIT - LVDS)	A4685A		
Requires 2, 4, or 6 DLT tape drives (not included); includes empty media magazines for 60 cartridges.			
HP SURESTORE DLT TAPE LIBRARY 8/80 (STANDALONE UNIT - HVDS)	A6287A		
HP SURESTORE DLT TAPE LIBRARY 8/80 (STANDALONE UNIT - LVDS)	A6288A		
Requires 2, 6, or 8 DLT tape drives (not included); includes empty media magazines for 80 cartridges.			
HP SURESTORE DLT TAPE LIBRARY 10/100 (STANDALONE UNIT - HVDS)	A6289A		
HP SURESTORE DLT TAPE LIBRARY 10/100 (STANDALONE UNIT - LVDS)	A6290A		
Requires 4 or 10 DLT tape drives (not included); includes empty media magazines for 100 cartridges.			
DLT Tape Drives – Required with all DLT libraries			
• HP SureStore DLT 8000 Tape Drive – HVDS	A5589A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	
• HP SureStore DLT 8000 Tape Drive - LVDS	A4686A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	

Description	Product #	Opt #	Price
Ultrium Tape Libraries			
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (RACKMOUNT UNIT - HVDS)	A6310A		
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (RACKMOUNT UNIT - LVDS)	A6311A		
Requires 1 or 2 Ultrium tape drives (not included); includes empty media magazines for 20 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (STANDALONE UNIT - HVDS)	A6312A		
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (STANDALONE UNIT - LVDS)	A6313A		
Requires 1 or 2 Ultrium tape drives (not included); includes empty media magazines for 20 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (RACKMOUNT UNIT - HVDS)	A6314A		
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (RACKMOUNT UNIT - LVDS)	A6315A		
Requires 2 or 4 Ultrium tape drives (not included); includes empty media magazines for 40 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (STANDALONE UNIT - HVDS)	A6316A		
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (STANDALONE UNIT - LVDS)	A6317A		
Requires 2 or 4 Ultrium tape drives (not included); includes empty media magazines for 40 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (RACKMOUNT UNIT - HVDS)	A6318A		
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (RACKMOUNT UNIT - LVDS)	A6319A		
Requires 2, 4, or 6 Ultrium tape drives (not included); includes empty media magazines for 60 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (STANDALONE UNIT - HVDS)	A6320A		
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (STANDALONE UNIT - LVDS)	A6321A		
Requires 2, 4, or 6 Ultrium tape drives (not included); includes empty media magazines for 60 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 8/80 (STANDALONE UNIT - HVDS)	A6291A		
HP SURESTORE ULTRIUM TAPE LIBRARY 8/80 (STANDALONE UNIT - LVDS)	A6292A		
Requires 2, 6, or 8 Ultrium tape drives (not included); includes empty media magazines for 80 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 10/100 (STANDALONE UNIT - HVDS)	A6293A		
HP SURESTORE ULTRIUM TAPE LIBRARY 10/100 (STANDALONE UNIT - LVDS)	A6294A		
Requires 4 or 10 Ultrium tape drives (not included); includes empty media magazines for 100 cartridges.			
Ultrium Tape Drives– Required with all Ultrium libraries			
HP SureStore Ultrium Tape Drive – HVDS	A6306A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	
HP SureStore Ultrium Tape Drive – HVDS	A6307A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	
Fibre Channel Interfaces			
HP SureStore Fibre Channel Interface – Ultrium LVDS	A4674A		
Factory Installation – Installs fibre channel interface in library at the factory. (Required unless ordering as an accessory.)		OD1	
• HP SureStore Fibre Channel Interface – DLT HVDS	A5590A		
Factory Installation – Installs fibre channel interface in library at the factory. (Required unless ordering as an accessory.)		OD1	
• HP SureStore Fibre Channel Interface – Ultrium HVDS (for field upgrade only)	A4673A		
• HP SureStore Fibre Channel Interface – DLT LVDS (for field upgrade only)	A4687A		
Upgrades, Power Supplies, and Magazines			
• 20 to 40 Slot Upgrade Kit for 2/20 DLT Library	A1378A		
• 40 to 60 Slot Upgrade Kit for 4/40 DLT Library	A1379A		
• 20 to 40 Slot Upgrade Kit for 2/20 Ultrium Library	A6325A		
• 40 to 60 Slot Upgrade Kit for 4/40 Ultrium Library	A6326A		
• 40 Slot Upgrade & Rack Kit for 40 or 60 Slot DLT Library	A6295A		
Use to upgrade either an existing 40 or 60 slot DLT tape library to a 80 or 100 slot DLT tape library. Kit includes a 2 meter rack plus an additional 40 slots. Requires one additional 20 slot upgrade kit (A6359A) if upgrading from an existing 40 slot to 80 slot OR 60 slot to 100 slot configuration.			
Requires two additional 20 slot upgrade kits (A6359A) if upgrading from an existing 40 slot to 100			

Description	Product #	Opt #	Price
slot configuration. Twenty slots will always be left over and unused when transferring an existing system into the 100 slot rack. Requires additional DLT tape drives (not included) to scale to the supported configurations (6/80, 8/80 or 10/100).			
<ul style="list-style-type: none"> 40 Slot Upgrade & Rack Kit for 40 or 60 Slot Ultrium Library 	A6296A		
Use to upgrade either an existing 40 or 60 slot Ultrium tape library to a 80 or 100 slot Ultrium tape Library. Kit includes a 2 meter rack plus an additional 40 slots. Requires one additional 20 slot upgrade kit (A6360A) if upgrading from an existing 40 slot to 80 slot OR 60 slot to 100 slot configuration. Requires two additional 20 slot upgrade kits (A6360A) if upgrading from an existing 40 slot to 100 slot configuration. Twenty slots will always be left over and unused when transferring an existing system into the 100 slot rack. Requires additional Ultrium tape drives (not included) to scale to the supported configurations (6/80, 8/80 or 10/100).			
<ul style="list-style-type: none"> 20 Slot Upgrade Kit for 80 or 100 Slot DLT Library 	A6359A		
Use to upgrade from an existing 40 or 60 slot to 80 or 100 slot tape library. Requires the 100 slot 2 meter rack upgrade kit (A6295A) if upgrading an existing library. Kit can also be used to upgrade a 6/80 or 8/80 configuration to the supported 10/100 configuration. Requires additional DLT tape drives (not included).			
<ul style="list-style-type: none"> 20 Slot Upgrade Kit for 60 to 100 Slot Ultrium Library 	A6360A		
Use to upgrade from an existing 40 or 60 slot to 80 or 100 slot tape library. Requires the 100 slot 2 meter rack upgrade kit (A6296A) if upgrading an existing library. Kit can also be used to upgrade a 6/80 or 8/80 configuration to the supported 10/100 configuration. Requires additional Ultrium tape drives (not included).			
<ul style="list-style-type: none"> 100 Slot to 120 and 140 Slot Upgrade Kit for 6/140 DLT Library 	A4671A	OD1	
Factory installation – installs upgrade kits for 6/140 at the factory. (This option is required with all orders for a 4,6/120 or 4,6/140 slot library; the kit upgrades the library in 20 slot increments. To order a capacity upgrade kit to upgrade from a 100 slot library to a 120 or 140 slot library in the field, use a separate order section and order the capacity upgrade kit without the OD1 option.)			
100 Slot to 120 and 140 Slot Upgrade Kit for 6/140 Ultrium Library	A4668A	OD1	
Factory installation – installs upgrade kits for 6/140 at the factory. (This option is required with all orders for a 4,6/120 or 4,6/140 slot library; the kit upgrades the library in 20 slot increments. To order a capacity upgrade kit to upgrade from a 100 slot library to a 120 or 140 slot library in the field, use a separate order section and order the capacity upgrade kit without the OD1 option.)			
<ul style="list-style-type: none"> Tape Library Redundant Power Supply (for use with 2/20 through 6/140 Ultrium tape libraries) 	A4676A	OD1	
Factory Installation – Installs power supply in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional power supply for upgrade or other purposes, use a separate order section and order the power supply as an accessory without the OD1 option.)			
<ul style="list-style-type: none"> 2/20-6/140 DLT 5-Slot Removable Magazine (with five pieces of media) 	C7236J		
<ul style="list-style-type: none"> 2/20-6/140 DLT 5-Slot Removable Magazine (empty) 	C7235J		
<ul style="list-style-type: none"> 2/20-6/140 Ultrium 5-Slot Removable Magazine (with five pieces of media) 	C9554A		
<ul style="list-style-type: none"> 2/20-6/140 Ultrium 5-Slot Removable Magazine (empty) 	C9553A		
Enclosures and Rack Mount Kits			
<ul style="list-style-type: none"> Desktop Enclosure Kit for 20 Slot Library 	C7204J		
<ul style="list-style-type: none"> Deskside Enclosure Kit for 40 Slot Library 	C7216J		
<ul style="list-style-type: none"> Deskside Enclosure Kit for 60 Slot Library 	C7232J		
<ul style="list-style-type: none"> Rackmount Kit for 2/20 	C7205J		
<ul style="list-style-type: none"> Rackmount Kit for 4/40 	C7217J		
<ul style="list-style-type: none"> Rackmount Kit for 6/60 	C7233J		
Multimode Cables for Tape Drives			
SCSI Cable 0.5m HDTS 68 pin Male/Male Multimode cable	C2978B		
SCSI Cable 1 m HDTS 68 pin Male/Male Multimode cable	C2911C		
SCSI Cable 1.5m HDTS 68 pin Male/Male Multimode cable	C2979B		
SCSI Cable 2.5m HDTS 68 pin Male/Male Multimode cable	C2924C		
SCSI Cable 5 m HDTS 68 pin Male/Male Multimode cable	C7521A		
SCSI Cable 10 m HDTS 68 pin Male/Male Multimode cable	C7522A		
SCSI Cable 1 m VHDS 68 pin Male/Male Multimode cable	C2361B		

Description	Product #	Opt #	Price
SCSI Cable 2.5 m VHDTS 68 pin Male/Male Multimode cable	C2362B		
SCSI Cable 5 m VHDTS 68 pin Male/Male Multimode cable	C2365B		
SCSI Cable 10 m VHDTS 68 pin Male/Male Multimode cable	C2363B		
SCSI Terminator LVDS/SE HDTS 68 Multimode	C2364A		
SCSI Terminator LVDS/SE VHDTS 68 Multimode	C2370A		

4.7.11—SureStore High-End Tape Libraries and Accessories

Description	Product #	Opt #	Price
Tape Libraries			
<ul style="list-style-type: none"> HP SureStore Tape Library 10/180 Requires 1 to 10 DLT drives, 1 to Ultrium drives, 1 to 6 9840 drives or a mixture of all types (not included); includes empty media magazines for 84 cartridges 	A5617A		
<ul style="list-style-type: none"> HP SureStore Tape Library 20/700 Requires 1 to 20 DLT drives, 1 to 20 Ultrium drives, 1 to 12 9840 drives or a mixture of all types (not included); includes empty media magazines for 216 cartridges. 	A5597B		
Tape Drives – Required with all libraries			
<ul style="list-style-type: none"> HP SureStore DLT 8000 Tape Drive for 10/180 or 20/700 Library 	A5599A		
<ul style="list-style-type: none"> HP SureStore Ultrium Tape Drive LVDS for 10/180 or 20/700 Library 	A6322A		
<ul style="list-style-type: none"> HP SureStore Ultrium Tape Drive HVDS for 10/180 or 20/700 Library 	A6323A		
<ul style="list-style-type: none"> HP SureStore 9840 Tape Drive for 10/180 or 20/700 Library <p>Note: Mixing and matching DLT 8000 tape drives, Ultrium tape drives and 9840 tape drives in the same library is supported in the 10/180 and 20/700 libraries. However, since the 9840 tape drive assembly is larger in size than the DLT 8000 tape drive and Ultrium tape drives, it is not a 1:1 ratio between drive types. The correct ratio is approximately 3:1, DLT/Ultrium to 9840 tape drives. Alone, only 12×9840 drives fill the allowable drive space in a 20/700 library and only 6×9840 drives fill the allowable drive space in a 10/180 library. If you are using only DLT 8000 tape drives and Ultrium tape drives the ratio is 1:1 since the Ultrium Tape drive is a little smaller than the DLT tape drives. See HP9000 Configuration Guide for specific combinations of drives.</p>	A5598A		
Upgrade Kits			
<ul style="list-style-type: none"> Expansion module to convert base 10/180 Library from 84 to 140 slots 	A1376A		
<ul style="list-style-type: none"> Expansion module to convert base 10/180 Library from 140 to 174 slots <p>Note: Requires 56 slot expansion (A1376A) to be installed first.</p>	A1377A		
<ul style="list-style-type: none"> Expansion module to convert base 20/700 Library from 216 to 384 slots 	A5604A		
<ul style="list-style-type: none"> Expansion module to convert base 20/700 Library from 384 to 678 slots 	A5605A		
<ul style="list-style-type: none"> Second Drive Tower to convert from 10 drive capacity to 20 drive capacity for 20/700 Library 	A5600A		
<ul style="list-style-type: none"> Second Cartridge Access Port to convert from 20 to 40 cartridge import/export for 20/700 Library 	A5601A		
<ul style="list-style-type: none"> Secondary Power Supply for 10/180 Library 	A6327A		
Multimode Cables for Tape Drives			
<ul style="list-style-type: none"> SCSI Cable 0.5m HDTS 68 pin Male/Male Multimode cable 	C2978B		
<ul style="list-style-type: none"> SCSI Cable 1 m HDTS 68 pin Male/Male Multimode cable 	C2911C		
<ul style="list-style-type: none"> SCSI Cable 1.5m HDTS 68 pin Male/Male Multimode cable 	C2979B		
<ul style="list-style-type: none"> SCSI Cable 2.5m HDTS 68 pin Male/Male Multimode cable 	C2924C		
<ul style="list-style-type: none"> SCSI Cable 5 m HDTS 68 pin Male/Male Multimode cable 	C7521A		
<ul style="list-style-type: none"> SCSI Cable 10 m HDTS 68 pin Male/Male Multimode cable 	C7522A		
<ul style="list-style-type: none"> SCSI Cable 1 m VHDTS 68 pin Male/Male Multimode cable 	C2361B		
<ul style="list-style-type: none"> SCSI Cable 2.5 m VHDTS 68 pin Male/Male Multimode cable 	C2362B		
<ul style="list-style-type: none"> SCSI Cable 5 m VHDTS 68 pin Male/Male Multimode cable 	C2365B		
<ul style="list-style-type: none"> SCSI Cable 10 m VHDTS 68 pin Male/Male Multimode cable 	C2363B		
<ul style="list-style-type: none"> SCSI Terminator LVDS/SE HDTS 68 Multimode 	C2364A		
<ul style="list-style-type: none"> SCSI Terminator LVDS/SE VHDTS 68 Multimode 	C2370A		

Subchapter 4.8—Optical Storage

Description	Product #	Opt #	Price
Magneto-Optical Disk Drives			
<i>Optical Jukeboxes - 14x (9.1 GB Magneto-Optical Disk Drives)</i>			
<ul style="list-style-type: none"> HP SureStore 220mx MO Jukebox (218.4GB) - 1 drive, 24 slots 	C1118M		
MO jukebox with 1 multifunction 9.1 GB optical disk drive, capacity for up to 24 rewritable or CCW WORM optical disks, auto-sensing single-ended / LVD SCSI interface (HDTS 68), one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Upgradeable to 2 drives. Note: Interface cable must be ordered separately.			
<ul style="list-style-type: none"> HP SureStore 220mx MO Jukebox (218.4 GB) - 2 drive, 24 slots 	C1119M		
MO jukebox with 2 multifunction 9.1 GB optical disk drives, capacity for up to 24 rewritable or WORM optical disks, auto-sensing single-ended / LVD SCSI interface (HDTS 68), one 9.1 GB CCW rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Note: Interface cable must be ordered separately.			
<ul style="list-style-type: none"> HP SureStore 300mx MO Jukebox (291.2 GB) - 2 drive, 32 slots 	C1150M		
MO jukebox with 2 multifunction 9.1 GB optical disk drives, capacity for up to 32 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) or Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Upgradeable to 4 drive, 64 slots. Note: Interface cable must be ordered separately			
<ul style="list-style-type: none"> HP SureStore 600mx MO Jukebox (582.4 GB) - 4 drive, 64 slots 	C1160M		
MO jukebox with 4 multifunction 9.1 GB optical disk drives, capacity for up to 64 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) or Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Note: Interface cable must be ordered separately			
<ul style="list-style-type: none"> HP SureStore 700mx MO Jukebox (691.6 GB) - 2 drive, 76 slots 	C1170M		
MO jukebox with 2 multifunction 9.1 GB optical disk drives, capacity for up to 76 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) or Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Note: Interface cable must be ordered separately			
<ul style="list-style-type: none"> HP SureStore 1200mx Jukebox (1164.8 GB) - 4 drive, 128 slots 	C1104M		
MO jukebox with 4 multifunction 9.1 GB optical disk drives, capacity for up to 128 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50)Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector),one year, on-site warranty, freight and installation. Upgradeable to 6 drive/128 slots, 4 drive/238 slots, 6 drive/238 slots or 10 drive/238 slots. Note: Interface cable must be ordered separately			
Delete Installation		0D4	
<ul style="list-style-type: none"> HP SureStore 1200mx Jukebox (1164.8 GB) - 6 drive, 128 slots 	C1105M		
MO jukebox with 6 multifunction 9.1 GB optical disk drives, capacity for up to 128 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50)Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector),one year, on-site warranty, freight and installation. Upgradeable to 6 drive/238 slots or 10 drive/238slots Note: Interface cable must be ordered separately			
<ul style="list-style-type: none"> HP SureStore 2200mx Jukebox (2165.8 GB) - 6 drive, 238 slots 	C1107M		
MO jukebox with 6 multifunction 9.1 GB optical disk drives, capacity for up to 238 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical			

Description	Product #	Opt #	Price
disk (4096 byte/sector), one year, on-site warranty, freight and installation. Upgradeable to 10 drive/238 slots			
Note: Interface cable must be ordered separately			
Delete Installation		OD4	
• HP SureStore 2200mx Jukebox (2165.8 GB) - 10 drive, 238 slots	C1110M		
MO jukebox with 10 multifunction 9.1 GB optical disk drives, capacity for up to 238 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty, freight and installation.			
Note: Interface cable must be ordered separately			
Delete Installation		OD4	
• HP SureStore 2200mx Jukebox (2165.8 GB) - 4 drive, 238 slots	C1111M		
MO jukebox with 4 multifunction 9.1 GB optical disk drives, capacity for up to 238 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty, freight and installation. Upgradeable to 6 drives, 238 slots or 10 drives, 238 slots.			
Note: Interface cable must be ordered separately.			
Delete Installation		OD4	
• HP SureStore 9100mx Optical Subsystem (9.1 GB)	C1114M		
Standalone MO drive with 1 multifunction 9.1 GB optical disk drive, capacity for one rewritable or CCW WORM optical disk, single-ended SCSI interface (HDTS 50), Macintosh, Windows®95/98/2000/NT® drivers, one 9.1 GB rewritable optical disk (4096 byte/sector), one year overnight exchange warranty and freight. Customer installable			
Note: Interface cable must be ordered separately.			
Optical Jukebox Upgrade Kits: 9.1 GB Jukeboxes (Upgrades increase the number of drives and/or capacity)			
• Drive Upgrade Kit for HP SureStore 220mx (1 drive, 24 slot Jukebox)	C5130M		
Includes one 9.1 GB optical disk drive, mounting hardware and installation			
Delete Installation		OD4	
• Drive and Capacity Upgrade for HP SureStore 300mx (2 drive, 32 slot Jukebox)	C1155M		
Includes two 9.1GB optical disk drives, mounting hardware and installation			
Delete Installation		OD4	
• Two Drive Upgrade Kit for 1200mx and 2200mx	C1154M		
Includes two 9.1 GB optical disk drives, mounting hardware and installation			
Delete Installation		OD4	
• Capacity Upgrade Kit for 1200mx	C1159M		
Adds 110 slot capacity. Includes controller electronics, mounting hardware and installation			
Delete Installation		OD4	
• Four Drive Upgrade for 2200mx	C1158M		
Includes four 9.1GB optical disk drives, 2 nd SCSI bus, mounting hardware and installation			
Delete Installation		OD4	
<i>Optical Jukeboxes - 8x (5.2 GB Magneto-Optical Disk Drives)</i>			
• HP Optical Module 5200 Multifunction Disk Drive (5.2 GB)	C1114J		
Includes cabinet, one 8x (5.2 GB) multifunction optical disk drives, capacity for one rewritable or CCW WORM optical disk, single-ended SCSI interface (HDTS 50), users guide, Macintosh, Windows®, and Windows NT® drivers, one 8x (5.2 GB) rewritable optical disk (1024 byte sectors), one SE SCSI terminator, one year overnight exchange warranty and freight. Customer installable.			
Note: Interface cable must be ordered separately.			
<i>Optical Jukebox Upgrade Kits: 5.2GB (8x) Jukeboxes</i> (Upgrades increase the number of drives and/or capacity. Upgrades from 2x-to-4x converted jukeboxes are not supported)			
Model 1/24 one-drive to Model 2/24 two-drive			
• Drive Upgrade Kit for Model 1/24 (and older 1/16)	C5130J		

	Description	Product #	Opt #	Price
	Includes one 5.2 GB optical disk drive, mounting hardware and installation. Delete Installation		OD4	
	Model 2/32 two-drive and 32 slots to Model 4/64 four-drive and 64 slots			
•	Drive Upgrade Kit for Model 2/32	C1155J		
	Includes two 5.2 GB optical disk drives w/electronic capacity upgrade to enable an additional 32 slots. Also includes mounting hardware and installation Delete Installation		OD4	
•	Two-Drive Upgrade Kit for Model 4/128 and 4/238	C1154J		
	Includes two 5.2 GB optical disks and mounting hardware w/installation. Delete Installation		OD4	
•	Capacity Upgrade Kit for 4/128 to 4/238	C1159J		
	Add 110 slots capacity Delete Installation		OD4	
•	Four-Drive Upgrade from 6-drive 238 slot jukebox to 10-drive 238-slot jukebox w/SCSI bus	C1158J		
	Delete Installation <i>Optical Jukebox Conversion Kits: 4x to 14x</i> (Conversion Kits exchange previous generation drives for next generation drives)		OD4	
•	80fx to 300mx Conversion Kit	C5131M		
	Exchanges two 9.1 GB drives for two 2.6 GB drives. Includes installation. Delete Installation		OD4	
•	160fx to 600mx Conversion Kit	C5132M		
	Exchanges four 9.1 GB drives for four 2.6 GB drives. Includes installation Delete Installation		OD4	
•	200fx to 700mx Conversion Kit	C5133M		
	Exchanges two 9.1 GB drives for two 2.6 GB drives. Includes installation Delete Installation		OD4	
•	330fx to 1200mx Conversion Kit	C5138M		
	Exchanges four 9.1 GB drives for four 2.6 GB drives. Includes installation Delete Installation		OD4	
•	600fx to 2200mx Conversion Kit	C5139M		
	Exchanges four 9.1 GB drives for four 2.6 GB drives. Includes installation Delete Installation		OD4	
	Optical Jukebox Conversion Kits: 8x to 14x (Conversion Kits exchange previous generation drives for next generation drives)			
•	125ex to 220mx Conversion Kit	C5130M		
	Exchanges one 9.1 GB drive for one 5.2 GB drive. Includes installation Delete Installation		OD4	
•	160ex to 300mx Conversion Kit	C5131M		
	Exchanges two 9.1 GB drives for two 5.2 GB drives. Includes installation Delete Installation		OD4	
•	320ex to 600mx Conversion Kit	C5187M		
	Exchanges four 9.1 GB drives for four 5.2 GB drives. Includes installation Delete Installation		OD4	
•	400ex to 700mx Conversion Kit	C5188M		
	Exchanges two 9.1 GB drives for two 5.2 GB drives. Includes installation Delete Installation		OD4	
•	660ex to 1200mx Conversion Kit			
	Exchanges four 9.1 GB drives for four 5.2 GB drives. Includes installation Delete Installation	C5138M	OD4	
•	1200ex to 2200mx Conversion Kit			
	Exchanges four 9.1 GB drives for four 5.2 GB drives. Includes installation	C5189M		

Description	Product #	Opt #	Price
Delete Installation		0D4	
14x Optical Disks: Single Disks			
• 5.25 inch 9.1 GB rewritable optical disk - 4096 bytes per sector	C7983A		
• 5.25 inch 9.1 GB WORM optical disk - 4096 bytes per sector	C7984A		
• 5.25 inch 8.6 GB rewritable optical disk - 2048 bytes per sector	C7985A		
• 5.25 inch 8.6 GB WORM optical disk - 2048 bytes per sector	C7986A		
• 5.25 inch 9.1 GB rewritable optical disk - 1024 bytes per sector	C7987A		
• 5.25 inch 9.1 GB rewritable optical disk - 512 bytes per sector	C7988A		
8x Optical Disks: Single Disks			
• 5.25-inch 5.2 GB rewritable optical disk - 1024 bytes per sector	88143J		
• 5.25-inch 5.2 GB WORM optical disk - 1024 bytes per sector	88145J		
• 5.25-inch 5.2 GB rewritable optical disk - 2048 bytes per sector	88147J		
• 5.25-inch 5.2 GB WORM optical disk - 2048 bytes per sector	88146J		
4x Optical Disks: single disks			
• 5.25-inch 2.6 GB rewritable optical disk - 1024 bytes per sector	92280F		
• 5.25-inch 2.6 GB WORM optical disk - 1024 bytes per sector	92290F		
• 5.25-inch 2.3 GB rewritable optical disk - 512 bytes per sector	92279F		
• 5.25-inch 2.3 GB WORM optical disk - 512 bytes per sector	92289F		
2x Optical Disks: single disks			
• 5.25-inch 1.3 GB rewritable optical disk - 1024 bytes per sector	92280T		
• 5.25-inch 1.3 GB WORM optical disk - 1024 bytes per sector	92290T		
• 5.25-inch 1.2 GB rewritable optical disk - 512 bytes per sector	92279T		
• 5.25-inch 1.2 GB WORM optical disk - 512 bytes per sector	92289T		

Subchapter 4.9—disk arrays

4.9.1—surestore disk array 12H (with AutoRAID technology) 12H w/FC MUX

Description	Product #	Opt #	Price
HP Surestore Disk Array 12H (with AutoRAID technology) 12H with FC MUX (FC MUX optional) <i>(To place orders for 12H with FC MUX, refer to sample order menus in the Design Guide at http://eps.rose.hp.com. (This site not available to channel partners) Full factory integration (including racking and cabling) is available only for configurations described in the Design Guide. Order A5147A for full factory integration of storage configurations described in the Design Guide. All cables [C2924A, C5167A, C2925A, and C2911A] must be ordered with the OD1 option to ensure factory integration.)</i>			
<ul style="list-style-type: none"> Deskside Disk Array with AutoRAID 	A3700AD		
<i>Standard Array Includes:</i> Deskside Array Enclosure Two Empty Controller slots Two Power Supplies (third power supply option available) Three Fan Modules Twelve empty Disk Slots 0.5 m Ultra-Flexible SCSI cable Fast Wide Differential SCSI Terminator Factory Installation into Deskside Cabinet Owners Guide and general usage document			
High Availability Options			

Description	Product #	Opt #	Price
Third Power Supply Option		002	
Storage Capacity Options (Minimum of 4 drives required)			
4x18.2 GB 10K rpm Disk drive modules		184	
5x18.2 GB 10K rpm Disk drive modules		185	
8x18.2 GB 10K rpm Disk drive modules		188	
12x18.2 GB 10K rpm Disk drive modules		192	
4x36.4 GB 10K rpm Disk drive modules		504	
5x36.4 GB 10K rpm Disk drive modules		505	
8x36.4 GB 10K rpm Disk drive modules		508	
12x36.4 GB 10K Disk drive modules		512	
Controllers (Must select Option 200 or Option 203)			
One 96 MB HP Disk Array Controller with AutoRAID		200	
Two 96 MB HP Disk Array Controllers with AutoRAID		203	
Cable Options			
0.9 m 68-pin high-density male to 68-pin high-density male cable		801	
2.5 m 68-pin high-density male to 68-pin high-density male cable		802	
5.0 m 68-pin high-density male to 68-pin high-density male cable		803	
10.0 m 68-pin high-density male to 68-pin high-density male cable		804	
CA – 1M 68 Pin LP to 68 Pin HD LP		806	
CA – 2.5M 68 Pin LP to 68 Pin HD LP		807	
CA – 5.0M 68 Pin LP to 68 Pin HD LP		808	
CA – 10M 68 Pin LP to 68 Pin HD LP		809	
1.0M VHDCI to 68 Pin HD Cable		811	
2.5M VHDCI to 68 Pin HD Cable		812	
5.0M VHDCI to 68 Pin HD Cable		813	
10.0M VHDCI to 68 Pin HD Cable		814	
2M V CBL VHDCI – VHDCI – 68 Pin HD		841	
2M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		842	
2M V CBL 68 Pin HD – VHDCI – 68 Pin HD		843	
2M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		844	
4M V CBL VHDCI – VHDCI – 68 Pin HD		B25	
4M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		B26	
4M V CBL 68 Pin HD – VHDCI – 68 Pin HD		B27	
4M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		B28	
2.0 m V cable - 68-pin high-density male		840	
10.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		851	
2/5 m V in-line terminator cable - 68-pin high-density male for V-Class		871	
2/3 m V in-line terminator cable - 68-pin high-density male for V-Class		873	
5.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		875	
• SCSI Cable 0.5m VHDTS68/HDTS68 HVD ILT M/F	C7519A		
Configuration Tools			
NT Support Kit (This software is required for the array to work with NT systems.)		ASJ	
MPE Tracking (This option should be ordered with all arrays that will be connected to MPE systems. This is a configuration tracking solution only.)		003	
Supporting Software (CD-ROMs)			
• Supporting Software (This software is required for the array to work with HP-UX. The customer is not required to order more than one per installation site. If the array is ordered as part of an integrated system order, B6191AA need not be ordered because the necessary supporting software is automatically included with the HP-UX order.)	B6191AA		
• Rackmount HP Surestore Disk Array 12H (with AutoRAID technology)	A3700A		
<i>Standard Array Includes:</i>			
Rackmount Array Enclosure			
Two Empty Controller slots			
Two Power Supplies (third power supply option available)			
Three Fan Modules			
Twelve Empty Half-Height Disk Slots			
0.5 m Ultra-Flexible SCSI cable			

Description	Product #	Opt #	Price
Fast Wide Differential SCSI Terminator			
Owners Guide and general usage document			
High Availability Options			
Third Power Supply Option		002	
Storage Capacity Options (Minimum of 4 drives required)			
4x18.2 GB 10K rpm Disk drive modules		184	
5x18.2 GB 10K rpm Disk drive modules		185	
8x18.2 GB 10K rpm Disk drive modules		188	
12x18.2 GB 10K rpm Disk drive modules		192	
4x36.4 GB 10K rpm Disk drive modules		504	
5x36.4 GB 10K rpm Disk drive modules		505	
8x36.4 GB 10K rpm Disk drive modules		508	
12x36.4 GB 10K Disk drive modules		512	
Controllers (Must select Option 200 or Option 203)			
One 96 MB HP Disk Array Controller with AutoRAID		200	
Two 96 MB HP Disk Array Controllers with AutoRAID		203	
Cable Options			
0.9 m 68-pin high-density male to 68-pin high-density male cable		801	
2.5 m 68-pin high-density male to 68-pin high-density male cable		802	
5.0 m 68-pin high-density male to 68-pin high-density male cable		803	
10.0 m 68-pin high-density male to 68-pin high-density male cable		804	
CA – 1M 68 Pin LP to 68 Pin HD LP		806	
CA – 2.5M 68 Pin LP to 68 Pin HD LP		807	
CA – 5.0M 68 Pin LP to 68 Pin HD LP		808	
CA – 10M 68 Pin LP to 68 Pin HD LP		809	
1.0M VHDCI to 68 Pin HD Cable		811	
2.5M VHDCI to 68 Pin HD Cable		812	
5.0M VHDCI to 68 Pin HD Cable		813	
10.0M VHDCI to 68 Pin HD Cable		814	
2M V CBL VHDCI – VHDCI – 68 Pin HD		841	
2M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		842	
2M V CBL 68 Pin HD – VHDCI – 68 Pin HD		843	
2M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		844	
4M V CBL VHDCI – VHDCI – 68 Pin HD		B25	
4M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		B26	
4M V CBL 68 Pin HD – VHDCI – 68 Pin HD		B27	
4M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		B28	
2.0 m V cable – 68-pin high-density male		840	
10.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		851	
2/5 m V in-line terminator cable – 68-pin high-density male for V-Class		871	
2/3 m V in-line terminator cable – 68-pin high-density male for V-Class		873	
5.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		875	
• SCSI Cable 0.5m VHDS68/HDTS68 HVD ILT M/F	C7519A		
Configuration Tools			
NT Support Kit (This software is required for the array to work with NT systems.)		ASJ	
MPE Tracking (This option should be ordered with all arrays that will be connected to MPE systems. This is a configuration tracking solution only.)		003	
Supporting Software (CD-ROMs)			
Supporting Software (This software is required for the array to work with HP-UX. The customer is not required to order more than one per installation site. If the array is ordered as part of an integrated system order, B6191AA need not be ordered because the necessary supporting software is automatically included with the HP-UX order.)	B6191AA		
• Factory-Racked HP Surestore Disk Array 12H (with AutoRAID technology)	A3700AZ		
<i>Standard Array Includes:</i>			
Factory Racked Enclosure			
Two Empty Controller slots			

Description	Product #	Opt #	Price
Two Power Supplies (third power supply option available)			
Three Fan Modules			
Twelve Empty Half-Height Disk Slots			
0.5 m Ultra-Flexible SCSI cable			
Fast Wide Differential SCSI Terminator			
Owners Guide and general usage document			
High Availability Options			
Third Power Supply Option		002	
Storage Capacity Options (Minimum of 4 drives required)			
4x18.2 GB 10K rpm Disk drive modules		184	
5x18.2 GB 10K rpm Disk drive modules		185	
8x18.2 GB 10K rpm Disk drive modules		188	
12x18.2 GB 10K rpm Disk drive modules		192	
4x36.4 GB 10K rpm Disk drive modules		504	
5x36.4 GB 10K rpm Disk drive modules		505	
8x36.4 GB 10K rpm Disk drive modules		508	
12x36.4 GB 10K Disk drive modules		512	
Controllers (Must select Option 200 or Option 203)			
One 96 MB HP Disk Array Controller with AutoRAID		200	
Two 96 MB HP Disk Array Controllers with AutoRAID		203	
Cable Options			
0.9 m 68-pin high-density male to 68-pin high-density male cable		801	
2.5 m 68-pin high-density male to 68-pin high-density male cable		802	
5.0 m 68-pin high-density male to 68-pin high-density male cable		803	
10.0 m 68-pin high-density male to 68-pin high-density male cable		804	
CA – 1M 68 Pin LP to 68 Pin HD LP		806	
CA – 2.5M 68 Pin LP to 68 Pin HD LP		807	
CA – 5.0M 68 Pin LP to 68 Pin HD LP		808	
CA – 10M 68 Pin LP to 68 Pin HD LP		809	
1.0M VHDCI to 68 Pin HD Cable		811	
2.5M VHDCI to 68 Pin HD Cable		812	
5.0M VHDCI to 68 Pin HD Cable		813	
10.0M VHDCI to 68 Pin HD Cable		814	
2M V CBL VHDCI – VHDCI – 68 Pin HD		841	
2M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		842	
2M V CBL 68 Pin HD – VHDCI – 68 Pin HD		843	
2M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		844	
4M V CBL VHDCI – VHDCI – 68 Pin HD		B25	
4M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		B26	
4M V CBL 68 Pin HD – VHDCI – 68 Pin HD		B27	
4M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		B28	
2.0 m V cable - 68-pin high-density male		840	
10.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		851	
2/5 m V in-line terminator cable - 68-pin high-density male for V-Class		871	
2/3 m V in-line terminator cable - 68-pin high-density male for V-Class		873	
5.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		875	
• SCSI Cable 0.5m VHDTS68/HDTS68 HVD ILT M/F	C7519A		
Configuration Tools			
NT Support Kit (This software is required for the array to work with NT systems.)		ASJ	
MPE Tracking (This option should be ordered with all arrays that will be connected to MPE systems. This is a configuration tracking solution only.)		003	
Supporting Software (CD-ROMs)			
Supporting Software (This software is required for the array to work with HP-UX. The customer is not required to order more than one per installation site. If the array is ordered as part of an integrated system order, B6191AA need not be ordered because the necessary supporting software is automatically included with the HP-UX order.)	B6191AA		

	Description	Product #	Opt #	Price
Add-On/Upgrade Products				
•	18.2 GB disk drive module 10K RPM S/E (54 mm disk module) (Must have all 3 fan modules A3709B)*	A3714A		
•	36.4 GB disk drive module 10K RPM S/E (54 mm disk module) (Must have all 3 fan modules A3709B)*	A6518A		
•	Power supply option (one power supply with no cable)	A3708A		
	Power cable option for racked configurations		004	
	Power cable option for wall outlets (localized according to country of origin of the order)		006	
•	12H Power Upgrade Kit (For use of upgrade kit in FC storage solutions, refer to the HP 9000 Enterprise Servers Configuration Guide. Choose Option OD1 for basic factory integration into rack)	A4915A		
	U.S. – English Localization		ABA	
	Europe (HPSA) – English Localization		ABB	
	200 – 240 V UPS 4.5 m Power Cable		024	
•	Fan Module	A3709B		
•	96 MB HP Disk Array Controller with AutoRAID	A3706A		
•	Fast Wide Differential SCSI Terminator	C2905A		
•	0.5 m Ultra-Flexible SCSI Cable	C2981A		
•	SCSI Cable 0.5m VHDS68/HDTS68 HVD ILT M/F	C7519A		
•	5.0 m 68-pin high-density male to 68-pin high-density male cable	A5167A		
•	Empty deskside cabinet (allows conversion of rackmounted unit to deskside unit)	A3701A		
•	Enterprise Storage Integration Product (for full factory integration of storage configurations) Described in the Design Guide (http://eps.rose.hp.com) (Site not available to channel partners)	A5147A		
•	CD-ROM FW upgrade kit (for single controller solutions)	A5284B		
•	PCI Differential UW SCSI HBA for NT	A5252A		
•	Software Integration Kit for NT	A5253C		
•	Front Door for 12H – Quartz Grey (For Parchment White door replacement)	A5329A		

* A3700A, A3700AD & A3700AZ enclosures ordered before 02 April 98, need to be upgraded with all 3 fan modules A3709B. Upgraded module is identified by a bubble label. Previous label was flat.

4.9.2—HP Surestore Virtual Array 7100

US List

Ordering Notes:

Choose ordering methodology:

Field Rackable Pre-Defined SKUs

Factory Racked Pre-Defined SKUs

Field Rackable “Build From Scratch”

Factory Racked “Build From Scratch”

Choose appropriate base controller enclosure unit and base unit disks

Choose desired disk system enclosure unit and disks based on chosen ordering methodology

Minimum of 4 disks are required per VA 7100

Maximum of 15 disks per VA 7400

All enterprise factory integrated products include appropriate disk filler panels

Commercial Channel specific products are no longer available. The VA Family has completed the “Universal Product Merge”

Factory SKU’s are no longer available for single controller or deskside units. Please see the following examples for how to order

How to order a single controller VA 7100 (with factory integration)

Table 1

	Product Number	Option	Description
<i>Count</i>			

1	A6183A		Virtual Array Enclosure
1	A6188A		Virtual Array Processor – One minimum, two per enclosure max
1	A6188A	OD1	Factory Integration
1	A6186A		512MB Cache for Virtual Array Processor – one per Virtual Array Processor
1	A6185A	OD1	Factory Integration
1	A6203A		SW GBIC for SureStore VA series – one per Virtual Array Processor
1	A6203A	OD1	Factory Integration
15	A6194A		Enterprise Class 73GB 10K RPM FC HDD (min 4)
15	A6194A	OD1	Factory Integration

How to order a deskside VA 7100 (with factory integration)

Table 2

<i>Count</i>	Product Number	Option	Description
1	A6183AD		Virtual Array Enclosure
2	A6188A		Virtual Array Processor – One minimum, two per enclosure max
2	A6188A	OD1	Factory Integration
2	A6186A		512MB Cache for Virtual Array Processor – one per Virtual Array Processor
2	A6185A	OD1	Factory Integration
2	A6203A		SW GBIC for SureStore VA series – one per Virtual Array Processor
2	A6203A	OD1	Factory Integration
15	A6194A		Enterprise Class 73GB 10K RPM FC HDD (min 4)
15	A6194A	OD1	Factory Integration

Description	Product #	Opt #	Price
VA 7100 Field Rackable Controller Enclosure, w/ Dual Controllers			
<ul style="list-style-type: none"> VA 7100 w/ Dual Controller 256MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 256MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS 	A6261A		
<ul style="list-style-type: none"> Enterprise Class 18GB 15K RPM FC HDD (min 4) 	A6191A	OD1	
<ul style="list-style-type: none"> Enterprise Class 36GB 10K RPM FC HDD (min 4) 	A6192A	OD1	
<ul style="list-style-type: none"> Enterprise Class 36GB 15K RPM FC HDD (min 4) 	A6193A	OD1	
<ul style="list-style-type: none"> Enterprise Class 73GB 10K RPM FC HDD (min 4) 	A6194A	OD1	
<ul style="list-style-type: none"> VA 7100 w/ Dual Controller 512MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS 	A6262A		
<ul style="list-style-type: none"> Enterprise Class 18GB 15K RPM FC HDD (min 4) 	A6191A	OD1	
<ul style="list-style-type: none"> Enterprise Class 36GB 10K RPM FC HDD (min 4) 	A6192A	OD1	
<ul style="list-style-type: none"> Enterprise Class 36GB 15K RPM FC HDD (min 4) 	A6193A	OD1	
<ul style="list-style-type: none"> Enterprise Class 73GB 10K RPM FC HDD (min 4) 	A6194A	OD1	
<ul style="list-style-type: none"> VA 7100 w/ Dual Controller 1024MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS 	A6263A		
<ul style="list-style-type: none"> Enterprise Class 18GB 15K RPM FC HDD (min 4) 	A6191A	OD1	
<ul style="list-style-type: none"> Enterprise Class 36GB 10K RPM FC HDD (min 4) 	A6192A	OD1	
<ul style="list-style-type: none"> Enterprise Class 36GB 15K RPM FC HDD (min 4) 	A6193A	OD1	
<ul style="list-style-type: none"> Enterprise Class 73GB 10K RPM FC HDD (min 4) 	A6194A	OD1	
VA 7100 Factory Racked Controller Enclosure, w/ Dual Controllers			
<ul style="list-style-type: none"> VA 7100 w/ Dual Controller 256MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 256MB, User Guide, RS232 	A6261AZ		

Description	Product #	Opt #	Price
Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS			
• Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
VA 7100 w/ Dual Controller 512MB Cache	A6262AZ		
includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS			
• Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
• VA 7100 w/ Dual Controller 1024MB Cache	A6263AZ		
includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS			
• Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
Module products			
• Virtual Array Enclosure	A6183A		
• Virtual Array Enclosure – Deskside (VA 7 100 ONLY)	A6183AD		
• Virtual Array Processor – One minimum, two per enclosure max	A6188A		
• 256MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6185A		
• 512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A		
• 1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A		
• Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
• SW GBIC for SureStore VA series – one per Virtual Array Processor	A6203A		
Cables & Accessories			
• Deskside Cab for Virtual Array Series	A6196A		
• 2 meter FC fibre optic cable	A3583A		
• 16 meter FC fibre optic cable	A3531A		
• 50 meter FC fibre optic cable	A3735A		
• 100 meter FC fibre optic cable	A3736A		
• VAP/LCC filler panel	A6197A		
• Disk Slot filler panel	A6198A		
Software			
• COMMAND VIEW SDM 1 HOST LTU AND SW KIT	T1001A		
• Enterprise Integrations for Command View SDM	T1002A		
• Secure Manager Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1003A		
• Secure Manager Virtual Array 500GB LTU	T1004A		
• Secure Manager Virtual Array 1TB LTU	T1005A		
• Business Copy Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1007A		
• Business Copy Virtual Array 500GB LTU	T1008A		
• Business Copy Virtual Array 1TB LTU	T1009A		
• Auto Path Virtual Array Windows 2000 1 Host LTU w/SW Media Kit (required for enablement)	T1011A		
• Auto Path Virtual Array Windows 2000 1 Host LTU	T1012A		
• Auto Path Virtual Array Windows 2000 5 Host LTU	T1013A		
• Auto Path Virtual Array Windows NT 4.0 1 Host LTU w/SW Media Kit (required for enablement)	T1039A		

	Description	Product #	Opt #	Price
•	Auto Path Virtual Array Windows NT 4.0 1 Host LTU	T1040A		
•	Auto Path Virtual Array Windows NT 4.0 5 Host LTU	T1041A		
•	Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU w/SW Media Kit (required for enablement)	T1060A		
•	Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU	T1061A		
•	Auto Path Virtual Array HP-UX 11.0/11.i 5 Host LTU	T1062A		
•	Fast Recovery Solutions for MS Exchange 2000	B9550A		

4.9.3—HP Surestore Virtual Array 7400

US List

Ordering Notes:

Choose ordering methodology:

Field Rackable Pre-Defined SKUs

Factory Racked Pre-Defined SKUs

Field Rackable “Build From Scratch”

Factory Racked “Build From Scratch”

Choose appropriate base controller enclosure unit and base unit disks

Choose desired disk system enclosure unit and disks based on chosen ordering methodology

Minimum of 10 disks are required per VA 7400 controller pair

Minimum of 4 drives of chosen capacity type per VA 7400 controller pair

Minimum of 2 drives per DS2405 enclosure

All enterprise factory integrated products include appropriate disk filler panels

Commercial Channel specific products are no longer available. The VA Family has completed the “Universal Product Merge”

	Description	Product #	Opt #	Price
	VA 7400 Field Rackable Controller Enclosure, w/ Dual Controllers			
•	VA 7400 w/ Dual Controller 512MB Cache – order additional disk systems separately includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet	A6264A		
•	Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
•	VA 7400 w/ Dual Controller 1024MB Cache– order additional disk systems separately includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet	A6265A		
•	Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
	VA 7400 Factory Racked Controller Enclosure, w/ Dual Controllers			
•	VA 7400 w/ Dual Controller 512MB Cache– order additional disk systems separately includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet	A6264AZ		
•	Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
•	VA 7400 w/ Dual Controller 1024MB Cache– order additional disk systems separately	A6265AZ		

Description	Product #	Opt #	Price
includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord, (2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet			
• Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
Virtual Array Family Modules – Integrated Build From Scratch Field Rackable			
• Virtual Array Enclosure- Field Rackable <i>includes:</i> VA Enclosure, User Guide, Installation Guide, Documentation Map, (2) power cord, HP CommandView SDM, HP-UX Patch Alert Data Sheet and disk filler panels	A6183A		
• Virtual Array Processor 7400 – two per enclosure required	A6189A	OD1	
• 512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A	OD1	
• 1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A	OD1	
• Enterprise Class 18GB 15K RPM FC HDD – may mix capacity points	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD – may mix capacity points	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD – may mix capacity points	A6194A	OD1	
Virtual Array Family Modules – Integrated Build From Scratch Factory Racked			
• Virtual Array Enclosure – Factory Racked <i>includes:</i> VA Enclosure, User Guide, Installation Guide, Documentation Map, (2) power cord, HP CommandView SDM, HP-UX Patch Alert Data Sheet and disk filler panels	A6183AZ		
• Virtual Array Processor 7400 – two per enclosure required	A6189A	OD1	
• 512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A	OD1	
• 1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A	OD1	
• Enterprise Class 18GB 15K RPM FC HDD – may mix capacity points	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD – may mix capacity points	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2400)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD – may mix capacity points	A6194A	OD1	
DS2400 WILL BE REPLACED WITH THE DS2405			
DS 2400 Field Rackable Disk Enclosure w/ Dual Link Control Cards			
• DS 2400 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy, (2) power cord, 2 FC Optical LC/LC Cables	A6214A		
• Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2400)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2400)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2400)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2400)	A6194A	OD1	
DS 2400 Factory Racked Disk Enclosure w/ Dual Link Control Cards			
• DS 2400 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy, (2) power cord, 2 FC Optical LC/LC Cables	A6214AZ		
• Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2400)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2400)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2400)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2400)	A6194A	OD1	
DS 2405 Field Rackable Disk Enclosure w/ Dual Link Control Cards			
• DS 2405 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy and (2) power cord. Cables are NOT included and must be ordered separately. Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM version 1.04 or later.	A6250A		
• Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2405)	A6191A	OD1	223
• Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2405)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2405)	A6193A	OD1	

	Description	Product #	Opt #	Price
•	Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2405)	A6194A	OD1	
	DS 2405 Factory Racked Disk Enclosure w/ Dual Link Control Cards			
•	DS 2405 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy and (2) power cord. Cables are NOT included and must be ordered separately. Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM version 1.04 or later.	A6250AZ		
•	Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2405)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2405)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2405)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2405)	A6194A	OD1	

4.9.4—virtual array family upgrade products

	Description	Product #	Opt #	Price
	Virtual Array Family Upgrade Products			
•	Virtual Array Enclosure- Field Rackable <i>includes:</i> VA Enclosure, User Guide, Installation Guide, Documentation Map, (2) power cord, HP CommandView SDM, HP-UX Patch Alert Data Sheet and NO DISK FILLER PANELS	A6183A		
•	DS 2400 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, (2) power cord, 2 FC Optical LC/LC cables NO DISK	A6214A		
	DS 2405 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, (2) power cord NO DISK FILLER PANELS. Cables are NOT included and must be ordered separately.	A6250A		
•	Virtual Array Processor 7400 – two per enclosure required	A6189A		
•	512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A		
•	1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A		
•	Enterprise Class 18GB 15K RPM FC HDD – may mix capacity points	A6191A		
•	Enterprise Class 36GB 10K RPM FC HDD – may mix capacity points	A6192A		
•	Enterprise Class 36GB 15K RPM FC HDD – may mix capacity points	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD – may mix capacity points	A6194A		
•	Disk Slot filler panel – must order one per empty disk slot	A6198A		
	LC/LC Cables			
•	FC Cable 2m LC Duplex 50/125 M/M Optical	C7524A		
•	FC Cable 16m LC 50/125 LC/LC M/M Optical	C7525A		
•	FC Cable 50m LC Duplex 50/125 M/M Optical	C7526A		
•	FC Cable 200m LC Duplex 50/125 M/M Optical	C7527A		
	LC/SC Adapter Cables			
•	FC Cable 2m LC/SC Duplex 50/125 M/M Optical	C7529A		
•	FC Cable 16m LC/SC Duplex 50/125 M/M Optical	C7530A		
•	Fibre Channel SC F/F Couple Optical –for use with C7529A, C7530A	C7534A		
•	Fibre Channel Adapter Kit - Optical (includes the C7529A and C7534A)	C7540A		
	Rack Kit Accessories			
•	System/E Rail Kit	A6209A		
•	RBI Rack Rail Kit for VA Family	A6244A		
•	Compaq 9000 Rack Rail Kit SF21	A5672A		
	Software			
•	COMMAND VIEW SDM 1 HOST LTU AND SW KIT	T1001A		
•	Enterprise Integrations for Command View SDM	T1002A		
•	Secure Manager Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1003A		
•	Secure Manager Virtual Array 500GB LTU	T1004A		
•	Secure Manager Virtual Array 1TB LTU	T1005A		
•	Secure Manager Virtual Array 5TB LTU	T1006A		

Description	Product #	Opt #	Price
• Business Copy Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1007A		
• Business Copy Virtual Array 500GB LTU	T1008A		
• Business Copy Virtual Array 1TB LTU	T1009A		
• Business Copy Virtual Array 5TB LTU	T1010A		
• Auto Path Virtual Array Windows 2000 1 Host LTU w/SW Media Kit (required for enablement)	T1011A		
• Auto Path Virtual Array Windows 2000 1 Host LTU	T1012A		
• Auto Path Virtual Array Windows 2000 5 Host LTU	T1013A		
• Auto Path Virtual Array Windows NT 4.0 1 Host LTU w/SW Media Kit (required for enablement)	T1039A		
• Auto Path Virtual Array Windows NT 4.0 1 Host LTU	T1040A		
• Auto Path Virtual Array Windows NT 4.0 5 Host LTU	T1041A		
• Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU w/SW Media Kit (required for enablement)	T1060A		
• Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU	T1061A		
• Auto Path Virtual Array HP-UX 11.0/11.i 5 Host LTU	T1062A		
• Fast Recovery Solutions for MS Exchange 2000	B9550A		

4.9.5—hp surestore disk array fc60

US List

Description	Product #	Opt #	Price
<ul style="list-style-type: none"> Surestore Disk Array FC60, Field Rackable <p>Requires one to six A5294A Disk Systems to form an array. Requires HP-UX 10.20 or later.</p> <p><i>Standard Array Includes:</i></p> <ul style="list-style-type: none"> – Rackmount enclosure with two empty controller slots – Two power supplies – Two fan modules – One battery backup unit (BBU) – Two power cords – Mounting rails for HP cabinets – Terminators for unused SCSI ports – ½ U Filler Panels – User manuals 	A5277A		
Controllers (Must select one option)			
Single controller with 256 MB cache, HP-UX firmware, one Media Interface Adapter and one filler panel		203	
Dual controllers with 256 MB mirrored cache and two Media Interface Adapters, HP-UX firmware		204	
Dual controllers with 256 MB mirrored cache and two Media Interface Adapters, Windows firmware		205	
Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, HP-UX firmware		304	
Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, Windows firmware		305	
Host Connect Cable Options			
2 meter Fibre Channel Cable		0Z4	
16 meter Fibre Channel Cable		AFY	
50 meter Fibre Channel Cable		0Z5	
• Supporting Software for HP-UX (CD-ROMs)	B6191AA		
• NT Support for the FC60, for converting HP-UX firmware to Windows	A5628A		
• 8-Partition support for Windows	A5649A		
Enter the following selection as a sub-item to the A5277A product above			
• Surestore Disk System SC10, Array Integrated, Field Rackable	A5294A		
This product may only be ordered in conjunction with the A5277A. To order a SC10 without integration into an array, order A5272A. Array Integrated product includes:			
– Rackmount enclosure that accommodates 10 disk modules (1.6" or 1")			

Description	Product #	Opt #	Price
– Two power supplies			
– Two fan modules			
– Two power cords			
– Two bus controller card modules (with enclosure monitoring)			
– Mounting rails for HP cabinets			
– User manuals			
– Two SCSI bus terminators			
– ½ U filler panel			
– One or two 2 meter VHDCI SCSI cables for connection to the A5277A. The number of cables included depends upon how many A5294As are connected to the A5277A.			
<u>Number of A5294A per A5277A</u> <u>Number of SCSI cables per A5294A</u>			
1, 2, or 3 2			
4, 5, or 6 1			
Storage Capacity Options			
Note: All disk systems ordered with a single A5277A must have identical Storage Capacity Options.			
Qty 4 18GB 10K RPM disk drive modules		204	
Qty 8 18GB 10K RPM disk drive modules		208	
Qty 10 18GB 10K RPM disk drive modules		210	
Qty 4 36GB 10K RPM disk drive modules		304	
Qty 8 36GB 10K RPM disk drive modules		308	
Qty 10 36GB 10K RPM disk drive modules		310	
Qty 4 73GB 10K RPM disk drive modules		404	
Qty 8 73GB 10K RPM disk drive modules		408	
Qty 10 73GB 10K RPM disk drive modules		410	
73GB 10K RPM disk drive modules (Note: Need to order quantity of 1 to 10 per enclosure)		350	
Qty four 18.2GB 15K RPM Ultra2 SCSI Disk Drive		504	
Qty eight 18.2GB 15K RPM Ultra2 SCSI Disk Drive		508	
Qty ten 18.2GB 15K RPM Ultra2 SCSI Disk Drive		510	
Custom cable options (use only if customer requires a non-standard configuration)			
Delete a 2m cable included in A5294A and add a 5m VHDCI SCSI cable for Connection to A5277A (suitable for connection of A5277A to A5294A in a different rack)		701	
• Surestore Disk Array FC60, Factory Racked	A5277AZ		
Requires one to six A5294AZ Disk Systems to form an array. Requires HP-UX 10.20 or later.			
<i>Standard Array Includes:</i>			
– Rackmount enclosure with two empty controller slots			
– Two power supplies			
– Two fan modules			
– One battery backup unit (BBU)			
– Two power cords			
– Mounting rails for HP cabinets			
– Terminators for unused SCSI ports			
– User manuals			
– Factory integrated into specified rack			
Controllers (Must select one option)			
Single controller with 256 MB cache, HP-UX firmware, one Media Interface Adapter and one filler panel		203	
Dual controllers with 256 MB mirrored cache and two Media Interface Adapters		204	
Dual controllers with 256 MB mirrored cache and two Media Interface Adapters, Windows firmware		205	
Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, HP-UX firmware		304	
Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, Windows firmware		305	

	Description	Product #	Opt #	Price
	Host Connect Cable Options			
	2 meter Fibre Channel Cable		0Z4	
	16 meter Fibre Channel Cable		AFY	
	50 meter Fibre Channel Cable		0Z5	
	Operating System Support Option (Must select one option)			
	Support for HP-UX 11.0		UM4	
	Enter the following selection as a sub-item to the A5277AZ product above			
•	[Brand name] Disk System SC10, Array Integrated, Factory Racked	A5294AZ		
	This product may only be ordered in conjunction with the A5277AZ. To order a SC10 without Integration into an array, order A5272AZ. Array Integrated product includes:			
	– Rackmount enclosure that accommodates 10 disk modules (1.6" or 1")			
	– Two power supplies			
	– Two fan modules			
	– Two power cords			
	– Two bus controller card modules (with enclosure monitoring)			
	– Mounting rails for HP cabinets			
	– User manuals			
	– Two SCSI bus terminators			
	– ½ U filler panel (as required for proper rack appearance)			
	– One or two 2 meter VHDCI SCSI cables for connection to the A5277AZ. The number of cables Included depends upon how many A5294AZs are connected to the A5277AZ.			
	<u>Number of A5294AZ per A5277AZ</u> <u>Number of SCSI cables per A5294AZ</u>			
	1, 2, or 3 2			
	4, 5, or 6 1			
	– Disks will be bound to the A5277AZ array			
	Storage Capacity Options			
	Note: All disk systems ordered with a single A5277AZ must have identical Storage Capacity Options.			
	Qty 4 18GB 10K RPM disk drive modules		204	
	Qty 8 18GB 10K RPM disk drive modules		208	
	Qty 10 18GB 10K RPM disk drive modules		210	
	Qty 4 36GB 10K RPM disk drive modules		304	
	Qty 8 36GB 10K RPM disk drive modules		308	
	Qty 10 36GB 10K RPM disk drive modules		310	
	Qty 4 73GB 10K RPM disk drive modules		404	
	Qty 8 73GB 10K RPM disk drive modules		408	
	Qty 10 73GB 10K RPM disk drive modules		410	
	73GB 10K RPM disk drive modules (Note: Need to order quantity of 1 to 10 per enclosure)		350	
	Qty four 18.2GB 15K RPM Ultra2 SCSI Disk Drive		504	
	Qty eight 18.2GB 15K RPM Ultra2 SCSI Disk Drive		508	
	Qty ten 18.2GB 15K RPM Ultra2 SCSI Disk Drive		510	
•	Supporting Software for HP-UX (CD-ROMs)	B6191AA		
•	NT Support for the FC60	A5628A		
	Add-On/Upgrade Products			
•	Cache Memory upgrade, 2 X 256 MB DIMMs	A5279A		
•	Add on 18.2 GB disk drive module, 10000 RPM Ultra2 LVD	A5282A		
•	Add on 36GB disk drive module 10K RPM Ultra2 LVD	A5595A		
•	Add on 73GB disk drive module 10K RPM Ultra2 LVD	A5622A		
•	Add on 73GB disk drive module 10K RPM Ultra3 LVD	A6276A		

	Description		Product #	Opt #	Price
•	Add on 18.2 GB disk drive module, 15,000 RPM Ultra2 LVD		A5633A		
•	Add on controller (no cache)		A5278A		
	Controller Cache Option (Required)				
	256 MB cache			002	
•	2-meter VHTDS68 (M/M) Multimd		C2373A	0D1	
•	5-meter VHTDS68 (M/M) Multimd		C2374A	0D1	
•	10-meter VHTDS68 (M/M) Multimd		C2375A	0D1	
•	Rack Rail Accessory Kit (for legacy cabinets only: C2785A, C2786A, C2787A, A1896A, A1897A)		A5250A		
•	HP Rack System/E Rack Rail Accessory Kit (for cabinets: A4900A, A4801A, A4902A, J1502A, J1501A, J1500A)		A5251A		
•	2 meter Fibre Channel Cable		A3583A		
•	16 meter Fibre Channel Cable		A3531A		
•	50 meter Fibre Channel Cable		A3735A		
•	100 meter Fibre Channel Cable		A3736A		
•	SCSI Terminator, VHDCI LVD/SE		A5296A		

4.9.6—HP Surestore Disk Array XP48 Ordering Process

Overview

Once the configuration choices have been made and saved in WATSON or Sales Builder for Windows (SBW), the configuration may be converted to a quote and imported into the order entry system. If configuration tools such as WATSON or SBW are not available, then it is important to follow an ascending numeric order for each Item / Sub-Item ordered in sequence. See Appendix for step by step Manual Procedures for configuring the XP48.

Structured Solution Programs (SSPs):

The HP Structured Solution Program (SSP) has been designed to make the ordering process simple, flexible, and easy to understand. It is completely menu driven requiring only a few simple choices for the various components in the system. Minimum/maximum numbers have been inserted into the menu wherever possible to simplify your choices and to guide your configuration decisions.

XP48 HW Ordering Information Using SSP

- 1) Upgrade products are bundled with the solution, NOT integrated.
- 2) Upgrades cannot be on the same order section with an SSP system order.
- 3) Cables and software can be on the same order section as the upgrades.

4.9.7—hp surestore disk array xp48 hardware

	Description		Product #	Opt. #	
	XP48 HW SSP				
1.0	HP Surestore Disk Array XP48 SSP Solution	[]	A5920A		
2.0	Surestore Disk Array XP48 Disk Control Frame (1 required). Single phase power only. Must select one power frequency option				
	XP48 Disk Control Frame with 1 ACP pair, Redundant Power Supplies for CHIP prs 1-3, HP Firmware and Continuous Track XP with Modem and pcAnywhere	[]	A5921A		
	XP48 Disk Control Frame				
	2 GB Cache Memory				
	512 MB Shared Memory				
	60 Hz Single Phase Power Option	[]	A5921A	001	
	50 Hz Single Phase Power Option	[]	A5921A	002	
2.1	Client-Host Interface Processor pairs (Min1 pr Max 3 pr)				
	4 Port ExSA Channel Adapter Pair	[]	A5923A		
	8 Port ExSA Channel Adapter Pair	[]	A5924A		
	4 Port Fiber Channel Adapter Pair for Short Wave	[]	A5925A		

	Description		Product #	Opt. #	
	8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[]	A5926A		
	8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave	[]	A5927A		
	1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[]	A5929A		
2.2	Additional Nonvolatile Cache (Min 0, Max 16 GB including 2 GB cache in base DKC configuration)				
	2 GB Cache Memory	[]	A5932A		
2.3	Additional Shared Memory (Min 0, Max 1024 MB including 512 MB Shared Memory in base DKC configuration)				
	256 MB Shared Memory Module	[]	A5933A		
2.4	Disk Array Groups (min 1 max 11)				
	18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[]	A5936A		
	18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[]	A5940A		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937A		
	73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[]	A5938A		
2.5	Spare Disk Drives (Min 1 per array group size, Max 4 total)				
	18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[]	A5936S		
	18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[]	A5440S		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937S		
	73 GB 10K rpm, FC Spare Disk Drive	[]	A5938S		

4.9.8—hp xp48 upgrade products

	Description		Product #	Opt. #	
•	4 Port ExSA Channel Adapter Pair	[]	A5923U		
•	8 Port ExSA Channel Adapter Pair	[]	A5924U		
•	4 Port Fiber Channel Adapter Pair for Short Wave	[]	A5925U		
•	8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[]	A5926U		
•	8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave	[]	A5927U		
•	1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[]	A5929U		
•	2 GB Cache Memory Module	[]	A5932U		
•	256 MB Shared Memory Module	[]	A5933U		
•	18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[]	A5936U		
•	18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[]	A5940U		
•	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937U		
•	73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[]	A5938U		
•	181 GB 7200 rpm, FC Disk Array Group - 4 drives per group	[]	A5939U		
•	18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[]	A5936SU		
•	18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[]	A5940SU		
•	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937SU		
	73 GB 10K rpm, FC Spare Disk Drive	[]	A5938SU		
	181 GB 7200 rpm, FC Spare Disk Drive	[]	A5939SU		
	Host Interface Cables (Same as XP512)				
•	1Gb/sec to 1Gb/sec Fibre Channel Cables – SC/SC	[]	A5750A		
•	16 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	001	
•	50 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	002	
•	100 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	003	
•	2Gb/sec to 2Gb/sec Fibre Channel Cables – LC/LC				
•	16 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	004	
•	50 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	005	
•	200 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	006	
•	2Gb/sec to 1Gb/sec Fibre Channel Cables – LC/SC				
•	2 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	007	
•	16 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	008	
	Cable Adapters				

	Description		Product #	Opt. #	
•	SC Female – SC Female adapter, for use with 2 or 16 meter LC/SC cables	[]	A5750A	009	
•	2 meter LC male adapter kit-contains both SC-SC adapter & 2 meter LC/SC cable	[]	A5750A	010	
•	Fibre Optic Cables (ESCON)		A5752A		
	Fiber Optic Cable - 7m	[]		001	
	Fiber Optic Cable - 13m	[]		002	
	Fiber Optic Cable - 22m	[]		003	
	Fiber Optic Cable - 31m	[]		004	
	Fiber Optic Cable - 46m	[]		005	
	Fiber Optic Cable - 61m	[]		006	
	Fiber Optic Cable - 92m	[]		007	
	Fiber Optic Cable - 122m	[]		008	

4.9.9—hp surestore disk array xp48 software

Description		Product #	Opt#
Software			
All LTU products for initial purchase or upgrade			
• Continuous Access XP	[]	B9320A	
• Continuous Access XP Media For XP512/XP48 includes RAID Manager	[]	B9320A	002
• Continuous Access XP 1 TB LTU	[]	B9321A	
• Continuous Access XP 5 TB LTU	[]	B9322A	
• Continuous Access XP 10 TB LTU	[]	B9323A	
• Continuous Access XP 25 TB LTU	[]	B9324A	
• Continuous Access XP Extension	[]	B9325A	
• Continuous Access XP Ext. Media For XP512/XP48	[]	B9325A	002
• Continuous Access XP Ext. 1 TB LTU	[]	B9326A	
• Continuous Access XP Ext. 5 TB LTU	[]	B9327A	
• Continuous Access XP Ext. 10 TB LTU	[]	B9328A	
• Continuous Access XP Ext. 25 TB LTU	[]	B9329A	
• Business Copy XP	[]	B9330A	
• Business Copy XP Media For XP512/XP48 includes RAID Manager	[]	B9330A	002
• Business Copy XP 1 TB LTU	[]	B9331A	
• Business Copy XP 5 TB LTU	[]	B9332A	
• Business Copy XP 10 TB LTU	[]	B9333A	
• Business Copy XP 25 TB LTU	[]	B9334A	
• Secure Manager XP	[]	B9351A	
• Secure Manager XP Media For XP512/XP48	[]	B9351A	002
• Secure Manager XP 1 TB LTU	[]	B9352A	
• Secure Manager XP 5 TB LTU	[]	B9353A	
• Secure Manager XP 10 TB LTU	[]	B9354A	
• Secure Manager XP 25 TB LTU	[]	B9355A	
• Auto Path XP	[]	B9351A	
Auto Path XP for AIX			
• Auto Path XP for AIX Media	[]	B7949B	
• Auto Path XP for AIX, 1 Server LTU (LTU on one server running AIX connected to an XP Disk Array)	[]	B7950B	
• Auto Path XP for AIX, Unlimited Server LTU (LTU on unlimited servers running AIX connected to an XP Disk Array)	[]	B7951B	
Auto Path XP for MS Windows 2000			
• Auto Path for W2K Media	[]	B9500A	
• Auto Path for W2K 1 Server LTU	[]	B9501A	
• Auto Path for W2K 5 Server LTU	[]	B9502A	
• Auto Path for W2K 10 Server LTU	[]	B9503A	
Auto Path XP for MS NT			
• Auto Path for NT Media	[]	B9505A	
• Auto Path for NT 1 Server LTU	[]	B9506A	
• Auto Path for NT 5 Server LTU	[]	B9507A	
• Auto Path for NT 10 Server LTU	[]	B9508A	
Cluster Extension XP			
Cluster Extension XP for VCS			
• Cluster Extension XP for Veritas Cluster Server	[]	B9531A	
Cluster Extension XP for HACMP			
• Cluster Extension XP for IBM HACMP	[]	B9532A	
Cluster Extension XP for MSCS			
• Cluster Extension XP for MSCS	[]	B9533A	
Cache LUN XP			

	Description		Product #	Opt#	
•	Cache LUN XP Media For XP512/XP48	[]	B9345A	002	
•	Cache LUN XP 1 TB LTU	[]	B9346A		
•	Cache LUN XP 5 TB LTU	[]	B9347A		
•	Cache LUN XP 10 TB LTU	[]	B9348A		
•	Cache LUN XP 25 TB LTU	[]	B9349A		
	Performance Advisor XP				
•	Performance Advisor XP	[]	B9369A		
•	Auto LUN XP	[]	B9340A		
•	Auto LUN XP Media For XP512/XP48	[]	B9340A	002	
•	Auto LUN XP 1 TB LTU	[]	B9341A		
•	Auto LUN XP 5 TB LTU	[]	B9342A		
•	Auto LUN XP 10 TB LTU	[]	B9343A		
•	Auto LUN XP 25 TB LTU	[]	B9344A		
	Command View XP				
•	HP Surestore Command View XP For New XP512/XP48 Installations Includes Remote Control XP For XP512/XP48	[]	B9357AB		
•	Remote Control XP Upgrade For XP512/XP48	[]	B9357AD		
•	LUN Configuration Manager XP Media	[]	B9335A		
•	LUN Configuration Mgr XP Media For XP512/XP48	[]	B9335A	002	
•	LUN Configuration Mgr XP 1 TB LTU	[]	B9336A		
•	LUN Configuration Mgr XP 5 TB LTU	[]	B9337A		
•	LUN Configuration Mgr XP 10 TB LTU	[]	B9338A		
•	LUN Configuration Mgr XP 25 TB LTU	[]	B9339A		
	Resource Manager XP				
•	Resource Manager XP For XP512/XP48	[]	B9358A	002	
	Data Exchange XP				
•	Data Exchange XP For XP256/XP512/XP48	[]	T1620AA		
•	Fast Recovery Solutions XP				
	Fast Recovery Solutions XP for MS Exchange				
•	Fast Recovery Solutions XP for MS Exchange	[]	B9550A		N/A
•	Direct Backup XP				
•	Direct Backup XP (LTU on one XP Disk Array)	[]	B9560A		

4.9.10—hp disk array xp128

	Description		Product #	Opt #	Price
1.0	HP Disk Array XP128 SSP Solution	[]	A7875A		
1.1	XP128 Disk Control Frame (1 required per XP system). Must select one power option.				
	XP128 Disk Control Frame with 2 GB Cache, 512 MB Shared Memory, Redundant Power Supplies for CHIP prs 1-3, HP microcode, HP Continuous Track XP, Modem and pcAnywhere. Does not include basic ACP pr.	[]	A7876A		
	XP128 Disk Control Frame				
	2 GB Cache Memory Module				
	512 MB Shared Memory Module				
	3 Phase 60 Hz for XP128	[]	A7876A	001	
	Power Cable Kit for Three Phase (60Hz)				
	AC Box for Three Phase				
	3 Phase 50 Hz for XP128	[]	A7876A	002	
	Power Cable Kit for Three Phase (50Hz)				
	AC Box for Three Phase				
	Single Phase 60 Hz for XP128	[]	A7876A	003	
	Power Cable Kit for Single Phase (60Hz)				
	AC Box for Single Phase				

	Description		Product #	Opt #	Price
	Single Phase 50 Hz for XP128	[]	A7876A	004	
	Power Cable Kit for Single Phase (50Hz)				
	AC Box for Single Phase				
1.2	DKC Accessories (min 0, max 1 of each)				
	XP1024/128 SVP High Reliability Support Kit	[]	A7907A		
	XP1024/128 UPS Connection Kit (for single phase DKC only)	[]	A7908A		
1.3	Client-Host Interface Processor pairs (Min 1, Max 3 if A7894A is not selected, Max 2 if A7894A is selected)				
	XP1024/128 8-Port ExSA Channel Adapter Pair	[]	A7909A		
	XP1024/128 8-Port 1 Gb/sec FC/CA Adapter Pair	[]	A7910A		
	XP1024/128 4 Port 1-2Gb/sec Auto-sensing FC/CA CHIP Pair	[]	A7911A		
	XP1024/128 8 Port 1-2Gb/sec Auto-sensing FC/CA CHIP Pair	[]	A7912A		
1.4	Additional Nonvolatile Cache (Min 0, Max 15) Max 32 GB Cache allowed including 2 GB Cache in base DKC configuration.				
	XP1024/128 2 GB Cache Memory Module	[]	A7918A		
1.5	Additional Shared Memory (Min 0, Max 4) Max 2560 MB Shared Memory allowed including 512 MB Shared Memory in base DKC configuration.				
	XP1024/128 512 MB Shared Memory Module	[]	A7921A		
1.6	Array Control Processor prs (Min 1 for 1 DKA Model, Max 2 A7922A for 2 DKA Model) 2 DKA model requires Disk Path Expansion Kit A7894A and then Max 2 CHIP prs allowed (Can not intermix high and std performance ACPs in same array).				
	XP1024/128 Array Control Processor (ACP) pair- High Performance	[]	A7922A		
1.7	Disk Port Switch Sets (Min 0, Max 1) A7893A Disk Port Switch Set required if 16 or more Disk Array Groups are configured and Disk Path Expansion Kit A7894A is not configured. Disk Path Expansion Kit is required if 2 ACP prs A7922A are configured for 2 DKA Model. Cannot configure A7893A and A7894A in the same array.				
	XP128 Additional Disk Port Switch Set	[]	A7893A		
	XP128 Disk Path Expansion Kit	[]	A7894A		
1.8	Disk Array Groups (min 1 max 31)				
	XP1024/128 36 GB 15k rpm, FC Array Group - 4 disks	[]	A7928A		
	XP1024/128 73 GB 10k rpm, FC Array Group - 4 disks	[]	A7929A		
1.9	Spare Disk Drives (Min 1,Max 4) Must configure 1 spare disk of equal capacity of Disk Array Group configured.				
	XP1024/128 36 GB 15k rpm, FC Spare Disk Drive	[]	A7928S		
	XP1024/128 73 GB 10K rpm, FC Spare Disk Drive	[]	A7929S		

4.9.11—hp disk array xp1024

	Description		Product #	Opt #	Price
	XP1024 (K2) HW Structure				
1.0	HP Disk Array XP1024 SSP Solution		A7905A		
	XP1024 Disk Control Frame (1 required per XP system) Must select one power option.				
1.01	XP1024 Disk Control Frame with 4 GB Cache, 512MB Shared memory, Redundant Power Supplies for CHIP prs 1-2, FC Cable Set for DKU Frame position R1, Basic High Performance ACP pr, HP microcode, HP Continuous Track XP, Modem and pcAnywhere		A7906A		
	3 Phase 60 or 50 Hz for XP1024		A7906A	001	
	Single Phase 60 Hz for XP1024		A7906A	003	
	Single Phase 50 Hz for XP1024		A7906A	004	
1.02	DKC Accessories (min 0, max 1 of each)				
	XP1024/128 SVP High Reliability Support Kit		A7907A		
	XP1024/128 UPS Connection Kit (for single phase DKC only)		A7908A		
1.03	Client-Host Interface Processor pairs (Min 1 pr, Max 4 pr)				
	XP1024/128 8-Port ExSA Channel Adapter Pair		A7909A		
	XP1024/128 8-Port 1 Gb/sec FC/CA Adapter Pair		A7910A		
	XP1024/128 4 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair		A7911A		
	XP1024/128 8 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair		A7912A		

	Description	Product #	Opt #	Price
1.04	Additional DKC Power Supply for CHIP pairs 3 and 4 (Min 0, Max 1) XP1024 Additional CHIP Power Supply	A7917A		
1.05	Additional Nonvolatile Cache (Min 0, Max 30) Max 64 GB including 4 GB cache in base DKC A7919A configuration (Must configure DKC in increments of 4 GB and order Additional Cache Platform Board for performance configurations) XP1024/128 2 GB Cache Memory Module	A7918A		
1.06	Additional Cache Platform Board (Min 0, Max 1) Required for all performance configurations or required for cache beyond 32GB including 4 GB in base DKC. XP1024 Cache Platform Board	A7919A		
1.07	Additional Battery for Cache Memory (Min 0, Max 1) Required for all cache configurations beyond 32GB including 4 GB in base DKC. XP1024 Additional Battery for Cache Memory	A7920A		
1.08	Additional Shared Memory (Min 0, Max 5) Max 3072 MB including 512 MB Shared Memory in base DKC configuration. XP1024/128 512 MB Shared Memory Module	A7921A		
1.09	Additional Array Control Processor (Min 0, Max 3) One ACP pair provided in base DKC configuration. XP1024/128 Array Control Processor (ACP) pair- High Performance	A7922A		
1.10	DKU Frame L1 Interconnect Cable. (Min 0, max 1) A7924A is required for DKU frame configured in L1 position. Cable set for DKU in position R1 is provided with base DKC and A7926A cable set is required for DKU for position R2 or L2. XP1024 FC Cable Set for L1 DKU	A7924A		
1.11	Disk Array Frame (Min 1 position R1, Max 4) Must select one option and must match Power option of DKC, no intermixing of power options. FC Cable set for DKU in position R1 is provided with base DKC. FC Device Cable Set A7924A required for DKU position L1 and A7926A Cable Set required for R2 and L2 position. XP1024 Disk Array Frame 3 Phase 60 Hz for XP1024 DKU 3 Phase 50 Hz, for XP1024 DKU Single Phase, 60 Hz, for XP1024 DKU Single Phase, 50 Hz, for XP1024 DKU	A7925A A7925A A7925A A7925A A7925A	 001 002 003 004	
1.12	DKU R2, L2 Frame Interconnect Cable. (Min 0, max 2) A7926A is required for DKU frame A7924A configured in R2 or L2 position. Cable set for DKU in position R1 is provided with base DKC and cable set is required for DKU for position L1. XP1024 FC Cable Set for R2 and L2 DKU	A7926A		
1.13	Disk Array Groups (min 1 max 254) (max 63 R1 and L1) (max 64 R2 and L2) XP1024/128 36 GB 15k rpm, FC Array Group - 4 disks XP1024/128 73 GB 10k rpm, FC Array Group - 4 disks	A7928A A7929A		
1.14	Spare Disk Drives (Min 1 per array group size, Max 4 for R1 DKU and 4 additional for L1 DKU) XP1024/128 36 GB 15k rpm, FC Spare Disk Drive XP1024/128 73 GB 10K rpm, FC Spare Disk Drive	A7928S A7929S		

4.9.12—hp disk array xp128/1024 upgrades

	Description	Product #	Opt #	Price
2.0	XP1024 (K2) HW Structure HP Disk Array XP128/1024 upgrades SSP Solution DKC Accessories (min 0, max 1 of each) XP1024/128 SVP High Reliability Support Kit XP1024/128 UPS Connection Kit (for single phase DKC only) Client-Host Interface Processor pairs (Min 1 pr, Max 4 pr) XP1024/128 8-Port ExSA Channel Adapter Pair XP1024/128 8-Port 1 Gb/sec FC/CA Adapter Pair XP1024/128 4 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair XP1024/128 8 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair Additional DKC Power Supply for CHIP pairs 3 and 4 (Min 0, Max 1) XP1024 Additional CHIP Power Supply	A7873A A7907U A7908U A7909U A7910U A7911U A7912U A7917U		

	Description	Product #	Opt #	Price
	Additional Nonvolatile Cache (Min 0, Max 30) Max 64 GB including 4 GB cache in base DKC A7919A configuration (Must configure DKC in increments of 4 GB and order Additional Cache Platform Board for performance configurations)			
	XP1024/128 2 GB Cache Memory Module	A7918U		
	Additional Cache Platform Board (Min 0, Max 1) Required for all performance configurations or required for cache beyond 32GB including 4 GB in base DKC.			
	XP1024 Cache Platform Board	A7919U		
	Additional Battery for Cache Memory (Min 0, Max 1) Required for all cache configurations beyond 32GB including 4 GB in base DKC.			
	XP1024 Additional Battery for Cache Memory	A7920U		
	Additional Shared Memory (Min 0, Max 5) Max 3072 MB including 512 MB Shared Memory in base DKC configuration.			
	XP1024/128 512 MB Shared Memory Module	A7921U		
	Additional Array Control Processor (Min 0, Max 3) One ACP pair provided in base DKC configuration.			
	XP1024/128 Array Control Processor (ACP) pair- High Performance	A7922U		
	Disk Array Frame (Min 1 position R1, Max 4) Must select one option and must match Power option of DKC, no intermixing of power options. FC Cable set for DKU in position R1 is provided with base R2 DKC. FC Device Cable Set A7924A required for DKU position L1 and A7926A Cable Set required for and L2 position.			
	XP1024 Disk Array Frame	A7925U		
	3 Phase 60 Hz for XP1024 DKU	A7925U	001	
	3 Phase 50 Hz, for XP1024 DKU	A7925U	002	
	Single Phase, 60 Hz, for XP1024 DKU	A7925U	003	
	Single Phase, 50 Hz, for XP1024 DKU	A7925U	004	
	DKU Frame L1 Interconnect Cable. (Min 0, max 1) A7924A is required for DKU frame configured in L1 position. Cable set for DKU in position R1 is provided with base DKC and A7926A cable set is required for DKU for position R2 or L2.			
	XP1024 FC Cable Set for L1 DKU	A7924U		
	DKU R2, L2 Frame Interconnect Cable. (Min 0, max 2) A7926A is required for DKU frame configured in R2 or L2 position. Cable set for DKU in position R1 is provided with base DKC and A7924A cable set is required for DKU for position L1.			
	XP1024 FC Cable Set for R2 and L2 DKU	A7926U		
1.13	Disk Array Groups (min 1 max 254) (max 63 R1 and L1) (max 64 R2 and L2)			
	XP1024/128 36 GB 15k rpm, FC Array Group - 4 disks	A7928U		
	XP1024/128 73 GB 10k rpm, FC Array Group - 4 disks	A7929U		
1.14	Spare Disk Drives (Min 1 per array group size, Max 4 for R1 DKU and 4 additional for L1 DKU)			
	XP1024/128 36 GB 15k rpm, FC Spare Disk Drive	A7928SU		
	XP1024/128 73 GB 10K rpm, FC Spare Disk Drive	A7929SU		

4.9.13—hp disk array xp1024 & hp disk array xp128 software

	Description	Product #	Opt #	Price
	xp1024 and xp128 software			
	All LTU products for initial purchase or upgrade			
	Command View XP			
•	Command View XP for XP1024/XP128 (LTU on one management console)	[] B9357AD		
	LUN Configuration & Security Manager XP			
	This Software Title orderable only on the XP1024 and XP128			
•	LUN Configuration and Security Manager XP 1 TB LTU (0 to 1 TB range, used capacity on one	[] T1614AA		
•	XP1024/XP128 disk array see config guide for more info)			
•	LUN Configuration and Security Manager XP 1 TB LTU (2 to 6 TB range, used capacity on one	[] T1614AB		
	XP1024/XP128 disk array (see config guide for more info)			
•	LUN Configuration and Security Manager XP 1 TB LTU (7 to 15 TB range, used capacity on one	[] T1614AC		

Description		Product #	Opt #	Price
XP1024/XP128 disk array (see config guide for more info)				
• LUN Configuration and Security Manager XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array) (see config guide for more info)	[]	T1614AD		
Cache LUN XP				
• Cache LUN XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AA		
• Cache LUN XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AB		
• Cache LUN XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AC		
• Cache LUN XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AD		
Auto LUN XP				
• Auto LUN XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AA		
• Auto LUN XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AB		
• Auto LUN XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AC		
• Auto LUN XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AD		
Application Policy Manager XP				
• Application Policy Manager XP for XP1024/XP128 (LTU on one management console and one XP1024/XP128 disk array)	[]	B9540AB		
Auto Path XP				
Auto Path XP for AIX				
• Auto Path XP for AIX Media	[]	B7949B		
• Auto Path XP for AIX, 1 Server LTU (LTU on one server running AIX connected to an XP Disk Array)	[]	B7950B		
• Auto Path XP for AIX, Unlimited Server LTU (LTU on unlimited servers running AIX connected to an XP Disk Array)	[]	B7951B		
Auto Path XP for Windows 2000				
• Auto Path for W2K Media	[]	B9500A		
• Auto Path for W2K 1 Server LTU (LTU on one server running W2K connected to an XP Disk Array)	[]	B9501A		
• Auto Path for W2K 5 Server LTU (LTU on five servers running W2K connected to an XP Disk Array)	[]	B9502A		
• Auto Path for W2K 10 Server LTU (LTU on ten servers running W2K connected to an XP Disk Array)	[]	B9503A		
Auto Path XP for Windows NT				
• Auto Path for NT Media	[]	B9505A		
• Auto Path for NT 1 Server LTU (LTU on one server running NT connected to an XP Disk Array)	[]	B9506A		
• Auto Path for NT 5 Server LTU (LTU on five servers running NT connected to an XP Disk Array)	[]	B9507A		
• Auto Path for NT 10 Server LTU (LTU on ten servers running NT connected to an XP Disk Array)	[]	B9508A		
Auto Path XP for HP-UX				
• Auto Path for HP-UX Media	[]	B9510A		
• Auto Path for HP-UX 1 Server LTU (LTU on one server running HP-UX connected to an XP Disk Array)	[]	B9511A		
• Auto Path for HP-UX 5 Server LTU (LTU on five servers running HP-UX connected to an XP Disk Array)	[]	B9512A		
• Auto Path for HP-UX 10 Server LTU (LTU on ten servers running HP-UX connected to an XP Disk Array)	[]	B9513A		
Auto Path XP for Linux				
• Auto Path for Linux Media	[]	B9515A		
• Auto Path for Linux Server LTU (LTU on one server running Linux connected to an XP Disk Array)	[]	B9516A		
• Auto Path for Linux 5 Server LTU (LTU on five servers running Linux connected to an XP Disk Array)	[]	B9517A		
• Auto Path for Linux 10 Server LTU (LTU on ten servers running Linux connected to an XP Disk Array)	[]	B9518A		

Description		Product #	Opt #	Price
Array)				
Business Copy XP Media				
• Business Copy XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AA		
• Business Copy XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AB		
• Business Copy XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AC		
• Business Copy XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AD		
Continuous Access XP				
• Continuous Access XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AA		
• Continuous Access XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AB		
• Continuous Access XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AC		
• Continuous Access XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AD		
Continuous Access XP Extension				
• Continuous Access XP Extension 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AA		
• Continuous Access XP Extension 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AB		
• Continuous Access XP Extension 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AC		
• Continuous Access XP Extension 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AD		
RAID Manager XP				
• RAID Manager XP (LTU on unlimited servers, any supported Operating System - see config guide for more information on supported Operating Systems)	[]	T1610A		
Cluster Extension XP				
Cluster Extension XP for VERITAS Cluster Server				
• Cluster Extension XP for VERITAS Cluster Server	[]	B9531A		
Cluster Extension XP for IBM HACMP Cluster Server				
• Cluster Extension XP for IBM HACMP	[]	B9532A		
Cluster Extension XP for Microsoft Cluster Service				
• Cluster Extension XP for MSCS	[]	B9533A		
Cluster Extension XP for MC/ServiceGuard for Linux				
• Cluster Extension XP for MC/ServiceGuard for Linux	[]	B9534A		
Performance Advisor XP				
• Performance Advisor XP (LTU on one management console)	[]	B9369A		
Resource Manager XP				
• Resource Manager XP for XP1024/XP128 (LTU on one XP1024/XP128 Disk Array)	[]	T1617A		
Data Exchange XP				
• Data Exchange XP For XP1024/XP128 (LTU on one server, any supported Operating Systems connected to an XP1024/XP128 Disk Array - see config guide for information on supported Operating Systems)	[]	T1620AB		
Fast Recovery Solutions XP				
Fast Recovery Solutions XP for Microsoft Exchange				
• Fast Recovery Solutions for MS Exchange (LTU on one XP Disk Array)	[]	B9550A		
Direct Backup XP				
• Direct Backup XP (LTU on one XP512 or XP48 Disk Array)	[]	B9560A		

4.9.14—hp surestore disk array xp512

Structured Solution Programs

	Description		Product #	Opt#	Price
1.0	HP Surestore Disk Array XP512 Solution	[x]	A5950A		
2.0	Surestore Disk Array XP512 Control Frame (1 required) Base DKC configuration is 3 phase 50/60 Hz . For single phase, select one single phase power option				
	XP512 Disk Control Frame with 1 ACP pair, Redundant Power Supplies for CHIP prs 1 and 2, HP Firmware (microcode) and Continuous Track XP with Modem and pcAnywhere	[]	A5951A		
	XP512 Disk Control Frame				
	1 GB Cache Memory Module, Quantity 2				
	256 MB Shared Memory Module, Quantity 2				
	FC Device Cable Set, DKC to R1U-DKU				
	SNMP Support Kit				
	60 Hz Single Phase Power, DKC	[]	A5951A	001	
	Power Cable Kit, Single Phase 60HZ DKC				
	AC Box Kit for Single Phase DKC				
	50 Hz Single Phase Power, DKC	[]	A5951A	002	
	Power Cable Kit, Single Phase 50HZ DKC				
	AC Box Kit for Single Phase DKC				
2.1	Client-Host Interface Processor pairs (Min1 pr Max 4 pr)				
	4 Port ExSA Channel Adapter Pair	[]	A5953A		
	8 Port ExSA Channel Adapter Pair	[]	A5954A		
	4 Port Fiber Channel Adapter Pair for Short Wave	[]	A5955A		
	8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[]	A5956A		
	8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave	[]	A5957A		
	1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[]	A5959A		
2.2	Additional DKC Power Supply for CHIP pairs 3 and 4				
	Additional CHIP Power Supply	[]	A5961A		
2.3	Additional Nonvolatile Cache (Min 0, Max 32 GB including 2 GB cache in base DKC configuration)2 GB Cache Memory Module	[]	A5962A		
2.4	Additional Cache Platform Board (Min 0, Max 1) Required for cache beyond 16 GB including 2 GB in base DKC configuration.				
	Additional Cache Platform Board	[]	A5960A		
2.5	Additional Shared Memory (Min 0, Max 1,280 MB including 512 MB Shared Memory in base DKC configuration)				
	256 MB Shared Memory Module	[]	A5963A		
2.6	Additional Array Control Processor (Min 0, Max 4 including 1 ACP pair in base DKC configuration)				
	Array Control Processor (ACP) pair	[]	A5964A		
2.7	DKU Frame L1 Interconnect - FC Device Cable Set. Required if DKU is configured to position L1.				
	(No cables required for DKU in position R1). Min 0, Max 1.				
	FC Device Cable Set, DKC to L1 or R1 DKU	[]	A5974A		
3.0	Disk Array Frame (Min 1 position R1, Max 6) Must select one option and must match Power option of DKC, no intermixing of power options. FC Device Cable Set A5974A required for position L1 DKU.				
	XP512 Disk Array Frame (Must select one power option)	[]	A5965A		
	XP512 Disk Array Frame				
	Disk Canister Mount Platform				
	3 Phase, 60 Hz, for DKU	[]	A5965A	001	
	AC Box for 3 Phase DKU				
	Power Cable Kit, 3 phase, 60 Hz DKU				
	3 Phase, 50 Hz, for DKU	[]	A5965A	002	
	AC Box for 3 Phase DKU				
	Power Cable Kit, 3 phase, 50 Hz DKU				
	Single Phase, 60 Hz, for DKU	[]	A5965A	003	

	Description		Product #	Opt#	Price
	AC Box for Single Phase, DKU				
	Power Cable Kit, single phase, 60 Hz DKU				
	Single Phase, 50 Hz, for DKU	[]	A5965A	004	
	AC Box for Single Phase, DKU				
	Power Cable Kit, single phase, 50 Hz DKU				
3.1	Disk Array Groups (min 1 max 126)(23 R1 and L1)(24 R2 and L2) (16 R3 and L3)				
	18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[]	A5966A		
	18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[]	A5970A		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5967A		
	73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[]	A5968A		
	181 GB 7200 rpm, FC Disk Array Group - 4 drives per group	[]	A5969A		
3.2	Spare Disk Drives (Min 1 per array group size) Max Spare Drives per position: 4 in R1 and 4 in L1.				
	18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[]	A5966S		
	18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[]	A5970S		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5967S		
	73 GB 10K rpm, FC Spare Disk Drive	[]	A5968S		
	181 GB 7200 rpm, FC Spare Disk Drive	[]	A5969S		
3.3	DKU Frame Interconnect - FC Device Cable Set. DKUs in positions R2, R3, L2 and L3 require one set A5975A cable for each position configured. Min 0, Max 4. (No cables required for DKU position R1. One cable set A5974A required for DKU position L1 only.)				
	FC Device Cable Set, DKU to R2, R3, L2, or L3 DKU	[]	A5975A		
	END SSP				
Host Interface Cables					
1Gb/sec to 1Gb/sec Fibre Channel Cables – SC/SC					
	16 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A		
	50 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	001	
	100 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	002	
	200 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	003	
2Gb/sec to 2Gb/sec Fibre Channel Cables – LC/LC					
	16 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	004	
	50 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	005	
	200 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	006	
2Gb/sec to 1Gb/sec Fibre Channel Cables – LC/SC					
	2 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	007	
	16 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	008	
Cable Adapters					
	SC Female – SC Female adapter, for use with 2 or 16 meter LC/SC cables	[]	A5750A	009	
	2 meter LC male adapter kit-contains both SC-SC adapter & 2 meter LC/SC cable	[]	A5750A	010	
Fibre Optic Cables (ESCON)			A5752A		
	Fiber Optic Cable - 7m	[]	A5752A	001	
	Fiber Optic Cable - 13m	[]	A5752A	002	
	Fiber Optic Cable - 22m	[]	A5752A	003	
	Fiber Optic Cable - 31m	[]	A5752A	004	
	Fiber Optic Cable - 46m	[]	A5752A	005	
	Fiber Optic Cable - 61m	[]	A5752A	006	
	Fiber Optic Cable - 92m	[]	A5752A	007	
	Fiber Optic Cable - 122m	[]	A5752A	008	

4.9.15—xp512 upgrades

Description	Product #	Opt. #	Price
Order Configuration Rules: 1. Upgrade products are bundled with the solution, NOT integrated 2. Upgrades cannot be on the same order section with a SSP A5950A system order. 3. Cables and Software can be on the same order section as the upgrades.			
UPGRADE PRODUCTS			
• 4 Port ExSA Channel Adapter Pair	[] A5953U		
• 8 Port ExSA Channel Adapter Pair	[] A5954U		
• 4 Port Fiber Channel Adapter Pair for Short Wave	[] A5955U		
• 8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[] A5956U		
• 8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave (Host & CA Support)	[] A5957U		
• 1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[] A5959U		
• Additional CHIP Power Supply	[] A5961U		
• 2 GB Cache Memory Module	[] A5962U		
• Additional Cache Platform Board	[] A5960U		
• 256 MB Shared Memory Module	[] A5963U		
• Array Control Processor (ACP) Pair	[] A5964U		
• XP512 Disk Array Frame (Must select one power option)	[] A5965U		
• XP512 Disk Array Frame			
• Disk Canister Mount Platform			
• 3 Phase, 60 Hz, for DKU	[] A5965U	001	
• AC Box for 3 Phase DKU			
• Power Cable Kit, 3 phase, 60 Hz DKU			
• 3 Phase, 50 Hz, for DKU	[] A5965U	002	
• AC Box for 3 Phase DKU			
• Power Cable Kit, 3 phase, 50 Hz DKU			
• Single Phase, 60 Hz, for DKU	[] A5965U	003	
• AC Box for Single Phase, DKU			
• Power Cable Kit, single phase, 60 Hz DKU			
• Single Phase, 50 Hz, for DKU	[] A5965U	004	
• AC Box for Single Phase, DKU			
• Power Cable Kit, single phase, 50 Hz DKU			
• 18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[] A5966U		
• 18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[] A5970U		
• 47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[] A5967U		
• 73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[] A5968U		
• 181 GB 7200 rpm, FC Disk Array Group - 4 drives per group	[] A5969U		
• 18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[] A5966SU		
• 18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[] A5970SU		
• 47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[] A5967SU		
• 73 GB 10K rpm, FC Spare Disk Drive	[] A5968SU		
• 181 GB 7200 rpm, FC Spare Disk Drive	[] A5969SU		
• FC Device Cable Set, DKC to L1 or R1-DKU Upgrade	[] A5974U		
• FC Device Cable Set, DKU to R2, R3, L2, or L3 DKU Upgrade	[] A5975U		
XP-iCOD-S Products			
• 2GB cache memory, XP-iCOD-S	[] A5962D		
• 256MB Shared Memory Module, XP-iCOD-S	[] A5963D		
• Additional ACP pair, XP-iCOD-S	[] A5964D		
• 18 GB array group - 4 drives per group, XP-iCOD-S	[] A5966D		
• 18 GB 15k rpm, array group - 4 drives per group, XP-iCOD-S	[] A5966D		
• 73 GB array group - 4 drives per group, XP-iCOD-S	[] A5968D		
• 181 GB array group - 4 drives per group, XP-iCOD-S	[] A5969D		

4.9.16—xp512 software, orca release – rev 17.1
Last Revision 4/17/01

	Description		Product #	Opt#	
	Software				
	All LTU products for initial purchase or upgrade				
•	Continuous Access XP	[]	B9320A		
•	Continuous Access XP Media For XP512/XP48 includes RAID Manager	[]	B9320A	002	
•	Continuous Access XP 1 TB LTU	[]	B9321A		
•	Continuous Access XP 5 TB LTU	[]	B9322A		
•	Continuous Access XP 10 TB LTU	[]	B9323A		
•	Continuous Access XP 25 TB LTU	[]	B9324A		
•	Continuous Access XP Extension	[]	B9325A		
•	Continuous Access XP Ext. Media For XP512/XP48	[]	B9325A	002	
•	Continuous Access XP Ext. 1 TB LTU	[]	B9326A		
•	Continuous Access XP Ext. 5 TB LTU	[]	B9327A		
•	Continuous Access XP Ext. 10 TB LTU	[]	B9328A		
•	Continuous Access XP Ext. 25 TB LTU	[]	B9329A		
•	Business Copy XP	[]	B9330A		
•	Business Copy XP Media For XP512/XP48 includes RAID Manager	[]	B9330A	002	
•	Business Copy XP 1 TB LTU	[]	B9331A		
•	Business Copy XP 5 TB LTU	[]	B9332A		
•	Business Copy XP 10 TB LTU	[]	B9333A		
•	Business Copy XP 25 TB LTU	[]	B9334A		
•	Secure Manager XP	[]	B9351A		
•	Secure Manager XP Media For XP512/XP48	[]	B9351A	002	
•	Secure Manager XP 1 TB LTU	[]	B9352A		
•	Secure Manager XP 5 TB LTU	[]	B9353A		
•	Secure Manager XP 10 TB LTU	[]	B9354A		
•	Secure Manager XP 25 TB LTU	[]	B9355A		
•	Auto Path XP	[]	B9351A		
	Auto Path XP for AIX				
•	Auto Path XP for AIX Media	[]	B7949B		
•	Auto Path XP for AIX, 1 Server LTU (LTU on one server running AIX connected to an XP Disk Array)	[]	B7950B		
•	Auto Path XP for AIX, Unlimited Server LTU (LTU on unlimited servers running AIX connected to an XP Disk Array)	[]	B7951B		
	Auto Path XP for MS Windows 2000				
•	Auto Path for W2K Media	[]	B9500A		
•	Auto Path for W2K 1 Server LTU	[]	B9501A		
•	Auto Path for W2K 5 Server LTU	[]	B9502A		
•	Auto Path for W2K 10 Server LTU	[]	B9503A		
	Auto Path XP for MS NT				
•	Auto Path for NT Media	[]	B9505A		
•	Auto Path for NT 1 Server LTU	[]	B9506A		
•	Auto Path for NT 5 Server LTU	[]	B9507A		
•	Auto Path for NT 10 Server LTU	[]	B9508A		
	Auto Path XP for HP-UX				
•	Auto Path for HP-UX Media	[]	B9510A		
•	Auto Path for HP-UX 1 Server LTU (LTU on one server running HP-UX connected to an XP Disk Array)	[]	B9511A		
•	Auto Path for HP-UX 5 Server LTU (LTU on five servers running HP-UX connected to an XP Disk Array)	[]	B9512A		
•	Auto Path for HP-UX 10 Server LTU (LTU on ten servers running HP-UX connected to an XP Disk Array)	[]	B9513A		
	Auto Path XP for Linux				

Description		Product #	Opt#
• Auto Path for Linux Media	[]	B9515A	
• Auto Path for Linux Server LTU (LTU on one server running Linux connected to an XP Disk Array)	[]	B9516A	
• Auto Path for Linux 5 Server LTU (LTU on five servers running Linux connected to an XP Disk Array)	[]	B9517A	
• Auto Path for Linux 10 Server LTU (LTU on ten servers running Linux connected to an XP Disk Array)	[]	B9518A	
Cluster Extension XP			
Cluster Extension XP for VCS			
• Cluster Extension XP for Veritas Cluster Server	[]	B9531A	
Cluster Extension XP for HACMP			
• Cluster Extension XP for IBM HACMP	[]	B9532A	
Cluster Extension XP for MSCS			
• Cluster Extension XP for MSCS	[]	B9533A	
Cluster Extension XP for MC/ServiceGuard for Linux			
• Cluster Extension XP for MC/ServiceGuard for Linux	[]	B9534A	
Cache LUN XP			
• Cache LUN XP Media For XP512/XP48	[]	B9345A	002
• Cache LUN XP 1 TB LTU	[]	B9346A	
• Cache LUN XP 5 TB LTU	[]	B9347A	
• Cache LUN XP 10 TB LTU	[]	B9348A	
• Cache LUN XP 25 TB LTU	[]	B9349A	
Performance Advisor XP			
• Performance Advisor XP	[]	B9369A	
Auto LUN XP			
• Auto LUN XP Media For XP512/XP48	[]	B9340A	002
• Auto LUN XP 1 TB LTU	[]	B9341A	
• Auto LUN XP 5 TB LTU	[]	B9342A	
• Auto LUN XP 10 TB LTU	[]	B9343A	
• Auto LUN XP 25 TB LTU	[]	B9344A	
Command View XP			
• HP Surestore Command View XP For New XP512/XP48 Installations Includes Remote Control XP For XP512/XP48	[]	B9357AB	
• Remote Control XP Upgrade For XP512/XP48	[]	B9357AD	
LUN Configuration Manager XP Media			
• LUN Configuration Mgr XP Media For XP512/XP48	[]	B9335A	002
• LUN Configuration Mgr XP 1 TB LTU	[]	B9336A	
• LUN Configuration Mgr XP 5 TB LTU	[]	B9337A	
• LUN Configuration Mgr XP 10 TB LTU	[]	B9338A	
• LUN Configuration Mgr XP 25 TB LTU	[]	B9339A	
Resource Manager XP			
• Resource Manager XP For XP512/XP48	[]	B9358A	002
Data Exchange XP			
• Data Exchange XP For XP256/XP512/XP48	[]	T1620AA	
Fast Recovery Solutions XP			
Fast Recovery Solutions XP for MS Exchange			
• Fast Recovery Solutions XP for MS Exchange	[]	B9550A	
Direct Backup XP			
• Direct Backup XP (LTU on one XP Disk Array)	[]	B9560A	

4.9.17—hp surestore disk array xp256

NOTE: The XP256 will be put on Blind CPL August 1st 2001, for easy order configuration for the Fire Sale on the remaining 42 DKC that are available (While quantities last). Must contact factory for availability before quoting. The XP256 “A/S” product then will be remove again and only the “Upgrades will be available as new”.

NOTE: The XP256 will be removed from CPL on 12/31/00. After that time new systems will no longer be orderable. Prior to 12/31, contact CSU factory for XP256 availability.

Ordering Process (XP256 Base Products Off CPL December 31, 2000 - Upgrades Products remain on CPL – 37GB/47GB Disks replaced with 73GB Disk)

Description	Off CPL Date	Replacement Product (if any)	Notes
XP256 Base Products (1)	December 31, 2000	XP512 and XP48(2)	Actual XP256 base product availability is quoted at time of order.
XP256 37GB SCSI Array Groups, Spares and iCOD-S	December 31, 2000 (all)	73GB SCSI Array Groups, Spares (3)	Actual 37GB SCSI drive availability is quoted at time of order.
XP256 47GB SCSI Array Groups, Spares and iCOD-S	December 31, 2000 (base/upgrades)	73GB SCSI Array Groups, Spares (3)	

XP256 base products include all new: Control Frames (DKC's), Disk Frames (DKU's), Array Groups, Cache, Shared Memory, ACP pairs, CHIP pairs (SCSI, Fibre Channel & ESCON), Array Frame Cables
73GB SCSI Array Groups, Spares will be available in December 2000.

Overview

Once the configuration choices have been made and saved in WATSON or Sales Builder for Windows (SBW), the configuration may be converted to a quote and imported into the order entry system. If configuration tools such as WATSON or SBW are not available, then it is important to follow an ascending numeric order for each Item / Sub-Item ordered in sequence. See Appendix for step by step Manual Procedures for configuring the XP256.

Structured Solution Programs (SSP's):

The HP Structured Solution Program (SSP) has been designed to make the ordering process simple, flexible, and easy to understand. It is completely menu driven requiring only a few simple choices for the various components in the system. Minimum/maximum numbers have been inserted into the menu wherever possible to simplify your choices and to guide your configuration decisions.

There is one SSP for this product:A5700A – offers a fully configurable menu of choices that span the entire capacity range of configurations

1. Host Interface Cables

Offers cable choices for each host interface in various lengths.

2. Software

Offers a wide choice of software products.

3. Upgrade Products

Allows for upgrading an existing array with more cache, disk storage, or host interfaces.

4. Product Support and Services

Choose the HW and SW support, and consulting services that your customer wants.

HP Surestore Disk Array XP256

	Description		Product #	Opt #	Status
1.0	HP Surestore Disk Array XP256 - Fully Configurable SSP	[x]	A5700A		While quantities last
2.0	Surestore Disk Array XP256 Control Fra (Required -- 1 Max)				
	Disk Control Frame - 3-phase power, 60 Hz and 50 Hz.	[]	A5701A		While quantities last
	Includes disk control frame with 1 ACP pair, HP Firmware, Continuous Track XP with Modem, 1GB cache memory, 256 MB shared memory, and redundant power.				
	Disk Control Frame with 60 Hz 1-phase power	[]	A5701B		While quantities last
	Includes disk control frame with 1 ACP pair, HP Firmware, Continuous Track XP with Modem, 1GB cache memory, 256 MB shared memory, and redundant power.				
	Disk Control Frame with 50 Hz 1-phase power	[]	A5701C		While quantities last
	Includes disk control frame with 1 ACP pair, HP Firmware, Continuous Track XP with Modem, 1GB cache memory, 256 MB shared memory, and redundant power.				
2.1	Client-Host Interface Processor (CHIP) pairs (Min.1 pair - Max. 4 pair)				
	8-Port SCSI adapter pair	[]	A5702A		While quantities last
	4-ExSA (ESCON compatible) channel adapter pair	[]	A5703A		While quantities last
	8-ExSA (ESCON compatible) channel adapter pair	[]	A5704A		While quantities last
	4-port fiber channel adapter pair	[]	A5705A		While quantities last
	Additional Redundant Power Supply needed for CHIP Pairs 3-4 (Min. 0, Max. 1)	[]	A5740A		While quantities last
2.2	Additional Cache Memory (1 GB) (Min 0, Max 15)	[]	A5710A		While quantities last
	Additional Cache Platform Board (Min 0, Max 1) Required for Cache > 8 GB	[]	A5711A		While quantities last
2.3	Additional Shared Memory (128 MB) (Min 0, Max 2)	[]	A5712A		While quantities last
2.4	Additional Array Control Processor (ACP) Pairs (Min 0, Max 3)	[]	A5719A		While quantities last
2.5	Fibre Channel Control Frame** (Min 0, Max 1)	[]	A5706A		While quantities last
	If A5706A is selected then a minimum of two FC-SCSI Bridges (A5707A) and a minimum of one SCSI CHIP (A5702A) are required. Includes all Bridge racking hardware, 2PDUs, and power cords				
	FC-SCSI Bridge	[]	A5707A		While quantities last
	FC-SCSI Bridge -if A5706A is ordered, Min 2, Max 16. Must order in multiples of 2				
	Disk Array Frame Configuration: Frame R1 Required. Min 1, Max 58 array groups				
	Default Factory Configuration is RAID-1				
3.0	R1 Disk Array Frame (Min 1 - Max 1)				
	Cannot intermix 1 phase, 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		
3.1	Frame R1 Configuration (Min. 1 - Max. 15 array groups)				
	ACP pair for Domain 2 must be ordered for array groups 8 to 15.				
	15 GB array group - 4 drives per group	[]	A5721R1		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723R1		While quantities last
	47 GB array group - 4 drives per group	[]	A5726R1		While quantities last
	73 GB array group - 4 drives per group	[]	A5727R1		While quantities last
	R1 Spare Disk Drives (Min 1 per Array Group capacity, Max 4)				
	15 GB spare drive (15 GB SP Drive)	[]	A5731S		While quantities last
	GB spare drive (47 GB SP Drive)	[]	A5736S		While quantities last
3.2	R2 Disk Array Frame (Min 0 - Max 1)				
	Cannot intermix 1 phase, 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		

	Description		Product #	Opt #	Status
3.3	Frame R2 Configuration (Min. 0 - Max. 14 array groups)				
	ACP pair for Domain 2 must be ordered for array groups 8 to 14.				
	15 GB array group - 4 drives per group	[]	A5721R2		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723R2		While quantities last
	47 GB array group - 4 drives per group	[]	A5726R2		While quantities last
	73 GB array group - 4 drives per group	[]	A5727R2		While quantities last
	SCSI Cable Set for Frame R2 (Required if frame R2 is ordered)	[]	A5746A		
3.4	L1 Disk Array Frame (Min 0 - Max 1)				
	Cannot intermix 1 phase, 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		
3.5	Frame L1 Array Group Configuration (Min. 0 - Max. 15 array groups)				
	ACP pair for Domain 3 required for array groups 1-7.				
	ACP pair for Domain 4 required for array groups 8-15.				
	15 GB array group - 4 drives per group	[]	A5721L1		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723L1		While quantities last
	47 GB array group - 4 drives per group	[]	A5726L1		While quantities last
	73 GB array group - 4 drives per group	[]	A5727L1		While quantities last
	SCSI Cable Set for Frame L1 (Required if L1 Frame is ordered)	[]	A5745A		
	L1 Spare Disk Drives (Min 0 - Max 4)				
	15 GB spare drive (15 GB SP Drive)	[]	A5731S		While quantities last
	36.9 GB spare drive (47 GB SP Drive)	[]	A5733S		While quantities last
	47 GB spare drive (47 GB SP Drive)	[]	A5736S		While quantities last
	73 GB spare drive (47 GB SP Drive)	[]	A5737S		While quantities last
3.6	L2 Disk Array Frame (Min 0 - Max 1)				
	Cannot intermix 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		
3.7	Frame L2 Array Group Configuration (Min. 0 - Max. 14 array groups)				
	Configuration of Frame L1 required, ACP pair for Domain 4 must be ordered for array groups 8-14.				
	15 GB array group - 4 drives per group	[]	A5721L2		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723L2		While quantities last
	47 GB array group - 4 drives per group	[]	A5726L2		While quantities last
	73 GB array group - 4 drives per group	[]	A5727L2		While quantities last
	SCSI Cable Set for Frame L2 (Required if L2 frame is ordered)	[]	A5746A		

Support Delivery Trigger Option #2YB must be added to A5701A or A5701B or A5701C.

A5706A and A5707A for expanded FC connectivity only. For basic FC Connectivity use 4 port Fibre Channel adapter pair A5705A.

XP256 A5700A SSP (Hardware)

Description		Product #	Opt #	
Host Interface Cables				
• Fibre Channel Cables		A5750A		
16 meter Fibre Channel Cable, 50 micron, multimode	[]		001	
50 meter Fibre Channel Cable, 50 micron, multimode	[]		002	
100 meter Fibre Channel Cable, 50 micron, multimode	[]		003	
• SCSI Cables		A5751A		
20 meter 68-pin HDTS to 68-pin HDTS cable	[]		003	
2 meter Y-cable/68-pin HDTS male cable	[]		004	
5 meter 68-pin HDTS to 68-pin HDTS cable in-line terminator cable for V-Class	[]		005	
10 meter 68-pin HDTS to 68-pin HDTS cable in-line terminator cable for V-Class	[]		006	
2/3 meter Y in-line terminator cable – 68-pin HD male for V-Class	[]		007	
2/5 meter Y in-line terminator cable – 68-pin HD male for V-Class	[]		008	
5 meter 68P HD LP to 68P HD LP	[]		009	
10 meter 68P HD LP to 68P HD LP	[]		010	
• Fibre Optic Cables (ESCON compatible)		A5752A		
Fiber Optic Cable - 7m	[]		001	
Fiber Optic Cable - 13m	[]		002	
Fiber Optic Cable - 22m	[]		003	
Fiber Optic Cable - 31m	[]		004	
Fiber Optic Cable - 46m	[]		005	
Fiber Optic Cable - 61m	[]		006	
Upgrade Products				
• 8-Port SCSI adapter pair	[]	A5702U		
• 4-ExSA (ESCON compatible) channel adapter pair	[]	A5703U		
• 8-ExSA (ESCON compatible) channel adapter pair	[]	A5704U		
• 4 port fiber channel adapter pair	[]	A5705U		
• Additional redundant power supply for CHIP Pairs 3 to 4	[]	A5740U		
• 1GB cache memory	[]	A5710U		
• Additional cache platform board	[]	A5711U		
• 128MB Shared Memory Module	[]	A5712U		
• Additional ACP pair	[]	A5719U		
• 60 Hz 3-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5708A		
• 50 Hz 3-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5709A		
• 60 Hz 1-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5708B		
• 50 Hz 1-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5709B		
• 15 GB array group - (4 disk drives per group)	[]	A5721U		
• 36.9 GB array group - (4 disk drives per group)	[]	A5723U		While quantities last
• 47 GB array group - (4 disk drives per group)	[]	A5726U		While quantities last
• 73 GB array group - (4 disk drives per group)	[]	A5727U		
• 15 GB spare drive	[]	A5731U		
• 36.9 GB spare drive	[]	A5733U		While quantities last
• 47 GB spare drive	[]	A5736U		While quantities last
• 73 GB spare drive	[]	A5737U		
• SCSI Cable Set for Array Frame L1	[]	A5745U		
• SCSI Cable Set for Array Frames R2 and L2	[]	A5746U		
XP-iCOD-S Products				
• 1GB cache memory, XP-iCOD-S	[]	A5710D		
• 128MB Shared Memory Module, XP-iCOD-S	[]	A5712D		
• Additional ACP pair, XP-iCOD-S	[]	A5719D		
• 15 GB array group - 4 drives per group, XP-iCOD-S	[]	A5721D		
• 73 GB array group - 4 drives per group, XP-iCOD-S	[]	A5727D		
Software				
Data Mirroring/Security				
• Continuous Access XP Media	[]	B9320A		

	Description		Product #	Opt #	
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (required)	[x]		OSY	
•	Continuous Access XP Media For XP256	[]	B9320A	001	
	includes RAID Manager				
•	Continuous Access XP 1 TB LTU (used capacity – see config guide for more information)	[]	B9321A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP 5 TB LTU (used capacity – see config guide for more information)	[]	B9322A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP 10 TB LTU (used capacity – see config guide for more information)	[]	B9323A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP 25 TB LTU (used capacity – see config guide for more information)	[]	B9324A		
•	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Extension Media	[]	B9325A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. Media For XP256	[]	B9325A	001	
•	Continuous Access XP Ext. 1 TB LTU (used capacity – see config guide for more information)	[]	B9326A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. 5 TB LTU (used capacity – see config guide for more information)	[]	B9327A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. 10 TB LTU (used capacity – see config guide for more information)	[]	B9328A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. 25 TB LTU (used capacity – see config guide for more information)	[]	B9329A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP Media	[]	B9330A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP Media For XP256	[]	B9330A	001	
	includes RAID Manager				
•	Implementation Service (#302 or #303 required)	[x]	H9273A		
•	Implementation Service for Simple environments	[]	H9273A	302	
•	Implementation Service for Complex environments	[]	H9273A	303	
•	Business Copy XP 1 TB LTU (used capacity – see config guide for more information)	[]	B9331A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP 5 TB LTU (used capacity – see config guide for more information)	[]	B9332A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP 10 TB LTU (used capacity – see config guide for more information)	[]	B9333A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP 25 TB LTU (used capacity – see config guide for more information)	[]	B9334A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP Media	[]	B9351A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP Media For XP256	[]	B9351A	001	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
•	Secure Manager XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9352A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9353A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9354A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9355A		
	First Year of System Support Option (required)	[x]		OS6	
•	Auto Path XP for AIX	[]	B7936B		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
	Auto Path for W2K/Pentium Media	[]	B9500A		
	First Year of System Support Option (required)	[x]		OS6	

Description		Product #	Opt #
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
Auto Path for W2K/Pentium 1 Server LTU	[]	B9501A	
First Year of System Support Option (required)	[x]		OS6
Auto Path for W2K/Pentium 5 Server LTU	[]	B9502A	
First Year of System Support Option (required)	[x]		OS6
Auto Path for W2K/Pentium 10 Server LTU	[]	B9503A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for NT Media	[]	B9505A	
First Year of System Support Option (required)	[x]		OS6
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto Path for NT 1 Server LTU	[]	B9506A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for NT 5 Server LTU	[]	B9507A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for NT 10 Server LTU	[]	B9508A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for HP-UX media		B9510A	
• First Year of System Support Option (required)	[x]		OS6
• Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto Path for HP-UX 1 server LTU		B9511A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for HP-UX 5 server LTU		B9512A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for HP-UX 10 server LTU		B9513A	
First Year of System Support Option (required)	[x]		OS6
• Cluster Extension XP for Veritas Cluster Server	[]	B9531A	
First Year of System Support Option (required)	[x]		OS6
• Cluster Extension XP for IBM HACMP	[]	B9532A	
First Year of System Support Option (required)	[x]		OS6
• Cluster Extension XP for MSCS	[]	B9533A	
First Year of System Support Option (required)	[x]		OS6
Performance			
• Cache LUN XP Media	[]	B9345A	
First Year of System Support Option (required)	[x]		OS6
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Cache LUN XP Media For XP256	[]	B9345A	001
• Cache LUN XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9346A	
First Year of System Support Option (required)	[x]		OS6
• Cache LUN XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9347A	
First Year of System Support Option (required)	[x]		OS6
• Cache LUN XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9348A	
First Year of System Support Option (required)	[x]		OS6
• Cache LUN XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9349A	
First Year of System Support Option (required)	[x]		OS6
• Performance Advisor XP		B9369A	
First year of system support required	[x]		OS6
SW Enablement option (included w/ initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto LUN XP Media	[]	B9340A	
First Year of System Support Option (required)	[x]		OS6
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto LUN XP Media For XP256	[]	B9340A	001
• Auto LUN XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9341A	

	Description		Product #	Opt #	
	First Year of System Support Option (required)	[x]		OS6	
•	Auto LUN XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9342A		
	First Year of System Support Option (required)	[x]		OS6	
•	Auto LUN XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9343A		
	First Year of System Support Option (required)	[x]		OS6	
	Array Management				
•	Auto LUN XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9344A		
	First Year of System Support Option (required)	[x]		OS6	
•	HP Surestore Command View XP	[]	B9357A		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (required)	[x]		OSY	
•	HP Surestore Command View XP For New XP256 Installations	[]	B9357A	001	
	Includes Remote Control XP For XP256				
•	Command View XP Upgrade (for Existing XP256 Installations)	[]	B9357A	003	
•	LUN Configuration Manager XP Media	[]	B9335A		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
•	LUN Configuration Mgr XP Media For XP256	[]	B9335A	001	
•	LUN Configuration Mgr XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9336A		
	First Year of System Support Option (required)	[x]		OS6	
•	LUN Configuration Mgr XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9337A		
	First Year of System Support Option (required)	[x]		OS6	
•	LUN Configuration Mgr XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9338A		
	First Year of System Support Option (required)	[x]		OS6	
•	LUN Configuration Mgr XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9339A		
	First Year of System Support Option (required)	[x]		OS6	
	Mainframe Software				
•	Resource Manager XP	[]	B9358A		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
•	Resource Manager XP For XP256	[]	B9358A	001	
•	Data Exchange XP For XP256/XP512/XP48	[]	T1620AA		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (required)	[x]		OSY	
•	Fast Recovery Solutions (1 support product required)	[]	B9550A	N/A	
•	1 Year 24x7 phone support	[]	H4405A	N/A	
•	3 Year 24x7 phone support	[]	H4405Y	N/A	
•	Direct Backup XP (LTU on one XP Disk Array)	[]	B9560A		

4.9.18—CNT UltraNet Storage Director

The CNT UltraNet Storage Director is a key component of HP's disaster-tolerant business continuity solutions, for use by HP customers with array-to-array data mirroring capabilities.

Two CNT UltraNet Storage Directors provide a high-speed switching platform at each data centre site, across unlimited distances, to interconnect HP XP48/512 storage systems to create an effective enterprise-wide storage area network (SAN).

By using either universally available telco-provided WAN links (e.g. ATM) or ubiquitous IP (Ethernet) packet-switched networks, HP customers can utilize better their existing network infrastructure. This allows users to maximize their cost savings by making more efficient use of their WAN connections whilst preventing considerable downtime, disruption and lost revenue by protecting one of their most valuable resources, data.

Description	Product #	Opt #	Price
CNT UltraNet Storage Director 6 slot Director with 2 Single ESCON ports and 1 WAN interface	CNTNSYAZ	OS6	
CNT UltraNet Storage Director 6 Slot Director with 2 Single ESCON ports and 2 WAN interfaces	CNTNSYBZ	OS6	
CNT UltraNet Storage Director 6 Slot Director with 2 Dual ESCON ports and 1 WAN interface	CNTNSYCZ	OS6	
CNT UltraNet Storage Director 6 Slot Director with 2 Dual ESCON ports and 2 WAN interfaces	CNTNSYDZ	OS6	

4.10 Solid State Disk – Excellerator™ file-caching solutions

The Excellerator from Solid Data is a file caching solution that multiplies system performance, scalability and reliability based on solid state disk (SSD) technology. It is the perfect fit in storage infrastructures that support mission-critical applications such as e-mail, messaging, and e-business applications, which heavily rely on speed of transaction processing. By combining HP Surestore disk arrays and Solid Data Excellerator file-caching appliances, an optimal high performance and high availability storage architecture can be configured. I/O wait will be eliminated; server performance and scalability in transaction-intensive applications will be multiplied.

Solid Data file-caching appliances are provided through HP Complementary Products (HPCP) on a worldwide basis. HP Support organization provides support services for the products (Multi-Vendor Support). Product Numbers as well as HP support options are available on CPL.

Description	Product #	Opt #	Price
Chassis – SCSI Interface			
<ul style="list-style-type: none"> 800 Ultra, High Voltage Differential, Dual Port, SCSI Chassis 	SSDEMY1Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 800 Ultra, Low Voltage, Dual Port, SCSI Chassis 	SSDEMY5Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 1000 Ultra, High Voltage Differential, Dual Port, SCSI Chassis 	SSDEMY2Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			

Description	Product #	Opt #	Price
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 1000 Ultra, Low Voltage, Dual Port, SCSI Chassis 	SSDEMY6Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
Chassis – Fibre Channel Interface			
<ul style="list-style-type: none"> 800 Fibre Channel, Single Port, FC Chassis 	SSDEMY3Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 800 Fibre Channel, Dual Port, FC Chassis 	SSDEMY7Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 1000 Fibre Channel, Single Port, FC Chassis 	SSDEMY4Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	

Description	Product #	Opt #	Price
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• 1000 Fibre Channel, Dual Port, FC Chassis	SSDEMY8Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
Memory Array Boards			
• 512MB Memory Array Board	SSDEMYBZ		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots			
Model 1000 Chassis have 16 memory array board slots			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
• 1GB Memory Array Board	SSDEMY9Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slot			
Model 1000 Chassis have 16 memory array board slots			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
• 2GB Memory Array Board	SSDEMYAZ		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots			
Model 1000 Chassis have 16 memory array board slots			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Remote Monitoring and Reporting			
• Remote Monitoring and Reporting	SSDEMYRZ		
Note: Must be ordered together with a Chassis. Can be applied with any Chassis model; support is covered by the Chassis			
e-100 Configured Solutions			
• e-100, High Voltage Differential, Dual Port, with 512MB	SSDEMYGZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, Low Voltage Differential, Dual Port, with 512MB	SSDEMYHZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	

Description	Product #	Opt #	Price
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, High Voltage Differential, Dual Port, with 1GB	SSDEMYIZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, Low Voltage Differential, Dual Port, with 1GB	SSDEMYJZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, High Voltage Differential, Dual Port, with 2GB	SSDEMYKZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, Low Voltage Differential, Dual Port, with 2GB	SSDEMYLZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	

Subchapter 4.11—Media

	Description	Product #	Opt #	Price
•	1.3 GB HP DDS DAT cartridge (60 meters) (box of five)	92283A		
•	2 GB HP DDS DAT cartridge (90 meters) (box of five)	92283B		
•	4 GB HP DDS DAT cartridge (120 meters) (box of five)	92300A		
•	12 GB HP DDS DAT cartridge (125-meters) (box of five)	C1517A		
•	DAT drive cleaning cassette	92283K		
•	Certified, 1/4-inch Tape Cartridges for the 9144A tape drive, 600-foot (box of five)	88140LC		
•	Certified, 1/4-inch Tape Cartridges for the 9144A tape drive, 150-foot (box of five)	88140SC		
•	Certified, 1/4-inch Tape Cartridges for the 9145A tape drive, 600-foot (box of five)	92245L		
•	1/2-inch Tape Reels (in seals, box of ten - 2400 ft.)	92150F		
•	40 GB HP DLT Tape IV Cartridge (1 pack)	C5141F		
•	15 GB HP DLT Tape III Cartridge (1 pack)	C5141A		
•	DLT Tape Cleaning Cartridge	C5142A		
•	100GB HP Ultrium Tape Cartridge (1 pack)	C7970A		
•	200GB HP Ultrium Tape Cartridge (1 pack)	C7971A		
•	Ultrium Universal Tape Cleaning Cartridge	C7978A		
•	DLT1 Tape Cleaning Cartridge	C7998A		
	9840 Data Cartridge (Ordering information telephone 1-800-905-8502)			
	9840 Cleaning Cartridge (Ordering information telephone 1-800-905-8502)			
	NOTE: Data cartridge labels can be ordered from Engineered Data Products (EDP).			
	US sales line 1-800-432-1337, International 303 438 8375			

Subchapter 4.12—Terminals

	Description	Product #	Opt #	Price
	HP Terminal/Console			
	14-inch screen, 8-page memory, 80/132 column data, high resolution character, full overscan, VT320/220 compatible, white phosphor display only, EPC 104 keyboard			
•	HP 700/96 with amber screen	C1099A		
	HP 700/60 ASCII/ANSI/PC Terminal			
	DEC VT320 compatible, Wyse 60 compatible, 80/132 column data, 14-inch full overscan display, 72 Hz refresh rate. PC-AT type keyboard (optional ANSI keyboard).			
•	HP 700/60 with amber screen; PC-AT type keyboard	C1080A		
•	HP 700/60 with green screen; PC-AT type keyboard	C1080G		
•	HP 700/60 with soft-white screen; PC-AT type keyboard	C1080W		
	HP 700/70 Terminal			
	14-inch screen, 80/132 column data, DEC VT320 and Wyse 60 compatible; 50, 60 or 72 Hz refresh rate. PC-AT type keyboard (optional ANSI keyboard). Includes license-to-use SSSI FacetTerm software.			
•	HP 700/70 with amber screen	C1093A		
•	HP 700/70 with green screen	C1093G		
•	HP 700/70 with white screen	C1093W		
•	HP 700/70 media kit for HP 9000 – DAT. One required per site.	C1096A		
•	Serial mouse	C3370A		
	HP 700/96 Terminal			
	14-inch screen, 8-page memory, 80/132 column data, high resolution character, full overscan, VT220 compatible.			
•	HP 700/96 with amber screen	C1064A		
•	HP 700/96 with green screen	C1064G		
•	HP 700/96 with soft-white screen	C1064W		
	HP 700/98 High Performance Terminal			

Description	Product #	Opt #	Price
14-inch screen, 16-page memory, 80/132 column data, high resolution characters, full overscan, forms cache, 11 edit checks, VT220 compatible.			
• HP 700/98 with amber screen	C1065A		
• HP 700/98 with green screen	C1065G		
• HP 700/98 with soft-white screen	C1065W		
• HP 700/60ES Terminal with soft-white screen. Has all HP 700/60 features plus compliance with Swedish MPR 1990:10 guidelines.	C1083W		
• HP 700/70ES – has all HP 700/70 features, plus compliance with Swedish MPR 1990:10 guidelines	C1094W		
• HP 700/96ES Terminal with Soft-White Screen. Has all HP 700/96 features plus compliance with Swedish MPR 1990:10 guidelines.	C1084W		
• HP 700/98ES Terminal with Soft-White Screen. Has all HP 700/98 features plus compliance with Swedish MPR 1990:10 guidelines.	C1085W		

Subchapter 4.13—NCD Thin Clients/X-Terminals

NCD is a leading provider of integrated thin client hardware and software solutions that deliver high performance, easy-to-manage access to any UNIX and legacy application. The NCD Network Computer Products deliver the broadest support for today's web, UNIX and legacy application access requirements, with expandability to meet tomorrow's needs. Major features include: outstanding X11 performance, a reliable local Netscape Navigator browser and the fastest and most flexible ICA client in a thin client.

Description	Product #	US \$ Ref. Price
NCD Network Computer X-Terminals		
Base Units include:		
– HP 3 Year International Limited Hardware Warranty with unit replacement		
– Mouse		
– Power Cord		
Keyboard to be ordered separately		
Monitor to be ordered separately		
N916, 16MB System Memory, 2 System Memory Slots, 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD916UB	
European and International Bundle (Power Cord)	NCD916EB	
N932, 32MB System Memory, 2 System Memory Slots (1 unused), 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD932UB	
European and International Bundle (Power Cord)	NCD932EB	
N948, 16MB System Memory, 2 System Memory Slots (1 unused), 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD948UB	
European and International Bundle (Power Cord)	NCD948EB	
N980, 80MB System Memory, 2 System Memory Slots (1 unused), 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD980UB	
European and International Bundle (Power Cord)	NCD980EB	
HP 3 Year International Limited Hardware warranty with unit Replacement MUST be ordered with every thin client	NCDWARTY	
Keyboards for the NCD900		
US – US Localization	NCDKBDUS	
UK – UK Localization	NCDKBDUK	
France – French Localization	NCDKBDFR	
Germany – German Localization	NCDKBDGR	

Description	Product #	US \$ Ref. Price
Sweden/Finland – Swedish/Finnish Localization	NCDKBDSE	
Italy – Italian Localization	NCDKBDIT	
Canada – French Canadian Localization	NCDKBDFC	
NCD900 Add-on Options		
2 Power Cords – 1 UK / 1 European	NCDPWREU	
Single Australian Power Cord	NCDPWRAU	
16MB 100-Pin DIMM, 4 Bank	NCDNF016	
32MB 100-Pin DIMM, 4 Bank	NCDNF032	
64MB 100-Pin DIMM, 4 Bank	NCDNF064	
128MB 100-Pin DIMM, 4 Bank	NCDNF128	
8MB Flash Memory Card	NCDF08FM	
16MB Flash Memory Card	NCDF16FM	
10 Base2 Thinnet Ethernet	NCDN9FB2	
Parallel Port Card	NCDNCFPL	
Display Stand – for monitors over 17 inches in size	NCDNCFDS	
Floppy Disk Drive	NCDFDD01	
NCD900 Software		
NCBridge 4.0, CD-ROM, site license upgrade for customers who purchased previous versions of NCBridge	NCD840CU	
NCBridge 4.0, CD-ROM, site license (1 License mandatory per site)	NCD840CS	
NCBridge 4.0, CD-ROM, corporate license	NCD840CC	
8 x 5 Phone-in assistance, LTU Updates, Media and Documentation Updates	NCD840S1	
24 x 7 Phone-in assistance, LTU Updates, Media and Documentation Updates	NCD840S2	

Subchapter 4.14—Printers

Description	Product #	Opt #	Price
HP 5000 Cut-Sheet Printers			
Printers and Accessories			
• PostScript™ Level 2 for the D640	C5630A		
• D640 16 megabytes add-on memory	C5635A		
Network Interfaces and Cables			
• 3-meter parallel cable for use with D640	C2946A		
• 10-meter parallel cable for use with D640	C2947A		
Supplies and Consumables			
• D640 Toner Kit (8 bottles)	C5626A		
• D640 Drum Kit	C5629A		
• D640 Developer Kit (2 bottles)	C5632B		
• D640 Printer Pick Roller Kit	C5633A		
• D640 Fuser (120-127V)	C5627A		
• D640 Fuser (200-240V)	C5628A		
• D640 HCI Pick Roller	C5636B		
• C30/C30D/C40D Toner, 2 cartridges	C4006A		
• C30/C30D/C40D Toner, 8 cartridges	C4007A		
• C30/C30D Photoconductor	C4682A		
• C40D Photoconductor	C4683A		
• C30/C30D/C40D Fuser, 100-127 VAC	C4675A		
• C30/C30D/C40D Fuser, 200-240 VAC	C4676A		
• Cleaner Unit for C30/C30D/C40D	C4011A		
• C30/C30D Developer Unit	C4015A		
• C40D Developer Unit	C4677A		
HP LineJet and LP Series Ribbons (Available as service parts; Contact HP Parts Direct)			
• 60 yard text ribbons, box of 6 ribbons (service part number: 171543-001)			

Description	Product #	Opt #	Price
<ul style="list-style-type: none"> 100 yard text ribbons, box of 6 ribbons (service part number: 171543-002) 60 yard bar code/OCR ribbons, box of 6 ribbons (service part number: 171543-003) 100 yard bar code/OCR ribbons, box of 6 ribbons (service part number: 171543-004) 			
P405 Multi-Purpose Impact Printer			
<ul style="list-style-type: none"> Model P405 Multi-purpose impact printer (600 cps in draft mode, 150 cps in letter) 	PSYP405P		
Localized for Europe and AAA (Only available in UK & France)			
<ul style="list-style-type: none"> Model P405 Multi-purpose impact printer (600 cps in draft mode, 150 cps in letter) 	PSYPAMER		
Localized for the Americas (obsolete as of July 1, 2001) *			
<ul style="list-style-type: none"> P405 Printer stand (635x670x730 - W x D x H) ** 	PSYP405S		
<ul style="list-style-type: none"> Pack of 5 ribbons for the P405 (black)** 	PSYP405R		
<ul style="list-style-type: none"> Replacement print head (Lifetime 350,000 pages)** 	PSYP405H		
<ul style="list-style-type: none"> Automatic sheet feeder cassette version A (for normal paper - max 180)** 	PSYP405A		
<ul style="list-style-type: none"> Automatic sheet feeder cassette version B (heavy paper and envelopes - max 50)** 	PSYP405B		
<ul style="list-style-type: none"> Replacement platen assembly (rubber roller to transport paper) ** 	PSYP405Y		
<ul style="list-style-type: none"> Replacement pick up rolls ** 	PSYP405L		
C-Series, HP LineJet, and LP Series Network Interfaces and Cables			
<ul style="list-style-type: none"> HP JetDirect EX Plus Ethernet/IEEE 802.3 Network Interface 	J2591A		
<ul style="list-style-type: none"> HP JetDirect 500X External Print Server 910/100Base-TX, 10Base 2 	J3265A		
<ul style="list-style-type: none"> HP JetDirect E500X External Print Server (Token Ring) 	J3264A		
<ul style="list-style-type: none"> HP JetDirect EX to LP Series parallel connect cable (3-meter) 	C2951B		
<ul style="list-style-type: none"> HP JetDirect EX to LP Series parallel connect cable (2-meter) 	C2950A		
HP 5000 F-Series Printer Consumables			
<ul style="list-style-type: none"> Toner for HP 5000 Printers, 9 kg (estimated yield is 267,000 pages) 	35192A		

* A 100% comparable PSYPAMER product is available through our OEM, PSI
 285 North Drive, #F
 Melbourne, FL 32934
 Phone: 321-254-1946
 Fax: 321-242-0258
 e-mail: psi-us@inetmail.att.net

** These products are still available in UK and France. Outside of these two countries, You can order these products through PSI (see above for the US), and PSI Europe, phone # +49 271 3597 361, email: p405-support@psi-si.de

Subchapter 4.15—Cables and Accessories

Description	Product #	Opt#	Price
Order a 0D1 option for factory integration of cables or terminators. If factory integration is available, the 0D1 option is listed below the cable product number.			
Low Density Bail Lock 50			
<ul style="list-style-type: none"> SCSI Cable 1m LDBL50 M/M 	92222B	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
<ul style="list-style-type: none"> SCSI Cable 3m LDBL50 M/F Ext 	C2900A	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
Low Density Bail Lock to High Density Thumb Screw			
<ul style="list-style-type: none"> SCSI Cable 1m HDTS50/LDBL50 M/M Adptr 	K2296	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
<ul style="list-style-type: none"> SCSI Cable 1m HDTS68/LDBL50 M/M Adptr 	C2915A	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
High Density Thumb Screw 50			
<ul style="list-style-type: none"> SCSI Cable 0.5m HDTS50 M/M 	C2955A	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
<ul style="list-style-type: none"> SCSI Cable 1m HDTS50 M/M 	C2908A		
<ul style="list-style-type: none"> SCSI Cable 2m HDTS50 M/M 	C2957A		
<ul style="list-style-type: none"> SCSI Cable 3m HDTC50 M/M 	C7521A		

Description	Product #	Opt#	Price
Factory Integrated		OD1	
• SCSI Cable 5m HDTS50 M/M	C2958A		
Factory Integrated		OD1	
High Density Thumb Screw 68 to High Density Thumb Screw 50			
• SCSI Cable 1m HDTS68/HDTS50 M/M Adptr	C2961A		
• Factory Integrated		OD1	
• SCSI Cable 2m HDTS68/HDTS50 M/M Adptr	C2906A		
• SCSI Cable 5m HDTS68/HDTS50 M/M Adptr	C2907A		
Factory Integrated		OD1	
Very High Density Thumb Screw 68 to High Density Thumb Screw 50			
• SCSI Cable 1m VHDS68/HDTS50 M/M Adptr	C2367A		
Factory Integrated		OD1	
• SCSI Cable 2.5m VHDS68/HDTS50 M/M Adptr	C2368A		
Factory Integrated		OD1	
High Density Thumb Screw 68			
• SCSI Cable 0.5m HDTS68 M/M Multimd	C2978B		
Factory Integrated		OD1	
• SCSI Cable 1m HDTS68 M/M Multimd	C2911C		
Factory Integrated		OD1	
• SCSI Cable 1.5m HDTS68 M/M Multimd	C2979B		
Factory Integrated		OD1	
• SCSI Cable 2.5m HDTS68 M/M Multimd	C2924C		
Factory Integrated		OD1	
• SCSI Cable 5m HDTS68 M/M Multimd	C7521A		
Factory Integrated		OD1	
• SCSI Cable 10m HDTS68 M/M Multimd	C7522A		
Factory Integrated		OD1	
• SCSI Cable 20m HDTS68 M/M Multimd	C7532A		
Factory Integrated		OD1	
Very High Density Thumb Screw 68			
• SCSI Cable 0.5m VHDS68 M/M Multimd	C2371A		
Factory Integrated		OD1	
• SCSI Cable 1m VHDS68 M/M Multimd	C2372A		
Factory Integrated		OD1	
• SCSI Cable 2m VHDS68 M/M Multimd	C2373A		
Factory Integrated		OD1	
• SCSI Cable 5m VHDS68 M/M Multimd	C2374A		
Factory Integrated		OD1	
• SCSI Cable 10m VHDS68 M/M Multimd	C2375A		
Very High Density 68 to High Density 68			
• SCSI Cable .5m VHDS68/HDTS68 M/F Multimd Ext	C7523A		
Factory Integrated		OD1	
• SCSI Cable 1m VHDS68/HDTS68 M/M Multimd	C2361B		
Factory Integrated		OD1	
• SCSI Cable 1.5m VHDS68/HDTS68 M/M Multimd	C2362B		
Factory Integrated		OD1	
• SCSI Cable 2m VHDS68/HDTS68 M/M Multimd	C2365B		
Factory Integrated		OD1	
• SCSI Cable 5m VHDS68/HDTS68 M/M Multimd	C2363B		
Factory Integrated		OD1	
Special V-Cables			
• SCSI V Cbl 2m HD/HD/HD M/M/M	C7544A		
Factory Integrated		OD1	
• SCSI V Cbl 2m VHD/VHD/HDTS68 M/M/M	A5607A		
Factory Integrated		OD1	

Description	Product #	Opt#	Price
• SCSI V Cbl 2m VHD/VHD ILT/HDTS68 M/M/M Factory Integrated	A5608A	OD1	
• SCSI V Cbl 2m HD/VHD/HDTS68 M/M/M Factory Integrated	A5609A	OD1	
• SCSI V Cbl 2m HD/VHD ILT/HDTS68 M/M/M Factory Integrated	A5610A	OD1	
In-Line Terminated Cables			
• SCSI Cable 0.5m HDTS68 HVD ILT M/F Ext Factory Integrated	C2980A	OD1	
• SCSI Cable 5m HDTS68 HVD ILT M/M Factory Integrated	C7554A	OD1	
• SCSI Cable 5m HDTS68 HVD ILT M/M Factory Integrated	C7555A	OD1	
• SCSI Cable 0.5m VHDS68/HDTS68 HVD ILT M/F Ext Factory Integrated	C7519A	OD1	
• SCSI Cable 5m VHDS68/HDTS68 HVD ILT M/M Factory Integrated	C5766A	OD1	
• SCSI Cable 10m VHDS68/HDTS68 HVD ILT M/M Factory Integrated	C5767A	OD1	
• SCSI Cable 2m VHDS68/HDTS68 LVD/SE ILT M/M Factory Integrated	C7541A	OD1	
• SCSI Cable 5m VHDS68/HDTS68 LVD/SE ILT M/M Factory Integrated	C7520A	OD1	
• SCSI Cable 10m VHDS68/HDTS68 LVD/SE ILT M/M Factory Integrated	C7556A	OD1	
• SCSI Cable 2m VHDS68 LVD/SE ILT M/M Factory Integrated	A5668A	OD1	
• SCSI Cable 5m VHDS68 LVD/SE ILT M/M Factory Integrated	A5669A	OD1	
• SCSI Cable 10m VHDS68 LVD/SE ILT M/M Factory Integrated	A5670A	OD1	
Fiber optic SCSI extender (supported on printers only)			
• Add 50m Fiber-optic cable		AFB	
• Add 100m Fiber-optic cable		AFD	
SCSI Terminators			
• SCSI Terminator SE LDBL50 Factory Integrated	K2291	OD1	
• SCSI Terminator SE HDTS50	C2904A		
• SCSI Terminator HVD HDTS50 Factory Integrated	C2905A	OD1	
• SCSI Terminator Active SE HDTS68 Factory Integrated	C2972A	OD1	
• SCSI Terminator LVD/SE HDTS68 Multimd Factory Integrated	C2364A	OD1	
• SCSI Terminator HVD VHDS68 Factory Integrated	C7528A	OD1	
• SCSI Terminator LVD/SE VHDS68 Multimd Factory Integrated	C2370A	OD1	

NOTE: When ordering SCSI Adapters A5149A, A5150A, A5159A, or A5838A, terminators are NOT included. Please order the appropriate terminator(s) for the final device(s) in your SCSI chain.

Subchapter 4.16—Networking Cables

Description	Product #	Opt #	Price
Order a OD1 option for factory integration of cables or terminators. If factory integration is available, the OD1 option is listed below the cable product number.			
CAT 5e cables			
• CAT 5e Cable 4 ft RJ 45 M/M	C7533A		
• Factory Integrated		OD1	
• CAT 5e Cable 7 ft RJ 45 M/M	C7535A		
• Factory Integrated		OD1	
• CAT 5e Cable 14 ft RJ 45 M/M	C7536A		
• Factory Integrated		OD1	
• CAT 5e Cable 25 ft RJ 45 M/M	C7537A		
• Factory Integrated		OD1	
• CAT 5e Cable 50 ft RJ 45 M/M	C7542A		
• Factory Integrated		OD1	
• CAT 5e C/O Cable 7 ft RJ 45 M/M	C7539A		
• Factory Integrated		OD1	
• CAT 5e C/O Cable 14 ft RJ 45 M/M	C7538A		
• Factory Integrated		OD1	
• CAT 5e C/O Cable 7 ft RJ 45 M/M	C7542A		
• Factory Integrated		OD1	
ThinLAN Cables and Accessories			
ThinLAN Coax Cable (with BNC connectors installed):			
• 1 m coax cable	92227A		
• 2 m coax cable	92227B		
• 4 m coax cable	92227C		
• 8 m coax cable	92227D		
• 16 m coax cable	92227E		
• 32 m coax cable	92227F		
• 128 m coax cable	92227H		
ThinLAN Accessories			
• BNC "T" Connector	92227N		
• ThinLAN Terminator Pair	92227P		
• Backbone LAN MAU and Tap, ThickLAN	30241A		
Backbone LAN AUI Cables (with connectors attached) for use with 30241A:			
• 6 m FEP AUI Cable	92254A		
• 12 m FEP AUI Cable	92254B		
• 48 m FEP AUI Cable	92254D		
• 6 m PVC (11) AUI Cable	92254E		
• 12 m PVC AUI Cable	92254F		
• 48 m PVC AUI Cable	92254H		
Backbone LAN Coax Cables (including connectors and terminators) ThickLAN			
• 500 m FEP without terminators attached	92253D		
• 500 m PVC without terminators attached	92253H		
Backbone LAN Coax Cable Tools for attaching connectors (order once):			
• N-Connectors, male, package of four	92253J		
• Barrel N-Connectors, female, and insulators, package of two	92253K		
• One grounding terminator and one floating point terminator with insulator	92253L		
For information on adapters, bridges, hubs, routers, switches, and transceivers, refer to Chapter 7, Networking and Communications			

Subchapter 4.17—Fibre Optic Cables

	Description	Product #	Opt #	Price
	Order a OD1 option for factory integration of cables or terminators. If factory integration is available, the OD1 option is listed below the cable product number.			
	Fibre Optic cables			
	SC/SC Connector			
•	Fibre Optic Cable 2m SC Duplex 50/125 M/M Factory Integrated	A3583A	OD1	
•	Fibre Optic Cable 16m SC Duplex 50/125 M/M	A3531A		
•	Fibre Optic Cable 50m SC Duplex 50/125 M/M Factory Integrated	A3735A	OD1	
	Fibre Optic Cable 100m SC Duplex 50/125 M/M	A3736A		
•	Factory Integrated		OD1	
	LC/LC Connector			
•	Fibre Optic Cable 2m LC Duplex 50/125 M/M Factory Integrated	C7524A	OD1	
•	Fibre Optic Cable 16m LC Duplex 50/125 M/M Factory Integrated	C7525A	OD1	
•	Fibre Optic Cable 50m LC Duplex 50/125 M/M	C7526A		
•	Fibre Optic Cable 200m LC Duplex 50/125 M/M	C7527A		
	LC/SC Adapter and Extenders			
•	Fibre Optic Cable LC/SC 2m Duplex 50/125 M/M Factory Integrated	C7529A	OD1	
•	Fibre Optic Cable LC/SC 16m Duplex 50/125 M/M Factory Integrated	C7530A	OD1	
•	Fibre Optic SC F/F Coupler Factory Integrated	C7534A	OD1	
•	Fibre Optic Cable Kit: Includes a 2m LC/SC Fibre Optic Cable and a Fibre Optic SC F/F Coupler Factory Integrated	C7540A	OD1	

Subchapter 4.1—Fibre Channel Infrastructure and DTCs

	Description	Product #	Opt #	Price
	Fibre Channel for Information Storage Infrastructure Products			
•	HP Brocade 8-Port Fibre Channel Switch (field installable)	A5625A		
•	Power Supply for Brocade 2400 Switch	A5671A		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	HP Brocade 8-Port Fibre Channel Switch (factory integrated)	A5625AZ		
•	Power Supply for Brocade 2400 Switch	A5671A		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	HP Brocade 16-Port Fibre Channel Switch (field installable)	A5624A		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	HP Brocade 16-Port Fibre Channel Switch (factory integrated)	A5624AZ		
•	2 meter fibre channel cable	A3583A		
•	16 meter fibre channel cable	A3531A		
•	50 meter fibre channel cable	A3735A		
•	100 meter fibre channel cable	A3736A		
•	SW GBIC	A5225A		
•	LW GBIC	A5226A		
•	2 Optical SW GBIC's with one 50 meter optical cable	D6980A		
•	2 Optical SW GBIC's with one 100 meter optical cable	D6981A		
•	2 Copper GBIC's with one 3 meter copper cable	D6978A		
•	2 Copper GBIC's with one 5 meter copper cable	D6979A		
•	2 Copper GBIC's with one 10 meter copper cable	D7080A		
•	Fibre Channel 1063 Mbps 10 port shortwave Hub (standalone or field integratable)	A3724A		
	Rack Mount Kit for FC Hub		001	
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	
	100 meter fibre cable		026	
•	Fibre Channel 1063 Mbps 10 port shortwave Hub (racked, factory integrated)	A3724AZ		
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	
	100 meter fibre cable		026	
•	Fibre Channel 1063 Mbps 9 port shortwave, 1 port long-wave Hub (standalone or field integratable)	A4839A		
	Rack Mount Kit for FC Hub		001	
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	
	100 meter fibre cable		026	
•	Fibre Channel 1063 Mbps 9 port shortwave, 1 port long-wave Hub (factory integrated)	A4839AZ		
	16 meter fibre cable		AFY	
	50 meter fibre cable		025	

Description	Product #	Opt #	Price
100 meter fibre cable		0Z6	
• Fibre Channel 1063 Mbps SCSI Multiplexer (factory integrated)	A3308A		
F/W SCSI interface card (4 maximum per SCSI Multiplexer)		003	
Fibre Channel 1063 Mbps interface card (2 maximum per SCSI Multiplexer)		004	
16 meter fibre cable		AFY	
50 meter fibre cable		0Z5	
100 meter fibre cable		0Z6	
• Fibre Channel 1063 Mbps SCSI Multiplexer (racked, factory integrated)	A3511AZ		
F/W SCSI interface card (4 maximum per SCSI Multiplexer)		003	
Fibre Channel 1063 Mbps interface card (2 maximum per SCSI Multiplexer)		004	
16 meter fibre cable		AFY	
50 meter fibre cable		0Z5	
100 meter fibre cable		0Z6	
• Fibre Channel SCSI Multiplexer (including rack kit)	A3511A		
F/W SCSI interface card		003	
Fibre Channel 1063 Mbps interface card		004	
16 meter fibre cable		AFY	
50 meter fibre cable		0Z5	
• F/W SCSI adapter upgrade for SCSI Multiplexer (provides additional F/W SCSI Channel)	A3509A		
• 1063 Mbps Fibre Channel adapter upgrade for SCSI Multiplexer (provides second FC connection)	A3512A		
100 meter fibre cable		0Z6	
Interface Manager			
• HP SureStore Interface Manager for 10/180 & 20/700	A6356A		
Includes card cage, remote management card, redundant power supplies, controller, fans, 2.5 SCSI cable, 10 plug PDU			
• HP SureStore Fibre Channel Interface Ultrium LVDS	A4674A		
2 pack of 2.5M Multimode SCSI cables		001	
• HP SureStore Fibre Channel Interface Ultrium HVDS	A4673A		
2 pack of 2.5M Multimode SCSI cables		001	
Fibre Bridges			
• HP SureStore Bridge FC 4/1 HV	A4688A		
Cable package, four each SCSI 2.5M		001	
Library installation kit including power strip, rackmount hardware, SCSI cable (bridge to controller)		002	
• HP SureStore Bridge FC 2/1 LV	A4689A		
Cable package, two each SCSI 2.5M		001	
Library installation kit including power strip, rackmount hardware, SCSI cable (bridge to controller)		002	
• SCSI Library HVD to LVD Convertor (for LVD bridge support of library robotics interface)	A6324A		
DTCs			
• DTC16TN Telnet Terminal Server with 16 RS-232 Ports	J2060A		
Racking kit for 1.1 or 1.6 meter cabinets		1AC	
Replace eight RJ-45 direct ports with eight DB-25 modem ports		UG5	
Replace RS-232 with 16 RS-423 ports		UG4	
• HP DTC Manager UX media for Servers	J2120A		
CD-ROM certificate		AAU	
HP-UX 10.01		APS	
HP-UX 10.10		APX	
HP-UX 10.20		APZ	
• DTC72MX Communications Server with three available slots	J2070A		
Racking kit for 1.1 or 1.6 meter cabinets		1AC	
Configure with 24 RS-232 direct connect ports with RJ-45 connectors		001	
Configure with 48 RS-232 direct connect ports with RJ-45 connectors		002	
Configure with 72 RS-232 direct connect ports with RJ-45 connectors		003	
Replace eight RJ-45 direct ports with eight DB-25 modem ports		UG5	
Configure with 24 RS-423 direct connect ports with RJ-45 connectors		UG4	
Add X.25 board with RS-232 interface		1CW	
Add X.25 board with V.35 interface		1CX	
Add Telnet Access board		004	

	Description		Product #	Opt #	Price
	Add-On Products for DTC72MX:				
•	24-Port RS-232 Direct Connect Card for DTC72MX with RJ-45 connections		J2076A		
	Replace eight RJ-45 direct ports with eight DB-25 modem ports			UG5	
•	24-Port RS-423 Direct Connect Card for DTC72MX		J2077A		
•	X.25 Board for DTC72MX		J2079A		
	RS-232 Interface			1CW	
	V.35 Interface			1CX	
•	Telnet Access Board for DTC72MX		J2080A		
	Terminal Server for Model 12H with Fibre Channel		A4917A		
	8 Port -for use with 12H and SCSI-FC MUX				
	Accessories for DTC16TN and DTC72MX				
•	Racking Kit for 5 DTC MDPs in 1.1 or 1.6 meter cabinets		J2084A		
•	DTC Connection Accessories		J2085A		
	8-Port RS-232 modem distribution panel with DB-25 connectors			101	
	8-Port direct connect distribution panel with DB-25 connectors			102	
	24-Port direct connect distribution panel with RJ-45 connectors			103	
	8-Port multi-port cable with HP 3-pin connectors			104	

Subchapter 4.2—HP Secure Web Console

	Description		Product #	Opt #	Price
1.0	HP Secure Web Console				
	HP Secure Web Console Note 1: Secure Web Console is integrated into the A-, R-, L-, and N-Class servers and does not need to be ordered with these servers. Note 2: An RS232 cable is required to connect the Secure Web Console to the server. This can be the existing console cable or a new customer supplied cable or it can be ordered from HP. The HP product number is 24542G. For more information, see the Configuration Guide, Chapter 4 Peripherals and Accessories, subchapter 4.2-HP Secure Web console	[]	J3591A		

Subchapter 4.3—HP Uninterruptible Power Supplies

	Description		Product #	Opt #	Price
	HP PowerTrust UPS (Must order option 021 for use with D- and K-Class Servers.)				
•	PowerTrust II-LR 1.4kW/2.0kVA UPS 120V		A1353A		
	Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals				
	Factory Racked			0D1	
	Additional Battery Pack note: maximum 4 additional battery packs for a total of 5			001	
	Field Rack RBII			002	
	Floor standing security brackets			003	
	Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable			25P	
	Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable			25M	
	Replace Standard RS232 cable with RS232 DB9f-DB9m for MS NT Servers (available 6/1/00)			013	
	Replace Standard power cord with 120V straight plug			011	
•	PowerTrust II-LR 1.4kW/2.0kVA UPS 230V		A1354A		
	Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals				
	Factory Racked			0D1	
	Additional Battery Pack note: maximum 4 additional battery packs for a total of 5			001	
	Field Rack RBII			002	
	Floor standing security brackets			003	
	Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable			25P	

Description	Product #	Opt #	Price
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		25M	
Replace Standard RS232 cable with RS232 DB9f-DB9m for MS NT Servers (available 6/1/00)		013	
Replace Standard power cord with Central European 4.5m C19/CEE7		AWT	
Replace Standard power cord with International 4.5m C19/IEC309 plug		AWU	
Replace Standard power cord with International/European C19/unterminated		AW5	
• PowerTrust II-LR 2.1kW/3.0kVA UPS 230V	A1356A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals			
Factory Racked		0D1	
Additional Battery Pack note: maximum 4 additional battery packs for a total of 5		001	
Field Rack RBII		002	
Floor standing security brackets		003	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		25P	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		25M	
Replace Standard RS232 cable with RS232 DB9f-DB9m for MS NT Servers (available 6/1/00)		013	
Replace Standard power cord with Central European 4.5m C19/CEE7		AWT	
Replace Standard power cord with International 4.5m C19/IEC309 plug		AWU	
Replace Standard power cord with International/European C19/unterminated		AW5	
• PowerTrust II-LR Battery Pack	A1357A		
• RS232 Extension Cable DB9f/DB9m	A1358A		
• PowerTrust II-LR SNMP/WEB Card	A1359A		
• PowerTrust II-LR Rack kit for Rosebowl I	A1361A		
• PowerTrust II-LR Rack kit for Rosebowl II	A1362A		
• PowerTrust II-LR Floor standing security brackets	A1363A		
• PowerTrust II-LR/MR RS232 DB-9f/DB-9m cable	A1364A		
• RS232 DB9-DB25 PCI MUX cable	A1365A		
• RS232 DB9-DB25 MDP MUX cable	A1366A		
• PowerTrust II-MR 4.0kW/4.5kVA UPS 230V	A6583A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals. Must choose one Power interface option.			
Factory Racked		0D1	
Additional Battery Pack note: 3 additional battery packs for a max of 4		001	
Field rack for RBII		002	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		004	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		005	
Input/output hardwired		007	
Power interface option, L6-30P plug line cord, w/PDP-2,output, US/Japan		008	
Power interface option, input hardwired w/PDP-2,output, US/Japan		011	
Power interface option, input hardwired w/PDP-1 output,Europe		012	
Power interface option, IC309 30A plug, line cord, w/PDP-1 output,Europe		013	
• PowerTrust II-M4.0kW Battery Pack note: 3 additional battery packs for a max of 4	A6586A		
• PowerTrust II-MR 6.5kW/9kVA UPS 230V	A6584A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals. Must choose one Power interface option.			
Factory Racked		0D1	
Additional Battery Pack Set (2 batteries/set) note: 3 additional battery pack sets for a max of 4		001	
Field rack for RBII		002	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		004	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		005	
Input/output hardwired		007	
Power interface option, 6-50P plug line cord, w/PDP-2,output, US/Japan		009	
Power interface option, IC309 60A plug, line cord, w/PDP-1 output,Europe		010	
Power interface option, input hardwired w/PDP-2,output, US/Japan		011	
Power interface option, input hardwired w/PDP-1 output,Europe		012	
Power interface option, IC309 60A plug, line cord, w/PDP-2 output,US/Japan		014	
• PowerTrust II-MR 8kW/12kVA UPS 230V	A6585A		
Includes; one battery pack, RS232 DB9f/DB9m cable for UPS to host connection, power cord based on country code and all manuals. Must choose one Power interface option.			

Description	Product #	Opt #	Price
Factory Racked		0D1	
Additional Battery Pack Set (2 batteries/set) note: 3 additional battery pack set for a max of 4		001	
Field rack for RBII		002	
Replace Standard RS232 cable with RS232 DB9-DB25 PCI MUX cable		004	
Replace Standard RS232 cable with RS232 DB9-DB25 MDP MUX cable		005	
Input/output hardwired		007	
Power interface option, input hardwired w/PDP-2,output, US/Japan		011	
Power interface option, input hardwired w/PDP-1 output,Europe		012	
• PowerTrust II-MR 6.5kW/8kW Battery Pack Set (2 batteries/set)) note: 3 additional battery pack set for a max of 4	A6587A		
• PowerTrust II-MR Input/Output Hardwired cable	A6588A		
• PowerTrust II-MR Rack kit for Rosebowl I	A6601A		
• PowerTrust II-MR Rack kit for Rosebowl II	A6602A		
• Power interface option, L6-30P plug line cord, w/PDP-2,output, US/Japan	A6589A		
• Power interface option, 6-50P plug line cord, w/PDP-2,output, US/Japan	A6590A		
• Power interface option, IC309 60A plug, line cord, w/PDP-1 output,Europe	A6591A		
• Power interface option, input hardwired w/PDP-2,output, US/Japan	A6592A		
• Power interface option, input hardwired w/PDP-1 output,Europe	A6594A		
• Power interface option, IC309 30A plug, line cord, w/PDP-1 output,Europe	A6595A		
• Power interface option, IC309 60A plug, line cord, w/PDP-2 output,US/Japan	A6596A		
• SNMP Card Communication Kit (available June 2001)	A6593A		
• Contact Closure Card Kit w/cable (direct connection w/native NT or remote status connection	A6597A		

Subchapter 4.4—Field Integrated Cabinets

Description	Product #	Opt #	Price
• HP Rack System/E41 (includes side panels, anti-tip feet) Field Integrated Cabinet	A4902A		
Delete Cabinet Side Panels		AXW	
Rear Door (Required – Max 1) (See Chapter 2 for factory integrated cabinet menu).	A5213AZ		
• HP Rack System/E33 (includes side panels, anti-tip feet) Field Integrated Cabinet	A4901A		
Delete Cabinet Side Panels		AXW	
Rear Door (Required – Max 1) (See Chapter 2 for factory integrated cabinet menu)	A5212AZ		
I/O Expansion Option (available only with Corporate Business Server 890, A1828A) Add HP-PB Expansion module with 14 HP-PB expansion slots, lower bus converter, and 10-meter interconnect cable			
• 1.6 m Field Integrated Base Cabinet - High Density D-Class 23" wide Cabinet	A3765A		
(See Chapter 2 for factory integrated cabinet menu) Note: PDUs can be ordered already integrated into the cabinet using the options for the Field Integrated Cabinet (A3765A). PDUs can also be ordered separately using the cabinet accessory menu and installed at the customer's site. Note: One mounting kit (A4838A) is required for each D-Class server integrated into the Field Integrated 23" wide cabinet (A3765A). One mounting kit (A4838A) is also required for each additional D-Class server integrated in the field into the Factory Integrated 23" wide cabinet (A3764A). Note: The Factory Integration product (A4834A) provides the mounting kit and factory integration for each D-Class integrated at the factory into the Factory Integrated 23" wide cabinet. The Mounting Kit product (A4838A) provides the mounting kit for someone to integrate a D-Class server in the field into the Field Integrated 23" wide cabinet or the Factory Integrated 23" wide cabinet. Note: 2 PDUs are required if 3 or 4 servers are integrated into the cabinet			
• Cabinet with capacity to integrate 1 to 4 D-Class servers	A3765A	001	
• Cabinet with capacity to integrate 1 to 2 D-Class servers as well as 15 EIA units of peripherals	A3765A	002	

Description	Product #	Opt #	Price
• 1st 200-240 volts North American power	A3765A	AW4	
• Add 2nd 200-240 volts North American power	A3765A	A5J	
• 1st 200-240 volts International power	A3765A	AW5	
• Add 2nd 200-240 volts International power	A3765A	A5K	
• 1st 240 volts North American UPS PDU	A3765A	A5F	
• 1st 240 volts European UPS PDU	A3765A	A5G	
• 1st 120/240 volts Universal UPS PDU	A3765A	A5H	
• Add 2nd 120/240 volts Universal UPS PDU	A3765A	A5L	
• Mounting kit for integrating one D-Class server in the field into the D-Class 23" wide cabinet	A4838A		
• D-Class deskside front bezel (optional) (only needed to replace the front bezel if moving a D-Class server in the field from a 19" wide cabinet to the 23" wide cabinet)	A4838A	010	
• HP Rack System/E25 (includes side panels, anti-tip feet) Field Integrated Cabinet	A4900A		
Rear Door (Required – Max 1) (See Chapter 2 for factory integrated cabinet menu.)	A5211AZ		
Cabinet Accessories			
• HP side panel kit for Rack System/E41	J1506A		
• HP side panel kit for Rack System/E33	J1507A		
• HP side panel kit for Rack System/E25	J1508A		
• HP Filler Panels for rack System/E Quantity 6	J1514A		
• ADP Rackmount Kit (for rear of cabinet)	C2792A		
• Rackmount kit for A-Class Systems	A5810A		
• Rackmount Kit for D-Class Systems (Only for standard 19" cabinets)	C2805C		
• Rackmount Kit for E-Class Systems	C2803C		
• Field Rackmount Kit for L-Class Systems – HA Slider rails	A5556A		
• Field Rackmount Kit for L-Class Systems – Static rails	A5575A		
• Field Rackmount Kit for L-Class Systems in A189xA cabinets – Static rails	A5562A		
• Rackmount Kit for K-Class Systems	C2804C		
• 14 Kg (30 lbs.) Anti-tip Ballast	C2790A		
• Rackmount Kit for 5 Modem Distribution Panels	J2084A		
• Rackmount Kit for 10 Modem Distribution Panels	J2087A		
• HP Tie Kit for Rack System/E41	J1512A		
• HP Tie Kit for Rack System/E33	J1513A		
Power Distribution Unit: (requires additional power cord except for 30A PDU and no separate installation kit to be ordered)			
<i>19" modular PDU's (no switch):</i>			
• 100-240V, 16A PDU w/ 7-C13, 1-C19 receptacles	E7674A		
• 200-240V, 30A PDU w/ 8-C13, 2-C19 receptacles, N. America (comes w/attached Nema L6-30P power cord)	E7681A		
• 200-240V, 30A PDU w/ 8-C13, 2-C19 receptacles, International (comes w/ attached IEC-309 power cord)	E7682A		
• 200-240V, 60A PDU w/8-C19 receptacles, N. America	E7683A		
• 200-240V, 60A PDU w/8-C19 receptacles, International	E7684A		
<i>To have the switching capability for the above 19" modular PDU's, additional SKU's needs to be ordered:</i>			
• 200-240V switch accessory for 16A PDU's (includes the switch accy. and switch panel)	E7680A		
Power Cords: (to be used to connect the PDU's to the power source- wall or UPS)			
• Power cord w/ 5-20P, 4.5m	E7802A		
• Power cord w/ L6-20P, 4.5m	E7803A		
• Power cord w/ C20 plug, 4.0m	E7804A		
• Power cord w/ L6-30P, 4.5m	E7805A		
• Power cord w/ no plug, 4.5m	E7806A		
• Power cord w/ IEC-309, 4.5m (outside N. America use only)	E7808A		
• Power cord w/ CEE7/7, 4.5m (outside N. America use only)	E7809A		
• Power cord w/ C20 plug, 2.5m	E7798A		
Jumper Cords: (to connect the mounted equipment to the PDU within the rack)			

Description	Product #	Opt #	Price
• 250V Jumper cord w/ C13 to C14, 2.3m	E7742A		
• 125V Jumper cord w/ C13 to Nema 5-15, 2.3m	E7743A		
• Jumper cord w/ C14 to C15, 0.7m	E7807A		

Subchapter 4.5—Add-on Memory and Accessories

Description	Product #	Opt #	Price
A-Class, R-Class, D-Class Memory			
• 128 MB ECC memory module	A3408A		
• 256 MB ECC memory module	A3564A		
• 512 MB ECC memory module	A3717A		
E-Class Memory			
• 16 MB ECC memory module	A2946A		
• 32 MB ECC memory module	A3309A		
• 64 MB ECC memory module	A2948A		
• 128 MB ECC memory module, quantity price break for 4 or more units, \$2,495 ea.	A3131A		
8x7, F, G, H, I-Class Memory			
• 128 MB ECC High Density memory module	A2516A		
K-Class Memory			
• 128 MB high-density ECC memory module	A3027A		
• 256 MB high-density ECC memory module	A3483A		
• 512 MB high-density ECC memory module	A3737A		
T-Class Memory and I/O Accessories			
• 256 MB ECC memory board	A2234A		
• 512 MB ECC memory board	A2588A		
• 768 MB ECC memory board	A2589A		
• 8 GB memory carrier (T600 only; no memory installed)	A3839A		
• 1 GB memory module for T600 (Used with A3839A)	A3832A		
• HP-PB I/O Expansion Module	A1828A		
• HSC bus converter (T600 only)	A3567A		
• HP-PB bus converter (T600 only)	A3568A		
• Dual I/O Bus Converter	A1829A		
Floating-Point Coprocessor Field Upgrades			
• Floating-Point Coprocessor Field Upgrade on HP 9000 F-, G-, H-, I-Class, and 8x7	A2293A		
For HP 9000 Model 10 systems, Model 807S (shipped after 3/15/92)		001	
For HP 9000 Model 20 systems, Model 817S - 827S		003	
For HP 9000 Model 30 systems, Model 837S - 857S		004	
For HP 9000 Model 40 systems, Models 867S - 877S		002	
32 MHz CPU board with Floating-Point Coprocessor for 807S Servers shipped before 3/15/92 without floating-point socket		101	

Subchapter 4.6—Add-on Storage Products for Installation inside the SPU Enclosure

Description	Product #	Opt #	Price
Disk Drives			
Unless otherwise specified, all disk drive products are supported on HP-UX 9.04 and 10.01.			
The following products occupy one half-height slot:			
• 2 GB FWD SCSI-2 low profile or (K-Class only)	A3351A	002	
• 4 GB SE SCSI-2 low profile disk drive	A3352A	002	
• 4 GB FWD SCSI-2 low profile disk drive (K-Class only)	A3353A	002	
Removable Media Drives			
The following products occupy one half-height slot and are single-ended SCSI-2			
• 2.88 MB 3.5" IDE floppy disk drive	A3307A		
For field add-on		002	
• 12x CD-ROM Drive	A3715A		
For field add-on		002	
• 4.0 GB DDS DAT drive + data compression	A3183A		
For field add-on (orderable July 1, 1997)		002	
• 7.0 GB 8 mm tape drive SCSI-2. HP-UX 9.04 required.	A3357A		
Installation kit for F/G/H/I SPU		002	

Subchapter 4.7—Mass Storage

4.7.1—Mass Storage Warranty*

Product Family	U.S. Base Warranty
hp StorageWorks disk system 2100	One-Year, enhanced parts only, return to HP
hp StorageWorks disk system 2300	Three-Year, Next Day Response, On-Site Support
hp StorageWorks disk system 2405	Two-Year, Same Business Day, On-Site Support
hp StorageWorks disk systems HVD10, SC10 and FC10	Three-Year, 3 Day Response, On-Site Support
DLT (Standalone Only) and DDS Tape Drives	Two-Year Total Duration, with Year 1 Next-Day On-Site, Year 2 Unit Exchange
DLT (Library Only)	One-Year, Next Day Support
All Other Mass Storage Products	One-Year, 3 Day Response

*Warranty May Differ Outside the U.S.

4.7.2—StorageWorks disk system 2100

Description	Product #	Opt #	Price
• Disk System 2100 (Field Rack)	A5675A		
• Disk System 2100 (Field Rack – empty enclosure only, disk drives cannot be integrated)	A5675AE		
• Disk System 2100 (Factory Rack)	A5675AZ		
• Disk System 2100 (Desktop)	A5675AD		
• Disk System 2100 (Desktop – empty enclosure only, disk drives cannot be integrated)	A5675AD		
• Disk System 2105, DC Powered (Field Rack)	Y1770A		
Accessories			
• 18GB 10K RPM Ultra3 SCSI	A6537A		
• 36GB 10K RPM Ultra3 SCSI	A6538A		
• 73GB 10K RPM Ultra3 SCSI	A6539A		
• 18GB 15K RPM Ultra3 SCSI	A6540A		
• 36GB 15K RPM Ultra3 SCSI	A6541A		
• HP System E/Rittal Rack Kit	A5679A		
• HP Original Rack Kit	A5680A		

Description	Product #	Opt #	Price
• Two Post Carrier Grade Rack Kit	A6576A		
• Four Post Carrier Grade Rack Kit	A6578A		
• 0.5m 68P HD to 68P HD SCSI Cable	C2978B		
• 1.0m 68P HD to 68P HD SCSI Cable	C2911C		
• 1.5m 68P HD to 68P HD SCSI Cable	C2979B		
• 2.5m 68P HD to 68P HD SCSI Cable	C2924C		
• 5.0m 68P HD to 68P HD SCSI Cable	C7521A		
• 1.0m VHDCI to 68P HD SCSI Cable	C2361B		
• 2.5m VHDCI to 68P HD SCSI Cable	C2362B		
• 5.0m VHDCI to 68P HD SCSI Cable	C2365B		
• 2.0m VHDTS68/HDTS68 LVD/SE Self-terminating cable for V-Class	C7541A		
• 5.0m VHDTS68/HDTS68 LVD/SE Self-terminating cable for V-Class	C7520A		
• SCSI Terminator	C2364A		
• Deskside Pedestal Upgrade Kit (for desktop model only)	A6519A		

4.7.3—StorageWorks disk system 2300

Description	Product #	Opt #	Price
• Disk System 2300 field rack enclosure	A6490A		
• Disk System 2300 field rack enclosure (empty enclosure for stocking – no drive integration)	A6490AE		
• Disk System 2300 factory rack enclosure	A6490AZ		
• Disk System 2300 deskside enclosure	A6490AD		
• Disk System 2300 deskside enclosure (empty enclosure for stocking – no drive integration)	A6490ED		
• Disk System 2300 disk enclosure integrated through select express	A6490AV		
• Redundant controller for HP DS2300	A6491A		
• Redundant controller for HP DS2300 installed in enclosure	A6491A	0D1	
• Redundant controller for HP DS2300 integrated through Select Express	A6491AV		
• 18GB 10K RPM LVD disk module	A6537A		
• 18GB 10K RPM LVD disk module installed in enclosure	A6537A	0D1	
• 18GB 10K RPM LVD disk module integrated through Select Express	A6537AV		
• 36GB 10K RPM LVD disk module	A6538A		
• 36GB 10K RPM LVD disk module installed in enclosure	A6538A	0D1	
• 36GB 10K RPM LVD disk module integrated through Select Express	A6538AV		
• 73GB 10K RPM LVD disk module	A6539A		
• 73GB 10K RPM LVD disk module installed in enclosure	A6539A	0D1	
• 73GB 10K RPM LVD disk module integrated through Select Express	A6539AV		
• 18GB 15K RPM LVD disk module	A6540A		
• 18GB 15K RPM LVD disk module installed in enclosure	A6540A	0D1	
• 18GB 15K RPM LVD disk module integrated through Select Express	A6540AV		
• 36GB 15K RPM LVD disk module	A6541A		
• 36GB 15K RPM LVD disk module installed in enclosure	A6541A	0D1	
• 36GB 15K RPM LVD disk module integrated through Select Express	A6541AV		
• HP System/E Rack Rail Kit	A6209A		
• HP System/E Rack Rail Kit integrated through Select Express	A6209AV		
• HP Original Rack Rail Kit	A6244A		
• NT/Rittal Rack Rail Kit	A6496A		
• NT/Rittal Rack Rail Kit integrated through Select Express	A6496AV		
• 3U 2-post Rack Rail Kit	A6498A		
• 3U 2-post Rack Rail Kit integrated through Select Express	A6498AV		
• SCSI Cable 2M VHDTS68 M/M Multimd	C2373A		
• SCSI Cable 2M VHDTS68 M/M Multimd integrated into enclosure packaging	C2373A	0D1	
• SCSI Cable 5M VHDTS68 M/M Multimd	C2374A		
• SCSI Cable 5M VHDTS68 M/M Multimd integrated into enclosure packaging	C2374A	0D1	
• SCSI Cable 10M VHDTS68 M/M Multimd	C2375A		
• SCSI Cable 10M VHDTS68 M/M Multimd integrated into enclosure packaging	C2375A	0D1	

	Description	Product #	Opt #	Price
•	SCSI Cable 2.5M VHDS68/HDTS68 M/M Multimd	C2362B		
	SCSI Cable 2.5M VHDS68/HDTS68 M/M Multimd integrated into enclosure packaging	C2362B	OD1	
•	SCSI Cable 5M VHDS68/HDTS68 M/M Multimd	C2365B		
	SCSI Cable 5M VHDS68/HDTS68 M/M Multimd integrated into enclosure packaging	C2365B	OD1	
•	SCSI Cable 10M VHDS68/HDTS68 M/M Multimd	C2363B		
	SCSI Cable 10M VHDS68/HDTS68 M/M Multimd integrated into enclosure packaging	C2363B	OD1	
•	SCSI Terminator LVD/SE VHDS68	C2370A		

4.7.4—StorageWorks disk system 2405

	Description	Product #	Opt #	Price
•	Disk System 2405 Field Rackable Enclosure	A6250A		
	Includes DS2405 chassis, 2 power supplies and fans, 2 link controller cards, 2 power cords, disk slot filler panels, user guide and Command View SDM (rackmount kit not included). Accommodates 15 low profile FC disk drives. Cables are not included and must be ordered separately.			
	Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM Version 1.04 or later.		223	
•	18.2GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6191A	OD1	
•	36.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6192A	OD1	
•	36.4GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6193A	OD1	
•	73.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6194A	OD1	
•	Disk System 2405 Factory Racked Enclosure	A6250AZ		
	Includes DS2405 chassis, 2 power supplies and fans, 2 link controller cards, 2 power cords, disk slot filler panels, rackmount kit, user guide and Command View SDM. Accommodates 15 low profile FC disk modules. Cables are not included and must be ordered separately.			
	Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM Version 1.04 or later.		223	
•	18.2GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6191A	OD1	
•	36.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6192A	OD1	
•	36.4GB 15K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6193A	OD1	
•	73.4GB 10K RPM Fibre Channel Disk Drive (minimum 2 per DS2405)	A6194A	OD1	
•	Disk System 2405 Empty Enclosure	A6250AE		
	Includes DS2405 chassis, 2 power supplies and fans, 2 link controller cards, 2 power cords, disk slot filler panels, user guide and Command View SDM (rackmount kit not included). Accommodates 15 low profile FC disk modules. Disk drives cannot be integrated.			
	Cables and Accessories			
•	Fibre Channel Cable 2-meter LC Duplex 50/125 M/M	C7524A		
•	Fibre Channel Cable 16-meter LC Duplex 50/125 M/M	C7525A		
•	Fibre Channel Cable 50-meter LC Duplex 50/125 M/M	C7526A		
•	Fibre Channel Cable 200-meter LC Duplex 50/125 M/M	C7527A		
•	Fibre Channel Cable 2-meter LC/SC Duplex 50/125 M/M	C7529A		
•	Fibre Channel Cable 16-meter LC/SC Duplex 50/125 M/M	C7530A		
•	Fiber Optic Coupler SC F/F (for use with C7529A and C7530A)	C7534A		
•	Fiber Optic Adapter Kit (includes C7529A and C7534A)	C7540A		
•	HP System/E Rack Rail Kit	A6209A		
•	HP Original Rack Rail Kit	A6244A		
•	NT/Rittal Rack Rail Kit	A6496A		
•	3U 2-post Rail Kit	A6498A		

4.7.5—StorageWorks disk system HVD10

Note: Effective July 1, 2002, the HVD10 will be discontinued. Customers can continue purchasing the add-on disk drives until July 1, 2003 or while supplies last. Depending on the server, the DS2100, DS2300 or DS2405 is the replacement product for the HVD10.

	Description	Product #	Opt #	Price
•	1-meter HDTS68 (M/M) Multimd	C2911C	OD1	
•	2.5-meter HDTS68 (M/M) Multimd	C2924C	OD1	
•	5-meter HDTS68 (M/M) Multimd	C7521A	OD1	
•	10-meter HDTS68 (M/M) Multimd	C7522A	OD1	
•	20-meter HDTS68 (M/M) Multimd	C7532A	OD1	
•	1-meter VHDS68/HDTS68 (M/M) Multimd	C2361B	OD1	
•	2.5-meter VHDS68/HDTS68 (M/M) Multimd	C2362B	OD1	
•	5-meter VHDS68/HDTS68 (M/M) Multimd	C2365B	OD1	
•	10-meter VHDS68/HDTS68 (M/M) Multimd	C2363B	OD1	
•	5-meter HDTS68 ILT (M/M)	C7554A	OD1	
•	10-meter HDTS68 ILT (M/M)	C7555A	OD1	
•	5-meter VHDS68/HDTS68 HVD ILT (M/M)	C5766A	OD1	
•	10-meter VHDS68/HDTS68 HVD ILT (M/M)	C5767A	OD1	
•	0.5-meter VHDS68/HDTS68 ILT (M/F)	C7519A	OD1	
•	2-meter V cable (68 pin HD) male	C7544A	OD1	
•	2-meter V cable VHDCI/VHDCI/ 68 pin HD	A5607A	OD1	
•	2-meter V cable VHDCI/VHDCI ILT/ 68 pin HD	A5608A	OD1	
•	2-meter V cable 68 pin HD/VHDCI/68 pin HD	A5609A	OD1	
•	2-meter V cable 68 pin HD/VHDCI ILT/68 pin HD	A5610A	OD1	
•	Add on 18.2 GB 10K RPM High Performance Ultra3 SCSI LVD Disk Module	A6272A		
•	Add on 18.2 GB 15K RPM High Performance Ultra3 SCSI LVD Disk Module	A6273A		
•	Add on 36.4 GB 10K RPM High Performance Ultra3 SCSI LVD Disk Module	A6274A		
•	Add on 36.4 GB 15K RPM High Performance Ultra3 SCSI LVD Disk Module	A6275A		
•	HP Rack System /E Rack Rail Accessory Kit	A5251A		

4.7.6—StorageWorks disk system SC10

Note: Effective June 1, 2002, the SC10 will be discontinued. Customers can continue purchasing the add-on disk drives until July 1, 2003 or while supplies last. Depending on the server, the DS2100 or DS2300 is the replacement product for the SC10. Please note that the DC version (Z7536A) is still available.

	Description	Product #	Opt #	Price
•	Z7536A Surestore Disk System SC10, DC Powered, Field Rackable (requires CE installation)	Z7536A		
	Includes 2 DC power supplies, 2 blower modules, 1 Bus Control Card, 2 power cords, 2 Rack Rail Kits and ½ U filler panel. Accommodates 10 Half High or 10 low profile disk modules.			
•	Add on Bus Controller Card	A5273A		
•	Add on 18.2 GB 10K RPM High Performance Ultra3 SCSI LVD Module	A6272A		
•	Add on 18.2 GB 15K RPM High Performance Ultra3 SCSI LVD Module	A6273A		
•	Add on 36.4 GB 10K RPM High Performance Ultra3 SCSI LVD Module	A6274A		
•	Add on 36.4 GB 15K RPM High Performance Ultra3 SCSI LVD Module	A6275A		
•	Add on 73.4 GB 10K RPM High Performance Ultra3 SCSI LVD Disk Module	A6276A		
•	2-meter VHTDS68 (M/M) Multimd	C2373A	OD1	
•	5-meter VHTDS68 (M/M) Multimd	C2374A	OD1	
•	10-meter VHTDS68 (M/M) Multimd	C2375A	OD1	
•	2-meter VHTDS68 LVD/SE ILT (M/M)	A5668A	OD1	
•	5-meter VHTDS68 LVD/SE ILT (M/M)	A5669A	OD1	
•	10-meter VHTDS68 LVD/SE ILT (M/M)	A5670A	OD1	
•	HP Rack System /E Rack Rail Accessory Kit	A5251A		

4.7.7—StorageWorks disk system FC10

Note: Effective April 1, 2002, the FC10 will be discontinued. Customers can continue purchasing the add-on disk drives until September 30, 2002 or while supplies last. The StorageWorks disk system 2405 is the replacement product for the FC10.

Description	Product #	Opt #	Price
• Add on 36GB 10K RPM High Performance Fibre Channel Disk Module	A6485A		
• Add on 73GB 10K RPM High Performance Fibre Channel Disk Module	A6487A		
• Add on 18GB 15K RPM High Performance Fibre Channel Disk Module	A6488A		
• Add on 36GB 15K RPM High Performance Fibre Channel Disk Module	A6486A		
• HP Rack System /E Rack Rail Accessory Kit	A5251A		

4.7.8—Mass Storage Subsystems

Note: Effective January 1, 2002, the HASS will be discontinued. Customers can continue purchasing the 18.2 GB 7200 RPM low profile drive (A5286A) while supplies last. The Surestore Disk System HVD10 or the DS2100 are the replacement products for the HASS.

Description	Product #	Opt #	Price
HP SMART Storage Family of Storage Modules & Enclosure: Factory Racked Tape Products			
• HP SMART Storage Full Height Enclosure, Factory-racked (3 EIA units high)	C4318SZ		
HP SMART Storage DDS-2 Tape Drive		102	
HP SMART Storage DDS-3 Tape Drive		103	
HP SMART Storage DDS-3 Tape Autoloader		104	
HP SMART Storage DDS-4 Tape Drive		110	
HP SMART Storage DDS-4 Tape Autoloader		111	
HP SMART Storage DLT 4000 (HP-UX)		106	
HP SMART Storage DLT 4000 (MPE/iX)		107	
HP SMART Storage DVD-ROM		108	
HP SMART Storage DLT-8000)		109	
.5 68-pin HD to 68-pin HD Cable		001	
.9 m 68-pin HD to 68-pin HD cable		801	
2.5 m 68-pin HD to 68-pin HD cable		802	
5 m 68-pin HD to 68-pin HD cable		803	
1 m VHDCI 68-pin to HD 68-pin cable		811	
2.5 m VHDCI 68-pin to HD 68-pin cable		812	
5.0 m VHDCI 68-pin to HD 68-pin cable		813	
10.0 m VHDCI 68-pin to HD 68-pin cable		814	
1 m 50-pin LD to 68-pin HD cable		821	
2 m 50-pin LD to 68-pin HD cable		822	
1 m 50-pin HD to 68-pin HD cable		825	
2 m 50-pin HD to 68-pin HD cable		827	
WSE 68-pin SCSI terminator		835	
FWD 68-pin SCSI terminator		836	
LVD/SE 68-pin terminator		837	
"Y" Power cable to power two devices from single PDU outlet		850	
10 m 68-pin HD to 68-pin HD V-Class cable		851	
2/3 m V in-line terminator V-Class 68-pin HDM		871	
2/3 m V in-line terminator V-Class 68-pin HDM		873	
5 m 68-pin HD to 68-pin HD V-Class cable		875	
HP SMART Storage Family of Storage Modules and Enclosure: Field Racked Customer Installable/Field Upgrade			
• HP SMART Storage Full- Height Enclosure Field-racked (3 EIA Units)	C4318B		

Description	Product #	Opt #	Price
• HP SMART Storage Half-Height Enclosure Field-racked (2 EIA Units)	C4317A		
• HP SMART Storage 9 GB LVD Disk Drive Field-racked	C6403A		
• .5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage Half Height NSE DVD-ROM Field-racked	C4315A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable (male to male)	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
HP SMART Storage Family of Storage Modules & Enclosures			
Field-Racked Tape Products (*C4318B or C4317A required)			
• HP SMART Storage NSE DDS-2 Tape Drive Field-racked	C6363A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage NSE DDS-3 Tape Drive Field-racked	C6365A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage NSE DDS-3 Tape Autoloader Field-racked	C6367A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 1 m 50-pin HD to 68-pin HD cable (male to male)	C2961A		
• 2 m 50-pin HD to 68-pin HD cable (male to male)	C2906A		
• WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage (LVD) DDS-4 Tape Drive Field-racked	C6369A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable	C2924C		
• LVD 68-pin SCSI terminator	C2364A		
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68-pin to HD 68-pin cable	C2362B		
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage (LVD) DDS-4 Tape Autoloader	C6371A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable	C2906A		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable	C2924C		
• LVD 68-pin SCSI terminator	C2364A		
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68-pin to HD 68-pin cable	C2362B		

Description	Product #	Opt #	Price
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage FWD DLT 8000 Drive Field-racked)	C6379A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable (male to male)	C2924C		
• FWD 68-pin SCSI terminator	C2905A		
• HP SMART Storage NSE DLT 4000 (MPE/iX) Field-racked	C6381A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 1 m 50-pin HD to 68-pin HD cable (male to male)	C2961A		
• 2 m 50-pin HD to 68-pin HD cable (male to male)	C2906A		
• Smart WSE 68-pin SCSI terminator	C2972A		
• HP SMART Storage FND DLT 4000 (HP-UX) Field-racked	C6383A		
• 0.5 m 68-pin HD to 68-pin HD cable (male to male)	C2978B		
• 0.9 m 68-pin HD to 68-pin HD cable (male to male)	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable (male to male)	C2924CA		
• FWD 68-pin SCSI terminator	C2905A		
HP SMART Storage Family: Desktop Modules			
• HP SMART Storage Desktop NSE DVD-ROM Drive	C4314A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
HP Smart Storage Desktop Tape Products			
• HP SMART Storage Desktop NSE DDS-2 Tape Drive	C6362A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
• HP SMART Storage Desktop NSE DDS-3 Tape Drive	C6364A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
• HP SMART Storage Desktop DDS-3 Tape Autoloader	C6366A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• 1.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2367A		
• 2.5 m 68 pin VHDCI to 50 pin HD SCSI cable	C2368A		
• HP SMART Storage Desktop LVD DDS-4 Tape Drive	C6368A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5 m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• WSE/NSE 68-pin SCSI terminator	C2972A		
• LVD/SE 68-pin SCSI terminator	C2364A		
• 2 m 68 pin to 50 pin HD SCSI cable	C2906A		

Description	Product #	Opt #	Price
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68-pin to HD 68-pin cable	C2362B		
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage Desktop LVD DDS-4 Tape Autoloader	C6370A		
• 0.5 m 68-pin HD to 68-pin HD cable	C2978B		
• 1.5m 68-pin HD to 68-pin HD cable	C2979B		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 68 pin to 50 pin HD SCSI cable	C2906A		
• LVD 68-pin SCSI terminator	C2364A		
• 1 m VHDCI 68-pin to HD 68-pin cable	C2361B		
• 2.5 m VHDCI 68 pin I to HD 68-pin cable	C2362B		
• 10.0 m VHDCI 68-pin to HD 68-pin cable	C2363B		
• 5.0 m VHDCI 68-pin to HD 68-pin cable	C2365B		
• HP SMART Storage Desktop DLT 8000 Drive	C6378A		
• 0.9 m 68-pin HD to 68-pin HD cable	C2911C		
• 2.5 m 68-pin HD to 68-pin HD cable	C2924C		
• FWD Terminator	C2905A		
• HP SMART Storage DLT 4000 (MPE/iX)	C6380A		
• .5 m 50-pin HD to HD SCSI cable	C2955A		
• 1 m 50-pin HD to HD SCSI cable	C2908A		
• 2 m 50-pin HD to HD SCSI cable	C2957A		
• NSE Terminator	C2904A		
• HP SMART Storage FND DLT 4000 (HP-UX) (terminator is included)	C6382A		
• 1 m 50-pin HD to 68-pin HD cable	C2961A		
• 2 m 50-pin HD to 68-pin HD cable)	C2906A		

4.7.9—SureStore Tape Autoloaders and Accessories

Description	Product #	Opt #	Price
DLT Tape Autoloaders			
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – HVDS)	C7145RA		
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – LVDS)	C7145NB		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – HVDS)	C7745RA		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – LVDS)	C7745NB		
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – HVDS) * with remote mgmt card	C7146RA		
• HP SureStore Autoloader 1/9 (DLT8000 – standalone unit – LVDS) * with remote mgmt card	C7146NB		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – HVDS) * with remote mgmt card	C7746RA		
• HP SureStore Autoloader 1/9 (DLT8000 – rackmount unit – LVDS) * with remote mgmt card	C7746NB		
Ultrium Tape Autoloaders			
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – HVDS)	C7147AA		
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – LVDS)	C7147CB		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – HVDS)	C7747AA		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – LVDS)	C7747CB		
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – HVDS) * with remote mgmt card	C7149AA		
• HP SureStore Autoloader 1/9 (Ultrium – standalone unit – LVDS) * with remote mgmt card	C7149CB		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – HVDS) * with remote mgmt card	C7748AA		
• HP SureStore Autoloader 1/9 (Ultrium – rackmount unit – LVDS) * with remote mgmt card	C7748CB		
Accessories			
• 1/9 Skins Kit (includes all cosmetic parts – front bezel, chin, enclosure and feet)	C7148A		
• 1/9 Rackmount Kit (Two 1/9 Autoloaders per rack; can be mounted side-by-side)	C7740R		
• 1/9 Remote Management Card Kit	C7749A		
• 1/9 Ultrium HVDS Conversion Kit (converts HVDS DLT or DLT1 autoloader to Ultrium)	C7768A		
• 1/9 Ultrium LVDS Conversion Kit (converts LVDS DLT or DLT1 autoloader to Ultrium)	C7768C		

Description	Product #	Opt #	Price
• 1/9 DLT 6-Slot Removable Magazine (with six pieces of media)	C7742R		
• 1/9 DLT 6-Slot Removable Magazine (empty)	C7741R		
• 1/9 Ultrium 6-Slot Removable Magazine (with six pieces of media)	C7744A		
• 1/9 Ultrium 6-Slot Removable Magazine (empty)	C7743A		
Multimode Cables for Tape Drives			
SCSI Cable 0.5m HDTS 68 pin Male/Male Multimode cable	C2978B		
SCSI Cable 1 m HDTS 68 pin Male/Male Multimode cable	C2911C		
SCSI Cable 1.5m HDTS 68 pin Male/Male Multimode cable	C2979B		
SCSI Cable 2.5m HDTS 68 pin Male/Male Multimode cable	C2924C		
SCSI Cable 5 m HDTS 68 pin Male/Male Multimode cable	C7521A		
SCSI Cable 10 m HDTS 68 pin Male/Male Multimode cable	C7522A		
SCSI Cable 1 m VHDS 68 pin Male/Male Multimode cable	C2361B		
SCSI Cable 2.5 m VHDS 68 pin Male/Male Multimode cable	C2362B		
SCSI Cable 5 m VHDS 68 pin Male/Male Multimode cable	C2365B		
SCSI Cable 10 m VHDS 68 pin Male/Male Multimode cable	C2363B		
SCSI Terminator LVDS/SE HDTS 68 Multimode	C2364A		
SCSI Terminator LVDS/SE VHDS 68 Multimode	C2370A		

4.7.10—SureStore Mid-Range Tape Libraries and Accessories

Description	Product #	Opt #	Price
DLT Tape Libraries			
• HP SURESTORE DLT TAPE LIBRARY 2/20 (RACKMOUNT UNIT - HVDS)	A5583A		
• HP SURESTORE DLT TAPE LIBRARY 2/20 (RACKMOUNT UNIT - LVDS)	A4680A		
Requires 1 or 2 DLT tape drives (not included); includes empty media magazines for 20 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 2/20 (STANDALONE UNIT - HVDS)	A5584A		
• HP SURESTORE DLT TAPE LIBRARY 2/20 (STANDALONE UNIT - LVDS)	A4681A		
Requires 1 or 2 DLT tape drives (not included); includes empty media magazines for 20 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 4/40 (RACKMOUNT UNIT - HVDS)	A5585A		
• HP SURESTORE DLT TAPE LIBRARY 4/40 (RACKMOUNT UNIT - LVDS)	A4682A		
Requires 2 or 4 DLT tape drives (not included); includes empty media magazines for 40 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 4/40 (STANDALONE UNIT - HVDS)	A5586A		
• HP SURESTORE DLT TAPE LIBRARY 4/40 (STANDALONE UNIT - LVDS)	A4683A		
Requires 2 or 4 DLT tape drives (not included); includes empty media magazines for 40 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 6/60 (RACKMOUNT UNIT - HVDS)	A5587A		
• HP SURESTORE DLT TAPE LIBRARY 6/60 (RACKMOUNT UNIT - LVDS)	A4684A		
Requires 2, 4, or 6 DLT tape drives (not included); includes empty media magazines for 60 cartridges.			
• HP SURESTORE DLT TAPE LIBRARY 6/60 (STANDALONE UNIT - HVDS)	A5588A		
• HP SURESTORE DLT TAPE LIBRARY 6/60 (STANDALONE UNIT - LVDS)	A4685A		
Requires 2, 4, or 6 DLT tape drives (not included); includes empty media magazines for 60 cartridges.			
HP SURESTORE DLT TAPE LIBRARY 8/80 (STANDALONE UNIT - HVDS)	A6287A		
HP SURESTORE DLT TAPE LIBRARY 8/80 (STANDALONE UNIT - LVDS)	A6288A		
Requires 2, 6, or 8 DLT tape drives (not included); includes empty media magazines for 80 cartridges.			
HP SURESTORE DLT TAPE LIBRARY 10/100 (STANDALONE UNIT - HVDS)	A6289A		
HP SURESTORE DLT TAPE LIBRARY 10/100 (STANDALONE UNIT - LVDS)	A6290A		
Requires 4 or 10 DLT tape drives (not included); includes empty media magazines for 100 cartridges.			
DLT Tape Drives – Required with all DLT libraries			
• HP SureStore DLT 8000 Tape Drive – HVDS	A5589A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	
• HP SureStore DLT 8000 Tape Drive - LVDS	A4686A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	

Description	Product #	Opt #	Price
Ultrium Tape Libraries			
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (RACKMOUNT UNIT - HVDS)	A6310A		
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (RACKMOUNT UNIT - LVDS)	A6311A		
Requires 1 or 2 Ultrium tape drives (not included); includes empty media magazines for 20 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (STANDALONE UNIT - HVDS)	A6312A		
HP SURESTORE ULTRIUM TAPE LIBRARY 2/20 (STANDALONE UNIT - LVDS)	A6313A		
Requires 1 or 2 Ultrium tape drives (not included); includes empty media magazines for 20 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (RACKMOUNT UNIT - HVDS)	A6314A		
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (RACKMOUNT UNIT - LVDS)	A6315A		
Requires 2 or 4 Ultrium tape drives (not included); includes empty media magazines for 40 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (STANDALONE UNIT - HVDS)	A6316A		
HP SURESTORE ULTRIUM TAPE LIBRARY 4/40 (STANDALONE UNIT - LVDS)	A6317A		
Requires 2 or 4 Ultrium tape drives (not included); includes empty media magazines for 40 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (RACKMOUNT UNIT - HVDS)	A6318A		
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (RACKMOUNT UNIT - LVDS)	A6319A		
Requires 2, 4, or 6 Ultrium tape drives (not included); includes empty media magazines for 60 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (STANDALONE UNIT - HVDS)	A6320A		
HP SURESTORE ULTRIUM TAPE LIBRARY 6/60 (STANDALONE UNIT - LVDS)	A6321A		
Requires 2, 4, or 6 Ultrium tape drives (not included); includes empty media magazines for 60 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 8/80 (STANDALONE UNIT - HVDS)	A6291A		
HP SURESTORE ULTRIUM TAPE LIBRARY 8/80 (STANDALONE UNIT - LVDS)	A6292A		
Requires 2, 6, or 8 Ultrium tape drives (not included); includes empty media magazines for 80 cartridges.			
HP SURESTORE ULTRIUM TAPE LIBRARY 10/100 (STANDALONE UNIT - HVDS)	A6293A		
HP SURESTORE ULTRIUM TAPE LIBRARY 10/100 (STANDALONE UNIT - LVDS)	A6294A		
Requires 4 or 10 Ultrium tape drives (not included); includes empty media magazines for 100 cartridges.			
Ultrium Tape Drives– Required with all Ultrium libraries			
HP SureStore Ultrium Tape Drive – HVDS	A6306A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	
HP SureStore Ultrium Tape Drive – HVDS	A6307A		
Factory Installation – Installs tape drives in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional drive for upgrade or other purposes, use a separate order section and order the drive as an accessory without the OD1 option.)		OD1	
Fibre Channel Interfaces			
HP SureStore Fibre Channel Interface – Ultrium LVDS	A4674A		
Factory Installation – Installs fibre channel interface in library at the factory. (Required unless ordering as an accessory.)		OD1	
• HP SureStore Fibre Channel Interface – DLT HVDS	A5590A		
Factory Installation – Installs fibre channel interface in library at the factory. (Required unless ordering as an accessory.)		OD1	
• HP SureStore Fibre Channel Interface – Ultrium HVDS (for field upgrade only)	A4673A		
• HP SureStore Fibre Channel Interface – DLT LVDS (for field upgrade only)	A4687A		
Upgrades, Power Supplies, and Magazines			
• 20 to 40 Slot Upgrade Kit for 2/20 DLT Library	A1378A		
• 40 to 60 Slot Upgrade Kit for 4/40 DLT Library	A1379A		
• 20 to 40 Slot Upgrade Kit for 2/20 Ultrium Library	A6325A		
• 40 to 60 Slot Upgrade Kit for 4/40 Ultrium Library	A6326A		
• 40 Slot Upgrade & Rack Kit for 40 or 60 Slot DLT Library	A6295A		
Use to upgrade either an existing 40 or 60 slot DLT tape library to a 80 or 100 slot DLT tape library. Kit includes a 2 meter rack plus an additional 40 slots. Requires one additional 20 slot upgrade kit (A6359A) if upgrading from an existing 40 slot to 80 slot OR 60 slot to 100 slot configuration.			
Requires two additional 20 slot upgrade kits (A6359A) if upgrading from an existing 40 slot to 100			

Description	Product #	Opt #	Price
slot configuration. Twenty slots will always be left over and unused when transferring an existing system into the 100 slot rack. Requires additional DLT tape drives (not included) to scale to the supported configurations (6/80, 8/80 or 10/100).			
<ul style="list-style-type: none"> 40 Slot Upgrade & Rack Kit for 40 or 60 Slot Ultrium Library 	A6296A		
Use to upgrade either an existing 40 or 60 slot Ultrium tape library to a 80 or 100 slot Ultrium tape Library. Kit includes a 2 meter rack plus an additional 40 slots. Requires one additional 20 slot upgrade kit (A6360A) if upgrading from an existing 40 slot to 80 slot OR 60 slot to 100 slot configuration. Requires two additional 20 slot upgrade kits (A6360A) if upgrading from an existing 40 slot to 100 slot configuration. Twenty slots will always be left over and unused when transferring an existing system into the 100 slot rack. Requires additional Ultrium tape drives (not included) to scale to the supported configurations (6/80, 8/80 or 10/100).			
<ul style="list-style-type: none"> 20 Slot Upgrade Kit for 80 or 100 Slot DLT Library 	A6359A		
Use to upgrade from an existing 40 or 60 slot to 80 or 100 slot tape library. Requires the 100 slot 2 meter rack upgrade kit (A6295A) if upgrading an existing library. Kit can also be used to upgrade a 6/80 or 8/80 configuration to the supported 10/100 configuration. Requires additional DLT tape drives (not included).			
<ul style="list-style-type: none"> 20 Slot Upgrade Kit for 60 to 100 Slot Ultrium Library 	A6360A		
Use to upgrade from an existing 40 or 60 slot to 80 or 100 slot tape library. Requires the 100 slot 2 meter rack upgrade kit (A6296A) if upgrading an existing library. Kit can also be used to upgrade a 6/80 or 8/80 configuration to the supported 10/100 configuration. Requires additional Ultrium tape drives (not included).			
<ul style="list-style-type: none"> 100 Slot to 120 and 140 Slot Upgrade Kit for 6/140 DLT Library 	A4671A	OD1	
Factory installation – installs upgrade kits for 6/140 at the factory. (This option is required with all orders for a 4,6/120 or 4,6/140 slot library; the kit upgrades the library in 20 slot increments. To order a capacity upgrade kit to upgrade from a 100 slot library to a 120 or 140 slot library in the field, use a separate order section and order the capacity upgrade kit without the OD1 option.)			
100 Slot to 120 and 140 Slot Upgrade Kit for 6/140 Ultrium Library	A4668A	OD1	
Factory installation – installs upgrade kits for 6/140 at the factory. (This option is required with all orders for a 4,6/120 or 4,6/140 slot library; the kit upgrades the library in 20 slot increments. To order a capacity upgrade kit to upgrade from a 100 slot library to a 120 or 140 slot library in the field, use a separate order section and order the capacity upgrade kit without the OD1 option.)			
<ul style="list-style-type: none"> Tape Library Redundant Power Supply (for use with 2/20 through 6/140 Ultrium tape libraries) 	A4676A	OD1	
Factory Installation – Installs power supply in library at the factory. (This option is required with all orders that include a tape library. To order a separate additional power supply for upgrade or other purposes, use a separate order section and order the power supply as an accessory without the OD1 option.)			
<ul style="list-style-type: none"> 2/20-6/140 DLT 5-Slot Removable Magazine (with five pieces of media) 	C7236J		
<ul style="list-style-type: none"> 2/20-6/140 DLT 5-Slot Removable Magazine (empty) 	C7235J		
<ul style="list-style-type: none"> 2/20-6/140 Ultrium 5-Slot Removable Magazine (with five pieces of media) 	C9554A		
<ul style="list-style-type: none"> 2/20-6/140 Ultrium 5-Slot Removable Magazine (empty) 	C9553A		
Enclosures and Rack Mount Kits			
<ul style="list-style-type: none"> Desktop Enclosure Kit for 20 Slot Library 	C7204J		
<ul style="list-style-type: none"> Deskside Enclosure Kit for 40 Slot Library 	C7216J		
<ul style="list-style-type: none"> Deskside Enclosure Kit for 60 Slot Library 	C7232J		
<ul style="list-style-type: none"> Rackmount Kit for 2/20 	C7205J		
<ul style="list-style-type: none"> Rackmount Kit for 4/40 	C7217J		
<ul style="list-style-type: none"> Rackmount Kit for 6/60 	C7233J		
Multimode Cables for Tape Drives			
SCSI Cable 0.5m HDTS 68 pin Male/Male Multimode cable	C2978B		
SCSI Cable 1 m HDTS 68 pin Male/Male Multimode cable	C2911C		
SCSI Cable 1.5m HDTS 68 pin Male/Male Multimode cable	C2979B		
SCSI Cable 2.5m HDTS 68 pin Male/Male Multimode cable	C2924C		
SCSI Cable 5 m HDTS 68 pin Male/Male Multimode cable	C7521A		
SCSI Cable 10 m HDTS 68 pin Male/Male Multimode cable	C7522A		
SCSI Cable 1 m VHDS 68 pin Male/Male Multimode cable	C2361B		

Description	Product #	Opt #	Price
SCSI Cable 2.5 m VHDTS 68 pin Male/Male Multimode cable	C2362B		
SCSI Cable 5 m VHDTS 68 pin Male/Male Multimode cable	C2365B		
SCSI Cable 10 m VHDTS 68 pin Male/Male Multimode cable	C2363B		
SCSI Terminator LVDS/SE HDTS 68 Multimode	C2364A		
SCSI Terminator LVDS/SE VHDTS 68 Multimode	C2370A		

4.7.11—SureStore High-End Tape Libraries and Accessories

Description	Product #	Opt #	Price
Tape Libraries			
<ul style="list-style-type: none"> HP SureStore Tape Library 10/180 Requires 1 to 10 DLT drives, 1 to Ultrium drives, 1 to 6 9840 drives or a mixture of all types (not included); includes empty media magazines for 84 cartridges 	A5617A		
<ul style="list-style-type: none"> HP SureStore Tape Library 20/700 Requires 1 to 20 DLT drives, 1 to 20 Ultrium drives, 1 to 12 9840 drives or a mixture of all types (not included); includes empty media magazines for 216 cartridges. 	A5597B		
Tape Drives – Required with all libraries			
<ul style="list-style-type: none"> HP SureStore DLT 8000 Tape Drive for 10/180 or 20/700 Library 	A5599A		
<ul style="list-style-type: none"> HP SureStore Ultrium Tape Drive LVDS for 10/180 or 20/700 Library 	A6322A		
<ul style="list-style-type: none"> HP SureStore Ultrium Tape Drive HVDS for 10/180 or 20/700 Library 	A6323A		
<ul style="list-style-type: none"> HP SureStore 9840 Tape Drive for 10/180 or 20/700 Library <p>Note: Mixing and matching DLT 8000 tape drives, Ultrium tape drives and 9840 tape drives in the same library is supported in the 10/180 and 20/700 libraries. However, since the 9840 tape drive assembly is larger in size than the DLT 8000 tape drive and Ultrium tape drives, it is not a 1:1 ratio between drive types. The correct ratio is approximately 3:1, DLT/Ultrium to 9840 tape drives. Alone, only 12×9840 drives fill the allowable drive space in a 20/700 library and only 6×9840 drives fill the allowable drive space in a 10/180 library. If you are using only DLT 8000 tape drives and Ultrium tape drives the ratio is 1:1 since the Ultrium Tape drive is a little smaller than the DLT tape drives. See HP9000 Configuration Guide for specific combinations of drives.</p>	A5598A		
Upgrade Kits			
<ul style="list-style-type: none"> Expansion module to convert base 10/180 Library from 84 to 140 slots 	A1376A		
<ul style="list-style-type: none"> Expansion module to convert base 10/180 Library from 140 to 174 slots <p>Note: Requires 56 slot expansion (A1376A) to be installed first.</p>	A1377A		
<ul style="list-style-type: none"> Expansion module to convert base 20/700 Library from 216 to 384 slots 	A5604A		
<ul style="list-style-type: none"> Expansion module to convert base 20/700 Library from 384 to 678 slots 	A5605A		
<ul style="list-style-type: none"> Second Drive Tower to convert from 10 drive capacity to 20 drive capacity for 20/700 Library 	A5600A		
<ul style="list-style-type: none"> Second Cartridge Access Port to convert from 20 to 40 cartridge import/export for 20/700 Library 	A5601A		
<ul style="list-style-type: none"> Secondary Power Supply for 10/180 Library 	A6327A		
Multimode Cables for Tape Drives			
<ul style="list-style-type: none"> SCSI Cable 0.5m HDTS 68 pin Male/Male Multimode cable 	C2978B		
<ul style="list-style-type: none"> SCSI Cable 1 m HDTS 68 pin Male/Male Multimode cable 	C2911C		
<ul style="list-style-type: none"> SCSI Cable 1.5m HDTS 68 pin Male/Male Multimode cable 	C2979B		
<ul style="list-style-type: none"> SCSI Cable 2.5m HDTS 68 pin Male/Male Multimode cable 	C2924C		
<ul style="list-style-type: none"> SCSI Cable 5 m HDTS 68 pin Male/Male Multimode cable 	C7521A		
<ul style="list-style-type: none"> SCSI Cable 10 m HDTS 68 pin Male/Male Multimode cable 	C7522A		
<ul style="list-style-type: none"> SCSI Cable 1 m VHDTS 68 pin Male/Male Multimode cable 	C2361B		
<ul style="list-style-type: none"> SCSI Cable 2.5 m VHDTS 68 pin Male/Male Multimode cable 	C2362B		
<ul style="list-style-type: none"> SCSI Cable 5 m VHDTS 68 pin Male/Male Multimode cable 	C2365B		
<ul style="list-style-type: none"> SCSI Cable 10 m VHDTS 68 pin Male/Male Multimode cable 	C2363B		
<ul style="list-style-type: none"> SCSI Terminator LVDS/SE HDTS 68 Multimode 	C2364A		
<ul style="list-style-type: none"> SCSI Terminator LVDS/SE VHDTS 68 Multimode 	C2370A		

Subchapter 4.8—Optical Storage

Description		Product #	Opt #	Price
Magneto-Optical Disk Drives				
<i>Optical Jukeboxes - 14x (9.1 GB Magneto-Optical Disk Drives)</i>				
•	HP SureStore 220mx MO Jukebox (218.4GB) - 1 drive, 24 slots	C1118M		
MO jukebox with 1 multifunction 9.1 GB optical disk drive, capacity for up to 24 rewritable or CCW WORM optical disks, auto-sensing single-ended / LVD SCSI interface (HDTS 68), one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Upgradeable to 2 drives. Note: Interface cable must be ordered separately.				
•	HP SureStore 220mx MO Jukebox (218.4 GB) - 2 drive, 24 slots	C1119M		
MO jukebox with 2 multifunction 9.1 GB optical disk drives, capacity for up to 24 rewritable or WORM optical disks, auto-sensing single-ended / LVD SCSI interface (HDTS 68), one 9.1 GB CCW rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Note: Interface cable must be ordered separately.				
•	HP SureStore 300mx MO Jukebox (291.2 GB) - 2 drive, 32 slots	C1150M		
MO jukebox with 2 multifunction 9.1 GB optical disk drives, capacity for up to 32 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) or Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Upgradeable to 4 drive, 64 slots. Note: Interface cable must be ordered separately				
•	HP SureStore 600mx MO Jukebox (582.4 GB) - 4 drive, 64 slots	C1160M		
MO jukebox with 4 multifunction 9.1 GB optical disk drives, capacity for up to 64 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) or Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Note: Interface cable must be ordered separately				
•	HP SureStore 700mx MO Jukebox (691.6 GB) - 2 drive, 76 slots	C1170M		
MO jukebox with 2 multifunction 9.1 GB optical disk drives, capacity for up to 76 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) or Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty and freight. Customer installable. Note: Interface cable must be ordered separately				
•	HP SureStore 1200mx Jukebox (1164.8 GB) - 4 drive, 128 slots	C1104M		
MO jukebox with 4 multifunction 9.1 GB optical disk drives, capacity for up to 128 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50)Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector),one year, on-site warranty, freight and installation. Upgradeable to 6 drive/128 slots, 4 drive/238 slots, 6 drive/238 slots or 10 drive/238 slots. Note: Interface cable must be ordered separately				
Delete Installation			0D4	
•	HP SureStore 1200mx Jukebox (1164.8 GB) - 6 drive, 128 slots	C1105M		
MO jukebox with 6 multifunction 9.1 GB optical disk drives, capacity for up to 128 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50)Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector),one year, on-site warranty, freight and installation. Upgradeable to 6 drive/238 slots or 10 drive/238slots Note: Interface cable must be ordered separately				
•	HP SureStore 2200mx Jukebox (2165.8 GB) - 6 drive, 238 slots	C1107M		
MO jukebox with 6 multifunction 9.1 GB optical disk drives, capacity for up to 238 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical				

Description	Product #	Opt #	Price
disk (4096 byte/sector), one year, on-site warranty, freight and installation. Upgradeable to 10 drive/238 slots Note: Interface cable must be ordered separately Delete Installation		OD4	
• HP SureStore 2200mx Jukebox (2165.8 GB) - 10 drive, 238 slots	C1110M		
MO jukebox with 10 multifunction 9.1 GB optical disk drives, capacity for up to 238 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty, freight and installation. Note: Interface cable must be ordered separately Delete Installation		OD4	
• HP SureStore 2200mx Jukebox (2165.8 GB) - 4 drive, 238 slots	C1111M		
MO jukebox with 4 multifunction 9.1 GB optical disk drives, capacity for up to 238 rewritable or CCW WORM optical disks, two-disk transport system, user-selectable single-ended SCSI (HDTS 50) Fast Differential SCSI (HDTS 68) interface, one 9.1 GB rewritable optical disk (4096 byte/sector), one year, on-site warranty, freight and installation. Upgradeable to 6 drives, 238 slots or 10 drives, 238 slots. Note: Interface cable must be ordered separately. Delete Installation		OD4	
• HP SureStore 9100mx Optical Subsystem (9.1 GB)	C1114M		
Standalone MO drive with 1 multifunction 9.1 GB optical disk drive, capacity for one rewritable or CCW WORM optical disk, single-ended SCSI interface (HDTS 50), Macintosh, Windows®95/98/2000/NT® drivers, one 9.1 GB rewritable optical disk (4096 byte/sector), one year overnight exchange warranty and freight. Customer installable Note: Interface cable must be ordered separately.			
Optical Jukebox Upgrade Kits: 9.1 GB Jukeboxes (Upgrades increase the number of drives and/or capacity)			
• Drive Upgrade Kit for HP SureStore 220mx (1 drive, 24 slot Jukebox)	C5130M		
Includes one 9.1 GB optical disk drive, mounting hardware and installation Delete Installation		OD4	
• Drive and Capacity Upgrade for HP SureStore 300mx (2 drive, 32 slot Jukebox)	C1155M		
Includes two 9.1GB optical disk drives, mounting hardware and installation Delete Installation		OD4	
• Two Drive Upgrade Kit for 1200mx and 2200mx	C1154M		
Includes two 9.1 GB optical disk drives, mounting hardware and installation Delete Installation		OD4	
• Capacity Upgrade Kit for 1200mx	C1159M		
Adds 110 slot capacity. Includes controller electronics, mounting hardware and installation Delete Installation		OD4	
• Four Drive Upgrade for 2200mx	C1158M		
Includes four 9.1GB optical disk drives, 2 nd SCSI bus, mounting hardware and installation Delete Installation		OD4	
<i>Optical Jukeboxes - 8x (5.2 GB Magneto-Optical Disk Drives)</i>			
• HP Optical Module 5200 Multifunction Disk Drive (5.2 GB)	C1114J		
Includes cabinet, one 8x (5.2 GB) multifunction optical disk drives, capacity for one rewritable or CCW WORM optical disk, single-ended SCSI interface (HDTS 50), users guide, Macintosh, Windows®, and Windows NT® drivers, one 8x (5.2 GB) rewritable optical disk (1024 byte sectors), one SE SCSI terminator, one year overnight exchange warranty and freight. Customer installable. Note: Interface cable must be ordered separately. <i>Optical Jukebox Upgrade Kits: 5.2GB (8x) Jukeboxes</i> <i>(Upgrades increase the number of drives and/or capacity. Upgrades from 2x-to-4x converted jukeboxes are not supported)</i> Model 1/24 one-drive to Model 2/24 two-drive			
• Drive Upgrade Kit for Model 1/24 (and older 1/16)	C5130J		

	Description	Product #	Opt #	Price
	Includes one 5.2 GB optical disk drive, mounting hardware and installation. Delete Installation		OD4	
	Model 2/32 two-drive and 32 slots to Model 4/64 four-drive and 64 slots			
•	Drive Upgrade Kit for Model 2/32	C1155J		
	Includes two 5.2 GB optical disk drives w/electronic capacity upgrade to enable an additional 32 slots. Also includes mounting hardware and installation Delete Installation		OD4	
•	Two-Drive Upgrade Kit for Model 4/128 and 4/238	C1154J		
	Includes two 5.2 GB optical disks and mounting hardware w/installation. Delete Installation		OD4	
•	Capacity Upgrade Kit for 4/128 to 4/238	C1159J		
	Add 110 slots capacity Delete Installation		OD4	
•	Four-Drive Upgrade from 6-drive 238 slot jukebox to 10-drive 238-slot jukebox w/SCSI bus	C1158J		
	Delete Installation <i>Optical Jukebox Conversion Kits: 4x to 14x</i> (Conversion Kits exchange previous generation drives for next generation drives)		OD4	
•	80fx to 300mx Conversion Kit	C5131M		
	Exchanges two 9.1 GB drives for two 2.6 GB drives. Includes installation. Delete Installation		OD4	
•	160fx to 600mx Conversion Kit	C5132M		
	Exchanges four 9.1 GB drives for four 2.6 GB drives. Includes installation Delete Installation		OD4	
•	200fx to 700mx Conversion Kit	C5133M		
	Exchanges two 9.1 GB drives for two 2.6 GB drives. Includes installation Delete Installation		OD4	
•	330fx to 1200mx Conversion Kit	C5138M		
	Exchanges four 9.1 GB drives for four 2.6 GB drives. Includes installation Delete Installation		OD4	
•	600fx to 2200mx Conversion Kit	C5139M		
	Exchanges four 9.1 GB drives for four 2.6 GB drives. Includes installation Delete Installation		OD4	
	Optical Jukebox Conversion Kits: 8x to 14x (Conversion Kits exchange previous generation drives for next generation drives)			
•	125ex to 220mx Conversion Kit	C5130M		
	Exchanges one 9.1 GB drive for one 5.2 GB drive. Includes installation Delete Installation		OD4	
•	160ex to 300mx Conversion Kit	C5131M		
	Exchanges two 9.1 GB drives for two 5.2 GB drives. Includes installation Delete Installation		OD4	
•	320ex to 600mx Conversion Kit	C5187M		
	Exchanges four 9.1 GB drives for four 5.2 GB drives. Includes installation Delete Installation		OD4	
•	400ex to 700mx Conversion Kit	C5188M		
	Exchanges two 9.1 GB drives for two 5.2 GB drives. Includes installation Delete Installation		OD4	
•	660ex to 1200mx Conversion Kit			
	Exchanges four 9.1 GB drives for four 5.2 GB drives. Includes installation Delete Installation	C5138M	OD4	
•	1200ex to 2200mx Conversion Kit			
	Exchanges four 9.1 GB drives for four 5.2 GB drives. Includes installation	C5189M		

Description	Product #	Opt #	Price
Delete Installation		0D4	
14x Optical Disks: Single Disks			
• 5.25 inch 9.1 GB rewritable optical disk - 4096 bytes per sector	C7983A		
• 5.25 inch 9.1 GB WORM optical disk - 4096 bytes per sector	C7984A		
• 5.25 inch 8.6 GB rewritable optical disk - 2048 bytes per sector	C7985A		
• 5.25 inch 8.6 GB WORM optical disk - 2048 bytes per sector	C7986A		
• 5.25 inch 9.1 GB rewritable optical disk - 1024 bytes per sector	C7987A		
• 5.25 inch 9.1 GB rewritable optical disk - 512 bytes per sector	C7988A		
8x Optical Disks: Single Disks			
• 5.25-inch 5.2 GB rewritable optical disk - 1024 bytes per sector	88143J		
• 5.25-inch 5.2 GB WORM optical disk - 1024 bytes per sector	88145J		
• 5.25-inch 5.2 GB rewritable optical disk - 2048 bytes per sector	88147J		
• 5.25-inch 5.2 GB WORM optical disk - 2048 bytes per sector	88146J		
4x Optical Disks: single disks			
• 5.25-inch 2.6 GB rewritable optical disk - 1024 bytes per sector	92280F		
• 5.25-inch 2.6 GB WORM optical disk - 1024 bytes per sector	92290F		
• 5.25-inch 2.3 GB rewritable optical disk - 512 bytes per sector	92279F		
• 5.25-inch 2.3 GB WORM optical disk - 512 bytes per sector	92289F		
2x Optical Disks: single disks			
• 5.25-inch 1.3 GB rewritable optical disk - 1024 bytes per sector	92280T		
• 5.25-inch 1.3 GB WORM optical disk - 1024 bytes per sector	92290T		
• 5.25-inch 1.2 GB rewritable optical disk - 512 bytes per sector	92279T		
• 5.25-inch 1.2 GB WORM optical disk - 512 bytes per sector	92289T		

Subchapter 4.9—disk arrays

4.9.1—surestore disk array 12H (with AutoRAID technology) 12H w/FC MUX

Description	Product #	Opt #	Price
HP Surestore Disk Array 12H (with AutoRAID technology) 12H with FC MUX (FC MUX optional) <i>(To place orders for 12H with FC MUX, refer to sample order menus in the Design Guide at http://eps.rose.hp.com. (This site not available to channel partners) Full factory integration (including racking and cabling) is available only for configurations described in the Design Guide. Order A5147A for full factory integration of storage configurations described in the Design Guide. All cables [C2924A, C5167A, C2925A, and C2911A] must be ordered with the OD1 option to ensure factory integration.)</i>			
<ul style="list-style-type: none"> Deskside Disk Array with AutoRAID 	A3700AD		
<i>Standard Array Includes:</i> Deskside Array Enclosure Two Empty Controller slots Two Power Supplies (third power supply option available) Three Fan Modules Twelve empty Disk Slots 0.5 m Ultra-Flexible SCSI cable Fast Wide Differential SCSI Terminator Factory Installation into Deskside Cabinet Owners Guide and general usage document			
High Availability Options			

Description	Product #	Opt #	Price
Third Power Supply Option		002	
Storage Capacity Options (Minimum of 4 drives required)			
4x18.2 GB 10K rpm Disk drive modules		184	
5x18.2 GB 10K rpm Disk drive modules		185	
8x18.2 GB 10K rpm Disk drive modules		188	
12x18.2 GB 10K rpm Disk drive modules		192	
4x36.4 GB 10K rpm Disk drive modules		504	
5x36.4 GB 10K rpm Disk drive modules		505	
8x36.4 GB 10K rpm Disk drive modules		508	
12x36.4 GB 10K Disk drive modules		512	
Controllers (Must select Option 200 or Option 203)			
One 96 MB HP Disk Array Controller with AutoRAID		200	
Two 96 MB HP Disk Array Controllers with AutoRAID		203	
Cable Options			
0.9 m 68-pin high-density male to 68-pin high-density male cable		801	
2.5 m 68-pin high-density male to 68-pin high-density male cable		802	
5.0 m 68-pin high-density male to 68-pin high-density male cable		803	
10.0 m 68-pin high-density male to 68-pin high-density male cable		804	
CA – 1M 68 Pin LP to 68 Pin HD LP		806	
CA – 2.5M 68 Pin LP to 68 Pin HD LP		807	
CA – 5.0M 68 Pin LP to 68 Pin HD LP		808	
CA – 10M 68 Pin LP to 68 Pin HD LP		809	
1.0M VHDCI to 68 Pin HD Cable		811	
2.5M VHDCI to 68 Pin HD Cable		812	
5.0M VHDCI to 68 Pin HD Cable		813	
10.0M VHDCI to 68 Pin HD Cable		814	
2M V CBL VHDCI – VHDCI – 68 Pin HD		841	
2M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		842	
2M V CBL 68 Pin HD – VHDCI – 68 Pin HD		843	
2M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		844	
4M V CBL VHDCI – VHDCI – 68 Pin HD		B25	
4M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		B26	
4M V CBL 68 Pin HD – VHDCI – 68 Pin HD		B27	
4M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		B28	
2.0 m V cable - 68-pin high-density male		840	
10.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		851	
2/5 m V in-line terminator cable - 68-pin high-density male for V-Class		871	
2/3 m V in-line terminator cable - 68-pin high-density male for V-Class		873	
5.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		875	
• SCSI Cable 0.5m VHDTS68/HDTS68 HVD ILT M/F	C7519A		
Configuration Tools			
NT Support Kit (This software is required for the array to work with NT systems.)		ASJ	
MPE Tracking (This option should be ordered with all arrays that will be connected to MPE systems. This is a configuration tracking solution only.)		003	
Supporting Software (CD-ROMs)			
• Supporting Software (This software is required for the array to work with HP-UX. The customer is not required to order more than one per installation site. If the array is ordered as part of an integrated system order, B6191AA need not be ordered because the necessary supporting software is automatically included with the HP-UX order.)	B6191AA		
• Rackmount HP Surestore Disk Array 12H (with AutoRAID technology)	A3700A		
<i>Standard Array Includes:</i>			
Rackmount Array Enclosure			
Two Empty Controller slots			
Two Power Supplies (third power supply option available)			
Three Fan Modules			
Twelve Empty Half-Height Disk Slots			
0.5 m Ultra-Flexible SCSI cable			

Description	Product #	Opt #	Price
Fast Wide Differential SCSI Terminator			
Owners Guide and general usage document			
High Availability Options			
Third Power Supply Option		002	
Storage Capacity Options (Minimum of 4 drives required)			
4x18.2 GB 10K rpm Disk drive modules		184	
5x18.2 GB 10K rpm Disk drive modules		185	
8x18.2 GB 10K rpm Disk drive modules		188	
12x18.2 GB 10K rpm Disk drive modules		192	
4x36.4 GB 10K rpm Disk drive modules		504	
5x36.4 GB 10K rpm Disk drive modules		505	
8x36.4 GB 10K rpm Disk drive modules		508	
12x36.4 GB 10K Disk drive modules		512	
Controllers (Must select Option 200 or Option 203)			
One 96 MB HP Disk Array Controller with AutoRAID		200	
Two 96 MB HP Disk Array Controllers with AutoRAID		203	
Cable Options			
0.9 m 68-pin high-density male to 68-pin high-density male cable		801	
2.5 m 68-pin high-density male to 68-pin high-density male cable		802	
5.0 m 68-pin high-density male to 68-pin high-density male cable		803	
10.0 m 68-pin high-density male to 68-pin high-density male cable		804	
CA – 1M 68 Pin LP to 68 Pin HD LP		806	
CA – 2.5M 68 Pin LP to 68 Pin HD LP		807	
CA – 5.0M 68 Pin LP to 68 Pin HD LP		808	
CA – 10M 68 Pin LP to 68 Pin HD LP		809	
1.0M VHDCI to 68 Pin HD Cable		811	
2.5M VHDCI to 68 Pin HD Cable		812	
5.0M VHDCI to 68 Pin HD Cable		813	
10.0M VHDCI to 68 Pin HD Cable		814	
2M V CBL VHDCI – VHDCI – 68 Pin HD		841	
2M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		842	
2M V CBL 68 Pin HD – VHDCI – 68 Pin HD		843	
2M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		844	
4M V CBL VHDCI – VHDCI – 68 Pin HD		B25	
4M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		B26	
4M V CBL 68 Pin HD – VHDCI – 68 Pin HD		B27	
4M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		B28	
2.0 m V cable – 68-pin high-density male		840	
10.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		851	
2/5 m V in-line terminator cable – 68-pin high-density male for V-Class		871	
2/3 m V in-line terminator cable – 68-pin high-density male for V-Class		873	
5.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		875	
• SCSI Cable 0.5m VHDS68/HDTS68 HVD ILT M/F	C7519A		
Configuration Tools			
NT Support Kit (This software is required for the array to work with NT systems.)		ASJ	
MPE Tracking (This option should be ordered with all arrays that will be connected to MPE systems. This is a configuration tracking solution only.)		003	
Supporting Software (CD-ROMs)			
Supporting Software (This software is required for the array to work with HP-UX. The customer is not required to order more than one per installation site. If the array is ordered as part of an integrated system order, B6191AA need not be ordered because the necessary supporting software is automatically included with the HP-UX order.)	B6191AA		
• Factory-Racked HP Surestore Disk Array 12H (with AutoRAID technology)	A3700AZ		
<i>Standard Array Includes:</i>			
Factory Racked Enclosure			
Two Empty Controller slots			

Description	Product #	Opt #	Price
Two Power Supplies (third power supply option available)			
Three Fan Modules			
Twelve Empty Half-Height Disk Slots			
0.5 m Ultra-Flexible SCSI cable			
Fast Wide Differential SCSI Terminator			
Owners Guide and general usage document			
High Availability Options			
Third Power Supply Option		002	
Storage Capacity Options (Minimum of 4 drives required)			
4x18.2 GB 10K rpm Disk drive modules		184	
5x18.2 GB 10K rpm Disk drive modules		185	
8x18.2 GB 10K rpm Disk drive modules		188	
12x18.2 GB 10K rpm Disk drive modules		192	
4x36.4 GB 10K rpm Disk drive modules		504	
5x36.4 GB 10K rpm Disk drive modules		505	
8x36.4 GB 10K rpm Disk drive modules		508	
12x36.4 GB 10K Disk drive modules		512	
Controllers (Must select Option 200 or Option 203)			
One 96 MB HP Disk Array Controller with AutoRAID		200	
Two 96 MB HP Disk Array Controllers with AutoRAID		203	
Cable Options			
0.9 m 68-pin high-density male to 68-pin high-density male cable		801	
2.5 m 68-pin high-density male to 68-pin high-density male cable		802	
5.0 m 68-pin high-density male to 68-pin high-density male cable		803	
10.0 m 68-pin high-density male to 68-pin high-density male cable		804	
CA – 1M 68 Pin LP to 68 Pin HD LP		806	
CA – 2.5M 68 Pin LP to 68 Pin HD LP		807	
CA – 5.0M 68 Pin LP to 68 Pin HD LP		808	
CA – 10M 68 Pin LP to 68 Pin HD LP		809	
1.0M VHDCI to 68 Pin HD Cable		811	
2.5M VHDCI to 68 Pin HD Cable		812	
5.0M VHDCI to 68 Pin HD Cable		813	
10.0M VHDCI to 68 Pin HD Cable		814	
2M V CBL VHDCI – VHDCI – 68 Pin HD		841	
2M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		842	
2M V CBL 68 Pin HD – VHDCI – 68 Pin HD		843	
2M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		844	
4M V CBL VHDCI – VHDCI – 68 Pin HD		B25	
4M V CBL VHDCI – VHDCI I / L Term – 68 Pin HD		B26	
4M V CBL 68 Pin HD – VHDCI – 68 Pin HD		B27	
4M V CBL 68 Pin HD – VHDCI I / L Term – 68 Pin HD		B28	
2.0 m V cable - 68-pin high-density male		840	
10.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		851	
2/5 m V in-line terminator cable - 68-pin high-density male for V-Class		871	
2/3 m V in-line terminator cable - 68-pin high-density male for V-Class		873	
5.0 m 68-pin high-density male to 68-pin high-density male in-line terminator cable for V-Class		875	
• SCSI Cable 0.5m VHDS68/HDS68 HVD ILT M/F	C7519A		
Configuration Tools			
NT Support Kit (This software is required for the array to work with NT systems.)		ASJ	
MPE Tracking (This option should be ordered with all arrays that will be connected to MPE systems. This is a configuration tracking solution only.)		003	
Supporting Software (CD-ROMs)			
Supporting Software (This software is required for the array to work with HP-UX. The customer is not required to order more than one per installation site. If the array is ordered as part of an integrated system order, B6191AA need not be ordered because the necessary supporting software is automatically included with the HP-UX order.)	B6191AA		

Description	Product #	Opt #	Price
Add-On/Upgrade Products			
• 18.2 GB disk drive module 10K RPM S/E (54 mm disk module) (Must have all 3 fan modules A3709B)*	A3714A		
• 36.4 GB disk drive module 10K RPM S/E (54 mm disk module) (Must have all 3 fan modules A3709B)*	A6518A		
• Power supply option (one power supply with no cable)	A3708A		
Power cable option for racked configurations		004	
Power cable option for wall outlets (localized according to country of origin of the order)		006	
• 12H Power Upgrade Kit (For use of upgrade kit in FC storage solutions, refer to the HP 9000 Enterprise Servers Configuration Guide. Choose Option OD1 for basic factory integration into rack)	A4915A		
U.S. – English Localization		ABA	
Europe (HPSA) – English Localization		ABB	
200 – 240 V UPS 4.5 m Power Cable		024	
• Fan Module	A3709B		
• 96 MB HP Disk Array Controller with AutoRAID	A3706A		
• Fast Wide Differential SCSI Terminator	C2905A		
• 0.5 m Ultra-Flexible SCSI Cable	C2981A		
• SCSI Cable 0.5m VHDS68/HDTS68 HVD ILT M/F	C7519A		
• 5.0 m 68-pin high-density male to 68-pin high-density male cable	A5167A		
• Empty deskside cabinet (allows conversion of rackmounted unit to deskside unit)	A3701A		
• Enterprise Storage Integration Product (for full factory integration of storage configurations) Described in the Design Guide (http://eps.rose.hp.com) (Site not available to channel partners)	A5147A		
• CD-ROM FW upgrade kit (for single controller solutions)	A5284B		
• PCI Differential UW SCSI HBA for NT	A5252A		
• Software Integration Kit for NT	A5253C		
• Front Door for 12H – Quartz Grey (For Parchment White door replacement)	A5329A		

* A3700A, A3700AD & A3700AZ enclosures ordered before 02 April 98, need to be upgraded with all 3 fan modules A3709B. Upgraded module is identified by a bubble label. Previous label was flat.

4.9.2—HP Surestore Virtual Array 7100

US List

Ordering Notes:

Choose ordering methodology:

Field Rackable Pre-Defined SKUs

Factory Racked Pre-Defined SKUs

Field Rackable “Build From Scratch”

Factory Racked “Build From Scratch”

Choose appropriate base controller enclosure unit and base unit disks

Choose desired disk system enclosure unit and disks based on chosen ordering methodology

Minimum of 4 disks are required per VA 7100

Maximum of 15 disks per VA 7400

All enterprise factory integrated products include appropriate disk filler panels

Commercial Channel specific products are no longer available. The VA Family has completed the “Universal Product Merge”

Factory SKU’s are no longer available for single controller or deskside units. Please see the following examples for how to order

How to order a single controller VA 7100 (with factory integration)

Table 1

Count	Product Number	Option	Description
-------	----------------	--------	-------------

1	A6183A		Virtual Array Enclosure
1	A6188A		Virtual Array Processor – One minimum, two per enclosure max
1	A6188A	OD1	Factory Integration
1	A6186A		512MB Cache for Virtual Array Processor – one per Virtual Array Processor
1	A6185A	OD1	Factory Integration
1	A6203A		SW GBIC for SureStore VA series – one per Virtual Array Processor
1	A6203A	OD1	Factory Integration
15	A6194A		Enterprise Class 73GB 10K RPM FC HDD (min 4)
15	A6194A	OD1	Factory Integration

How to order a desktide VA 7100 (with factory integration)

Table 2

Count	Product Number	Option	Description
1	A6183AD		Virtual Array Enclosure
2	A6188A		Virtual Array Processor – One minimum, two per enclosure max
2	A6188A	OD1	Factory Integration
2	A6186A		512MB Cache for Virtual Array Processor – one per Virtual Array Processor
2	A6185A	OD1	Factory Integration
2	A6203A		SW GBIC for SureStore VA series – one per Virtual Array Processor
2	A6203A	OD1	Factory Integration
15	A6194A		Enterprise Class 73GB 10K RPM FC HDD (min 4)
15	A6194A	OD1	Factory Integration

Description	Product #	Opt #	Price
VA 7100 Field Rackable Controller Enclosure, w/ Dual Controllers			
<ul style="list-style-type: none"> VA 7100 w/ Dual Controller 256MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 256MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS Enterprise Class 18GB 15K RPM FC HDD (min 4) Enterprise Class 36GB 10K RPM FC HDD (min 4) Enterprise Class 36GB 15K RPM FC HDD (min 4) Enterprise Class 73GB 10K RPM FC HDD (min 4) VA 7100 w/ Dual Controller 512MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS Enterprise Class 18GB 15K RPM FC HDD (min 4) Enterprise Class 36GB 10K RPM FC HDD (min 4) Enterprise Class 36GB 15K RPM FC HDD (min 4) Enterprise Class 73GB 10K RPM FC HDD (min 4) VA 7100 w/ Dual Controller 1024MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS Enterprise Class 18GB 15K RPM FC HDD (min 4) Enterprise Class 36GB 10K RPM FC HDD (min 4) Enterprise Class 36GB 15K RPM FC HDD (min 4) Enterprise Class 73GB 10K RPM FC HDD (min 4) 	A6261A		
	A6191A	OD1	
	A6192A	OD1	
	A6193A	OD1	
	A6194A	OD1	
	A6262A		
	A6191A	OD1	
	A6192A	OD1	
	A6193A	OD1	
	A6194A	OD1	
	A6263A		
	A6191A	OD1	
	A6192A	OD1	
	A6193A	OD1	
	A6194A	OD1	
VA 7100 Factory Racked Controller Enclosure, w/ Dual Controllers			
<ul style="list-style-type: none"> VA 7100 w/ Dual Controller 256MB Cache includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 256MB, User Guide, RS232 	A6261AZ		

	Description	Product #	Opt #	Price
	Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS			
•	Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
	VA 7100 w/ Dual Controller 512MB Cache	A6262AZ		
	includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS			
•	Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
•	VA 7100 w/ Dual Controller 1024MB Cache	A6263AZ		
	includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet & 2 GBICS			
•	Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
	Module products			
•	Virtual Array Enclosure	A6183A		
•	Virtual Array Enclosure – Deskside (VA 7 100 ONLY)	A6183AD		
•	Virtual Array Processor – One minimum, two per enclosure max	A6188A		
•	256MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6185A		
•	512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A		
•	1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A		
•	Enterprise Class 18GB 15K RPM FC HDD (min 4)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 4)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 4)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 4)	A6194A	OD1	
•	SW GBIC for SureStore VA series – one per Virtual Array Processor	A6203A		
	Cables & Accessories			
•	Deskside Cab for Virtual Array Series	A6196A		
•	2 meter FC fibre optic cable	A3583A		
•	16 meter FC fibre optic cable	A3531A		
•	50 meter FC fibre optic cable	A3735A		
•	100 meter FC fibre optic cable	A3736A		
•	VAP/LCC filler panel	A6197A		
•	Disk Slot filler panel	A6198A		
	Software			
•	COMMAND VIEW SDM 1 HOST LTU AND SW KIT	T1001A		
•	Enterprise Integrations for Command View SDM	T1002A		
•	Secure Manager Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1003A		
•	Secure Manager Virtual Array 500GB LTU	T1004A		
•	Secure Manager Virtual Array 1TB LTU	T1005A		
•	Business Copy Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1007A		
•	Business Copy Virtual Array 500GB LTU	T1008A		
•	Business Copy Virtual Array 1TB LTU	T1009A		
•	Auto Path Virtual Array Windows 2000 1 Host LTU w/SW Media Kit (required for enablement)	T1011A		
•	Auto Path Virtual Array Windows 2000 1 Host LTU	T1012A		
•	Auto Path Virtual Array Windows 2000 5 Host LTU	T1013A		
•	Auto Path Virtual Array Windows NT 4.0 1 Host LTU w/SW Media Kit (required for enablement)	T1039A		

	Description	Product #	Opt #	Price
•	Auto Path Virtual Array Windows NT 4.0 1 Host LTU	T1040A		
•	Auto Path Virtual Array Windows NT 4.0 5 Host LTU	T1041A		
•	Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU w/SW Media Kit (required for enablement)	T1060A		
•	Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU	T1061A		
•	Auto Path Virtual Array HP-UX 11.0/11.i 5 Host LTU	T1062A		
•	Fast Recovery Solutions for MS Exchange 2000	B9550A		

4.9.3—HP Surestore Virtual Array 7400

US List

Ordering Notes:

Choose ordering methodology:

Field Rackable Pre-Defined SKUs

Factory Racked Pre-Defined SKUs

Field Rackable “Build From Scratch”

Factory Racked “Build From Scratch”

Choose appropriate base controller enclosure unit and base unit disks

Choose desired disk system enclosure unit and disks based on chosen ordering methodology

Minimum of 10 disks are required per VA 7400 controller pair

Minimum of 4 drives of chosen capacity type per VA 7400 controller pair

Minimum of 2 drives per DS2405 enclosure

All enterprise factory integrated products include appropriate disk filler panels

Commercial Channel specific products are no longer available. The VA Family has completed the “Universal Product Merge”

	Description	Product #	Opt #	Price
	VA 7400 Field Rackable Controller Enclosure, w/ Dual Controllers			
•	VA 7400 w/ Dual Controller 512MB Cache – order additional disk systems separately includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet	A6264A		
•	Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
•	VA 7400 w/ Dual Controller 1024MB Cache– order additional disk systems separately includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet	A6265A		
•	Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
	VA 7400 Factory Racked Controller Enclosure, w/ Dual Controllers			
•	VA 7400 w/ Dual Controller 512MB Cache– order additional disk systems separately includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (2) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord,(2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet	A6264AZ		
•	Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
•	VA 7400 w/ Dual Controller 1024MB Cache– order additional disk systems separately	A6265AZ		

Description	Product #	Opt #	Price
includes: VA Enclosure, (2) 2Gb/1Gb VA Cont Module Assy, (4) DIMM 512MB, User Guide, RS232 Installation Guide, Documentation Map, (2) power cord, (2) power supplies, (2) fan modules, ESD Kit, CBL 9-9 PIN, HP CommandView SDM, HP-UX Patch Alert Data Sheet			
• Enterprise Class 18GB 15K RPM FC HDD (min 10)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 10)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 10)	A6194A	OD1	
Virtual Array Family Modules – Integrated Build From Scratch Field Rackable			
• Virtual Array Enclosure- Field Rackable <i>includes:</i> VA Enclosure, User Guide, Installation Guide, Documentation Map, (2) power cord, HP CommandView SDM, HP-UX Patch Alert Data Sheet and disk filler panels	A6183A		
• Virtual Array Processor 7400 – two per enclosure required	A6189A	OD1	
• 512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A	OD1	
• 1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A	OD1	
• Enterprise Class 18GB 15K RPM FC HDD – may mix capacity points	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD – may mix capacity points	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 10)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD – may mix capacity points	A6194A	OD1	
Virtual Array Family Modules – Integrated Build From Scratch Factory Racked			
• Virtual Array Enclosure – Factory Racked <i>includes:</i> VA Enclosure, User Guide, Installation Guide, Documentation Map, (2) power cord, HP CommandView SDM, HP-UX Patch Alert Data Sheet and disk filler panels	A6183AZ		
• Virtual Array Processor 7400 – two per enclosure required	A6189A	OD1	
• 512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A	OD1	
• 1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A	OD1	
• Enterprise Class 18GB 15K RPM FC HDD – may mix capacity points	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD – may mix capacity points	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2400)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD – may mix capacity points	A6194A	OD1	
DS2400 WILL BE REPLACED WITH THE DS2405			
DS 2400 Field Rackable Disk Enclosure w/ Dual Link Control Cards			
• DS 2400 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy, (2) power cord, 2 FC Optical LC/LC Cables	A6214A		
• Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2400)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2400)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2400)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2400)	A6194A	OD1	
DS 2400 Factory Racked Disk Enclosure w/ Dual Link Control Cards			
• DS 2400 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy, (2) power cord, 2 FC Optical LC/LC Cables	A6214AZ		
• Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2400)	A6191A	OD1	
• Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2400)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2400)	A6193A	OD1	
• Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2400)	A6194A	OD1	
DS 2405 Field Rackable Disk Enclosure w/ Dual Link Control Cards			
• DS 2405 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy and (2) power cord. Cables are NOT included and must be ordered separately. Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM version 1.04 or later.	A6250A		
• Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2405)	A6191A	OD1	223
• Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2405)	A6192A	OD1	
• Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2405)	A6193A	OD1	

	Description	Product #	Opt #	Price
•	Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2405)	A6194A	OD1	
	DS 2405 Factory Racked Disk Enclosure w/ Dual Link Control Cards			
•	DS 2405 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, Disk Filler Assy and (2) power cord. Cables are NOT included and must be ordered separately. Mandatory option: Instructs VA customers to have HP14 or later firmware and Command View SDM version 1.04 or later.	A6250AZ		
•	Enterprise Class 18GB 15K RPM FC HDD (min 2 per DS 2405)	A6191A	OD1	
•	Enterprise Class 36GB 10K RPM FC HDD (min 2 per DS 2405)	A6192A	OD1	
•	Enterprise Class 36GB 15K RPM FC HDD (min 2 per DS 2405)	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD (min 2 per DS 2405)	A6194A	OD1	

4.9.4—virtual array family upgrade products

	Description	Product #	Opt #	Price
	Virtual Array Family Upgrade Products			
•	Virtual Array Enclosure- Field Rackable <i>includes:</i> VA Enclosure, User Guide, Installation Guide, Documentation Map, (2) power cord, HP CommandView SDM, HP-UX Patch Alert Data Sheet and NO DISK FILLER PANELS	A6183A		
•	DS 2400 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, (2) power cord, 2 FC Optical LC/LC cables NO DISK	A6214A		
	DS 2405 Disk Enclosure – for use ONLY with VA 7400 products <i>includes:</i> Disk Enclosure, Installation Guide, (2) power cord NO DISK FILLER PANELS. Cables are NOT included and must be ordered separately.	A6250A		
•	Virtual Array Processor 7400 – two per enclosure required	A6189A		
•	512MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6186A		
•	1024MB Cache for Virtual Array Processor – one per Virtual Array Processor	A6187A		
•	Enterprise Class 18GB 15K RPM FC HDD – may mix capacity points	A6191A		
•	Enterprise Class 36GB 10K RPM FC HDD – may mix capacity points	A6192A		
•	Enterprise Class 36GB 15K RPM FC HDD – may mix capacity points	A6193A	OD1	
•	Enterprise Class 73GB 10K RPM FC HDD – may mix capacity points	A6194A		
•	Disk Slot filler panel – must order one per empty disk slot	A6198A		
	LC/LC Cables			
•	FC Cable 2m LC Duplex 50/125 M/M Optical	C7524A		
•	FC Cable 16m LC 50/125 LC/LC M/M Optical	C7525A		
•	FC Cable 50m LC Duplex 50/125 M/M Optical	C7526A		
•	FC Cable 200m LC Duplex 50/125 M/M Optical	C7527A		
	LC/SC Adapter Cables			
•	FC Cable 2m LC/SC Duplex 50/125 M/M Optical	C7529A		
•	FC Cable 16m LC/SC Duplex 50/125 M/M Optical	C7530A		
•	Fibre Channel SC F/F Couple Optical –for use with C7529A, C7530A	C7534A		
•	Fibre Channel Adapter Kit - Optical (includes the C7529A and C7534A)	C7540A		
	Rack Kit Accessories			
•	System/E Rail Kit	A6209A		
•	RBI Rack Rail Kit for VA Family	A6244A		
•	Compaq 9000 Rack Rail Kit SF21	A5672A		
	Software			
•	COMMAND VIEW SDM 1 HOST LTU AND SW KIT	T1001A		
•	Enterprise Integrations for Command View SDM	T1002A		
•	Secure Manager Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1003A		
•	Secure Manager Virtual Array 500GB LTU	T1004A		
•	Secure Manager Virtual Array 1TB LTU	T1005A		
•	Secure Manager Virtual Array 5TB LTU	T1006A		

Description	Product #	Opt #	Price
• Business Copy Virtual Array 50GB LTU w/SW Media Kit (required for enablement)	T1007A		
• Business Copy Virtual Array 500GB LTU	T1008A		
• Business Copy Virtual Array 1TB LTU	T1009A		
• Business Copy Virtual Array 5TB LTU	T1010A		
• Auto Path Virtual Array Windows 2000 1 Host LTU w/SW Media Kit (required for enablement)	T1011A		
• Auto Path Virtual Array Windows 2000 1 Host LTU	T1012A		
• Auto Path Virtual Array Windows 2000 5 Host LTU	T1013A		
• Auto Path Virtual Array Windows NT 4.0 1 Host LTU w/SW Media Kit (required for enablement)	T1039A		
• Auto Path Virtual Array Windows NT 4.0 1 Host LTU	T1040A		
• Auto Path Virtual Array Windows NT 4.0 5 Host LTU	T1041A		
• Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU w/SW Media Kit (required for enablement)	T1060A		
• Auto Path Virtual Array HP-UX 11.0/11.i 1 Host LTU	T1061A		
• Auto Path Virtual Array HP-UX 11.0/11.i 5 Host LTU	T1062A		
• Fast Recovery Solutions for MS Exchange 2000	B9550A		

4.9.5—hp surestore disk array fc60

US List

Description	Product #	Opt #	Price
<ul style="list-style-type: none"> Surestore Disk Array FC60, Field Rackable <p>Requires one to six A5294A Disk Systems to form an array. Requires HP-UX 10.20 or later.</p> <p><i>Standard Array Includes:</i></p> <ul style="list-style-type: none"> – Rackmount enclosure with two empty controller slots – Two power supplies – Two fan modules – One battery backup unit (BBU) – Two power cords – Mounting rails for HP cabinets – Terminators for unused SCSI ports – ½ U Filler Panels – User manuals 	A5277A		
Controllers (Must select one option)			
Single controller with 256 MB cache, HP-UX firmware, one Media Interface Adapter and one filler panel		203	
Dual controllers with 256 MB mirrored cache and two Media Interface Adapters, HP-UX firmware		204	
Dual controllers with 256 MB mirrored cache and two Media Interface Adapters, Windows firmware		205	
Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, HP-UX firmware		304	
Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, Windows firmware		305	
Host Connect Cable Options			
2 meter Fibre Channel Cable		0Z4	
16 meter Fibre Channel Cable		AFY	
50 meter Fibre Channel Cable		0Z5	
• Supporting Software for HP-UX (CD-ROMs)	B6191AA		
• NT Support for the FC60, for converting HP-UX firmware to Windows	A5628A		
• 8-Partition support for Windows	A5649A		
Enter the following selection as a sub-item to the A5277A product above			
• Surestore Disk System SC10, Array Integrated, Field Rackable	A5294A		
This product may only be ordered in conjunction with the A5277A. To order a SC10 without integration into an array, order A5272A. Array Integrated product includes:			
– Rackmount enclosure that accommodates 10 disk modules (1.6" or 1")			

	Description	Product #	Opt #	Price						
	<ul style="list-style-type: none">– Two power supplies– Two fan modules– Two power cords– Two bus controller card modules (with enclosure monitoring)– Mounting rails for HP cabinets– User manuals– Two SCSI bus terminators– ½ U filler panel– One or two 2 meter VHDCI SCSI cables for connection to the A5277A. The number of cables included depends upon how many A5294As are connected to the A5277A.									
	<table><tr><td><u>Number of A5294A per A5277A</u></td><td><u>Number of SCSI cables per A5294A</u></td></tr><tr><td>1, 2, or 3</td><td>2</td></tr><tr><td>4, 5, or 6</td><td>1</td></tr></table>	<u>Number of A5294A per A5277A</u>	<u>Number of SCSI cables per A5294A</u>	1, 2, or 3	2	4, 5, or 6	1			
<u>Number of A5294A per A5277A</u>	<u>Number of SCSI cables per A5294A</u>									
1, 2, or 3	2									
4, 5, or 6	1									
	Storage Capacity Options									
	Note: All disk systems ordered with a single A5277A must have identical Storage Capacity Options.									
	Qty 4 18GB 10K RPM disk drive modules		204							
	Qty 8 18GB 10K RPM disk drive modules		208							
	Qty 10 18GB 10K RPM disk drive modules		210							
	Qty 4 36GB 10K RPM disk drive modules		304							
	Qty 8 36GB 10K RPM disk drive modules		308							
	Qty 10 36GB 10K RPM disk drive modules		310							
	Qty 4 73GB 10K RPM disk drive modules		404							
	Qty 8 73GB 10K RPM disk drive modules		408							
	Qty 10 73GB 10K RPM disk drive modules		410							
	73GB 10K RPM disk drive modules (Note: Need to order quantity of 1 to 10 per enclosure)		350							
	Qty four 18.2GB 15K RPM Ultra2 SCSI Disk Drive		504							
	Qty eight 18.2GB 15K RPM Ultra2 SCSI Disk Drive		508							
	Qty ten 18.2GB 15K RPM Ultra2 SCSI Disk Drive		510							
	Custom cable options (use only if customer requires a non-standard configuration)									
	Delete a 2m cable included in A5294A and add a 5m VHDCI SCSI cable for Connection to A5277A (suitable for connection of A5277A to A5294A in a different rack)		701							
•	Surestore Disk Array FC60, Factory Racked	A5277AZ								
	Requires one to six A5294AZ Disk Systems to form an array. Requires HP-UX 10.20 or later.									
	<i>Standard Array Includes:</i>									
	<ul style="list-style-type: none">– Rackmount enclosure with two empty controller slots– Two power supplies– Two fan modules– One battery backup unit (BBU)– Two power cords– Mounting rails for HP cabinets– Terminators for unused SCSI ports– User manuals– Factory integrated into specified rack									
	Controllers (Must select one option)									
	Single controller with 256 MB cache, HP-UX firmware, one Media Interface Adapter and one filler panel		203							
	Dual controllers with 256 MB mirrored cache and two Media Interface Adapters		204							
	Dual controllers with 256 MB mirrored cache and two Media Interface Adapters, Windows firmware		205							
	Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, HP-UX firmware		304							
	Dual controllers with 512 MB mirrored cache and two Media Interface Adapters, Windows firmware		305							

Description	Product #	Opt #	Price
Host Connect Cable Options			
2 meter Fibre Channel Cable		0Z4	
16 meter Fibre Channel Cable		AFY	
50 meter Fibre Channel Cable		0Z5	
Operating System Support Option (Must select one option)			
Support for HP-UX 11.0		UM4	
Enter the following selection as a sub-item to the A5277AZ product above			
• [Brand name] Disk System SC10, Array Integrated, Factory Racked	A5294AZ		
This product may only be ordered in conjunction with the A5277AZ. To order a SC10 without Integration into an array, order A5272AZ. Array Integrated product includes:			
– Rackmount enclosure that accommodates 10 disk modules (1.6" or 1")			
– Two power supplies			
– Two fan modules			
– Two power cords			
– Two bus controller card modules (with enclosure monitoring)			
– Mounting rails for HP cabinets			
– User manuals			
– Two SCSI bus terminators			
– ½ U filler panel (as required for proper rack appearance)			
– One or two 2 meter VHDCI SCSI cables for connection to the A5277AZ. The number of cables Included depends upon how many A5294AZs are connected to the A5277AZ.			
<u>Number of A5294AZ per A5277AZ</u>	<u>Number of SCSI cables per A5294AZ</u>		
1, 2, or 3	2		
4, 5, or 6	1		
– Disks will be bound to the A5277AZ array			
Storage Capacity Options			
Note: All disk systems ordered with a single A5277AZ must have identical Storage Capacity Options.			
Qty 4 18GB 10K RPM disk drive modules		204	
Qty 8 18GB 10K RPM disk drive modules		208	
Qty 10 18GB 10K RPM disk drive modules		210	
Qty 4 36GB 10K RPM disk drive modules		304	
Qty 8 36GB 10K RPM disk drive modules		308	
Qty 10 36GB 10K RPM disk drive modules		310	
Qty 4 73GB 10K RPM disk drive modules		404	
Qty 8 73GB 10K RPM disk drive modules		408	
Qty 10 73GB 10K RPM disk drive modules		410	
73GB 10K RPM disk drive modules (Note: Need to order quantity of 1 to 10 per enclosure)		350	
Qty four 18.2GB 15K RPM Ultra2 SCSI Disk Drive		504	
Qty eight 18.2GB 15K RPM Ultra2 SCSI Disk Drive		508	
Qty ten 18.2GB 15K RPM Ultra2 SCSI Disk Drive		510	
• Supporting Software for HP-UX (CD-ROMs)	B6191AA		
• NT Support for the FC60	A5628A		
Add-On/Upgrade Products			
• Cache Memory upgrade, 2 X 256 MB DIMMs	A5279A		
• Add on 18.2 GB disk drive module, 10000 RPM Ultra2 LVD	A5282A		
• Add on 36GB disk drive module 10K RPM Ultra2 LVD	A5595A		
• Add on 73GB disk drive module 10K RPM Ultra2 LVD	A5622A		
• Add on 73GB disk drive module 10K RPM Ultra3 LVD	A6276A		

	Description		Product #	Opt #	Price
•	Add on 18.2 GB disk drive module, 15,000 RPM Ultra2 LVD		A5633A		
•	Add on controller (no cache)		A5278A		
	Controller Cache Option (Required)				
	256 MB cache			002	
•	2-meter VHTDS68 (M/M) Multimd		C2373A	0D1	
•	5-meter VHTDS68 (M/M) Multimd		C2374A	0D1	
•	10-meter VHTDS68 (M/M) Multimd		C2375A	0D1	
•	Rack Rail Accessory Kit (for legacy cabinets only: C2785A, C2786A, C2787A, A1896A, A1897A)		A5250A		
•	HP Rack System/E Rack Rail Accessory Kit (for cabinets: A4900A, A4801A, A4902A, J1502A, J1501A, J1500A)		A5251A		
•	2 meter Fibre Channel Cable		A3583A		
•	16 meter Fibre Channel Cable		A3531A		
•	50 meter Fibre Channel Cable		A3735A		
•	100 meter Fibre Channel Cable		A3736A		
•	SCSI Terminator, VHDCI LVD/SE		A5296A		

4.9.6—HP Surestore Disk Array XP48 Ordering Process

Overview

Once the configuration choices have been made and saved in WATSON or Sales Builder for Windows (SBW), the configuration may be converted to a quote and imported into the order entry system. If configuration tools such as WATSON or SBW are not available, then it is important to follow an ascending numeric order for each Item / Sub-Item ordered in sequence. See Appendix for step by step Manual Procedures for configuring the XP48.

Structured Solution Programs (SSPs):

The HP Structured Solution Program (SSP) has been designed to make the ordering process simple, flexible, and easy to understand. It is completely menu driven requiring only a few simple choices for the various components in the system. Minimum/maximum numbers have been inserted into the menu wherever possible to simplify your choices and to guide your configuration decisions.

XP48 HW Ordering Information Using SSP

- 1) Upgrade products are bundled with the solution, NOT integrated.
- 2) Upgrades cannot be on the same order section with an SSP system order.
- 3) Cables and software can be on the same order section as the upgrades.

4.9.7—hp surestore disk array xp48 hardware

	Description		Product #	Opt. #	
	XP48 HW SSP				
1.0	HP Surestore Disk Array XP48 SSP Solution	[]	A5920A		
2.0	Surestore Disk Array XP48 Disk Control Frame (1 required). Single phase power only. Must select one power frequency option				
	XP48 Disk Control Frame with 1 ACP pair, Redundant Power Supplies for CHIP prs 1-3, HP Firmware and Continuous Track XP with Modem and pcAnywhere	[]	A5921A		
	XP48 Disk Control Frame				
	2 GB Cache Memory				
	512 MB Shared Memory				
	60 Hz Single Phase Power Option	[]	A5921A	001	
	50 Hz Single Phase Power Option	[]	A5921A	002	
2.1	Client-Host Interface Processor pairs (Min1 pr Max 3 pr)				
	4 Port ExSA Channel Adapter Pair	[]	A5923A		
	8 Port ExSA Channel Adapter Pair	[]	A5924A		
	4 Port Fiber Channel Adapter Pair for Short Wave	[]	A5925A		

	Description		Product #	Opt. #	
	8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[]	A5926A		
	8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave	[]	A5927A		
	1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[]	A5929A		
2.2	Additional Nonvolatile Cache (Min 0, Max 16 GB including 2 GB cache in base DKC configuration)				
	2 GB Cache Memory	[]	A5932A		
2.3	Additional Shared Memory (Min 0, Max 1024 MB including 512 MB Shared Memory in base DKC configuration)				
	256 MB Shared Memory Module	[]	A5933A		
2.4	Disk Array Groups (min 1 max 11)				
	18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[]	A5936A		
	18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[]	A5940A		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937A		
	73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[]	A5938A		
2.5	Spare Disk Drives (Min 1 per array group size, Max 4 total)				
	18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[]	A5936S		
	18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[]	A5440S		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937S		
	73 GB 10K rpm, FC Spare Disk Drive	[]	A5938S		

4.9.8—hp xp48 upgrade products

	Description		Product #	Opt. #	
•	4 Port ExSA Channel Adapter Pair	[]	A5923U		
•	8 Port ExSA Channel Adapter Pair	[]	A5924U		
•	4 Port Fiber Channel Adapter Pair for Short Wave	[]	A5925U		
•	8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[]	A5926U		
•	8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave	[]	A5927U		
•	1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[]	A5929U		
•	2 GB Cache Memory Module	[]	A5932U		
•	256 MB Shared Memory Module	[]	A5933U		
•	18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[]	A5936U		
•	18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[]	A5940U		
•	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937U		
•	73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[]	A5938U		
•	181 GB 7200 rpm, FC Disk Array Group - 4 drives per group	[]	A5939U		
•	18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[]	A5936SU		
•	18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[]	A5940SU		
•	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5937SU		
	73 GB 10K rpm, FC Spare Disk Drive	[]	A5938SU		
	181 GB 7200 rpm, FC Spare Disk Drive	[]	A5939SU		
	Host Interface Cables (Same as XP512)				
•	1Gb/sec to 1Gb/sec Fibre Channel Cables – SC/SC	[]	A5750A		
•	16 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	001	
•	50 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	002	
•	100 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	003	
•	2Gb/sec to 2Gb/sec Fibre Channel Cables – LC/LC				
•	16 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	004	
•	50 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	005	
•	200 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	006	
•	2Gb/sec to 1Gb/sec Fibre Channel Cables – LC/SC				
•	2 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	007	
•	16 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	008	
	Cable Adapters				

	Description		Product #	Opt. #	
•	SC Female – SC Female adapter, for use with 2 or 16 meter LC/SC cables	[]	A5750A	009	
•	2 meter LC male adapter kit-contains both SC-SC adapter & 2 meter LC/SC cable	[]	A5750A	010	
•	Fibre Optic Cables (ESCON)		A5752A		
	Fiber Optic Cable - 7m	[]		001	
	Fiber Optic Cable - 13m	[]		002	
	Fiber Optic Cable - 22m	[]		003	
	Fiber Optic Cable - 31m	[]		004	
	Fiber Optic Cable - 46m	[]		005	
	Fiber Optic Cable - 61m	[]		006	
	Fiber Optic Cable - 92m	[]		007	
	Fiber Optic Cable - 122m	[]		008	

4.9.9—hp surestore disk array xp48 software

Description		Product #	Opt#
Software			
All LTU products for initial purchase or upgrade			
• Continuous Access XP	[]	B9320A	
• Continuous Access XP Media For XP512/XP48 includes RAID Manager	[]	B9320A	002
• Continuous Access XP 1 TB LTU	[]	B9321A	
• Continuous Access XP 5 TB LTU	[]	B9322A	
• Continuous Access XP 10 TB LTU	[]	B9323A	
• Continuous Access XP 25 TB LTU	[]	B9324A	
• Continuous Access XP Extension	[]	B9325A	
• Continuous Access XP Ext. Media For XP512/XP48	[]	B9325A	002
• Continuous Access XP Ext. 1 TB LTU	[]	B9326A	
• Continuous Access XP Ext. 5 TB LTU	[]	B9327A	
• Continuous Access XP Ext. 10 TB LTU	[]	B9328A	
• Continuous Access XP Ext. 25 TB LTU	[]	B9329A	
• Business Copy XP	[]	B9330A	
• Business Copy XP Media For XP512/XP48 includes RAID Manager	[]	B9330A	002
• Business Copy XP 1 TB LTU	[]	B9331A	
• Business Copy XP 5 TB LTU	[]	B9332A	
• Business Copy XP 10 TB LTU	[]	B9333A	
• Business Copy XP 25 TB LTU	[]	B9334A	
• Secure Manager XP	[]	B9351A	
• Secure Manager XP Media For XP512/XP48	[]	B9351A	002
• Secure Manager XP 1 TB LTU	[]	B9352A	
• Secure Manager XP 5 TB LTU	[]	B9353A	
• Secure Manager XP 10 TB LTU	[]	B9354A	
• Secure Manager XP 25 TB LTU	[]	B9355A	
• Auto Path XP	[]	B9351A	
Auto Path XP for AIX			
• Auto Path XP for AIX Media	[]	B7949B	
• Auto Path XP for AIX, 1 Server LTU (LTU on one server running AIX connected to an XP Disk Array)	[]	B7950B	
• Auto Path XP for AIX, Unlimited Server LTU (LTU on unlimited servers running AIX connected to an XP Disk Array)	[]	B7951B	
Auto Path XP for MS Windows 2000			
• Auto Path for W2K Media	[]	B9500A	
• Auto Path for W2K 1 Server LTU	[]	B9501A	
• Auto Path for W2K 5 Server LTU	[]	B9502A	
• Auto Path for W2K 10 Server LTU	[]	B9503A	
Auto Path XP for MS NT			
• Auto Path for NT Media	[]	B9505A	
• Auto Path for NT 1 Server LTU	[]	B9506A	
• Auto Path for NT 5 Server LTU	[]	B9507A	
• Auto Path for NT 10 Server LTU	[]	B9508A	
Cluster Extension XP			
Cluster Extension XP for VCS			
• Cluster Extension XP for Veritas Cluster Server	[]	B9531A	
Cluster Extension XP for HACMP			
• Cluster Extension XP for IBM HACMP	[]	B9532A	
Cluster Extension XP for MSCS			
• Cluster Extension XP for MSCS	[]	B9533A	
Cache LUN XP			

	Description		Product #	Opt#	
•	Cache LUN XP Media For XP512/XP48	[]	B9345A	002	
•	Cache LUN XP 1 TB LTU	[]	B9346A		
•	Cache LUN XP 5 TB LTU	[]	B9347A		
•	Cache LUN XP 10 TB LTU	[]	B9348A		
•	Cache LUN XP 25 TB LTU	[]	B9349A		
	Performance Advisor XP				
•	Performance Advisor XP	[]	B9369A		
•	Auto LUN XP	[]	B9340A		
•	Auto LUN XP Media For XP512/XP48	[]	B9340A	002	
•	Auto LUN XP 1 TB LTU	[]	B9341A		
•	Auto LUN XP 5 TB LTU	[]	B9342A		
•	Auto LUN XP 10 TB LTU	[]	B9343A		
•	Auto LUN XP 25 TB LTU	[]	B9344A		
	Command View XP				
•	HP Surestore Command View XP For New XP512/XP48 Installations Includes Remote Control XP For XP512/XP48	[]	B9357AB		
•	Remote Control XP Upgrade For XP512/XP48	[]	B9357AD		
•	LUN Configuration Manager XP Media	[]	B9335A		
•	LUN Configuration Mgr XP Media For XP512/XP48	[]	B9335A	002	
•	LUN Configuration Mgr XP 1 TB LTU	[]	B9336A		
•	LUN Configuration Mgr XP 5 TB LTU	[]	B9337A		
•	LUN Configuration Mgr XP 10 TB LTU	[]	B9338A		
•	LUN Configuration Mgr XP 25 TB LTU	[]	B9339A		
	Resource Manager XP				
•	Resource Manager XP For XP512/XP48	[]	B9358A	002	
	Data Exchange XP				
•	Data Exchange XP For XP256/XP512/XP48	[]	T1620AA		
•	Fast Recovery Solutions XP				
	Fast Recovery Solutions XP for MS Exchange				
•	Fast Recovery Solutions XP for MS Exchange	[]	B9550A		N/A
•	Direct Backup XP				
•	Direct Backup XP (LTU on one XP Disk Array)	[]	B9560A		

4.9.10—hp disk array xp128

	Description		Product #	Opt #	Price
1.0	HP Disk Array XP128 SSP Solution	[]	A7875A		
1.1	XP128 Disk Control Frame (1 required per XP system). Must select one power option.				
	XP128 Disk Control Frame with 2 GB Cache, 512 MB Shared Memory, Redundant Power Supplies for CHIP prs 1-3, HP microcode, HP Continuous Track XP, Modem and pcAnywhere. Does not include basic ACP pr.	[]	A7876A		
	XP128 Disk Control Frame				
	2 GB Cache Memory Module				
	512 MB Shared Memory Module				
	3 Phase 60 Hz for XP128	[]	A7876A	001	
	Power Cable Kit for Three Phase (60Hz)				
	AC Box for Three Phase				
	3 Phase 50 Hz for XP128	[]	A7876A	002	
	Power Cable Kit for Three Phase (50Hz)				
	AC Box for Three Phase				
	Single Phase 60 Hz for XP128	[]	A7876A	003	
	Power Cable Kit for Single Phase (60Hz)				
	AC Box for Single Phase				

	Description		Product #	Opt #	Price
	Single Phase 50 Hz for XP128	[]	A7876A	004	
	Power Cable Kit for Single Phase (50Hz)				
	AC Box for Single Phase				
1.2	DKC Accessories (min 0, max 1 of each)				
	XP1024/128 SVP High Reliability Support Kit	[]	A7907A		
	XP1024/128 UPS Connection Kit (for single phase DKC only)	[]	A7908A		
1.3	Client-Host Interface Processor pairs (Min 1, Max 3 if A7894A is not selected, Max 2 if A7894A is selected)				
	XP1024/128 8-Port ExSA Channel Adapter Pair	[]	A7909A		
	XP1024/128 8-Port 1 Gb/sec FC/CA Adapter Pair	[]	A7910A		
	XP1024/128 4 Port 1-2Gb/sec Auto-sensing FC/CA CHIP Pair	[]	A7911A		
	XP1024/128 8 Port 1-2Gb/sec Auto-sensing FC/CA CHIP Pair	[]	A7912A		
1.4	Additional Nonvolatile Cache (Min 0, Max 15) Max 32 GB Cache allowed including 2 GB Cache in base DKC configuration.				
	XP1024/128 2 GB Cache Memory Module	[]	A7918A		
1.5	Additional Shared Memory (Min 0, Max 4) Max 2560 MB Shared Memory allowed including 512 MB Shared Memory in base DKC configuration.				
	XP1024/128 512 MB Shared Memory Module	[]	A7921A		
1.6	Array Control Processor prs (Min 1 for 1 DKA Model, Max 2 A7922A for 2 DKA Model) 2 DKA model requires Disk Path Expansion Kit A7894A and then Max 2 CHIP prs allowed (Can not intermix high and std performance ACPs in same array).				
	XP1024/128 Array Control Processor (ACP) pair- High Performance	[]	A7922A		
1.7	Disk Port Switch Sets (Min 0, Max 1) A7893A Disk Port Switch Set required if 16 or more Disk Array Groups are configured and Disk Path Expansion Kit A7894A is not configured. Disk Path Expansion Kit is required if 2 ACP prs A7922A are configured for 2 DKA Model. Cannot configure A7893A and A7894A in the same array.				
	XP128 Additional Disk Port Switch Set	[]	A7893A		
	XP128 Disk Path Expansion Kit	[]	A7894A		
1.8	Disk Array Groups (min 1 max 31)				
	XP1024/128 36 GB 15k rpm, FC Array Group - 4 disks	[]	A7928A		
	XP1024/128 73 GB 10k rpm, FC Array Group - 4 disks	[]	A7929A		
1.9	Spare Disk Drives (Min 1,Max 4) Must configure 1 spare disk of equal capacity of Disk Array Group configured.				
	XP1024/128 36 GB 15k rpm, FC Spare Disk Drive	[]	A7928S		
	XP1024/128 73 GB 10K rpm, FC Spare Disk Drive	[]	A7929S		

4.9.11—hp disk array xp1024

	Description		Product #	Opt #	Price
	XP1024 (K2) HW Structure				
1.0	HP Disk Array XP1024 SSP Solution		A7905A		
	XP1024 Disk Control Frame (1 required per XP system) Must select one power option.				
1.01	XP1024 Disk Control Frame with 4 GB Cache, 512MB Shared memory, Redundant Power Supplies for CHIP prs 1-2, FC Cable Set for DKU Frame position R1, Basic High Performance ACP pr, HP microcode, HP Continuous Track XP, Modem and pcAnywhere		A7906A		
	3 Phase 60 or 50 Hz for XP1024		A7906A	001	
	Single Phase 60 Hz for XP1024		A7906A	003	
	Single Phase 50 Hz for XP1024		A7906A	004	
1.02	DKC Accessories (min 0, max 1 of each)				
	XP1024/128 SVP High Reliability Support Kit		A7907A		
	XP1024/128 UPS Connection Kit (for single phase DKC only)		A7908A		
1.03	Client-Host Interface Processor pairs (Min 1 pr, Max 4 pr)				
	XP1024/128 8-Port ExSA Channel Adapter Pair		A7909A		
	XP1024/128 8-Port 1 Gb/sec FC/CA Adapter Pair		A7910A		
	XP1024/128 4 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair		A7911A		
	XP1024/128 8 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair		A7912A		

	Description	Product #	Opt #	Price
1.04	Additional DKC Power Supply for CHIP pairs 3 and 4 (Min 0, Max 1) XP1024 Additional CHIP Power Supply	A7917A		
1.05	Additional Nonvolatile Cache (Min 0, Max 30) Max 64 GB including 4 GB cache in base DKC A7919A configuration (Must configure DKC in increments of 4 GB and order Additional Cache Platform Board for performance configurations) XP1024/128 2 GB Cache Memory Module	A7918A		
1.06	Additional Cache Platform Board (Min 0, Max 1) Required for all performance configurations or required for cache beyond 32GB including 4 GB in base DKC. XP1024 Cache Platform Board	A7919A		
1.07	Additional Battery for Cache Memory (Min 0, Max 1) Required for all cache configurations beyond 32GB including 4 GB in base DKC. XP1024 Additional Battery for Cache Memory	A7920A		
1.08	Additional Shared Memory (Min 0, Max 5) Max 3072 MB including 512 MB Shared Memory in base DKC configuration. XP1024/128 512 MB Shared Memory Module	A7921A		
1.09	Additional Array Control Processor (Min 0, Max 3) One ACP pair provided in base DKC configuration. XP1024/128 Array Control Processor (ACP) pair- High Performance	A7922A		
1.10	DKU Frame L1 Interconnect Cable. (Min 0, max 1) A7924A is required for DKU frame configured in L1 position. Cable set for DKU in position R1 is provided with base DKC and A7926A cable set is required for DKU for position R2 or L2. XP1024 FC Cable Set for L1 DKU	A7924A		
1.11	Disk Array Frame (Min 1 position R1, Max 4) Must select one option and must match Power option of DKC, no intermixing of power options. FC Cable set for DKU in position R1 is provided with base DKC. FC Device Cable Set A7924A required for DKU position L1 and A7926A Cable Set required for R2 and L2 position. XP1024 Disk Array Frame 3 Phase 60 Hz for XP1024 DKU 3 Phase 50 Hz, for XP1024 DKU Single Phase, 60 Hz, for XP1024 DKU Single Phase, 50 Hz, for XP1024 DKU	A7925A A7925A A7925A A7925A A7925A	 001 002 003 004	
1.12	DKU R2, L2 Frame Interconnect Cable. (Min 0, max 2) A7926A is required for DKU frame A7924A configured in R2 or L2 position. Cable set for DKU in position R1 is provided with base DKC and cable set is required for DKU for position L1. XP1024 FC Cable Set for R2 and L2 DKU	A7926A		
1.13	Disk Array Groups (min 1 max 254) (max 63 R1 and L1) (max 64 R2 and L2) XP1024/128 36 GB 15k rpm, FC Array Group - 4 disks XP1024/128 73 GB 10k rpm, FC Array Group - 4 disks	A7928A A7929A		
1.14	Spare Disk Drives (Min 1 per array group size, Max 4 for R1 DKU and 4 additional for L1 DKU) XP1024/128 36 GB 15k rpm, FC Spare Disk Drive XP1024/128 73 GB 10K rpm, FC Spare Disk Drive	A7928S A7929S		

4.9.12—hp disk array xp128/1024 upgrades

	Description	Product #	Opt #	Price
2.0	XP1024 (K2) HW Structure HP Disk Array XP128/1024 upgrades SSP Solution DKC Accessories (min 0, max 1 of each) XP1024/128 SVP High Reliability Support Kit XP1024/128 UPS Connection Kit (for single phase DKC only) Client-Host Interface Processor pairs (Min 1 pr, Max 4 pr) XP1024/128 8-Port ExSA Channel Adapter Pair XP1024/128 8-Port 1 Gb/sec FC/CA Adapter Pair XP1024/128 4 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair XP1024/128 8 Port 1-2 Gb/sec Auto-sensing FC/CA CHIP Pair Additional DKC Power Supply for CHIP pairs 3 and 4 (Min 0, Max 1) XP1024 Additional CHIP Power Supply	A7873A A7907U A7908U A7909U A7910U A7911U A7912U A7917U		

	Description	Product #	Opt #	Price
	Additional Nonvolatile Cache (Min 0, Max 30) Max 64 GB including 4 GB cache in base DKC A7919A configuration (Must configure DKC in increments of 4 GB and order Additional Cache Platform Board for performance configurations)			
	XP1024/128 2 GB Cache Memory Module	A7918U		
	Additional Cache Platform Board (Min 0, Max 1) Required for all performance configurations or required for cache beyond 32GB including 4 GB in base DKC.			
	XP1024 Cache Platform Board	A7919U		
	Additional Battery for Cache Memory (Min 0, Max 1) Required for all cache configurations beyond 32GB including 4 GB in base DKC.			
	XP1024 Additional Battery for Cache Memory	A7920U		
	Additional Shared Memory (Min 0, Max 5) Max 3072 MB including 512 MB Shared Memory in base DKC configuration.			
	XP1024/128 512 MB Shared Memory Module	A7921U		
	Additional Array Control Processor (Min 0, Max 3) One ACP pair provided in base DKC configuration.			
	XP1024/128 Array Control Processor (ACP) pair- High Performance	A7922U		
	Disk Array Frame (Min 1 position R1, Max 4) Must select one option and must match Power option of DKC, no intermixing of power options. FC Cable set for DKU in position R1 is provided with base R2 DKC. FC Device Cable Set A7924A required for DKU position L1 and A7926A Cable Set required for and L2 position.			
	XP1024 Disk Array Frame	A7925U		
	3 Phase 60 Hz for XP1024 DKU	A7925U	001	
	3 Phase 50 Hz, for XP1024 DKU	A7925U	002	
	Single Phase, 60 Hz, for XP1024 DKU	A7925U	003	
	Single Phase, 50 Hz, for XP1024 DKU	A7925U	004	
	DKU Frame L1 Interconnect Cable. (Min 0, max 1) A7924A is required for DKU frame configured in L1 position. Cable set for DKU in position R1 is provided with base DKC and A7926A cable set is required for DKU for position R2 or L2.			
	XP1024 FC Cable Set for L1 DKU	A7924U		
	DKU R2, L2 Frame Interconnect Cable. (Min 0, max 2) A7926A is required for DKU frame configured in R2 or L2 position. Cable set for DKU in position R1 is provided with base DKC and A7924A cable set is required for DKU for position L1.			
	XP1024 FC Cable Set for R2 and L2 DKU	A7926U		
1.13	Disk Array Groups (min 1 max 254) (max 63 R1 and L1) (max 64 R2 and L2)			
	XP1024/128 36 GB 15k rpm, FC Array Group - 4 disks	A7928U		
	XP1024/128 73 GB 10k rpm, FC Array Group - 4 disks	A7929U		
1.14	Spare Disk Drives (Min 1 per array group size, Max 4 for R1 DKU and 4 additional for L1 DKU)			
	XP1024/128 36 GB 15k rpm, FC Spare Disk Drive	A7928SU		
	XP1024/128 73 GB 10K rpm, FC Spare Disk Drive	A7929SU		

4.9.13—hp disk array xp1024 & hp disk array xp128 software

	Description	Product #	Opt #	Price
	xp1024 and xp128 software			
	All LTU products for initial purchase or upgrade			
	Command View XP			
•	Command View XP for XP1024/XP128 (LTU on one management console)	[] B9357AD		
	LUN Configuration & Security Manager XP			
	This Software Title orderable only on the XP1024 and XP128			
•	LUN Configuration and Security Manager XP 1 TB LTU (0 to 1 TB range, used capacity on one	[] T1614AA		
•	XP1024/XP128 disk array see config guide for more info)			
•	LUN Configuration and Security Manager XP 1 TB LTU (2 to 6 TB range, used capacity on one	[] T1614AB		
	XP1024/XP128 disk array (see config guide for more info)			
•	LUN Configuration and Security Manager XP 1 TB LTU (7 to 15 TB range, used capacity on one	[] T1614AC		

Description		Product #	Opt #	Price
XP1024/XP128 disk array (see config guide for more info)				
• LUN Configuration and Security Manager XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array) (see config guide for more info)	[]	T1614AD		
Cache LUN XP				
• Cache LUN XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AA		
• Cache LUN XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AB		
• Cache LUN XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AC		
• Cache LUN XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1616AD		
Auto LUN XP				
• Auto LUN XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AA		
• Auto LUN XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AB		
• Auto LUN XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AC		
• Auto LUN XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1615AD		
Application Policy Manager XP				
• Application Policy Manager XP for XP1024/XP128 (LTU on one management console and one XP1024/XP128 disk array)	[]	B9540AB		
Auto Path XP				
Auto Path XP for AIX				
• Auto Path XP for AIX Media	[]	B7949B		
• Auto Path XP for AIX, 1 Server LTU (LTU on one server running AIX connected to an XP Disk Array)	[]	B7950B		
• Auto Path XP for AIX, Unlimited Server LTU (LTU on unlimited servers running AIX connected to an XP Disk Array)	[]	B7951B		
Auto Path XP for Windows 2000				
• Auto Path for W2K Media	[]	B9500A		
• Auto Path for W2K 1 Server LTU (LTU on one server running W2K connected to an XP Disk Array)	[]	B9501A		
• Auto Path for W2K 5 Server LTU (LTU on five servers running W2K connected to an XP Disk Array)	[]	B9502A		
• Auto Path for W2K 10 Server LTU (LTU on ten servers running W2K connected to an XP Disk Array)	[]	B9503A		
Auto Path XP for Windows NT				
• Auto Path for NT Media	[]	B9505A		
• Auto Path for NT 1 Server LTU (LTU on one server running NT connected to an XP Disk Array)	[]	B9506A		
• Auto Path for NT 5 Server LTU (LTU on five servers running NT connected to an XP Disk Array)	[]	B9507A		
• Auto Path for NT 10 Server LTU (LTU on ten servers running NT connected to an XP Disk Array)	[]	B9508A		
Auto Path XP for HP-UX				
• Auto Path for HP-UX Media	[]	B9510A		
• Auto Path for HP-UX 1 Server LTU (LTU on one server running HP-UX connected to an XP Disk Array)	[]	B9511A		
• Auto Path for HP-UX 5 Server LTU (LTU on five servers running HP-UX connected to an XP Disk Array)	[]	B9512A		
• Auto Path for HP-UX 10 Server LTU (LTU on ten servers running HP-UX connected to an XP Disk Array)	[]	B9513A		
Auto Path XP for Linux				
• Auto Path for Linux Media	[]	B9515A		
• Auto Path for Linux Server LTU (LTU on one server running Linux connected to an XP Disk Array)	[]	B9516A		
• Auto Path for Linux 5 Server LTU (LTU on five servers running Linux connected to an XP Disk Array)	[]	B9517A		
• Auto Path for Linux 10 Server LTU (LTU on ten servers running Linux connected to an XP Disk Array)	[]	B9518A		

Description		Product #	Opt #	Price
Array)				
Business Copy XP Media				
• Business Copy XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AA		
• Business Copy XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AB		
• Business Copy XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AC		
• Business Copy XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1613AD		
Continuous Access XP				
• Continuous Access XP 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AA		
• Continuous Access XP 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AB		
• Continuous Access XP 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AC		
• Continuous Access XP 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1611AD		
Continuous Access XP Extension				
• Continuous Access XP Extension 1 TB LTU (0 to 1 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AA		
• Continuous Access XP Extension 1 TB LTU (2 to 6 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AB		
• Continuous Access XP Extension 1 TB LTU (7 to 15 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AC		
• Continuous Access XP Extension 1 TB LTU (16 to 36 TB range, used capacity on one XP1024/XP128 disk array - see config guide for more info)	[]	T1612AD		
RAID Manager XP				
• RAID Manager XP (LTU on unlimited servers, any supported Operating System - see config guide for more information on supported Operating Systems)	[]	T1610A		
Cluster Extension XP				
Cluster Extension XP for VERITAS Cluster Server				
• Cluster Extension XP for VERITAS Cluster Server	[]	B9531A		
Cluster Extension XP for IBM HACMP Cluster Server				
• Cluster Extension XP for IBM HACMP	[]	B9532A		
Cluster Extension XP for Microsoft Cluster Service				
• Cluster Extension XP for MSCS	[]	B9533A		
Cluster Extension XP for MC/ServiceGuard for Linux				
• Cluster Extension XP for MC/ServiceGuard for Linux	[]	B9534A		
Performance Advisor XP				
• Performance Advisor XP (LTU on one management console)	[]	B9369A		
Resource Manager XP				
• Resource Manager XP for XP1024/XP128 (LTU on one XP1024/XP128 Disk Array)	[]	T1617A		
Data Exchange XP				
• Data Exchange XP For XP1024/XP128 (LTU on one server, any supported Operating Systems connected to an XP1024/XP128 Disk Array - see config guide for information on supported Operating Systems)	[]	T1620AB		
Fast Recovery Solutions XP				
Fast Recovery Solutions XP for Microsoft Exchange				
• Fast Recovery Solutions for MS Exchange (LTU on one XP Disk Array)	[]	B9550A		
Direct Backup XP				
• Direct Backup XP (LTU on one XP512 or XP48 Disk Array)	[]	B9560A		

4.9.14—hp surestore disk array xp512

Structured Solution Programs

	Description		Product #	Opt#	Price
1.0	HP Surestore Disk Array XP512 Solution	[x]	A5950A		
2.0	Surestore Disk Array XP512 Control Frame (1 required) Base DKC configuration is 3 phase 50/60 Hz . For single phase, select one single phase power option				
	XP512 Disk Control Frame with 1 ACP pair, Redundant Power Supplies for CHIP prs 1 and 2, HP Firmware (microcode) and Continuous Track XP with Modem and pcAnywhere	[]	A5951A		
	XP512 Disk Control Frame				
	1 GB Cache Memory Module, Quantity 2				
	256 MB Shared Memory Module, Quantity 2				
	FC Device Cable Set, DKC to R1U-DKU				
	SNMP Support Kit				
	60 Hz Single Phase Power, DKC	[]	A5951A	001	
	Power Cable Kit, Single Phase 60HZ DKC				
	AC Box Kit for Single Phase DKC				
	50 Hz Single Phase Power, DKC	[]	A5951A	002	
	Power Cable Kit, Single Phase 50HZ DKC				
	AC Box Kit for Single Phase DKC				
2.1	Client-Host Interface Processor pairs (Min1 pr Max 4 pr)				
	4 Port ExSA Channel Adapter Pair	[]	A5953A		
	8 Port ExSA Channel Adapter Pair	[]	A5954A		
	4 Port Fiber Channel Adapter Pair for Short Wave	[]	A5955A		
	8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[]	A5956A		
	8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave	[]	A5957A		
	1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[]	A5959A		
2.2	Additional DKC Power Supply for CHIP pairs 3 and 4				
	Additional CHIP Power Supply	[]	A5961A		
2.3	Additional Nonvolatile Cache (Min 0, Max 32 GB including 2 GB cache in base DKC configuration)2 GB Cache Memory Module	[]	A5962A		
2.4	Additional Cache Platform Board (Min 0, Max 1) Required for cache beyond 16 GB including 2 GB in base DKC configuration.				
	Additional Cache Platform Board	[]	A5960A		
2.5	Additional Shared Memory (Min 0, Max 1,280 MB including 512 MB Shared Memory in base DKC configuration)				
	256 MB Shared Memory Module	[]	A5963A		
2.6	Additional Array Control Processor (Min 0, Max 4 including 1 ACP pair in base DKC configuration)				
	Array Control Processor (ACP) pair	[]	A5964A		
2.7	DKU Frame L1 Interconnect - FC Device Cable Set. Required if DKU is configured to position L1.				
	(No cables required for DKU in position R1). Min 0, Max 1.				
	FC Device Cable Set, DKC to L1 or R1 DKU	[]	A5974A		
3.0	Disk Array Frame (Min 1 position R1, Max 6) Must select one option and must match Power option of DKC, no intermixing of power options. FC Device Cable Set A5974A required for position L1 DKU.				
	XP512 Disk Array Frame (Must select one power option)	[]	A5965A		
	XP512 Disk Array Frame				
	Disk Canister Mount Platform				
	3 Phase, 60 Hz, for DKU	[]	A5965A	001	
	AC Box for 3 Phase DKU				
	Power Cable Kit, 3 phase, 60 Hz DKU				
	3 Phase, 50 Hz, for DKU	[]	A5965A	002	
	AC Box for 3 Phase DKU				
	Power Cable Kit, 3 phase, 50 Hz DKU				
	Single Phase, 60 Hz, for DKU	[]	A5965A	003	

	Description		Product #	Opt#	Price
	AC Box for Single Phase, DKU				
	Power Cable Kit, single phase, 60 Hz DKU				
	Single Phase, 50 Hz, for DKU	[]	A5965A	004	
	AC Box for Single Phase, DKU				
	Power Cable Kit, single phase, 50 Hz DKU				
3.1	Disk Array Groups (min 1 max 126)(23 R1 and L1)(24 R2 and L2) (16 R3 and L3)				
	18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[]	A5966A		
	18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[]	A5970A		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5967A		
	73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[]	A5968A		
	181 GB 7200 rpm, FC Disk Array Group - 4 drives per group	[]	A5969A		
3.2	Spare Disk Drives (Min 1 per array group size) Max Spare Drives per position: 4 in R1 and 4 in L1.				
	18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[]	A5966S		
	18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[]	A5970S		
	47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5967S		
	73 GB 10K rpm, FC Spare Disk Drive	[]	A5968S		
	181 GB 7200 rpm, FC Spare Disk Drive	[]	A5969S		
3.3	DKU Frame Interconnect - FC Device Cable Set. DKUs in positions R2, R3, L2 and L3 require one set A5975A cable for each position configured. Min 0, Max 4. (No cables required for DKU position R1. One cable set A5974A required for DKU position L1 only.)				
	FC Device Cable Set, DKU to R2, R3, L2, or L3 DKU	[]	A5975A		
	END SSP				
	Host Interface Cables				
	1Gb/sec to 1Gb/sec Fibre Channel Cables – SC/SC	[]	A5750A		
	16 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	001	
	50 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	002	
	100 meter SC/SC Fibre Channel Cable, 50 micron, multimode	[]	A5750A	003	
	2Gb/sec to 2Gb/sec Fibre Channel Cables – LC/LC				
	16 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	004	
	50 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	005	
	200 meter 2Gb/sec LC/LC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	006	
	2Gb/sec to 1Gb/sec Fibre Channel Cables – LC/SC				
	2 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	007	
	16 meter LC/SC Fibre Channel Cable, 50/125 micron, multimode	[]	A5750A	008	
	Cable Adapters				
	SC Female – SC Female adapter, for use with 2 or 16 meter LC/SC cables	[]	A5750A	009	
	2 meter LC male adapter kit-contains both SC-SC adapter & 2 meter LC/SC cable	[]	A5750A	010	
	Fibre Optic Cables (ESCON)		A5752A		
	Fiber Optic Cable - 7m	[]	A5752A	001	
	Fiber Optic Cable - 13m	[]	A5752A	002	
	Fiber Optic Cable - 22m	[]	A5752A	003	
	Fiber Optic Cable - 31m	[]	A5752A	004	
	Fiber Optic Cable - 46m	[]	A5752A	005	
	Fiber Optic Cable - 61m	[]	A5752A	006	
	Fiber Optic Cable - 92m	[]	A5752A	007	
	Fiber Optic Cable - 122m	[]	A5752A	008	

4.9.15—xp512 upgrades

Description		Product #	Opt. #	Price
Order Configuration Rules: 1. Upgrade products are bundled with the solution, NOT integrated 2. Upgrades cannot be on the same order section with a SSP A5950A system order. 3. Cables and Software can be on the same order section as the upgrades.				
UPGRADE PRODUCTS				
• 4 Port ExSA Channel Adapter Pair	[]	A5953U		
• 8 Port ExSA Channel Adapter Pair	[]	A5954U		
• 4 Port Fiber Channel Adapter Pair for Short Wave	[]	A5955U		
• 8 Port Fiber Channel Adapter Pair for Short Wave (While quantities last)	[]	A5956U		
• 8 Port Fiber Channel for Continuous Access Adapter Pair for Short Wave (Host & CA Support)	[]	A5957U		
• 1-2Gb/sec 8 Port Auto sensing FC Adapter for Continuous Access Adapter Pair for Short Wave	[]	A5959U		
• Additional CHIP Power Supply	[]	A5961U		
• 2 GB Cache Memory Module	[]	A5962U		
• Additional Cache Platform Board	[]	A5960U		
• 256 MB Shared Memory Module	[]	A5963U		
• Array Control Processor (ACP) Pair	[]	A5964U		
• XP512 Disk Array Frame (Must select one power option)	[]	A5965U		
• XP512 Disk Array Frame				
• Disk Canister Mount Platform				
• 3 Phase, 60 Hz, for DKU	[]	A5965U	001	
• AC Box for 3 Phase DKU				
• Power Cable Kit, 3 phase, 60 Hz DKU				
• 3 Phase, 50 Hz, for DKU	[]	A5965U	002	
• AC Box for 3 Phase DKU				
• Power Cable Kit, 3 phase, 50 Hz DKU				
• Single Phase, 60 Hz, for DKU	[]	A5965U	003	
• AC Box for Single Phase, DKU				
• Power Cable Kit, single phase, 60 Hz DKU				
• Single Phase, 50 Hz, for DKU	[]	A5965U	004	
• AC Box for Single Phase, DKU				
• Power Cable Kit, single phase, 50 Hz DKU				
• 18 GB 10k rpm, FC Disk Array Group - 4 drives per group (While quantities last)	[]	A5966U		
• 18 GB 15k rpm, FC Disk Array Group - 4 drives per group (Obsoletes 18GB-10k after inventory roll)	[]	A5970U		
• 47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5967U		
• 73 GB 10k rpm, FC Disk Array Group - 4 drives per group	[]	A5968U		
• 181 GB 7200 rpm, FC Disk Array Group - 4 drives per group	[]	A5969U		
• 18 GB 10k rpm, FC Spare Disk Drive (While quantities last)	[]	A5966SU		
• 18 GB 15k rpm, FC Spare Disk Drive (Obsoletes 18GB-10k after inventory roll)	[]	A5970SU		
• 47 GB 10K rpm, FC Spare Disk Drive (While quantities last)	[]	A5967SU		
• 73 GB 10K rpm, FC Spare Disk Drive	[]	A5968SU		
• 181 GB 7200 rpm, FC Spare Disk Drive	[]	A5969SU		
• FC Device Cable Set, DKC to L1 or R1-DKU Upgrade	[]	A5974U		
• FC Device Cable Set, DKU to R2, R3, L2, or L3 DKU Upgrade	[]	A5975U		
XP-iCOD-S Products				
• 2GB cache memory, XP-iCOD-S	[]	A5962D		
• 256MB Shared Memory Module, XP-iCOD-S	[]	A5963D		
• Additional ACP pair, XP-iCOD-S	[]	A5964D		
• 18 GB array group - 4 drives per group, XP-iCOD-S	[]	A5966D		
• 18 GB 15k rpm, array group - 4 drives per group, XP-iCOD-S	[]	A5966D		
• 73 GB array group - 4 drives per group, XP-iCOD-S	[]	A5968D		
• 181 GB array group - 4 drives per group, XP-iCOD-S	[]	A5969D		

4.9.16—xp512 software, orca release – rev 17.1
Last Revision 4/17/01

Description		Product #	Opt#
Software			
All LTU products for initial purchase or upgrade			
• Continuous Access XP	[]	B9320A	
• Continuous Access XP Media For XP512/XP48 includes RAID Manager	[]	B9320A	002
• Continuous Access XP 1 TB LTU	[]	B9321A	
• Continuous Access XP 5 TB LTU	[]	B9322A	
• Continuous Access XP 10 TB LTU	[]	B9323A	
• Continuous Access XP 25 TB LTU	[]	B9324A	
• Continuous Access XP Extension	[]	B9325A	
• Continuous Access XP Ext. Media For XP512/XP48	[]	B9325A	002
• Continuous Access XP Ext. 1 TB LTU	[]	B9326A	
• Continuous Access XP Ext. 5 TB LTU	[]	B9327A	
• Continuous Access XP Ext. 10 TB LTU	[]	B9328A	
• Continuous Access XP Ext. 25 TB LTU	[]	B9329A	
• Business Copy XP	[]	B9330A	
• Business Copy XP Media For XP512/XP48 includes RAID Manager	[]	B9330A	002
• Business Copy XP 1 TB LTU	[]	B9331A	
• Business Copy XP 5 TB LTU	[]	B9332A	
• Business Copy XP 10 TB LTU	[]	B9333A	
• Business Copy XP 25 TB LTU	[]	B9334A	
• Secure Manager XP	[]	B9351A	
• Secure Manager XP Media For XP512/XP48	[]	B9351A	002
• Secure Manager XP 1 TB LTU	[]	B9352A	
• Secure Manager XP 5 TB LTU	[]	B9353A	
• Secure Manager XP 10 TB LTU	[]	B9354A	
• Secure Manager XP 25 TB LTU	[]	B9355A	
• Auto Path XP	[]	B9351A	
Auto Path XP for AIX			
• Auto Path XP for AIX Media	[]	B7949B	
• Auto Path XP for AIX, 1 Server LTU (LTU on one server running AIX connected to an XP Disk Array)	[]	B7950B	
• Auto Path XP for AIX, Unlimited Server LTU (LTU on unlimited servers running AIX connected to an XP Disk Array)	[]	B7951B	
Auto Path XP for MS Windows 2000			
• Auto Path for W2K Media	[]	B9500A	
• Auto Path for W2K 1 Server LTU	[]	B9501A	
• Auto Path for W2K 5 Server LTU	[]	B9502A	
• Auto Path for W2K 10 Server LTU	[]	B9503A	
Auto Path XP for MS NT			
• Auto Path for NT Media	[]	B9505A	
• Auto Path for NT 1 Server LTU	[]	B9506A	
• Auto Path for NT 5 Server LTU	[]	B9507A	
• Auto Path for NT 10 Server LTU	[]	B9508A	
Auto Path XP for HP-UX			
• Auto Path for HP-UX Media	[]	B9510A	
• Auto Path for HP-UX 1 Server LTU (LTU on one server running HP-UX connected to an XP Disk Array)	[]	B9511A	
• Auto Path for HP-UX 5 Server LTU (LTU on five servers running HP-UX connected to an XP Disk Array)	[]	B9512A	
• Auto Path for HP-UX 10 Server LTU (LTU on ten servers running HP-UX connected to an XP Disk Array)	[]	B9513A	
Auto Path XP for Linux			

Description		Product #	Opt#	
• Auto Path for Linux Media	[]	B9515A		
• Auto Path for Linux Server LTU (LTU on one server running Linux connected to an XP Disk Array)	[]	B9516A		
• Auto Path for Linux 5 Server LTU (LTU on five servers running Linux connected to an XP Disk Array)	[]	B9517A		
• Auto Path for Linux 10 Server LTU (LTU on ten servers running Linux connected to an XP Disk Array)	[]	B9518A		
Cluster Extension XP				
Cluster Extension XP for VCS				
• Cluster Extension XP for Veritas Cluster Server	[]	B9531A		
Cluster Extension XP for HACMP				
• Cluster Extension XP for IBM HACMP	[]	B9532A		
Cluster Extension XP for MSCS				
• Cluster Extension XP for MSCS	[]	B9533A		
Cluster Extension XP for MC/ServiceGuard for Linux				
• Cluster Extension XP for MC/ServiceGuard for Linux	[]	B9534A		
Cache LUN XP				
• Cache LUN XP Media For XP512/XP48	[]	B9345A	002	
• Cache LUN XP 1 TB LTU	[]	B9346A		
• Cache LUN XP 5 TB LTU	[]	B9347A		
• Cache LUN XP 10 TB LTU	[]	B9348A		
• Cache LUN XP 25 TB LTU	[]	B9349A		
Performance Advisor XP				
• Performance Advisor XP	[]	B9369A		
Auto LUN XP				
• Auto LUN XP Media For XP512/XP48	[]	B9340A	002	
• Auto LUN XP 1 TB LTU	[]	B9341A		
• Auto LUN XP 5 TB LTU	[]	B9342A		
• Auto LUN XP 10 TB LTU	[]	B9343A		
• Auto LUN XP 25 TB LTU	[]	B9344A		
Command View XP				
• HP Surestore Command View XP For New XP512/XP48 Installations Includes Remote Control XP For XP512/XP48	[]	B9357AB		
• Remote Control XP Upgrade For XP512/XP48	[]	B9357AD		
LUN Configuration Manager XP Media				
• LUN Configuration Mgr XP Media For XP512/XP48	[]	B9335A	002	
• LUN Configuration Mgr XP 1 TB LTU	[]	B9336A		
• LUN Configuration Mgr XP 5 TB LTU	[]	B9337A		
• LUN Configuration Mgr XP 10 TB LTU	[]	B9338A		
• LUN Configuration Mgr XP 25 TB LTU	[]	B9339A		
Resource Manager XP				
• Resource Manager XP For XP512/XP48	[]	B9358A	002	
Data Exchange XP				
• Data Exchange XP For XP256/XP512/XP48	[]	T1620AA		
Fast Recovery Solutions XP				
Fast Recovery Solutions XP for MS Exchange				
• Fast Recovery Solutions XP for MS Exchange	[]	B9550A		
Direct Backup XP				
• Direct Backup XP (LTU on one XP Disk Array)	[]	B9560A		

4.9.17—hp surestore disk array xp256

NOTE: The XP256 will be put on Blind CPL August 1st 2001, for easy order configuration for the Fire Sale on the remaining 42 DKC that are available (While quantities last). Must contact factory for availability before quoting. The XP256 “A/S” product then will be remove again and only the “Upgrades will be available as new”.

NOTE: The XP256 will be removed from CPL on 12/31/00. After that time new systems will no longer be orderable. Prior to 12/31, contact CSU factory for XP256 availability.

Ordering Process (XP256 Base Products Off CPL December 31, 2000 - Upgrades Products remain on CPL – 37GB/47GB Disks replaced with 73GB Disk)

Description	Off CPL Date	Replacement Product (if any)	Notes
XP256 Base Products (1)	December 31, 2000	XP512 and XP48(2)	Actual XP256 base product availability is quoted at time of order.
XP256 37GB SCSI Array Groups, Spares and iCOD-S	December 31, 2000 (all)	73GB SCSI Array Groups, Spares (3)	Actual 37GB SCSI drive availability is quoted at time of order.
XP256 47GB SCSI Array Groups, Spares and iCOD-S	December 31, 2000 (base/upgrades)	73GB SCSI Array Groups, Spares (3)	

XP256 base products include all new: Control Frames (DKC's), Disk Frames (DKU's), Array Groups, Cache, Shared Memory, ACP pairs, CHIP pairs (SCSI, Fibre Channel & ESCON), Array Frame Cables
73GB SCSI Array Groups, Spares will be available in December 2000.

Overview

Once the configuration choices have been made and saved in WATSON or Sales Builder for Windows (SBW), the configuration may be converted to a quote and imported into the order entry system. If configuration tools such as WATSON or SBW are not available, then it is important to follow an ascending numeric order for each Item / Sub-Item ordered in sequence. See Appendix for step by step Manual Procedures for configuring the XP256.

Structured Solution Programs (SSP's):

The HP Structured Solution Program (SSP) has been designed to make the ordering process simple, flexible, and easy to understand. It is completely menu driven requiring only a few simple choices for the various components in the system. Minimum/maximum numbers have been inserted into the menu wherever possible to simplify your choices and to guide your configuration decisions.

There is one SSP for this product: A5700A – offers a fully configurable menu of choices that span the entire capacity range of configurations

1. Host Interface Cables

Offers cable choices for each host interface in various lengths.

2. Software

Offers a wide choice of software products.

3. Upgrade Products

Allows for upgrading an existing array with more cache, disk storage, or host interfaces.

4. Product Support and Services

Choose the HW and SW support, and consulting services that your customer wants.

HP Surestore Disk Array XP256

	Description		Product #	Opt #	Status
1.0	HP Surestore Disk Array XP256 - Fully Configurable SSP	[x]	A5700A		While quantities last
2.0	Surestore Disk Array XP256 Control Fra (Required -- 1 Max)				
	Disk Control Frame - 3-phase power, 60 Hz and 50 Hz.	[]	A5701A		While quantities last
	Includes disk control frame with 1 ACP pair, HP Firmware, Continuous Track XP with Modem, 1GB cache memory, 256 MB shared memory, and redundant power.				
	Disk Control Frame with 60 Hz 1-phase power	[]	A5701B		While quantities last
	Includes disk control frame with 1 ACP pair, HP Firmware, Continuous Track XP with Modem, 1GB cache memory, 256 MB shared memory, and redundant power.				
	Disk Control Frame with 50 Hz 1-phase power	[]	A5701C		While quantities last
	Includes disk control frame with 1 ACP pair, HP Firmware, Continuous Track XP with Modem, 1GB cache memory, 256 MB shared memory, and redundant power.				
2.1	Client-Host Interface Processor (CHIP) pairs (Min.1 pair - Max. 4 pair)				
	8-Port SCSI adapter pair	[]	A5702A		While quantities last
	4-ExSA (ESCON compatile) channel adapter pair	[]	A5703A		While quantities last
	8-ExSA (ESCON compatible) channel adapter pair	[]	A5704A		While quantities last
	4-port fiber channel adapter pair	[]	A5705A		While quantities last
	Additional Redundant Power Supply needed for CHIP Pairs 3-4 (Min. 0, Max. 1)	[]	A5740A		While quantities last
2.2	Additional Cache Memory (1 GB) (Min 0, Max 15)	[]	A5710A		While quantities last
	Additional Cache Platform Board (Min 0, Max 1) Required for Cache > 8 GB	[]	A5711A		While quantities last
2.3	Additional Shared Memory (128 MB) (Min 0, Max 2)	[]	A5712A		While quantities last
2.4	Additional Array Control Processor (ACP) Pairs (Min 0, Max 3)	[]	A5719A		While quantities last
2.5	Fibre Channel Control Frame** (Min 0, Max 1)	[]	A5706A		While quantities last
	If A5706A is selected then a minimum of two FC-SCSI Bridges (A5707A) and a minimum of one SCSI CHIP (A5702A) are required. Includes all Bridge racking hardware, 2PDUs, and power cords				
	FC-SCSI Bridge	[]	A5707A		While quantities last
	FC-SCSI Bridge -if A5706A is ordered, Min 2, Max 16. Must order in multiples of 2				
	Disk Array Frame Configuration: Frame R1 Required. Min 1, Max 58 array groups				
	Default Factory Configuration is RAID-1				
3.0	R1 Disk Array Frame (Min 1 - Max 1)				
	Cannot intermix 1 phase, 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		
3.1	Frame R1 Configuration (Min. 1 - Max. 15 array groups)				
	ACP pair for Domain 2 must be ordered for array groups 8 to 15.				
	15 GB array group - 4 drives per group	[]	A5721R1		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723R1		While quantities last
	47 GB array group - 4 drives per group	[]	A5726R1		While quantities last
	73 GB array group - 4 drives per group	[]	A5727R1		While quantities last
	R1 Spare Disk Drives (Min 1 per Array Group capacity, Max 4)				
	15 GB spare drive (15 GB SP Drive)	[]	A5731S		While quantities last
	GB spare drive (47 GB SP Drive)	[]	A5736S		While quantities last
3.2	R2 Disk Array Frame (Min 0 - Max 1)				
	Cannot intermix 1 phase, 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		

	Description		Product #	Opt #	Status
3.3	Frame R2 Configuration (Min. 0 - Max. 14 array groups)				
	ACP pair for Domain 2 must be ordered for array groups 8 to 14.				
	15 GB array group - 4 drives per group	[]	A5721R2		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723R2		While quantities last
	47 GB array group - 4 drives per group	[]	A5726R2		While quantities last
	73 GB array group - 4 drives per group	[]	A5727R2		While quantities last
	SCSI Cable Set for Frame R2 (Required if frame R2 is ordered)	[]	A5746A		
3.4	L1 Disk Array Frame (Min 0 - Max 1)				
	Cannot intermix 1 phase, 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		
3.5	Frame L1 Array Group Configuration (Min. 0 - Max. 15 array groups)				
	ACP pair for Domain 3 required for array groups 1-7.				
	ACP pair for Domain 4 required for array groups 8-15.				
	15 GB array group - 4 drives per group	[]	A5721L1		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723L1		While quantities last
	47 GB array group - 4 drives per group	[]	A5726L1		While quantities last
	73 GB array group - 4 drives per group	[]	A5727L1		While quantities last
	SCSI Cable Set for Frame L1 (Required if L1 Frame is ordered)	[]	A5745A		
	L1 Spare Disk Drives (Min 0 - Max 4)				
	15 GB spare drive (15 GB SP Drive)	[]	A5731S		While quantities last
	36.9 GB spare drive (47 GB SP Drive)	[]	A5733S		While quantities last
	47 GB spare drive (47 GB SP Drive)	[]	A5736S		While quantities last
	73 GB spare drive (47 GB SP Drive)	[]	A5737S		While quantities last
3.6	L2 Disk Array Frame (Min 0 - Max 1)				
	Cannot intermix 50Hz and 60Hz frames on same order.				
	60 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708A		
	60 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5708B		
	50 Hz 3-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709A		
	50 Hz 1-phase Disk Array frame w/ 2 Disk Canister Mount Platforms	[]	A5709B		
3.7	Frame L2 Array Group Configuration (Min. 0 - Max. 14 array groups)				
	Configuration of Frame L1 required, ACP pair for Domain 4 must be ordered for array groups 8-14.				
	15 GB array group - 4 drives per group	[]	A5721L2		While quantities last
	36.9 GB array group - 4 drives per group	[]	A5723L2		While quantities last
	47 GB array group - 4 drives per group	[]	A5726L2		While quantities last
	73 GB array group - 4 drives per group	[]	A5727L2		While quantities last
	SCSI Cable Set for Frame L2 (Required if L2 frame is ordered)	[]	A5746A		

Support Delivery Trigger Option #2YB must be added to A5701A or A5701B or A5701C.

A5706A and A5707A for expanded FC connectivity only. For basic FC Connectivity use 4 port Fibre Channel adapter pair A5705A.

XP256 A5700A SSP (Hardware)

Description		Product #	Opt #	
Host Interface Cables				
• Fibre Channel Cables		A5750A		
16 meter Fibre Channel Cable, 50 micron, multimode	[]		001	
50 meter Fibre Channel Cable, 50 micron, multimode	[]		002	
100 meter Fibre Channel Cable, 50 micron, multimode	[]		003	
• SCSI Cables		A5751A		
20 meter 68-pin HDTS to 68-pin HDTS cable	[]		003	
2 meter Y-cable/68-pin HDTS male cable	[]		004	
5 meter 68-pin HDTS to 68-pin HDTS cable in-line terminator cable for V-Class	[]		005	
10 meter 68-pin HDTS to 68-pin HDTS cable in-line terminator cable for V-Class	[]		006	
2/3 meter Y in-line terminator cable – 68-pin HD male for V-Class	[]		007	
2/5 meter Y in-line terminator cable – 68-pin HD male for V-Class	[]		008	
5 meter 68P HD LP to 68P HD LP	[]		009	
10 meter 68P HD LP to 68P HD LP	[]		010	
• Fibre Optic Cables (ESCON compatible)		A5752A		
Fiber Optic Cable - 7m	[]		001	
Fiber Optic Cable - 13m	[]		002	
Fiber Optic Cable - 22m	[]		003	
Fiber Optic Cable - 31m	[]		004	
Fiber Optic Cable - 46m	[]		005	
Fiber Optic Cable - 61m	[]		006	
Upgrade Products				
• 8-Port SCSI adapter pair	[]	A5702U		
• 4-ExSA (ESCON compatible) channel adapter pair	[]	A5703U		
• 8-ExSA (ESCON compatible) channel adapter pair	[]	A5704U		
• 4 port fiber channel adapter pair	[]	A5705U		
• Additional redundant power supply for CHIP Pairs 3 to 4	[]	A5740U		
• 1GB cache memory	[]	A5710U		
• Additional cache platform board	[]	A5711U		
• 128MB Shared Memory Module	[]	A5712U		
• Additional ACP pair	[]	A5719U		
• 60 Hz 3-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5708A		
• 50 Hz 3-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5709A		
• 60 Hz 1-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5708B		
• 50 Hz 1-phase Disk Array frame w/ 2 disk canister mount platforms	[]	A5709B		
• 15 GB array group - (4 disk drives per group)	[]	A5721U		
• 36.9 GB array group - (4 disk drives per group)	[]	A5723U		While quantities last
• 47 GB array group - (4 disk drives per group)	[]	A5726U		While quantities last
• 73 GB array group - (4 disk drives per group)	[]	A5727U		
• 15 GB spare drive	[]	A5731U		
• 36.9 GB spare drive	[]	A5733U		While quantities last
• 47 GB spare drive	[]	A5736U		While quantities last
• 73 GB spare drive	[]	A5737U		
• SCSI Cable Set for Array Frame L1	[]	A5745U		
• SCSI Cable Set for Array Frames R2 and L2	[]	A5746U		
XP-iCOD-S Products				
• 1GB cache memory, XP-iCOD-S	[]	A5710D		
• 128MB Shared Memory Module, XP-iCOD-S	[]	A5712D		
• Additional ACP pair, XP-iCOD-S	[]	A5719D		
• 15 GB array group - 4 drives per group, XP-iCOD-S	[]	A5721D		
• 73 GB array group - 4 drives per group, XP-iCOD-S	[]	A5727D		
Software				
Data Mirroring/Security				
• Continuous Access XP Media	[]	B9320A		

	Description		Product #	Opt #	
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (required)	[x]		OSY	
•	Continuous Access XP Media For XP256	[]	B9320A	001	
	includes RAID Manager				
•	Continuous Access XP 1 TB LTU (used capacity – see config guide for more information)	[]	B9321A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP 5 TB LTU (used capacity – see config guide for more information)	[]	B9322A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP 10 TB LTU (used capacity – see config guide for more information)	[]	B9323A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP 25 TB LTU (used capacity – see config guide for more information)	[]	B9324A		
•	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Extension Media	[]	B9325A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. Media For XP256	[]	B9325A	001	
•	Continuous Access XP Ext. 1 TB LTU (used capacity – see config guide for more information)	[]	B9326A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. 5 TB LTU (used capacity – see config guide for more information)	[]	B9327A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. 10 TB LTU (used capacity – see config guide for more information)	[]	B9328A		
	First Year of System Support Option (required)	[x]		OS6	
•	Continuous Access XP Ext. 25 TB LTU (used capacity – see config guide for more information)	[]	B9329A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP Media	[]	B9330A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP Media For XP256	[]	B9330A	001	
	includes RAID Manager				
•	Implementation Service (#302 or #303 required)	[x]	H9273A		
•	Implementation Service for Simple environments	[]	H9273A	302	
•	Implementation Service for Complex environments	[]	H9273A	303	
•	Business Copy XP 1 TB LTU (used capacity – see config guide for more information)	[]	B9331A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP 5 TB LTU (used capacity – see config guide for more information)	[]	B9332A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP 10 TB LTU (used capacity – see config guide for more information)	[]	B9333A		
	First Year of System Support Option (required)	[x]		OS6	
•	Business Copy XP 25 TB LTU (used capacity – see config guide for more information)	[]	B9334A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP Media	[]	B9351A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP Media For XP256	[]	B9351A	001	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
•	Secure Manager XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9352A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9353A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9354A		
	First Year of System Support Option (required)	[x]		OS6	
•	Secure Manager XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9355A		
	First Year of System Support Option (required)	[x]		OS6	
•	Auto Path XP for AIX	[]	B7936B		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
	Auto Path for W2K/Pentium Media	[]	B9500A		
	First Year of System Support Option (required)	[x]		OS6	

Chapter 4 Storage, Accessories, and Other Peripherals



Description		Product #	Opt #
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
Auto Path for W2K/Pentium 1 Server LTU	[]	B9501A	
First Year of System Support Option (required)	[x]		OS6
Auto Path for W2K/Pentium 5 Server LTU	[]	B9502A	
First Year of System Support Option (required)	[x]		OS6
Auto Path for W2K/Pentium 10 Server LTU	[]	B9503A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for NT Media	[]	B9505A	
First Year of System Support Option (required)	[x]		OS6
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto Path for NT 1 Server LTU	[]	B9506A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for NT 5 Server LTU	[]	B9507A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for NT 10 Server LTU	[]	B9508A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for HP-UX media		B9510A	
• First Year of System Support Option (required)	[x]		OS6
• Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto Path for HP-UX 1 server LTU		B9511A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for HP-UX 5 server LTU		B9512A	
First Year of System Support Option (required)	[x]		OS6
• Auto Path for HP-UX 10 server LTU		B9513A	
First Year of System Support Option (required)	[x]		OS6
• Cluster Extension XP for Veritas Cluster Server	[]	B9531A	
First Year of System Support Option (required)	[x]		OS6
• Cluster Extension XP for IBM HACMP	[]	B9532A	
First Year of System Support Option (required)	[x]		OS6
• Cluster Extension XP for MSCS	[]	B9533A	
First Year of System Support Option (required)	[x]		OS6
Performance			
• Cache LUN XP Media	[]	B9345A	
First Year of System Support Option (required)	[x]		OS6
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Cache LUN XP Media For XP256	[]	B9345A	001
• Cache LUN XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9346A	
First Year of System Support Option (required)	[x]		OS6
• Cache LUN XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9347A	
First Year of System Support Option (required)	[x]		OS6
• Cache LUN XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9348A	
First Year of System Support Option (required)	[x]		OS6
• Cache LUN XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9349A	
First Year of System Support Option (required)	[x]		OS6
• Performance Advisor XP		B9369A	
First year of system support required	[x]		OS6
SW Enablement option (included w/ initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto LUN XP Media	[]	B9340A	
First Year of System Support Option (required)	[x]		OS6
Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY
• Auto LUN XP Media For XP256	[]	B9340A	001
• Auto LUN XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9341A	

	Description		Product #	Opt #	
	First Year of System Support Option (required)	[x]		OS6	
•	Auto LUN XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9342A		
	First Year of System Support Option (required)	[x]		OS6	
•	Auto LUN XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9343A		
	First Year of System Support Option (required)	[x]		OS6	
	Array Management				
•	Auto LUN XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9344A		
	First Year of System Support Option (required)	[x]		OS6	
•	HP Surestore Command View XP	[]	B9357A		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (required)	[x]		OSY	
•	HP Surestore Command View XP For New XP256 Installations	[]	B9357A	001	
	Includes Remote Control XP For XP256				
•	Command View XP Upgrade (for Existing XP256 Installations)	[]	B9357A	003	
•	LUN Configuration Manager XP Media	[]	B9335A		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
•	LUN Configuration Mgr XP Media For XP256	[]	B9335A	001	
•	LUN Configuration Mgr XP 1 TB LTU (raw capacity – see config guide for more information)	[]	B9336A		
	First Year of System Support Option (required)	[x]		OS6	
•	LUN Configuration Mgr XP 5 TB LTU (raw capacity – see config guide for more information)	[]	B9337A		
	First Year of System Support Option (required)	[x]		OS6	
•	LUN Configuration Mgr XP 10 TB LTU (raw capacity – see config guide for more information)	[]	B9338A		
	First Year of System Support Option (required)	[x]		OS6	
•	LUN Configuration Mgr XP 25 TB LTU (raw capacity – see config guide for more information)	[]	B9339A		
	First Year of System Support Option (required)	[x]		OS6	
	Mainframe Software				
•	Resource Manager XP	[]	B9358A		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (Included with initial array purchase, required for upgrade to an existing array)	[]		OSY	
•	Resource Manager XP For XP256	[]	B9358A	001	
•	Data Exchange XP For XP256/XP512/XP48	[]	T1620AA		
	First Year of System Support Option (required)	[x]		OS6	
	Software Enablement Option (required)	[x]		OSY	
•	Fast Recovery Solutions (1 support product required)	[]	B9550A	N/A	
•	1 Year 24x7 phone support	[]	H4405A	N/A	
•	3 Year 24x7 phone support	[]	H4405Y	N/A	
•	Direct Backup XP (LTU on one XP Disk Array)	[]	B9560A		

4.9.18—CNT UltraNet Storage Director

The CNT UltraNet Storage Director is a key component of HP's disaster-tolerant business continuity solutions, for use by HP customers with array-to-array data mirroring capabilities.

Two CNT UltraNet Storage Directors provide a high-speed switching platform at each data centre site, across unlimited distances, to interconnect HP XP48/512 storage systems to create an effective enterprise-wide storage area network (SAN).

By using either universally available telco-provided WAN links (e.g. ATM) or ubiquitous IP (Ethernet) packet-switched networks, HP customers can utilize better their existing network infrastructure. This allows users to maximize their cost savings by making more efficient use of their WAN connections whilst preventing considerable downtime, disruption and lost revenue by protecting one of their most valuable resources, data.

Description	Product #	Opt #	Price
CNT UltraNet Storage Director 6 slot Director with 2 Single ESCON ports and 1 WAN interface	CNTNSYAZ	OS6	
CNT UltraNet Storage Director 6 Slot Director with 2 Single ESCON ports and 2 WAN interfaces	CNTNSYBZ	OS6	
CNT UltraNet Storage Director 6 Slot Director with 2 Dual ESCON ports and 1 WAN interface	CNTNSYCZ	OS6	
CNT UltraNet Storage Director 6 Slot Director with 2 Dual ESCON ports and 2 WAN interfaces	CNTNSYDZ	OS6	

4.10 Solid State Disk – Excellerator™ file-caching solutions

The Excellerator from Solid Data is a file caching solution that multiplies system performance, scalability and reliability based on solid state disk (SSD) technology. It is the perfect fit in storage infrastructures that support mission-critical applications such as e-mail, messaging, and e-business applications, which heavily rely on speed of transaction processing. By combining HP Surestore disk arrays and Solid Data Excellerator file-caching appliances, an optimal high performance and high availability storage architecture can be configured. I/O wait will be eliminated; server performance and scalability in transaction-intensive applications will be multiplied.

Solid Data file-caching appliances are provided through HP Complementary Products (HPCP) on a worldwide basis. HP Support organization provides support services for the products (Multi-Vendor Support). Product Numbers as well as HP support options are available on CPL.

Description	Product #	Opt #	Price
Chassis – SCSI Interface			
<ul style="list-style-type: none"> 800 Ultra, High Voltage Differential, Dual Port, SCSI Chassis 	SSDEMY1Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 800 Ultra, Low Voltage, Dual Port, SCSI Chassis 	SSDEMY5Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 1000 Ultra, High Voltage Differential, Dual Port, SCSI Chassis 	SSDEMY2Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			

Description	Product #	Opt #	Price
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 1000 Ultra, Low Voltage, Dual Port, SCSI Chassis 	SSDEMY6Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
Chassis – Fibre Channel Interface			
<ul style="list-style-type: none"> 800 Fibre Channel, Single Port, FC Chassis 	SSDEMY3Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 800 Fibre Channel, Dual Port, FC Chassis 	SSDEMY7Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots and can scale up to 10GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
<ul style="list-style-type: none"> 1000 Fibre Channel, Single Port, FC Chassis 	SSDEMY4Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	

Description	Product #	Opt #	Price
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• 1000 Fibre Channel, Dual Port, FC Chassis	SSDEMY8Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 1000 Chassis have 16 memory array board slots and can scale up to 32GB			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Universal Short Rack Mount Kit 0.4M/36"		R04	
Universal Long Rack Mount Kit 1.8M/72"		R18	
Slide Rack Mount Kit for HP Cabinets		R0H	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
Memory Array Boards			
• 512MB Memory Array Board	SSDEMYBZ		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots			
Model 1000 Chassis have 16 memory array board slots			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
• 1GB Memory Array Board	SSDEMY9Z		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slot			
Model 1000 Chassis have 16 memory array board slots			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
• 2GB Memory Array Board	SSDEMYAZ		
Note: Prices include first year of system support (8x5 next day on-site)			
Model 800 Chassis have 5 memory array board slots			
Model 1000 Chassis have 16 memory array board slots			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
Remote Monitoring and Reporting			
• Remote Monitoring and Reporting	SSDEMYRZ		
Note: Must be ordered together with a Chassis. Can be applied with any Chassis model; support is covered by the Chassis			
e-100 Configured Solutions			
• e-100, High Voltage Differential, Dual Port, with 512MB	SSDEMYGZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, Low Voltage Differential, Dual Port, with 512MB	SSDEMYHZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	

Description	Product #	Opt #	Price
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, High Voltage Differential, Dual Port, with 1GB	SSDEMYIZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, Low Voltage Differential, Dual Port, with 1GB	SSDEMYJZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, High Voltage Differential, Dual Port, with 2GB	SSDEMYKZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	
• e-100, Low Voltage Differential, Dual Port, with 2GB	SSDEMYLZ		
Note: Price include first year of system support (8x5 next day on-site)			
First Year of System Support Option (8x5 same day).		OS3	
First Year of System Support Option (24x7).		OS6	
SCSI cable 68 Pin Micro D Male 0.9M/36"		S09	
SCSI cable 68 Pin Micro D Male 1.8M/72"		S18	
SCSI cable VHDCI LVD cable 0.9M/36"		V09	
SCSI cable VHDCI LVD cable 1.8M/72"		V18	
Power Cord 0.9M/36" 230V		P09	
Standard US, 115VAC		P15	
Power Cord 1.8M/72" 230V		P18	
Standard US and some Foreign, 230VAC		P23	

Subchapter 4.11—Media

	Description	Product #	Opt #	Price
•	1.3 GB HP DDS DAT cartridge (60 meters) (box of five)	92283A		
•	2 GB HP DDS DAT cartridge (90 meters) (box of five)	92283B		
•	4 GB HP DDS DAT cartridge (120 meters) (box of five)	92300A		
•	12 GB HP DDS DAT cartridge (125-meters) (box of five)	C1517A		
•	DAT drive cleaning cassette	92283K		
•	Certified, 1/4-inch Tape Cartridges for the 9144A tape drive, 600-foot (box of five)	88140LC		
•	Certified, 1/4-inch Tape Cartridges for the 9144A tape drive, 150-foot (box of five)	88140SC		
•	Certified, 1/4-inch Tape Cartridges for the 9145A tape drive, 600-foot (box of five)	92245L		
•	1/2-inch Tape Reels (in seals, box of ten - 2400 ft.)	92150F		
•	40 GB HP DLT Tape IV Cartridge (1 pack)	C5141F		
•	15 GB HP DLT Tape III Cartridge (1 pack)	C5141A		
•	DLT Tape Cleaning Cartridge	C5142A		
•	100GB HP Ultrium Tape Cartridge (1 pack)	C7970A		
•	200GB HP Ultrium Tape Cartridge (1 pack)	C7971A		
•	Ultrium Universal Tape Cleaning Cartridge	C7978A		
•	DLT1 Tape Cleaning Cartridge	C7998A		
	9840 Data Cartridge (Ordering information telephone 1-800-905-8502)			
	9840 Cleaning Cartridge (Ordering information telephone 1-800-905-8502)			
	NOTE: Data cartridge labels can be ordered from Engineered Data Products (EDP).			
	US sales line 1-800-432-1337, International 303 438 8375			

Subchapter 4.12—Terminals

	Description	Product #	Opt #	Price
	HP Terminal/Console			
	14-inch screen, 8-page memory, 80/132 column data, high resolution character, full overscan, VT320/220 compatible, white phosphor display only, EPC 104 keyboard			
•	HP 700/96 with amber screen	C1099A		
	HP 700/60 ASCII/ANSI/PC Terminal			
	DEC VT320 compatible, Wyse 60 compatible, 80/132 column data, 14-inch full overscan display, 72 Hz refresh rate. PC-AT type keyboard (optional ANSI keyboard).			
•	HP 700/60 with amber screen; PC-AT type keyboard	C1080A		
•	HP 700/60 with green screen; PC-AT type keyboard	C1080G		
•	HP 700/60 with soft-white screen; PC-AT type keyboard	C1080W		
	HP 700/70 Terminal			
	14-inch screen, 80/132 column data, DEC VT320 and Wyse 60 compatible; 50, 60 or 72 Hz refresh rate. PC-AT type keyboard (optional ANSI keyboard). Includes license-to-use SSSI FacetTerm software.			
•	HP 700/70 with amber screen	C1093A		
•	HP 700/70 with green screen	C1093G		
•	HP 700/70 with white screen	C1093W		
•	HP 700/70 media kit for HP 9000 – DAT. One required per site.	C1096A		
•	Serial mouse	C3370A		
	HP 700/96 Terminal			
	14-inch screen, 8-page memory, 80/132 column data, high resolution character, full overscan, VT220 compatible.			
•	HP 700/96 with amber screen	C1064A		
•	HP 700/96 with green screen	C1064G		
•	HP 700/96 with soft-white screen	C1064W		
	HP 700/98 High Performance Terminal			

Description	Product #	Opt #	Price
14-inch screen, 16-page memory, 80/132 column data, high resolution characters, full overscan, forms cache, 11 edit checks, VT220 compatible.			
• HP 700/98 with amber screen	C1065A		
• HP 700/98 with green screen	C1065G		
• HP 700/98 with soft-white screen	C1065W		
• HP 700/60ES Terminal with soft-white screen. Has all HP 700/60 features plus compliance with Swedish MPR 1990:10 guidelines.	C1083W		
• HP 700/70ES – has all HP 700/70 features, plus compliance with Swedish MPR 1990:10 guidelines	C1094W		
• HP 700/96ES Terminal with Soft-White Screen. Has all HP 700/96 features plus compliance with Swedish MPR 1990:10 guidelines.	C1084W		
• HP 700/98ES Terminal with Soft-White Screen. Has all HP 700/98 features plus compliance with Swedish MPR 1990:10 guidelines.	C1085W		

Subchapter 4.13—NCD Thin Clients/X-Terminals

NCD is a leading provider of integrated thin client hardware and software solutions that deliver high performance, easy-to-manage access to any UNIX and legacy application. The NCD Network Computer Products deliver the broadest support for today's web, UNIX and legacy application access requirements, with expandability to meet tomorrow's needs. Major features include: outstanding X11 performance, a reliable local Netscape Navigator browser and the fastest and most flexible ICA client in a thin client.

Description	Product #	US \$ Ref. Price
NCD Network Computer X-Terminals		
Base Units include:		
– HP 3 Year International Limited Hardware Warranty with unit replacement		
– Mouse		
– Power Cord		
Keyboard to be ordered separately		
Monitor to be ordered separately		
N916, 16MB System Memory, 2 System Memory Slots, 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD916UB	
European and International Bundle (Power Cord)	NCD916EB	
N932, 32MB System Memory, 2 System Memory Slots (1 unused), 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD932UB	
European and International Bundle (Power Cord)	NCD932EB	
N948, 16MB System Memory, 2 System Memory Slots (1 unused), 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD948UB	
European and International Bundle (Power Cord)	NCD948EB	
N980, 80MB System Memory, 2 System Memory Slots (1 unused), 10/100 BaseT Ethernet, Simultiple Color		
US Localization Bundle (Power Cord)	NCD980UB	
European and International Bundle (Power Cord)	NCD980EB	
HP 3 Year International Limited Hardware warranty with unit Replacement MUST be ordered with every thin client	NCDWARTY	
Keyboards for the NCD900		
US – US Localization	NCDKBDUS	
UK – UK Localization	NCDKBDUK	
France – French Localization	NCDKBDFR	
Germany – German Localization	NCDKBDGR	

Description	Product #	US \$ Ref. Price
Sweden/Finland – Swedish/Finnish Localization	NCDKBDSE	
Italy – Italian Localization	NCDKBDIT	
Canada – French Canadian Localization	NCDKBDFC	
NCD900 Add-on Options		
2 Power Cords – 1 UK / 1 European	NCDPWREU	
Single Australian Power Cord	NCDPWRAU	
16MB 100-Pin DIMM, 4 Bank	NCDNF016	
32MB 100-Pin DIMM, 4 Bank	NCDNF032	
64MB 100-Pin DIMM, 4 Bank	NCDNF064	
128MB 100-Pin DIMM, 4 Bank	NCDNF128	
8MB Flash Memory Card	NCDF08FM	
16MB Flash Memory Card	NCDF16FM	
10 Base2 Thinnet Ethernet	NCDN9FB2	
Parallel Port Card	NCDNCFPL	
Display Stand – for monitors over 17 inches in size	NCDNCFDS	
Floppy Disk Drive	NCDFDD01	
NCD900 Software		
NCBridge 4.0, CD-ROM, site license upgrade for customers who purchased previous versions of NCBridge	NCD840CU	
NCBridge 4.0, CD-ROM, site license (1 License mandatory per site)	NCD840CS	
NCBridge 4.0, CD-ROM, corporate license	NCD840CC	
8 x 5 Phone-in assistance, LTU Updates, Media and Documentation Updates	NCD840S1	
24 x 7 Phone-in assistance, LTU Updates, Media and Documentation Updates	NCD840S2	

Subchapter 4.14—Printers

Description	Product #	Opt #	Price
HP 5000 Cut-Sheet Printers			
Printers and Accessories			
• PostScript™ Level 2 for the D640	C5630A		
• D640 16 megabytes add-on memory	C5635A		
Network Interfaces and Cables			
• 3-meter parallel cable for use with D640	C2946A		
• 10-meter parallel cable for use with D640	C2947A		
Supplies and Consumables			
• D640 Toner Kit (8 bottles)	C5626A		
• D640 Drum Kit	C5629A		
• D640 Developer Kit (2 bottles)	C5632B		
• D640 Printer Pick Roller Kit	C5633A		
• D640 Fuser (120-127V)	C5627A		
• D640 Fuser (200-240V)	C5628A		
• D640 HCI Pick Roller	C5636B		
• C30/C30D/C40D Toner, 2 cartridges	C4006A		
• C30/C30D/C40D Toner, 8 cartridges	C4007A		
• C30/C30D Photoconductor	C4682A		
• C40D Photoconductor	C4683A		
• C30/C30D/C40D Fuser, 100-127 VAC	C4675A		
• C30/C30D/C40D Fuser, 200-240 VAC	C4676A		
• Cleaner Unit for C30/C30D/C40D	C4011A		
• C30/C30D Developer Unit	C4015A		
• C40D Developer Unit	C4677A		
HP LineJet and LP Series Ribbons (Available as service parts; Contact HP Parts Direct)			
• 60 yard text ribbons, box of 6 ribbons (service part number: 171543-001)			

Description	Product #	Opt #	Price
<ul style="list-style-type: none"> 100 yard text ribbons, box of 6 ribbons (service part number: 171543-002) 60 yard bar code/OCR ribbons, box of 6 ribbons (service part number: 171543-003) 100 yard bar code/OCR ribbons, box of 6 ribbons (service part number: 171543-004) 			
P405 Multi-Purpose Impact Printer			
<ul style="list-style-type: none"> Model P405 Multi-purpose impact printer (600 cps in draft mode, 150 cps in letter) 	PSYP405P		
Localized for Europe and AAA (Only available in UK & France)			
<ul style="list-style-type: none"> Model P405 Multi-purpose impact printer (600 cps in draft mode, 150 cps in letter) 	PSYPAMER		
Localized for the Americas (obsolete as of July 1, 2001) *			
<ul style="list-style-type: none"> P405 Printer stand (635x670x730 - W x D x H) ** 	PSYP405S		
<ul style="list-style-type: none"> Pack of 5 ribbons for the P405 (black)** 	PSYP405R		
<ul style="list-style-type: none"> Replacement print head (Lifetime 350,000 pages)** 	PSYP405H		
<ul style="list-style-type: none"> Automatic sheet feeder cassette version A (for normal paper - max 180)** 	PSYP405A		
<ul style="list-style-type: none"> Automatic sheet feeder cassette version B (heavy paper and envelopes - max 50)** 	PSYP405B		
<ul style="list-style-type: none"> Replacement platen assembly (rubber roller to transport paper) ** 	PSYP405Y		
<ul style="list-style-type: none"> Replacement pick up rolls ** 	PSYP405L		
C-Series, HP LineJet, and LP Series Network Interfaces and Cables			
<ul style="list-style-type: none"> HP JetDirect EX Plus Ethernet/IEEE 802.3 Network Interface 	J2591A		
<ul style="list-style-type: none"> HP JetDirect 500X External Print Server 910/100Base-TX, 10Base 2 	J3265A		
<ul style="list-style-type: none"> HP JetDirect E500X External Print Server (Token Ring) 	J3264A		
<ul style="list-style-type: none"> HP JetDirect EX to LP Series parallel connect cable (3-meter) 	C2951B		
<ul style="list-style-type: none"> HP JetDirect EX to LP Series parallel connect cable (2-meter) 	C2950A		
HP 5000 F-Series Printer Consumables			
<ul style="list-style-type: none"> Toner for HP 5000 Printers, 9 kg (estimated yield is 267,000 pages) 	35192A		

* A 100% comparable PSYPAMER product is available through our OEM, PSI
 285 North Drive, #F
 Melbourne, FL 32934
 Phone: 321-254-1946
 Fax: 321-242-0258
 e-mail: psi-us@inetmail.att.net

** These products are still available in UK and France. Outside of these two countries, You can order these products through PSI (see above for the US), and PSI Europe, phone # +49 271 3597 361, email: p405-support@psi-si.de

Subchapter 4.15—Cables and Accessories

Description	Product #	Opt#	Price
Order a 0D1 option for factory integration of cables or terminators. If factory integration is available, the 0D1 option is listed below the cable product number.			
Low Density Bail Lock 50			
<ul style="list-style-type: none"> SCSI Cable 1m LDBL50 M/M 	92222B	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
<ul style="list-style-type: none"> SCSI Cable 3m LDBL50 M/F Ext 	C2900A	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
Low Density Bail Lock to High Density Thumb Screw			
<ul style="list-style-type: none"> SCSI Cable 1m HDTS50/LDBL50 M/M Adptr 	K2296	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
<ul style="list-style-type: none"> SCSI Cable 1m HDTS68/LDBL50 M/M Adptr 	C2915A	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
High Density Thumb Screw 50			
<ul style="list-style-type: none"> SCSI Cable 0.5m HDTS50 M/M 	C2955A	0D1	
<ul style="list-style-type: none"> Factory Integrated 			
<ul style="list-style-type: none"> SCSI Cable 1m HDTS50 M/M 	C2908A		
<ul style="list-style-type: none"> SCSI Cable 2m HDTS50 M/M 	C2957A		
<ul style="list-style-type: none"> SCSI Cable 3m HDTC50 M/M 	C7521A		

Description	Product #	Opt#	Price
Factory Integrated		OD1	
• SCSI Cable 5m HDTS50 M/M	C2958A		
Factory Integrated		OD1	
High Density Thumb Screw 68 to High Density Thumb Screw 50			
• SCSI Cable 1m HDTS68/HDTS50 M/M Adptr	C2961A		
• Factory Integrated		OD1	
• SCSI Cable 2m HDTS68/HDTS50 M/M Adptr	C2906A		
• SCSI Cable 5m HDTS68/HDTS50 M/M Adptr	C2907A		
Factory Integrated		OD1	
Very High Density Thumb Screw 68 to High Density Thumb Screw 50			
• SCSI Cable 1m VHDTS68/HDTS50 M/M Adptr	C2367A		
Factory Integrated		OD1	
• SCSI Cable 2.5m VHDTS68/HDTS50 M/M Adptr	C2368A		
Factory Integrated		OD1	
High Density Thumb Screw 68			
• SCSI Cable 0.5m HDTS68 M/M Multimd	C2978B		
Factory Integrated		OD1	
• SCSI Cable 1m HDTS68 M/M Multimd	C2911C		
Factory Integrated		OD1	
• SCSI Cable 1.5m HDTS68 M/M Multimd	C2979B		
Factory Integrated		OD1	
• SCSI Cable 2.5m HDTS68 M/M Multimd	C2924C		
Factory Integrated		OD1	
• SCSI Cable 5m HDTS68 M/M Multimd	C7521A		
Factory Integrated		OD1	
• SCSI Cable 10m HDTS68 M/M Multimd	C7522A		
Factory Integrated		OD1	
• SCSI Cable 20m HDTS68 M/M Multimd	C7532A		
Factory Integrated		OD1	
Very High Density Thumb Screw 68			
• SCSI Cable 0.5m VHDTS68 M/M Multimd	C2371A		
Factory Integrated		OD1	
• SCSI Cable 1m VHDTS68 M/M Multimd	C2372A		
Factory Integrated		OD1	
• SCSI Cable 2m VHDTS68 M/M Multimd	C2373A		
Factory Integrated		OD1	
• SCSI Cable 5m VHDTS68 M/M Multimd	C2374A		
Factory Integrated		OD1	
• SCSI Cable 10m VHDTS68 M/M Multimd	C2375A		
Very High Density 68 to High Density 68			
• SCSI Cable .5m VHDTS68/HDTS68 M/F Multimd Ext	C7523A		
Factory Integrated		OD1	
• SCSI Cable 1m VHDTS68/HDTS68 M/M Multimd	C2361B		
Factory Integrated		OD1	
• SCSI Cable 1.5m VHDTS68/HDTS68 M/M Multimd	C2362B		
Factory Integrated		OD1	
• SCSI Cable 2m VHDTS68/HDTS68 M/M Multimd	C2365B		
Factory Integrated		OD1	
• SCSI Cable 5m VHDTS68/HDTS68 M/M Multimd	C2363B		
Factory Integrated		OD1	
Special V-Cables			
• SCSI V Cbl 2m HD/HD/HD M/M/M	C7544A		
Factory Integrated		OD1	
• SCSI V Cbl 2m VHD/VHD/HDTS68 M/M/M	A5607A		
Factory Integrated		OD1	

Description	Product #	Opt#	Price
• SCSI V Cbl 2m VHD/VHD ILT/HDTS68 M/M/M Factory Integrated	A5608A	OD1	
• SCSI V Cbl 2m HD/VHD/HDTS68 M/M/M Factory Integrated	A5609A	OD1	
• SCSI V Cbl 2m HD/VHD ILT/HDTS68 M/M/M Factory Integrated	A5610A	OD1	
In-Line Terminated Cables			
• SCSI Cable 0.5m HDTS68 HVD ILT M/F Ext Factory Integrated	C2980A	OD1	
• SCSI Cable 5m HDTS68 HVD ILT M/M Factory Integrated	C7554A	OD1	
• SCSI Cable 5m HDTS68 HVD ILT M/M Factory Integrated	C7555A	OD1	
• SCSI Cable 0.5m VHDS68/HDTS68 HVD ILT M/F Ext Factory Integrated	C7519A	OD1	
• SCSI Cable 5m VHDS68/HDTS68 HVD ILT M/M Factory Integrated	C5766A	OD1	
• SCSI Cable 10m VHDS68/HDTS68 HVD ILT M/M Factory Integrated	C5767A	OD1	
• SCSI Cable 2m VHDS68/HDTS68 LVD/SE ILT M/M Factory Integrated	C7541A	OD1	
• SCSI Cable 5m VHDS68/HDTS68 LVD/SE ILT M/M Factory Integrated	C7520A	OD1	
• SCSI Cable 10m VHDS68/HDTS68 LVD/SE ILT M/M Factory Integrated	C7556A	OD1	
• SCSI Cable 2m VHDS68 LVD/SE ILT M/M Factory Integrated	A5668A	OD1	
• SCSI Cable 5m VHDS68 LVD/SE ILT M/M Factory Integrated	A5669A	OD1	
• SCSI Cable 10m VHDS68 LVD/SE ILT M/M Factory Integrated	A5670A	OD1	
Fiber optic SCSI extender (supported on printers only)			
• Add 50m Fiber-optic cable		AFB	
• Add 100m Fiber-optic cable		AFD	
SCSI Terminators			
• SCSI Terminator SE LDBL50 Factory Integrated	K2291	OD1	
• SCSI Terminator SE HDTS50	C2904A		
• SCSI Terminator HVD HDTS50 Factory Integrated	C2905A	OD1	
• SCSI Terminator Active SE HDTS68 Factory Integrated	C2972A	OD1	
• SCSI Terminator LVD/SE HDTS68 Multimd Factory Integrated	C2364A	OD1	
• SCSI Terminator HVD VHDS68 Factory Integrated	C7528A	OD1	
• SCSI Terminator LVD/SE VHDS68 Multimd Factory Integrated	C2370A	OD1	

NOTE: When ordering SCSI Adapters A5149A, A5150A, A5159A, or A5838A, terminators are NOT included. Please order the appropriate terminator(s) for the final device(s) in your SCSI chain.

Subchapter 4.16—Networking Cables

Description	Product #	Opt #	Price
Order a OD1 option for factory integration of cables or terminators. If factory integration is available, the OD1 option is listed below the cable product number.			
CAT 5e cables			
• CAT 5e Cable 4 ft RJ 45 M/M	C7533A		
• Factory Integrated		OD1	
• CAT 5e Cable 7 ft RJ 45 M/M	C7535A		
• Factory Integrated		OD1	
• CAT 5e Cable 14 ft RJ 45 M/M	C7536A		
• Factory Integrated		OD1	
• CAT 5e Cable 25 ft RJ 45 M/M	C7537A		
• Factory Integrated		OD1	
• CAT 5e Cable 50 ft RJ 45 M/M	C7542A		
• Factory Integrated		OD1	
• CAT 5e C/O Cable 7 ft RJ 45 M/M	C7539A		
• Factory Integrated		OD1	
• CAT 5e C/O Cable 14 ft RJ 45 M/M	C7538A		
• Factory Integrated		OD1	
• CAT 5e C/O Cable 7 ft RJ 45 M/M	C7542A		
• Factory Integrated		OD1	
ThinLAN Cables and Accessories			
ThinLAN Coax Cable (with BNC connectors installed):			
• 1 m coax cable	92227A		
• 2 m coax cable	92227B		
• 4 m coax cable	92227C		
• 8 m coax cable	92227D		
• 16 m coax cable	92227E		
• 32 m coax cable	92227F		
• 128 m coax cable	92227H		
ThinLAN Accessories			
• BNC "T" Connector	92227N		
• ThinLAN Terminator Pair	92227P		
• Backbone LAN MAU and Tap, ThickLAN	30241A		
Backbone LAN AUI Cables (with connectors attached) for use with 30241A:			
• 6 m FEP AUI Cable	92254A		
• 12 m FEP AUI Cable	92254B		
• 48 m FEP AUI Cable	92254D		
• 6 m PVC (11) AUI Cable	92254E		
• 12 m PVC AUI Cable	92254F		
• 48 m PVC AUI Cable	92254H		
Backbone LAN Coax Cables (including connectors and terminators) ThickLAN			
• 500 m FEP without terminators attached	92253D		
• 500 m PVC without terminators attached	92253H		
Backbone LAN Coax Cable Tools for attaching connectors (order once):			
• N-Connectors, male, package of four	92253J		
• Barrel N-Connectors, female, and insulators, package of two	92253K		
• One grounding terminator and one floating point terminator with insulator	92253L		
For information on adapters, bridges, hubs, routers, switches, and transceivers, refer to Chapter 7, Networking and Communications			

Subchapter 4.17—Fibre Optic Cables

	Description	Product #	Opt #	Price
	Order a OD1 option for factory integration of cables or terminators. If factory integration is available, the OD1 option is listed below the cable product number.			
	Fibre Optic cables			
	SC/SC Connector			
•	Fibre Optic Cable 2m SC Duplex 50/125 M/M Factory Integrated	A3583A	OD1	
•	Fibre Optic Cable 16m SC Duplex 50/125 M/M	A3531A		
•	Fibre Optic Cable 50m SC Duplex 50/125 M/M Factory Integrated	A3735A	OD1	
	Fibre Optic Cable 100m SC Duplex 50/125 M/M	A3736A		
•	Factory Integrated		OD1	
	LC/LC Connector			
•	Fibre Optic Cable 2m LC Duplex 50/125 M/M Factory Integrated	C7524A	OD1	
•	Fibre Optic Cable 16m LC Duplex 50/125 M/M Factory Integrated	C7525A	OD1	
•	Fibre Optic Cable 50m LC Duplex 50/125 M/M	C7526A		
•	Fibre Optic Cable 200m LC Duplex 50/125 M/M	C7527A		
	LC/SC Adapter and Extenders			
•	Fibre Optic Cable LC/SC 2m Duplex 50/125 M/M Factory Integrated	C7529A	OD1	
•	Fibre Optic Cable LC/SC 16m Duplex 50/125 M/M Factory Integrated	C7530A	OD1	
•	Fibre Optic SC F/F Coupler Factory Integrated	C7534A	OD1	
•	Fibre Optic Cable Kit: Includes a 2m LC/SC Fibre Optic Cable and a Fibre Optic SC F/F Coupler Factory Integrated	C7540A	OD1	



hp storage virtual array 7100



key features and benefits

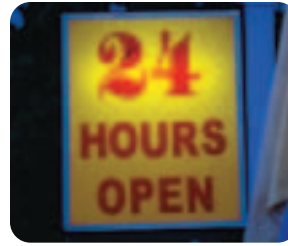
- **predictable:** double parity RAID 5 DP offers more data protection than traditional RAID 5 arrays
- **flexible:** unique AutoRAID virtual array technology has the fastest time-to-ready in the industry
- **available:** delivers 99.95% uptime; even more in mirrored MC/Serviceguard configurations
- **reliable:** end-to-end checksums keep data intact across the entire data path, 24 x 7
- **affordable:** costs less than products that offer less availability, security, and manageability

the storage choice for heterogeneous environments

The HP Surestore Virtual Array 7100 uses virtual array technology to deliver the best availability and manageability of your data, making it an ideal choice for heterogeneous environments. A single VA 7100 delivers extremely high availability: up to 99.95% uptime. If you combine two or more VA 7100s in a mirrored MC/Serviceguard environment, with two or more hosts and two switches, your availability can go even higher.

HP's online hot-swappable architecture virtually eliminates planned downtime. HP's virtual array technology lets you create new files or LUNs quickly, without worrying about the underlying physical technology. You can even mix drive sizes or download a firmware upgrade, all without interrupting service. Traditional disk array technology can't do that.

hp virtual array 7100



available

technical specifications

native capacity	Up to 1,095 GB raw
external I/O ports	Two 100 MB/s Fibre Channel ports
sustained performance	90 MB/s read
memory cache	Up to 1 GB mirrored cache
compatible operating systems	HP-UX 10.20, 11.0 and 11i; Red Hat Linux 6.2; HP MPE/iX 6.5 and 7.0; Microsoft® Windows NT® 4.0 and Windows® 2000; Sun Solaris 2.6, 7, and 8; IBM AIX; Novell NetWare
power consumption	8.2A RMS @ 2 power cords 36A peak
power supply	100–240V AC auto-ranging, 50–60 Hz
compatible network mgt. tools	HP OpenView Network Node Manager, HP Toptools, CA Unicenter, IBM Tivoli
dimensions (h × w × d)	5.0 × 18.9 × 27.2 in (127 × 480.1 × 691 mm)
weight	101.6 lb (46.1 kg)
cache (internal)	1 GB cache per controller
temperature range	Operating: 41 to 95°F (5 to 35°C) Storage: –40 to 158°F (–40 to 70°C)
humidity range	Operating: 10 to 80% @ 28°C (wet bulb) Storage: 10 to 90% @ 28°C (wet bulb)
acoustic power emissions	8.0 dB(A)
compatible network backup options	HP OpenView Omniback II
software included	HP Surestore Command View SDM



product numbers

product number	product name	description
A6261A	Virtual Array 7100 with 256 MB cache	Virtual array base enclosure with 2 controllers, each with 256 MB mirrored cache
A6262A	Virtual Array 7100 with 512 MB cache	Virtual array base enclosure with 2 controllers, each with 512 MB mirrored cache
A6263A	Virtual Array 7100 with 1024 MB cache	Virtual array base enclosure with 2 controllers, each with 1024 MB mirrored cache
A6191A	18 GB 15K rpm Fibre Channel disk drive	18 GB 15K rpm Fibre Channel disk drive
A6192A	36 GB 10K rpm Fibre Channel disk drive	36 GB 10K rpm Fibre Channel disk drive
A6193A	36 GB 15K rpm Fibre Channel disk drive	36 GB 15K rpm Fibre Channel disk drive
A6194A	73 GB 10K rpm Fibre Channel disk drive	73 GB 10K rpm Fibre Channel disk drive



hp virtual array 7100



flexible

additional information

what's in the box

Two virtual array controllers, two power supplies, two fans, power cords, printed manuals, software CD, manuals on CD, and the number and type of disk drives that the customer has chosen

accessories

Deskside cabinet for virtual array series A6196A; Software GBIC for virtual array series A6203A; 2m FC fiber optic cable A3583A; 16m FC fiber optic cable A3531A; 50m FC fiber optic cable A3735A; 100m FC fiber optic cable A3736A; Virtual array processor/link control card filler panel A6197A; Disk slot filler panel A6198A

supplies

N/A

safety

IEC 60950 (1991) 2nd Edition, 1992-A1, 1993-A2, 1995-A3, 1996-A4
CSA C22.2 No. 950-95; UL 1950-95

warranty features— hp service and support

3-year, on-site limited warranty from HP or authorized resellers; next-business-day response during standard business hours

warranty options

3-year on-site, 4-hour response time, standard business hours

for more information

For more information on HP storage products, contact any of our worldwide sales offices or visit our Web site at: www.hp.com/go/storage or www.hp.com/go/diskarrays



hp storage
virtual array 7400



key features and benefits

- **predictable:** spreads data across all available spindles to boost performance, minimize “hot spots”
- **efficient:** provides simultaneous heterogeneous array sharing for cost-effective management
- **manageable:** offers cost-effective remote management capabilities
- **available:** provides high-availability observatory support; hot-swappable, redundant components
- **reliable:** delivers greater reliability with RAID 5 double parity and end-to-end data integrity
- **compatible:** integrates into your management environment with HP array management software
- **expandable:** allows online storage capacity upgrades with mixed-capacity disk drives

high-performance, low-cost virtual array

The HP Surestore Virtual Array 7400 is a low-cost, high-capacity, high-performance array capable of delivering up to 99.95% uptime or higher. An ideal choice for environments requiring heterogeneous operating systems, the va7400 allows you to mix and match disk drives, add capacity instantly, and perform online firmware upgrades fast. HP’s hot-swap technology reduces planned downtimes, and our virtual array technology simplifies management and administration of the array.

HP’s online hot-swappable architecture virtually eliminates planned downtime.

HP’s virtual array technology lets you create new files or LUNs quickly, without worrying about the underlying physical technology. You can even mix drive sizes or download a firmware upgrade, all without interrupting service. Traditional disk array technology can’t do that.

hp virtual array 7400



low-cost

technical specifications

native capacity	7.7 TB
external I/O ports	Two 200 MB/s Fibre Channel ports
sustained performance	170 MB/s read
memory cache	Up to 1 GB mirrored cache
compatible operating systems	HP-UX 10.20, 11.0, and 11i; Red Hat Linux 6.2 and 7.0; Microsoft® Windows NT® 4.0 and Windows® 2000; Sun Solaris 2.6, 7, and 8; IBM AIX; Novell NetWare
power consumption	738 VA (8.2A RMS 90V AC)
power supply	100–240V AC auto-ranging, 50–60 Hz
compatible network mgt. tools	HP OpenView Network Node Manager, HP Tootools, CA Unicenter, IBM Tivoli
dimensions (h × w × d)	5 × 19 × 27 in (480 × 691 × 120 mm)
weight	120 lb (46.1 kg)
cache (internal)	1 GB cache per controller
temperature range	Operating: 5°C to 35°C Storage: –40°C to 70°C
humidity range	Operating: 10 to 80% @ 28°C (wet bulb) Storage: 10 to 90% @ 28°C (wet bulb)
acoustic power emissions	8.0 dB(A)
compatible network backup options	HP OpenView Omniback II
software included	HP Surestore Command View SDM

hp virtual array 7400



high-capacity

product numbers

product number	product name	description
A6264A	Virtual Array 7400 Field-racked, with 512 MB cache	Field-racked va7400 dual controller 512 MB cache
A6264AZ	Virtual Array 7400 Factory-racked, with 512 MB cache	Factory-racked va7400 dual controller 512 MB cache
A6264AE	Virtual Array 7400 Non-integrated, with 512 MB cache	Field-racked va7400 dual controller 512 MB cache; ships non-integrated only
A6265A	Virtual Array 7400 Field-racked, with 1024 MB cache	Field-racked va7400 dual controller 1024 MB cache
A6265AZ	Virtual Array 7400 Factory-racked, with 1024 MB cache	Factory-racked va7400 dual controller 1024 MB cache
A6265AE	Virtual Array 7400 Non-integrated, with 1024 MB cache	Field-racked va7400 dual controller 1024 MB cache; ships non-integrated only
A6183A	Virtual Array 7400 base enclosure	Field-racked va7400 base enclosure
A6183AZ	Virtual Array 7400 base enclosure	Factory-racked va7400 base enclosure
A6183AE	Virtual Array 7400 base enclosure	Field-racked va7400 base enclosure; ships non-integrated only
A6186A	512 MB cache for va7400	512 MB cache
A6187A	1024 MB cache for va7400	1024 MB cache
A6189A	Virtual Array 7400 processor	Virtual Array 7400 processor
A6214A	Disk System 2400	Disk System 2400 with dual 1 GB/s link control cards
A6191A	18 GB 15K rpm Fibre Channel disk drive	18 GB 15K rpm Fibre Channel disk drive
A6192A	36 GB 10K rpm Fibre Channel disk drive	36 GB 10K rpm Fibre Channel disk drive
A6193A	36 GB 15K rpm Fibre Channel disk drive	36 GB 15K rpm Fibre Channel disk drive
A6194A	73 GB 10K rpm Fibre Channel disk drive	73 GB 10K rpm Fibre Channel disk drive



hp virtual array 7400



simplified

additional information

what's in the box

Array enclosure, two power supplies, two fans, power cords, printed manuals, software CD, manuals on CD, and the number and type of disk drives that the customer has chosen

For those customers requiring capacities in excess of 1.1 TB, the solution includes the HP Surestore Disk System 2400

accessories

For enterprise products

Disk slot filler panel A6198A; 2m FC fiber optic cable multi-mode duplex LC-SC C7529A; 16m FC fiber optic cable multi-mode duplex LC-SC C7530A; FC fiber optic coupler F/F SC-SC C7534A; FC adapter kit (includes C7529A and C7534A) C7540A

supplies

None

safety

IEC 60950 (1991) 2nd Edition, 1992-A1, 1993-A2, 1995-A3, 1996-A4, CSA C22.2 No. 950-95; UL 1950-95

warranty features— hp service and support

H4726A—2-year, on-site limited warranty from HP or authorized resellers; same-business-day response during standard business hours

warranty options

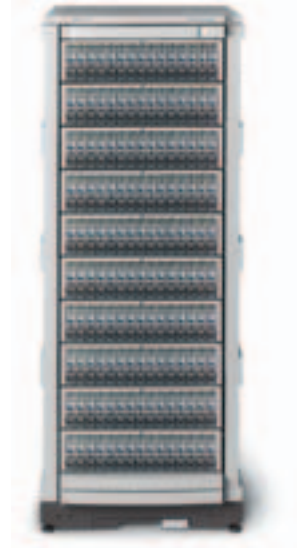
H4405A—1-year 24 x 7
H4405J—2-year 24 x 7
H4405Y—3-year 24 x 7
H4403A—3-year same-day

for more information

For more information on HP Surestore virtual arrays, contact any of our worldwide sales offices or visit our Web site at: www.hp.com/go/storage or www.hp.com/go/diskarrays



hp storage
hp virtual array 7410



key features and benefits

- **available:** provides high-availability support with hot-swappable, redundant components
- **compatible:** integrates into your management environment with hp array management software
- **efficient:** provides simultaneous heterogeneous disk array sharing for cost-effective management
- **expandable:** allows online storage capacity upgrades with mixed-capacity disk drives
- **connectable:** has four host ports, enabling larger numbers of host and SAN connections
- **manageable:** offers cost-effective remote management capabilities
- **predictable:** spreads data across all available spindles to boost performance, minimize "hot spots"
- **reliable:** delivers greater reliability with RAID 5 double parity and end-to-end data integrity

high-performance, low-cost virtual disk array

The HP StorageWorks Virtual Array 7410 is a low-cost, high-capacity, high-performance, multi-port 2 Gbps Fibre Channel virtual disk array that delivers up to 99.995% uptime. An ideal choice for environments requiring heterogeneous operating systems, the va7410 allows you to mix and match disk drives and add capacity instantly. HP's hot-swap technology reduces planned downtime, and our virtual array architecture simplifies management and administration of the array.

The va7410 has four host ports to enable simplified and more extensive server and storage area network (SAN) connectivity. These ports support either 1 Gb or 2 Gb Fibre Channel devices. With four back-end disk ports and faster array controllers, the va7410 is capable of up to 34,000 cached I/Os per second and up to 330 MBps sequential throughput.

hp va7410



simplicity

technical specifications

native capacity	7.7 TB
external I/O ports	Four 2 Gb or 1 Gb Fibre Channel ports
sustained performance	330 MBps read
memory cache	Up to 2 GB mirrored cache per controller
RAID levels	RAID 1+0 and RAID 5DP (double parity)
maximum disks per array	105
available disk mechanisms	36 GB, 10K rpm; 36 GB, 15K rpm; 73 GB, 10K rpm
compatible operating systems	HP-UX, Windows NT®, Windows® 2000, Linux, Solaris, AIX, HP MPE/iX (secondary release), NetWare (secondary release)
current (maximum)	6.85 A @ 100 Vac; 2.98 A @ 200 Vac (current rating is with two inputs [power cords])
power consumption	670 W
power supply	100 to 240 Vac auto-ranging, 50 to 60 Hz
compatible network management tools	HP OpenView Network Node Manager, HP Tootools, CA Unicenter, IBM Tivoli
dimensions (h × w × d)	5.0 × 17.6 × 26.0 in (12.8 × 44.8 × 66.0 cm)
weight	92.3 lb (41.8 kg) minimum; 103.5 lb (46.9 kg) maximum
temperature range	41 to 95°F (5 to 35°C) (operating) −40 to 158°F (−40 to 70°C) (storage)
humidity range	10 to 80% @ 82°F (28°C) (wet bulb) (operating) 10 to 90% @ 82°F (28°C) (wet bulb) (storage)
acoustic power emissions	8.0 B(A)

hp va7410



availability

product numbers

product number	product name	description
A6267A	Virtual Array 7410	Field-rackable va7410 dual controller, 1024 MB cache
A6267AZ	Virtual Array 7410	Factory-racked va7410 dual controller, 1024 MB cache
A6267AE	Virtual Array 7410	Field-rackable va7410 dual controller, 1024 MB cache; ships non-integrated only
A6268A	Virtual Array 7410	Field-rackable va7410 dual controller, 2048 MB cache
A6268AZ	Virtual Array 7410	Factory-racked va7410 dual controller, 2048 MB cache
A6268AE	Virtual Array 7410	Field-rackable va7410 dual controller, 2048 MB cache; ships non-integrated only
A6183A	VA enclosure	Field-rackable VA family base enclosure
A6183AZ	VA enclosure	Factory-racked VA family base enclosure
A6183AE	VA enclosure	Field-rackable va7410 family base enclosure; ships non-integrated only
A6187B	1024 MB cache for Virtual Array 7410	1024 MB cache (single DIMM)
A6218A	Virtual Array 7410 virtual array processor	va7410 virtual array processor
A6250A	Disk System 2405	ds2405 with dual 2 GBps link control cards, field rackable
A6250AZ	Disk System 2405	ds2405 with dual 2 GBps link control cards, factory racked
A6250AE	Disk System 2405	ds2405 with dual 2 GBps link control cards, ships non-integrated only; order cables separately
C7524A	2m Fibre Channel LC/LC duplex 50/125 M/M	FC cable for ds2405 (must order two per ds2405)
A6192A	36 GB 10K rpm Fibre Channel disk drive	36 GB 10K rpm Fibre Channel disk drive
A6193A	36 GB 15K rpm Fibre Channel disk drive	36 GB 15K rpm Fibre Channel disk drive
A6194A	73 GB 10K rpm Fibre Channel disk drive	73 GB 10K rpm Fibre Channel disk drive



hp va7410



compatibility

additional information

what's in the box

Array enclosure, two power supplies, two fans, power cords, printed manuals, software CD, manuals on CD, the number and type of disk drives that the customer has chosen, disk slot filler panels

For those customers requiring capacities in excess of 1.1 TB, the solution includes the HP StorageWorks Disk System 2405

accessories

For enterprise products:

Note: the following cables are for use between the ds2405 and va7410 enclosures or between va7410 enclosures and server or SAN components.

Fiber optic cable, LC to LC, M/M, 2m C7524A; fiber optic cable, LC to LC, M/M, 16m (52 ft) C7525A; fiber optic cable, LC to LC, M/M, 50m C7526A; fiber optic cable, LC to LC, M/M, 200m C7527A; fiber optic coupler, SC to SC, F/F C7534A; fiber optic adapter kit (C7529A + C7534A), LC to SC, M/F 2m (79 in) C7540A

safety

IEC 60950 (1991) 2nd Edition, 1992-A1, 1993-A2, 1995-A3, 1996-A4; CSA C22.2 No. 950-95; UL 1950-95

warranty features— hp service and support

2-year, on-site, limited warranty from HP or authorized resellers; same-business-day response during standard business hours and Command View SDM phone-in-assistance

warranty and support options

Warranty

- 2-year, 8 x 5, same-day, 4-hour on-site response with Command View SDM phone-in assistance (PIA)

Hardware and mission critical support/warranty upgrade offerings

- 1-, 2-, or 3-year, 4-hour on-site response, 24 x 7 phone-in assistance
- Storage critical support (SCS for VA):
 - 1-, 2-, 3-, 4-, or 5-year, assigned account team, on-site, 6-hour call-to-repair, 6 hours ASE consulting, storage map maintenance
- Business continuity support (BCS):
 - Services that include assigned account team, operational assessment, change management assistance, system monitoring, and preventive assistance with the High Availability Observatory (HAO)

Software support offerings

- 1-, 2-, or 3-year, 8 x 5, same-day support with phone-in assistance
- 1-, 2-, or 3-year, 24 x 7, same-day support with phone-in assistance

for more information

For more information on HP StorageWorks virtual arrays, contact any of our worldwide sales offices or visit our Web site at: www.hp.com/go/diskarrays

hp command view SDM

storage device management

keep your storage under control

simplify storage management

The more complicated your storage network gets, the more management it requires—and the harder it is for you to manage it. What you need is a single device management tool that lets you monitor and control your entire storage network right from your desktop. What you need is HP StorageWorks Command View Storage Device Management (SDM).

HP Command View SDM makes it easy for you to manage all of your modular storage. It also integrates into HP Storage Area Manager (SAM) and enterprise network management frameworks to protect your investment in these tools and provide a common user interface.

simple and flexible device management with hp command view SDM



features

common look and feel GUI

**easy to install,
configure, and use**

**proactive monitoring
and event notification**

**performance monitoring
and logging**

launches value-added software

benefits

one common user interface for all of your storage management tasks—by direct attached storage or remote Web browser access

get the job done fast so you can focus on other business issues

notifies you automatically when problems occur and interfaces with SNMP-standard notification applications

historical performance logs can be exported into spreadsheets and viewed from a command line interface (CLI), graphical user interface (GUI), or a Web browser

control HP Business Copy VA and Secure Manager VA from within the Command View SDM window



uncommonly powerful device management

You'll never have to waste time learning a different tool for each new task again. HP Command View SDM provides a single, easy-to-use device management architecture for HP's modular virtual arrays (VAs). HP Command View SDM dramatically reduces the learning curve and lets you manage more storage in less time.

easy does it

HP Command View SDM follows the look and feel of the HP Toptools graphical user interface (GUI) and takes full advantage of the self-managing technology built into HP virtual arrays. The result is the industry's easiest array management solution, with status at a glance and active graphic displays so you can easily monitor any device on the network. There's never been a simpler or more comprehensive device management tool for monitoring your storage environment.

proactive

Your system is important to you—and to HP. So we built HP Command View SDM to proactively monitor your system and automatically notify you if anything goes wrong. HP Command View SDM also integrates via SNMP with your network and system management tools, with SAN tools, and with HP-UX system management tools such as HP-UX SAM and Muxplex.

the strength of the family

HP Command View SDM software is part of the HP family of virtual array hardware and software products, a complete worry-free storage solution.

hp virtual arrays

HP virtual arrays greatly increase both the availability and manageability of your data. They're an ideal choice for enterprise HP-UX 11.0 and 11i, Windows® 2000 and Windows NT® 4.0, Solaris 7.0 and 8.0, and Red Hat Linux 7.1.

hp enterprise management integrations

HP Command View SDM has been integrated with the leading network and systems management tools, empowering you to manage your network and storage from a single management console. Integrations include HP OpenView Network Node Manager (NNM), HP Toptools, CA Unicenter TNG, Tivoli NetView, and BMC Patrol.

hp command view SDM gives you what you need to make storage management the least of your worries

- **always available**—HP Command View SDM uses the same GUI for both direct host attached or remote Web browser access, so you can manage your entire network from anywhere on the network.
- **always secure**—HP Command View SDM works with HP's Secure Manager VA software to provide secure host access in both direct attached and SAN environments.
- **always scalable**—HP Command View SDM easily spans across your storage system as it grows from midrange to enterprise class.
- **always economical**—Each HP virtual array includes a single-host license of HP Command View SDM, and you can add additional host licenses (sold separately) as your environment grows.

proactive



hp auto path virtual array

HP Auto Path VA automatically manages multiple I/O paths, balances loads dynamically for peak efficiency, and instantly routes I/O around any path failure for maximum uptime.

hp business copy virtual array

With HP Business Copy VA, you can replicate entire array-based LUNs for development, testing, or backup while the system is up and running—zero downtime.

hp secure manager virtual array

Airtight security controls server access on a LUN-by-LUN basis and supports simultaneous heterogeneous array sharing for easy compatibility.

performance monitoring and logging

Even the most detailed performance monitoring information is useless if it's difficult to read. HP Command View SDM doesn't just tell you how your data is being used—it shows you. All you have to do is click on the performance tab, choose the historical performance data you want to graph, and you'll instantly see the workload of your entire array.

simple setup

Installation is quick—just four easy steps:

1. install HP Command View SDM
2. select a device to manage
3. set up a LUN
4. start writing data

Installation wizards guide you through the whole process!

the ultimate goal

You know what you need from a device management tool—a simple tool that's easy to use, with proactive monitoring and notification. One that integrates

into your network management applications and offers performance monitoring and logging. One that's compatible with your computer system, other HP virtual array software, and HP SAN products. One from a company you can rely on. HP Command View SDM.

get everything you need in a device management tool with hp command view SDM

ready to go

specifications

requirements

HP-UX 11.0 and 11i:

All HP PA-RISC computers

Windows NT 4.0 and 2000, Red Hat Linux 7.1

kernel 2.4.2:

Intel® Pentium® III, 500 MHz computers or above

Solaris 7.0 and 8.0:

(supported through HP-UX, Windows, or Linux management station)

1024x768 video resolution

64k colors

256 MB system memory

60 MB free disk space

16 MB disk space per month for performance logs

HP Virtual Array 7100 or 7400

software compatibility

HP Command View SDM

HP Business Copy Virtual Array

HP Secure Manager Virtual Array

HP Auto Path Virtual Array

HP Tiptools

HP OpenView Storage Node Manager

HP OpenView LUN Manager

HP OpenView Storage Optimizer

HP OpenView Storage Builder

Tivoli NetView

BMC Patrol



www.hp.com/go/storage

Intel and Pentium are U.S. registered trademarks of Intel Corporation. Windows and Windows NT are U.S. registered trademarks of Microsoft Corporation.

The information contained in this document is subject to change without notice.

© Copyright Hewlett-Packard Company 2002
07/02

5981-2692EN

hp secure manager virtual array

hp secure manager virtual array

bulletproof data security for shared array environments

The more people in your company who can access your data, the more valuable it is. Unfortunately, the more valuable your data is, the more vulnerable it becomes to individuals who may want to gain unauthorized access. If you want to share your virtual array with multiple hosts, you need a bulletproof security manager. You need HP Surestore Secure Manager Virtual Array (VA).

HP Secure Manager VA lets you set LUN permissions within the array to protect your most sensitive data. As a bonus, it also guards against LUNs being deleted by unauthorized servers or users, whether by accident or intentionally. Don't leave your precious data unprotected—put HP Secure Manager VA on the case.



features	benefits
LUN-level data security	the highest level of data security available
multiple secure connections	create multiple secure LUNs for your virtual array using up to 128 World Wide Names (WWNs); refer to ordering and configurations guides for specifics
fully integrated into hp command view storage device management (SDM)	uses a single point of management from the command line or enhanced GUI
50 GB demo version	try hp secure manager VA in a trial version, including software, manual, and 90-days of phone support



who do you trust with your data?

There's no one you trust more than yourself. So HP Secure Manager Virtual Array puts you in control of which servers see which LUNs inside your shared virtual array. You can change access permissions at any time to allow other servers to configure their LUN, read or write data to their LUN, or no longer read from the LUN they were authorized to access.

Every time you set up a new LUN, you can easily set read, write, configuration, and access security parameters on a LUN-by-LUN basis. Each physical connection authorized to access the shared virtual array has its World Wide Name recorded and is granted access only to the LUNs it's authorized to see. And because each World Wide Name is unique, it's like having a fingerprint on the file that can't be duplicated.

you're in command

HP Secure Manager VA software runs in HP Command View SDM. Not only can you configure and manage your LUN security environment, but you can do it from a single point of contact—without having to learn a new program. All HP Secure Manager VA commands can be managed from HP Command View SDM's command line or enhanced graphical user interface—whichever works best for you.

the best security

Standard file-system-based data security products can be circumvented by people hacking into your Storage Area Network (SAN) or server. But HP Secure Manager VA gives you bulletproof array-based data security at the LUN level. So even if someone hacks into your SAN or server, they won't be able to access your data. That's security you can count on.

the strength of the family

HP Secure Manager VA software is part of the HP family of virtual array hardware and software products, a complete worry-free storage solution.

hp virtual arrays

HP virtual arrays greatly increase both the availability and manageability of your data. They're an ideal choice for enterprise HP-UX 11.0 and 11i; Windows NT® 4.0 and Windows® 2000; Solaris 2.6, 7.0, and 8.0; Novell NetWare 5.0 and 5.1; IBM AIX 4.3.3; and Red Hat Linux 6.2 and 7.1.

hp secure manager virtual array always gives you what you need to make data security the least of your worries:

- **always available**—HP Secure Manager VA lets you change access permissions at any time, so your data is always available—only to the people you want to have it.
- **always scalable**—We designed HP Secure Manager VA to support entry-level virtual arrays and scale easily to maximized configurations.
- **always economical**—For a cost-effective solution, start with an affordable configuration and add capacity licenses as your environment grows.
- **always fast**—Powerful features make installation and configuration easy for a short time to solution. Don't wait until it's too late to make your data safe.

control



hp command view SDM integration

HP Secure Manager VA is integrated with Command View SDM, a device management tool for modular HP storage.

don't take our word for it

If you're not sure about buying a full-priced license, there's a simple solution. Just try out our demo version—it'll let you experience first-hand the peace of mind you get from having HP Secure Manager VA protecting your data. It comes with everything you need to get started, including 90-day phone support. Easily secure LUNs up to a 50-GB limit with the demo, and upgrade to the full version when you need more capacity.

share with confidence

With HP Secure Manager VA, you can share your virtual array with up to 128 servers on the va7100 or va7400 with up to 128 secure LUNs on the va7100 and 1,024 secure LUNs on the va7400—and you can isolate each LUN from each and every server as you wish.

guaranteed

Most software doesn't have a guarantee these days. Then again, most companies aren't HP. If you are not satisfied with the quality of your HP Secure Manager VA software, for any reason, you may return it for a full refund anytime within the first 90 days.

virtual array family data security software

When it comes to your most valuable data, you can't skip on security. You need array-based data security that works at the LUN level so you can share a single array between multiple Windows and non-Windows servers with maximum protection.

You need easy management of security settings on a LUN-by-LUN basis, integrated into HP Command View SDM. You need compatibility with your computer system and other HP virtual array software. And most important, you need it to be backed by a company with an uncompromised reputation for integrity.

secure your data and your peace of mind with hp secure manager virtual array

**share with
confidence**

system requirements

HP-UX 11.0 and 11i:

All HP PA-RISC computers

Microsoft® Windows NT and 2000; and Red Hat Linux 6.2 and 7.1:

Intel® Pentium® III, 500 MHz computers or above

Solaris 2.6, 7.0, and 8.0:

(supported through HP-UX, Windows, or Linux management station)

Novell NetWare 5.0 and 5.1; IBM AIX 4.3.3:

(both require a separate management station)

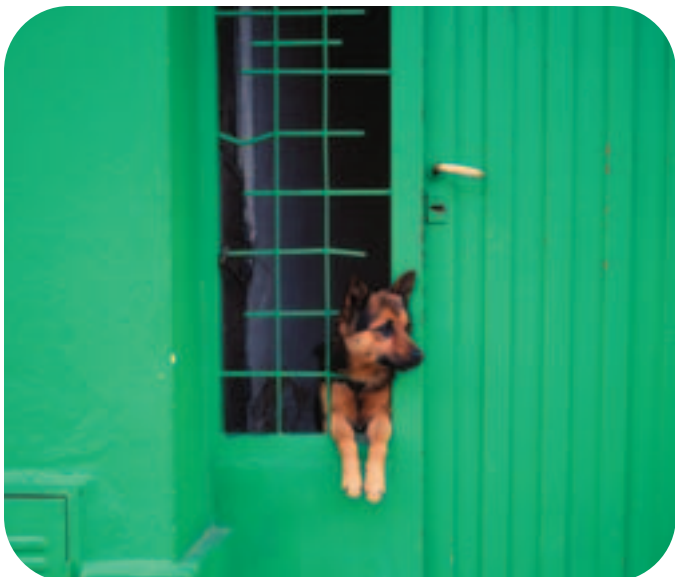
1024 x 768 video resolution

64K colors

256 MB system memory

60 MB free disk space

HP Secure Manager Virtual Array



www.hp.com/go/storage

Intel and Pentium are U.S. registered trademarks of Intel Corporation. Microsoft, Windows, and Windows NT are U.S. registered trademarks of Microsoft Corporation.

The information contained in this document is subject to change without notice.

© Copyright Hewlett-Packard Company 2002
01/02

5980-9493EN

hp business copy virtual array

array-based data replication for hp virtual arrays

HP Surestore Business Copy Virtual Array makes nearly instantaneous copies of LUNs for development, testing, or backup, without taking your system down. Until recently, this capability has only been offered on very high-end storage arrays. The good news is, not anymore.

HP Business Copy VA is one of the first software products that offers array-based copy and restores functionality to modular storage arrays. Unlike file system copies that hog the I/O path, HP Business Copy VA replicates entire LUNs nearly instantly; while the system is online, all data movement is handled by the virtual array.

simple and flexible device management with hp business copy virtual array



features benefits

array-based data replication

makes nearly instantaneous online copies and restores within a single virtual array

full hp command view SDM integration

allows you to manage, replicate, delete, and restore LUNs from the command line (CLI) or graphical user interface (GUI)

50 GB demo version

try HP Business Copy VA before you buy—including software, user manual, and 90-day phone support

custom backup integration tools

provides maximum investment protection, performance, and scalability

optional hp backup integration services

save time and resources integrating your backup solution when you choose our services



hp command view SDM integration

HP Business Copy VA brings to modular storage arrays unprecedented power that is easy to harness. Everything can be controlled right from the standard HP Command View SDM software device management interface. HP Command View SDM offers both command line and graphical user interfaces, so you can use whichever is easier for you.

replication goes both ways

HP Business Copy VA uses point-in-time copy technology to create nearly instantaneous copies of source LUNs. Entire LUNs can be copied, without clogging your I/O paths—and without taking your array offline. You can easily use your replicated LUNs for parallel development, for testing new software releases, or for your online backup application.

The same point-in-time copy technology that makes fast online copies works in reverse to make restores just as fast. With HP Business Copy VA you can restore a LUN from damage by a destructive virus or other forms of data loss with the bare minimum of I/O interruption.

hp integration services

The only thing easier than integrating your HP virtual array into your backup application environment is having HP do it for you. Why struggle to make everything work? HP offers backup integration services for the busy IT professional with existing Omniback II and VERITAS NetBackup environments.

the strength of the family

HP Business Copy VA software is part of the HP family of virtual array hardware and software products, a complete worry-free storage solution.

hp virtual arrays

HP virtual arrays greatly increase both the availability and the manageability of your data. They're an ideal choice for enterprise HP-UX 11.0 and 11i; Windows® 2000 and NT® 4.0; Solaris 2.6, 7.0, and 8.0; Red Hat Linux 6.2; AIX 4.3.3; and NetWare 5.0 and 5.1.

hp command view SDM

A single device management tool for modular HP storage, HP Command View SDM simplifies local and remote management and integrates into HP SANs and enterprise network management applications.

hp enterprise management smart plug-ins

HP Smart Plug-ins automatically discover and launch HP Command View SDM and pass all virtual array device information through to HP OpenView NNM, HP Tiptools, CA Unicenter TNG, Tivoli NetView, or BMC Patrol.

hp auto path virtual array

HP Auto Path VA automatically manages multiple I/O paths, balances loads dynamically for peak efficiency, and instantly routes I/O around any path failure for maximum uptime.

hp business copy va gives you what you need to make data replication the least of your worries—always:

- **always available**—HP Business Copy VA lets you run copy and restore jobs without taking down your system.
- **always secure**—HP Business Copy VA works seamlessly with HP's Secure Manager VA to provide secure host access in direct connect and SAN environments.
- **always manageable**—HP Business Copy VA is fully integrated with HP Command View SDM, which provides a familiar HP Tiptools GUI look and feel for easy navigation.
- **always scalable**—HP Business Copy VA works with virtual array configurations, from the simplest to the most complex.
- **always economical**—HP Business Copy VA lets you start with an affordable configuration, and you add capacity licenses as your environment grows.
- **always fast**—Powerful ease-of-use features make installation and configuration easier for fast storage deployment.

integration



hp secure manager virtual array

This airtight security controls server access on a LUN-by-LUN basis and supports simultaneous heterogeneous array sharing for easy compatibility.

try it out

If you're not sure about buying a full-priced license, there's a simple solution. Just try our demo version—it'll let you experience first-hand the power of HP Business Copy VA. Just ask for our 50 GB demo version. It comes with everything you need to get started—including 90-day phone support—and offers the full power of HP Business Copy VA, with a 50 GB limit on LUN copies.

tools for the IT professional

If you have experience scripting device-level controls, you'll appreciate the Backup Integration Tool Set that comes with HP Business Copy VA.

HP gives you everything you need to integrate HP Business Copy VA into your backup environment, including examples of how to create, delete, and restore virtual array LUN copies using standard SNMP commands.

guaranteed

Most software doesn't have a guarantee these days. But then, most companies aren't HP. If you are not satisfied with the quality of your HP Business Copy VA software, for any reason, you can return it for a full refund anytime within the first 90 days.

power you need today

Now that you can have the power of array-based replication for your modular storage array, how could you afford not to have all of its advantages? Nearly instant online data replication, nearly instant data restoration, complete integration into HP Command View SDM, optional HP backup integration services with backup integration tools, and a software developers kit. All from the company you trust with your most important data.

unprecedented replication power—hp business copy virtual array

power

specifications

requirements

HP-UX 11.0 and 11i:

All HP PA-RISC computers

Windows NT and 2000; Red Hat Linux 6.2:

Intel® Pentium® III, 500 MHz computers or above

Solaris 2.6, 7.0, and 8.0; AIX 4.3.3; NetWare 5.0

and 5.1: (supported through HP-UX, Windows, or Linux dedicated management station)

1024x768 video resolution

64K colors

256 MB system memory

60 MB free disk space

HP Virtual Array 7000 family

software compatibility

HP Command View SDM

HP Business Copy Virtual Array

HP Secure Manager Virtual Array

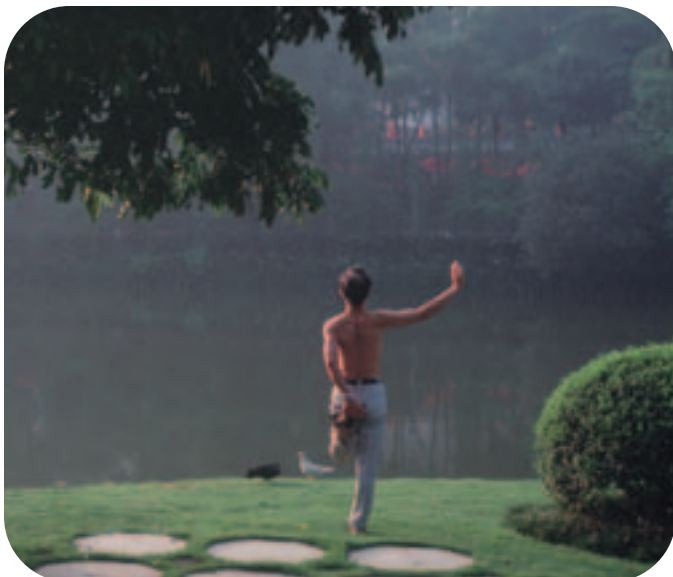
HP Auto Path Virtual Array

HP Tiptools

HP OpenView Network Node Manager

Tivoli NetView

BMC Patrol



www.hp.com/go/storage

Intel and Pentium are U.S. registered trademarks of Intel Corporation. Windows and Windows NT are U.S. registered trademarks of Microsoft Corporation.

The information contained in this document is subject to change without notice.

© Copyright Hewlett-Packard Company 2002

01/02

5980-9045EN

hp storage

hp auto path virtual array

keep your system up and running—automatically

When your system goes down it's always at the worst possible time. And when it does, every minute until it's back up costs you money. Add up enough downtime and it could even cost you your job. How failsafe is your system?

Every chain is only as strong as its weakest link. In most configurations, that weak link is the I/O path. Even if you already have an automatic host failover solution, what good is it if your host bus adapters don't automatically failover? And you have to do it manually—at the worst possible time?

the missing link

Now you can turn that potential weakness into a strength with HP Auto Path virtual array (VA), part of the HP Surestore family of storage products. It routes all your I/O streams across all available I/O paths, so if a host bus adapter (HBA)—or a cable or array controller—fails, your system won't fail with it. This virtual array even detects when a failure is resolved and restores data flow. And it does it automatically, with no manual intervention required. Because you have better things to do than worry about your system.

make the automatic choice for maximum availability with hp auto path virtual array



features	benefits
automatic error detection and failover	eliminate failures associated with host bus adapters (HBAs), cables, and array controllers
dynamic load balancing over multiple paths	keeps all storage at maximum performance
operating system compatibility	uses the Fibre Channel HBAs configured by your supported operating system (OS) with hp netserver and HBA support
supports hp virtual arrays	provides maximum investment protection, performance, and scalability
automated configuration	simple, no-work installation and configuration
graphical management	consistent, easy-to-use management makes your job easier



put hp auto path virtual array to work for you

Taking care of I/O path failover 24 hours a day isn't fun or glamorous. But when you need it, it can be the most important job in the world. HP Auto Path VA delivers continuous automatic I/O path failover for multiple servers on multiple HP virtual arrays. If any host bus adapter (HBA) fails, all I/O activity is immediately rerouted to the remaining adapters. So you get all the benefits of 24-hour system monitoring, without the cost or the work.

load balanced

While it's protecting your system from hardware failures, this VA also automatically load balances all I/O activity across all HBAs in your server. You can even pre-configure and assign redundant HBAs to maintain peak performance in case your primary HBA fails.

fast time to solution

Install HP Auto Path VA and turn it on for any HP virtual array on your system. The software does the rest; it automatically configures the I/O path for each logical unit number (LUN), and monitors and balances the load. All you have to do is stop worrying about your storage.

compatible with your system

HP Auto Path VA software is completely transparent to your OS and server applications. It automatically recognizes and uses the Fibre Channel HBAs configured by your operating system, so it works on any computer running a supported operating system. You can review a complete list of Microsoft® Cluster Server–certified configurations on the Microsoft Hardware Compatibility List Web site at: <http://www.microsoft.com/hcl>

hp auto path virtual array always gives you what you need to make hardware failures the least of your worries:

- **always available**—Keeps your system up and running in case of hardware failures of HBAs, cables, and array controllers.
- **always secure**—This virtual array works seamlessly with HP Secure Manager VA to provide secure host access in direct-connect and SAN environments.
- **always manageable**—Click and configure for easy GUI management. Select an array in the interface to automatically configure the I/O path for each LUN in the array. It's that simple.
- **always scalable**—This VA automatically configures itself to work with as many hosts and I/O paths as you have, from a single server to your most complex Microsoft Cluster Server environments.
- **always fast**—HP Auto Path VA requires no changes to OS kernel or application code, and can configure itself for fast installation.

automatic



the strength of the family

HP Auto Path VA software is part of the HP family of virtual array hardware and software products, a complete worry-free storage solution.

hp virtual arrays

HP Surestore virtual arrays greatly increase both the availability and manageability of your data. They're an ideal choice for enterprise HP-UX 11.0, 11i, and 11.11, Windows NT® and Windows® 2000, and Red Hat Linux 7.1 operating systems.

hp command view SDM

A single device manager (SDM) for modular HP storage, HP Command View SDM simplifies local and remote management and integrates into HP SANs and enterprise network management applications.

hp enterprise management smart plug-ins

HP Enterprise Management smart plug-ins automatically discover and launch HP Command View SDM and pass all virtual array device information through to HP OpenView NNM, HP Tootools, CA Unicenter TNG, Tivoli NetView, or BMC Patrol.

hp business copy virtual array

With HP Business Copy VA, you can replicate entire array-based LUNs or development, testing, or backup while the system is up and running for zero downtime.

hp secure manager virtual array

Airtight security controls server access on a LUN-by-LUN basis. HP Secure Manager VA supports simultaneous heterogeneous array sharing for easy compatibility.

room to grow

Because HP Auto Path VA has automatic discovery and configuration, it can scale from a single server to the most sophisticated cluster server configurations certified for the HP virtual array 7100 and 7400—automatically. What could be easier?

guaranteed

Most software doesn't have a guarantee, but then, most companies aren't HP. If you are not satisfied with the quality of your HP Auto Path VA software, for any reason, you may return it for a full refund anytime within the first 90 days.

a complete solution

Don't wait for hardware failures to ruin your day. Install HP Auto Path VA and start enjoying all the benefits it offers immediately. Maximum availability. Peak performance. Automatic failover. Easy configuration and management. And the peace of mind that only comes from HP.

get everything you want in a failover solution—get hp auto path virtual array

worry-free

specifications

supported operating systems

HP-UX 11.0, 11i, and 11.11
Windows NT
Windows 2000
Red Hat Linux 7.1

requirements

Windows NT/2000, and Red Hat Linux 7.1
Intel® Pentium® III, 500 MHz computers or above
HP-UX 11.0 and 11i: All PA-RISC computers
1024x768 video resolution
64K colors
256 MB system memory
60 MB free disk space
HP virtual array 7100 or 7400

software compatibility

HP Command View SDM
HP Enterprise Management smart plug-ins
HP Secure Manager virtual array
HP Business Copy virtual array



www.hp.com/go/storage

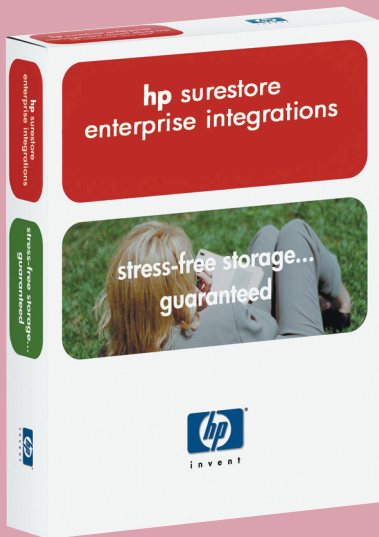
Microsoft, Windows, and Windows NT are U.S. registered trademarks of Microsoft Corporation. Intel and Pentium are U.S. registered trademarks of Intel Corporation.

Products may be shown with optional modules. The information contained in this document is subject to change without notice.

© Hewlett-Packard Company 2002
01/02

5980-9043EN

hp enterprise integrations



hp enterprise integrations for hp command view SDM and modular tape products

get the help you need

Storage capacities are growing, creating the need for storage management tools. But you have invested in an enterprise network and system management solution for your network infrastructure and would like to manage your storage from this console. Is there any way to protect this investment?

HP's Enterprise Integrations unify your virtual disk array and modular tape products into the leading enterprise network and system management solutions. You benefit by having the ability to manage your infrastructure and storage from a single pane of glass, reducing the complexity of your environment and protecting your investment in HP OpenView Network Node Manager, CA Unicenter TNG, BMC Patrol, or Tivoli NetView. Integration is also available for HP Toptools to unite the management of your PCs, servers, printers, and storage devices from a single management console.

No need for your administrator to spend time integrating and testing. HP has completed all this work for you. Our automated scripts provide you with an out-of-the-box solution so you can get down to business—fast!

manage your whole environment trust hp

features	benefits
integrates with industry-standard management applications	with applications including hp OpenView NNM for hp-ux, Windows NT® 4.0 or Windows® 2000, hp toptools, CA Unicenter TNG, BMC Patrol, and Tivoli NetView
easy installation with automatic scripts	includes pre-tested scripted configurations for faster installation, and ongoing updates mean you don't have to worry about the future
centralized monitoring and event notification	each virtual array communicates with your network management application so you have instant and continuous device status information



make management easy

HP Enterprise Integrations work with your network management application's graphical user interface to display the status of all virtual array components at a glance. Drives, fans, and power supplies are constantly monitored and status colors change to reflect the state of each component.

Any events or traps generated by the virtual array will be forwarded via SNMP to the enterprise package of your choice. This means that your administrator only needs to monitor one event log to stay on top of their environment.

proactive monitoring and notification

Command View SDM works in conjunction with these integrations to ensure proactive notification of any event via e-mail and pager. No matter where you are during the day, you can stay a step ahead of any problems—before end users start to call. Our pre-tested scripted configurations provide out-of-the-box integration for:

- hp OpenView NNM for hp-ux
- hp OpenView NNM for Windows NT
- hp OpenView NNM for Windows 2000
- hp toptools
- CA Unicenter TNG
- Tivoli NetView
- BMC Patrol

More pre-tested scripted configurations are added frequently; please ask your HP representative for an updated list.

compatible with your system

Even though HP virtual arrays simultaneously support multiple heterogeneous operating systems, HP Enterprise Integrations let you manage each virtual array from one centralized management console for HP-UX 11.0 and 11i, Windows NT, Windows 2000, and Red Hat Linux 6.2.

the strength of the family

HP Enterprise Integrations software is part of the HP family of virtual array hardware and software products, a complete worry-free storage solution.

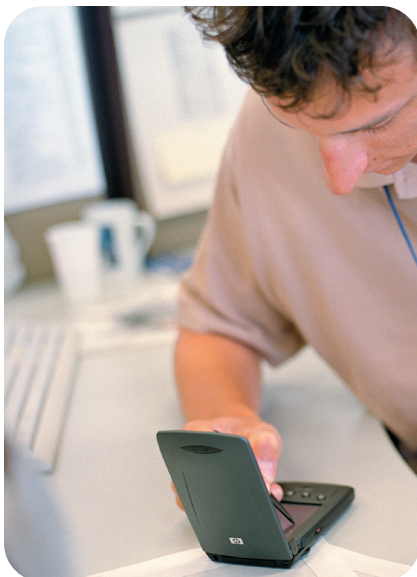
hp virtual arrays

HP virtual arrays greatly increase both the availability and manageability of your data. It's an ideal choice for enterprise HP-UX 11.0 and 11i, Windows NT and 2000, and Red Hat Linux 6.2.

hp enterprise integrations give you what you need to make management the least of your worries:

- **always available**—Our HP Enterprise Integrations unify your enterprise management applications, keeping you on top of potential problems so your system stays online.
- **always secure**—HP Enterprise Integrations work with HP's Secure Manager VA software to give you the ultimate in data security.
- **always manageable**—With HP Enterprise Integrations you'll have an end-to-end management solution that you can access either locally or remotely for maximum convenience.
- **always scalable**—With our HP Enterprise Integrations you can manage any size IT environment from the smallest to the largest configuration.
- **always economical**—With HP's modular virtual array technology and HP Enterprise Integrations you'll get the most cost-effective solution on the market.
- **always fast**—The installation wizard delivers fast, easy integration with your enterprise network management applications, for short time to solution.

easy



hp command view SDM

A single device management tool for modular HP storage, HP Command View SDM simplifies local and remote management and integrates into HP SANs and enterprise network management applications.

hp secure manager virtual array

Airtight security controls server access on a LUN-by-LUN basis. Supports simultaneous heterogeneous array sharing for easy compatibility.

hp auto path virtual array

HP Auto Path VA automatically manages multiple I/O paths, balances loads dynamically for peak efficiency, and instantly routes I/O around any path failure for maximum uptime.

hp business copy virtual array

With HP Business Copy VA, you can replicate entire array-based LUNs for development, testing, or backup while the system is up and running—zero downtime.

let hp do the work for you

How much time have you spent writing custom scripts—scripts you just have to rewrite every time your IT environment changes? Save yourself the trouble. We've already written and tested the script you need for every possible combination of HP hardware and software, so you don't have to.

easy installation

Our installation wizard makes integration into enterprise network management applications simple and quick. Put in the CD and follow the instructions on the screen and you'll be up and running in minutes. We'll save your valuable time and resources for more important things.

guaranteed

Most software doesn't have a guarantee these days. But then, most companies aren't HP. If you are not satisfied with the quality of the HP Smart Plug-in software for any reason, you may return it for a full refund anytime within the first 90 days.

make the smart choice

You're smart—you know what it takes to make your management job easier. Proactive monitoring and automatic notification of any problems. Easy installation with pre-tested integration with enterprise network management applications. Compatibility with your HP SAN and HP virtual array software. And the confidence you can only get with HP.

increase your management intelligence with hp enterprise integrations

smart

specifications

requirements

HP-UX 11.0 & 11i: All HP PA-RISC computers
Windows NT & 2000, and Red Hat Linux 6.2:
Intel® Pentium® III, 500 MHz computers or above
Solaris 7.0 and 8.0: (supported through HP-UX,
Windows, or Linux management station)
1024×768 video resolution
64K colors
256 MB system memory
60 MB free disk space
HP Virtual Array 7100 or 7400

software compatibility

HP Command View SDM
HP Business Copy Virtual Array
HP Secure Manager Virtual Array
HP Auto Path Virtual Array
HP Toptools
HP OpenView Network Node Manager
Tivoli NetView
BMC Patrol



www.hp.com/go/storage

Intel and Pentium are U.S. registered trademarks of Intel Corporation. Windows and Windows NT are U.S. registered trademarks of Microsoft Corporation.

The information contained in this document is subject to change without notice.

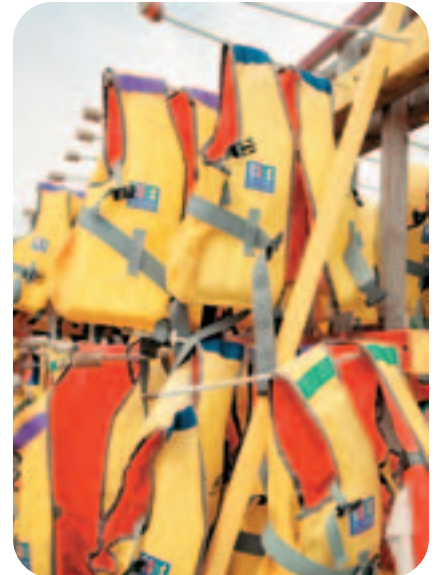
© Copyright Hewlett-Packard Company 2002
02/02

5980-9054EN



hp storage

fast recovery solutions



key features and benefits

- **efficient:** application availability is maximized, with recovery in minutes instead of hours
- **predictable:** ASPs or IT departments can meet or exceed Service Level Agreement requirements
- **scalable:** larger databases can be recovered in a short time, for a reduced cost per MB
- **reliable:** no access conflict to backup devices will occur, so recovery will not be delayed
- **performance:** large databases can be configured without risking long recovery windows
- **compatible:** can be used with any backup solution, including Omniback and NetBackup
- **adaptable:** can be integrated to work automatically with nightly backup processes

enables database recovery in minutes

HP Surestore Fast Recovery solutions (FRS) are designed to enable quick recovery of Exchange databases. Perfect for database environments that require the highest level of availability (such as Exchange), FRS combines database recovery features with Business Copy XP or Continuous Access XP on XP disk arrays and with Business Copy VA on VA disk arrays. FRS can utilize the duplicate secondary volume technology of Business Copy and Continuous Access to manage the database volumes, prepare for database recovery, and recover the database from this secondary volume. Fast Recovery solutions keep enterprise businesses up and running by enabling databases to be recovered in minutes rather than the hours typically required for a conventional restore from backup.



technical specifications

recovery performance

Recovery of a 100 Gb Exchange environment was tested using a conventional recovery vs. FRS. Conventional recovery was approximately four hours. FRS recovery was under five minutes.

product numbers

product number	product name	description
B9550A	Fast Recovery solutions (FRS)	HP Surestore Fast Recovery solutions

additional information

what's in the box
accessories

CD-ROM containing software, scripts, and documentation; license to use
N/A

supplies

N/A

safety
warranty features—
hp service and support
warranty options
for more information

N/A
N/A
N/A
HP offers an extensive portfolio of HP and mixed-environment storage-specific consulting and support services to assist with your IT storage needs. For additional information, please contact your local HP representative or a worldwide sales office, or visit our Web site at: www.hp.com/go/storage or www.hp.com/go/diskarrays

hp storage



**hp solutions
for Microsoft® Exchange**

managing your business critical applications

The ability to communicate with co-workers, customers, and suppliers via messaging applications is critical for enterprises today. E-mail, collaboration, and calendaring have become more than simply peripheral tools; they are now consistently ranked as mission-critical and among the top three functions named in large corporations. Businesses rely upon rich and varied messaging content and format, such as attachments and enclosures, as well as voice and video integration.

As messaging and collaboration tools are changing the way companies do business, the volume of enterprise data is soaring. With the volume of mission-critical data being sent and received, the issues of performance and storage are of utmost importance to the success of your business.

Exchange 2000 from Microsoft has become a leading front-end business critical messaging application. With collaboration tools like group scheduling and group folders, data and video conferencing, and services for building Web applications, Exchange 2000 allows for the highest level of productivity at a very low cost.

Given the increasing importance of messaging applications, and their often mission-critical performance, HP recognizes that the effective management of Exchange 2000 has never been more important to the success of companies with large Exchange environments.

HP's enterprise storage solution for Exchange, along with its full suite of consulting and support services, allows for the highest standards of data reliability, availability, scalability, and security at the lowest total cost of ownership (TCO). HP's Exchange solution provides a consolidated, intelligent, scalable storage infrastructure while supporting multiple operating systems and servers on a single storage platform. This infrastructure remains available 24x7 and features centralized management tools to monitor and react to events across the entire infrastructure.



capacity

hp meets today's storage needs

It is likely that the significant growth in volume of your business data has resulted in corresponding degrees of growth in your business's infrastructure. Chances are, you've built your storage networks as your Exchange needs have grown, adding hardware here and software there, and perhaps enjoying moderate to strong performance in some portions of your infrastructure and weaker performance in others.

Many organizations like yours have come to realize that they are not utilizing their resources effectively because of the proliferation and distributed deployment of Exchange servers and infrastructure throughout their organization. This leads to the inability to scale either their server or storage without experiencing downtime—which can result in considerable losses. Additionally, this ineffective use of resources can result in lower performance with expansion, under-utilized storage capacity (typically 50% of storage is unused to allow for storage expansion), intensive management to ensure the proper security and retrieval of data, and an overall higher cost of ownership.

These challenges are best met by HP enterprise storage for Exchange. When compared to server-centric storage, HP enterprise storage offers you many benefits for Exchange, including easier information sharing across different functions, better information protection, higher availability, and disaster recovery. Enterprise storage for Exchange also offers more cost-effective data management from centralized, cross-platform management tools. The combination of these benefits allows for a more flexible business environment that will help your company move quickly, develop and implement new applications, and run processes in parallel. While recovering from any problem, your business keeps running.

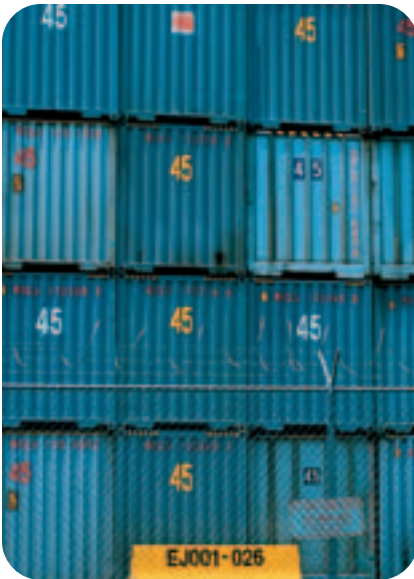
single-storage solution benefits:

- range of capacity storage solutions
- increase performance online
- instant capacity on demand
- guaranteed I/O bandwidth on XP array
- disaster recovery solutions
- fully automated zero downtime backup
- database corruption recovery
- manage applications, devices, and SAN from anywhere
- replicate online databases without interruption to revenue-generating applications

always on, always available

With HP's enterprise storage solution for Exchange, you no longer need to segregate and deploy storage by operating system environment, by server, or by application. HP's new industry-leading Surestore family has been engineered with your business needs in mind and provides an increased performance environment designed to meet your business critical applications.

Scalability of capacity and performance is essential as storage requirements continue to increase. HP's storage family surpasses present and future volume requirements while providing options for easy and non-disruptive addition of more storage when and where you need it. HP's Instant Capacity on Demand (iCOD) for Storage program provides business critical protection to HP disk array storage environments that require additional storage capacity instantaneously. To further increase your flexibility, HP designs and installs a contractually planned storage buffer before it is needed. This means that your company's excess capacity requirements are met and you pay for storage only when you use it. Backup capabilities can be scaled online as well, to match these increases in storage capacity.



Business continuity has come to the forefront of IT infrastructure planning and implementation; and without a first-class business continuity solution, the mission-critical data that defines your business could be lost forever. The HP storage family provides solutions for high availability, security, performance, online data replication, and online backup and disaster recovery to ensure the “always-on” Internet infrastructure necessary for Exchange.

Consolidation enables your Exchange storage solution to be the same as your enterprise storage solution—with a single set of management tools and processes and with support from a single vendor. In this heterogeneous environment, all your servers are on a single storage solution, providing an efficient and manageable use of resources. An enterprise storage solution can also help enable server consolidation. Reducing the number of Exchange servers by using larger, higher-performance servers can produce significant management and support savings.

Manageability is essential for every enterprise storage solution and HP provides management tools for the entire Exchange environment. Web-based management tools enable you to monitor and manage your storage resources from anywhere at any time. The disk array families provide a consistent similar interface so you don't have to learn how to use new tools when you add new functionality. HP's integration of device and SAN management tools into enterprise management tools like OpenView provides operational efficiency that allows you to manage much more information with the same resources.

Additionally, HP's umbrella strategy for storage, called Federated Storage Area Management (FSAM), is dedicated to providing the solutions and technologies enterprise-class businesses need to manage unpredictable storage demands. Specifically, FSAM allows for a naturally scalable environment of federated storage resources. This means allowing physically separate domain(s) to operate as one logical resource, even if networked storage devices are of different types and manufactured by different vendors. The backbone of FSAM is technological innovation, and this aspect of enterprise storage for Exchange is just another reason why HP is a leader in storage solutions.

hp's consolidation and manageability benefits:

- range of solutions from hundreds of megabytes to hundreds of terabytes
- VA arrays
 - 1.1 TB to 7.7 TB
- XP arrays
 - up to 92 TB
- hp SAN configuration
 - virtually boundless capacity
- tapes, libraries, and backup solutions for data protection
- optical libraries for long-term archiving and virtually unlimited mail box capacity
- hp OpenView storage area manager
 - centralized management
 - manage disparate devices in a uniform way
 - allocate unused capacity on demand
- common look and feel for storage management across devices and infrastructure
- device management using web-based tools to manage applications, devices, and SAN from anywhere
- device and SAN management integration into enterprise management solutions

hp comprehensive solutions and services

HP offers a robust worldwide infrastructure to design, consolidate, and install your storage solution. The implementation of your Exchange solution is made easy with HP's comprehensive suite of service specializations, which includes storage assessment, SAN architecture design, data migration, backup integration and availability services, installation, software enablement service, Business Copy implementation service, critical data availability service, LUN/SAN implementation service, and performance optimization service. HP partners with you to develop a customized storage plan, reducing the total cost of ownership and providing enhanced cost flexibility.

hp solutions for Exchange support your business critical applications

HP recognizes that never before has it been this critical to your business to maintain an enterprise storage solution for Exchange—one that's always on and always available, that provides an efficient utilization of resources, and that offers the lowest total cost of ownership. HP's comprehensive Exchange solution is uniquely positioned to help you achieve the best utilization of resources in terms of data integration and management. By deploying a single, consolidated HP storage solution your business realizes efficiencies while supporting business critical applications cost-effectively and without compromise. Contact HP to start the process of planning and maintaining an effective Exchange environment.

If you want to know more about HP storage solutions, visit the HP Web site at www.hp.com/go/enterprisestorage

For more information about Exchange and Exchange services from HP, visit www.hp.com/go/exchangesolutions



www.hp.com/go/storage

Microsoft is a U.S. registered trademark of Microsoft Corporation.
The information contained in this document is subject to change
without notice.

© Copyright Hewlett-Packard Company 2002
1/02

5980-9383EN



mathematics behind RAID 5DP

hp

technical guide

**for the hp va 7000
series disk arrays**

for information about the va 7000 series
and periodic updates to this guide
see the HP SureStore website at
<http://www.hp.com/go/storage>



Copyright© by Hewlett-Packard Company, 2001.
All Rights Reserved.

This document contains information which is protected by copyright. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of the Hewlett-Packard Company.

Hewlett-Packard Product Information

mathematics behind RAID 5DP – for the **hp** va 7000 series disk arrays

Published: April 2001

Revision level 1.0

For the latest updates to this document see
<http://www.hp.com/go/storage>

Warranty

This document is supplied on an “as is” basis with no warranty and no support. Hewlett-Packard makes no express warranty, whether written or oral with respect to this document. HEWLETT-PACKARD DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: IN NO EVENT SHALL HEWLETT-PACKARD BE LIABLE FOR ERRORS CONTAINED HEREIN OR FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT OR LOST DATA) WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS MATERIAL.

The information contained in this document is subject to change without notice.

No trademark, copyright, or patent licenses are expressly or implicitly granted (herein) with this white paper.

Disclaimer

All brand names and product names used in this document are trademarks, registered trademarks, or trade names of their respective holders. Hewlett-Packard is not associated with any other vendors or products mentioned in this document.

Table of Contents

Overview	1
Data Layout	2
N+2 Mathematics	2
<i>Figure 1: Example of Error-correction Coding — Finite Field Arithmetic</i>	4
<i>Figure 2: Recalculation of segment on disk X1</i>	4
<i>Figure 3: Recalculation of data on disks X1 and X2</i>	5
References	5



hp va 7000 series

Overview

Understanding the mathematics of RAID 5DP

Hewlett Packard's Virtual Array RAID 5 Double Parity (RAID 5DP) provides superior data availability by allowing the operation to continue after two simultaneous disk failures. This paper describes the mathematical details behind RAID 5DP.

HP's RAID 5DP, while similar to RAID 5, is *superior* because it uses two separate and independent mechanisms for the redundant information used to recreate data during disk failures.

In general, RAID 5DP comprises a system of two equations in two unknowns, with the two unknowns being the two failed data disks. Standard linear algebra techniques can be used to derive a general solution. The two redundancy schemes, **P** and **Q**, are computed as a *sum of products* with different coefficients being applied to each data block for **P** and **Q**.

P uses the value one (1) for all coefficients which reduces to a standard exclusive OR (parity) calculation. **Q** uses coefficient values *other than the value one (1)* which makes the calculation of **Q** more complex than standard exclusive OR. The **Q** coefficients are chosen so that the **Q** equation is linearly independent from **P** allowing the two equations to be solved in all cases.

The RAID 5DP coding-scheme is an instance of the well-known *Reed-Solomon* class of error correction codes. Variations of *Reed-Solomon ECCs* are also used in the design of hard disk drives and are used in conjunction with semiconductor memory (RAM).

This paper use **N+M** nomenclature to indicate the width (N+M) of the redundancy group. In each stripe of an N+M redundancy group **N** is the number of storage elements used for data and **M** is the number of storage elements used for redundancy. For RAID 5DP, **M=2**. There is one (**1**) redundant storage element used for **P** and one (**1**) used for **Q** in each stripe.

Data Layout

A set of disks are known as a redundancy group.

The similarity of the data layout for RAID 5DP and the traditional RAID 5 is that the parity information rotates through all the disks. Where it differs, however, is that the equivalent capacity of two disks per redundancy group are used for storing parity information by RAID 5DP, where only a single disk is used by RAID 5. HP Virtual Array uses the term “redundancy group” to refer to a set of disks that are isolated with respect to disk failures. Disk failures in one redundancy group do not effect the operation of other redundancy groups. Each RAID 5DP stripe uses a single segment from each disk in a single redundancy group.

N+2 Mathematics

How does the N+2 redundancy group provide dual correction?

The *N+2 redundancy group* arrangement provides data correction capability for any two failed disks in a group. Thus, an N+2 group can tolerate the loss of any two disks in the group and still maintain data availability. This is in contrast to an N+1 redundancy group, which can only correct a single failed disk in a stripe. To achieve the dual correction capability, two segments of redundant data are stored along with N segments of user data in a RAID 5 stripe. The values for the two redundant segments are computed with a more powerful error-correction coding scheme than the simple parity calculation typically used for N+1 redundancy groups.

Below is a general form of the N+2 computation.

$$P = p_0x_0 + p_1x_1 + p_2x_2 + \dots + p_{N-1}x_{N-1} = \sum p_i x_i (i = 0 \dots N-1)$$

$$Q = q_0x_0 + q_1x_1 + q_2x_2 + \dots + q_{N-1}x_{N-1} = \sum q_i x_i (i = 0 \dots N-1)$$

Where

P is the value of one redundancy segment

Q is the value of the other redundancy segment

x_i are the values of the user data segments

p_i and q_i are coefficients of the error correction-coding scheme

Note: The equation for **P** reduces to the simple parity calculation typically used for N+1 groups when all coefficients p_i have the value one (1).

The equations for calculating **P** and **Q** *error-correction terms* form a system of two equations that, by the rules of linear algebra, can potentially be solved for any two unknowns (x_a and x_b), which represent any two failed disks in the stripe. In fact, the equations can be solved for any two unknowns if the sets of coefficients p_i and q_i are linearly independent.

An example of linearly independent coefficients is $p_0=1, p_1=1, p_2=1, \dots$ (simple parity) and $q_0=1, q_1=2, q_2=3$, and so on. Many other examples are possible.

A general solution for any two unknowns, x_a and x_b , can be derived from a linear algebra matrix manipulation as shown below.

$$R = p_a x_a + p_b x_b = P - \sum p_i x_i (i = 0 \dots N-1, i \neq a, i \neq b)$$

$$S = q_a x_a + q_b x_b = Q - \sum q_i x_i (i = 0 \dots N-1, i \neq a, i \neq b)$$

In matrix form

$$\begin{bmatrix} p_a & p_b \\ q_a & q_b \end{bmatrix} \begin{bmatrix} x_a \\ x_b \end{bmatrix} = \begin{bmatrix} R \\ S \end{bmatrix}$$

The matrix solution, using the standard formula for the inverse of a two by two square matrix, is

$$\begin{bmatrix} x_a \\ x_b \end{bmatrix} = \begin{bmatrix} p_a & p_b \\ q_a & q_b \end{bmatrix}^{-1} \begin{bmatrix} R \\ S \end{bmatrix} = (p_a q_b - p_b q_a)^{-1} \begin{bmatrix} q_b & -p_b \\ -q_a & p_a \end{bmatrix} \begin{bmatrix} R \\ S \end{bmatrix}$$

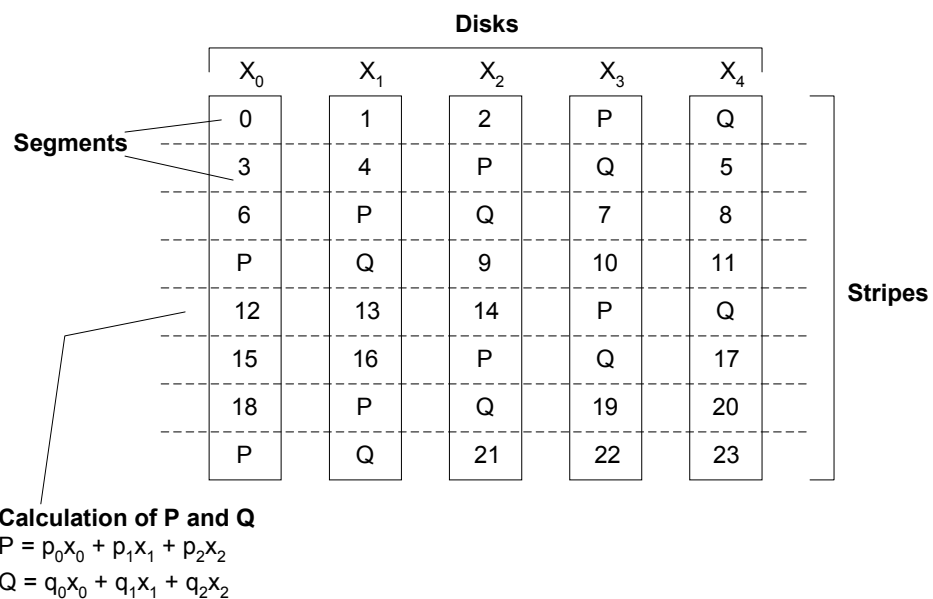
For a solution to exist the term $(p_a q_b - p_b q_a)^{-1}$ must exist. For the inverse to exist the difference must be non-zero and the inverse of the non-zero value must exist in the arithmetic system being used to perform computations. A non-zero difference is ensured by linear independence of the coefficients. A non-zero difference is a formal method of stating the need for linear independence in the coefficients. To ensure that the inverse of any non-zero value exists, the system of arithmetic called ***Galois Field*** or finite field arithmetic is used. One of the properties of finite field arithmetic used, is that addition and subtraction are the same. Therefore, the matrix solution is as follows.

$$\begin{bmatrix} x_a \\ x_b \end{bmatrix} = (p_a q_b + p_b q_a)^{-1} \begin{bmatrix} q_b & p_b \\ q_a & p_a \end{bmatrix} \begin{bmatrix} R \\ S \end{bmatrix}$$

The following figures and explanation gives a description of how data would be written to a set of disks. We show how data can be recalculated or recovered in the event of a loss of a disk or the simultaneous loss of two disks.

Figure 1 shows how data is striped across three data disks and two parity disks. Independent calculations are made to generate the values for P and Q for each stripe. The specific equations for generating the values of P and Q for the row starting with segment 12 are shown in Figure 1. The parity data is rotated to different disks by stripe.

FIGURE 1. Example of Error-correction Coding — Finite Field Arithmetic



In the event one disk fails, the data on that disk can be recalculated using either the P or Q segment and the data stored on the remaining good segments in the stripe. The equations to recalculate the data are as follows in Figure 2.

FIGURE 2. Recalculation of segment on disk X_1

Single correction using P (disk x_1 failed)	Single correction using Q (disk x_1 failed)
$P = x_0 + x_1 + x_2$ $x_1 = P + x_0 + x_2$	$Q = q_0x_0 + q_1x_1 + q_2x_2$ $x_1 = q_1^{-1}(Q + q_0x_0 + q_2x_2)$

If two disks were to fail simultaneously, for example disk X_1 and X_2 , or if a second disk were to fail before the first failed disk was completely recovered, then using the RAID5DP as described in this paper, the data from both failed disks could be rebuilt using the equations as shown in Figure 3.

FIGURE 3. Recalculation of data on disks X_1 and X_2

Double correction => two equations in two unknowns

(disks x_1 and x_2 failed)

$$P = p_0x_0 + p_1x_1 + p_2x_2$$

$$Q = q_0x_0 + q_1x_1 + q_2x_2$$

$$p_1x_1 + p_2x_2 = P + p_0x_0$$

$$q_1x_1 + q_2x_2 = Q + q_0x_0$$

Do the matrix inversion to solve for x_1 and x_2

$$x_1 = (p_1q_2 + p_2q_1)^{-1}(q_2(P + p_0x_0) + p_2(Q + q_0x_0))$$

$$x_2 = (p_1q_2 + p_2q_1)^{-1}(q_1(P + p_0x_0) + p_1(Q + q_0x_0))$$

Both segments of missing data can be recalculated using the P and Q parity data and the remaining data segment on X_0 .

If the data contained in the segment of a lost disk was either P or Q parity data, then the parity data can be recalculated from the remaining user data. If two disks are lost and one disk contains user data and the other parity data, the user data can be recalculated first using the remaining parity segment, as above, then the lost parity segment could be recalculated using the restored user data. Thus the array can survive the simultaneous loss of two disks where RAID5DP has been used to record the data.

Note: Information presented in this paper, including diagrams, is for the purpose of illustrating the mathematical principles and does not necessarily represent the exact implementation in the Virtual Array.

References

A complete description of the finite field arithmetic used in this error-correction coding scheme is found in "Practical Error Correction Design for Engineers," Neal Glover, Data Systems Technology Corp, Broomfield, CO, 1982.



hp va 7000 series

References



heterogeneous server environment

hp

white paper

with the
hp va 7100 array

for information about the va 7000 series and
periodic updates to this white paper
see the HP SureStore website at
<http://www.hp.com/go/storage>



Copyright© by Hewlett-Packard Company, 2001.
All Rights Reserved.

This document contains information which is protected by copyright. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of the Hewlett-Packard Company.

Hewlett-Packard Product Information

heterogeneous server environment – with the **hp** va 7100 array

Published: May 2001

Revision level 1.0

For the latest updates to this document see
<http://www.hp.com/go/storage>

Warranty

This document is supplied on an “as is” basis with no warranty and no support. Hewlett-Packard makes no express warranty, whether written or oral with respect to this document. HEWLETT-PACKARD DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: IN NO EVENT SHALL HEWLETT-PACKARD BE LIABLE FOR ERRORS CONTAINED HEREIN OR FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT OR LOST DATA) WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS MATERIAL.

The information contained in this document is subject to change without notice.

No trademark, copyright, or patent licenses are expressly or implicitly granted (herein) with this white paper.

Disclaimer

All brand names and product names used in this document are trademarks, registered trademarks, or trade names of their respective holders. Hewlett-Packard is not associated with any other vendors or products mentioned in this document.

Trademark Credits

HP-UX and HP-UX 11.00 are Open Group UNIX 95 branded products. Intel® is a registered trademark of Intel Corporation. Windows®, Windows NT®, Windows 2000®, and Microsoft Windows® are U.S. registered trademarks of Microsoft Corporation.

Table of Contents

Introduction	1
The VA 7100 and connections to multiple hosts with different operating systems.....	2
The VA 7100 disk array.....	2
Fibre channel fabric	3
Supported hosts.....	3
Benefits of sharing storage between hosts	3
How to implement	4
Topologies.....	4
Software required and recommended	6
How to configure and setup.....	6
LUN security.....	7
New behaviors associated with shared environments.....	7
Summary	7



hp va 7000 series

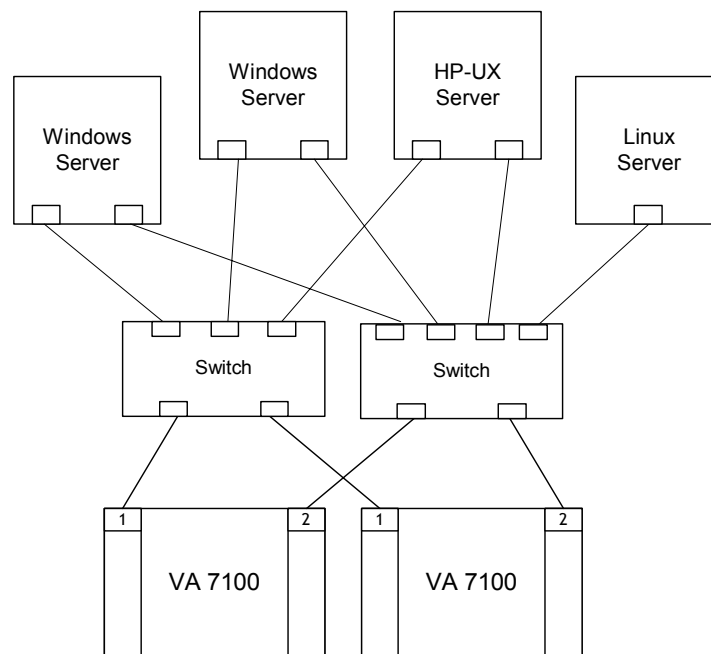
Introduction

Today's data centers typically contain a mix of server architectures and operating systems to run the applications that users demand. The HP VA 7100 disk array allows data center administrators and architects to maximize the utility of their storage investment by providing a storage solution that supports multiple operating systems and server architectures simultaneously.

Heterogeneous operating system environments can be as simple as two servers, each running different operating systems, sharing a VA 7100 array through a hub or switch. Or they can be as complex as a storage area network with many hosts connected to a large number of VA 7100 arrays.

The illustration below shows a heterogeneous configuration with multiple VA 7100s being shared by multiple hosts and operating systems.

FIGURE 1. Heterogeneous configuration of multiple hosts and operating systems sharing multiple VA 7100s



The VA 7100 and connections to multiple hosts with different operating systems

The HP VA 7100 disk array is an entry-level array supporting 4 to 15 disk drives. These disk drives are logically combined into a large pool of storage, then divided up into *logical units* (LUNs) and shared by multiple hosts. Sharing the storage on these different hosts is easy for the storage administrator to accomplish. This paper gives an overview of the following:

- The type of sharing possible.
- Basic topologies of connections supported.
- The benefits of sharing storage, a description of array management tools.
- The security available to make sure that different hosts only access data for which they have the appropriate permissions.
- A brief description of how to implement an array shared by multiple systems with different operating systems.
- Description of behaviors of the array, in heterogeneous environments, that may be unexpected by the first time administrator.

The VA 7100 disk array

The VA 7100 array offers 4 to 15 disk drives in a highly available array. Each component in the array is redundant and hot swappable. Thus if any power supply, fan, controller, or disk drive fails, the component can be replaced *without turning off the array and without interrupting availability of the data* to the host.

Supported disks include 18 GB 15 k-rpm and 36 GB 10 k-rpm low profile drives. The VA 7100 will support 73 GB low profile drives as soon as they become available. The drives are all aggregated into a single pool of storage configured in RAID 1+0. This pool of available storage, referred to as a *redundancy group*, can then be divided up into multiple logical units (LUNs). These LUNs are then assigned to various hosts attached to the VA 7100. Up to 64 LUNs can be supported on the array at present. The administrator has the flexibility to set the LUN size to the precise requirements of the application, regardless of the size of the physical disks.

Fibre channel fabric

VA 7100 devices are connected to hosts via a combination of *fibre channel* cables, switches, and hubs. The combination of cables, switches, and hubs is sometimes referred to as the “fabric.” The VA 7000 series array currently supports a broad line of switches and hubs, and HP will continue to qualify more as they appear in the marketplace. For a definitive list of supported devices, see your HP or reseller account representative. Complete descriptions of supported configurations are also available in the VA 7100 users manual, which can be located at www.hp.com/go/storage.

Supported hosts

Host computers that can attach to the VA 7100 include HP 9000 PA-RISC; Intel-based servers running various versions of Microsoft Windows operating systems, and Intel based servers running Linux. Support for other operating systems and servers will be released in the future. For current details regarding supported host bus adapters for each of these hosts, contact your HP or authorized HP reseller sales team, or visit www.hp.com/go/storage.

Benefits of sharing storage between hosts

The primary reasons for sharing storage between multiple hosts of different types include convenience for the administrator, investment protection of the users storage investments, and effective use of available storage.

1. Sharing storage between multiple hosts is convenient because it enables the user to provide storage quickly to the host where it is needed, without concern for which vendor supplied the host or the storage.
2. Sharing storage protects the users’ investment by allowing storage to be redeployed to other hosts as the need arises. If one set of servers is decommissioned, the storage attached to that server can be readily redeployed to another set of servers without regard to the vendor of those new servers.
3. In addition, if one server needs a small incremental amount of storage, this amount can be readily provided from an existing array, instead of purchasing an array or additional disk storage specifically to meet this incremental need.

How to implement

To implement a shared VA 7100 implementation, first plan the necessary amount of usable storage capacity. For some installations, multiple VA 7100s are attached to one host to provide the required capacity. For other installations, just one VA 7100 array will supply enough storage for multiple servers running different operating systems. The following text describes the general steps for how to install such a shared configuration.

Topologies

The VA 7100 is supported in a wide variety of topologies to provide the user with the desired combination of failover capability, performance, and cost effectiveness. Generally, when connecting more than one host to a VA 7100, the user will use switches or hubs to connect the hosts to the VA 7100. Using switches or hubs provides greater flexibility in failover applications. In addition, this allows support of greater distances between the storage and the servers. Using redundant switches or hubs allows for creating multiple data paths between the host and the array to provide higher availability to the data, in the event of failure of any component in the data path.

Deciding how many hosts should share a VA 7100 is determined based on the expected total I/O load and capacity requirements that each host will place against the VA 7100. The VA 7100 can support over 3000 I/Os per second from disk and over 400 GB of raw storage capacity with 36 GB disks. A single VA 7100 is a good choice, if a particular host or set of hosts need this many or fewer I/Os per second and up to this amount of storage capacity. If a particular host or set of hosts need more than 3000 I/Os per second, or more capacity, then multiple VA 7100s will provide the required performance. With the modular architecture of the VA 7100, users can readily scale the performance and capacity of the configuration by adding additional VA 7100 arrays as the load on the set of hosts increases.

One VA 7100 can be shared by up to 8 hosts with full LUN security between hosts using the **Secure Manager VA**, the LUN security management utility for the VA 7100. A single VA 7100 can be shared by more than 8 hosts without LUN security, but users may encounter unacceptable performance or capacity limitations in such a large configuration.

Shown below are some of the more common topologies for connecting VA 7100s to hosts of various kinds.

FIGURE 2. Heterogeneous connection with two (2) servers

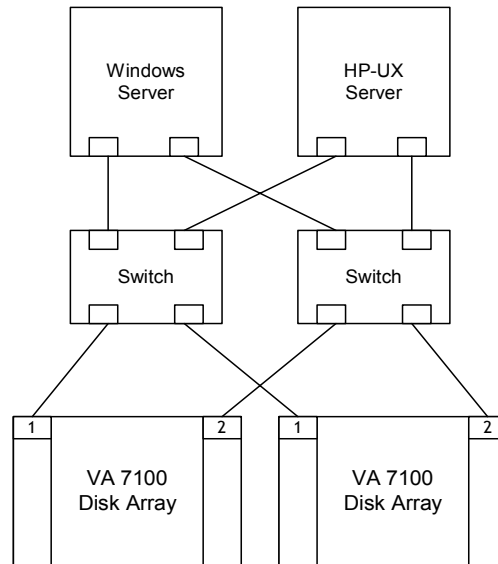
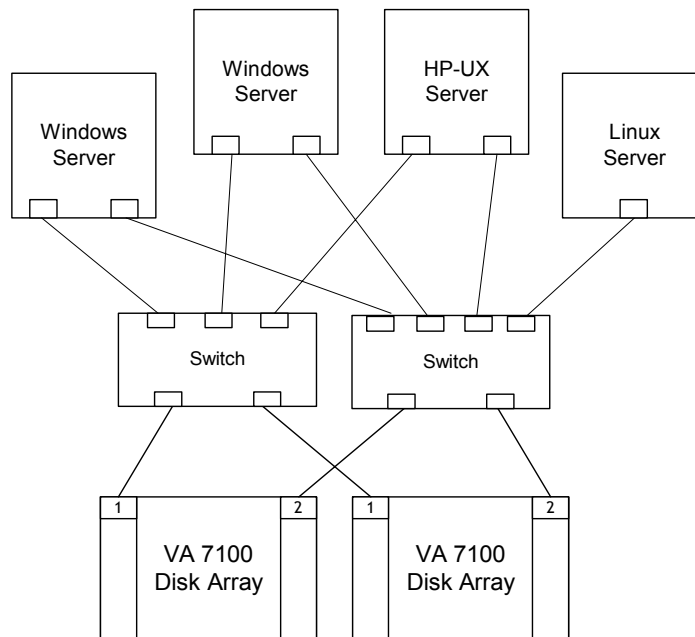


FIGURE 3. Heterogeneous connection with four (4) servers



Software required and recommended

To configure heterogeneous VA 7100 configurations, use the **Command View SDM** software that comes with the VA 7100, installing it on one of the hosts attached to the VA 7100. Command View SDM currently runs on HP-UX 11.00, Windows NT 4.0, Windows 2000, or Linux Red Hat 6.2.

You receive one Command View SDM host 'license to use' per VA 7100. If you choose to install Command View on additional hosts, based on your specific configuration, an additional license fee is required for each additional host.

How to configure and setup

There are several basic steps associated with setting up and configuring a VA 7100 for use with multiple hosts.

1. Install the array hardware.
2. Connect to hosts via hubs and/or switches.
3. Install the Command View SDM device management software.
4. Configure Host Table for each host in your configuration.
5. Configure logical units (LUNs) on the array.
6. Assign LUNs to the hosts that will own them using the World Wide Name (WWN) of the host, or the host bus adapter, based on the host's operating system.
7. Set up LUN security, using Secure Manager VA.
8. Start using the array by writing data to the array from the respective hosts.

Note: Steps 1 through 4 are usually completed only once per array/host connection. Steps 4 through 7 may be repeated many times over the life of the array to accommodate newly added hosts or changes in the usage pattern of the array.

HP provides detailed information on how to accomplish all of the above steps in the Command View SDM and the Secure Manager VA documentation. This may be reviewed online by going to www.hp.com and selecting "support," then specifying the modular storage software product for which you need information. In addition, a complete set of documentation is included with delivery of a VA 7100 and associated software products.

LUN security

To assure that only the appropriate designated host can access the host's assigned storage, HP offers the **Secure Manager VA** software tool to implement LUN security on the VA 7100. Secure Manager VA allows the user to turn on the hardware security implemented in the array. The security capabilities assure that only the host(s) with the appropriate world wide name(s) can access the specified LUNs. The details of how to implement this feature are fully described in the Secure Manager VA user manual that is included with the software.

New behaviors associated with shared environments

Shared devices do not have the same guaranteed service characteristic of a dedicated device. One or more of the hosts that share a device may induce an operation or a performance workload that will affect the other hosts sharing an array. Operations, such as an array reset, will obviously be 'seen' by the other host, as both a short interruption-in-service and an entry in the system log. While the OS is tolerant to such behavior, some specific applications may be intolerant.

Summary

The VA 7100 provides a *flexible inexpensive platform* for users who would like to share external RAID protected storage among hosts of different operating systems. Using the HP provided tools; users can easily set up and manage networks of shared storage. By sharing storage in this fashion, users can meet a diversity of storage needs, protect their storage investment, and maximize the use of the storage they purchase.

**business copy
virtual array
integration
guide**



**data replication
and backup
for the
hp va 7000 series**

hp — white paper

for information about the va 7000 series
and periodic updates to this white paper
see the HP SureStore website at
<http://www.hp.com/go/storage>



Copyright© by Hewlett-Packard Company, 2001.
All Rights Reserved.

This document contains information which is protected by copyright. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of the Hewlett-Packard Company.

Hewlett-Packard Product Information

business copy virtual array integration guide – data replication and backup for the hp va 7000 series

Published: July 2001

Revision level 1.1

For the latest updates to this document see
<http://www.hp.com/go/storage>

Warranty

This document is supplied on an “as is” basis with no warranty and no support. Hewlett-Packard makes no express warranty, whether written or oral with respect to this document. HEWLETT-PACKARD DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: IN NO EVENT SHALL HEWLETT-PACKARD BE LIABLE FOR ERRORS CONTAINED HEREIN OR FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT OR LOST DATA) WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS MATERIAL.

The information contained in this document is subject to change without notice.

No trademark, copyright, or patent licenses are expressly or implicitly granted (herein) with this white paper.

Disclaimer

All brand names and product names used in this document are trademarks, registered trademarks, or trade names of their respective holders. Hewlett-Packard is not associated with any other vendors or products mentioned in this document.

Trademark Credits

Windows®, Windows NT®, Windows 2000®, and Microsoft Windows® are U.S. registered trademarks of Microsoft Corporation.

Table of contents

Purpose.....	1
Overview	1
References	2
Data consistency.....	3
Consistency using volume state management	3
Consistency using online backup facilities.....	4
Consistency using post copy update procedures	4
Procedures	5
Copy procedure.....	5
1c. Prepare parent LUNs for data consistency.....	5
2c. Capture software configuration information if needed.....	6
3c. Prepare Business Copy LUNs for data consistency.....	6
4c. Make the copy from parent LUNs to Business Copy LUNs	6
5c. Set permissions on the Business Copy LUNs (required for Windows).....	7
6c. Release parent LUNs for ongoing use.....	7
7c. Configure Business Copy LUNs for use with software	8
8c. Update the Business Copy LUNs for data consistency, if needed.....	9
9c. Use the Business Copy	9
10c. Discard the Business Copy when no longer needed	9
Restore procedure	10
1r. Prepare Business Copy LUNs for data consistency.....	10
2r. Prepare parent LUNs for data consistency.....	10
3r. Make the copy from Business Copy LUNs to parent LUNs	10
4r. Release parent LUNs for ongoing use.....	11
Integration in Microsoft Windows® environments	12
Business Copy LUN discovery.....	12
Discovery and LUN security	12
Dismounting and remounting Windows volumes	13



hp va 7000 series

Purpose

This paper, the Business Copy Virtual Array Integration Guide, provides an overview of information to support custom integration of Business Copy Virtual Array (VA) into backup and other data replication processes and environments. The emphasis of this guide is on integration with operating system and application software so that correct results are obtained when Business Copy VA is used in those software environments. In addition, examples are given for command line usage.

Overview

What is Business Copy VA and how is it used?

Business Copy VA is data replication software that makes nearly instant point-in-time copies of LUNs. Business Copy LUNs can be used immediately after they are created. Applications can read or write to Business Copy LUNs just like any normal LUN.

Business Copy VA creates nearly instant LUN copies.

A business copy LUN is created in milliseconds because it only points to the data logs of the parent LUN, using a meta data file. Therefore, data does not have to physically move from the parent LUN to the business copy LUN.

A business copy LUN is presented as a complete copy of the parent LUN at the time it was copied. Once the business copy LUN is created, new business copy data is added only to the business copy meta-file and new parent LUN data is added only to the parent LUN's data log file.

Note: Business copy LUNs are “point-in-time,” not mirrored, copies. Once a business copy LUN is created, it is an independent logical entity.

Each business copy requires the same amount of space as its parent LUN, just like a traditional split mirrored data replication environment. Even though Business Copy VA copies Meta data, it reserves the same physical space as the parent LUN, allowing the business copy LUN to change up to 100 percent of its data. The size of the parent LUN limits the growth of the business copy LUN.

HP Command View Storage Device Manager software is the management software for use with the VA 7000 series of disk arrays from HP. This management software supports two user interfaces for Business Copy Virtual Array:

- The Graphical User Interface (GUI):
The GUI provides a quick and simple way to create Business Copy LUNs for manual backup processes or application testing purposes.
- The Command Line User Interface (CLUI):
The CLUI is scriptable, making it easy to integrate into almost any backup application environment.

References

“HP SureStore Command View SDM Installation and User's Guide”

“HP SureStore Business Copy Virtual Array Installation and User's Guide”

“HP SureStore Secure Manager Virtual Array Installation and User's Guide”

Data consistency

Operating system and application software typically stores data in a structured format. This structure usually involves some kind of meta-data, or descriptive data about the data. The structure also implies a need for internal consistency of the stored data. If consistency is compromised, the application data is rendered useless until consistency can be restored.

Business Copy VA can be used to make copies of virtual array LUNs containing application data objects. The process for making the copies must be integrated with application software in such a way that the copies retain enough internal consistency to be useful by the application software.

Consistency using volume state management

From the point of view of the software, storage volumes can typically be in one of two states: mounted or dismounted.

To create a useful copy or backup of a data volume, the data in the volume generally must be consistent. Steps must be taken before making a backup to assure that the backup will be consistent. While a volume is mounted, it is subject to ongoing access and modification by the software. The consistency of the data on a mounted volume usually depends on the contents of the volume as well as the internal state of the software. A copy of a mounted volume is typically not guaranteed to have enough consistency to be useful.

Software often provides facilities to suspend usage of its storage volumes. These facilities often go by names such as “dismount” or “deactivate.” The result of this operation is that the volume has been placed into the dismounted state. Data objects on dismounted volumes are usually fully consistent. A copy of a dismounted volume will also have full consistency. Dismounting a storage volume usually requires that the software using the volume be terminated, suspended, or placed into a special operating state.

For the purpose of this document the following terms are defined:

Mounteda storage volume is in use by the software (a copy will not be consistent)

Dismounteda storage volume is not in use by the software (a copy will be consistent)

Mountthe act of transitioning a storage volume from the dismounted to the mounted state

Dismountthe act of transitioning a storage volume from the mounted to the dismounted state

These terms are used generically in this document and do not refer to any specific operation in any particular software application or operating system.

Consistency using online backup facilities

For data consistency, place application software into online backup mode.

Some software implementations include online backup facilities. These facilities allow the software to be placed into a mode such that a copy of the application data objects are consistent but the applications using the data need not be taken offline. This is sometimes referred to as “online” or “hot” backup mode. A Business Copy of data that has been placed into online backup mode will have the necessary consistency.

Consistency using post copy update procedures

It may be possible to create a consistent copy of application data without taking the application offline.

Even if a software implementation does not include an online backup facility, it may still be possible to create a consistent copy of application data without taking the application offline. In this approach a copy is made that does not have consistency. Then updates are applied to the copy to make it consistent. One possible source of the updates is a recovery log being maintained by the software. Another possible source is a data consistency check and restoration tool (such as the Unix “fsck” command). With this approach, the application need not go offline but the software may still need to be brought into a particular state so that the copy can be made consistent by the update (for example, a database checkpoint).

Procedures

Following are procedures for creating a copy using Business Copy and for restoring a copy from backup using Business Copy that account for the need to maintain data consistency. In these procedures, the term “parent LUN” refers to a virtual array LUN that contains the data to be copied. The term “Business Copy LUN” or just “Business Copy” refers to a virtual array LUN containing the copied data

Copy procedure

Depending on the operating system and application software, each step in the Business Copy usage processes have corresponding details with which Business Copy is used.

To ensure data consistency, prepare the parent LUNS before making the Business Copy.

The corresponding details of the Business Copy usage process are described here for some common usage environments. We assume that the user is familiar with storage device configuration tools and processes for the applicable environments and with any logical volume management software to be used in those environments.

An assumption at the beginning of the copy procedure is that the parent LUNs have been created and configured for normal use by software and are currently in use. Given this assumption the process is as follows:

1c. Prepare parent LUNs for data consistency

For consistency, using volume state management, the parent LUNs are dismounted. Parent LUNs are dismounted differently depending on the type of volume and file system.

Raw logical volume

- Suspend or terminate any applications using the logical volume.
- Use volume manager software to deactivate the corresponding volume group.

File system residing on a logical volume

- Suspend or terminate any applications using the file system.
- Use the operating system facility to dismount the file system.
- Use volume manager software to deactivate the corresponding volume group.

Raw virtual array LUN

- Suspend or terminate any applications using the LUN.

File system residing on a virtual array LUN

- Suspend or terminate any applications using the file system.
- Use operating system facility to dismount the file system.

For consistency, when using application software with an online backup capability, the software is placed into online backup mode.

For consistency, when using software that supports post copy updates, the application software is placed into the necessary state so that updates can be applied to the copy.

2c. Capture software configuration information if needed

The volume manager produces configuration information useful for accessing a copy made with Business Copy.

Software may require configuration information to make use of the Business Copy LUNs after the data has been copied. This information is extracted from the instance of the software being used to access the parent LUNs. In particular, some logical volume managers support an “export” operation. The purpose of the export operation is to provide the means to access a volume group on a different host system for clustering or for physical movement of storage between host systems. The configuration information produced by a volume manager export is useful to access a copy that has been made with Business Copy.

Logical volume manager volume group

- Use the export operation to save configuration information for use with the Business Copy LUNs.

3c. Prepare Business Copy LUNs for data consistency

It is not necessary to prepare the Business Copy LUNs the first time a copy is made.

The Business Copy LUNs are dismounted as described in 1c for consistency using volume state management. It is not necessary to prepare the Business Copy LUNs the first time a copy is made since the Business Copy LUNs will not have been created or configured with the software yet. Preparation is needed only when the Business Copy LUNs are in existence and configured with the software when a copy is made. Some of the details of 1c may be slightly different or unnecessary since the use of the Business Copy may be different from the use of the parent.

4c. Make the copy from parent LUNs to Business Copy LUNs

Three methods are available for making a copy of the parent LUNs.

There are a few different ways to use Business Copy to make a copy of the parent LUNs.

1. If the Business Copy LUNs are to be created whenever the copy is made and then deleted to discard the copy, use the “create attached” operation to make the Business Copy and the “delete” operation is used to discard the Business Copy.
2. If the Business Copy LUNs remain in existence and remain accessible between uses after being created for the first time, use the “attach” operation to both make the Business Copy and to discard the Business Copy.

3. If the Business Copy LUNs retain their original LUN number after having been first created, but are not accessible after the copy is discarded, use the “attach” operation to make the Business Copy and the “detach” operation to discard the Business Copy.

In all three cases, the “create” operation must be used first to define the relationship between the parent LUNs and the Business Copy LUNs.

A Business Copy LUN can be created in either the attached or detached state.

If created in the attached state, a copy is made when the Business Copy LUN is created. This *create in attached state* process would typically be used to support cases 1 and 2 above.

If *created in the detached state*, a copy is not made and an attach operation will be required to make a copy. This create in a detached state process would typically be used to support case 3 above.

The method of defining the Business Copy LUNs with a create operation may only apply to an initial configuration process. The other methods may be most useful for repetitive operations. The *create*, *delete*, *attach*, and *detach* operations are all available for use in Command View SDM. These operations may be integrated with user written scripts or programs for automation.

The table below contains the details for these operations.

TABLE 1. Command View SDM Operations

Operation	Command Line
Create attached	armcopy -p <parent> -s <business copy> -a true <array-id>
Create detached	armcopy -p <parent> -s <business> -a false <array-id>
Delete	armcfg -L <business copy> -d <array-id>
Attach	armcopy -s <business copy> -a true <array-id>
Detach	armcopy -s <business copy> -a false <array-id>

5c. Set permissions on the Business Copy LUNs (required for Windows)

See the “*HP SureStore Secure Manager Virtual Array Installation and User's Guide*” for details. Permissions can be set using the **armsecure** command line or with the Command View SDM graphical user interface.

6c. Release parent LUNs for ongoing use

This reverses the effect of 1c. *Prepare parent LUNs for data consistency* on page 5, putting software and parent LUNs back into the normal operating state.

Using volume state management tools, the parent LUNs are again mounted to enable their use by the application software.

Raw logical volume

- Use volume manager software to activate the corresponding volume group.
- Resume or restart any applications using the logical volume.

File system residing on a logical volume

- Use volume manager software to activate the corresponding volume group.
- Use operating system facility to mount the file system.
- Resume or restart any applications using the file system.
- Raw virtual array LUN.
- Resume or restart any applications using the LUN.

File system residing on a virtual array LUN.

- Use operating system facility to mount the file system.
- Resume or restart any applications using the file system.

For consistency, using online backup the software is taken out of online backup mode.

For consistency, using post copy updates the software taken out of the necessary copy state and placed back into the normal operating state.

7c. Configure Business Copy LUNs for use with software

Using the configuration information captured in 2c Capture software configuration.

Using the configuration information captured in 2c. *Capture software configuration information if needed* on page 6, configure the Business Copy LUNs for use with the application software with the designated host system.

Business Copy LUNs may be configured for access on the same host system as the parent LUNs or on a different host system in a multi-host system configuration. Some uses of Business Copy may require the Business Copy LUNs to exist in exactly the same environment as the parent LUNs, including host volume labels, volume group names, and file system mount points. If the Business Copy LUNs must be configured exactly the same to work with the application software, then the Business Copy LUNs must be configured on another host system since both the parent LUNs and Business Copy LUNs can not be in exactly the same environment on the same host system at the same time.

**Logical volume manager volume group**

- Import the volume group using exported volume group definition information from *2c. Capture software configuration information if needed* on page 6.
- Change the name of the volume group as it is being imported if configured on the same host system.

8c. Update the Business Copy LUNs for data consistency, if needed

Use the software to apply updates to the Business Copy LUNs.

9c. Use the Business Copy

To use the Business Copy, follow the steps outlined in *6c. Release parent LUNs for ongoing use* on page 7. The step is the same as *6c*, except the actions are performed on the Business Copy LUNs rather than the parent LUNs. Some of the details of *6c* may be slightly different or unnecessary since the use of the Business Copy LUNs may be different from the use of the parent LUNs. For example, in a backup scenario the data is copied from the Business Copy LUNs to backup media using backup software rather than resuming operations on the Business Copy LUNs with the normal application software.

10c. Discard the Business Copy when no longer needed

To avoid consuming excess storage space, discard the Business Copy when no longer needed.

Discarding a Business Copy that is no longer needed is useful because a Business Copy does consume some amount of storage space and array controller performance resources. The space consumed by a Business Copy will tend to grow as the copy ages, therefore it is beneficial to discard a Business Copy soon after it is no longer needed.

Prior to discarding a Business Copy the actions of *3c. Prepare Business Copy LUNs for data consistency* on page 6 should be used to prepare the Business Copy LUNs. Below are listed the three options described in *4c. Make the copy from parent LUNs to Business Copy LUNs* on page 6 for making/discarding Business Copies.

1. create/delete
2. attach/attach
3. attach/detach.

Discarding a Business Copy with delete or detach (options 1 or 3) prevents the copy from consuming resources until the copy is made again with create or attach. Discarding a Business Copy with attach (option 2) is essentially the same as making a copy again. This does not prevent the copy from consuming resources as it ages, however it does start the resource consumption cycle over. It may be useful when using option 2 to discard the copy on a regular basis

whenever it is not being used. Although, option 2 is the most difficult way to create and discard copies it is required in any environment that requires continuous access to the Business Copy LUNs as a part of basic system operation.

Restore procedure

When a parent LUN is lost or damaged, you have to restore the parent LUN using data captured using Business Copy as described above. There are a few assumptions at the beginning of the restore procedure.

- 1.** The data to be restored has been copied from backup media to on-line disks in form of the Business Copy LUNs.
- 2.** The Business Copy LUNs are no longer subject to access by backup software.
- 3.** The parent LUNs have been created and configured for normal use by software. They may or may not be currently in use depending on the state of the application.

Given these assumptions the process is as follows:

1r. Prepare Business Copy LUNs for data consistency

The details are the same as *3c. Prepare Business Copy LUNs for data consistency* on page 6.

2r. Prepare parent LUNs for data consistency

The details are the same as *1c. Prepare parent LUNs for data consistency* on page 5.

3r. Make the copy from Business Copy LUNs to parent LUNs

The “copy to parent” operation is used to copy data from the Business Copy LUNs back to the parent LUNs.

Command line

```
armcopy -r <parent> <array-id>
```



4r. Release parent LUNs for ongoing use

The details are the same as 6c. *Release parent LUNs for ongoing use* on page 7. The software is now operating with restored data.

Example:

Process partitioning

Configure the system to automatically perform “backup” and “restore” using Business Copy after a manual set up procedure then manually execute “maintenance” as needed.

The Business Copy usage processes can be partitioned into more than one executable process. In particular, it may be useful to break them into an initial configuration process that is executed only once and a repetitive process that is used each time a copy needs to be made. This would allow some process steps to be avoided in the ongoing use case once the configuration is initially set up and would result in a simplification of the repetitive process. This is an example of how the process could be partitioned for a backup and restore usage scenario.

Configuration process use steps: 1c, 2c, 4c, 5c, 6c, 7c, 8c

Backup process use steps: 1c, 3c, 4c, 6c, 7c, 9c

Restore process use steps: 1r, 2r, 3r, 4r

Maintenance process use step: 10c

In this example,

- The **configuration** process is executed manually when first configuring the system to perform backup using Business Copy.
- The **backup** process is executed automatically by time or demand scheduling.
- The **restore** process is executed automatically on demand.
- The **maintenance** process is executed manually as needed.

Integration in Microsoft Windows® environments

This section provides details about integrating Business Copy VA in Microsoft Windows NT® 4.x and Microsoft Windows 2000® environments that may not be readily apparent to users of those systems.

Business Copy LUN discovery

Discovery can be achieved without a reboot.

Newly created Business Copy LUNs (or any newly attached disks) are normally discovered by Windows during a system boot. However, discovery can also be achieved without a reboot. In Windows 2000 discovery without reboot is accomplished by use of the disk administrator tool “rescan” function. In Windows NT 4.x discovery without reboot is accomplished by starting and then exiting the disk administrator tool after making the Windows registry entry described in the following web document:

<http://support.microsoft.com/support/kb/articles/Q162/4/71.ASP>

Making Business Copy LUNs accessible to Windows.

Discovery of Business Copy LUNs is relevant to 4c (page 6) and 7c (page 8). After being discovered by Windows, Business Copy LUNs can be made accessible to Windows using the disk administrator tool. Once they have been made accessible to Windows they are subject to access by Windows as long as Windows remains booted. If the Business Copy LUNs do not remain accessible (in the attached state) while Windows is up, attempts to access them may result in placement into a failed state by Windows and a reboot may be required to recover. Therefore, in 4c. *Make the copy from parent LUNs to Business Copy LUNs* on page 6, the use model in which the Business Copy LUNs remain in the attached state between uses (case 2) is most useful for Windows.

Discovery and LUN security

Use Secure Manager Virtual Array to prevent discovery and access of a Business Copy LUN by the wrong host system.

Once a newly created Business Copy LUN has been discovered by Windows there is a potential that it can be made accessible by use of the disk administrator tool. When a LUN is made accessible to Windows, a signature is written on the LUN that would otherwise prevent it from being used on a different Windows system in a multi-host configuration. Secure Manager VA, the LUN security management tool available from HP for the VA series of disk arrays, can be used to prevent discovery and access of a Business Copy LUN by the wrong host system in a multi-host Windows environment (and in SAN configurations). Security is set on the Business Copy LUN after it has been created but before it is put to use on the host system as described in 5c. *Set permissions on the Business Copy LUNs (required for Windows)* on page 7.

Dismounting and remounting Windows volumes

The ability to dismount a volume in Windows is not supported in the disk administrator tool. The capability is provided in an operating system API. A command line utility that uses the API is provided with Business Copy VA.

The following command line can be used to dismount a Windows volume after all usage of the volume has been terminated:

```
BCopyUtil -dismount <volume path>
```

The following command line can be used to remount a dismounted Windows volume:

```
BCopyUtil -mount <volume path>
```

Dismounting and remounting Windows volumes is relevant to 1c, 3c, 6c, 9c, 1r, 2r, and 4r.



hp va 7000 series

Integration in Microsoft Windows® environments

**hp surestore
command view
sdm software**



**for the
hp va 7000
series arrays**

hp — primer

for information about the va 7000 series
and periodic updates to this white paper
see the HP SureStore website at
<http://www.hp.com/go/storage>



Copyright© by Hewlett-Packard Company, 2001.
All Rights Reserved.

This document contains information which is protected by copyright. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of the Hewlett-Packard Company.

Hewlett-Packard Product Information

hp surestore command view sdm software – for the hp va 7000 series arrays

Published: July 2001

Revision level 1.1

For the latest updates to this document see
<http://www.hp.com/go/storage>

Warranty

This document is supplied on an “as is” basis with no warranty and no support. Hewlett-Packard makes no express warranty, whether written or oral with respect to this document. HEWLETT-PACKARD DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: IN NO EVENT SHALL HEWLETT-PACKARD BE LIABLE FOR ERRORS CONTAINED HEREIN OR FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT OR LOST DATA) WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS MATERIAL.

The information contained in this document is subject to change without notice.

No trademark, copyright, or patent licenses are expressly or implicitly granted (herein) with this document.

Disclaimer

All brand names and product names used in this document are trademarks, registered trademarks, or trade names of their respective holders. Hewlett-Packard is not associated with any other vendors or products mentioned in this document.

Trademark Credits

Windows®, Windows NT®, Windows 2000®, and Microsoft Windows® are U.S. registered trademarks of Microsoft Corporation.

Table of contents

Introduction	1
A brief overview of HP's Command View SDM.....	1
Enterprise e-business support	2
Other highlights of HP Command View SDM tools.....	3
Software components	4
SAN Host Agent and DIAL Services	4
Graphical user interface (GUI)	4
Command line user interface (CLUI)	4
Command view user interface (CVUI).....	5
HP Command View log tool	5
HP Command View web manager	5
Event reporting software	5
Other features	6
<i>HP Surestore Enterprise Management Smart Plug-Ins</i>	<i>6</i>
<i>HP Surestore Business Copy Virtual Array</i>	<i>8</i>
<i>HP Surestore Secure Manager Virtual Array</i>	<i>8</i>
<i>HP Surestore Auto Path Virtual Array</i>	<i>8</i>
<i>HP OpenView Storage Node Manager</i>	<i>8</i>
Architecture	9



The VA7000 Series



Introduction

Storing and protecting data is more important than ever.

Over the years, the IT business industry has come to realize the need for more robust and highly available storage systems to *store their most valuable asset*, their *business data*. This need for increased storage is constantly on the rise with the storage cost contributing to a significant percentage of the company's IT budget.

What is the focus when deciding on storage architecture?

According to a recent study, storage capacity, maintenance/upgrades, reliability, secure backup solutions, and speed are some of the major factors that the storage consumers are focusing on when deciding on storage architecture. The advent of Storage Area Network (SAN) brought with it many benefits; namely improved data availability using alternate data paths, consolidated storage that leads to simplified management and scalability, and easy and fast remote data transfer. Given the complex nature of the storage architecture, storage management software products are expected to evolve from isolated point products to full suites of solutions that will support varying operating environments including HP-UX, Windows NT, Windows 2000, and Linux. The need for a complete software solution that will perform all of the storage management tasks for device discovery, monitoring, reporting, and configuring the storage devices is becoming evident.

HP's latest **HP Surestore Command View SDM** (storage device management) software suite provides exactly the same benefits as mentioned above. With this array management software, HP is ready to deliver the storage management capabilities required by today's storage customers.

A brief overview of HP's Command View SDM

HP's software suite, "HP Command View SDM" is a tool that provides device management capabilities for its array products. In the future, **HP Command View SDM** will support other modular storage devices such as disk systems. The HP Command View SDM is a one-stop solution that provides all the required functionality to configure, launch virtual array value-added enterprise software, and perform all storage administration for the devices it is managing in a single software suite. The entire software suite works seamlessly in both direct host-attached and SAN environments. The HP Command View SDM has a client-server based architecture and each component within the suite is designed to provide a specific functionality.

Enterprise e-business support

According to a recent survey conducted by Gartner, *availability, scalability, security, performance, manageability, and third-party software support* are the important characteristics that IT managers think are necessary for a data center, supporting an enterprise e-business. Given that, here is how HP provides solutions to these issues.

HP Command View SDM eliminates the need for multiple software tools, reducing software costs and training.

- Software costs contribute to a significant percentage of the data center operating cost. It becomes necessary to purchase software to cater to all the various operating systems, which quickly adds to the total cost. Moreover, these different tools also increase the amount of training required, which is one of the biggest challenges that data centers are facing today. **HP Command View SDM** is a JAVA based tool, making it portable across multiple operating platforms, and therefore reducing software costs and training. HP's users will use the same software to manage new arrays and other new devices, thereby reducing the time required for training. As new features are added to existing arrays, minimal additional training will be required because HP Command View SDM will simply be extended to manage these new features. In addition, the use of a single tool makes configuring and monitoring a variety of IT storage devices easy for managers.
- With the frequent emergence of newer and more refined architectures, software scalability plays a major role in reducing operating costs. **HP Command View SDM** is highly scalable with its modular architecture designed towards enabling it for embedded systems, which is the future in SAN management software.

What about supporting third-party tools?

- Data centers use a wide variety of tools from different vendors to achieve the desired functionality. Consequently, it is important for a new software solution to be flexible enough to support those third-party tools to help reduce retraining costs and limit the changes to the existing data center operations.
HP Command View SDM offers support for third party tools through the HP Surestore Enterprise Management Smart Plug-Ins. This component helps in integration with tools such as HP OpenView Network Node Manager, CA Unicenter TNG, and HP TopTools. It also provides support for widely used HP-UX software tools such as SAM and MESA.
- With the increase in distributed computing, data centers span across multiple geographic locations. In addition, the need to better serve the customers has lead to IT personnel spending a large amount of time at the data center either configuring the systems or troubleshooting problems. This in turn increases the cost of system administration.



To overcome this issue, HP Command View SDM provides remote array management capabilities, thus providing its users the freedom to manage their array from different geographic locations. Remote management can be done using either the web-based GUI or the command line user interface (CLUI) using the standard telnet application.

HP Command View SDM provides support that Data Centers need to ensure that users receive quality, uninterrupted service.

- Data centers face a major challenge of providing their users uninterrupted and faster access to the data. This issue becomes even more critical in time-sensitive business such as Internet applications. **HP Command View SDM** provides support for creating and managing *point-in-time copies* for replicating virtual disks, known as logical unit numbers (LUNs) for online backup through the *HP Surestore Business Copy VA*. In addition to providing quick and easy backup, this tool can increase performance by maintaining multiple copies of the data for faster user access.

Other highlights of HP Command View SDM tools

- The device discovery tool quickly identifies and recognizes other components.
- An enhanced *Log Viewer* tool to view and analyze the array logs.
- A launcher consisting of a list of icons for each array connected to a specific host, which—when double-clicked—launches the GUI window for the management of a specific array.
- Support for Heterogeneous servers by providing varying behavior by the array for different hosts containing different operating systems.
- Support for installing optional features.
- HP's Command View SDM *multi-host synchronization* prevents conflicts when more than one host tries to perform the same operation at the same time. This feature is completely transparent to the user and embedded in the HP Command View SDM architecture

Software components

The HP Command View SDM suite consists of the following set of software components.

SAN Host Agent and DIAL Services

Both the SAN Host Agent and DIAL Services are daemons or services that must be running on at least one server or host to which the array is connected for all other HP Command View SDM components to function. DIAL discovers all the storage devices that are connected to the host. The SAN Host Agent provides access to the array as needed by the other HP Command View SDM software utilities.

Graphical user interface (GUI)

The HP Command View SDM GUI is a graphical tool used to manage the array. This tool has a common look and feel for all the storage management tasks. A key advantage of this tool is the ability to use it for both direct host-attached using the HP Command View SDM Launcher and remote management of the array using a web browser.

In addition, this tool provides active graphic displays that allows array management from anywhere within the network. This tool provides support for almost all of the features of array management including configuring the array, proactive health monitoring event notification, resolving faults, creating snapshot copies with Business Copy VA, protecting data using LUN security with Secure Manager VA, monitoring performance, and performing online firmware downloads.

Command line user interface (CLUI)

In addition to the state-of-the-art GUI, the HP Command View SDM suite also provides a powerful Command Line User Interface that can be used in creating custom scripts for efficient array management in a SAN environment. This tool is effective in quickly configuring a set of arrays in a network management application environment.

This tool can also be used to remotely manage the arrays by using the telnet application to log into the host system. It provides a set of 14 commands to support array management. Each of these commands is used for a specific functionality such as array discovery, providing array status, array configuration, Business Copy, Secure Manager, Heterogeneous Servers, Array Log analysis, and Firmware Downloads.



Command view user interface (CVUI)

This is a text-based, menu-driven version of the CLUI. This removes the need to become familiarized with the switch options in the regular CLUI commands and provides an easy menu-based tool to achieve the same results as the CLUI

HP Command View log tool

This graphical tool provides information on the array logs. It presents the same log information provided by the CLUI, but in a more easily readable format.

HP Command View web manager

This tool is a web-enabled GUI that is used for remote array management. It provides all the functionality that the regular GUI offers.

Event reporting software

All internal actions in the array are monitored, such as configuration changes, system state changes, and malfunctions. The more serious internal actions are identified as *events*. These events are retrieved from the array and communicated to the user in the form of warnings. HP's Command View SDM event reporting software broadcasts these events to various platform dependent targets such as HP OpenView, HP TopTools, Event Viewer and CA Unicenter TNG on windows platforms, Syslog on Linux platforms, and Syslog and HP EMS on HP-UX platform.

On Microsoft Windows NT, events are put into the event log. There are SNMP agents that send out SNMP traps. The SNMP traps can be received via various third party tools such as CA Unicenter-TNG, HP OpenView Network Node Manager, and so forth. On HP-UX, HP Command View SDM is integrated with the standard HP-UX Event Monitoring Service (EMS). This in turn can send out SNMP events. On Linux, events are placed into Syslog, the standard event-logging file.

Other features

In addition to the previously mentioned components, HP Command View SDM also provides other optional features that offer additional applications to better manage the array. These optional features are discussed briefly below.

HP Surestore Enterprise Management Smart Plug-Ins

Enables the HP Command View SDM in HP OpenView Network Node Manager for HP-UX, Windows 2000 and Windows NT 4.0, HP TopTools, and CA Unicenter TNG environments.

The Smart Plug-Ins enable HP OpenView Network Node Manager, HP TopTools, and CA Unicenter TNG to discover the HP Command View SDM stations. Then the list of all the HP Surestore Virtual Arrays connected to each of those stations is obtained and are represented by individual icons for each array.

These arrays can then be managed from within any of the above-mentioned tools by double-clicking on the icon, which launches the HP Command View SDM GUI on a web browser. The HP Command View SDM SNMP Agent sends SNMP information such as SNMP traps, which are then interpreted by the Smart Plug-Ins and the status of the array is updated appropriately.

The following are some screen shots that depict array management using HP OpenView Network Node Manager, CA Unicenter TNG, and HP TopTools.



FIGURE 1. HP OpenView Network Node Manager

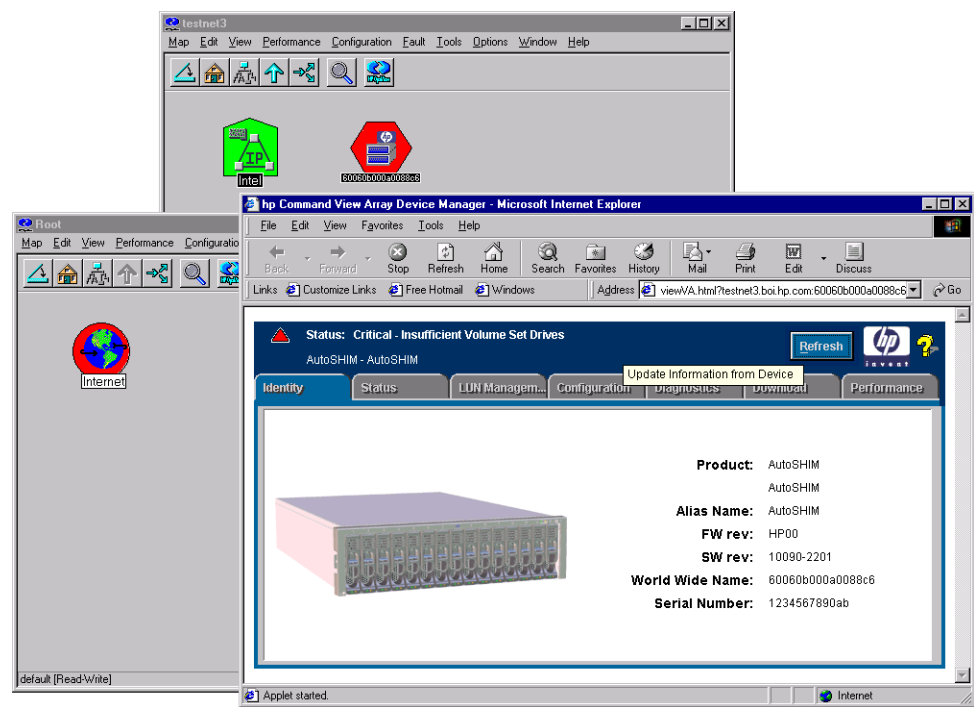


FIGURE 2. CA Unicenter TNG 2D Device Map

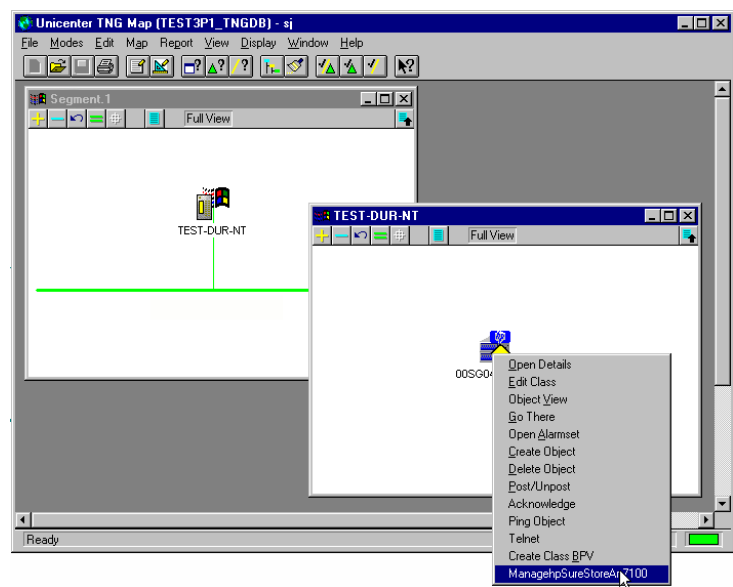
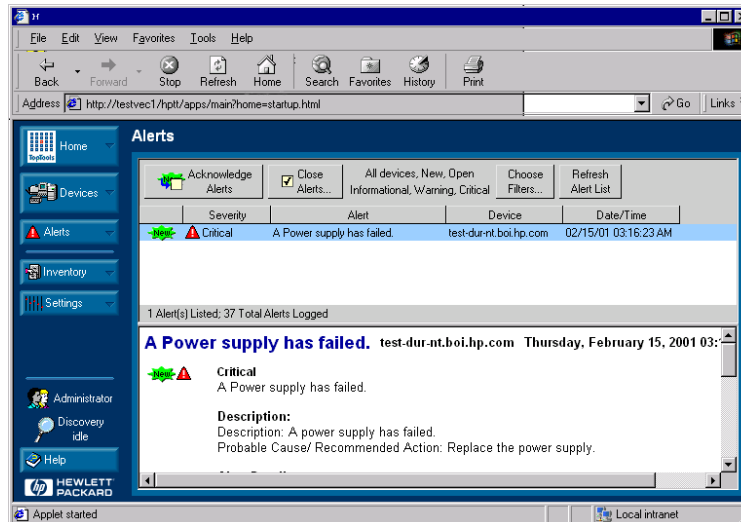


FIGURE 3. Alerts within HP Tootools


HP Surestore Business Copy Virtual Array

This utility enables online data replication or LUN copying within the array for testing and backup. These copies, sometimes referred to as snapshots, are nearly instant, so that user's access to data effectively continues without interruption.

HP Surestore Secure Manager Virtual Array

This management utility enables LUN security features in the VA 7000 series arrays. Using this utility, the administrator can secure access to specific LUNs such that only specific hosts can have access to specific LUNs. This feature allows different hosts to have varying permission levels for each LUN.

HP Surestore Auto Path Virtual Array

This software utility enables I/O path fail-over in Windows NT and Windows 2000 environments. Auto Path VA support for Linux and HP-UX will be introduced later 2001. Where multiple host bus adapters are configured in a single host to connect to the same array, if one of the host bus adapters or other component in a path fails, Auto Path VA will automatically redirect I/O traffic from that path to an alternate path.

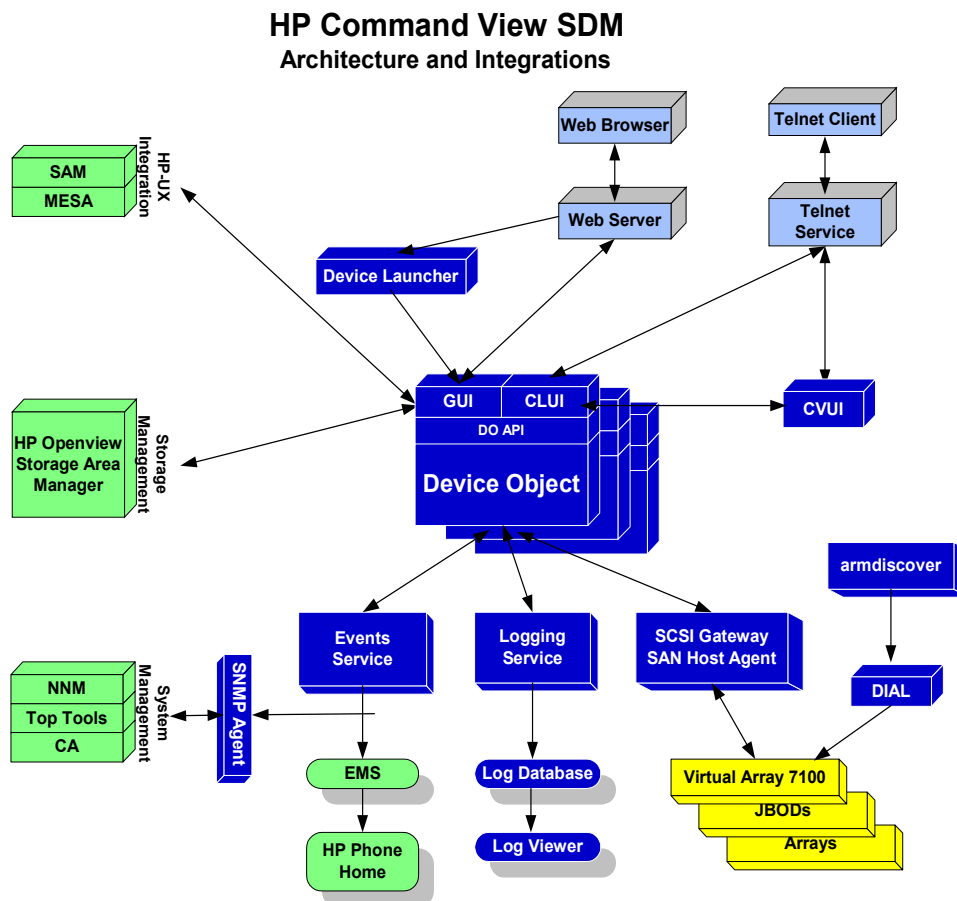
HP OpenView Storage Node Manager

HP Command View is integrated with the Open View Storage Node Manager software that offers solutions for the management of network storage infrastructure and storage access control. The Command View GUI can be launched from within the Storage Node Manager. The Storage Node Manager Software is also capable of retrieving capacity, LUN, and performance information from the HP Command View SDM.

Architecture

The HP Command View SDM architecture is simple yet robust, and flexible enough to suit any business setup. Figure 4 depicts the HP Command View SDM architecture and its integration with various tools.

FIGURE 4. HP Command View SDM architecture



Once a discovery of all the arrays connected to the host is made by DIAL, the client applications such as the GUI and CLUI communicate with the array through the services provided by the SAN Host Agent. The communication channel uses JCore, a framework created within HP that uses several key technologies such as Java RMI, Java dynamic class-loading, and spontaneous networking for seamless and fast response.

In addition, JCore also provides a single point of enforcement for authentication and security services involving a two way authentication process between the server and the client that enables a trusted environment for client-server communication.

In order to illustrate the superiority of HP's Command View SDM Software suite over its competitors, here are some facts and figures.

- Unlike some competitors' arrays, HP Command View SDM does not require expensive array controller software to install the device manager, but offers a simple yet robust software suite.
- The HP Command View SDM provides a single tool that works on multiple operating environments, unlike some software suites that have different tools for different operating environments.
- Some vendors' solutions are supported only on Wintel platforms, whereas HP Command View SDM is supported on HP-UX and Linux platforms as well as Wintel platforms.
- The HP Command View SDM provides a web-based GUI used for remote storage management which most of its other competitors do not provide, with the exception of a few.
- HP Command View SDM provides extensive array performance information relative to other vendors management software.

The HP Command View SDM software suite is the answer to excellent storage management.

HP's Command View SDM Software Suite along with the VA series of disk arrays are sure to provide a stress-free storage environment as stated by HP. HP Command View SDM provides real value to the user by providing state of the art, powerful, yet easy to use storage management tools.

**enterprise
smart
plug-ins**



**network
management
for the
hp va 7000 series**

hp — white paper

for information about the va 7000 series
and periodic updates to this white paper
see the HP SureStore website at
<http://www.hp.com/go/storage>



Copyright© by Hewlett-Packard Company, 2001.
All Rights Reserved.

This document contains information which is protected by copyright. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of the Hewlett-Packard Company.

Hewlett-Packard Product Information

enterprise smart plug-ins – network management for the hp va 7000 series

Published: July 2001

Revision level 1.1

For the latest updates to this document see
<http://www.hp.com/go/storage>

Warranty

This document is supplied on an “as is” basis with no warranty and no support. Hewlett-Packard makes no express warranty, whether written or oral with respect to this document. HEWLETT-PACKARD DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: IN NO EVENT SHALL HEWLETT-PACKARD BE LIABLE FOR ERRORS CONTAINED HEREIN OR FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT OR LOST DATA) WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS MATERIAL.

The information contained in this document is subject to change without notice.

No trademark, copyright, or patent licenses are expressly or implicitly granted (herein) with this white paper.

Disclaimer

All brand names and product names used in this document are trademarks, registered trademarks, or trade names of their respective holders. Hewlett-Packard is not associated with any other vendors or products mentioned in this document.

Trademark Credits

HP-UX Release 10.20 and later and HP-UX Release 11.00 and later (in both 32 and 64-bit configurations) on all HP 9000 computers are Open Group UNIX 95 branded products.

Windows®, Windows NT®, Windows 2000®, and Microsoft Windows® are U.S. registered trademarks of Microsoft Corporation.

Table of Contents

Overview.....	1
Simple Network Management Protocol (SNMP).....	2
Enterprise Smart Plug-Ins	3
Functionality and Ease of Installation	3
<i>Plug-in Features</i>	3
Management Frameworks	4
<i>Troubleshooting examples</i>	4
CommandView SDM.....	7
References.....	7
<i>SNMP Overview</i>	7
<i>HP-UX Event Monitoring Service</i>	7
<i>HP OpenView NNM</i>	7
<i>CA Unicenter TNG</i>	7
<i>HP Surestore Command View (white paper*)</i>	7



The VA7000 Series

Overview

Many system administrators use enterprise and system management tools to reduce the effort required to manage large networks of computer equipment. These tools, often called *management frameworks*, provide the ability to manage network resources such as storage, servers, hubs, switches, and printers from a single management station. Typically, these management frameworks use a networking protocol called the Simple Network Management Protocol (SNMP) for communications between the *managed elements* and the *management station*.

Command View SDM, the host-based management software for the VA7100, allows SNMP-based management of the array by providing an SNMP agent. To allow easy management of the VA7100 Disk Arrays, HP is also introducing **Enterprise Smart Plug-ins**, a set of software components that provide an easy way to manage VA7100 arrays using three of the leading management frameworks. The Command View SDM management software interfaces with the management frameworks over a local area network. The management framework uses the Enterprise Smart Plug-ins to interpret the data sent between Command View SDM and the management framework.

*Why do system
administrators use
Enterprise Smart Plug-ins?*

The plug-ins allow administrators to easily incorporate management of the VA7100 Disk Array within their existing management scheme. The plug-ins will also reassure administrators considering the use of these management frameworks to know that HP is making integration easy for them. Without the convenience of Enterprise Smart Plug-ins, users would have to integrate their enterprise management framework directly with Command View SDM themselves. Using the plug-ins saves the user time and money by providing an out-of-the-box solution.

This white paper describes the Enterprise Smart Plug-Ins and the functionality they provide for the following management frameworks:

- HP OpenView Network Node Manager
(for HP-UX and Windows NT/2000)
- HP TopTools
- CA Unicenter TNG for Windows NT/2000

Simple Network Management Protocol (SNMP)

What is SNMP?

SNMP is a communication protocol that has gained widespread acceptance since 1993 as a method of managing TCP/IP networks, including individual network devices and devices in aggregate.

SNMP was developed by the Internet Engineering Task Force (IETF), and is applicable to any TCP/IP network, as well as other types of networks.

For the purposes of this paper, SNMP can be thought of as being in two parts:

1. Management Information Base (MIB)
2. Traps

MIB – what is it and what does it do?

The MIB provides a means for a management application to **pull** information from a device. The MIB is a packet of information about the managed device that can be browsed by the management application to gather information. A large amount of MIBs have been defined for different purposes, although some are standard. One of the reasons that SNMP has become popular is that the protocol is easy to implement and extend. For example, the CommandView SDM SNMP agent uses a MIB to publish identity information regarding managed arrays.

How are Traps used?

Traps are a means for the device to **push** information to the host. The CommandView SDM SNMP agent typically sends out a *trap* when a managed array changes state.

All the managed elements in the network will have their own MIBs and Traps. The management station reads the MIBs to build up *maps* of the network and listens for *traps* to detect events such as errors or status changes.



Enterprise Smart Plug-Ins

Functionality and Ease of Installation

The plug-in installs easily into the management framework and provides the *glue* to link the framework with the *CommandView SDM SNMP* agent.

The management framework uses the plug-in to interpret the SNMP information from CommandView SDM. As noted above, this information consists of *MIBS* requested by the management station and *traps* sent by CommandView SDM. The plug-ins also provide icons, menu choices, and other configuration information to the framework, therefore providing a clear representation of the behavior of the array to an administrator.

Plug-in Features

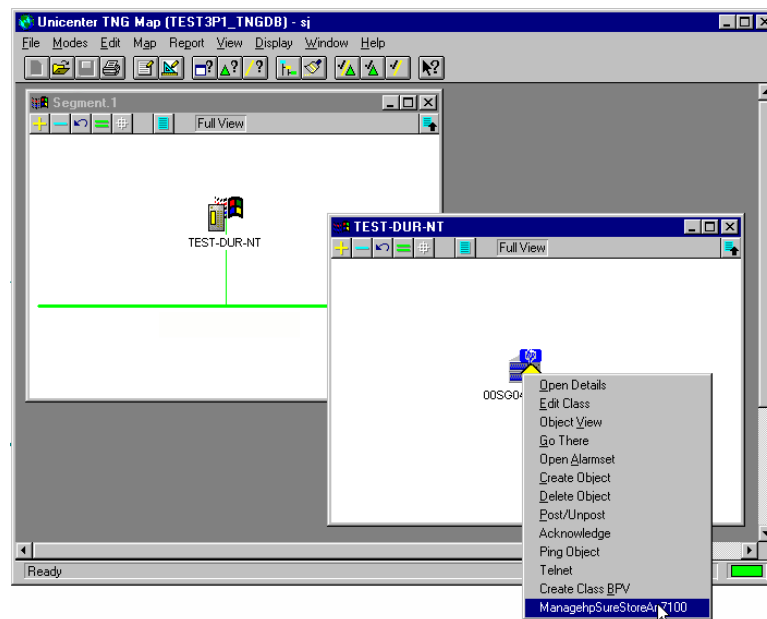
- Display icons for discovered arrays in management framework *device maps* along with product and identification information.
- Status reporting of managed arrays within the management framework. This can be used to initiate actions such as email or pager alerts.
- Provides hotlinks to the CommandView SDM Web Interface. This allows for quick identification and rectification of problems.

Management Frameworks

Troubleshooting examples

The figures below display examples of various screen shots and troubleshooting scenarios from the management frameworks.

FIGURE 1. CA Unicenter TNG 2D Device Map



In Figure 1, you can see a Windows Server with a SureStore VA7100 Array contained within it. Notice that the Server is yellow, indicating that there is a problem with the array.

By right clicking on the array icon, you can launch a browser to look at the array in question more closely.

Most of the applications follow this *tree* paradigm allowing users to drill down to get more information.

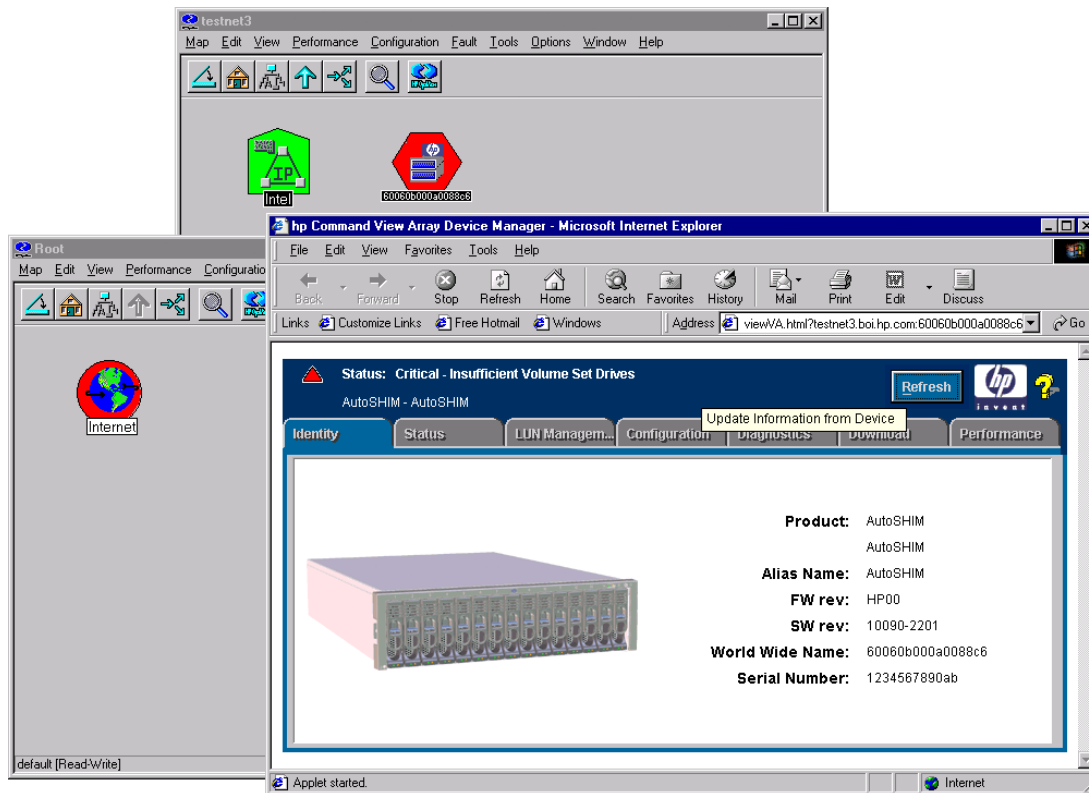
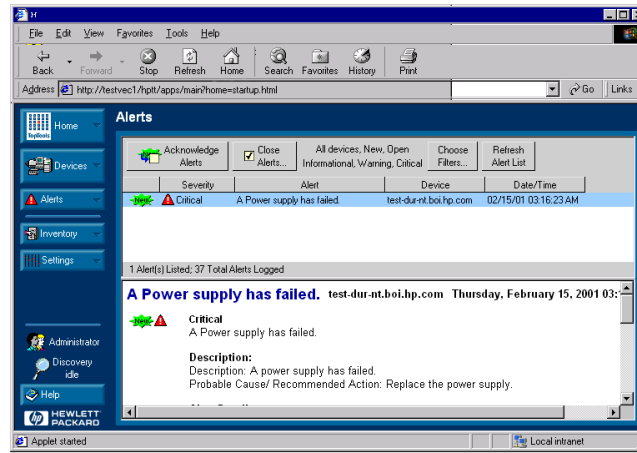
FIGURE 2. OpenView Network Node Manager and CommandView SDM

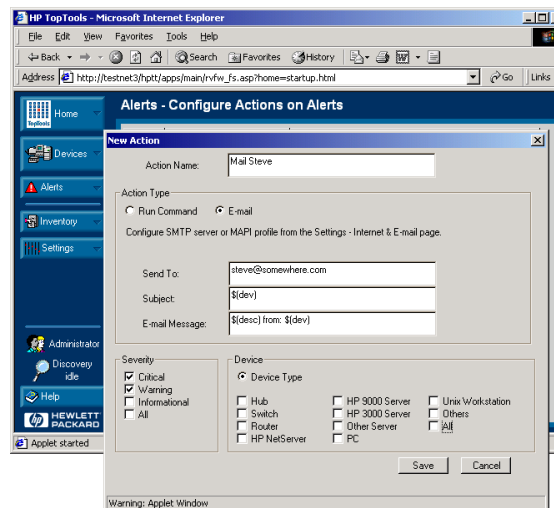
Figure 2 displays a screen from **HP OpenView Network Node Manager**. In this example, a critical failure has occurred on an array. This failure, in turn, has changed the status of the *whole network* to red. The *whole network* is represented in the window above by the world icon labeled “Internet.”

Note: Normally you can configure how status changes are handled.

The user drilled down through his network, clicking on the world icon, then the hexagon icon which represents the VA7100 array. Clicking on the VA7100 array icon, the user launched a web browser to investigate the problem further and found in this case that apparently some drives were removed from the array.

FIGURE 3. Alerts within HP TopTools


All of the enterprise management applications have *alert* browsers that provide more information on the *traps* received from devices as well as the graphical views. This allows more information to be gathered on failures and usually allows trending or rule application.

FIGURE 4. Configuring email with TopTools


As described above, management applications typically allow the administrator to apply rules and/or actions to received events with varying degrees of sophistication.



In the example shown in Figure 4, the user is configuring an email to be sent to the administrator for certain levels of events. The email could be sent to a pager, cell phone, or similar device.

CommandView SDM

Will the Enterprise Smart Plug-ins run on Windows, HP-UX, and Linux?

The Enterprise Smart Plug-ins are designed to work with CommandView SDM running on a Windows NT/2000 host. CommandView SDM is integrated with the Windows SNMP service.

On HP-UX, CommandView SDM is integrated with the Event Monitoring Service (EMS) that in turn provides an SNMP service for integration with various management frameworks. EMS is not discussed in this white paper, although it is possible to use EMS to route CommandView SDM events to most management frameworks.

Note: At present, there is no SNMP integration available for the Linux OS. In this case a separate Windows based host could be used as a *proxy* agent to send SNMP alerts to a management framework.

References

SNMP Overview

http://www.ddri.com/Doc/SNMP_Overview.html

HP-UX Event Monitoring Service

<http://unix.hp.com/highavailability/sysclusmonitor/083/index.html>

HP OpenView NNM

<http://www.openview.hp.com/products/nnm/index.asp>

CA Unicenter TNG

<http://www.ca.com/unicenter/>

HP Surestore Command View (white paper*)

<http://www.hp.com/go/storage/>

**At the above URL, search for the HP Surestore Command View white paper*



The VA7000 Series

References



hp storage

july 2002

technical blueprint

hp zero downtime backup for the virtual array

executive summary

HP Zero Downtime Backup for the Virtual Array is an approach to data protection that utilizes logical, disk-based point-in-time copies (known as snapshots) of production data to enable customers to stage their backup first to disk and then copy that data to tape at their convenience.

This paper presents an HP Zero Downtime Backup technical blueprint for building a staged backup solution for the HP StorageWorks Virtual Array family, and includes the solution design rules, sample bill of material, and an example Zero Downtime Backup solution from a logical and physical view. Specifications are supplied for the solution components and a discussion of scaling the Zero Downtime Backup solution is also provided.

The example Zero Downtime Backup solution is for a SAN-attached configuration and assumes an HP StorageWorks va7400 disk array with one ds2405 disk enclosure (30 physical disk drives) plus an HP StorageWorks 1/20 Tape Library with an Ultrium LTO 230 tape drive.

Using the HP Zero Downtime Backup solutions described in this blueprint, customers can maintain business application and performance service levels while also protecting their data. The solution also eliminates the backup window as a constraint on IT planning, and can lead to a significant increase in tape library utilization.

Figure 1 presents a logical view of an HP Zero Downtime Backup solution configured in a SAN-attached configuration.

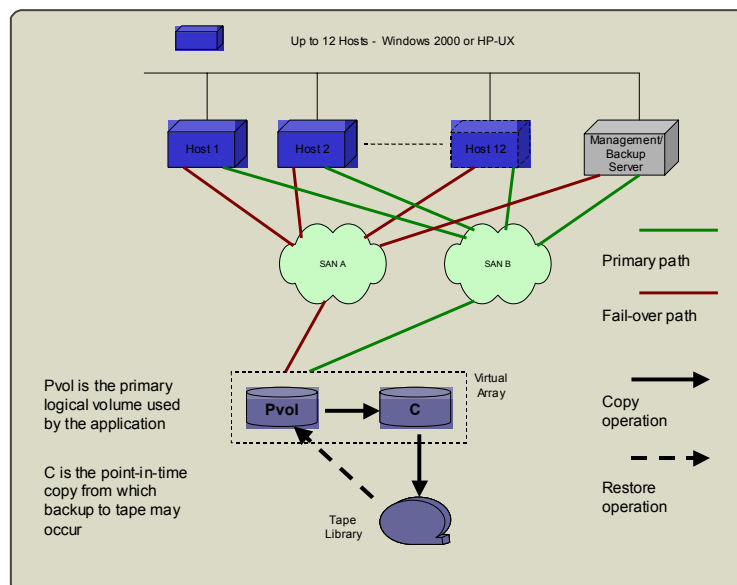
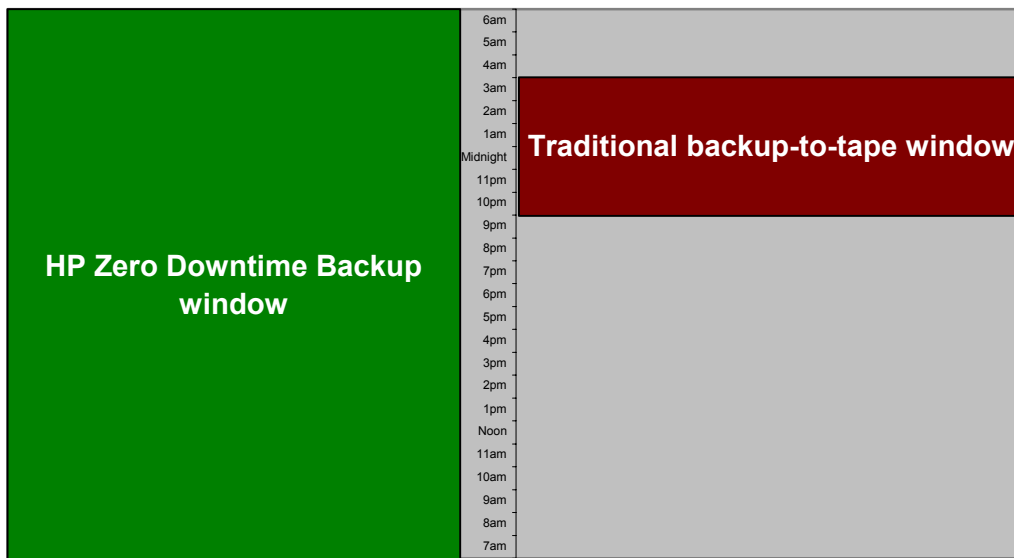


figure 1 - hp zero downtime backup solution logical view

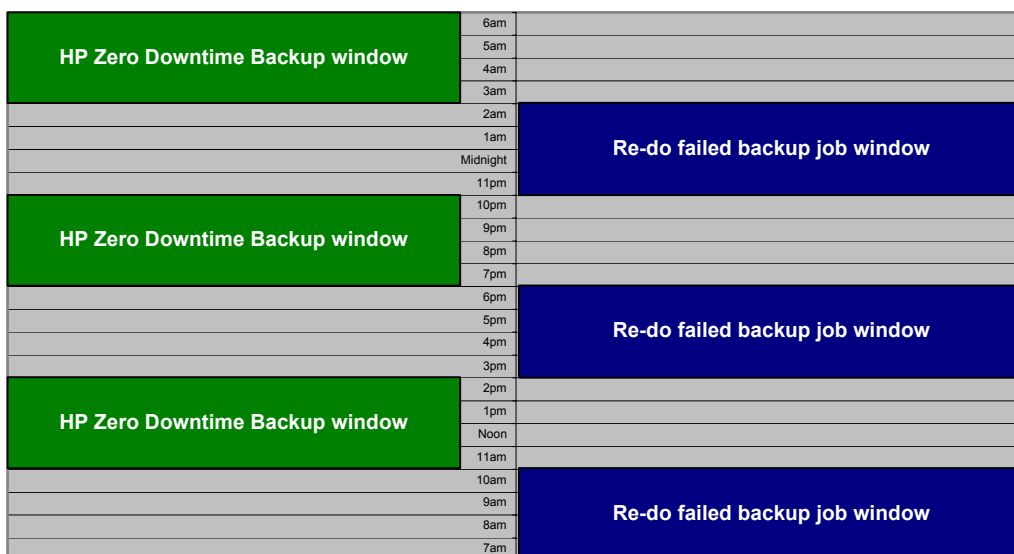
today's challenges in storage

Businesses today know that even planned downtime costs money, and the process of backing up data in the traditional manner – directly from a primary volume to tape – can take hours to complete, slow application performance or require the business application to be taken offline. HP Zero Downtime Backup enables customer to back data up to secondary volumes in minutes and subsequently – at their convenience – back up that data to tape without affecting application performance or availability.

As customers implement HP Zero Downtime Backup, they will be able to significantly extend the acceptable backup-to-tape window, effectively eliminating the backup window as a constraint on IT planning. Assuming the customer originally had a 6-hour backup window, HP Zero Downtime Backup could extend the backup out to 24 hours, thus quadrupling their tape resources without purchase of new equipment.



In addition, one of the primary concerns about backup-to-tape is ensuring the backup job is completed successfully. With HP Zero Downtime Backup, customers may parse out their backup-to-tape operation in 4-hour increments – backup for four hours, and then idle for four hours – over the course of a 24-hour day. This would extend the customer backup window to 12 hours for a 2x increase in tape resource utilization (assuming an original 6-hour, traditional backup to tape window), and also provide a period after each backup job to re-do any jobs that failed.



why an hp zero downtime backup solution?

HP provides a fully tested and qualified, end-to-end solution built from industry-leading product components that are easy-to-use, and supported by one point of contact – HP. With a commitment to quality, and a service and support organization of over 30,000 professionals in 120 countries around the world, HP provides customers the peace of mind that comes from knowing their solution works right now – and will keep working for them into the future.

The engine behind the HP Zero Downtime Backup solution is HP OpenView Storage Data Protector's replication and backup-to-tape management functionality. Data Protector has significant advantages over other technologies; for example:

- Easy scheduling of data replication tasks like create snapshots, and suspend/resume business applications
- Optional integrated backup-to-tape management provided by HP OpenView Storage Data Protector
- Ability to script a “mount copy volume to backup server” in order to support 3rd party backup applications from vendors like Veritas, Computer Associates and Legato
- Heterogeneous support across:
 - multiple business applications like Oracle, SAP, MS SQL and MS Exchange and application backup tools like SAP brbackup and Oracle RMAN
 - HP-UX and Windows operating systems as well as clustered environments






The HP Storageworks Virtual Array and Business Copy software also bring significant advantages over other technologies:

- Using Business Copy VA, the customer may create more than more than 100 snapshots with the va7100 and more than 1,000 snapshots with the va7400 or va7410
- Multiple snapshots per parent volume are supported
- The Virtual Array family includes autoraid for maximum device ease of use and can support up to 128 servers in a SAN configuration

HP is also a leading provider of tape libraries that ship with LTO tape drives, offering some of the fastest read/write tape drive speeds in the industry.

Last, every solution component is highly modular, easy-to-use and cost-effective to scale – from Data Protector's modular architecture and licensing to the Virtual Array's ability to non-disruptively add capacity.

key components

HP StorageWorks Virtual Array family		<ul style="list-style-type: none"> • Pro-active self-monitoring and end-to-end checksums keep data intact across the entire data path • Fault tolerant, redundant architecture w/ no single point of failure • Multi-terabyte scalability
HP OpenView Storage Data Protector software		<ul style="list-style-type: none"> • Advanced, flexible GUI-based job scheduling • Single, central management interface to manage replication and backup jobs • Tightly integrated with OpenView management tools
HP StorageWorks Business Copy VA software		<ul style="list-style-type: none"> • More than 100 snapshots w/ va7100 & more than 1000 snapshots w/ va7400 & 7410 • Multiple snapshots per parent volume • Cluster support and easy-to-use GUI
HP StorageWorks Ultrium LTO Tape Drives		<ul style="list-style-type: none"> • HP is leading developer of Ultrium/LTO tape technology • 54 GB/hour transfer rate* • 100 GB per tape cartridge capacity* <p><i>*data compression can double transfer rates and capacities</i></p>
HP StorageWorks Tape Libraries		<ul style="list-style-type: none"> • HP is a leading vendor of modular tape libraries • Can seamlessly scale from 1 to 6 drives and 20 to 60 slots as the customer requires • Larger tape libraries are also available w/ superior library management

physical configuration of hp zero downtime backup

Below is a physical view of a Zero Downtime Backup solution in a SAN configuration to facilitate cabling and physical design.

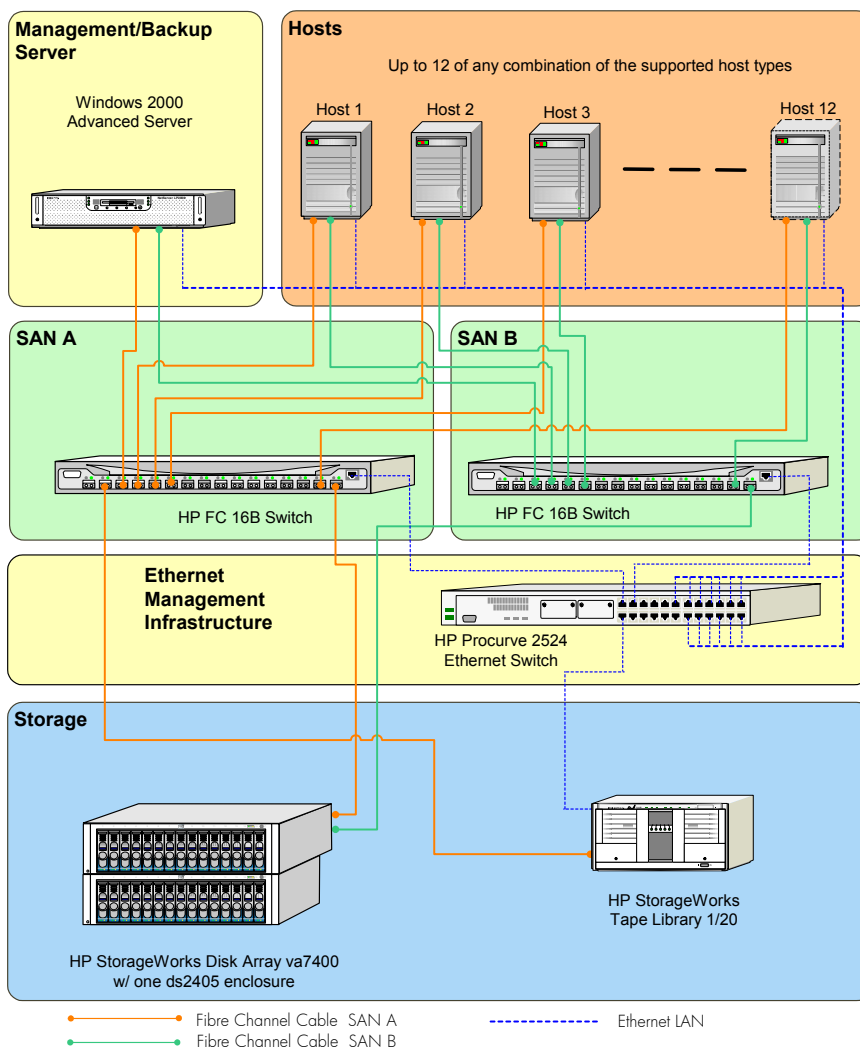


figure 2 - hp zero downtime backup solution physical view

The Ethernet switch provides important LAN connectivity for out-of-band SAN component management. For example, host-based agent software can be loaded from the management server using the Ethernet connection. See the Bill of Materials for specific component information.

The HP Zero Downtime Backup solution is a SAN configuration that can be racked to minimize space at a customer's site. Pictured below is an HP Rack System/E33. If additional rack space is needed, an HP Rack System/E41 may be used. For example, space for fibre channel switches, ds2405 enclosures or tape libraries may be needed as the solution grows.

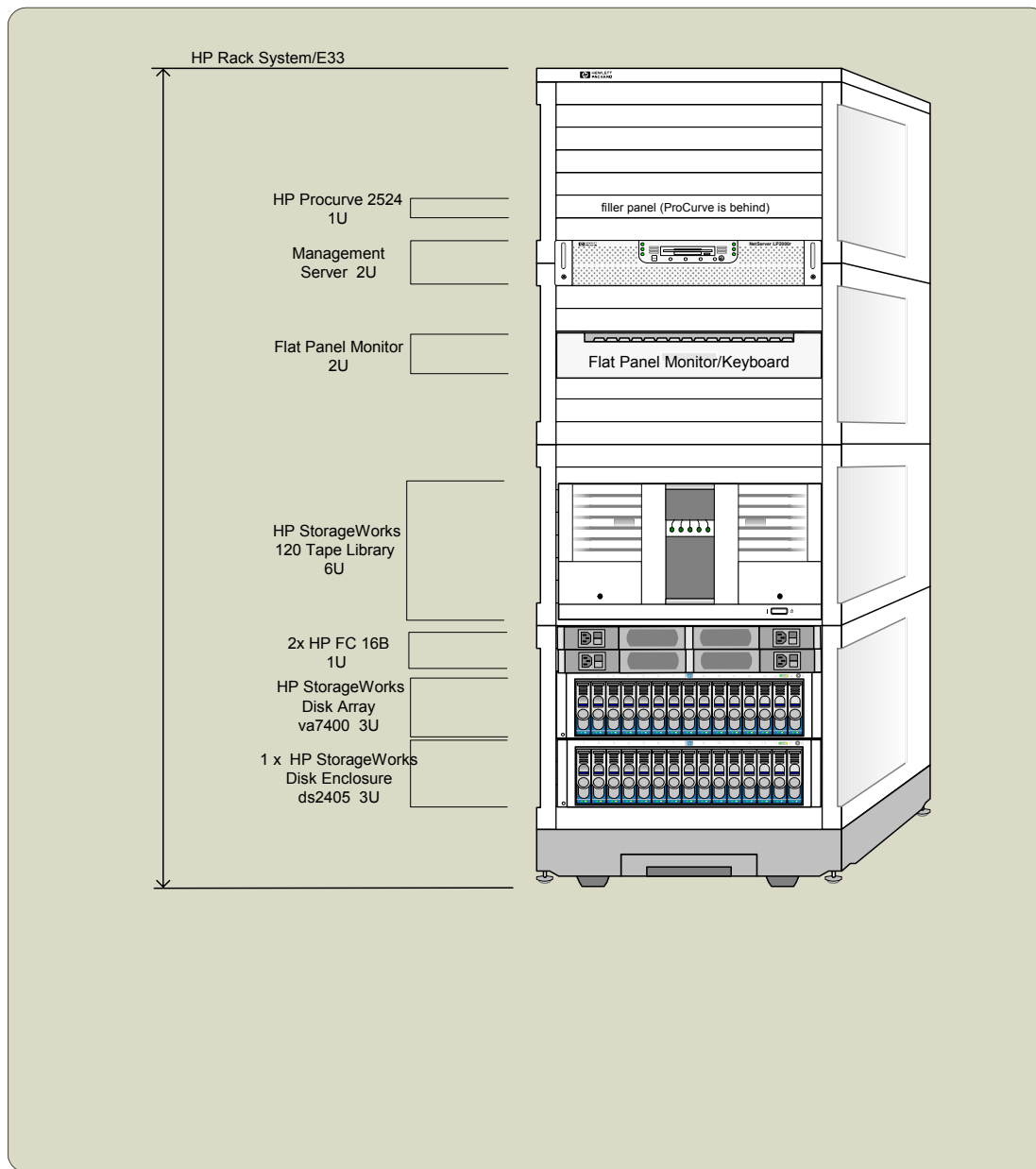


figure 3 - example hp zero downtime backup racked solution

hp zero downtime backup for the virtual array: growing the solution

The example solution illustrated in this blueprint can be modified to meet specific customer needs. To provide this flexibility, design assumptions and rules are listed below.

assumptions:

- va7400 and ds2405 are fully loaded (i.e. total of 30 drives – 15 each)
- Primary volumes will reside on smaller, faster 18 or 36 GB physical disk (recommended)
- Snapshot copy volumes will reside larger, less expensive 73 GB physical disks (recommended)
- One snapshot copy will be maintained on an ongoing basis for backup-to-tape purposes and will be re-synched with the primary volume once backup-to-tape is complete
- Available capacities for the primary volume and snapshot copy volume physical disks are calculated in autoraid mode
- Data replication occurs within the device using Business Copy VA
- Full backups occur once a day
- Full backups have been parsed into three segments that each take no more than four hours to complete, and which are separated by four hours of tape library idle time
- ~3 full copies of the data are stored within the tape library

rules:

- SAN solutions may accommodate up to 12 hosts of any of the supported types (see SAN supplement – “Supported Hosts” section) for one pair of HP FC 16B switches
- One Fibre Channel port and one Fibre Channel Bridge will be required for every two tape drives
- A total of 4 Fibre Channel switch ports are used for the management server and the va7400
- If using 18GB drives as the primary volume physical disks:
 - Usable capacity: ~285 GB's for primary volumes
 - Required # of 73 GB drives to support secondary point-in-time copies: 6
 - HP recommends a 1/20 Ultrium tape library
- If using 36 GB drives as the primary volume physical disk:
 - Usable capacity: ~475 GB's for primary volumes
 - Required # of 73 GB drives to support secondary point-in-time copies: 10
 - HP recommends a 1/20 Ultrium LTO tape library
- If using 73 GB drives as the primary volume physical disk:
 - Usable capacity: ~720 GB's for primary volumes
 - Required # of 73 GB drives to support secondary point-in-time copies: 15
 - HP recommends a 2/20 Ultrium LTO tape library

scaling options for the hp zero downtime backup solution

The example solution provided in this technical blueprint can scale over time to meet expanding customer requirements. If there is a need for more storage capacity, the customer should increase the size of the disk drives, add ds2405 enclosures and additional drives, or add additional storage arrays. Adding arrays may require additional Fibre Channel switches for additional connectivity and to maintain redundant paths. With additional disk capacity, more tape capacity will be needed as well.

It should be noted that a common switch will be used for both tape and disk SAN connections. “Tape-only” zoning is then utilized to simplify configuration of tape devices for hosts and backup software. The zone would include the tape connections and the tape-dedicated HBA's on each server in the SAN.

Without the zone, multiple tape images would appear on the host for a given tape drive requiring manual configuration of device driver files and backup software to resolve the I/O mapping. In addition to simplifying the configuration process, this method also enables optimal performance for tape and disk during backup operations by providing separate dedicated paths for data being read from disk while also being written to tape.

The example configuration may support more hosts and tape libraries by adding incremental meshed Fibre Channel switches. For specific guidelines on selecting the appropriate components, please consult your HP sales representative or channel partner.

hp zero downtime backup for the Virtual Array solution specifications

To ensure that the latest supported software, firmware and driver revisions are being used for Zero Downtime Backup in SAN configurations, please check with your HP sales representative or channel partner.

Below are the specifications for a SAN-attached configuration.

supported hosts

Supported Hosts and HBA's

	HP-UX	Windows
OS Version	11.0 & 11.11	2000
HBA	A5158A; A6684A; A6685A	QLogic 2200 F; Emulex LP 8000
Application Integration		
Oracle 8.1.x	yes	yes
Oracle 9i	yes	yes
SAP R/3	yes	yes
MS SQL Server 2000	n/a	yes
MS Exchange 2000	n/a	yes
File System	yes	yes
Raw logical volume	yes	no
Raw disk	yes	yes
Application Backup Tool		
Oracle RMAN	yes	yes
SAP brtools	yes	yes

interconnect

SAN Fibre Channel Infrastructure

Features	fc 1GB/2GB switch 8B	fc 1GB/2GB switch 16B
Number of Ports	8	16
Per Port Line Speed	1.0625/2.125 gbps, full duplex	1.0625/2.125 gbps, full duplex

storage

Disk Storage

Features	va7100	va7400	va7410
Array Raw Capacity	72 GB to 1.1 TB's	72 GB to 7.7 TB's	72 GB to 7.7 TB's
External I/O Ports	Two 100 mbps	Two 200 mbps	Four 200 mbps
Sustained Performance	90 mbps	170 mbps	330 mbps

Tape Storage

example HP StorageWorks Tape Libraries w/ Ultrium LTO 230 Drives/Cartridges							
Type of library	1/20	2/20	4/40	6/60	10/100	10/180	20/700
Maximum Native* Transfer Rate per hour	54 GB	108 GB	216 GB	324 GB	540 GB	540 GB	1.1 TB
Max. Native* Capacity Backed Up in less than 12 hours	628 GB	1.3TB	2.6 TB	3.9 TB	6.5 TB	6.5 TB	13 TB
(*capacity can be expanded at a 2:1 ratio thru data compression)							

Management Server

Features	Comments
HP NetServer LP2000r in the following configuration: <ul style="list-style-type: none"> 2 Processors (1.3 GHZ or better) 1.5 GB or more of 133MHz ECC SDRAM Redundant power supplies 	Order Windows 2000 Advanced Server
HP NetRAID 2M 64 MB Controller	
HP 18.2 GB 15K Ultra3 Wide SCSI-3 HS HDD	Order a minimum of 4, a maximum of 6

Out-of-Band SAN Management – Ethernet Switch

Features	HP Procurve Switch 2512	HP Procurve Switch 2524
Number of Ports	12	24
Speed	10/100 mbs	10/100 mbs

Management/Backup Software Components

Application	Host Agent	Description
HP OpenView Storage Area Manager	yes	Enables device monitoring, capacity planning, Fibre Channel performance evaluation, billing and LUN management
HP OpenView Storage Data Protector	yes	Manages replication and restore operations
HP StorageWorks Autopath	yes	Multipath fail-over and load balancing
HP StorageWorks Business Copy VA	no	Data replication
HP StorageWorks CommandView VA	no	Device management
HP StorageWorks Secure Manager VA	no	Provides device-based security to LUN's

Life cycle

	Description
Invent	Zero Downtime Backup Design
Build	Business Copy implementation
	Data Protector implementation
	SAN implementation
Run	Business Continuity support
	SAN Environment support
Evolve	Performance/Capacity planning
	High Availability Storage Assessment

bill of materials

The following is a listed bill of materials representing the hardware and software used in the example configuration in this blueprint.

Bill of Materials

Management/Backup Server		
QTY	DESCRIPTION	COMMENTS
1	HP NetServer LP2000r in the following configuration: 2 Processors (1.3 GHz or better) 1.5 GB or more of 133MHz ECC SDRAM Redundant power supplies	Order Windows 2000 Advanced Server
1	HP NetRAID 2M 64 MB Controller	
4	HP 18.2 GB 15K Ultra3 Wide SCSI-3 HS HDD	Order a minimum of 4, a maximum of 6
1	HP Procurve 10/100 managed 24 port switch	
OpenView Software		
QTY	DESCRIPTION	COMMENTS
Variable	HP OpenView Storage Area Manager	SAM Suite includes Storage Node Manager, Builder, Accountant, Optimizer and Allocator
1	HP OpenView Storage Data Protector Cell Manager single drive Windows Starter Pack (LTU, Media and Manuals)	
Variable (* depends on TB of used disk space)	HP OpenView Storage Data Protector Zero Downtime Backup extension for HP Virtual Arrays	
StorageWorks Software		
QTY	DESCRIPTION	COMMENTS
variable	HP StorageWorks Business Copy VA	Includes media and LTU's
1	HP StorageWorks Command View VA	Includes media and LTU's
variable	HP StorageWorks Autopath VA	Includes media and LTU's
variable	HP StorageWorks Secure Manager VA	Includes media and LTU's
Virtual Array		
QTY	DESCRIPTION	COMMENTS
1	HP StorageWorks Disk Array va7400 dual controller, 256/512/1024 MB cache	Customer has choice of ordering the 256, 512 or 1024 MB cache configuration
1	HP StorageWorks ds2405 enclosure	
Variable (total disk drives may not exceed 30)	Enterprise class 18 GB 15k rpm FC hdd	Customer has choice of ordering a mix of 18GB, 36 GB or 73GB disk drives
	Enterprise class 36 GB 15k rpm FC hdd	
	Enterprise class 73 GB 10k rpm FC hdd	
HP Tape Libraries		
QTY	DESCRIPTION	COMMENTS
1	HP StorageWorks Tape Library 1/20	Base Ultrium library with one Ultrium 230 tape drive
1	FC Bridge 1 FC Port, 2 LVDS SCSI ports	
15	HP StorageWorks Ultrium Data Cartridges, 100 GB (native)	
Interconnect		
QTY	DESCRIPTION	COMMENTS
Variable	Optical SFP's	
2	HP FC switch 16B	
Host Hardware Components		
QTY	DESCRIPTION	COMMENTS
Variable	HP a5158a HBA	Two per HP-UX rp24xx (a-class), rp54xx (l class), rp74xx (n class), v-class and superdome hosts
Variable	HP a6685a HBA	Two per HP-UX k-class hosts
Variable	HP a6684a HBA	Two per HP-UX d and r class hosts
Variable	QLogic 2200F Fibre Channel or Emulex LP8000 HBA	Two per Windows 2000 server. Must be ordered from another vendor or re-seller.

additional information

business continuity solutions

To get answers on further implementation questions, contact your HP sales representative or channel partner who will be able to consult regularly updated technical resources and provide additional guidance.

hp storage product components

To get further information on individual storage product components, go to www.hp.com/go/storage

hp storage service components

HP offers a complete life-cycle of storage support and consulting, for more information, go to www.hp.com/hps/storage

hp storage integration

HP also offers storage integration services, which provide a quick and trouble –free installation of your solution. For more information, go to www.hp.com/hps/gds

All brand names are trademarks of their respective owners.
Technical information in this document is subject to change without notice.
© Copyright Hewlett-Packard Company 2002
07/02

hp StorageWorks virtual array and Oracle



automated to save you time



"We've used the **HP** virtual array to test Oracle9i Real Application Clusters for over a year. We're pleased with both its performance, automation and management capabilities."

Annie Chen
Director, Technology and Business Solutions,
Cluster and Parallel Storage Technology Oracle Corporation

In this demanding age of 24x7 accessibility and availability, using the power of Oracle databases and applications is more essential than ever. Ensuring that performance meets the increasing demands of savvy Oracle users requires information technology staffs be well armed with the right infrastructure products and tools. Performance must be optimized for users, and batch processes cannot be compromised nor affected by varying loads. Delivery of quality services affects both customer satisfaction and business growth. Plus, the management of business information must be easier and conducted with fewer resources.

Providing real-time access to Oracle databases and applications, while staying ahead of the growth demands of your business can now be accomplished through the use of storage virtualization, which reduces the complexity of managing and storing vast amounts of vital information. The HP StorageWorks virtual array (VA) family lets you:

- easily monitor disk space and add more capacity without taking the array down – saving time and increasing productivity
- view disparate storage disks as one virtual unit – improving efficiencies
- use automatic striping and mirroring – increasing performance

When matched with Oracle9i Database or application products, the HP StorageWorks virtual arrays give you an easy-to-manage, cost-effective, high performance, and efficient solution. In essence, the power of HP automation saves you valuable time.

ORACLE®

"We've found it very easy to allocate space with the **HP** VA 7100 and have saved time with reduced administrative overhead. With the AutoRAID feature, we've eliminated worrying about mirroring. We let AutoRAID go to work and don't even have to think about it."

Tom Elder,
DBA 3 Children,
Youth and Family Department
State of New Mexico

fact:

Oracle promotes the use of stripe and mirror everything (SAME) for maximizing performance of any disk array; **hp** does this automatically.

fact:

the **hp** StorageWorks virtual array AutoRAID feature is more efficient than ever.

achieve cost-effective performance

The HP StorageWorks virtual array implements SAME automatically, giving you more time to do what you were hired to do. The VA provides a very powerful answer for database expansion, as expanding a stripe set is as simple as adding drives. The array then re-distributes data across the new drives in the background. This is not the case with many other arrays requiring the application data to be backed up, the new stripe and mirror set to be defined, and the data to be restored. By contrast, the HP virtual array improves performance of Oracle databases and applications by:

- reducing time spent managing individual arrays
- allowing you to manage more storage with less effort
- permitting scaling up or down with no downtime
- reducing the opportunities for human error
- freeing up precious IT resources to work on revenue-generating projects
- self-managing the RAID configuration for optimum performance

improve management

The HP StorageWorks virtual array AutoRAID feature allows disk controllers to automatically choose the most appropriate RAID level based on recent historical usage. Or, if further customization is required, you can easily choose the desired RAID level. These algorithms are far more efficient than those used in the previous AutoRAID 12 storage product, and the improved efficiency has been tried and tested in numerous customer installations for close to two years. This powerful feature provides the flexibility required in an Oracle environment.

"The SAME configuration produces close to optimal performance for ALL workloads; OLTP, Warehouse and Batch."

Juan Loaiza
Vice President, Server Technologies
Oracle Corporation

fact:

the **hp** StorageWorks virtual arrays offer the best performance for Oracle environments.

The HP VA 7100 and HP Superdome server running Oracle9i Database Enterprise Edition offers the best performance and best price/performance in the industry with 25,805 QphH for the 1 Terabyte TPC-H benchmark – 37% higher performance over the nearest competitor. This benchmark illustrates the power of HP's cost-effective, high performance virtual arrays by measuring the ability of decision support systems to examine large volumes of data, execute queries with a high degree of complexity, and respond to critical business questions.



double your
efficiency

maximize efficiencies

HP has extended the management of the HP virtual array by offering you a host of software and services to set up and run an Oracle production database or application effectively.

hp storage software

HP's storage software suite gives you flexible choices for centralized device management, high availability, data security, online backup and data replication for the HP Virtual Array family. Of course, these tools also work with the award-winning HP OpenView products for an integrated solution.

- HP Auto Path Virtual Array
- HP Business Copy Virtual Array
- HP Command View SDM
- HP Enterprise Management Smart Plug-ins
- HP Instant Recovery Solutions
- HP MC Service Guard Extensions for Oracle environments
- HP OpenView plug-ins for Oracle environments
- HP Secure Manager Virtual Array

hp comprehensive services

Wherever you are in your infrastructure lifecycle, HP provides the people, processes and portfolio to meet your storage needs.

- HP Backup Application Design and Implementation
- HP Business Copy Implementation
- HP Critical Data Availability Services
- HP Storage Area Network Services

rest easy with **hp** for your Oracle solutions

No matter which or how many Oracle database or application products you use, the HP/Oracle alliance can help you build – run – and evolve your infrastructure to achieve the best short and long term return on investment. In essence, users can ‘rest easy’ knowing they are tapping an alliance based on:

- executive alignment – from the top with Larry Ellison, Carly Fiorina and Michael Capellas, as well as having over 400 people assigned to alliance activities
- 20 years of collaborative partnership
- 80,000 joint customers
- 13 technology and competency centers throughout the world
- industry’s best price/performance for Oracle environments
- leading reputation for availability, reliability and manageability
- comprehensive, joint HP/Oracle R&D product development

why **hp** StorageWorks virtual array

Your Oracle data is critical. Implement the HP StorageWorks virtual array, and gain the confidence of knowing that you have chosen an easy-to-manage, cost-effective, high performance, and efficient solution with HP’s patented virtual technology. And, while the solution may be virtual, the time saving benefits are real.

“We selected the **HP** VA 7400 storage based on the number of Oracle ERP instances that would be needed. We found the virtual array has many more features and capabilities than the Sun solution that was being proposed. We felt it would scale the way we needed, provided strong price/performance, and offered excellent operating efficiencies. It has saved many hours and long nights for our DBA’s and system administrators.”

Mike Johnson,
IT Manager, ViaSat

For more information, simply visit www.hp.com/go/oracle, or contact your HP Sales Representative, Channel Partner or System Integrator.

The information in this document is subject to change without notice.
All brand names are trademarks of their respective owners.
© Copyright Hewlett-Packard Company 2002. All Rights Reserved.
Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.
P/N 5981-2837ENUC

ORACLE®

