HP ProLiant Storage Server user guide

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Legal and notice information

HP ProLiant Storage Server user guide

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About this Guide

Intended audience

This book is intended for use by technical professionals who are experienced with the following:

- Microsoft® administrative procedures
- System and storage configurations

Prerequisites

Before you set up the HP ProLiant Storage Server, HP recommends that you obtain supplemental documentation relative to the items listed above in the section titled Intended audience.

Related documentation

In addition to this guide, HP provides additional documentation related to these products:

- *HP ProLiant Storage Server administration guide*
- *HP ProLiant Storage Server release notes*

These documents can be obtained at http://h18006.www1.hp.com/storage/nas.html. Select your product, then click **Technical documentation** under the Support section.

Conventions

Conventions consist of the following:

- Document conventions
- Text symbols

Document conventions

This document follows the conventions in the following table.

Table 1 Document conventions

Convention	Element
Blue text	Cross-reference links
Bold	Menu items, buttons, and key, tab, and box names
Italics	Text emphasis and document titles in body text
`Monospace font`	User input, commands, code, file and directory names, and system responses (output and messages)
`Monospace, italic font`	Command-line and code variables
Blue underlined text (http://www.hp.com)	Web site addresses

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:

⚠ **WARNING!**

Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

△ **CAUTION:**

Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

NOTE:

Text set off in this manner presents commentary, sidelights, or interesting points of information.

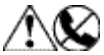
Equipment symbols

The following equipment symbols may be found on hardware for which this guide pertains.

⚠ WARNING!

 Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts. *WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.*

⚠ WARNING!

 Any RJ-45 receptacle marked with these symbols indicates a network interface connection. *WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.*

⚠ WARNING!

 Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury. *WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.*

⚠ **WARNING!**

 Power supplies or systems marked with these symbols indicate the presence of multiple sources of power. *WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.*

⚠ **WARNING!**

 Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely. *WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.*

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access our web site: http://www.hp.com.

NOTE:

Known issues and workarounds for the storage server products and the service release are addressed in release notes. To view the latest version, visit http://www.hp.com/go/support. Select **See support and troubleshooting** information and enter a product name/number. Under self-help resources, select the **manuals (guides, supplements, addendums, etc)** link.

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: http://www.hp.com/support/. From this web site, select the country of origin.

NOTE:

For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP hardware support services

HP Instant Support Enterprise Edition (ISEE) provides proactive remote monitoring, diagnostics, and troubleshooting to help you enhance the availability of your servers, as well as storage and network devices. The ISEE software is located on the storage server in the `c:\hpnas\components\ISEE` folder. For more information, go to the HP web site: http://h20219.www2.hp.com/services/cache/10707-0-0-225-121.aspx.

HP Services provides service tools that notify you when a significant system event has or will occur. These tools, WEBES System Event Analyzer (SEA) and OSEM, are used both as part of the ISEE remote service offering and as standalone tools for HP service customers. They are designed to send a notification only when an event or series of events has occurred that require service action. They are not intended to be real-time system state monitors that trigger with every event. Most system components have the capability of sending hundreds of state events during normal operation. SEA and OSEM are designed to filter these component events, and only notify customers and/or HP Services when action needs to be taken to resolve or prevent an outage. As designed, they will not report all events. Other utilities are available to monitor real time system state. The software is located on the storage server in the `c:\hpnas\components\ISEE\OSEM` and `c:\hpnas\components\ISEE\WEBES` folders.

NOTE:

This feature is only available on the 300 or 500 series ProLiant storage servers.

HP authorized reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-282-6672
- Elsewhere, see the HP web site for locations and telephone numbers: http://www.hp.com.

Helpful web sites

For third-party product information, see the following HP web sites:

- http://www.hp.com
- http://www.hp.com/go/storage
- http://www.hp.com/support
- http://www.docs.hp.com

1 Overview

This guide provides basic instructions for installing and initially configuring HP ProLiant Storage Servers. The basic steps are:

1. Set up the hardware.

   See the *HP ProLiant Storage Server installation instructions* for model-specific information.
2. Collect configuration information.

   See Tables 2 through 5 in this chapter.
3. Use one of the following methods to initialize the storage server and identify the configuration parameters:

   - Remote browser
   - Direct attach

   See Chapter 2 of this guide.
4. Use the Rapid Startup Wizard to complete the initial configuration.

   See Chapter 2 of this guide.
5. Configure storage, if applicable.

   See Chapter 3 of this guide for an overview of storage concepts.
6. Use the *HP ProLiant Storage Server administration guide* to complete any additional configuration tasks.

NOTE:

The latest service release kit is included with the ProLiant storage server. The service release DVD provides software updates, upgrades, and enhancements that were not available when the storage server was manufactured. Please read the *quick start guide* in the service release kit for a complete description of the service release and its installation instructions.

NOTE:

This user guide and the *HP ProLiant Storage Server administration guide* provides information for multiple storage servers. Not all information is relevant to all storage servers. Exceptions are noted throughout the text. In addition, see Tables 2 through 5 for major feature differences among these storage servers.

The following tables provide a quick reference for determining which sections of the storage server documentation apply to a particular model. See the QuickSpecs for specific hardware and software information.

Table 2 Model quick reference (ML110)

	ML110 G1	ML110 G2[1]	ML110 G2
OS version	Express	Express	Workgroup
Preconfig-ured stor-age	Yes	Yes	Yes
Storage Manager[2]	Yes	No	Yes
Feature Pack support	Yes	No	Yes
Print services support	No[3]	No	Yes (up to 5 printers)
SAN support	No	No	No
Cluster support	No	No	No
Remote manage-ment	None	Optional LO-100	Optional LO-100
NIC Ports[4]	1	1	1

[1]The Windows® Storage Server 2003 Express Edition OS on the ML110 G2 Storage Server 320 GB model is limited to basic file serving functionality. This OS *does not* include support for Storage Resource Manager 2.0 (file screening and quotas) or print serving. Also, this OS does not allow Microsoft Exchange storage, iSCSI Feature Pack, HP OpenView Storage Mirroring, anti-virus, backup, or any other third-party storage service applications to be loaded on the storage server.
[2]Storage Manager consists of directory quotas, file filtering, and storage reports.
[3]Print Server Kit (377385–B21) option available, allowing print server services to network printers.
[4]Most servers support NIC teaming by default and include software support. The ML110 supports NIC teaming by adding the appropriate network cards and software from HP.

Table 3 Model quick reference (DL100)

	DL100	DL100 G2	DL100 G2
OS version	Workgroup	Workgroup	Standard[1]
Preconfig-ured stor-age	Yes	Yes	Yes
Storage Manager[2]	Yes	Yes	Yes
Feature Pack support	Yes	Yes	Yes
Print services support	Yes (up to 5 printers)	Yes (up to 5 printers)	Yes
SAN support	No	No	No
Cluster support	No	No	No
Remote manage-ment	None	IPMI 2.0[3]	IPMI 2.0[3]
NIC Ports[4]	2	2	2

[1]The Standard version of the Windows Storage Server operating system is only available on the 640 GB print server and through a COA upgrade.
[2]Storage Manager consists of directory quotas, file filtering, and storage reports.
[3]Intelligent Platform Management Interface (IPMI) is handled through the use of Server Management Software (SMS) loaded on the DL100 G2. For further information, refer to the SMS help files available on the storage server.
[4]Most servers support NIC teaming by default and include software support. The DL100 supports NIC teaming using the Intel network adapter user interface. The DL100 G2 supports NIC teaming using the Broadcom Advanced Server Program (BASP) user interface.

Table 4 Model quick reference (ML350 through ML370)

	ML350 G4	ML350 G4p	ML370 G4
OS version	Standard	Standard	Standard
Preconfig-ured stor-age	No	No	No
Storage Manager[1]	Yes	Yes	Yes
Feature Pack support	Yes	Yes	Yes
Print services support	Yes	Yes	Yes
SAN support	Yes	Yes	Yes
Cluster support	No	No	No
Remote manage-ment	Optional RILOE II	iLO	iLO
NIC Ports[2]	1	1	1

[1]Storage Manager consists of directory quotas, file filtering, and storage reports.
[2]Most servers support NIC teaming by default and include software support.

Table 5 Model quick reference (DL380 through DL585)

	DL380 G4	DL380 G4	DL580 G2	DL 585
OS version	Standard	Enterprise	Enterprise	Enterprise
Preconfig-ured stor-age	No	No	No	No
Storage Manager[1]	Yes	Yes	Yes	Yes
Feature Pack support	Yes	No	No	No
Print services support	Yes	Yes	Yes	Yes
SAN support	Yes	Yes	Yes	Yes
Cluster support	No	Yes	Yes	Yes
Remote manage-ment	iLO	iLO	iLO	iLO
NIC Ports[2]	1	2	2	2

[1]Storage Manager consists of directory quotas, file filtering, and storage reports.
[2]Most servers support NIC teaming by default and include software support.

2 Storage server startup

Before beginning the startup procedures, verify that the storage server is completely installed, and that all cables and cords are connected. Also, read the supplied documentation before starting. Documents include:

- HP ProLiant Storage Server installation instructions for your model
- *HP ProLiant Storage Server administration guide*
- *HP ProLiant Storage Server release notes* (if required, this document will be available at http://www.hp.com/go/servers)

NOTE:

Known issues and workarounds for the storage server products and the service release are addressed in release notes. To view the latest version, visit http://www.hp.com/go/support. Select **See support and troubleshooting** information and enter a product name/number. Under **self-help resources**, select the **manuals (guides, supplements, addendums, etc)** link.

Deploying the storage server on the network

The default shipping configuration contains one or two 10/100/1000 integrated network interface controller (NIC) ports for client data access. NIC data ports also allow access to the WebUI that accompanies the product. Most management and administrative procedures can be accomplished via the WebUI.

IP networking and setup requirements are:

- Windows-based PC running Microsoft Internet Explorer 5.5 (or later) on the same network segment as the storage server; this is used to set up and administer the storage server.
- Additional Ethernet connection ports to client subnets (depending on network options ordered).

Collecting configuration information

Choose a host name and collect general information required to initialize the storage server for either dynamic host configuration protocols (DHCP)

or non-DHCP configurations (see Table 6). This information is needed during configuration. Become familiar with this information before attempting to configure the storage server.

Table 6 Configuration information

Part A: To be completed for DHCP and non-DHCP configurations			
Server host name:			
Part B: To be completed for non-DHCP configurations only			
DNS servers	IP address		
1			
2			
3			
Storage server NIC port*	IP address	Subnet mask	Gateway address
NIC 1			
NIC 2			
* Disable ports that will not be used. Each Ethernet port, whether standard or added, must be configured with a separate subnet.			
Part C: SNMP information (optional)			
Trap destination (IP address) manager client:			
Management traps community string:			
System management community string:			

Windows Multilingual User Interface on Storage Server service release DVD

The latest HP ProLiant Storage Server Service Release (SR) DVD includes Microsoft Windows Multilingual User Interface (MUI) pack. The Windows MUI pack is a set of language-specific resource files that can be added to the English version of Windows Server 2003. When

installed on the English version of Windows, MUI allows the language of the operating system user interface to be changed according to the preferences of individual users. Languages included on the SR DVD are French, German, Italian, Spanish, Korean, simplified Chinese, traditional Chinese, Portuguese (Brazil), Dutch, Swedish, and Japanese. For more information about the MUI, visit the Microsoft web site at http://www.microsoft.com/globaldev/DrIntl/faqs/MUIFaq.mspx

To install Windows MUI (if desired):

1. Review the Windows MUI *read me first* document.
2. Before configuring the ProLiant storage server, insert the Service Release DVD into the DVD ROM drive on your storage server.
3. The installation should begin automatically. If the setup does not begin automatically, browse to the CD in Windows Explorer and double-click on **`Setup.exe`**.
4. On the HP storage server service release menu, click **Install Service Release** *X.X* (where *X.X* is the version number) to start the setup wizard and from the *Features menu*, select the appropriate MUI packs and follow the instructions to install them on the system. Do not select the service release items because they have already been installed on the storage server.

NOTE:

Installing Windows MUI only localizes the Windows operating system, and does not localize the NAS WebUI or NAS-unique Help files.

WebUI configuration

The WebUI is an easy-to-use graphical application that gathers the necessary information for configuration. The WebUI can be accessed through two methods:

- Remote Browser method (using host name)
- Direct Attach method

NOTE:

You can configure this system through the WebUI or manually through Remote Desktop or Windows Storage Server 2003 Desktop.

NOTE:

The storage server can be deployed without a monitor, keyboard, and mouse. These ports are available and supported by the storage server, if used.

Method 1: Remote browser (using host name)

The storage server ships with DHCP enabled on the network port. If the system is placed on a DHCP-enabled network and the serial number of the device is known, it can be accessed through a client running Internet Explorer 5.5 (or later) on that network, using the 3202 port of the device.

Requirements to run the WebUI configuration application are:

- Windows-based PC loaded with Internet Explorer 5.5 (or later) on the same segment as the storage server
- DHCP-enabled network
- Serial number of the storage server

1. Connect the Ethernet cable to the network port of the storage server and the corresponding network segment.
2. Go to the storage server and power it on. It takes several minutes before the storage server is accessible on the network.

NOTE:

The storage server responds when the storage server operating system has started.

3. Open Internet Explorer on the PC. Enter `https://`, the serial number of the storage server followed by a hyphen (-), and then `:3202`. Press **Enter**.

   Example: `https://D4059ABC3433-:3202`

NOTE:

Substitute the server name for the serial number if a server name was previously set.

4. Log into the WebUI. This launches the WebUI configuration application (Rapid Startup) on the target HP ProLiant storage server, as shown in Figure 1.

NOTE:

The default login for the WebUI is `administrator` and the password is `hpinvent`. The WebUI uses the same login as the local administrator's account or an account with administrative privileges.

5. Go to Rapid Startup Wizard configuration, page 26, to complete the setup procedures.

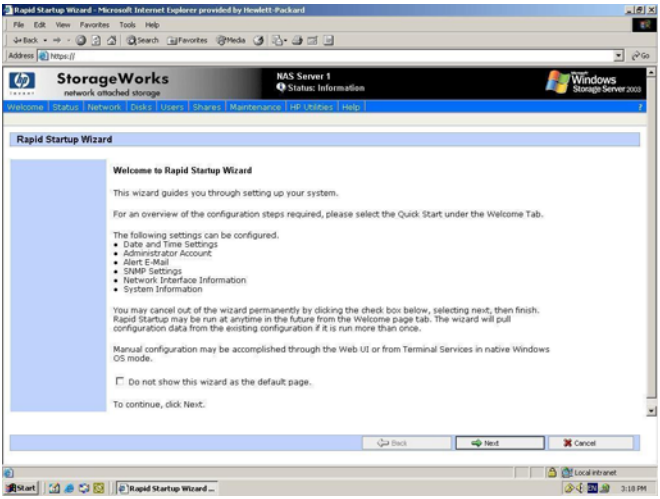


Figure 1 Rapid Startup Wizard window

Method 2: Direct attach

You can access the WebUI using a monitor, mouse, and keyboard directly attached to the storage server.

1. Connect the Ethernet cable to the network port of the storage server and the corresponding network segment.
2. Connect the monitor, mouse, and keyboard directly to the rear panel connectors of the storage server.
3. Power on the storage server.
4. Log into the device using the WebUI user name and password.

NOTE:

The default login for the WebUI is `administrator` and the password is `hpinvent`. The WebUI uses the same login as the local administrator's account or an account with administrative privileges.

5. Open Internet Explorer to launch the WebUI configuration application (Rapid Startup) on the target storage server, as shown in Figure 1. If the WebUI does not launch, connect to the *Local Host* and log into the WebUI.
6. Go to Rapid Startup Wizard configuration to complete the setup procedures.

Rapid Startup Wizard configuration

This utility guides you through the configuration process.

Ensure that an Internet Explorer window is open and the WebUI is at the Rapid Startup Wizard, as shown in Figure 1.

NOTE:

The Rapid Startup Wizard is the default page unless you complete the wizard or select the checkbox next to the text that reads *Do not show this wizard as the default page*.

NOTE:

Some models require an additional step to configure Integrated Lights-Out (iLO) settings.

Using the information from Table 6, fill in the windows that follow.

1. On the Rapid Startup Wizard screen, click **Next** to start wizard. There may be a slight pause because the wizard gathers information about the system and the population of the fields.
2. Configure the Date and Time Settings. Click **Next** to continue.
3. Configure the Administrator Account settings. Click **Next** to continue.
4. Configure the Alert E-mail settings. Click **Next** to continue.
5. Configure the SNMP Settings. Click **Next** to continue.

6. Configure the Network Interface Information for both NICs. Click **Next** to continue.
7. Configure the System Information. Click **Next** to continue.
8. Verify that the information is correct when the configuration review window is displayed (see Figure 2).

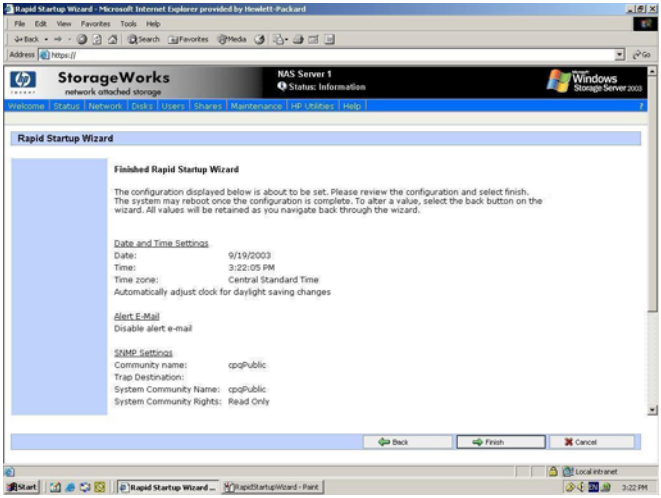


Figure 2 Rapid Startup configuration review window

9. Click **Finish** to exit Rapid Startup. If a reboot is required, Rapid Startup displays a message that a reboot is occurring and that the configuration information will be set.

   The browser returns to the status window. The refresh can take several minutes if the device was restarted.

NOTE:

After the Rapid Startup Wizard is complete, the Welcome window becomes the default page.

Completing the system configuration

The basic configuration for the HP ProLiant Storage Server is complete at this point, however, some computing environments can require additional settings and configuration.

Most of these tasks can be completed using the WebUI. All procedures for the configuration tasks can be found in the *HP ProLiant Storage Server administration guide*.

- Place the storage server into an Active Directory or Windows NT® 4.0 domain for ease of manageability (highly recommended).
- Enable protocols such as NFS sharing, NCP, and/or AppleTalk.
- Create shares corresponding to the protocols mentioned in the previous steps.
- Configure shadow copies for creating point-in-time snapshots of data volumes.
- Configure data replication software via Microsoft File Replication Services.
- Enable and establish space usage quotas.
- Configure the Distributed File System (DFS) or publish the storage server shares into an already existing DFS structure.
- Adjust logging for system, application, and security events.
- Install additional third-party software, such as backup, anti-virus, or monitoring agents.

NOTE:

HP StorageWorks Library and Tape Tools installer software is located on the storage server in the `c:\hpnas\components\tapetools` folder. For more information about this product, go to http://www.hp.com/support/tapetools.

NOTE:

HP highly recommends that you run Microsoft Windows updates to identify, review, and install the latest, applicable, critical security updates on the storage server. For recommendations, instructions, and documentation to help manage the software update, hotfix, and security patches process on the storage server, see *Microsoft Software Updates on HP ProLiant Storage Servers* at http://h18006.www1.hp.com/storage/storageservers.html.

- Configure UNIX® user and group mappings.
- Create and verify a full storage server system backup before putting the system into production.

Cluster setup

If your storage server model supports clustering, see the *HP ProLiant Storage Server administration guide* for complete details on cluster setup.

3 Storage management overview

This chapter provides an overview of the components that make up the storage structure of the HP ProLiant Storage Server.

The storage server is configured at the factory with default system settings and with the operating system installed. The information in this chapter refers to data storage that, except for the 100 series, does not come pre-carved or RAID-configured.

△ CAUTION:

This section on storage management is required reading material for the storage server administrator. This section develops the concepts and requirements that serve as the basis for successfully using an HP ProLiant Storage Server. Failure to read this section and the appropriate sections on storage management in the administration guide may lead to data loss or file corruption.

Storage management elements

Storage is divided into four major divisions:

- Physical storage elements
- Logical storage elements
- File system elements
- File sharing elements

Each of these elements is composed of the previous level's elements.

Storage Management example

The MSA1000 storage and the associated Array Configuration Utility are used in this example (see Figure 3). The array storage device in use impacts the devices in use and the relevant storage management software required.

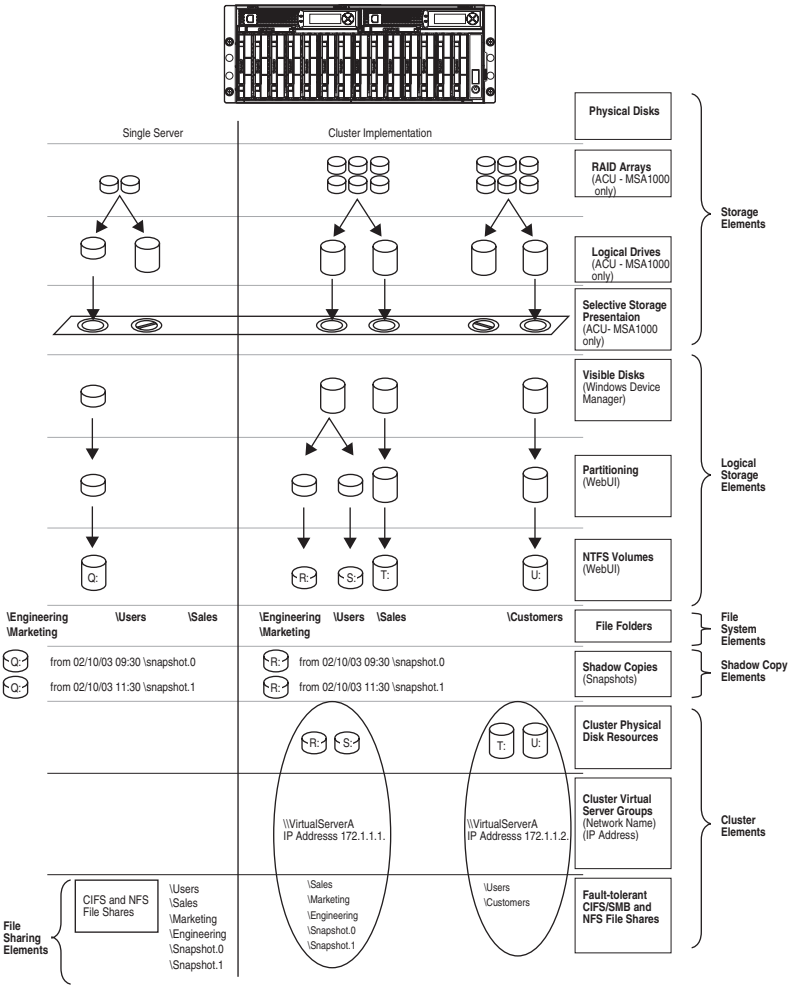


Figure 3 Storage Management process example

Physical storage elements

The lowest level of storage management occurs at the physical drive level. Minimally, choosing the best disk carving strategy includes the following policies:

- Analyze current corporate and departmental structure.

- Analyze the current file server structure and environment.
- Plan properly to ensure the best configuration and use of storage.
  - Determine the desired priority of fault tolerance, performance, and storage capacity.
  - Use the determined priority of system characteristics to determine the optimal striping policy and RAID level.
- Include the appropriate number of physical drives in the arrays to create logical storage elements of desired sizes.

Arrays

See Figure 4. With an array controller installed in the system, the capacity of several physical drives (P1–P3) can be logically combined into one or more logical units (L1) called arrays. When this is done, the read/write heads of all the constituent physical drives are active simultaneously, dramatically reducing the overall time required for data transfer.

NOTE:

Depending on the storage server model, array configuration may not be possible or necessary.

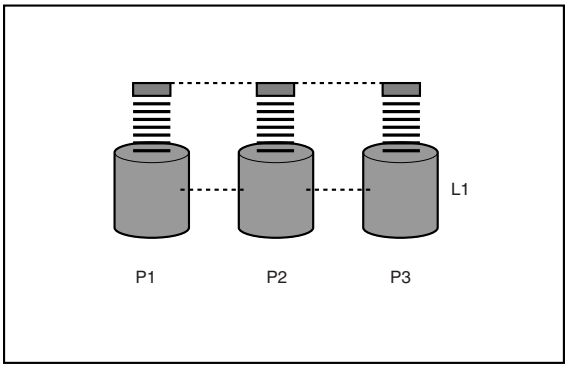


Figure 4 Configuring arrays from physical drives

Because the read/write heads are simultaneously active, the same amount of data is written to each drive during any given time interval. Each unit of data is termed a block. The blocks form a set of data stripes over all the hard drives in an array, as shown in Figure 5.

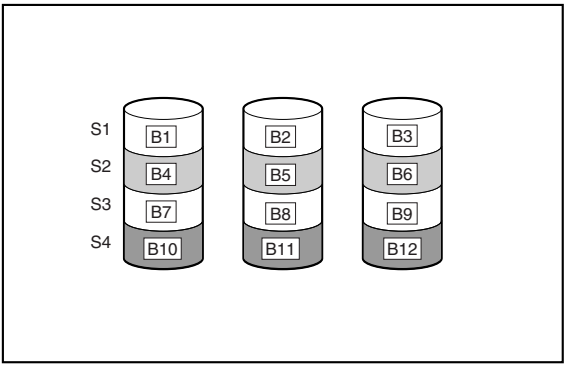


Figure 5 RAID 0 (data striping) (S1-S4) of data blocks (B1-B12)

For data in the array to be readable, the data block sequence within each stripe must be the same. This sequencing process is performed by the array controller, which sends the data blocks to the drive write heads in the correct order.

A natural consequence of the striping process is that each hard drive in a given array contains the same number of data blocks.

NOTE:

If one hard drive has a larger capacity than other hard drives in the same array, the extra capacity is wasted because it cannot be used by the array.

Fault tolerance

Drive failure, although rare, is potentially catastrophic. For example, using simple striping as shown in Figure 5, failure of any hard drive leads to failure of all logical drives in the same array, and hence to data loss.

To protect against data loss from hard drive failure, storage servers should be configured with fault tolerance. HP recommends adhering to RAID 5 configurations.

The table below summarizes the important features of the different kinds of RAID supported by the Smart Array controllers. The decision chart in

the following table can help determine which option is best for different situations.

Table 7 Summary of RAID methods

	RAID 0 Striping (no fault tolerance)	RAID 1+0 Mirroring	RAID 5 Distributed Data Guarding	RAID ADG
Maximum number of hard drives	N/A	N/A	14	Storage system dependent
Tolerant of single hard drive failure?	No	Yes	Yes	Yes
Tolerant of multiple simultaneous hard drive failure?	No	If the failed drives are not mirrored to each other	No	Yes (two drives can fail)

Online Spares

Further protection against data loss can be achieved by assigning an online spare (or hot spare) to any configuration except RAID 0. This hard drive contains no data and is contained within the same storage subsystem as the other drives in the array. When a hard drive in the array fails, the controller can then automatically rebuild information that was originally on the failed drive onto the online spare. This quickly restores the system to full RAID level fault tolerance protection. However, unless RAID Advanced Data Guarding (ADG) is being used, which can support two drive failures in an array, in the unlikely event that a third drive in the array should fail while data is being rewritten to the spare, the logical drive still fails.

NOTE:

For configurable storage servers, storage limitations are based on the type of SAN to which the storage server is connected. See the individual SAN documentation for limitations of Windows Storage Server 2003.

Logical storage elements

Logical storage elements consist of those components that translate the physical storage elements to file system elements. The storage server uses the WebUI to manage the various types of disks presented to the file system. The WebUI has two types of LUN presentation: basic disk and dynamic disk. Each of these types of disk has special features that enable different types of management.

Logical drives (LUNs)

While an array is a physical grouping of hard drives, a logical drive consists of components that translate physical storage elements into file system elements.

It is important to note that a LUN may extend over (span) all physical drives within a storage controller subsystem, but cannot span multiple storage controller subsystems.

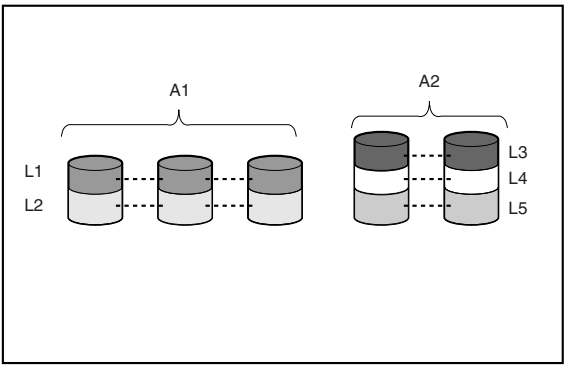


Figure 6 Two arrays (A1, A2) and five logical drives (L1 through L5) spread over five physical drives

NOTE:

This type of configuration may not apply to all storage servers and serves only as an example.

Through the use of basic disks, primary partitions or extended partitions can be created. Partitions can only encompass one LUN. Through the use of dynamic disks, volumes can be created that span multiple LUNs. The WebUI can be used to convert disks to dynamic and back to basic, and

manage the volumes residing on dynamic disks. Other options include the ability to delete, extend, mirror, and repair these elements.

NOTE:

See the *Dynamic growth* section in the administration guide for additional information on LUN extension and use by the operating system.

Partitions

Partitions exist as either primary partitions or extended partitions and can be composed of only one basic disk no larger than 2 TB. Basic disks can also only contain up to four primary partitions, or three primary partitions and one extended partition. In addition, the partitions on them cannot be extended beyond the limits of a single LUN. Extended partitions allow the user to create multiple logical drives. These partitions or logical disks can be assigned drive letters or be used as mount points on existing disks. If mount points are used, it should be noted that Services for UNIX (SFU) does not support mount points at this time. The use of mount points in conjunction with NFS shares is not supported.

Volumes

When planning dynamic disks and volumes, there is a limit to the amount of growth a single volume can undergo. Volumes are limited in size and can have no more than 32 separate LUNs, with each LUN not exceeding 2 terabytes (TB), and volumes totaling no more than 64 TB of disk space.

The RAID level of the LUNs included in a volume must be considered. All of the units that make up a volume should have the same high-availability characteristics. In other words, the units should all be of the same RAID level. For example, it would be a bad practice to include both a RAID 1+0 and a RAID 5 array in the same volume set. By keeping all the units the same, the entire volume retains the same performance and high-availability characteristics, making managing and maintaining the volume much easier. If a dynamic disk goes offline, the entire volume dependent on the one or more dynamic disks is unavailable. There could be a potential for data loss depending on the nature of the failed LUN.

Volumes are created out of the dynamic disks, and can be expanded on the fly to extend over multiple dynamic disks if they are spanned volumes. However, after a type of volume is selected, it cannot be altered. For example, a spanning volume cannot be altered to a mirrored volume without deleting and recreating the volume, unless it is a simple volume. Simple volumes can be mirrored or converted to spanned volumes. Fault tolerant disks cannot be extended either. Therefore, selection of the volume

type is important. The same performance characteristics on numbers of reads and writes apply when using fault tolerant configurations as is the case with controller-based RAID. These volumes can also be assigned drive letters or be mounted as mount points off existing drive letters. In general, HP recommends using the array controller for the management of fault tolerance over the use of Windows Storage Server 2003 software RAID because it places an additional level of operating system overhead on volumes. If mount points are used, please note that they are not supported by SFU at this time.

The administrator should carefully consider how the volumes will be carved up and what groups or applications will be using them. For example, putting several storage-intensive applications or groups into the same dynamic disk set would not be efficient. These applications or groups would be better served by being divided up into separate dynamic disks, which could then grow as their space requirements increased, within the allowable growth limits.

NOTE:

Dynamic disks cannot be used for clustering configurations because Microsoft Cluster only supports basic disks.

More detailed information regarding the WebUI for disk management activities can be found in the *HP ProLiant Storage Server administration guide*.

File system elements

File system elements are composed of the folders and subfolders that are created under each logical storage element (partitions, logical disks, and volumes). Folders are used to further subdivide the available file system, providing another level of granularity for management of the information space. Each of these folders can contain separate permissions and share names that can be used for network access. Folders can be created for individual users, groups, projects, and so on.

Detailed information on file system elements can be found in the administration guide.

File sharing elements

The storage server supports several file sharing protocols, including Distributed File System (DFS), Network File System (NFS), File Transfer Protocol (FTP), Hypertext Transfer Protocol (HTTP), and Microsoft Server Message Block (SMB). On each folder or logical storage element, different

file sharing protocols can be enabled using specific network names for access across a network to a variety of clients. Permissions can then be granted to those shares based on users or groups of users in each of the file sharing protocols.

Volume Shadow Copy Service overview

The Volume Shadow Copy Service (VSS) provides an infrastructure for creating point-in-time snapshots (shadow copies) of volumes. VSS supports 64 shadow copies per volume.

Shadow Copies of Shared Folders resides within this infrastructure, and helps alleviate data loss by creating shadow copies of files or folders that are stored on network file shares at pre-determined time intervals. In essence, a shadow copy is a previous version of the file or folder at a specific point in time.

By using shadow copies, a storage server can maintain a set of previous versions of all files on the selected volumes. End users access the file or folder by using a separate client add-on program, which enables them to view the file in Windows Explorer.

Shadow copies should not replace the current backup, archive, or business recovery system, but they can help to simplify restore procedures. For example, shadow copies cannot protect against data loss due to media failures, however, recovering data from shadow copies can reduce the number of times needed to restore data from tape.

Detailed information on shadow copies can be found in the administration guide.

Using storage elements

No matter which type of storage element is created in the WebUI, the last step in creating the element is determining its drive letter or mount point and formatting the element. Each element created can exist as a drive letter, assuming one is available and/or as mount points off of an existing folder of a drive letter. Either method is supported. However, mount points can not be used for shares that will be shared using Microsoft Services for Unix. They can be set up with both but the use of the mount point in conjunction with NFS shares causes instability with the NFS shares.

Formats consist of NTFS, FAT32, and FAT and all three types can be used on the storage server. However, VSS can only use volumes that are NTFS formatted. Also, quota management is possible only on NTFS.

Clustered Server Elements

Select storage servers support clustering. The HP ProLiant storage server supports several file-sharing protocols, including DFS, NFS, FTP, HTTP, and Microsoft SMB. Only NFS, FTP, and Microsoft SMB are cluster-aware protocols. HTTP can be installed on each node but the protocols cannot be set up through cluster administrator, and they will not fail over during a node failure.

△ **CAUTION:**

AppleTalk shares should not be created on clustered resources as this is not supported by Microsoft Clustering, and data loss may occur.

Network names and IP address resources for the clustered file share resource can also be established for access across a network to a variety of clients. Permissions can then be granted to those shares based on users or groups of users in each of the file sharing protocols.

If your storage server model supports clustering, see the *HP ProLiant Storage Server administration guide* for complete details on cluster setup.

4 Default storage configurations

HP ProLiant storage servers are preconfigured with default storage settings and preinstalled with the operating system (OS). This chapter provides additional details about the preconfigured storage configurations for the following:

- 100 series ProLiant Storage Servers
- 300 and 500 series ProLiant Storage Servers

Storage for the 100 series HP ProLiant Storage Servers

The 100 series ProLiant Storage Servers are set up at the factory with logical partitions for the operating system and user data. No additional storage configuration is needed.

Physical configuration

Depending on the model and version of the OS, each storage server comes with either two or four Serial Advanced Technology Attachment (SATA) hard disk drives (HDDs). The sections below describe how these HDDs are configured for each storage server based on whether two or four HDDs are installed.

Two-HDD configurations

The two HDDs included with the storage servers are configured for software RAID fault tolerance using the motherboard SATA controllers.

The HDDs for the ML110 G2 (Express) storage server are not hot-pluggable. The drives should not be removed or inserted while the power is on. The HDDs for the DL100 G2 (Workgroup, 2 drive) are hot-pluggable, but not hot-swappable. The drives can be removed or inserted while the power is on, but user intervention is needed to rebuild the arrays.

Microsoft Disk Manager is used to present the HDDs to the system as dynamic disks. The primary OS logical drive resides on disk 0 and is mirrored on disk 1. The secondary OS logical drive resides on disk 1 and is mirrored on disk 0. The data volume is the third logical drive mirroring the remaining space on disk 0 and disk 1.

The drives are configured by default into three logical disks at the controller level as described in Table 8.

Table 8 100 series two-HDD configurations

ML110 G2 (Express)			
Logical disk	**RAID level**	**Size/allocation**	**Purpose**
1	RAID 1	9 GB across physical drives 0, 1	Primary OS
2	RAID 1	9 GB across physical drives 1, 0	Secondary OS
3	RAID 1	Remaining space across all physical drives	Data
DL100 G2 (Workgroup, 2 drives)[1]			
Logical disk	**RAID level**	**Size/allocation**	**Purpose**
1	RAID 1	12 GB across physical drives 0, 1	Primary OS
2	RAID 1	12 GB across physical drives 0,1	Secondary OS
3	RAID 1	Remaining space across all physical drives	Data

[1]The DL100 G2 (Workgroup) also is available in a four-drive configuration. See the section called "Four-HDD configurations" for configuration information.

When the primary OS has a failure such as system files becoming corrupted, registry corrupted, or the system hangs during boot, the system should be run from the secondary OS. To run the system from the secondary OS:

1. Power down the unit.
2. Connect a monitor, keyboard, and mouse directly to the rear of the unit.
3. Power on the unit.
4. During boot up, select to use the secondary partition.

Be sure to back up your user data, and then use the Quick Restore DVD to restore the server to the factory default state as soon as conveniently possible.

Four-HDD configurations

The four HDDs included with the storage servers are configured for hardware RAID fault tolerance using Adaptec RAID controllers.

The HDDs for the ML110 G1 storage servers are not hot-pluggable. The drives should not be removed or inserted while the power is on. The HDDs for the ML110 G2 (Workgroup), DL100, and DL100 G2 (Workgroup/Standard, 4 drives) are hot-pluggable and hot-swappable. The drives can be removed and installed with the power on, and the Adaptec controller determines whether a rebuild of a drive is necessary. Refer to the administration guide for additional information.

NOTE:

In Adaptec Storage Manager (ASM), logical disks are labeled 1, 2, and so on. In Microsoft Disk Manager, logical disks are displayed as 0, 1, and so on. For ASM configuration information, the ASM installation and user's guide can be obtained from http://download.adaptec.com/pdfs/user_guides/aar2410Sa_iug.pdf.

With the ML110 G1 and DL100 storage servers, the primary OS logical drive resides on disk 0 and is mirrored on disk 1. The secondary OS logical drive resides on disk 2 and is mirrored on disk 3. The data volume is configured as a hardware RAID 5 based basic partition across all four drives. This ensures redundancy in the event of a drive failure. The data volume is accessible by both the primary OS and secondary OS.

With the ML110 G2 (Workgroup) and DL100 G2 (Workgroup/Standard) storage servers, the OS logical drive is a hardware RAID 5 basic disk across all disks. The data volume is also configured as a hardware RAID 5 basic partition across all four drives. This ensures redundancy in the event of a drive failure.

Table 9 shows how the ProLiant 100 series 4-HDD storage servers are configured.

Table 9 100 series four-HDD configurations

ML110 G1 and DL100			
Logical disk	**RAID level**	**Size/allocation**	**Purpose**
1	RAID 1	9 GB mirror across physical drives 0, 1	Primary OS
2	RAID 1	9 GB mirror across physical drives 2, 3	Secondary OS
3	RAID 5	Remaining space across all physical drives	Data
ML110 G2 (Workgroup)			
Logical disk	**RAID level**	**Size/allocation**	**Purpose**
1	RAID 5	9 GB across physical drives 0, 1, 2, 3	OS
2	RAID 5	Remaining space across all physical drives	Data
DL100 G2 (Workgroup or Standard, 4 drives)			
Logical disk	**RAID level**	**Size/allocation**	**Purpose**
1	RAID 5	12 GB across physical drives 0, 1, 2, 3	Primary OS
2	RAID 5	5 GB across physical drives 0, 1, 2, 3	DON'T ERASE
3	RAID 5	Remaining space across all physical drives	Data

NOTE:

The DON'T ERASE logical disk supports the Quick Restore process only and does not host the secondary operating system. If you need to perform a quick restore of your server, see the Quick Restore Instructions inside the Quick Restore DVD. Be sure to back up your user data, and then use the Quick Restore DVD to restore the server to the factory default state

On the ML110 G1 and DL100, when the primary OS has a failure such as system files becoming corrupted, registry corrupted, or the system hangs during boot, the system should be run from the secondary OS. To run the system from the secondary OS:

1. Power down the unit.
2. Connect a monitor, keyboard, and mouse directly to the rear of the unit.
3. Power on the unit.
4. During boot up, select to use the secondary partition.

Be sure to back up your user data, and then use the Quick Restore DVD to restore the server to the factory default state as soon as conveniently possible.

Storage for 300 series and 500 series ProLiant storage servers

The 300 series and 500 series ProLiant Storage Servers are preinstalled at the factory with the operating system only. Additional storage configuration is needed for the creation of data drives. Depending on the type of storage server, storage configuration can involve local storage configuration via the HP Array Configuration Utility, Adaptec Storage Manager, or SAN management tools.

Physical drive configuration

Each 300 series and 500 series ProLiant Storage Server comes with two hot-pluggable HDDs for the operating system only. The drives are

configured by default into two logical disks at the controller level as described in Table 10.

Table 10 ProLiant 300 and 500 series servers HDD configuration

Logical disk	RAID level	Size/allocation	Purpose
1	RAID 1	27 GB across physical drive 0, 1	Primary OS
2	RAID 1	7 GB across physical drive 0, 1	DON'T ERASE
ML350 G4p (SATA) model only:			
1	RAID 1	65 GB across physical drive 0, 1	Primary OS
2	RAID 1	9.3 GB across physical drive 0, 1	DON'T ERASE

NOTE:

In the HP Array Configuration Utility (ACU) and Adaptec Storage Manager (ASM), logical disks are labeled 1 and 2. In Disk Manager, logical disks are displayed as 0 and 1. The ACU user guide is available for download at http://h200002.www2.hp.com/bc/docs/support/SupportManual/c00294139/c00294139.pdf. For ASM configuration information, the ASM installation and user's guide can be obtained from http://download.adaptec.com/pdfs/user_guides/aar2410Sa_iug.pdf.

NOTE:

The DON'T ERASE logical disk supports the Quick Restore process only and does not host the secondary operating system. If you need to perform a quick restore of your server, see the Quick Restore Instructions inside the Quick Restore DVD. Be sure to back up your user data, and then use the Quick Restore DVD to restore the server to the factory default state

Data volumes are not carved at the factory or by the Quick Restore DVD, and must be configured manually by the end user. Refer to the *HP ProLiant Storage Server administration guide* for additional information.

Default boot sequence

The BIOS supports the following default boot sequence:

1. DVD-ROM
2. HDD order as follows:
   - HDD 0, 1 (for two-HDD storage servers and the ML110 G2 (Workgroup))
   - HDD 0, 1, 2 (for four-HDD storage servers, except for the ML100 G2 (Workgroup))
3. PXE (network boot)

Under normal circumstances, the storage servers boot up from the primary OS logical drive.

- If the system experiences a drive failure, the drive displays an amber disk failure LED.
- If a single drive failure occurs, it is transparent to the OS.

The hardware RAID controller on four-HDD storage server configurations sounds an audible alarm to indicate a drive failure.

A Regulatory compliance and safety

Federal Communications Commission notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (personal computers, for example). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful

interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Declaration of conformity for products marked with the FCC logo, United States only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact:

Hewlett-Packard Company

P. O. Box 692000, Mail Stop 530113

Houston, Texas 77269-2000

Or, call

1-800- 652-6672

For questions regarding this FCC declaration, contact:

Hewlett-Packard Company

P. O. Box 692000, Mail Stop 510101

Houston, Texas 77269-2000

Or, call

(281) 514-3333

To identify this product, refer to the Part, Series, or Model number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Laser compliance

This product may be provided with an optical storage device (that is, CD or DVD drive) and/or fiber optic transceiver. Each of these devices contains a laser that is classified as a Class 1 Laser Product in accordance with US FDA regulations and the IEC 60825–1. The product does not emit hazardous laser radiation.

⚠ **WARNING!**

Use of controls or adjustments or performance of procedures other than those specified herein or in the installation guide of the laser product may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- Do not try to open the module enclosure. There are no user-serviceable components inside.
- Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
- Allow only HP authorized service technicians to repair the unit.

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

International notices and statements

Canadian notice (Avis Canadien)

Class A equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

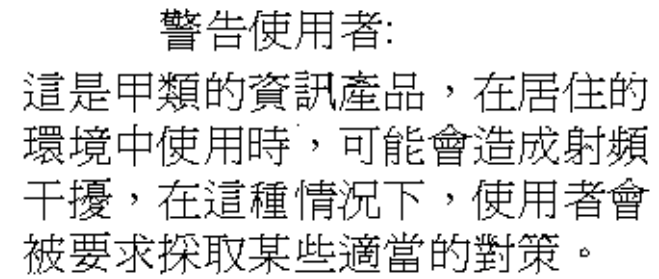
European Union notice

CE Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community and if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22) - Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11) - Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2) - Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3) - Power Line Flicker
- EN 60950 (IEC 60950) - Product Safety

BSMI notice



Japanese notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

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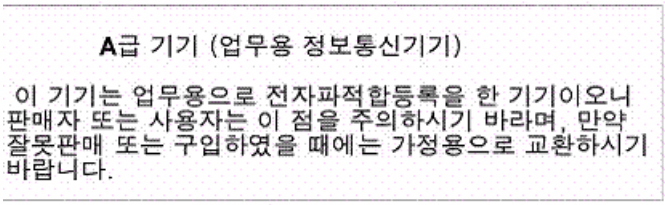
Korean notice A&B

Class A equipment



Class B equipment

B급 기기 (가정용 정보통신기기)

이 기기는 가정용으로 전자파적합등록을 한 기기로서
주거지역에서는 물론 모든지역에서 사용할 수 있습니다.

Safety

Battery replacement notice

⚠ **WARNING!**

The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.

Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, please use the public collection system or return them to HP, an authorized HP Partner, or their agents.

For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

Taiwan battery recycling notice

The Taiwan EPA requires dry battery manufacturing or importing firms in accordance with Article 15 of the Waste Disposal Act to indicate the recovery marks on the batteries used in sales, giveaway or promotion. Contact a qualified Taiwanese recycler for proper battery disposal.

Power cords

The power cord set must meet the requirements for use in the country where the product was purchased. If the product is to be used in another country, purchase a power cord that is approved for use in that country.

The power cord must be rated for the product and for the voltage and current marked on the product electrical rating label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product. In addition, the diameter of the wire must be a minimum of 1.00 mm^2 or 18 AWG, and the length of the cord must be between 1.8 m (6 ft) and 3.6 m (12 ft). If you have questions about the type of power cord to use, contact an HP authorized service provider.

NOTE:

Route power cords so that they will not be walked on and cannot be pinched by items placed upon or against them. Pay particular attention to the plug, electrical outlet, and the point where the cords exit from the product.

Japanese power cord notice

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

Electrostatic discharge

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing electrostatic discharge

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper grounding, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

NOTE:

For more information on static electricity, or for assistance with product installation, contact your authorized reseller.

Waste Electrical and Electronic Equipment (WEEE) directive

Czechoslovakian notice

Likvidace zařízení soukromými domácími uživateli v Evropské unii

Tento symbol na produktu nebo balení označuje výrobek, který nesmí být vyhozen spolu s ostatním domácím odpadem. Povinností uživatele je předat takto označený odpad na předem určené sběrné

místo pro recyklaci elektrických a elektronických zařízení. Okamžité třídění a recyklace odpadu pomůže uchovat přírodní prostředí a zajistí takový způsob recyklace, který ochrání zdraví a životní prostředí člověka. Další informace o možnostech odevzdání odpadu k recyklaci získáte na příslušném obecním nebo městském úřadě, od firmy zabývající se sběrem a svozem odpadu nebo v obchodě, kde jste produkt zakoupili.

Danish notice

Bortskaffelse af affald fra husstande i den Europæiske Union

Hvis produktet eller dets emballage er forsynet med dette symbol, angiver det, at produktet ikke må bortskaffes med andet almindeligt husholdningsaffald. I stedet er det dit ansvar at bortskaffe kasseret udstyr ved at aflevere det på den kommunale genbrugsstation, der forestår genvinding af kasseret elektrisk og elektronisk udstyr. Den centrale modtagelse og genvinding af kasseret udstyr i forbindelse med bortskaffelsen bidrager til bevarelse af naturlige ressourcer og sikrer, at udstyret genvindes på en måde, der beskytter både mennesker og miljø. Yderligere oplysninger om, hvor du kan aflevere kasseret udstyr til genvinding, kan du få hos kommunen, den lokale genbrugsstation eller i den butik, hvor du købte produktet.

Dutch notice

Verwijdering van afgedankte apparatuur door privé-gebruikers in de Europese Unie

Dit symbool op het product of de verpakking geeft aan dat dit product niet mag worden gedeponeerd bij het normale huishoudelijke afval. U bent zelf verantwoordelijk voor het inleveren van uw afgedankte apparatuur bij een inzamelingspunt voor het recyclen van oude elektrische en elektronische apparatuur. Door uw oude apparatuur apart aan te bieden en te recyclen, kunnen natuurlijke bronnen worden behouden en kan het materiaal worden hergebruikt op een manier waarmee de volksgezondheid en het milieu worden beschermd. Neem contact op met uw gemeente, het afvalinzamelingsbedrijf of de winkel waar u het product hebt gekocht voor meer informatie over inzamelingspunten waar u oude apparatuur kunt aanbieden voor recycling.

English notice

Disposal of waste equipment by users in private household in the European Union

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service, or the shop where you purchased the product.

Estonian notice

Seadmete jäätmete kõrvaldamine eramajapidamistes Euroopa Liidus

See tootel või selle pakendil olev sümbol näitab, et kõnealust toodet ei tohi koos teiste majapidamisjäätmetega kõrvaldada. Teie kohus on oma seadmete jäätmed kõrvaldada, viies need elektri- ja elektroonikaseadmete jäätmete ringlussevõtmiseks selleks ettenähtud kogumispunkti. Seadmete jäätmete eraldi kogumine ja ringlussevõtmine kõrvaldamise ajal aitab kaitsta loodusvarasid ning tagada, et ringlussevõtmine toimub viisil, mis kaitseb inimeste tervist ning keskkonda. Lisateabe saamiseks selle kohta, kuhu oma seadmete jäätmed ringlussevõtmiseks viia, võtke palun ühendust oma kohaliku linnakantselei, majapidamisjäätmete kõrvaldamise teenistuse või kauplusega, kust Te toote ostsite.

Finnish notice

Laitteiden hävittäminen kotitalouksissa Euroopan unionin alueella

Jos tuotteessa tai sen pakkauksessa on tämä merkki, tuotetta ei saa hävittää kotitalousjätteiden mukana. Tällöin hävitettävä laite on toimitettava sähkölaitteiden ja elektronisten laitteiden kierrätyspisteeseen. Hävitettävien laitteiden erillinen käsittely ja kierrätys auttavat säästämään luonnonvaroja ja varmistamaan, että laite kierrätetään tavalla, joka estää terveyshaitat ja suojelee luontoa. Lisätietoja paikoista, joihin hävitettävät laitteet voi toimittaa kierrätettäväksi, saa ottamalla yhteyttä jätehuoltoon tai liikkeeseen, josta tuote on ostettu.

French notice

Élimination des appareils mis au rebut par les ménages dans l'Union européenne

Le symbole apposé sur ce produit ou sur son emballage indique que ce produit ne doit pas être jeté avec les déchets ménagers ordinaires. Il est de votre responsabilité de mettre au rebut vos appareils en les déposant dans les centres de collecte publique désignés pour le recyclage des équipements électriques et électroniques. La collecte et le recyclage de vos appareils mis au rebut indépendamment du reste des déchets contribue à la préservation des ressources naturelles et garantit que ces appareils seront recyclés dans le respect de la santé humaine et de l'environnement. Pour obtenir plus d'informations sur les centres de collecte et de recyclage des appareils mis au rebut, veuillez contacter les autorités locales de votre région, les services de collecte des ordures ménagères ou le magasin dans lequel vous avez acheté ce produit.

German notice

Entsorgung von Altgeräten aus privaten Haushalten in der EU

Das Symbol auf dem Produkt oder seiner Verpackung weist darauf hin, dass das Produkt nicht über den normalen Hausmüll entsorgt werden darf. Benutzer sind verpflichtet, die Altgeräte an einer Rücknahmestelle für Elektro- und Elektronik-Altgeräte abzugeben. Die getrennte Sammlung und ordnungsgemäße Entsorgung Ihrer Altgeräte trägt zur Erhaltung der natürlichen Ressourcen bei und garantiert eine Wiederverwertung, die die Gesundheit des Menschen und die Umwelt schützt. Informationen

dazu, wo Sie Rücknahmestellen für Ihre Altgeräte finden, erhalten Sie bei Ihrer Stadtverwaltung, den örtlichen Müllentsorgungsbetrieben oder im Geschäft, in dem Sie das Gerät erworben haben.

Greek notice

Απόρριψη άχρηστου εξοπλισμού από χρήστες σε ιδιωτικά νοικοκυριά στην Ευρωπαϊκή Ένωση

Το σύμβολο αυτό στο προϊόν ή τη συσκευασία του υποδεικνύει ότι το συγκεκριμένο προϊόν δεν πρέπει να διατίθεται μαζί με τα άλλα οικιακά σας απορρίμματα. Αντίθετα, είναι δική σας ευθύνη να απορρίψετε τον άχρηστο εξοπλισμό σας παραδίδοντάς τον σε καθορισμένο σημείο συλλογής για την ανακύκλωση άχρηστου ηλεκτρικού και ηλεκτρονικού εξοπλισμού. Η ξεχωριστή συλλογή και ανακύκλωση του άχρηστου εξοπλισμού σας κατά την απόρριψη θα συμβάλει στη διατήρηση των φυσικών πόρων και θα διασφαλίσει ότι η ανακύκλωση γίνεται με τρόπο που προστατεύει την ανθρώπινη υγεία και το περιβάλλον. Για περισσότερες πληροφορίες σχετικά με το πού μπορείτε να παραδώσετε τον άχρηστο εξοπλισμό σας για ανακύκλωση, επικοινωνήστε με το αρμόδιο τοπικό γραφείο, την τοπική υπηρεσία διάθεσης οικιακών απορριμμάτων ή το κατάστημα όπου αγοράσατε το προϊόν.

Hungarian notice

Készülékek magánháztartásban történő selejtezése az Európai Unió területén

A készüléken, illetve a készülék csomagolásán látható azonos szimbólum annak jelzésére szolgál, hogy a készülék a selejtezés során az egyéb háztartási hulladéktól eltérő módon kezelendő. A vásárló a hulladékká vált készüléket köteles a kijelölt gyűjtőhelyre szállítani az elektromos és elektronikai készülékek újrahasznosítása céljából. A hulladékká vált készülékek selejtezéskori begyűjtése és újrahasznosítása hozzájárul a természeti erőforrások megőrzéséhez, valamint biztosítja a selejtezett termékek környezetre és emberi egészségre nézve biztonságos feldolgozását. A begyűjtés pontos helyéről bővebb tájékoztatást a lakhelye szerint illetékes önkormányzattól, az illetékes szemételtakarító vállalattól, illetve a terméket elárusító helyen kaphat.

Italian notice

Smaltimento delle apparecchiature da parte di privati nel territorio dell'Unione Europea

Questo simbolo presente sul prodotto o sulla sua confezione indica che il prodotto non può essere smaltito insieme ai rifiuti domestici. È responsabilità dell'utente smaltire le apparecchiature consegnandole presso un punto di raccolta designato al riciclo e allo smaltimento di apparecchiature elettriche ed elettroniche. La raccolta differenziata e il corretto riciclo delle apparecchiature da smaltire permette di proteggere la salute degli individui e l'ecosistema. Per ulteriori informazioni relative ai punti di raccolta delle apparecchiature, contattare l'ente locale per lo smaltimento dei rifiuti, oppure il negozio presso il quale è stato acquistato il prodotto.

Latvian notice

Nolietotu iekārtu iznīcināšanas noteikumi lietotājiem Eiropas Savienības privātajās mājsaimniecībās

Šāds simbols uz izstrādājuma vai uz tā iesaiņojuma norāda, ka šo izstrādājumu nedrīkst izmest kopā ar citiem sadzīves atkritumiem. Jūs atbildat par to, lai nolietotās iekārtas tiktu nodotas speciāli iekārtotos punktos, kas paredzēti izmantoto elektrisko un elektronisko iekārtu savākšanai otrreizējai pārstrādei. Atsevišķa nolietoto iekārtu savākšana un otrreizējā pārstrāde palīdzēs saglabāt dabas resursus un garantēs, ka šīs iekārtas tiks otrreizēji pārstrādātas tādā veidā, lai pasargātu vidi un cilvēku veselību. Lai uzzinātu, kur nolietotās iekārtas var izmest otrreizējai pārstrādei, jāvēršas savas dzīves vietas pašvaldībā, sadzīves atkritumu savākšanas dienestā vai veikalā, kurā izstrādājums tika nopirkts.

Lithuanian notice

Vartotojų iš privačių namų ūkių įrangos atliekų šalinimas Europos Sąjungoje

Šis simbolis ant gaminio arba jo pakuotės rodo, kad šio gaminio šalinti kartu su kitomis namų ūkio atliekomis negalima. Šalintinas įrangos atliekas privalote pristatyti į specialią surinkimo vietą elektros ir elektroninės įrangos atliekoms perdirbti. Atskirai surenkamos ir perdirbamos šalintinos įrangos atliekos padės saugoti gamtinius išteklius ir užtikrinti, kad jos bus perdirbtos tokiu būdu, kuris nekenkia žmonių sveikatai ir aplinkai. Jeigu norite sužinoti daugiau apie tai, kur galima pristatyti perdirbtinas įrangos atliekas, kreipkitės į savo seniūniją, namų ūkio atliekų šalinimo tarnybą arba parduotuvę, kurioje įsigijote gaminį.

Polish notice

Pozbywanie się zużytego sprzętu przez użytkowników w prywatnych gospodarstwach domowych w Unii Europejskiej

Ten symbol na produkcie lub jego opakowaniu oznacza, że produktu nie wolno wyrzucać do zwykłych pojemników na śmieci. Obowiązkiem użytkownika jest przekazanie zużytego sprzętu do wyznaczonego punktu zbiórki w celu recyklingu odpadów powstałych ze sprzętu elektrycznego i elektronicznego. Osobna zbiórka oraz recykling zużytego sprzętu pomogą w ochronie zasobów naturalnych i zapewnią ponowne wprowadzenie go do obiegu w sposób chroniący zdrowie człowieka i środowisko. Aby uzyskać więcej informacji o tym, gdzie można przekazać zużyty sprzęt do recyklingu, należy się skontaktować z urzędem miasta, zakładem gospodarki odpadami lub sklepem, w którym zakupiono produkt.

Portuguese notice

Descarte de Lixo Elétrico na Comunidade Européia

Este símbolo encontrado no produto ou na embalagem indica que o produto não deve ser descartado no lixo doméstico comum. É responsabilidade do cliente descartar o material usado (lixo elétrico), encaminhando-o para um ponto de coleta para reciclagem. A coleta e a reciclagem seletivas desse tipo de lixo ajudarão a conservar as reservas naturais; sendo assim, a reciclagem será feita de uma forma

segura, protegendo o ambiente e a saúde das pessoas. Para obter mais informações sobre locais que reciclam esse tipo de material, entre em contato com o escritório da HP em sua cidade, com o serviço de coleta de lixo ou com a loja em que o produto foi adquirido.

Slovakian notice

Likvidácia vyradených zariadení v domácnostiach v Európskej únii

Symbol na výrobku alebo jeho balení označuje, že daný výrobok sa nesmie likvidovať s domovým odpadom. Povinnosťou spotrebiteľa je odovzdať vyradené zariadenie v zbernom mieste, ktoré je určené na recykláciu vyradených elektrických a elektronických zariadení. Separovaný zber a recyklácia vyradených zariadení prispieva k ochrane prírodných zdrojov a zabezpečuje, že recyklácia sa vykonáva spôsobom chrániacim ľudské zdravie a životné prostredie. Informácie o zberných miestach na recykláciu vyradených zariadení vám poskytne miestne zastupiteľstvo, spoločnosť zabezpečujúca odvoz domového odpadu alebo obchod, v ktorom ste si výrobok zakúpili.

Slovenian notice

Odstranjevanje odslužene opreme uporabnikov v zasebnih gospodinjstvih v Evropski uniji

Ta znak na izdelku ali njegovi embalaži pomeni, da izdelka ne smete odvreči med gospodinjske odpadke. Nasprotno, odsluženo opremo morate predati na zbirališče, pooblaščeno za recikliranje odslužene električne in elektronske opreme. Ločeno zbiranje in recikliranje odslužene opreme prispeva k ohranjanju naravnih virov in zagotavlja recikliranje te opreme na zdravju in okolju neškodljiv način. Za podrobnejše informacije o tem, kam lahko odpeljete odsluženo opremo na recikliranje, se obrnite na pristojni organ, komunalno službo ali trgovino, kjer ste izdelek kupili.

Spanish notice

Eliminación de residuos de equipos eléctricos y electrónicos por parte de usuarios particulares en la Unión Europea

Este símbolo en el producto o en su envase indica que no debe eliminarse junto con los desperdicios generales de la casa. Es responsabilidad del usuario eliminar los residuos de este tipo depositándolos en un "punto limpio" para el reciclado de residuos eléctricos y electrónicos. La recogida y el reciclado selectivos de los residuos de aparatos eléctricos en el momento de su eliminación contribuirá a conservar los recursos naturales y a garantizar el reciclado de estos residuos de forma que se proteja el medio ambiente y la salud. Para obtener más información sobre los puntos de recogida de residuos eléctricos y electrónicos para reciclado, póngase en contacto con su ayuntamiento, con el servicio de eliminación de residuos domésticos o con el establecimiento en el que adquirió el producto.

Swedish notice

Bortskaffande av avfallsprodukter från användare i privathushåll inom Europeiska Unionen

Om den här symbolen visas på produkten eller förpackningen betyder det att produkten inte får slängas på samma ställe som hushållssopor. I stället är det ditt ansvar att bortskaffa avfallet genom att överlämna det till ett uppsamlingsställe avsett för återvinning av avfall från elektriska och elektroniska produkter. Separat insamling och återvinning av avfallet hjälper till att spara på våra naturresurser och gör att avfallet återvinns på ett sätt som skyddar människors hälsa och miljön. Kontakta ditt lokala kommunkontor, din närmsta återvinningsstation för hushållsavfall eller affären där du köpte produkten för att få mer information om var du kan lämna ditt avfall för återvinning.

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