

# Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

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## Notes, Notices, and Cautions

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
  -  **NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.
  -  **CAUTION:** A CAUTION indicates a potential for property damage, personal injury, or death.
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## Initial Configuration

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [Configuring Your NAS System for the First Time](#)
- [Other Documents You May Need](#)

This section provides information necessary to perform the initial configuration of the system.

The NAS system is a "headless" system that is managed through the network; it can be operated without a keyboard, monitor, or mouse. The NAS system is configured and managed using the Web-based Dell™ PowerVault™ NAS Manager, which can be accessed from a client system on the same network. See "[NAS Manager](#)" for more information. For certain configuration tasks and for troubleshooting, you can connect a keyboard, monitor, and mouse.

## Configuring Your NAS System for the First Time

You can configure your system in several ways, depending on whether Dynamic Host Configuration Protocol (DHCP) is installed on your network:

- 1 If DHCP is installed on your network, your system automatically configures the network settings. If you are unsure whether your network uses DHCP, contact your network administrator. See "[Configuring Your NAS System Automatically on a Network \(With DHCP\)](#)."
- 1 If DHCP is not installed on your network, you can configure your system using the Dell OpenManage™ Kick-Start utility. See "[Configuring Your System Using the Kick-Start Utility](#)."
- 1 You can use a keyboard, monitor, and mouse connected directly to the NAS system. See "[Configuring Your System Using a Keyboard, Monitor, and Mouse](#)."

## Configuring Your NAS System Automatically on a Network (With DHCP)

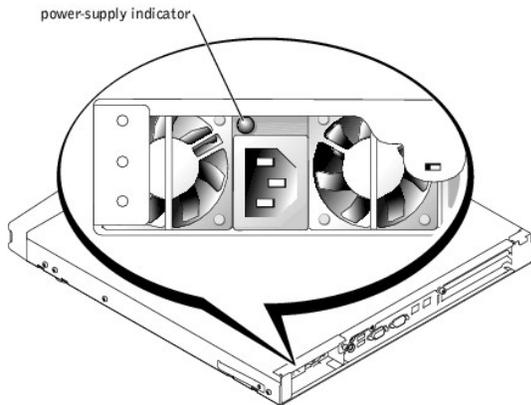
1. Connect one end of the power cable to the NAS system and the other end to an electrical outlet, and verify that the power LED is green. See [Figure 1-1](#).
2. Connect one end of an Ethernet cable into one of the two NIC connectors on the back of your NAS system.

For more information about the location of system connectors, see the *User's Guide*.

3. Connect the other end of the Ethernet cable to a functioning Ethernet jack, and verify that the link LED on the NIC connector is illuminated.

If the LED is not illuminated, check to make sure that each end of the Ethernet cable is seated properly in the NIC connector and the Ethernet jack.

**Figure 1-1. Power-Supply Indicator**



4. Push the power button to turn on the NAS system.

The NAS system retrieves the information it needs (the IP address, gateway subnet mask, and DNS server address) from a DHCP server on the network.

**NOTE:** It may take several minutes for the NAS system to boot.

5. From a client system on the same network, launch Microsoft® Internet Explorer 5.5 or later (or for Red Hat Linux only, launch Netscape Navigator 6.2.2 or later), type the default system name in the Web address field, and press <Enter>.

The default system name is DELLxxxxxx, where xxxxxx is the system's service tag number, which is located on the top of the system. For example, if your service tag number is 1234567, type `http://DELL1234567`.

**NOTE:** If you cannot connect to the system through a Web browser, you must use another method to configure the IP address, gateway subnet mask, and DNS server. See "[Configuring Your NAS System for the First Time](#)."

6. Enter the default administrator user name and password for your system when prompted, and then click **OK**.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

7. Use the NAS Manager to begin setting up shares and volumes on the NAS system.

See "[NAS Manager](#)."

## Configuring Your System Using a Keyboard, Monitor, and Mouse

 **NOTE:** To perform this procedure, you need a unique static IP address, as well as a subnet and gateway address.

1. Connect one end of the power cable to the NAS system and the other end to an electrical outlet, and verify that the power LED is green.
2. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

3. Push the power button to turn on the NAS system.

 **NOTE:** It may take several minutes for the NAS system to boot.

4. Log in to the NAS system.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

5. If the **PowerVault Advanced Administration Menu** appears, click **Exit**.
6. Right-click **Network Places** and select **Properties**.
7. Right-click **Local Area Connection** for the NIC that you will use to connect the NAS system to the network.
8. In the **Local Area Connection Properties** window, click **TCP/IP** and then click **Properties**.
9. Click **Use the following IP address**.
10. Enter the IP address, subnet, and gateway.
11. Click **OK** and restart the system when prompted.

For more information, see "[Configuring the Network Address for the NAS System](#)" or your Microsoft® Windows® operating system's online help.

For more information about configuring the second NIC, see "[Configuring Network Properties](#)" in "NAS Manager."

## Configuring Your System Using the Kick-Start Utility

 **NOTE:** Perform the procedures in this section only if you cannot configure your NAS system using a DHCP server on the network. See "[Configuring Your NAS System Automatically on a Network \(With DHCP\)](#)."

1. Connect one end of the power cable to the NAS system and the other end to an electrical outlet.
2. Connect one end of an Ethernet cable into one of the two NIC connectors on the back of your NAS system.

For more information on the location of system connectors, see the *User's Guide*.

3. Connect the other end of the Ethernet cable to a functioning Ethernet jack.
4. From a client system on the same network, enable the Kick-Start utility and create your DHCP settings:
  - a. Insert the *Resource* CD into the CD drive of the client system.
  - b. When the *Resource* CD window displays, click **Dell OpenManage Kick-Start**.
  - c. Click **Run Dell OpenManage Kick-Start**.
  - d. If a security warning appears, click **Yes**.
  - e. When asked if you want to run the program, click **Yes**.
  - f. At the bottom of the **Dell OpenManage Kick-Start** window, click **Setup**.
  - g. Click **Add**.
  - h. In the **Add Scope** window, type the following information and click **OK**:
    - i **Starting IP Address:** 10.40.10.10
    - i **Ending IP Address:** 10.40.10.20
    - i **Subnet:** 255.255.255.0
    - i **Gateway IP Address:** 10.40.10.1

 **NOTE:** The client system should be on the same subnet as the NAS system. Because the NAS system is assigned an address on the 10.40.10.x subnet, the client system IP address must also be statically assigned to the 10.40.10.x subnet.

- i. Click **OK** to close the **Add Scope** window.
  - j. Click **Interfaces for DHCP Server** so that it is checked.
  - k. Click **OK** to close the **DHCP Server Setup** window.
5. Click **Enabled** at the bottom of the **Dell OpenManage Kick-Start** window to start the integrated DHCP server.
  6. Push the power button to turn on the NAS system.

After the system boots, it is displayed in the **Discovered Systems** list of the **Dell OpenManage Kick-Start** window.

 **NOTE:** It may take several minutes for the NAS system to boot, depending on your configuration.

7. Click the NAS system in the **Discovered Systems** list.
8. Click **Launch Configuration Tool** to launch the NAS Manager.

The **Configuring** icon is displayed for 5 minutes after you click **Launch Configuration Tool**. If the agent is still running after 5 minutes, the icon displays "Ready."

9. Use the NAS Manager to configure the NAS system's IP address.

See "[Configuring the Network Address for the NAS System](#)" in "NAS Manager."

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## Other Documents You May Need

 The *System Information Guide* provides important safety and regulatory information. Warranty information may be included within this document or as a separate document.

- 1 The *Rack Installation Guide* included with your rack solution describes how to install your system into a rack.
- 1 The *Setting Up Your System* document provides an overview of initially setting up your system.
- 1 The *User's Guide* provides information about system features and technical specifications.
- 1 The *Installation and Troubleshooting Guide* describes how to troubleshoot the system and install or replace system components.
- 1 Documentation for any components you purchased separately provides information to configure and install these options.
- 1 Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

 **NOTE:** Always read the updates first because they often supersede information in other documents.

- 1 Release notes or readme files may be included to provide last-minute updates to the system or documentation or advanced technical reference material intended for experienced users or technicians.
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# NAS Manager

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The Dell™ PowerVault™ NAS Manager is a Web-based user interface that is the primary tool for configuring NAS systems. This section provides basic information on using the NAS Manager, including how to log on and navigate the interface, configuring network properties and IP addresses, creating users, using shares and disk quotas, and managing disks and volumes.

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## Logging in to the NAS Manager

To use the NAS Manager, you must be logged in as an administrator. You can log in only if the NAS system is on the network or if you are connected directly to the NAS system using a keyboard, monitor, and mouse.

To log in to the NAS Manager, perform the following steps:

1. Open a Web browser from a client system.

The NAS Manager supports clients running Microsoft® Internet Explorer 5.5 or later (or Netscape Navigator 6.2.2 or later for Red Hat Linux).

2. Type in the name of the NAS system in the Web address field, and then press <Enter>.

The default system name is Dellxxxxxxx, where xxxxxxx is the system's service tag number, which is located on the top of the system. For example, if your service tag number is 1234567, enter `http://DELL1234567`.

The NAS Manager is served on port 1279 and is accessed using the following Web address: `https://systemname:1279` or `https://system_ipaddress:1279`, where *systemname* is Dellxxxxxxx (xxxxxxx is the system's service tag number). For example, if your service tag number is 1234567, you would enter `https://DELL1234567:1279`. Port 1279 uses secure socket layer (SSL) to encrypt data going to and coming from the NAS system to provide data security.

➡ **NOTICE:** Although port 1278 can be used, it uses plain text authentication, which can be a significant security risk. Therefore, using port 1278 is not recommended.

3. When the **Enter Network Password** window displays, type the administrator user name and password and then click **OK**.

📌 **NOTE:** The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

4. Click **Administer this server appliance**.
5. When the **Security Alert** window displays, click **Yes**.
6. When the **Enter Network Password** window appears again, enter the same user name and password that you entered in [step 3](#), and then click **OK**.

You are now logged in to the NAS Manager.

## Default Administrator User Name and Password

When logging into the NAS system for the first time, you must enter an administrator user name and password. The default administrator user name for your NAS system is `administrator` and the default password is `powervault`.

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## Basic Navigation

When navigating the NAS Manager, use the buttons within the program to go backward and forward.

The top of each page of the Web user interface (UI) displays a status area, as well as primary and secondary menu bars, and the body of each page displays specific content related to each functional area.

## Status Area

The following information is displayed in the top band of the NAS Manager Web UI:

- 1 System host name
- 1 System status, which displays the following status conditions:
  - o Normal (green text)
  - o Informational (grey text)
  - o Warning (yellow text)
  - o Critical (red text)

Clicking **Status**: `<status_type>` takes you to the **Status** page.

- 1 Microsoft Windows® Powered logo

## Primary Menu

The primary menu bar below the status area allows you to choose from the following menu items:

- 1 **Welcome** — Allows you to take a tour and set the administrator password, NAS system name, and default page.
- 1 **Status** — Provides information about alerts and other status.
- 1 **Network** — Provides access to basic network setup tasks such as setting the NAS system name, configuring properties of network interfaces, configuring global network settings, setting IP addresses and ports for the administration website, configuring Telnet, and changing passwords.
- 1 **Disks** — Allows you to configure disks and volumes, set disk quotas, and create snapshots (or persistent images).
- 1 **Users** — Enables you to create, edit, and delete local users and groups.
- 1 **Shares** — Enables you to manage local folders and create or modify file shares.
- 1 **Maintenance** — Allows you to perform maintenance tasks such as backup and restore, apply software updates, check logs, change the language of the NAS Manager, and access the Terminal Services Advanced Client.
- 1 **MDM** — Allows you to configure multiple device management (MDM) settings.
- 1 **Help** — Provides access to online Help for network attached storage.

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## Changing the NAS Manager Language

The NAS Manager is available in different languages. To change the NAS Manager language, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Language**.
4. Click the radio button next to the language you want to use.
5. Click **OK**.
6. Reboot the system when prompted.

The NAS system reboots, and the changes are complete after the reboot.

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## How to Find Online Help

The NAS Manager provides two kinds of help. The NAS Manager online help provides information on NAS Manager functionality and procedures. The Windows Powered operating system online help, which you can access through the Terminal Services on the **Maintenance** page, documents the functionality of the Windows Powered operating system.

Also, most other software applications have online help that you can access when you use those applications.

To access NAS Manager Help, use one of the following methods:

- 1 Click **Help** on the primary menu: the NAS Manager screen is replaced by a split **Help** screen that displays a table of contents on the left and topics on the right.
- 1 Click the question mark icon at the far right of the primary menu to access the context-sensitive help topic related to the current page.

To start Windows Powered help, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to the NAS system.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

5. Perform one of the following procedures:
    1. From the **Start** menu, click **Help**.
    1. On the **Advanced Administration Menu**, click **Administrative Tools**, and then click **Windows Powered Help**.
- 

## Configuring Network Properties

Use the **Network** tab in the NAS Manager to configure the NAS system for the network. This section provides information for setting up your NAS system on the network, including naming the system, defining the IP address, and configuring the NIC.

### Naming the NAS System

By default, the NAS system uses your service tag number as the system name. To change the name of the NAS system, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Network**.
3. Click **Identification**.
4. Type a new name for the NAS system in the **Server appliance name** field.
5. Click **OK**.
6. Click **OK** to reboot, or click **Cancel**.

Until you reboot the system, the new name will not take effect. Use the new name when you connect to the NAS Manager.

### Configuring the Network Address for the NAS System

If you have a DHCP server on your network, you do not need to configure your NAS system's IP address because DHCP automatically assigns an address to the NAS system. If you do not have a DHCP server on your network, you must set the address for the NAS system through the NAS Manager.

 **NOTE:** To configure an IP address for another interface such as DNS, WINS, or AppleTalk, see your NAS Manager online help.

 **NOTE:** Before you configure the IP address on a network adapter, ensure that the NAS system is connected to the network through that adapter.

To configure the IP address, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Network**, and then click **Interfaces**.
3. Select the radio button beside the network connection that you want to configure.

 **NOTE:** If some of the text is missing due to column width, pass your cursor over the text in the column to see a pop-up window with a full description.

4. Click **IP** and select **Use the following IP settings**.
5. Enter the desired IP address, subnet mask, and default gateway.

If you do not have this information, contact your system administrator.

6. Click **OK**.

The network address setup is complete.

 **NOTE:** When you change the IP address, you may be unable to access the NAS Manager until you reboot the NAS system, or for approximately 15 minutes until the network recognizes the new IP address. You can also try to access the NAS system by typing `https://new_ip_address:1279` in the NAS Manager, where `new_ip_address` is the new address that you just set.

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## Creating Users

A user is a person or group that has access to the shares on the NAS system. You create users after you configure the network properties of your NAS system.

### Creating a Single Local User

 **NOTE:** In a domain environment, you cannot create domain users.

1. Log in to the NAS Manager.
2. Click **Users**.
3. Click **Local Users**.
4. On the **Local Users on Server Appliance** page, click **New**.
5. Complete the information on the **Create New User** page.

 **NOTE:** In a domain environment, do not create local users that have the same user name as domain users unless the local user and domain user have identical passwords.

The **Home Directory** text box specifies a new directory that will be created and to which the user will have exclusive access permission. The directory name is the same as the user name and is located in the path specified.

6. Click **OK**.

## Creating a Group of Local Users

 **NOTE:** In a domain environment, you cannot create domain groups. However, you can add domain users to your local groups.

1. Log in to the NAS Manager.
2. Click **Users**.
3. Click **Local Groups**.
4. On the **Local Groups on Server Appliance** page, click **New**.
5. On the **Create New Group** page, enter the name and description of the group.
6. Click **Members**.
7. Select the members of the group by performing one of the following:
  1. In the **Add user or group** box, select a local user or group from the list, and then click **Add**.
  1. Type the domain and group name (*domain\group\_name*) of a domain group or of a domain user account (*domain\user\_name*) and then click **Add**.

 **NOTE:** If you are adding a domain group, you must also enter the user name and password that will allow you to add from that domain.

8. Click **OK**.
- 

## Using Shares

A share is a folder on the NAS system that is shared with other systems on the network, whether those systems are running a Windows, Novell® NetWare®, Macintosh, or UNIX® operating system.

A NAS system supports the following methods of sharing folders:

1. CIFS — The Common Internet File System protocol is used by clients running a Windows operating system.
1. NFS — The Network File System protocol is used by clients running UNIX.
1. FTP — The File Transfer Protocol is an alternative way of accessing a file share from any operating system.
1. HTTP — The Hypertext Transfer Protocol is the protocol for accessing a file share from Web browsers.
1. AppleTalk — The AppleTalk protocol is used by clients running a Macintosh operating system.
1. NetWare — The NetWare protocol is used by NetWare clients.

 **NOTE:** The AppleTalk and NetWare protocols are disabled by default on the NAS system. See "[Advanced Features](#)" for information about enabling these protocols.

## Adding a Share

To create a share, you must supply a share name that is different from all other shares on the system. This is the name that the client system uses to access the share. Some protocols also support the inclusion of a comment or brief description of the share. Additionally, you must enable at least one of the available protocols.

 **NOTICE:** To make the shares more fault-tolerant, create your data shares on the data drives.

To add a share, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Tasks** list on the **Shared Folders** page, click **New**.
5. Type the share name and share path.

 **NOTE:** Do not share the root directory of your system. Share only folders in the root directory. For example, do not share **d:\**; instead, share **d:\foldername**, where *foldername* is the name of the folder in the root directory.

6. If you entered a nonexistent folder in the **Share path**, click **Create folder if it does not already exist**.

 **NOTE:** The **Comment** field is ignored for NFS, FTP, and HTTP shares.

7. If desired, enter comments in the **Comments** box.
8. Check the appropriate box(es) to specify the types of protocols to enable.

If you want to use a protocol that is grayed out, you must first enable it on the NAS system. See "[Advanced Features](#)" for information about enabling the AppleTalk and NCP protocols.

9. Use the protocol tabs to configure the specific properties of each type of share.

 **NOTE:** Services for NetWare (SFN) are compatible with the Novell NetWare Bindery service for authentication and file access using the Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) network protocol. You must perform a NetWare logon to the NAS system using a NetWare client before you can connect to the NetWare shares.

10. Click **OK**.

## Modifying Share Properties

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Shared Folders** table, click the share you want to modify.
5. Click **Properties**.

The **Share Properties** page displays. Use this page to change the description of the share. You can also select the type of client from which the share is accessible.

6. Click **OK**.

## Removing a Share

When you remove a share, access to the share is removed; however, the actual files remain on the NAS system.

To remove a share, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Shared Folders** table, click the share that you want to delete.
5. Click **Delete**.

A confirmation dialog appears.

6. Click **OK** to confirm the deletion, or click **Cancel** to keep the share.

## Removing a Protocol From the Share

Because a share may have more than one protocol assigned, it is possible to remove a protocol from a share without removing the remaining protocols.

To remove one or more specific protocols from a share, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Shared Folders** table, click the share for which you want to remove a protocol.
5. Click **Properties**.
6. Uncheck the protocol(s) to remove it from the share.
7. Click **OK** to confirm the protocol removal, or click **Cancel** to keep the protocol(s) for the share.

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## Disk Quotas

Disk quotas track and control the use of disk space for volumes. You can configure the volumes on your NAS system to:

- 1 Prevent further use of disk space and log an event when a user exceeds a specified disk space limit.
- 1 Log an event when a user exceeds a specified disk space warning level.

When you enable disk quotas, you can set both the disk quota limit and the disk quota warning level.

- 1 The disk quota limit specifies the amount of disk space a user is allocated within a specific volume.

- 1 The warning level specifies the point at which the event log displays that a user is nearing the quota limit within a specific volume.

For example, you can set a user's disk quota limit to 50 MB and the disk quota warning level to 45 MB. With these settings, the user can store no more than 50 MB on the volume. If the user stores more than 45 MB on the volume, you can set the disk quota system to log a system event to the event log.

In addition, you can specify a quota limit for users but allow the users to exceed that quota limit. When you enable quotas without limiting disk space, you can track disk-space use on a per-user basis without denying users access to a volume when they exceed that limit. It is also possible to specify whether the system logs an event when a user exceeds the quota warning level and quota limit.

## Enabling or Disabling Disk Quotas

To enable or disable quota management on a volume, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **Disk Quota**.
4. On the **Volumes and Quotas** page, click the volume to manage.
5. Click **Quota**.
6. On the **Default Quota for volume** page, click the appropriate check box to enable or disable quota management.
7. Select the quota size and settings for this volume.
8. Click **OK**.

## Adding Disk Quota Entries

The **Quota Entries** page allows you to add, delete, or configure disk quotas for any NAS system user.

When you enable disk quotas for an existing volume, volume usage is automatically tracked for new users from that point forward. However, existing volume users have no disk quotas applied to them. You can apply disk quotas to existing volume users by adding new quota entries in the **Quota Entries** window.

To add a new quota entry, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **Disk Quota**.
4. On the **Disk Quota** page, click the volume to manage.
5. Click **Quota Entries**.
6. Click **New**.
7. Select a local user from the list box, or type the name of a domain account in the text box (in the format *domain\_name\user\_name*).
8. To allow unlimited disk space usage, click the **Do not limit disk usage** radio button, and then go to step 10. Otherwise, go to step 9.
9. To limit disk space, perform the following steps:
  - a. Click the **Limit disk space to** radio button.
  - b. In the text box, enter a numerical value to specify the amount of disk space to assign to a particular user or group. Use the drop-down box to select kilobytes (**KB**), megabytes (**MB**), gigabytes (**GB**), terabytes (**TB**), petabytes (**PB**), or exabytes (**EB**).
  - c. Enter the amount of disk space that, when filled, triggers a warning to the user or group member that the used disk space is near the disk-capacity limit. Use the drop-down box to select **KB**, **MB**, **GB**, **TB**, **PB**, or **EB**.
10. Click **OK**.

## Modifying Quota Properties

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **Disk Quota**.
4. On the **Volumes and Quotas** page, click the volume to manage.
5. Click **Quota Entries**.
6. In the **Logon** list on the **Quota Entries** page for the selected volume, select a user account.
7. Click **Properties**.
8. On the **Quota entry for user** page, click the **Do not limit disk usage** radio button to allow unlimited disk use, or perform the following procedure to limit disk space:
  - a. Click the **Limit disk space to** radio button.
  - b. In the text box, enter a numerical value to specify the amount of disk space to assign to a particular user or group. Use the drop-down box to select **KB**, **MB**, **GB**, **TB**, **PB**, or **EB**.
  - c. Enter the amount of disk space that, when filled, triggers a warning to the user or group member that the used disk space is near the disk-capacity limit. Use the drop-down box to select **KB**, **MB**, **GB**, **TB**, **PB**, or **EB**.

 **NOTE:** Any previously entered warning level does not appear in the text box. However, the warning level is still set on the NAS system.

9. Click **OK**.

## Removing Disk Quota Entries

1. Log in to the NAS Manager.
  2. Click **Disks**.
  3. Click **Disk Quota**.
  4. On the **Volumes and Quotas** page, select the volume to manage.
  5. From the **Tasks** list, select **Quota Entries**.
  6. On the **Quota Entries** page, select the **Logon name** from which you want to remove the quota entry.
  7. On the **Tasks** list, select **Delete**.
  8. Click **OK**.
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## Using Logs

A log file stores messages, which are sometimes called events or event log entries, generated by an application, service, or operating system. The messages are used to track the operations performed by the system. Log files are usually plain text (ASCII) files with the **.log** file extension.

The NAS system provides access to the following logs:

- 1 Application log
- 1 FTP log
- 1 NFS log
- 1 Security log
- 1 System log
- 1 Web (HTTP) shares log
- 1 Web administration log

## Viewing Log Entry Details

You can view details from specific log files such as the date, time, source, event ID, description, and data.

To view log entry details, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Logs**.
4. On the **Logs** page, select the type of log you want to view.
5. Click the radio button next to the log entry you want to view.
6. In the **Tasks** list, click **Event Details** or **View Log** depending on the selected log type.
7. On the **Log Details** page, click **Up** and **Down** to scroll through the log files.
8. Click **Back** to close the **Log Details** page and return to the log entry list on the **Logs** page.

## Modifying Log Properties

For system, security, and application logs, you can specify the maximum log size and determine how the system handles log entries when the maximum capacity of the NAS system is reached.

To modify the properties of a log file, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Logs**.
4. On the **Logs** page, select the type of log you want to configure.
5. In the **Tasks** list, click **Log Properties**.
6. In the **Maximum log size** text box on the **Log Properties** page, enter the maximum size (in kilobytes) of the log.
7. Determine how you want the system to handle log file entries after the maximum log file size has been reached, and then click one of the following choices:
  - 1 **Overwrite events as needed** — The system writes over older events with new events as they occur.

- 1 **Overwrite events older than \_\_\_\_ days** — The system retains the event entries for the specified number of days before the events can be written over by current event entries.
  - 1 **Do not overwrite events** — The system retains all events in the log and appends new events to the end of the file.
8. Click **OK**.

## Downloading Log Files

The NAS Manager allows you to download specific log files from your NAS system.

To download log files, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Logs**.
4. On the **Logs** page, select the type of log you want to download.
5. In the **Tasks** list on the *Log Type Log* page, click **Download Log**.
6. On the **Download Log Type Log** page, if available, select the file type that you want to download, and then click **Download Log**.
7. In the **File Download** dialog window, select **Save this file to disk**.
8. Specify a directory where the log will be saved, and then click **Save**.
9. Click **Close** to close the **File Download** dialog window after the download is complete.

## Viewing Downloaded Log Files

After downloading the log files, it is possible to view them in the following ways:

- 1 **.log** files — With a text editor such as Microsoft Notepad.
- 1 **.csv** files — With a text editor or with Microsoft Excel.
- 1 **.evt** files — With the Event Viewer. The Event Viewer can usually be found under **Administrative Tools** from the **Start** menu of a Windows 2000 system. In the **Event Viewer** window, click **Action** and then click **Open Log File**. Browse to the location of your log file, choose the log type of your file, and then click **Open**.

## Clearing Log Files

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Logs**.
4. On the **Logs** page, select the type of log you want to clear.
5. Select the specific log you want to clear, and then click **Clear** in the **Tasks** list.
6. On the **Clear Log Confirmation** page, click **OK** to clear the log.

---

## Multiple Device Management

Multiple Device Management (MDM) is a part of the NAS Manager functionality that allows you to run jobs on one or more NAS systems simultaneously. You can use MDM to perform tasks such as adding a user or retrieving system status information on multiple NAS systems from a single system.

 **NOTE:** MDM is disabled by default in your NAS system.

MDM is composed of two components: a device and a controller. A device is a system that executes jobs received from a controller and returns the job results to the controller. Jobs can be applied to individual devices or to a group of devices called *sets*. The purpose of the controller is to discover other MDM-enabled devices, manage ownership of devices, and manage jobs. To use MDM services, one of your NAS systems must be designated as a controller.

---

## Configuring MDM on Your NAS System

From the **MDM** tab in the NAS Manager, use the **Multiple Device Management Settings** option to configure controllers and devices and to disable MDM services.

### Configuring an MDM Controller

When you configure your NAS system as an MDM controller, it becomes both a device and a controller for other MDM devices.

1. Log in to the NAS Manager.
2. Click **MDM**.
3. Click **Configure MDM**.

The **Multiple Device Management Settings** page displays and the **Configure MDM Type** tab is active.

4. Select **MDM Controller**.
5. Click **OK**.

The system automatically reboots.

## Configuring an MDM Device

Your NAS system can be configured as a device that can be controlled by any controller (*trust mode*) or as a device controlled only by a controller with a specific certificate (*certificate mode*). If you choose trust mode, the first controller that attempts to control the device becomes the device's controller. In certificate mode, only the system with the uploaded certificate can control the device.

To configure your NAS system as a device, perform the following steps:

1. Log in to the NAS Manager.
2. Click **MDM**.
3. Click **Configure MDM**.

The **Multiple Device Management Settings** page displays and the **Configure MDM Type** tab is active.

4. Select **MDM Device**.
5. Select one of the following **MDM Device** options:
  - 1 **Any controller** — Allows the system to be controlled by any MDM controller. Choosing this option puts the system in *trust mode*.
  - 1 **Only the controller with the following certificate** — Allows the system to be controlled only by an MDM controller with a specific certificate. Choosing this option puts the system in *certificate mode*. If you choose this option, you must first copy the required certificate from the MDM controller to your local system (client), and then upload the required certificate from your local system (client) to the NAS system (MDM device).

To upload the certificate, perform the following steps:

- a. Click **Upload Certificate**.
- b. In the **Upload Certificate File** window, type the name of the certificate file or click **Browse** to navigate to it.
- c. Click **Upload Certificate**.

The MDM controller certificate file is uploaded to the intended MDM device.

6. Click **OK**.

The system automatically reboots.

## Resetting MDM

Resetting MDM will disable the MDM feature and remove the MDM designation from your NAS system. After MDM has been reset, your system will no longer be designated as a device or controller.

 **NOTE:** If a system is controlled by another device, you must release control from that device before reconfiguring the system.

To reset MDM on your NAS system, perform the following steps:

1. Log in to the NAS Manager.
2. If the system is configured as a device, click **MDM**. If the system is figured as a controller, click **Controller**.
3. Click **Reset MDM**.
4. Click **OK**.

The system automatically reboots.

---

## Viewing MDM Device Status

When your NAS system is configured as an MDM device, you can use the NAS Manager to track the status of the system.

To view the status of an MDM device, perform the following steps:

1. Log in to the NAS Manager.
2. Click **MDM**.

The **MDM Agent Status** page displays the following information:

- o **Require Certificate** — **Yes** indicates that the system is operating in *certificate mode*. **No** indicates that the system is operating in *trust mode*.
- o **Certificate** — Indicates whether the certificate is installed.
- o **Controller** — Displays the host name of the last controller to take control of the system.

When an MDM device is powered down or is inaccessible from the network, it may take the controller several minutes to show the device as missing. If a system is inaccessible and the device status is not yet reported as missing, any jobs run on the system may show a pending status. These jobs may never complete. Also, when the device becomes accessible, it may take several minutes for the controller to report the device as active.

---

## Using the MDM Controller to Administer NAS Devices

The NAS Manager's MDM feature allows you to collectively administer several NAS devices in a data center. MDM also allows you to automate routine processes such as adding users and querying systems for status information.

From the NAS Manager **Controller** tab, you can run a job, view alerts and job history, take or release control of individual devices, group individual devices into sets, and administer multiple devices.

### Creating and Using MDM Sets

Use the **Create Sets** option from the NAS Manager **Controller** tab to create and manage sets and to administer individual devices contained in sets. The **Create Sets** option displays an Object/Task Selector that simultaneously lists up to 100 sets that can be sorted by selecting a column heading. You can also create or delete sets, modify set properties, or run a job on one or more sets.

To create a new set, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Create Sets**.
4. In the **Tasks** list, click **New**.
5. Type a name and description for the new set.
6. Select the members for the new set from the **Devices** or **Existing sets** list, and then click **Add**.
7. Click **OK**.

### Controlling MDM Devices

Use the **Control Devices** option from the NAS Manager **Controller** tab to create or delete device records, group devices into sets, take or release control of devices, modify device properties, or run jobs on one or more devices.

#### Creating a New MDM Device Record

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Control Devices**.
4. In the **Tasks** list, click **Add Device**.
5. Type the name, optional description, and optional MAC addresses for the device you are adding.
6. Click **OK**.

#### Grouping Devices into a Set

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Control Devices**.
4. In the **Name** column of the Object/Task Selector on the **Devices** page, select one or more devices to group into a set.
5. In the **Tasks** list, click **Create Set**.
6. On the **Create Set** page, enter a name and description for the new set.
7. From the **Devices** or **Existing sets** lists, add any additional members for the new set.
8. Click **OK**.

### Taking Control of a Device

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Control Devices**.
4. In the **Device Name** column of the Object/Task Selector on the **Control Devices** page, select the device you want to control.
5. In the **Tasks** list, click **Take Control**.

If the operation completes successfully, the Object/Task Selector on the **Devices** page is redisplayed, and the status of the device chosen shows as **Active** (or **Missing** if the device did not respond to a heartbeat request).

If the operation did not complete successfully, an error page is displayed, giving you the option to retry or terminate the operation.

## Running an MDM Job

A job is an administration task executed on a single device or on all controlled devices in a set. Jobs can take many forms; they can be scripts executed on devices by the controller, or they can be special operations such as shutting down or rebooting a NAS system.

To run a job, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Run Jobs**.
4. In the **Tasks** list, click **Run**.
5. Follow the instructions in the Run Job Wizard.

## Running a Job Using Quick Run

If an MDM job already exists, use Quick Run to execute the job on another device or set.

To use Quick Run, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Run Jobs**.
4. Select a job and click **Quick Run**.

## Using MDM Job Templates

In addition to sample job scripts provided with the NAS Manager MDM services, you can create custom scripts that can be run remotely on one or more devices. These custom scripts are then incorporated into job templates that can be used later for running jobs.

### Creating a New Job Template

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Run Jobs**.
4. In the **Tasks** list, click **New**.
5. Follow the instructions in the Job Template Wizard.

When the Job Template Wizard completes, the **Run Jobs** page displays.

### Running a New Job Template

1. Create a new job template as described in "[Creating a New Job Template](#)."

When the Job Template Wizard completes, the **Run Jobs** page displays.

2. In the Object/Task Selector of the **Run Jobs** page, select the new job template.
3. Click **Run**.
4. Follow the instructions in the Run Job Wizard.

## Using Sample MDM Scripts

Sample scripts are located in the `c:\MDMScripts` directory on your NAS system. They include scripts that join systems to a domain or workgroup, create users, verify a Microsoft QFE installation, or change user passwords. You can either run these scripts or make them part of a job template.

 **NOTE:** To see an example of how each script is used, type '?' in the parameter field and then run the job. The output shows script usage.

 **NOTE:** When script parameters include a password, the password must be entered for each job run. If a password is included in a template, the password will be replaced by a '\*'. The script will not run until the '\*' is replaced with a valid password.

### JoinDomain.vbs

The `JoinDomain.vbs` script will join a specific NAS system or device set to a domain.

The parameters of the `JoinDomain.vbs` script to join a domain are:

```
-join <domainname> <username> -password <password>
```

Where *domainname* is the name of the domain, *username* is the name of a user on the domain, and *password* is the domain user's password.

The parameters of the `JoinDomain.vbs` script to join a workgroup are:

```
-workgroup <workgroupname>
```

Where *workgroupname* is the name of the workgroup.

### CreateUser.vbs

The **CreateUser.vbs** script will add a user to a specific NAS system or device set.

The parameters of the **CreateUser.vbs** script are:

```
[ -group <group> ] <username> -password <password>
```

Where *group* (optional) is the group to which the user is being added, *username* is the name of the new user, and *password* is the new user's password.

### IsQFEInstalled.vbs

The **IsQFEInstalled.vbs** script uses a QFE number for a parameter to validate the installation of QFE on a specific NAS system or on each system in a device set.

The parameters of the **IsQFEInstalled.vbs** script are:

```
<qfenum>
```

Where *qfenum* is the "Q" number of a Microsoft QFE, such as Q1111111.

### SetUserPassword.vbs

The **SetUserPassword.vbs** script sets or changes a user password.

The parameters of the **SetUserPassword.vbs** script are:

```
<username> -password <password>
```

Where *username* is the name of the user whose password is being changed, and *password* is the new password.

## Viewing MDM Job Histories

Use the **View Job History** option to view summary information about jobs that have been run previously by the controller. From the **View Job History** page, you can view summary results from a specific job or summary information about alerts that have been generated on devices where alerts are enabled.

### Viewing Job Results

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **View Job History**.
4. In the Object/Task Selector of the **View Job History** page, select the job you want to view.
5. In the **Tasks** list, click **View Results**.

If the job was performed on a device set, the **View Results** page displays an Object/Task Selector list for each device in the set.

6. In the Object/Task Selector of the **View Results** page, select the device you want to view.
7. In the **Tasks** list, click **Properties**.

### Viewing Alerts



**NOTE:** To view alerts from an MDM device, the alerts for that device must be enabled. To enable alerts, go to Control Device under the Controller tab from the NAS Manager on the controller system. Select a controlled device and click **Properties**. Choose **Yes** from the Alerts **Enabled** drop-down menu, and then click OK.

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **View Alerts**.
4. Select the check box next to the alert you want to view.
5. In the **Tasks** list, choose **Alert Details**.
6. On the **Alert Details** page, you can view information about the condition(s) that caused the alert, and then follow the instructions.
7. Click **Clear Message** to delete the alert.

---

## Shutting Down the NAS System

To shut down, restart, or schedule a shutdown of the NAS system using the NAS Manager, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.

3. Click **Shutdown**.
4. Click **Shut Down, Restart**, or **Scheduled Shutdown**.
5. If you select **Scheduled Shutdown**, specify when the shutdown should occur, and then click **OK**.
6. On the **Confirmation** page, click **OK** to confirm the action.

If you choose to restart the NAS system, the **Restarting** page displays. When the NAS Manager detects that the NAS system has come back online, the NAS Manager automatically returns to the home page.

 **NOTE:** Do not refresh or perform any function in the NAS Manager until it comes back online. If you click **Refresh**, the NAS Manager might not automatically refresh after rebooting.

---

## Managing Disks

The NAS Manager allows you to list available disks, rescan for a disk, and view disk properties.

### Listing Available Disks and Viewing Properties

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)."

2. Click **Disks**.
3. On the **Disks** page, click **Disks**.

The **Disks** page displays a list of the available disks and shows their status.

4. Click the disk whose properties you want to view, and then click **Properties**.

The **Properties** page displays the status, capacity, device type, and vendor for the selected disk.

### Rescanning for Disks

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)."

2. Click **Disks**.
  3. In the **Physical Disks** column on the **Disks** page, select the disk to rescan.
  4. In the **Tasks** list, click **Rescan**.
  5. On the **Rescan** page, click **OK** to start the rescan.
- 

## Managing Volumes

A volume is an allocation of usable space on one or more physical disks. The NAS Manager allows you to reconfigure or repair a volume and view the properties of a volume.

 **NOTE:** You can also create volumes in Array Manager. See "[Creating a Dynamic Volume](#)" in "Advanced Disk and Volume Management."

### Reconfiguring a Volume

 **NOTICE:** Reconfiguring a data volume deletes all data on the existing volume. Back up your data before reconfiguring a volume.

1. Prior to reconfiguring the volume, manually remove all shares and persistent images.

 **NOTE:** If the volume is in use or contains shares or persistent images, the system does *not* complete the deletion and reconfiguration operation and displays the message `Use Array Manager`. The administrator can use Array Manager to force the deletion of the volume. See "[Using the Array Manager to Manage Your Disks and Volumes](#)" in "Advanced Disk and Volume Management."

2. If during the deletion, the system messages that it cannot complete the deletion, use Array Manager.

See "[Using the Array Manager to Manage Your Disks and Volumes](#)" in "Advanced Disk and Volume Management."

3. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)."

4. Click **Disks**.
5. Click **Volumes**.
6. In the **Volumes** column, select the volume whose properties you want to view.

7. On the **Tasks** list, click **Reconfigure**.

 **NOTE:** **Reconfigure** appears only if all of the disks in the NAS system are functioning properly. If **Reconfigure** does not appear, one or more of your volumes is damaged and needs to be repaired. See "[Repairing a Volume](#)."

8. Select the **New Layout**, which is either **Single RAID-5** or **Single RAID-0**.

 **NOTE:** RAID 0 volumes are not fault-tolerant and do not provide data protection if a drive fails.

9. Click **OK** to delete and reconfigure the volume.

 **NOTE:** If the volume is in use—for example, the volume is open in a browser window, the volume contains shares or snapshots, or another application is using the volume—a message displays stating that the operation has failed and that you need to use Dell OpenManage Array Manager. See "[Advanced Disk and Volume Management](#)" for more information.

## Repairing a Volume

If an operating system drive or a data drive fails, replace the drive, and use the NAS Manager to repair the volume to make it fault-tolerant again. However, if more than one drive fails, you must reinstall the operating system. See "[Hard-Drive Failures](#)."

 **NOTE:** RAID 0 volumes are not fault-tolerant and cannot be repaired.

1. Remove the failed hard drive.
2. Insert a new hard drive ordered from Dell that is the same size as or larger than the failed drive.

 **NOTE:** The repair feature will not work if you insert a hard drive that is smaller than the failed drive.

3. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)."

4. Click **Disks**.
5. Click **Volumes**.
6. Click **Repair**.

 **NOTE:** **Repair** appears only if the volume is damaged and you have placed a new drive in the system. The drive must be the same size as or larger than the failed drive. If **Repair** does not appear, one or more of your volumes is damaged and needs to be repaired. See "[Repairing a Volume](#)."

7. Click **OK**.

 **NOTE:** The process of fully rebuilding the RAID volumes may take several hours.

## Viewing Volume Properties

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)."

2. Click **Disks**.
3. Click **Volumes**.
4. In the **Volumes** column, select the volume whose properties you want to view.
5. On the **Tasks** list, click **Properties**.
6. Click **OK** to return to the **Volumes** window.

---

## Using the PowerVault Advanced Administration Menu

The **Advanced Administration Menu** is a software application that provides links to advanced functionality in your NAS system. The menu runs automatically when you access your NAS system through Terminal Services.

To access the **Advanced Administration Menu**, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**, and then log in to the NAS system as an administrator.

 **NOTE:** The default administrative user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS.

system.

4. Click **Administrative Tools** or **System Management** to display the list of selectable options.
5. Click the tool or setting you want.
6. When you are finished using the **Advanced Administration Menu**, log off by clicking **Logoff** at the bottom of the **Advanced Administration Menu**.

The following tools are available through the **Advanced Administration Menu**:

- 1 **Broadcom Network Teaming** — Launches Broadcom Advanced Server Control Suite, which allows you to perform advanced functions on Broadcom NICs, such as setting up teaming and virtual LANs.
- 1 **Distributed File System** — Allows management of multiple network shares.
- 1 **Event Viewer** — Allows you to view events in your application log, security log, and system log.
- 1 **Network Tools** — Displays the **Network Tools Interface Utility**, which allows you to perform operations such as nslookup, ping, and tracert.
- 1 **Performance Monitor** — Displays the Performance Monitor.
- 1 **Perform System State Backup** — Enables you to back up your system-state data.
- 1 **Retrieve Dell Service Tag** — Provides the Dell service tag number for your NAS system.
- 1 **Windows Powered Help** — Displays help for the Windows Powered operating system.
- 1 **Windows QFEs** — Displays the QFEs installed on the NAS system.
- 1 **Windows 2000 Backup/Recovery** — Launches Windows 2000 Backup and Recovery Tools.
- 1 **Computer Management** — Provides management for local or remote computers.
- 1 **Disk Management** — Launches Dell OpenManage Array Manager, which provides comprehensive storage management for your disks and volumes.
- 1 **Internet Information Services** — Provides management for Internet Information Services on the system.
- 1 **Local Security Settings** — Enables you to manually set security settings.
- 1 **Network Properties** — Displays the **Network and Dial-up Connections** window.
- 1 **NFS Cache** — Enables and disables the NFS write-back cache.
- 1 **Removable Storage** — Enables you to track or manage storage media and devices.
- 1 **Set Date/Time** — Allows you to set the date and time.
- 1 **Set Regional Options** — Displays the **Regional Options** window, which allows you to change the locale and language settings for the system.
- 1 **Task Manager** — Provides applications, processes, and performance information.
- 1 **Terminal Services Config** — Enables you to configure Terminal Services.

Click the **Language** link to change the language of the **Advanced Administration Menu** to Chinese, English, French, German, Japanese, or Spanish.

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## Advanced Disk and Volume Management

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [How the Drives Are Configured](#)
- [Using the Array Manager to Manage Your Disks and Volumes](#)
- [Disk Management](#)
- [Volume Management](#)
- [Working With Mirrors](#)

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This section provides information about the drives on your NAS system and how to use Dell OpenManage™ Array Manager to manage your disks and volumes and your physical hard drives.

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### How the Drives Are Configured

The NAS system, which is a rack-mounted system, has four IDE hard drives that are in a RAID configuration. Each drive contains both a copy of the operating system and one or more data partitions (see [Table 3-1](#)). The working copies of the Microsoft® Windows® Powered operating system and boot sectors are installed on two hard drives in partitions that are RAID 1 (mirrored) partitions. Additional copies of the operating system are placed on the other two drives in RAID 1 partitions. Data can be stored on all four drives in partitions that are configured as RAID 5.

**Table 3-1. Hard-Drive Partitions**

Volume	Disks and RAID Layout	Description
C:	0 and 1: RAID 1	Primary operating system volume
D:	2 and 3: RAID 1	Recovery operating system volume
E:	0, 1, 2, and 3: RAID 5	Data volume

---

### Using the Array Manager to Manage Your Disks and Volumes

Although Dell OpenManage Array Manager provides a comprehensive solution to storage management, you should use it for *advanced features* that cannot be performed from the **Disks** tab in the NAS Manager.

Array Manager allows you to configure your storage devices and the logical volumes contained in your system. Array Manager displays storage configuration in both a physical and a logical view. The physical view shows the physical connections between the storage devices. The logical view shows a logical representation of your storage as logical volumes.

### Launching Array Manager From the NAS Manager

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in "NAS Manager."

2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to the **Terminal Services** session as an administrator.

 **NOTE:** The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

5. From the **Advanced Administration Menu**, click **Disk Management** under **System Management**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

6. If a Dell OpenManage Array Manager window with buttons such as **Create Volume** or **Create Virtual Disk** displays, click the task you want to perform, or close the window to view the Array Manager Console.

### Array Manager Console

The Array Manager console display uses a tree view to display storage objects in the left pane of the window and tabbed views in the right pane to display additional information about storage objects. The following subsections provide more information about the left and right panes.

#### Left Pane

The left pane shows objects that the Array Manager software detects. The major storage objects are the local system object, arrays, disks, and volumes. By clicking the plus sign (+) in front of a storage object, you can see the subordinate storage objects under that object.

1. Disks represent the disks recognized by the Microsoft Windows Powered operating system.

- 1 Volumes include dynamic RAID volumes created in Array Manager, primary and extended partitions, and logical drives associated with extended partitions.
- 1 **My Network Places**, **History**, and **Favorites** provide remote connection functionality not supported by the NAS system and should be ignored.

## Right Pane

The right pane identifies the various objects and their status and displays any error conditions that might exist. The four tabbed views in the right pane include the following:

- 1 The **General** tab displays parameters based on the objects you select in the console's tree view.

The parameters for **Disks** are as follows:

- o **Name** is the name of the object.
- o **Status** can vary, depending on the object. Common status conditions are **Online**, **Healthy**, and **Resyncing**.
- o **Type** identifies the object, such as **Dynamic Disk**.
- o **Disk Group** shows an entry for disks in a basic or dynamic group.
- o **Capacity** is the maximum size of the disk.
- o **Unallocated Space** is the amount of free hard-drive space still available.
- o **Graphical Layout** is a graphical representation of how much of the disk is being used.
- o **Progress** shows the current progress (percentage of completion) for tasks.
- o **Device** is the type of disk: All of the drives on the NAS system are IDE drives. However, two of the drives will appear in Array Manager as SCSI drives. This is a design issue that will be addressed in a later release.
- o **Port** identifies the controller card. A SCSI port has zero or more target IDs, and a target ID has one or more logical unit numbers (LUNs).
- o **LUN** is the logical unit number.
- o **Target** is the SCSI ID that uniquely identifies the disk on the controller card.
- o **Vendor** identifies the vendor on hardware objects.

The parameters for **Volumes** are as follows:

- o **Name** is the name of the object.
- o **Status** can vary, depending on the object. Common status conditions are **Online**, **Healthy**, and **Resyncing**.
- o **Layout** identifies the object, such as **Dynamic Mirrored Volume** and **Dynamic Striped Volume**.
- o **Disk Group** shows an entry for disks in a basic or dynamic group.
- o **Capacity** is the maximum size of the disk.
- o **Free Space** is the amount of free hard-drive space still available.
- o **Progress** shows the current progress (percentage of completion) for tasks.
- o **File System** shows the type of file system.
- o **Graphical Layout** is a graphical representation of how much of the disk is being used.

- 1 The **Events** tab displays event log messages associated with storage objects.
- 1 The **Disk View** tab displays a graphical layout of the disks on your system, including CDs or other removable media.
- 1 The **DM View** tab is grayed-out on the Array Manager console.

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## Disk Management

This subsection provides conceptual and procedural information about how Array Manager implements basic and dynamic disks.

The following topics are discussed:

- 1 Upgrading a basic disk to a dynamic disk
- 1 Reactivating dynamic disks
- 1 Merging foreign disks

## Upgrading a Basic Disk to a Dynamic Disk

### Basic and Dynamic Disks

Disks are any storage unit presented to Windows 2000 as a single contiguous block of storage. When using the Array Manager, you can use two types of disks—basic or dynamic.

Basic disks employ the traditional disk partitioning used by MS-DOS® and Microsoft Windows 95, Windows 98, and Windows NT® 4.0 operating systems. A basic disk can have up to four primary partitions or three primary partitions plus an extended partition. The extended partition can be subdivided into a number of logical drives.

Dynamic disks contain volume management databases comprising information about all other dynamic disks and volumes on a system. This information allows dynamic disks to support dynamic volumes, which are defined in the following subsection. Storage on a dynamic disk is divided into volumes instead of partitions.

## Basic and Dynamic Volumes

A volume is made up of portions of one or more physical disks. You can format a volume with a file system and access it by a drive letter. Like disks, volumes can be basic or dynamic.

Basic volumes refer to volumes created on basic disks. They include primary and extended partitions and logical drives on extended partitions.

Dynamic volumes are volumes created on dynamic disks. There are five types of dynamic volumes—simple, spanned, mirrored, striped, and RAID-5. However, you can expand only simple and spanned volumes using Array Manager. These are the only types of volumes that this document addresses. See the Array Manager online help for more information about mirrored, striped, and RAID-5 dynamic volumes.

To upgrade a basic disk to a dynamic disk, perform the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. Right-click the disk you want to upgrade and click **Upgrade Dynamic Disk**.

The Upgrade Disk Wizard provides information about upgrading.

3. Click **Next** to continue.

The system asks you to select the disks to upgrade.

4. Add the basic disks you want to upgrade to the list of dynamic disks and click **Next**.

5. Click **Finish**.

 **NOTE:** After a disk is upgraded to dynamic, it cannot be reverted back to basic unless all volumes on that disk are removed. Dell recommends that you do *not* revert a disk back to basic after data volumes are present.

## Reactivating Dynamic Disks

A dynamic disk might appear as a missing disk when it is corrupted, powered down, or disconnected. You can reactivate a dynamic disk to bring it back online by performing the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. Right-click the disk labeled **Missing** or **Offline dynamic disk**.

3. Click **Reactivate Disk** on the menu.

The disk is labeled **Online** after it has been reactivated.

## Merging Foreign Disks

Dynamic disks with a foreign status are disks that have been moved from another system. You cannot reactivate a foreign disk; you must merge the disk to the system. To change the status of a foreign disk and enable it to be seen as a part of the current system, use the **Merge Foreign Disk** command.

To merge foreign disks, perform the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. Right-click a disk marked as **Foreign** and click **Merge Foreign Disks**.

The Merge Foreign Disk Wizard displays.

3. Select the foreign disks that you want to merge to the system.

By default, the system selects all foreign disks to be merged.

4. Click **Next**.

5. Click **Next** again to validate the volume status of each foreign disk.

6. Click **Finish**.

---

## Volume Management

This subsection provides conceptual and procedural information about how Array Manager implements basic and dynamic volumes.

The following topics are discussed:

- 1 Volume overview
- 1 Checking partition or volume properties
- 1 Formatting a partition or volume
- 1 Deleting a partition or volume

## Volume Overview

A volume is a logical entity that is made up of portions of one or more physical disks. A volume can be formatted with a file system and can be accessed by a drive letter.

Like disks, volumes can be basic or dynamic. In Array Manager, basic volumes refer to all volumes that are not on dynamic disks. Dynamic volumes are logical volumes created from dynamic disks with Array Manager.

In your system, create all data volumes and dynamic volumes on dynamic disks.

## Checking Partition or Volume Properties

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. Right-click the partition or volume to be checked.
3. Select **Properties** from the context menu.

The **Properties** window displays.

4. Check the properties for your volume.

## Formatting a Partition or Volume

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. Right-click the volume or partition you want to format, and then click **Format**.
3. Select **NTFS** as the file system type.



**NOTE:** Your NAS system supports only NTFS partitions. Formatting all partitions as NTFS allows for advanced features only available under that file system.

4. Enter a label for the volume.

The label appears on the Array Manager console. If a name has been selected, this name appears in the **Name** field. You can change the name by typing a different name.

5. Enter an allocation size or use the default, which is automatically selected.

6. Select the file system type and formatting options:

- 1 **Quick format** — Formats the volume or partition without scanning for bad sectors in the volume or partition. Check the box to use this format method.
- 1 **Enable file and folder compression** — This option is not supported on the NAS system.

7. Click **OK** to begin formatting.

A progress bar displays in the list view.

## Deleting a Partition or Volume



**NOTICE:** You must delete all shares and persistent images from your volume before deleting it. If a volume is removed before all shares of that volume have been removed, the NAS Manager might not display shares correctly.

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. Right-click the designated volume, and then click **Delete Volume**.
3. Click **Yes** to delete or **No** to cancel.

The system deletes the volume immediately if you click **Yes**.

## Working With Dynamic Volumes

Dynamic volumes are volumes created on dynamic disks with Array Manager. This section discusses how to create and extend dynamic volumes.

### Creating a Dynamic Volume

 **NOTE:** To take advantage of all the system features such as defrag and encryption, Dell recommends that you use the default value of 64 KB for the allocation unit size when creating a virtual disk.

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)."

2. From the toolbar, click the **Create Volume** icon.

The Create Volume Wizard appears.

3. Click **Next**.

You must select whether to create a partition or a volume. Make sure that the **Dynamic Volume** button is selected.

The dynamic group to which the volume belongs is automatically created and appears selected.

4. Click **Next**.

You are prompted for the volume layout and size of the volume to create.

5. Click **Concatenated**, **Striped**, or **RAID-5**.

6. If you selected **Striped** or **RAID-5**, choose the **Number of Columns**.

The number of columns represents the number of disks to be used in the dynamic volume array.

7. Select **MB** (megabytes) or **GB** (gigabytes) and enter the size of the volume in **Total volume size** field, or use the **Query Max Size** button.

**Query Max Size** works differently, depending on whether you have one disk or multiple disks selected.

- 1 If you do not select a disk and click **Query Max Size**, the size shown in the **Total volume size** field is the maximum for all available disks.
- 1 If you select a disk or disks and click **Query Max Size**, the size indicated is the maximum size for the selected disk(s). However, if you click **Query Max Size** a second time, the size is the maximum for all available disks.

8. Click **Next**.

9. After all selections are made, verify your settings and click **Next**.

10. If you want to select a different disk for the volume you are creating, click **Modify** to display the **Modify Disks** dialog box.

11. Click the disk you want to change, select a disk from the **Disk** drop-down menu, and then click **OK**.

12. Click **Assign a drive letter**, select the drive letter, and then click **Next**.

13. Make sure **Format this volume** and **NTFS** are selected.

14. Type a volume label and an allocation unit size, if you chose to use a size other than the default.

15. Click **Next**, and then click **Finish**.
- 

## Working With Mirrors

A mirrored volume is a volume that duplicates your data to two physical disks. A mirror provides redundancy by simultaneously writing the same data to two separate volumes that reside on different disks. If one of the disks fails, data continues to be written to and read from the unaffected disk.

This section discusses how to add, remove, or break a mirror.

### Adding a Mirror

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)."

2. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.

3. In the left pane, right-click a volume name, and then click **Add Mirror**.

The Add Mirror Wizard displays.

4. Click **Next**.

5. Select **Custom Mode**, and then click **Next**.

6. Verify that the correct disk for mirroring the volume is selected. If the correct disk is not selected, click **Modify**, and then go to step 7. If the correct disk is selected, go to step 9.

7. From the **Modify Disk Selection** window, click the disk you want to change.

A drop-down box appears.

8. Click the arrow, select a different disk from the drop-down box, and then click **OK**.

9. Click **Next**, and then click **Finish** to create the mirror.

## Removing a Mirror

Removing a mirror from a volume removes or destroys the data from the selected mirror and leaves the other mirror intact. After you remove a mirror, the space on the disk used by the removed mirrored volume becomes unallocated space. The remaining (no longer mirrored) volume becomes a simple volume on the disk.

To remove a mirror, perform the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
3. In the left pane, right-click a volume name, and then click **Remove Mirror**.

The **Remove Mirror** window displays.

4. Select the mirror you want to remove, and then click **OK**.

## Breaking a Mirror

Breaking a mirror creates two simple volumes with individual drive letters. Each volume contains the data on the mirror at the time the mirror was broken. The data is no longer redundant, but it remains intact.

To break a mirror, perform the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager.](#)"

2. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
3. In the left pane, right-click a volume name, and then click **Break Mirror**.

The confirmation message, *Are you sure you want to break the mirror?* displays.

 **NOTICE:** If you break the mirror, your data might not be fault-tolerant.

4. If you are sure you want to break the mirror, click **OK**.

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## Backing Up the System

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [System-State Backup](#)
- [Backing Up Data Volumes](#)
- [Backing Up Dell ActiveArchive™ Persistent Images](#)

This section provides instructions on how to back up files on your system. You should regularly backup, or have mirrors of, the following types of information:

- 1 System state — Files that contain configuration information about the NAS system. System-state files include the registry, COM+ class registration database, system boot files, users and groups information, and CIFS/NFS/Novell® NetWare®/Macintosh share data.
- 1 Operating system — Files that are necessary to run the Microsoft® Windows® Powered operating system on the NAS system.
- 1 Data files — The documents and other files that are not part of the operating system.

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## System-State Backup

Backing up the system state allows you to recover the system if an operating system reinstallation is required. Restoring your system state restores customized settings such as user information and share information.

System-state data includes the following:

- 1 Registry
- 1 COM+ class registration database
- 1 System boot files
- 1 Users and groups information
- 1 CIFS/NFS/Novell NetWare/Macintosh share data

For more information, see the online help for Windows 2000 Backup & Recovery Tools.

To ensure information about all shares is preserved, back up the following folders with the system-state data, if they exist:

- 1 C:\Documents and Settings\Administrator\Application Data
- 1 C:\Documents and Settings\All Users\Application Data
- 1 C:\Documents and Settings\Default User\Application Data
- 1 C:\Documents and Settings\SYSTEM\Application Data

## Backing Up System-State Data

Dell recommends that you regularly back up your system state. This action enables you to go back to the most recent state if an operating system reinstallation is required.

To back up system-state data, perform the following steps:

1. Log in to the NAS Manager as an administrator.  
  
See "[Logging in to the NAS Manager](#)" in "NAS Manager."
2. Click **Maintenance**.
3. Click **Backup**.
4. In the **Log on to Windows** window, enter the administrator user name and password and click **OK**.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

The **Welcome to the Windows 2000 Backup and Recovery Tools** window displays.

 **NOTE:** If the **Windows 2000 Backup and Recovery Tools** window does not display, click **Maintenance**, and then click **Terminal Services**. On the Advanced Administration Menu, click **Administrative Tools** and then click **Windows 2000 Backup/Recovery**.

5. Click **Backup Wizard**.
6. In the **Backup Wizard** window, click **Next**.
7. In the **What to Back Up** window, click **Back up selected files, drives, or network data**, and click **Next**.
8. In the **Items to Back Up** window, click the **System State** check box in the **My Appliance** tree.
9. Click the check box for the following folders, if they exist:
  - 1 C:\Documents and Settings\Administrator\Application Data

- 1 C:\Documents and Settings\All Users\Application Data
  - 1 C:\Documents and Settings\Default User\Application Data
  - 1 C:\Documents and Settings\SYSTEM\Application Data
10. In the **Where to Store the Backup** window, click **Browse**.
  11. In the **Open** window, select the location to store your system-state backup file, enter the file name, and then click **Open**.  
  
For fault tolerance, select a location that is not on the NAS system.
  12. Click **Next** and then click **Finish**.  
  
The backup begins and progress displays in the **Backup Progress** window.
  13. When the backup is complete, click **Close**.

## Restoring System-State Data

To restore your system-state data, you must have previously backed up your system using the backup and recovery tools. See "[Backing Up System-State Data](#)."

 **NOTE:** If you are restoring system-state data after reinstalling the operating system, perform the procedure in "[Restoring System-State Data After Reinstallation](#)" in "Recovering and Restoring the System."

To restore system-state data, perform the following steps:

1. Log in to the NAS Manager as an administrator.  
  
See "[Logging in to the NAS Manager](#)" in "NAS Manager."
2. Click **Maintenance**.
3. Click **Backup**.
4. In the **Log on to Windows** window, enter the user name and password and click **OK**.

 **NOTE:** The default administrative user name is `administrator` and the default password is `powervault`.

The **Welcome to Windows 2000 Backup and Recovery Tools** window displays.

5. Click **Restore Wizard**.
6. In the **Restore Wizard** window, click **Next**.
7. In the **What to Restore** window, click (+) to expand the **File** tree, and then click to expand **Media created yyyy/mm/dd**, where *yyyy/mm/dd* is the year/month/date that you made the system-state backup.
8. Click the check box next to **System State** and any other application data folders that you backed up and then click **Next**.
9. Click **Finish**.
10. When the **Enter Backup File Name** window displays, click **OK**.

 **NOTE:** If your backup file is in a different location, click **Browse** and locate the file.

11. Restart the system after the restore process completes.

 **NOTE:** Windows must replace all locked files on the system; therefore, the process of restarting the system might take approximately 15 minutes to complete.

---

## Backing Up Data Volumes

To back up your volumes, you can use direct-attached local backups or network backups.

 **NOTE:** To perform a local tape backup you must have a SCSI adapter card installed on the NAS system.

The following software is supported for direct-attached local backups:

- 1 Windows 2000 Backup and Recovery Tools
- 1 VERITAS® Backup Exec® Server Professional 8.6 for Windows NT® and Windows 2000
- 1 Computer Associates® ARCserveIT™ 2000 for Windows NT and Windows 2000

The following software is supported for remote network backups:

- 1 VERITAS Backup Exec Server Professional 8.6 for Windows NT and Windows 2000
- 1 Computer Associates ARCserveIT
  - o ARCserve 2000 for Windows NT and Windows 2000

- o ARCServeIT 7.0 for Red Hat Linux 7.0 and 7.1

## Windows 2000 Backup and Recovery Tools

Windows 2000 backup and recovery tools allow you to back up your data volumes to a locally attached tape drive or to a file.

 **NOTE:** You must have a supported SCSI controller card and a tape device installed to back up your data volumes to tape.

You can access the Windows 2000 backup and recovery tools by clicking the **Maintenance** tab on the NAS Manager primary menu and clicking **Backup** or by clicking **Windows 2000 Backup/Recovery Tools** on the **Advanced Administration Menu** under **Administrative Tools**.

For more information about the Windows 2000 backup and recovery tools, see the Windows Powered Help. You can access Windows Powered Help by clicking **Windows Powered Help** in the **Advanced Administration Menu** under **Administrative Tools** or by clicking **Help** in the Start menu when using the Terminal Services Client.

## Installing Tape Device Drivers for Windows 2000 Backup and Recovery Tools

If you are using Windows 2000 backup and recovery tools, you might need to install drivers for both tape drives and tape media changers.

 **NOTE:** Most of the tape device drivers are located in the `c:\dell\drivers` directory. However, you should always check the Dell Support website at [support.dell.com](http://support.dell.com) for updated drivers and patches.

### Installing Drivers for Dell™ PowerVault™ Tape Drives

1. Connect the PowerVault tape drive, and then restart the system.
2. Log in to the NAS Manager.  
  
See "[Logging in to the NAS Manager](#)" in "NAS Manager."
3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to a Terminal Services Client session.
6. On the **Advanced Administration Menu** under **System Management**, click **Computer Management**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

7. Click **Computer Management** in the left pane.
  8. Click **System Tools** in the left pane.
  9. Click **Device Manager** in the left pane.
  10. Click **Unknown Devices** in the right pane.  
  
 **NOTE:** The tape device may also appear under **Other Devices**.
  11. Double-click the tape device.
  12. Click **Driver** in the pop-up window.
  13. Click **Update Driver**.
- The Upgrade Device Driver Wizard displays.
14. Click **Next**.
  15. Click the radio button next to **Search for a suitable driver for my device (recommended)**, and then click **Next**.
  16. In **Optional search locations**, click the check box next to **Specify a location**, and deselect the other check boxes.
  17. Click **Next**.
  18. In the path for **Copy manufacturer's files from**, specify the folder name that contains the device drivers.
  19. Click **OK**, and then click **Next**.

The Upgrade Device Driver Wizard searches the specified folder for the driver files.

20. Make sure that the wizard has selected the appropriate PowerVault tape device, and then click **Next**.
21. Click **Finish**.
22. Click **Close** to exit the driver properties dialog box.

### Installing Drivers for PowerVault Tape Drive Media Changers

To install drivers for tape media changers when using Windows 2000 backup and recovery tools, perform the following steps:

1. Connect the PowerVault tape device, and then restart the NAS system.
2. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in "NAS Manager."

3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to a **Terminal Services Client** session.
6. In the **Advanced Administration Menu**, click **Computer Management** under **System Management**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

7. Click **Computer Management** in the left pane, and then click **System Tools**.
8. Click **Device Manager** in the left pane.
9. Click **Medium Changers** in the right pane.
10. Double-click **Unknown Medium Changer**.
11. Click **Driver** in the **Properties** window.
12. Click **Update Driver**.

The Upgrade Device Driver Wizard displays.

13. Click **Next**.
14. Click the radio button next to **Search for a suitable driver for my device (recommended)**, and then click **Next**.
15. In **Optional search locations**, click the check box next to **Specify a location**, and deselect the other check box.
16. Click **Next**.

A dialog box displays with a field for you to enter the location of the device driver.

17. In the path for **Copy manufacturer's files from**, specify the folder name that contains the device drivers, and then click **OK**.
18. Click **Next**.

The Upgrade Device Driver Wizard searches the specified folder for the driver files.

19. Make sure that the Upgrade Device Driver Wizard has selected the appropriate PowerVault tape device, and then click **Next**.
20. Click **Finish**.
21. Click **Close**.

## ARCserve 2000

 **NOTE:** Before installing the backup software, check the Dell Support website at [support.dell.com](http://support.dell.com) for the latest driver and software updates. You might need to install the updates after completing the procedures that follow.

### Installing ARCserve 2000 on the NAS System

 **NOTE:** You must first attach a keyboard, mouse, and monitor to the system before installing ARCserveIT 2000. ARCserveIT 2000 cannot be installed or managed using Terminal Services.

1. Create a share for the CD drive on the client system:
  - a. Log in to the client system with an account that has administrator privileges.
  - b. Double-click **My Computer**
  - c. Right-click the CD drive, and select **Sharing**.
  - d. Click **Share this folder**.
  - e. Type **cd** for the name of the share, and then click **OK** to confirm the share settings.

2. Insert the *ARCserve 2000* CD into the CD drive of the client system.
3. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in "NAS Manager."

4. Click **Maintenance**.
5. Click **Terminal Services**.
6. Log in to the NAS system.
7. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
8. Run Product Explorer (**pe.exe**) from the CD.
9. Follow the instructions in the documentation that came with your backup software to complete the installation.

## VERITAS Backup Exec

 **NOTE:** Before installing the backup software, check the Dell Support website at [support.dell.com](http://support.dell.com) for the latest driver and software updates. You might need to install the updates after completing the procedures below.

### Installing VERITAS Backup Exec on the NAS System

 **NOTE:** VERITAS Backup Exec supports installation using Terminal Services and management using VERITAS Remote Administrator.

1. Share the CD drive on a remote system, mount that remote CD drive on the NAS system, and then insert the *VERITAS Backup Exec* CD into the CD drive of the remote system.
2. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in "NAS Manager."

3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to the NAS system.
6. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
7. Follow the instructions in the documentation that came with your backup software.

 **NOTE:** After the software installation is complete, disconnect the network drive for the CD share before you reboot your system. To disconnect the network drive, right-click **My Appliance** on the NAS system desktop, and select **Disconnect Network Drive**. Click the CD share in the **Disconnect Network Drive** window, and then click **OK**.

### Installing VERITAS Backup Exec Remote Administrator on a Client System

1. Insert the *VERITAS Backup Exec* CD in the CD drive of the client system.  
The CD starts the software automatically.
2. If the CD does not start the software automatically, open Windows Explorer, right-click the CD drive that contains the VERITAS software, and select **Autoplay** from the menu.
3. Follow the instructions in the documentation that came with your backup software.

### Using VERITAS Backup Exec Remote Administrator

1. On the remote system, click the **Start** button, and then point to **Programs**→ **VERITAS Backup Exec**→ **VERITAS Backup Exec**.

The **Connect to Server** window displays.

2. Enter the name of the NAS system in the **Server** field.
3. Enter login information in the **Login Information** field, and then click **OK**.

The **Backup Exec Assistant** window, which displays in front of the **Backup Exec** window, provides wizards for many common backup tasks. You can also use the **Tools** menu on the **Backup Exec** window to display the **Backup Exec Assistant**.

Use Remote Administrator to manage all backup operations just as you would from the local application. See the VERITAS Backup Exec documentation for more information about how to use the software.

## Backup Software for Network Backups

You may back up your data volumes over the network to local area network (LAN)-attached backup servers. This backup requires that you already have a backup server on your network.

Dell recommends that you use backup software network accelerator agents to greatly improve network backup performance.

### Installing Network Accelerator Agents

VERITAS Backup Exec accelerator agents can be installed remotely by installing the agent to the system from a remote system on the network.

See the documentation for your backup software for more information about how to install the network accelerator agents.

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## Backing Up Dell ActiveArchive™ Persistent Images

Backing up persistent images eliminates the possibility of files changing during the back up job. Persistent images always contain the data that existed when the persistent image was taken. However, backing up persistent images requires that you perform several steps and should be performed only by advanced backup administrators. Dell recommends that you use the available open file agents in VERITAS Backup Exec to back up your open files rather than backing up persistent images.

 **NOTE:** Do not use Computer Associates ARCserve to back up persistent images.

To back up a persistent image, perform the following steps:

1. Use the NAS Manager to create a persistent image.

See "[Dell ActiveArchive](#)."

 **NOTE:** For increased performance, back up only read-only persistent images.

2. On the NAS Manager primary menu, click **Maintenance**.
3. Click **Terminal Services** and log in to the NAS system.
4. If the **PowerVault Advanced Administration** window displays, click **Exit**.
5. Double-click **My Appliance** and browse to the persistent image you created in [step 1](#).

Persistent images are located in the Dell ActiveArchive directory of the volume on which you created the persistent image in step 1.

6. Right-click the persistent image, and then click **Sharing**.
7. Click **Share this folder**.
8. Type the name of the share in the **Share name** field.
9. Click **Permissions**.
10. Set the required permissions in the **Permissions** window, and then click **OK**.
11. Click **OK** in the **Properties** window.
12. On the system that is running VERITAS Backup Exec, set up VERITAS Backup Exec so that it is able to back up user shares.

You can find this option in **Tools**→**Options** menu on the **Network** tab.

13. In the VERITAS Backup Exec **Backup Selections** window, browse to your NAS system under **Entire Network**.
14. Select the share name that you created in step 8 for your persistent image.
15. Deselect the **Persistent Storage Manager State** directory when performing persistent image backups.

This directory contains files needed for persistent images. However, to save space on your backup media, backing up the files is not recommended.

16. Click **Backup**.
17. Select **Run Now** to run the backup now or **Schedule** to schedule your backup job to run at a later time.

 **NOTE:** Although you are backing up your persistent image from a network share, it does not create network traffic if you are backing up to a local backup device.

## Limitations on Backing Up Persistent Images

- 1 You cannot do incremental or differential backups of persistent images.
- 1 You cannot use GFS rotation schemes when backing up persistent images.
- 1 You cannot schedule a backup of a persistent image.

You must perform a manual backup of persistent image files because each persistent image filename is unique in that it includes the date and time (hour-minute-second) that the persistent image was taken.

- 1 When you restore a persistent image, you must redirect the restore to a location other than the original persistent image location. A restore to the original location is not successful.

## Restoring Persistent Images From Tape Backup

 **NOTE:** Do not use Computer Associates ARCserve to restore persistent images.

To restore your persistent images from tape backup, perform the following steps:

1. On the system on your network that is running VERITAS Backup Exec, click the **Restore Selections** tab to bring up the window that lists your previous backup files.
2. Browse to your backup of the persistent image that you want to restore, and then select it by clicking the check box next to it.
3. Click **Restore**.
4. Click the **Redirection** tab.
5. Click the check box next to **Redirect Files**.
6. Enter the drive letter and path where you want the files to be restored.
7. Click **Run Now** to run the restore immediately or click **Schedule** to schedule your restore job to run at a later time.

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## Recovering and Restoring the System

Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [Solutions to Try Before Reinstalling](#)
- [Hard-Drive Failures](#)
- [Software Failures](#)
- [Replacing Hard Drives](#)
- [Recovering From an Operating System Failure](#)
- [Restoring System-State Data After Reinstallation](#)
- [Restoring Initial System Setup](#)

This section provides instructions on how to recover the NAS system if the operating system or a hard drive fails. Additionally, this section provides information for possible solutions that do not require restoring the operating system or hard drives.

Because your NAS system is designed to have redundancy, it can recover from certain hardware and software failures. In some situations, it can recover automatically, and in others, you must have administrator privileges and manually intervene to recover the NAS system.

Use the following methods in the order listed to restore your NAS system:

1. Check all of the items in "[Solutions to Try Before Reinstalling](#)."
2. Follow the procedures described in "[Bootting From the Recovery Operating System Mirror Hard Drives](#)."
3. Reinstall the operating system as described in "[Recovering From an Operating System Failure](#)."

---

### Solutions to Try Before Reinstalling

This section provides checks and solutions that you should try before you reinstall your operating system or replace a hard drive. Some of the checks require you to observe the LEDs on the front and back of the NAS system. For more information about the LEDs, see your *Installation and Troubleshooting Guide*.

- 1 Does the power LED show that the NAS system is turned on? If not, ensure that the power cable connected to the NAS system and a power source and that the NAS system is turned on.
- 1 Are the link LEDs on the back of the NAS system and any network switches to which it may be connected illuminated? If not, ensure that the Ethernet cable is securely connected to the NAS system and a functioning Ethernet jack.
- 1 Are you are using a standard Ethernet cable to connect to the network? Do not use the cable labeled "Ethernet Crossover Cable" that was shipped with your system.
- 1 Have you allowed enough time for the NAS system to boot? The NAS system typically takes several minutes to boot.
- 1 Does the NAS system boot completely? Connect a keyboard, mouse, and monitor to the NAS system, and observe the boot process.
- 1 Are the LEDs for all four hard drives on the NAS system lit? If they are not all lit, you have a failed hard drive. See "[Hard-Drive Failures](#)."

---

### Hard-Drive Failures

Your NAS system has a mirror of the operating system on hard drives, which allows you to recover in most cases. Depending on which drive fails, use one of the procedures in [Table 5-1](#) to recover from a hard-drive failure.

**Table 5-1. Hard-Drive Recovery Procedures**

Hard Drive That Failed	Necessary Action
Hard drive 0	Replace the failed hard drive. See " <a href="#">Replacing Hard Drive 0</a> ."
Hard drive 1, 2, or 3	Replace the failed hard drive. See " <a href="#">Replacing Hard Drive 1, 2, or 3</a> ."
Two or more hard drives fail	Replace the failed hard drives, and then follow the procedures in " <a href="#">Recovering From an Operating System Failure</a> ."

---

### Software Failures

To recover from the following software failures, use one of the following procedures:

- 1 If the main operating system files are missing or corrupt, you must manually boot from the recovery operating system mirror hard drives 2 and 3. For instructions, see "[Bootting From the Recovery Operating System Mirror Hard Drives](#)."
- 1 If the main operating system mirrored partition fails, you must manually boot from the recovery operating system mirror hard drives 2 and 3 and restore the original files to the main operating system hard drives 0 and 1. See "[Replacing Hard Drive 0](#)." After the system is running, you can boot the system back to the main operating system hard drives and then perform a system-state restore operation. See "[Restoring System-State Data After Reinstallation](#)."

## Replacing Hard Drives

This section provides the procedures for replacing hard drive 0, hard drives 1, 2, or 3, re-establishing the recovery operating system partitions, and booting from the recovery operating system mirror hard drives.

### Replacing Hard Drive 0

1. Shut down the system.
2. Remove the front bezel from the NAS system.
3. Remove failed hard drive 0 from the NAS system.

See your *Installation and Troubleshooting Guide* for information about removing and replacing drives.

4. Remove good hard drive 1, and then insert it in the hard drive 0 location.
5. Insert a new hard drive in the hard drive 1 location.
6. Replace the front bezel on the NAS system.
7. Turn on the system.
8. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in "NAS Manager."

9. Click **Disks**, and then click **Volumes**.
10. Click **Repair**.

 **NOTE:** If the repair button does not appear, then you do not have a drive the same size or larger than the failed drive, you did not have the drive in the system when the system booted, or you were not using a RAID 5 volume. Use Dell OpenManage™ Array Manager to repair or reconfigure your volumes. See "[Using the Array Manager to Manage Your Disks and Volumes](#)" in "Advanced Disk and Volume Management."

### Replacing Hard Drive 1, 2, or 3

1. Remove the front bezel from the NAS system.
2. Remove the failed hard drive from the NAS system.

See your *Installation and Troubleshooting Guide* for information about removing and replacing drives.

3. Insert a new hard drive in the same location.
4. Replace the front bezel on the NAS system.
5. Turn on the system, if it is not turned on already.

 **NOTE:** The NAS system takes approximately 5 minutes to boot completely.

6. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in "NAS Manager."

7. Click **Disks**, and then click **Volumes**.
8. Click **Repair**.

 **NOTE:** If the repair button does not appear, then you do not have a drive that the same size or larger than the failed drive, you did not have the drive in the system when the system booted, or you were not using a RAID 5 volume. Use Array Manager to repair or reconfigure your volumes. See "[Using the Array Manager to Manage Your Disks and Volumes](#)" in "Advanced Disk and Volume Management."

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## Recovering From an Operating System Failure

If the operating system for your NAS system fails, recover data by booting from the recovery mirror hard drives, and then use one of the following methods to reinstall the operating system:

1. Reinstall the operating system using a dedicated Microsoft® Windows® 2000 client system
1. Reinstall the operating system using a Windows 2000 system that is on the same LAN
  - o With a DHCP server
  - o Without a DHCP server
1. Use an existing Preboot Execution Environment (PXE) server

 **NOTICE:** The reinstallation procedure resets your NAS system to the Dell™ default settings and deletes all data on the NAS system. Before performing this procedure, attempt to boot from the operating system image on the mirrored hard drives. See "[Bootting From the Recovery Operating System Mirror Hard Drives](#)."

## Bootting From the Recovery Operating System Mirror Hard Drives

You might need the NAS system to boot from the recovery operating system mirror so that you can perform a file restore on the main operating system mirror or access the data on the data partition and back it up to tape.

 **NOTE:** The recovery operating system mirror is intended as a temporary way to back up your data. After performing the backup, you should reinstall the operating system using the procedures in "[Reinstalling the Operating System](#)."

To boot from the recovery drive, perform the following steps:

1. Shut down the NAS system.
2. Remove the front bezel from the NAS system.
3. Swap hard drives 0 and 2 with each other.

See your *Installation and Troubleshooting Guide* for information about swapping drives.

4. Swap hard drives 1 and 3 with each other.
5. Replace the bezel.
6. Turn on the NAS system.

The NAS system boots from the operating system on hard drives 0 and 1.

 **NOTE:** Because the system boots using the recovery image operating system with the Dell default settings, any configuration information is lost. See "[Configuring Your NAS System for the First Time](#)" in "Initial Configuration."

7. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in "NAS Manager."

8. Back up your data and then reinstall the operating system.

## Reinstalling the Operating System

This procedure resets your NAS system to the Dell default settings and deletes all data on the NAS system. Before performing this procedure, attempt to boot from the operating system image on the mirrored hard drives and backup your data. See "[Booting From the Recovery Operating System Mirror Hard Drives](#)."

Depending on your environment, you can use one of the following methods to reinstall the operating system:

- 1 Use a dedicated Windows 2000 system (recommended)
- 1 Use a Windows 2000 system on the network
- 1 Use an existing PXE server

### Using a Dedicated Windows 2000 System

 **NOTICE:** This procedure resets your NAS system to the Dell default settings and deletes all data on the NAS system. Before performing this procedure, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Recovery Operating System Mirror Hard Drives](#)."

#### Requirements

- 1 Crossover cable included with your NAS system
- 1 Windows 2000 (Professional or Server Family) client system with a CD drive
- 1 *Resource* CD included with your NAS system
- 1 *Reinstallation* CD included with your NAS system

#### Procedure

To restore your NAS system to the Dell default settings, perform the following steps:

 **NOTICE:** This procedure deletes all of the data on your NAS system.

1. Connect a Windows 2000 client system to the NAS system.
  - a. Shut down the NAS system, and do not turn it back on until instructed.  
See "[Shutting Down the NAS System](#)" in "NAS Manager."
  - b. Turn off the client system, if it is running.
  - c. Connect the crossover cable (labeled "Cross Over Ethernet Cable") to the Ethernet port labeled "LAN 1" on the NAS system and the Ethernet port on the client system.

For information about system connectors, see your *User's Guide*.

3. Turn on the Windows 2000 client system.
4. Log in to the client system with an account that has administrator privileges.

5. Create a new user with the name pv725 and the password set to password:
  - a. From the desktop of your client system, right-click **My Computer**, and then select **Manage**.
  - b. On the left side of the **Computer Management** window, double-click **Local Users and Groups**.
  - c. Right-click **Users** and select **New User**.
  - d. In the **New User** window, type pv725 as the user name.
  - e. Type password for the password, and type it again in the **Confirm password** field.
  - f. Clear the **User must change password at next logon** check box.
  - g. Click **Create** and then click **Close**.
6. Change the name of the Windows 2000 client system to pv725rec:
  - a. From the desktop of your client system, right-click **My Computer**, and then select **Properties**.
  - b. In the **System Properties** window, click **Network Identification**.
  - c. Click **Properties**.
  - d. In the **Identification Changes** window, type pv725rec for the computer name.
  - e. Click **OK**, but do not reboot when prompted.
  - f. Click **OK** to close the **Properties** window.
7. Change the IP address on the network adapter of the client system to 10.40.10.1 and the subnet mask to 255.255.255.0:
  - a. From the desktop of the client system, right-click **My Network Places** and select **Properties**.
  - b. In the **Network and Dial-up Connections** window, right-click the network interface controller that you connected to the NAS system with the crossover cable in step 1, and click **Properties**.
  - c. In the **Local Area Connection Properties** window, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
  - d. Click **Use the following IP address**.
  - e. For IP address, type 10.40.10.1.
  - f. For subnet mask, type 255.255.255.0.
  - g. For gateway, type 10.40.10.1.
  - h. Click **OK**, and then click **OK** to close the **Local Area Connection Properties** window.
  - i. If you are prompted to reboot the client system, click **No**.
8. Create a share for the CD drive:
  - a. Log in to the client system with an account that has administrator privileges.
  - b. Double-click **My Computer**
  - c. Right-click the CD drive, and select **Sharing**.
  - d. Click **Share this folder**.
  - e. Type cd for the name of the share, and then click **OK** to confirm the share settings.
9. Install the Dell Reinstallation Console from the *Resource* CD:
  - a. Insert the *Resource* CD into the CD drive of your client system.  
The **Dell PowerVault 725N Resource CD** window displays in a browser window.

 **NOTE:** If the CD does not run automatically, double-click the **start.bat** file on the CD.

  - b. Click **Resources**.
  - c. Click **Install Reinstallation Console**.
  - d. When the **File Download** window displays, click **Open this file from its current location**, and then click **OK**.
  - e. Click **Next** and follow the instructions on the screen.
  - f. When prompted to reboot the client system, click **Yes**.

The *Resource* CD is no longer required: remove it from the client system.
10. Insert the *Reinstallation* CD in the client system's CD drive.
11. Enable the Dell OpenManage Kick-Start utility and create your DHCP settings:
  - a. Turn on the NAS system.  
The system must be turned on so that you can set the IP address using the Kick-Start utility.
  - b. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Dell OpenManage Kick-Start**.
  - c. When asked if you want to run the program, click **Yes**.
  - d. At the bottom of the **Dell OpenManage Kick-Start** window, click **Setup**.

- e. Click **Add**.
  - f. In the **Add Scope** window, enter the following information and click **OK**:
    - 1 10.40.10.10 for **Starting IP Address**
    - 1 10.40.10.20 for **Ending IP Address**
    - 1 255.255.255.0 for **Subnet**
    - 1 10.40.10.1 for **Gateway IP Address**
  - g. Click **OK** to close the **Add Scope** window.
  - h. Click **Interfaces for DHCP Server** so that it is checked.
  - i. Click **OK** to close the **Setup** window.
  - j. Click **Enabled** at the bottom of the **Dell OpenManage Kick-Start** window to start the integrated DHCP server.
12. Start the Intel® PXE Server and verify that the services are running:
- a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Intel PXE Server**.
  - b. In the **PXE Configuration Utility** window, right-click the server name, **PV725REC**, and then select **Start/Stop Services**.
  - c. Verify that the proxy DHCP/Boot PXE and M/TFTP services are installed and running correctly by selecting **Stop** and then selecting **Start**.
- If the services are running, the indicator should display **Started** after you click **Start** and **Stopped** after you click **Stop**.
- d. Click **OK**.

13. Reboot the NAS system by pressing the power button for less than 2 seconds.

14. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

15. From the menu, select option 4, **Reinstallation**, and then type *y* to confirm the selection.
16. When the screen warns that you are going to reinstall and that it will erase data, type *y*.
17. Press *y* again to confirm the selection.

Depending on your configuration, this process could take several hours to complete. When the reinstallation is complete, the NAS system shuts down.

 **NOTE:** During the reinstallation, do not attempt to connect to your NAS system.

18. After the NAS system shuts down, reboot the system.

The system is set to the original defaults.

19. Reconfigure the system.

See "[Configuring Your NAS System for the First Time](#)" in "Initial Configuration."

## Using a Windows 2000 Client System on the Same Network

With a Windows 2000 client system that is in the same network as the NAS system, you can install the NAS system operating system whether the network has a dynamic host control protocol (DHCP) server or not.

 **NOTE:** This procedure resets your NAS system to the Dell default settings. Before performing this procedure, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Recovery Operating System Mirror Hard Drives](#)."

### Network Without a DHCP Server

If your network does not have a DHCP server, you need the following to reinstall the operating system:

- 1 Windows 2000 (Professional or Server Family) client system with a CD and diskette drive on the same subnet as the NAS system
- 1 *Resource* CD included with your NAS system
- 1 *Reinstallation* CD included with your NAS system
- 1 A range of available IP addresses

To reinstall your NAS operating system, perform the following steps:

 **NOTICE:** This procedure deletes all of the data on your NAS system.

1. Shut down the NAS system, and do not turn it back on until instructed.

See "[Shutting Down the NAS System](#)" in "NAS Manager."

2. Turn off the client system, if it is running.
3. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

4. Turn on the Windows 2000 client system.
5. Log in to the client system with an account that has administrator privileges.
6. Create a new user with the name `pv725` and the password set to `password`:
  - a. From the desktop of your client system, right-click **My Computer**, and then select **Manage**.
  - b. On the left side of the **Computer Management** window, double-click **Local Users and Groups**.
  - c. Right-click **Users** and select **New User**.
  - d. In the **New User** window, type `pv725` as the user name.
  - e. Type `password` in the **Password** field, and type it again in the **Confirm password** field.
  - f. Click **User must change password at next logon** to clear the check box.
  - g. Click **Create** and then click **Close**.
7. Create a share for the CD drive on the client system:
  - a. Double-click **My Computer**.
  - b. Right-click the CD drive, and select **Sharing**.
  - c. Type `cd` for the name of the share, and then click **OK** to confirm the share settings.
8. Install the Dell Reinstallation Console from the *Resource CD*:
  - a. Insert the *Resource CD* into the CD drive of your client system.

The **Dell PowerVault 725N Resource CD** screen displays in a browser window.

 **NOTE:** If the CD does not run automatically, double-click the `start.bat` file on the CD.

  - b. Click **Resources**.
  - c. Click **Install Reinstallation Console**.
  - d. When the **File Download** window displays, click **Open this file from its current location**, and then click **OK**.
  - e. Click **Next** and follow the instructions on the screen.
  - f. When prompted to reboot the client system, click **Yes**.
9. Create a reinstallation diskette from the *Resource CD*:
  - a. Make sure that the *Resource CD* is in the CD drive of your client system.
  - b. In the *Resource CD Main Menu* window, click **Resources**.
  - c. In the **Resources** window, click **Reinstallation Diskette**.
  - d. When the **File Download** window displays, click **Run this program from its current location**, and then click **OK**.
  - e. Click **Yes** if you receive a security warning.

A DOS screen appears and prompts you to insert a diskette into the diskette drive of the client system.
  - f. Insert a formatted diskette into the diskette drive of your client system, and then press `<Enter>`.

The DOS screen closes after the reinstallation diskette is made.
10. Edit the `go.bat` file for the renamed client system and CD drive:
  - a. In Windows Explorer, right-click the `go.bat` file on the diskette, and then select **Edit** to edit the file to the following variable value for your environment:

```
\\server_name\share_name, where server_name is the name of the client system and share_name is the name of the CD drive share (for example, \\PV725\CD)
```
  - b. Save and exit the `go.bat` file.
11. Update the boot image:
  - a. If it is not still in the diskette drive, insert the reinstallation diskette that you created in [step 9](#) into the diskette drive of the networked Windows 2000 client system.
  - b. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Update boot image**.
  - c. Wait for the DOS window to close, and then remove the diskette from the diskette drive and the CD from the CD drive.
  - d. Reboot the client system.
12. If the *Resource CD* is still in the CD drive, remove it.
13. Insert the *Reinstallation CD* in the CD drive.
14. Enable the Dell OpenManage Kick-Start utility and create your DHCP settings:
  - a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Dell OpenManage Kick-Start**.

- b. When asked if you want to run the program, click **Yes**.
- c. At the bottom of the **Dell OpenManage Kick-Start** window, click **Setup**.
- d. Click **Add**.
- e. In the **Add Scope** window, enter the IP network and subnet mask information.

If you are not sure about what to enter in these fields contact your network administrator.

 **NOTE:** If you run the Kick-Start utility in a non-DHCP environment, the you must enter a gateway IP address.

- f. Click **OK**.
  - g. Click **Interfaces for DHCP Server** so that it is checked.
  - h. Click **OK**.
  - i. Click **Enabled** at the bottom of the **Dell OpenManage Kick-Start** window to start the integrated DHCP server.
15. Start the Intel PXE server and verify that the services are running:
- a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Intel PXE Server**.
  - b. In the **PXE Configuration Utility** window, right-click the server name, **PV725REC**, and then select **Start/Stop Services**.
  - c. Verify that the proxy DHCP/Boot PXE and M/TFTP services are installed and running correctly by selecting **Stop** and then selecting **Start**.
- If the services are running, the indicator should display **Started** after you click **Start** and **Stopped** after you click **Stop**.
- d. Click **OK**.

16. Turn on your NAS system.

17. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

18. From the menu, select option 4, **Reinstallation**, and then type **y** to confirm the selection.

The NAS system automatically reboots and begins the reinstallation process, which restores the NAS system back to the Dell default settings.

19. When the screen warns that you are going to reinstall and that it will erase data, type **y**.

20. Press **y** again to confirm the selection.

Depending on your configuration, this process could take several hours to complete. When the reinstallation completes, the NAS system shuts down.

 **NOTE:** During the reinstallation, do not attempt to connect to your NAS system.

21. After the NAS system shuts down, reconfigure the system.

See "[Configuring Your NAS System for the First Time](#)" in "Initial Configuration."

### Network With a DHCP Server

If your network has a dynamic host control protocol (DHCP) server and you have a Windows 2000 client on the same network, use the procedure in this section to reinstall your NAS system's operating system.

 **NOTE:** This procedure resets your NAS system to the Dell default settings and deletes all data on the NAS system. Before performing this procedure, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Recovery Operating System Mirror Hard Drives](#)."

If your network has a DHCP server, you need the following to reinstall the operating system:

- 1 Windows 2000 (Professional or Server Family) client system on the same subnet as the NAS system.

 **NOTE:** The system being used for the installation is *not* the DHCP server.

- 1 *Resource* CD included with your NAS system.
- 1 *Reinstallation* CD included with your NAS system.
- 1 Existing DHCP service in the LAN.

To reinstall your NAS operating system, perform the following steps:

 **NOTICE:** This procedure deletes all of the data on your NAS system.

1. Shut down the NAS system, and do not turn it back on until instructed.

See "[Shutting Down the NAS System](#)" in "NAS Manager."

2. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

3. Log in to the client system with an account that has administrator privileges.
4. Create a new user with the name `pv725` and the password set to `password`:
  - a. From the desktop of your client system, right-click **My Computer**, and then select **Manage**.
  - b. On the left side of the **Computer Management** window, double-click **Local Users and Groups**.
  - c. Right-click **Users** and select **New User**.
  - d. In the **New User** window, type `pv725` as the user name.
  - e. Type `password` for the password, and type it again in **Confirm password**.
  - f. Click **User must change password at next logon** to clear the check box.
  - g. Click **Create** and then click **Close**.
5. Create a share for the CD drive on the client system:
  - a. Double-click **My Computer**.
  - b. Right-click the CD drive, and select **Sharing**.
  - c. Type `cd` for the name of the share, and then click **OK** to confirm the share settings.
6. Install the Dell Reinstallation Console from the *Resource CD*:
  - a. Insert the *Resource CD* into the CD drive of your client system.  
The **Dell PowerVault 725N Resource CD** screen displays in a browser window.

 **NOTE:** If the CD does not run automatically, double-click the `start.bat` file on the CD.

  - b. Click **Resources**.
  - c. Click **Install Reinstallation Console**.
  - d. When the **File Download** window displays, click **Open this file from its current location**, and then click **OK**.
  - e. Click **Next** and follow the instructions on the screen.
  - f. When prompted to reboot the client system, click **Yes**.
7. Create a reinstallation diskette from the *Resource CD*:
  - a. Make sure the *Resource CD* is in the CD drive of your client system.
  - b. In the *Resource CD Main Menu* window displays, click **Resources**.
  - c. In the **Resources** window, click **Reinstallation Diskette**.
  - d. When the **File Download** window displays, click **Run this program from its current location**, and then click **OK**.
  - e. Click **Yes** if you receive a security warning.  
A DOS screen appears and prompts you to insert a diskette into the diskette drive of the client system.
  - f. Insert a formatted diskette into the diskette drive of your client system, and then press <Enter>.  
The DOS screen closes after the reinstallation diskette is made.
8. Edit the `go.bat` file for the renamed client system and CD drive:
  - a. In Windows Explorer, right-click the `go.bat` file on the diskette, and then select **Edit** to edit the file to the following variable value for your environment:  
`\\server_name\share_name`, where `server_name` is the name of the client system and `share_name` is the name of the CD drive share (for example, `\\PV725\CD`).
  - b. Save and exit the `go.bat` file.
9. Update the boot image:
  - a. If it is not still in the diskette drive, insert the reinstallation diskette that you created in [step 7](#) into the diskette drive of the networked Windows 2000 client system.
  - b. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Update boot image**.
  - c. Wait for the DOS window to close, and then remove the diskette from the diskette drive, and then reboot the client system.
10. If the *Resource CD* is still in the CD drive, remove it.
11. Insert the *Reinstallation CD* in the CD drive.
12. Start the Intel PXE Server and verify that the services are running.
  - a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Intel PXE Server**.
  - b. In the **PXE Configuration Utility** window right-click the server name, **PV725REC**, and then select **Start/Stop Services**.
  - c. Verify that the proxy DHCP/Boot PXE and M/TFTP services are installed and running correctly by selecting **Stop** and then selecting **Start**.  
If the services are running, the indicator should display **started** after you click **Start** and **stopped** after you click **Stop**.

- d. Click **OK**.
13. On the Intel PXE server software, configure the system to listen to the DHCP port by performing the following steps:
  - a. Right-click **proxyDHCP Server Name**, and select **Configure proxyDHCP Server**.
  - b. In the **Configure proxyDHCP Server** window, click the **Use DHCP Port for Listening** check box.
  - c. Close and re-open the PXE server software.

14. Turn on your NAS system.

15. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

16. From the menu, select option 4, **Reinstallation**, and then type *y* to confirm the selection.

The NAS system automatically reboots and begins the reinstallation process, which restores the NAS system back to the Dell default settings.

17. **When the screen warns that you are going to reinstall and that it will erase data, type *y*.**

18. Press *y* again to confirm the selection.

Depending upon your configuration, this process could take several hours to complete. When the reinstallation completes, the NAS system shuts down.

During the reinstallation, do not attempt to connect to your NAS system.

19. After the NAS system shuts down, reconfigure the system.

See "[Configuring Your NAS System for the First Time](#)" in "Initial Configuration."

## Using an Existing PXE Server

 **NOTE:** This procedure resets your NAS system to the Dell default settings. Before performing this procedure, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Recovery Operating System Mirror Hard Drives](#)."

If your network has a PXE server, you need the following to reinstall the operating system:

- 1 Windows 2000 (Professional or Server Family) client system on the same subnet as the NAS system
- 1 *Resource* CD included with your NAS system
- 1 *Reinstallation* CD included with your NAS system
- 1 An existing PXE server on the same network

To reinstall the main operating system with Dell default settings on hard disk 0 from an existing PXE server, perform the following steps:

1. Shut down the NAS system, and do not turn it back on until instructed.

See "[Shutting Down the NAS System](#)" in "NAS Manager."

2. Insert the *Reinstallation* CD in to the CD drive on the PXE server.

3. Create a share for the CD drive on the client system:

- a. Double-click **My Computer**.
- b. Right-click the CD drive, and select **Sharing**.
- c. Type *cd* for the name of the share, and then click **OK** to confirm the share settings.

4. Create a reinstallation diskette from the *Resource* CD:

- a. Insert the *Resource* CD into the CD drive of your client system.
- b. When the *Resource* CD **Main Menu** window displays, click **Resources**.
- c. On the **Resources** window, click **Reinstallation Diskette**.
- d. When the **File Download** window displays, click **Run this program from its current location**, and then click **OK**.
- e. Click **Yes** if you receive a security warning.

A DOS screen appears and prompts you to insert a diskette into the diskette drive of the client system.

- f. Insert a formatted diskette into the diskette drive of your client system, and then press <Enter>.

The DOS screen closes after the reinstallation diskette is made.

5. Edit the reinstallation diskette for your environment:

- a. From the client system, browse to the reinstallation diskette.
- b. Right-click the file named **go.bat** on the reinstallation diskette, and then select **Edit** to edit the file to the following variable values for your environment:
  - 1 *SHARE*, where *SHARE* is the share resource for the *Reinstallation* CD in the form \\pxe\_server\_name\cd\_share\_name
  - 1 *USER*, where *USER* is the Windows user who is to access the share resource

1. `PASSWD`, where `PASSWD` is the password for the user who is to access the share resource
  6. Install the customized reinstallation diskette image, which you just created on your client system, on your PXE server.  
For more information, see your PXE server documentation.
  7. Connect a keyboard, monitor, and mouse to the NAS system.  
For information about system connectors, see your *User's Guide*.
  8. Turn on your NAS system.
  9. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:  
  
Press <F2> to enter the Function Select menu.
  10. From the menu, select option 4, **Reinstallation**, and then type `y` to confirm the selection.  
  
The NAS system automatically reboots and begins the reinstallation process, which restores the NAS system back to the Dell default settings.
  11. **When the screen warns that you are going to reinstall and that it will erase data, type `y`.**
  12. Press `y` again to confirm the selection.  
  
Depending upon your configuration, this process could take several hours to complete. When the reinstallation completes, the NAS system shuts down.  
  
 **NOTE:** During the reinstallation, do not attempt to connect to your NAS system.
  13. After the NAS system shuts down, reconfigure the system.  
  
See "[Configuring Your NAS System for the First Time](#)" in "Initial Configuration."
- 

## Restoring System-State Data After Reinstallation

To restore your system-state data, you must have previously backed up your system using the backup and recovery tools. See "[Backing Up System-State Data](#)" in "Backing Up the System."

 **NOTE:** If you are not restoring system-state data after reinstalling the operating system, perform the procedure in "[Restoring System-State Data](#)" in "Backing Up the System."

To restore system-state data, perform the following steps:

1. Log in to the NAS Manager.  
  
See "[Logging in to the NAS Manager](#)."
2. Click **Maintenance**.
3. Click **Backup**.
4. In the **Log on to Windows** window, enter the same user name and password that you used to log in to the NAS Manager and click **OK**.  
  
The **Welcome to Windows 2000 Backup and Recovery Tools** window displays.
5. Click **Restore Wizard**.
6. In the **Restore Wizard** window, click **Next**.
7. Click **Import File**.
8. In the **Backup File Name** window, click **OK** if the file and location are correct. Otherwise, click **Browse** and navigate to the correct backup file location.  
  
 **NOTE:** If the `.bkf` file is in another system you must copy the file to the NAS system or map a share to the file before restoring.
9. In the **What to Restore** window, click (+) to expand the **File** tree, and then click to expand **Media created yyyy/mm/dd**, where `yyyy/mm/dd` is the year/month/date that you made the system-state backup.
10. Click the (+) next to **System State**.
11. In the **Backup File Name** window, click **OK** if the file and location are correct. Otherwise, click **Browse** and navigate to the correct backup file location.
12. Click **System State** so that it is checked, and check any other application data files that you backed up, and then click **Next**.
13. Click **Advanced**.
14. In the **Where to Restore** window, select **Original location** from the drop-down menu as the location to restore the files, and then click **Next**.
15. In the **How to Restore** window, click **Always replace the files on disk**, and then click **Next**.
16. In the **Advanced Restore Options** window, leave all check boxes unchecked and click **Next**.
17. Click **Finish**.
18. When the **Enter Backup File Name** window displays, click **OK**.

 **NOTE:** If your backup file is in a different location, click **Browse** and navigate to the file.

19. Click **Start Restore**.
20. When a message warns that the system restore will overwrite the current system state, click **OK**.
21. Click **OK** in the **Confirm Restore** window.
22. Restart the NAS system after the restore process completes.

 **NOTE:** Windows must replace all locked files on the system; therefore, the process of restarting the system might take approximately 15 minutes to complete.

---

## Restoring Initial System Setup

After the operating system is reinstalled on the system, the NAS system is set back to factory defaults. Make sure you configure the system again to establish network communication. For information about configuring your system, see "[Initial Configuration](#)."

 **NOTE:** If you used the multilanguage user interface before reinstalling the operating system, you must reinstall it. See "[Installing Multilanguage User Interface \(MUI\) Support](#)."

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## Dell ActiveArchive

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

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- [Restoring Volumes From an Existing Persistent Image](#)
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Dell ActiveArchive™ allows the creation and preservation of persistent images of your NAS system's data volumes. The Dell ActiveArchive software can be configured using the NAS Manager.

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## Introduction to Persistent Images

A persistent image is a point-in-time copy of a disk volume. A persistent image contains an exact copy of the file system at the time the persistent image was created. If you change a file on the active file system after taking a persistent image, the persistent image contains the old version of the file. If an active file gets corrupted or deleted, you can restore the old version by copying the file from the latest persistent image or restoring the entire volume. Also, because the persistent image contains the contents of the file system when the persistent image was taken, you can perform a backup from the persistent image without stopping all I/O to the NAS system, thus eliminating the backup window required by other types of backup.

 **NOTICE:** Persistent images are temporary backups of your data that reside on the same volume as your data. If the volume becomes damaged and you lose your data, the persistent image is also lost. Therefore, persistent images do not replace regular backups of your volume.

## Cache File

The Dell ActiveArchive software stores changed data in a cache file. A cache file resides on each volume of your system. By default, the persistent image cache file is 20 percent of each volume. You can use the NAS Manager to change the percentage of the volume that is dedicated to the cache file.

 **NOTE:** You cannot take a persistent image of the operating system volumes.

## Cache Thresholds

The Dell ActiveArchive software has two thresholds that provide warnings when the cache file is approaching maximum capacity. The warning threshold logs an event in the event log and displays a warning in the NAS Manager status indicator when the cache file reaches the threshold (default is 80 percent full). The deletion threshold, which is labeled "Begin deleting images" in the NAS Manager, specifies the threshold at which the NAS Manager deletes the oldest persistent images with the lowest retention weights until the cache file is below the deletion threshold (default is 90 percent full). The NAS Manager indicates when it is necessary to delete persistent images to get below the threshold by displaying an error on the NAS Manager **Status** page.

## Persistent Image Retention Weights

When the ActiveArchive cache file reaches the deletion threshold, the system begins deleting files, depending on the retention weight (the deletion priority of the file) and age of the persistent image. The system first looks for the persistent image with the lowest retention weight in the cache file. It then deletes the oldest persistent image with the lowest retention weight until the cache file is below the deletion threshold. After all persistent images with the lowest retention weight have been deleted, Dell ActiveArchive looks for and deletes the oldest files with the next lowest retention weight.

## Persistent Image Considerations

When using persistent images, system performance might be degraded, depending on the rate your data is changing and the number of persistent images kept for each virtual disk. Read performance of the virtual disk remains constant, regardless of the presence of persistent images. Read performance of the persistent image is identical to that of the virtual disk. Write performance, however, might vary. Each initial write to a virtual disk area causes the Dell ActiveArchive software to rewrite the data to the persistent image cache file, and the initial write is slower if the data is being protected by a persistent image. Changes to data that is not protected by a persistent image does not cause a performance degradation.

## Storing Persistent Images

You can configure the NAS system to store a maximum of 250 persistent images per system; however, if you exceed the maximum, the oldest persistent image with the lowest retention weight is overwritten. This number of persistent images allows you to schedule multiple persistent images. (You should tailor your schedule depending on how the data is changing.) For example, you could implement a schedule similar to the following schedule:

- 1 Seven daily persistent images with a high priority
- 1 Two weekly persistent images with a medium priority
- 1 Two monthly persistent images with a low priority

This type of schedule gives you good snapshot coverage and ensures that your most recent data has the highest priority.

---

## Configuring the Persistent Image Global Settings

You can modify the various aspects of the persistent image environment by performing the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Global Settings**.
5. Configure the following options.

 **NOTE:** Before changing the image directory name, you must delete all existing persistent images.

- 1 **Maximum persistent images** — Specifies the maximum number of active persistent images per system, up to a maximum of 250. When the system has 250 persistent images stored, starting another persistent image overwrites the oldest persistent image with the lowest retention weight.
  - 1 **Inactive period** — Prior to starting a persistent image, the system waits for a period of relative inactivity on the volume being imaged. The default value for this period, which is 5 seconds, allows systems to start an image with a consistent file set and a minimal time-out. Experienced administrators may reduce or increase this value for system optimization. Reducing the inactive period allows persistent images to begin on systems where disk inactivity is rare, at the possible expense of synchronization problems within applications that are concurrently writing to multiple files.
  - 1 **Inactive time-out** — Specifies the amount of time the system continues to retry to create a persistent image (default time is 15 minutes). A persistent image cannot start until a period of relative inactivity, specified by **Inactive period**, occurs. If an interval longer than **Inactive time-out** passes before the persistent image can begin, the persistent image cannot be taken and an error is displayed in the NAS Manager status indicator and logged in the event log.
  - 1 **Image directory** — Specifies the directory name that is to be used for the persistent image mount point. Each persistent image appears as a subdirectory in the volume that is being imaged. The entire content of the volume, as it existed when the persistent image was created, appears under this directory.
6. If you need to re-establish the system defaults, click **Restore Defaults**.
  7. Click **OK** to update the global settings.
- 

## Configuring Persistent Image Volume Settings

You can modify volume settings by performing the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Volume Settings**.
5. Select the volume that you want to reconfigure.
6. Click **Configure**.
7. Use the appropriate menus to configure the following options.

 **NOTE:** Before changing the cache size, you must delete all persistent images on that volume.

- 1 **Warning threshold reached when** — Defines the percentage of cache space used that triggers warning messages to the system event log.
  - 1 **Begin deleting images when** — Defines the percentage of cache space used that triggers automatic deletion of the oldest persistent images with the lowest retention weight on the system. Automatic persistent image deletions are recorded in the system log.
  - 1 **Cache size** — Specifies the percentage of the volume that is allocated to the cache file. Increasing this value allows more and larger persistent images to be maintained. Ensure that adequate space is available on the persistent image files' location drive.
8. If you need to re-establish the system defaults, click **Restore Defaults**.
  9. Click **OK**.
- 

## Using Persistent Images

In addition to scheduling persistent images, you can take new persistent images on demand, delete existing persistent images, configure the persistent image environment, and set persistent image retention weights.

### Taking a New Persistent Image on Demand

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.

4. Click **Persistent Images**.
5. In the **Tasks** list on the **Persistent Images** page, click **New**.
6. In the menu that is displayed, select the **Volume(s)** to preserve.

Consider the following when selecting the volume(s):

- 1 You can take persistent images only of volumes with drive letters, not volumes mounted to a directory (mount points).
- 1 If volumes are not protected by RAID 1 or RAID 5, or if volumes are frequently being added and removed, it is recommended that you make persistent images of individual volumes. Because multivolume persistent images are linked to each other, a multivolume persistent image may become inaccessible if one volume in the multivolume persistent image fails or is removed from the system.

 **NOTE:** To select multiple volumes, press and hold <Ctrl> and select all volumes that are to be included in the persistent image.

7. Select the **Read Only** or **Read/Write** attribute.
8. Select the retention weight for the persistent image.
9. Confirm the persistent image name.

You can use patterns in the persistent image name to differentiate your persistent images. For example if you use a pattern of **Snapshot.%i** and you take two persistent images, you have **Snapshot.1** and **Snapshot.2**. The default persistent image name pattern is **Snapshot %M-%D-%Y %H.%m.%s**. Valid pattern macros are as follows:

- 1 %M = Month
- 1 %D = Day
- 1 %Y = Year
- 1 %h = Hours in 12-hour format
- 1 %H = Hours in 24-hour format
- 1 %m = Minute
- 1 %s = Second
- 1 %i = Instance, which increments once per instance
- 1 %a = AM/PM
- 1 %W = Day of the week
- 1 %w = Three-letter day of the week
- 1 %% = Percent sign

10. Click **OK** to create the persistent image.

## Deleting a Persistent Image

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Persistent Images**.
5. Click the check box next to the persistent image that is to be deleted.
6. In the **Tasks** list, click **Delete**.
7. Click **OK** to delete the persistent image.

## Undoing Writes to a Read/Write Persistent Image

To undo writes to a read/write persistent image, you must select an item from the **Persistent Images** list and then click **Undo** in the **Tasks** list.

To undo persistent image writes, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click the persistent image to be restored to its original state.
5. In the **Tasks** list, click **Undo**.
6. Click **OK** to restore the image or **Cancel** to leave it intact.

## Setting Persistent Image Retention Weights and Read Only or Read/Write Attributes

To change the read only or read/write attribute or the retention weight (deletion priority) of an image, you must edit the persistent image properties by selecting an image from the **Persistent Image** list, and then clicking **Properties** in the **Tasks** list.

To edit the persistent image properties, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Persistent Images**.
5. Click the persistent image that you want to edit.
6. In the **Task** list, click **Properties**.
7. Select the **Read Only** or **Read/Write** attribute.
8. Select the retention weight.
9. Click **OK** to update the persistent image.

## Scheduling Persistent Images

When you click from the NAS Manager primary menu **Disks**→ **ActiveArchive**→ **Schedules**, the **Scheduled Persistent Image** page displays a list of all scheduled persistent images and associated tasks. Each scheduled persistent image is identified by the scheduled time, day, frequency, starting date, and target volume ID. Persistent images identified by time and date are located in the **ActiveArchive** directory. The **ActiveArchive** directory is located in the root of each ActiveArchive volume. Only the administrator can access the **ActiveArchive** directory. The files and folders in the persistent image directories have the same permissions as the files and folders on the original volume. Persistent image directories are used exactly the same way as conventional system volumes. Unlike conventional volumes, read-only persistent image images are static, recording the precise content of the originating volume at the time you created the persistent image.

## Displaying the List of Persistent Images

The **Persistent Images** page displays all currently active persistent images. Each entry identifies the date and time that the persistent image was created and the volume it preserves. Select an individual persistent image by clicking its check box.

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Persistent Images**.

## Adding Persistent Images to the Schedule

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. In the **Tasks** list on the **Persistent Image Schedules** page, click **New**.
6. Use the menus to select the start time (**Start at**), the frequency at which to repeat the persistent image (**Repeat every**), the day to begin (**Begin**), the volume(s) to include, the image attributes (**Read-only** or **Read/Write**), the retention weight, number of images to save (per schedule), and the persistent image name.

 **NOTE:** To select multiple volumes, press and hold <Ctrl> and select all volumes that are to be included in the persistent image.

 **NOTE:** If volumes are not protected by RAID 1 or RAID 5, or if volumes are frequently being added and removed, it is recommended that you make persistent images of individual volumes. Because multivolume persistent images are linked to each other, a multivolume persistent image may become inaccessible if one volume in the multivolume persistent image fails or is removed from the system.

You can use patterns in the persistent image name to differentiate your persistent images. For example if you use a pattern of **Snapshot.%i** and you take two persistent images, you have **Snapshot.1** and **Snapshot.2**. The default persistent image name pattern is **Snapshot %M-%D-%Y %H.%m.%s**. Valid pattern macros are as follows:

- 1 %M = Month
- 1 %D = Day
- 1 %Y = Year
- 1 %h = Hours in 12-hour format
- 1 %H = Hours in 24-hour format
- 1 %m = Minute
- 1 %s = Second
- 1 %i = Instance, which increments once per instance
- 1 %a = AM/PM
- 1 %W = Day of the week
- 1 %w = Three-letter day of the week
- 1 %% = Percent sign

7. Click **OK** to save the new scheduled persistent image.

## Deleting a Persistent Image Schedule

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. On the **Persistent Image Schedules** page, click the check box next to the scheduled persistent image to be deleted.
6. In the **Tasks** list on the **Persistent Image Schedules** page, click **Delete**.
7. Click **OK** to delete the item or click **Cancel** to leave the item intact.

## Editing the Properties of a Persistent Image Schedule

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. Click the persistent image schedule you want to change.
6. In the **Tasks** list on the **Persistent Image Schedules** page, click **Properties**.
7. Use the appropriate menus to select or change the starting time, the frequency at which to repeat the persistent image (**Repeat every**), the day to begin, the volume(s) to include, the image attributes (**Read-only** or **Read/Write**), retention weight, the number of images to save (per schedule), and the image name.

 **NOTE:** To select multiple volumes, press and hold <Ctrl> and select all volumes that are to be included in the persistent image.

 **NOTE:** If volumes are not protected by RAID 1 or RAID 5, or if volumes are frequently being added and removed, it is recommended that you make persistent images of individual volumes. Because multivolume persistent images are linked to each other, a multivolume persistent image may become inaccessible if one volume in the multivolume persistent image fails or is removed from the system.

8. Click **OK** to modify the schedule or **Cancel** to leave the schedule intact.
- 

## Accessing Stored Persistent Images

 **NOTE:** Only Windows clients (CIFS) can access Dell ActiveArchive persistent images.

 **NOTE:** The name of the utility that creates persistent images is Dell ActiveArchive. The name of the directory where Dell ActiveArchive persistent images are stored is **ActiveArchive**.

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to a **Terminal Services Advanced Client** session.
5. If the **PowerVault Advanced Administration Menu** window is displayed, click **Exit**, and then click **OK** to close it.
6. Use Microsoft® Windows® Explorer to navigate to the **ActiveArchives** directory on the volume root.

## Accessing Directories, Folders, and Files

By default, administrators can access the **ActiveArchives** directory in the root of each volume. Each persistent image is displayed separately with a date and time stamp showing when the persistent image occurred. The administrator can browse the persistent image as if it were a standard volume. Each persistent image is mounted as a volume on the file system to allow access by clients. Persistent images are created as read-only or write-only.

Persistent image directories are used in the same way that conventional directories are used. The files and folders in the persistent image directories have the same permissions as the files and folders on the original volume. All persistent images are persistent and survive system power losses or reboots.

## Allowing User Access to Persistent Images

The files and folders within a persistent image are identical to the permissions on the original files and folders. However, by default, the **ActiveArchives** directory is restricted to administrator access only. To allow users to access the persistent images, the system administrator must modify the permissions for the **ActiveArchives** directory.

Use the NAS Manager to change the **ActiveArchives** directory permissions by performing the following steps:

1. Log in to the NAS Manager as an administrator.
2. Click **Maintenance**.
3. Click **Terminal Services**.

4. Log in to a **Terminal Services Advanced Client** session.
5. Open Windows Explorer.
6. Select the drive on the left side.
7. Right-click the **ActiveArchive** directory, and then click **Properties**.
8. Click **Security**, and then click **Add**.
9. Click specific users or groups or type the individual users or group names to add individual users or groups, and then click **OK**.

 **NOTE:** To ensure that all persistent image files do not inherit the same permissions as the ActiveArchive directory, under **Permissions**→**Security**→**Advanced**, be sure the **Reset permissions on all child objects and enable propagation of inheritable permissions** is not checked.

10. Give the selected members **Read** and **List Folder Contents** permissions.
11. Click **OK**.

After setting the permissions for the **ActiveArchive** directory, perform the following procedure to allow the user access to a share on the directory:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Tasks** list on the **Shared Folders** page, click **New**.
5. Type the share name **ActiveArchives** and path `volume_letter:\ActiveArchives`, where *volume\_letter* is the volume of the persistent images.

 **NOTE:** Ignore the **Comment** field for NFS, FTP, and HTTP shares.

6. Check the **Microsoft Windows (CIFS)** box.
7. Click **CIFS Sharing** and add the users that you want to have access to persistent images.
8. Click **OK**.

Users can access persistent images from a Windows 2000 client by performing the following steps:

1. Right-click **My Appliance**, and select **Map Network Drive**.
2. Map to the ActiveArchives directory as a user that has permissions to the ActiveArchives share.
3. For **Folder**, type `\\Dellxxxxxxx\ActiveArchives`, where Dellxxxxxxx is the name of the NAS system.

The default system name is Dellxxxxxxx, where xxxxxxx is the system's service tag number. For example, if your service tag number is 1234567, enter `http://DELL1234567`.

4. Use Windows Explorer to navigate to the **ActiveArchive** directory on the newly mapped drive.

## Naming Files in Microsoft Windows Explorer

Windows Explorer has a limitation of 255 characters in a filename, including the path. When you make a persistent image, the entire path and filename are stored in addition to the Dell ActiveArchive default path and persistent image name. The default Dell ActiveArchive naming convention would result in a name such as the following:

```
Drive_Letter:\ActiveArchives\Snapshot 01-01-2001 12.00.00\Path_and_Filename
```

The original path and filename and the Dell ActiveArchive default path might exceed the 255-character limit and become inaccessible through Windows Explorer.

If a file becomes inaccessible because of the 255-character limit, perform the following steps to ensure that you can access long path and file names in Windows Explorer:

1. Create a share for the desired snapshot folder. For example:

```
E:\ActiveArchives\Snapshot 01-01-2001 12.00.00\
```

2. Access that share through the desired client.

The path and filename no longer include the additional directory information, which shortens the path and filename to the original character length. You can now access the file through Windows Explorer.

## Restoring Volumes From an Existing Persistent Image

To restore a volume(s) from a persistent image, you must select the persistent image to be restored. Ensure that you select the persistent image carefully because any activity that occurred after the persistent image was taken is lost.

-  **NOTICE:** Restoring a volume restores the volume back to its state at the time the persistent image was made. This restore destroys all data on the volume and replaces it with the data from the persistent image.
-  **NOTICE:** A volume is dismounted during a restore. All reads and writes to a volume that occur during the restore process are denied. Therefore, you must stop all I/O traffic to a volume while restoring it.

To restore volumes from a persistent image, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Restore Persistent Images**.
5. Click the persistent image that is to be restored.
6. Click **Restore**.
7. Click **OK** to restore the volumes protected by the persistent image, or click **Cancel** to leave the volume intact.

 **NOTE:** Restoring persistent images that contain multiple volumes restores all of the volumes in the persistent image. If you want the ability to restore a single volume, you must take single volume persistent images.

 **NOTICE:** If you delete a share from a volume after a snapshot is taken, that share will not be accessible after you restore the snapshot. For example, if you create a persistent image of volume E, which has a share called "users," and you later delete "users," when you restore volume E, the "users" share will not be accessible, although the directory will still exist and contain the files.

---

## Changing the Dell ActiveArchive Event Log Language

Applying a selected language changes the graphical user interface to that language, but it does not change the language in which the Dell ActiveArchive event log messages are generated. The messages are generated in English unless you run a batch file to change the language to one of the following supported languages:

- 1 English
- 1 French
- 1 German
- 1 Japanese
- 1 Spanish

To change the language in which the event log messages are generated, perform the following steps:

1. Log in to the NAS Manager.
  2. Click **Maintenance**.
  3. Click **Terminal Services**.
  4. Log in to the system as `administrator`.
  5. If the **Advanced Administration Menu** is open, click **Exit**, and then **OK** to close it.
  6. Open the Microsoft Windows Explorer, expand the hard drive C directory and the **Dell** directory.
  7. Open the **AArchive\_Langpatch** directory.
  8. Double-click the appropriate batch file, such as the **english.bat** file for English or the **japanese.bat** file for Japanese.
  9. After the batch file has run, reboot your system.
- 

## Defragmenting a Volume Containing Persistent Images

 **NOTICE:** Defragmenting a volume containing persistent images without using the following procedure can corrupt your persistent images and degrade your system performance.

 **NOTICE:** To defragment a volume, you must delete all persistent images on that volume.

 **NOTE:** If you do not have persistent images on your volume, this procedure does not apply.

To defragment a volume containing persistent images, perform the following steps:

1. Log in to the NAS Manager.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. Select a scheduled persistent image, and then click **Delete**.
6. Repeat until all scheduled persistent images are deleted.
7. Click **Back**.

8. Click **Persistent Images**.
9. Select a persistent image, click **Delete**, click **OK**, and then click **OK**.
10. Repeat until all persistent images are deleted.
11. Click **Maintenance**.
12. Click **Terminal Services**.
13. Log in to the NAS system.
14. If the **Advanced Administration Menu** appears, click **Exit**, and then **OK** to close it.
15. Double-click **My Appliance**.
16. Right-click the drive that you want to defragment, and click **Properties**.
17. Click **Tools**.
18. Click **Defragment Now**.

The **Defragmentation** window displays.

19. Click **Defragment**.

You are notified when defragmentation is complete.

20. Exit **Terminal Services Client**.
21. Reschedule your persistent images for this volume.

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## Advanced Features

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

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  - [Microsoft Directory Synchronization Services](#)
  - [Using Secure Sockets Layers](#)
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This section includes descriptions of advanced features that cannot be performed from the Dell™ PowerVault™ NAS Manager.

To perform the procedures in this section, you must use the Terminal Services Advanced Client. To access the Terminal Services Advanced Client, perform the following steps:

1. Log in to the NAS Manager.
2. From the NAS Manager, click **Maintenance**.
3. Click **Terminal Services**.
4. Log on as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

---

## Updating the BIOS

To update the BIOS, you must first copy the BIOS file to the NAS system and then update it using Terminal Services.

 **NOTE:** See the Dell Support website at [support.dell.com](http://support.dell.com) for the latest BIOS updates for your system.

## Copying the BIOS to the NAS System

1. Using a Web browser, connect to the PowerVault NAS Manager and create a shared folder on the NAS system. See "[Adding a Share](#)" in "NAS Manager."
2. From a client system running the Microsoft® Windows® 2000 operating system, map the share you created in step 1.
  - a. Right-click **My Computer** and select **Map Network Drive**.
  - b. Specify the drive letter and folder for the connection and click **OK**.
  - c. Enter the name of the NAS system and the name of the share you created in step 1 and click **OK**.
  - d. In the **Map Network Drive** window, click a different user name.
  - e. In the **Connect As** window, enter a user name and password to connect to the NAS system with administrator privileges, and then click **OK**.
  - f. Click **Finish**.
3. Download the latest BIOS file from [support.dell.com](http://support.dell.com) and copy it to the share.
4. Disconnect the share from the client system.
  - a. Right-click **My Computer** and select **Disconnect Network Drive**.
  - b. Select the share that you want to disconnect and click **OK**.

## Running the BIOS Update Utility

1. Log into the NAS Manager.
2. On the NAS Manager primary menu, click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to the Terminal Services session as an administrator.
5. If the **Advanced Administration Menu** is open, click **Exit**, and then **OK** to close it.
6. Open Windows Explorer, and expand the directory `C:\Dell\Firmware Utility`.
7. Double-click the `WinSFI.exe` file to start the BIOS Update Utility.
8. In the `WinSFI_AMIWinFlash` window, ensure that only the boxes for **Boot Block Programming** and **NVRAM Programming** are checked.

9. In the **File** drop-down menu, select **Load BIOS and Flash**.
  10. When the **Open** window appears, use the folder's navigation icons to navigate to the NAS system's desktop, and select the share folder in which you placed the downloaded BIOS file.
  11. Click **Open**.
  12. When a message appears asking if you are sure you want to update the BIOS, click **Yes**.  
  
The utility erases the current BIOS, opens the new updated BIOS file, and programs the system to accept the new BIOS file (a status bar at the bottom of the window provides progress information).
  13. When a message appears stating that the flash ROM update is complete and that you need to restart your system, click **OK**.
  14. Restart the NAS system.
- 

## Installing Multilanguage User Interface (MUI) Support

 **NOTE:** Installing the MUI for your language automatically installs the appropriate language locale.

The NAS system allows you to change languages for its Microsoft Windows Powered operating system's user interface. The MUI allows the NAS system to display Windows Powered operating systems menus, dialogs, and help files in multiple languages. The supported MUI languages are simplified Chinese, traditional Chinese, Dutch, English, French, German, Italian, Japanese, Korean, Spanish, and Swedish. You must install a language MUI from the *Multilingual Support* CD before it can be used on the system.

 **NOTE:** Installing and configuring the operating system MUI does not affect the language used by the NAS Manager.

1. Log in to the NAS Manager.  
  
See "[Logging in to the NAS Manager](#)" in "NAS Manager."

2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Close the **Advanced Administration Menu** by clicking **Exit**.
5. Double-click **My Appliance** on the NAS desktop.
6. If this is a new system, perform the following steps, and then go to step 8. Otherwise, go to step 7.
  - a. Double-click **Local Disk C:** to open the root directory.
  - b. Double-click the **localization** directory.
  - c. Double-click the **muisetup.exe** file to configure the language.
7. If you performed the reinstallation procedure on your system, perform the following steps:
  - a. In the **Sharing** tab on the **Compact Disk Properties** page, click the radio button next to **Share this folder** to share the CD drive, and then insert the *Multilingual Support* CD that came with your NAS system into your remote client system's CD drive.
  - b. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
  - c. Browse to the mapped drive, and then double-click the CD icon to launch the *Multilingual Support* CD's Web interface.
  - d. Click the **Install Multilanguage User Interface (MUI) Support** link to launch the Multilanguage File Installation installer program.
8. In the installer window, select the languages to be installed, and select the default MUI language from the menu.
9. Click **OK** to perform the installation.
10. If the **Insert Disk** window appears, you must perform the following steps:
  - a. Click **OK**.
  - b. In the **Files needed** window, click **Browse**, browse to the **1386** directory on the *Multilingual Support* CD or in the **C:\localization** directory (which does not exist if you reinstall the operating system), and then click **Open**.
  - c. If the **Insert Disk** window displays, click **OK** to allow the operating system to find the required files for installation.
11. Disconnect the mapped network drive from the CD share that you mapped in step 7.
12. After the installation is complete and you have disconnected the network drive, you must reboot your system.

## Applying the MUI Language

After a MUI language has been installed, you can apply it to any user by performing the following steps:

1. From a client system, log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to the system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

5. On the **Advanced Administration Menu**, click **System Management**, and then click **Set Regional Options** to launch the **Regional Options** control panel.
6. On the **General** tab, select the MUI language from the **Your locale (location)** drop-down menu, and then click **Apply**.
7. Log off and log in to the system again for the new language MUI to take effect.

---

## Installing and Configuring Support for Other Languages

 **NOTE:** Install additional language locales only if your preferred language is not available with MUI support or you need additional locale support.

The Windows Powered operating system that comes installed on your NAS system can be configured to support reading and writing documents in a number of languages. To install the software required to support a specific language, perform the following steps:

1. Insert the *Multilingual Support* CD into the NAS system's CD drive.
2. From a client system, log in to the NAS Manager.
3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to the system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

6. Close the **Advanced Administration Menu** by clicking **Exit** and then clicking **OK**.
7. Double-click **My Appliance** on the NAS desktop.
8. If this is a new system from Dell, perform the following steps, and then go to [step 10](#). If you are performing this procedure after reinstalling your operating system, go to [step 9](#).
  - a. Double-click **Control Panel**.
  - b. Double-click **Regional Options**.
9. If you performed the reinstallation procedure on your system, perform the following steps:
  - a. In Windows Explorer on a remote system, right-click the CD drive, and then click **Sharing**. In **Sharing** tab on the **Compact Disk Properties** page, click the radio button next to **Share this folder** to share the CD drive, and then insert the *Multilingual Support* CD that came with the NAS system into your remote system CD drive.
  - b. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
  - c. Browse to the mapped drive, and then double-click the *Multilingual Support* CD icon to launch the *Multilingual Support* CD's Web interface.
  - d. Click the **Install Language Locales Not Supported by MUI** link to launch the **Regional Options** control panel.
10. From the **Language Settings for the System** panel, select the languages to be configured.
11. Set the default language for the system by clicking **Select default...** and selecting the appropriate language from the menu, and then click **OK**.
12. Click **Apply** to complete the operation.
13. If the **Insert Disk** window appears, you must perform the following steps:
  - a. Click **OK**.
  - b. In the **Files needed** window, click **Browse**, browse to the **i386** directory on the *Multilingual Support* CD or in the **C:\localization** directory (which does not exist if you reinstall the operating system), and then click **Open**.
  - c. Click **Open**, and then click **OK** from the **Insert Disk** window to allow the operating system to find the required files for installation.
14. After the installation is complete, if applicable, disconnect the mapped network drive from the CD share that you mapped in [step 7](#).
15. Reboot your system.

 **NOTE:** For more information about language settings, see the Microsoft Windows Powered operating system's online help.

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## Network Adapter Teaming

Network adapter teaming allows the system to use the combined throughput of multiple network ports in parallel to increase performance or to provide fault tolerance. Network adapter teaming on your NAS system supports the following technologies:

- 1 Link Aggregation
- 1 Fast EtherChannel (FEC)
- 1 IEEE 802.3ad

 **NOTE:** When creating or removing network adapter teams, the IP address of the NAS system's LAN connections changes. To prevent disconnection from the NAS system during team configuration, connect a keyboard, monitor, and mouse to the NAS system when creating or removing teams. See "Initial Configuration" before configuring your teams.

## Smart Load Balancing (SLB)

SLB balances IP traffic across multiple adapters in a bi-directional manner. With SLB, all adapters on the team have separate MAC addresses. SLB provides automatic fault detection and dynamic failover to other team members or to a hot standby member. This is done independently of the layer 3 protocol (IP, IPX, Net BEUI). It works with existing layer 2 and 3 switches.

## Link Aggregation (802.3ad)

This mode supports Link Aggregation through static configuration and conforms to the IEEE 802.3ad specification. Configuration software allows you to statically configure which adapters they want to participate in a given team. Future releases will support LACP. If the link partner is not correctly configured for 802.3ad link configuration, errors are detected and noted. With this mode, all adapters in the team are configured to receive packets for the same MAC address. The outbound load-balancing scheme is determined by our BASP driver. The team's link partner determines the load-balancing scheme for inbound packets.

## Generic Link Aggregation (Trunking)

This mode is very similar to 802.3ad in that all adapters in the team need to be configured to receive packets for the same MAC address. However, this mode does not provide LACP or marker protocol support. This mode supports a variety of environments where the NICs' link partners are statically configured to support a proprietary trunking mechanism. For instance, this mode could be used to support Lucent's "OpenTrunk" or Cisco's Fast EtherChannel (FEC). Basically, this mode is a "light" version of the 802.3ad link aggregation. This approach is much simpler in that there is not a formalized link aggregation control protocol. As with the other modes, the creation of teams, and the allocation of physical adapters to various teams, is done statically via user configuration software.

Trunking supports load balancing and failover for both outbound and inbound traffic.

## Failover Teaming

Failover Teaming provides redundant adapter operation in the event that a network connection fails. When multiple Gigabit Ethernet Adapters are installed in the same server, they can be paired into Teams. Each team must have at least one adapter, but can support up to eight adapters. The number of teams is limited by the number of adapters that are installed.

If the primary adapter in a team is disconnected because of failure of the adapter, cable, or switch port, the secondary team member becomes active, redirecting both inbound and outbound traffic originally assigned to the primary adapter. Sessions will be maintained, causing no impact to the user.

## Creating Network Teams Using the Broadcom Advanced Server Control Suite

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the Terminal Services session as `administrator`.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Broadcom Network Teaming**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

The **Broadcom Advanced Server Control Suite** window displays.

5. Click **Load Balance/Virtual LAN**.
6. Click **Create Team**.
7. Enter the team name and select the appropriate team mode.

The types of team include **Smart Load Balance and Fail Over**, **Generic Trunking (FEC/GEC)**, and **Link Aggregation (IEEE 802.3ad)**.

8. Click **OK**.
9. Select the team name in the **Configuration** box.
10. Select an unassigned adapter to add to the team, and then click the arrow adjacent to the **Team Members** list to add the adapter.
11. Repeat step 10 for the second adapter.
12. Click **OK**.

## Removing Broadcom Adapter From a Network Team

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the Terminal Services session as `administrator`.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Broadcom Network Teaming**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

The **Broadcom Advanced Server Control Suite** window displays.

5. Click **Load Balance/Virtual LAN**.
6. Select the team name in the **Configuration** box.
7. Select an adapter in the **Team Members** list, and then click the arrow adjacent to **Load Balance Members** to remove the adapter.
8. Click **OK**.

## Changing the Network Team Mode Using the Broadcom Advanced Server Control Suite

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the Terminal Services session as administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Broadcom Network Teaming**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

The **Broadcom Advanced Server Control Suite** window displays.

5. Click **Load Balance/Virtual LAN**.
6. Right-click the team name in the **Configuration** box, and then click **Properties**.
7. Select the new type of team and click **OK** to apply the change.

The types of team include **Smart Load Balance and Fail Over**, **Generic Trunking (FEC/GEC)**, and **Link Aggregation (IEEE 802.3ad)**.

8. Click **OK** to complete the change.

For more information, see your Broadcom Advanced Server Control Suite help.

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## Services for UNIX®

Services for UNIX (SFU) provides the tools needed to integrate UNIX and Windows networks by leveraging existing UNIX network resources and expertise. SFU includes more than 60 of the most common UNIX command line utilities to provide a familiar environment for UNIX users and administrators.

Server for NFS (network file system) allows you to leverage your existing UNIX network resources for UNIX clients.

SFU provides important tools to enhance and simplify the administration of your network.

- 1 Telnet Server enables character- and script-based remote administration of Windows 2000 and Windows NT®-based servers from a variety of clients.
- 1 Microsoft Management Console (MMC) snap-in enables a consistent and central management point for all SFU functionality.
- 1 ActivePerl enables existing and new scripts to use the Windows Management Interface (WMI) to automate network administration tasks.
- 1 User Name Mapping associates Windows and UNIX user names, which allows users to connect to NFS resources without having to log in to UNIX systems separately.

## Server for Network File System (NFS)

SFU provides a robust Server for NFS that can be used to provide disk resources from systems running Windows NT and Windows 2000 to any system on your network that supports NFS. To administer Server for NFS, set the following options from the SFU MMC console:

- 1 **User Mapping** is the name of the mapping server to use.
- 1 **Auditing** is the size and location of the logging file and the operations to audit.
- 1 **Locking** is the grace period for locks and a list of current locks.
- 1 **Client Groups** is used to group client systems for easier setting of permissions.

See [Table 7-1](#) for information on the utilities provided with SFU.

## UNIX Utilities

Table 7-1. UNIX Utilities Provided With SFU

Category	Utility
File and directory utilities	basename, cp, diff, dirname, dos2unix, find, ln, ls, mkdir, mount, mv, paste, pwd, rm, rmdir, sdiff, split, tee, touch, uniq, uuencode, uuencode, umount
Text utilities	cat, cut, grep, egrep, fgrep, head, more, printf, sed, sort, tail, tr, vi, wc

Programming utilities	perl, od, sh, strings
Security utilities	chmod, chown, su
Process and general utilities	cron, crontab, date, du, kill, nice, printenv, ps, rcmd, renice, sleep, atr, top, uname, wait, which, xargs

## Telnet Server

The Telnet server works optimally for most installations. It accepts logins from a variety of clients, including the Telnet clients shipped with Windows 2000, Windows NT, Windows 95, and Windows 98, as well as a variety of character mode terminal clients from virtually any operating system. In addition, it can be configured to meet specific site requirements such as improving security, simplifying logins, and supporting stream or console mode.

### Authentication

The SFU Telnet server supports Windows NT LAN Manager (NTLM) for authentication of client logins. NTLM allows users to be automatically authenticated to the Telnet server based on their Windows NT login. This makes using Telnet completely transparent to users, while ensuring that clear text passwords do not pass over the network. However, NTLM must be supported on the client side of the login as well.

When users are logged in to a system that is using NTLM login, they are restricted to local drives on that system. If they need to map network resources, they can do so by explicitly mapping with full credentials.

### Administration

The Telnet server is administered using the SFU MMC snap-in or the **tnadmin** program.

The following options are available:

- 1 **Authentication** gives you the choice of **NTLM** or **Username/Password**.
- 1 **Auditing** allows you to set event logging to a separate log file or to the event log and to specify what events to log.
- 1 **Server Settings** allows you to set the following options:
  - o Maximum number of simultaneous connections.
  - o Maximum number of failed login attempts.
  - o Map <Alt> to <Ctrl><a>.
  - o Telnet port.
  - o **Console** or **Stream** for mode of operation.
  - o **Default Domain Name** is the domain name that is automatically added to the login username. The default is ".", which disables this feature.
  - o **Idle Session Timeout** is the time until an idle session is forcibly disconnected.
  - o **Terminate all programs when disconnecting** or **Continue to run programs started with the command bgjob**.
- 1 **Sessions** allows you to see data about the currently active sessions (such as user, domain, system, and logon date/time) and to either send a message to the session or terminate it.

## Services for UNIX MMC Console

SFU includes a single MMC for managing all of SFU. The MMC provides a cohesive management interface that allows you to administer all systems on the network from any console. Further, since SFU supports the Windows management interface (WMI), management can be scripted from the command line.

You can access the MMC Console by selecting **Computer Management** under **System Management** on the **Advanced Administration Menu**. See "[Using the PowerVault Advanced Administration Menu](#)" in "NAS Manager."

## ActiveState ActivePerl 5.6

SFU includes ActiveState's ActivePerl 5.6, a full-featured port of Perl 5.6 and Perl Script to Windows Powered operating systems. Among other improvements, ActivePerl 5.6 includes support for `fork()` emulation at the interpreter level, improving the portability of scripts and modules. ActivePerl also provides full support for the Windows Script Host, making ActivePerl an excellent tool for system administration tasks.

## User Name Mapping

User Name Mapping provides mapping of names between the UNIX and Windows environments. You can configure User Name Mapping from the SFU MMC Console or by using the NAS Manager to configure properties for the NFS Sharing Protocol. With User Name Mapping, you can create simple maps between Windows Powered user accounts and corresponding UNIX accounts. You can also use the Advanced Map feature to map accounts with dissimilar names. Because UNIX user names are case-sensitive, and Windows Powered operating system names are not, the use of User Name Mapping can greatly simplify maintaining and managing accounts in the two environments. User Name Mapping uses Network Information Service (NIS) or local Personal Computer Network File System (PCNFS) user and group files to authenticate users. Also, User Name Mapping supports bidirectional one-to-many mapping, allowing you to map a single UNIX or Windows Powered operating system account to multiple accounts in the other environment. For example, you can map more than one administrative account in a Windows Powered operating system to the UNIX root account.

### Special Mappings

By default, the root user for the UNIX client is mapped to an unmapped user. This setting is commonly known as "root squashing." When an NFS authentication request is made for a user name mapped to an unmapped user, the result is an anonymous UID and GID (typically -2 and -1, respectively). Any files created by such a user will show file ownership as an anonymous Windows user.

 **NOTE:** To prevent SFU from performing root squashing for specific NFS shares, the UNIX root user and group must be mapped to the Windows administrator user and group. The "access type" for the NFS share's permissions must also be set to root for each applicable client or client group.

To create user and group name maps, perform the following steps:

1. Log in to the NAS Manager.
2. From the NAS Manager, click **Shares**.
3. Click **Sharing Protocols**.
4. Click **NFS Protocol**, and then click **Properties**.
5. Click **User and Group Mappings**.
6. Use the **User and Group Mappings** window to define your user and group maps.

## Configuration

To configure the type of server to be used to access UNIX user and group names, perform the following steps:

1. On the **User and Group Mappings** window, click **General**.
2. Click **Use NIS server**, or click **Use password and group files** to select the server type.
3. Depending on whether you use an NIS server or password and group files, perform one of the following steps:
  - 1 For password and group files, specify the location and filename of the UNIX password file and UNIX group file.

 **NOTE:** The UNIX password file and group file formats must conform to the UNIX standard for these files.

- 1 For NIS server, type the NIS domain and, optionally, the name of the NIS server.
4. Click **OK** to apply the configuration.

## Defining Maps

To define simple maps in SFU, perform the following steps:

1. In the **User and Group Mappings** window menu, click **Simple Mappings**.
2. Click **Enable Simple Mapping**.
3. Specify the **Windows Domain**.
4. Click **OK** to create the maps.

If you are defining explicit maps, you create user and group maps individually. To create explicit maps, perform the following steps:

1. On the **User and Group Mappings** window menu, click **Explicit User Mapping** to create user maps, or click **Explicit Group Mapping** to create group maps.
2. Specify the **Windows Domain**. If the server is configured as **PCNFS**, go to step 4.
3. Click **List UNIX Users** or **List UNIX Groups**.

This action refreshes your UNIX users or groups selection.

4. Create map entries by selecting a Windows user or group and a UNIX user (UID) or group (GID) from the list and clicking **Add**.
5. Click **OK** to create the maps.

## Basic Scenarios

For UNIX and Windows NT User Name Mapping, an NIS Server must already exist in the UNIX environment, or UNIX user and group files must exist on the PowerVault NAS system. User Name Mapping associates UNIX users and groups to Windows NT users and groups. You can use two types of maps, simple and explicit. Simple maps define a one-to-one relationship between the same user names and groups. Explicit maps define a relationship between dissimilar user names and groups.

## Workgroup

In the workgroup scenario, you configure User Name Mapping locally on the NAS system. All maps are contained on this system.

## Domain

In the domain scenario, you configure NFS Authentication on all domain controllers. The NT Authentication Service installation program must be installed on the domain controller and available in the **DomainUtils** share on the NAS system.

To install the NT Authentication Service on a domain controller, perform the following steps:

1. Log in to the domain controller as an administrator.
2. Map the NAS system's **DomainUtils** share.
3. Run **sfucustom.msi**, which is located in the **Services for Unix** directory.

## Filename Character Translation

Although Windows and UNIX file systems do not allow certain characters in filenames, the characters that are prohibited by each operating system are not the same. For example, a valid Windows filename can not contain a colon (:), but a UNIX filename can. If a UNIX user attempts to create a file in an NFS share and that file contains an illegal character in its name, the attempt will fail.

You can use filename character translation to replace characters that are not allowed in a file system by mapping them to characters that are valid. To enable filename character translation, create a text file that maps Windows to UNIX characters, and then modify the registry entry that specifies the path and name of the translation file.

The filename character translation text file is a list of mapped characters in the following format, such as the following:

```
0xnn : 0xnn [ ; comment ]
```

where *nn* is the hexadecimal value of the character

The entry for a map from the UNIX character ":" to the Windows character "-" in the filename character translation text is as follows:

```
0x3a : 0x2d ; Map ':' (0x3a) to '-' (0x2d)
```

To map the character combination "()" to the character "^", add the following entry:

```
0x28 0x29 : 0x5e ; Map '()' to '^'
```

To specify the path and name of the filename character translation text file for Server for NFS to use, modify the following registry key to contain the path and filename of the character translation file:

```
HKLM\SOFTWARE\Microsoft\Server for NFS\CurrentVersion\Mapping\CharacterTranslation
```

---

## File Server for Macintosh

File Server for Macintosh (FSM) provides the tools needed to integrate Macintosh and Windows networks by leveraging existing Macintosh network resource and expertise. FSM is disabled by default on the NAS system. See "[Enabling the AppleTalk Protocol](#)" for information about enabling FSM.

### Enabling the AppleTalk Protocol

The AppleTalk protocol is disabled on the NAS system by default. You must enable the AppleTalk protocol for Macintosh clients to access the NAS system.

To enable the AppleTalk protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **AppleTalk Protocol**, and then click **Enable**.

### Disabling the AppleTalk Protocol

To disable the AppleTalk protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **AppleTalk Protocol**, and then click **Disable**.

### Configuring the AppleTalk Protocol

To configure the AppleTalk protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **AppleTalk Protocol**, and then click **Properties**.
5. In the **AppleTalk Service Properties** window, type the logon message the users will see at logon, click the **Security** check box if you allow workstations to save passwords and select the type of authentication to be used, and specify the number of concurrent sessions that are allowed.
6. Click **OK** to complete the configuration.

## Adapter Bindings

FSM can bind to only one network adapter. By default, it is bound to the embedded 10/100TX Network Adapter. To change the binding in systems with multiple network adapters, the AppleTalk protocol properties for the network adapter to be used by AppleTalk must be modified to accept inbound connections.

### AppleTalk Protocol Adapter Binding

To modify the AppleTalk protocol adapter binding for systems with multiple network adapters, perform the following steps from the NAS Manager:

1. Log in to the NAS Manager.
2. Click **Network**.

3. Click **Interfaces**.
4. Click the radio button next to an enabled adapter to bind the AppleTalk protocol.

 **NOTE:** The AppleTalk protocol must bind to an adapter that is enabled, regardless of whether the File Server for Macintosh is disabled.

5. On the **Tasks** menu, click **AppleTalk**.
6. Click the check box next to **Enable inbound AppleTalk connections on this adapter**.
7. Optionally, if you use AppleTalk zones, select the appropriate zone in the drop-down box.
8. Click **OK**.

## Microsoft UAM Volume

A user authentication map (UAM) is a software program that prompts users for an account name and password before they log in to a server. The Macintosh Chooser has a standard UAM built in that uses the clear-text password or Apple's RandNum Exchange method of security.

Microsoft Authentication offers an additional level of security because the password is used as a key to encrypt a random number. If the system administrator has determined that encryption is an important security measure, you may be asked to use Microsoft Authentication in addition to Microsoft UAM authentication.

### Requirements

To use Microsoft UAM 5.01, you must have a Macintosh client running AppleShare Client 3.8 or later or Macintosh 8.5 or later operating system. If you do not meet the minimum requirements, the Microsoft UAM Installer installs the old Microsoft UAM 1.0 module. If you upgrade your system software, you need to run the Microsoft UAM Installer again.

### Installing User Authentication

Log in to the Microsoft UAM Volume on the system to access the **MS UAM** file, and then drag this file to the **AppleShare Folder** in your **System** folder.

To access the Microsoft Authentication files on the system, perform the following steps:

1. Create a user with a password of less than eight characters.
  - a. Log in to the NAS Manager.
  - b. Click **Users**.
  - c. Click **Local Users**.
  - d. Click **New**.
  - e. Complete the information in the **Create New User** window and click **OK**.

 **NOTE:** The password can be no longer than eight characters. Passwords longer than eight characters cannot be used when mapping an Apple share without a UAM.

2. Click **Chooser** on the **Macintosh Apple** menu.
3. Double-click the **AppleShare** icon, and then click the **AppleTalk** zone in which the system with Services for Macintosh resides.

Ask your system administrator if you are not sure of the zone.

4. Select the system from the list of file servers, and click **OK**.
5. Click **Registered User**.
6. Enter the user name and password you created in step 1, and then click **OK**.
7. Select the **Microsoft UAM Volume**, and then click **OK**.
8. Close the **Chooser** dialog box.

To install the authentication files on the Macintosh workstation, perform the following steps:

1. Double-click **Microsoft UAM Volume** on the Macintosh desktop.
2. Double-click the **Microsoft UAM Installer** file on the Microsoft UAM volume.
3. Click **Continue** in the **Installer Welcome** screen.

The installer reports whether the installation succeeds.

If the installation succeeds, Macintosh users of this workstation are offered Microsoft Authentication when they connect to the system.

## Restarting Workstation Services

If File Services for Macintosh cannot establish communications to the local RPC service, you may need to restart the Workstation Service.

To restart the Workstation Service, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.

3. Log in to the NAS system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **System Management**, and then click **Computer Management**.
  5. Click **Services and Application**.
  6. Double-click **Services**.
  7. Right-click **Workstation** in the **Services** window, and select **Restart**.
  8. Confirm that you want to restart the Workstation Services.
- 

## Services for Novell® NetWare®

Services for NetWare (SFN) are compatible with Novell NetWare Bindery service for authentication and file access using the internetwork packet exchange/sequenced packet exchange (IPX/SPX) network protocol. Services for NetWare are disabled by default. See "[Enabling Services for NetWare](#)."

### Enabling Services for NetWare

The NetWare protocol is disabled on the NAS system by default. You must enable the NetWare protocol for NetWare clients to access the NAS system.

To enable the NetWare protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **NetWare Protocol**, and then click **Enable**.

 **NOTE:** For the NAS system, the default NetWare supervisor user name is `supervisor`, and the password is `powervault`. You should change the user name and password to ensure security.

### Disabling Services for NetWare

To disable the NetWare protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **NetWare Protocol**, and then click **Disable**.

## Configuring the NWLink IPX/SPX Compatible Protocol

To configure this protocol, you need the internal network number, frame type, and network number.

### Internal Network Number

Internal network numbers are used for internal routing and are generally needed only for servers. You should not need to change this option on your system.

### Frame Type and Network Number

Frame types define the packet formats that are used by different networks. It is important that all systems in a network have the same frame type so that they can communicate with the rest of the network.

When you are configuring your system, it attempts to automatically detect the frame type for the client. In most cases, this is successful. However, the automatic detection feature occasionally selects an inappropriate frame type, usually because more than one frame type exists on the network. If this happens, you should manually set the frame type to match the one specified on your NetWare server.

 **NOTE:** If more than one frame type exists, you should select the one that is detected first. For example, if the frame types Ethernet 802.2 and Ethernet 802.3 are bound to the same segment, configure frame type Ethernet 802.2. The order of detection is Ethernet 802.2, Ethernet 802.3, Ethernet II, and then Ethernet SNAP.

## Configuring the IPX Protocol

By default, the IPX protocol is configured on the NAS system to automatically detect frame types. To use the IPX protocol, you must change your NAS system's IPX properties to manually detect frame types.

To configure the IPX protocol to manually detect frame types, perform the following steps:

1. Log in to the NAS Manager.

2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the NAS system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **System Management**, and then click **Network Properties**.
5. In the **Network and Dial-up Connections** window, right-click the network adapter used by the NAS system and select **Properties**.
6. In the **Local Area Connection Properties** window, click **NWLink/IPX/NetBIOS Compatible Transport Protocol**, and click **Properties**.
7. In the **NWLink/IPX/NetBIOS Compatible Transport Protocol** window, select **Manual Frame type detection**.
8. Click **Add**.
9. In the **Manual Frame Detection** window, select a frame type, enter a network number for the IPX network, and then click **OK**.
10. Click **OK**.
11. Click **OK** to close the **Local Area Connection** window.
12. Close the **Network and Dial-Up Connections** window.

The IPX protocol is now configured on the NAS system to manually detect frame types.

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## Microsoft Directory Synchronization Services

Microsoft Directory Synchronization Services (MSDSS) allows you to synchronize a wide variety of data stored in the Active Directory service with Novell Directory Service (NDS) and NetWare 3.x binderies.

MSDSS is a highly flexible service that helps Novell users to perform the following tasks:

- 1 Adopt Windows 2000 Server and the Active Directory service
- 1 Reduce directory management through two-way synchronization
- 1 Migrate NDS and bindery information to Windows 2000 Server

MSDSS supports two-way synchronization with NDS and one-way synchronization with NetWare 3.x binderies to provide a complete directory interoperability solution. MSDSS also supports password synchronization and provides a directory migration service.

MSDSS allows NetWare users to deploy Active Directory without having to replace existing directories or bear the cost of managing two separate directories. As a result, users have the flexibility to:

- 1 Consolidate directory management when multiple directories are required
- 1 Manage accounts from either directory
- 1 Use directory-enabled applications, devices, and services based on the Windows 2000 Active Directory service

MSDSS is easy to use and makes synchronization and Active Directory setup easy through its management interface. It is fully featured to allow users a choice of management, synchronization, and migration options.

MSDSS supports all major NetWare platforms and most Novell directories and binderies, and it includes support for IPX/SPX and TCP/IP network protocols.

## Windows 2000 MSDSS Domain Controller

To implement MSDSS, you must install the Windows 2000 Server operating system and the MSDSS software (available on the *Microsoft Services for NetWare Version 5 CD*) on at least one system. In Windows 2000, when you promote a system running Windows 2000 Server to an Active Directory server, it becomes a domain controller. You use this domain controller to configure Active Directory, install MSDSS, and then import information from the existing NetWare environment.

The larger the environment, the more new servers you need. If you are planning to have more than one domain, then you need new hardware for the first domain controller in each domain.

You must also install Novell Client Access software on the MSDSS server or servers. MSDSS uses Novell Client Access to authenticate and to access NDS. While accessing NDS, it authenticates, but does not use a license. MSDSS also uses Novell Client Access to map one directory's contents to another, taking into account the fact that the object classes in Novell's NDS or bindery directories are different from Active Directory object classes. Novell Client Access is also required to use the File Migration utility to migrate files.

You can install Novell Client Access in four modes: **IP only**, **IPX only**, **IP and IPX combined**, and **IP with IPX Compatibility Mode**. Most NetWare environments still use IPX. MSDSS works in all the modes because it uses Novell Client Access to access the lower layers.

If you are migrating NDS, you can import the user and group information from one NDS server to the MSDSS server because you have one user database per tree. You can then migrate the file system. Remember that each Novell server has its own file system, which is not replicated to other servers (whereas NDS is replicated to other servers). After the files are migrated, you can uninstall NDS from the server to provide more space for the Windows 2000 Server operating system.

## Outline of the MSDSS Deployment Procedure

The next two sections describe the procedures for implementing MSDSS in a smaller (local area network [LAN] only) or larger (wide area network [WAN]) network. You should adapt the guidelines to suit your environment and goals.

## Small Environment

A small company with a LAN-based, simple network is often a likely candidate for a quick migration. After doing all the preparations described in the previous section, perform the following steps (adjusted, if necessary, to your situation):

1. Back up your NetWare system and user data.
2. Install and configure a Windows 2000 domain controller (see the documentation that came with your operating system software).
3. Install the Novell Client for Windows 2000 from the Novell website at [www.novell.com/download](http://www.novell.com/download).
4. Replace services or applications that require NDS with software that is compatible with Active Directory. (Remove NDS applications before you begin using MSDSS, except for ZENworks, which can be replaced by IntelliMirror at any time.)
5. Install MSDSS from the system **DomainUtils** share.

 **NOTE:** To access MSDSS software, map a network drive to \\Dellxxxxxx\DomainUtils, where xxxxxx is the system's service tag number. For example, if your service tag number is 1234567, type <http://Dell1234567>.

6. Log in to the NDS tree or bindery server as **administrator**.
7. Log in to the appropriate Windows 2000 domain as a member of the Domain Admins group.
8. On the MSDSS server, open the Help files, and then print out the procedures "To perform a one-time migration" and "To migrate files."
9. Click the **Start** button, and then point to **Programs**→**Administrative Tools**→**Directory Synchronization** to start MSDSS.
10. Follow the instructions as described in the Help printout, "To perform a one-time migration." The prompts guide you through the following steps:
  - a. Right-click **MSDSS** in the console tree, and then click **New Session** to start the New Session Wizard.
  - b. Specify whether objects are to be copied from NDS or Bindery.
  - c. Click **Migration**.
  - d. If you plan to migrate files as well as directory objects, click the **Migrate Files** check box.

You must also run the File Migration utility.
  - e. Specify the path to the Active Directory container in which you want to copy items.
  - f. Accept the default domain controller in which to store the migration log.
  - g. Specify the NDS Container or Bindery Container from which to copy items.
  - h. Provide the name and password of the Novell administrative account.
  - i. On the **Initial Reverse Synchronization** page, specify the password options (such as **Set passwords to the user name**).

When you are performing a migration, this page does not include the option to actually perform an initial reverse synchronization, but it is the page where you specify which password option you want to use.
  - j. Set **synchronization mode** to **default object mapping** or to **custom object mapping**.
  - k. If you selected **custom object mapping**, you are prompted to manually establish one-to-one relationships between pairs of objects.
  - l. Click **Finish**.

After the user accounts are migrated, you can migrate the file system (migrating the users before the files allows you to migrate file-system permissions). Follow the instructions in the Help printout, "To migrate files." The prompts guide you through the following steps:

1. To start the File Migration Utility, click the **Start** button and point to **Programs**→**Administrative Tools**→**File Migration Utility**.
1. To view mapping relationships, click **View Maps**.
1. To view mapped access rights for the users, groups, organization units, and organizations to be migrated, click **Access Rights**.

The **NDS Modify** option converts, by default, to **Read** because it does not have an equivalent NDFS right. You might want to click the **Write** check box to allow read/write access.

1. On the **Step 2 — Security Accounts** tab, verify that you are logged on with the correct Active Directory, NDS, or Bindery credentials.
1. On the **Step 3 — Source and Target** tab under **Source (NDS/Bindery)**, click the volume or directories from which you want to migrate files. Under **Target (Active Directory)**, click the shares or directories to which you want to migrate files, click the **Map** button, and then click **Next**.

If the NDS or Bindery volume you selected in the source tree displays **Unavailable**, then you are not currently logged in to that tree or Bindery server. Log in, and then press <F5> after reselecting the volume to view the directories within the displayed volume.

1. On the **Step 4 — Log File** tab, select your logging options, and then click **Next**.
1. On the **Step 5 — Scan** tab, click **Scan**, and then click **Next**.

The utility scans all source volumes and counts and displays the number of directories and files in each. It ensures that proper access has been given to each source volume, directory, and file. If any errors occur, the utility displays them under **NetWare scan logs** and **Windows scan logs**, respectively. You can select a number of acceptable errors; if this number is exceeded, the process aborts, allowing you to return to previous steps to correct the errors.

1. On the **Step 6 — Migrate** tab, click **Migrate**.

Manually migrate (or use third-party utilities to migrate) object security permissions and system accounts, printer objects, application objects, and other objects that MSDSS does not migrate from Bindery or NDS to Active Directory. (MSDSS migrates NetWare user accounts, groups, and distribution lists for Bindery and NDS, and, for NDS only, MSDSS also migrates NDS organizational units and organizations.)

1. Upgrade your NetWare server(s) to the Windows 2000 Server or Professional operating system.

2. On each Windows desktop in your NetWare network, uninstall Novell Client Access.

You must configure the desktops to join the Windows 2000 domain.

3. Optionally, upgrade NetWare clients (workstations) to the Windows 2000 Professional operating system.
4. Configure all client systems (both Windows and non-Windows), to join the Windows 2000 domain.

Be sure that the users know how to handle their password the first time they log in (for possible password options, see "MSDSS Password Management" in "MSDSS Deployment: Understanding Synchronization and Migration") at [www.microsoft.com](http://www.microsoft.com).

## Medium-Sized or Large Environment

An organization large enough to have WAN links probably selects to synchronize its networks temporarily while performing a gradual migration over time (up to 3 months for a large network), or it prefers to use synchronization to establish a mixed Novell/Windows 2000 network on a long-term basis. If you plan a staged migration, one-way synchronization is often the appropriate choice.

After doing all the preparation described above, perform the following steps (adjusted, if necessary, to your situation):

1. Back up your NetWare user and system data.
2. Install and configure a Windows 2000 domain controller (see the documentation that came with your operating system software).
3. Install the Novell Client for Windows 2000 from the Novell website at [www.novell.com/download](http://www.novell.com/download).
4. Install MSDSS from the NAS system **DomainUtils** share.  
 **NOTE:** To access MSDSS software, map a network drive to \\Dellxxxxxx\DomainUtils, where xxxxxx is the system's service tag number. For example, if your service tag number is 1234567, type `http://DELL1234567`.
5. Log in to the NDS tree or Bindery server with administrative credentials.
6. Log in to the appropriate Windows 2000 domain as a member of the **Domain Admins** group.
7. On the MSDSS server, open the Help files, and then print out the steps (briefly summarized below) for "To perform a one-way synchronization" or "To perform a two-way synchronization."
8. Click the **Start** button, point to **Programs**→ **Administrative Tools**→ **Directory Synchronization** to start MSDSS, and then allow the prompts to guide you through the following tasks:
  - a. Start the New Session Wizard (right-click **MSDSS** in the console tree).
  - b. Select **Novell Bindery** or **Novell Directory Services (NDS)** for one-way synchronization, or select **Novell Directory Services (NDS)** for two-way synchronization.
  - c. Select **One-way synchronization (from Active Directory to NDS or Bindery)** or select **Two-way synchronization (from Active Directory to NDS and back)**.
  - d. Specify the path to the **Active Directory** container into which you want to copy items.
  - e. Accept the default domain controller in which to store the session database.
  - f. Specify the NDS Container or Bindery Container from which to copy items.
  - g. Provide the name and password of the Novell administrative account.
  - h. On the **Initial Reverse Synchronization** page, select **Perform an initial reverse synchronization**.
  - i. Still on the **Initial Reverse Synchronization** page, specify the password options (such as **Set passwords to the user name**).
  - j. On the **Object Mapping Scheme** page, click **Default** (to accept the default mapping for each source and target directory pair) or **Custom** (for NDS only), and then click **Object Mapping Table** (to specify objects for which you want to establish a one-to-one relationship, regardless of the object location in either directory tree).  

MSDSS does not support custom object mapping for Bindery.
  - k. Still on the **Object Mapping Scheme** page, click **Filters** if you want to configure a filter for this synchronization session.
  - l. On the **Session Name** page, accept the default session name or specify a new name.
  - m. Click **Finish**.
9. If you selected one-way synchronization, you should now perform all user, group, and NDS organizational unit container (OU) object management from Active Directory. If you established two-way synchronization, you can now manage user, group, and OU objects from either Active Directory or NDS.
10. If you plan long-term coexistence between Active Directory and NetWare, you are now finished, unless you want to migrate a subset of users, systems, and/or files. If you plan to continue by migrating in stages from NetWare to Active Directory, perform the following tasks in the time-frame that is convenient for you:
  1. Install and configure File and Print Services for NetWare (to allow NetWare clients access to files and printers on Windows 2000 servers) and Gateway Services for NetWare (to allow Windows clients access files and printers on NetWare servers).
  1. Replace services or applications that require NDS with commensurate software compatible with Active Directory. Perform large conversions (such as GroupWise to Exchange) as separate projects.
  1. Migrate the pilot group of users and their files (adapt instructions from the migration steps provided in the "[Small Environment](#)" section). Get the pilot group's feedback, and then set a schedule to migrate additional groups of users, according to the priorities you have established.
  1. Migrate the rest of the users as appropriate (for example, if you migrate the set of applications they use, it is time to migrate them as well).

For more information, see the Novell website at [support.novell.com/servlet/Knowledgebase](http://support.novell.com/servlet/Knowledgebase) and the Windows 2000 website at [www.microsoft.com/windows2000](http://www.microsoft.com/windows2000).

## Using Secure Sockets Layers

This section explains how secure sockets layers (SSL) are used in the NAS system. It also explains how to use your own certificate, if you have one, and how to regenerate your certificate.

### Introduction to SSL Certificates

Certificates contain information used to establish system identities over a network. This identification process is called authentication. Although authentication is similar to conventional forms of identification, certificates enable Web servers and users to authenticate each other before establishing a connection to create more secure communications. Certificates also contain encryption values, or keys, that are used in establishing an SSL connection between the client and server. Information, such as a credit card number, sent over this connection is encrypted so that it cannot be intercepted and used by unauthorized parties.

Two types of certificates are used in SSL. Each type has its own format and purpose. *Client certificates* contain personal information about the clients requesting access to your site, which allows you to positively identify them before allowing them access to the site. *Server certificates* contain information about the server, which allows the client to positively identify the server before sharing sensitive information.

### Server Certificates

To activate your Web server's SSL 3.0 security features, you must obtain and install a valid server certificate. Server certificates are digital identifications containing information about your Web server and the organization sponsoring the server's Web content. A server certificate enables users to authenticate your server, check the validity of Web content, and establish a secure connection. The server certificate also contains a *public key*, which is used in creating a secure connection between the client and server.

The success of a server certificate as a means of identification depends on whether the user trusts the validity of information contained in the certificate. For example, a user logging on to your company's website might be hesitant to provide credit card information, despite having viewed the contents of your company's server certificate. This might be especially true if your company is new and not well known.

For this reason, certificates are sometimes issued and endorsed by a mutually trusted, third-party organization, called a certification authority. The certification authority's primary responsibility is confirming the identity of those seeking a certificate, thus ensuring the validity of the identification information contained in the certificate.

Alternatively, depending on your organization's relationship with its website users, you can issue your own server certificates. For example, in the case of a large corporate intranet handling employee payroll and benefits information, corporate management might decide to maintain a certificate server and assume responsibility for validating identification information and issuing server certificates. For more information, see "[Obtaining a Server Certificate From a Certification Authority](#)."

### PowerVault 725N Certificate

By default, your NAS system has a self-generated and self-signed certificate. The configured SSL port is 1279.

 **NOTE:** For non-SSL communication, use port 1278. This port is not a secure port and all text is sent in plain text over the network.

### Using a Custom Certificate

If a certification authority is present in the network, the administrator can choose to change the default certificate for your NAS system. The administrator must use the wizards to first request a certificate and then apply it to the NAS system.

### Obtaining a Server Certificate From a Certification Authority

 **NOTE:** If you are replacing your current server certificate, the Internet Information Server (IIS) continues to use the old certificate until the new request has been completed.

Find a certification authority that provides services that meet your business needs, and then request a server certificate.

 **NOTE:** For the latest list of certification authorities supporting IIS, see the Microsoft Security website. In the **By Category** list, select **Certification Authority Services**.

To obtain a server certificate, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the NAS system as an administrator.

 **NOTE:** The default administrative user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **System Management**, and then from the list, click **Internet Information Services**.
5. Navigate to and right-click the **Administration** folder, and then select **Properties**.
6. Under **Secure Communications** on the **Directory Security** property sheet, click **Server Certificate** to access the Web Server Certificate Wizard.
7. Use the Web Server Certificate Wizard to create a certificate request.
8. Send the certificate request to the certification authority.

The certification authority processes the request and sends you the certificate.

 **NOTE:** Some certification authorities require you to prove your identity before processing your request or issuing you a certificate.

9. Use the Web Server Certificate Wizard to install your certificate.

For more information about SSL, see the Internet Information Server online help.

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## Troubleshooting

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [Tools and Techniques](#)
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## Tools and Techniques

This section provides suggestions for and information about alternative troubleshooting tools and techniques.

### Ping Your NAS System

If you are unable to connect to the NAS system using the NAS Manager, try to ping the NAS system. From a client system, click the **Start** button, click **Run**, and then type `cmd`. At the command prompt in the `cmd.exe` window, type `ping system_name`, and then press <Enter>.

 **NOTE:** The default system name is DELLxxxxxxx, where xxxxxxx is the system's service tag number. For example, if your service tag number is 1234567, type `http://DELL1234567`.

If you can ping the NAS system but cannot access it through the NAS Manager, your NAS system might still be booting into Microsoft® Windows® and might not have started the Microsoft Internet Information Services (IIS).

 **NOTE:** It may take several minutes for the NAS system to boot.

### My Network Places

If you have a Windows 2000 client system on the same subnet as the NAS system, double-click **My Network Places**. Browse through the network and locate your NAS system.

### System LEDs and Beep Codes

If your NAS system is not booting or responding properly, you can diagnose some problems using the system's LEDs and beep codes. For more information about the LEDs and beep codes, see your system's *Installation and Troubleshooting Guide*.

### Keyboard, Monitor, and Mouse

The NAS system is intended to operate as a "headless" device, meaning that you do not need to connect a keyboard, monitor, and mouse to the system to operate it. However, you can connect a keyboard, monitor, and mouse for troubleshooting, if necessary.

### Terminal Services

You can use the Terminal Services Advanced Client to connect to your NAS system from a client system. You can access Terminal Services Client through the NAS Manager or the **Start** menu.

To access Terminal Services from the NAS Manager, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Enter the administrator user name and password and click **OK**.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

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## Troubleshooting

Use the following tables to help you troubleshoot various conditions that might occur on your NAS system:

- 1 [Table 8-1](#), "General Troubleshooting"
- 1 [Table 8-2](#), "NAS Manager"
- 1 [Table 8-3](#), "Dell ActiveArchive"
- 1 [Table 8-4](#), "Dell OpenManage Array Manager"
- 1 [Table 8-5](#), "UNIX and Red Hat Linux"
- 1 [Table 8-6](#), "Macintosh and AppleTalk"
- 1 [Table 8-7](#), "Netscape Navigator"

### Table 8-1. General Troubleshooting

Issue	Possible Cause	Resolution
I just created a new volume on my system but cannot see the volume on Windows Explorer through Terminal Services.	Terminal Services cannot update to show a new volume during the session in which it was created.	Log off Terminal Services. When you reconnect to Terminal Services, the volume should be visible.
I see the following error message in the event log:  WMI ADAP was unable to load the winspool.drv performance library due to an unknown problem within the library: 0x0	This is an issue with the WDAP Performance library and is documented on Microsoft's website.	Connect to the system via Terminal Services Advanced Client, and then open a local command prompt. Type the following command: WINMGMT/CLEARADAP. When the prompt returns, type WINMGMT/RESYNCPERF winmgmt service PID.
I have just brought up my new NAS system on the network, but I am unable to upload files using FTP even though I am the administrator.	By default, no user has write privileges on the default FTP site.	The FTP permissions must be configured using the Microsoft Management Console (MMC). To access the MMC, click <b>Computer Management</b> on the <b>Advanced Administration Menu</b> , which is available through Terminal Services. See the online help for specific information about configuring this service.
I have deleted an FTP share and folder from my NAS system. However, when I use Terminal Services to confirm the removal, I can still see the shared folder in the FTP section of the MMC.	By default, this folder is not deleted by the NAS Manager.	Manually remove this listing from the listed shared folders in the FTP section of the MMC.
I cannot connect to or ping the NAS system after turning it on.	The NAS system has not finished booting.	Wait at least 5 minutes for the NAS system to finish booting. If you still cannot connect, attempt the procedures in " <a href="#">Solutions to Try Before Reinstalling</a> " in "Recovering and Restoring the System."
After using Terminal Services to connect to my NAS system, I am unable to type using my native language.	The NAS system is set to English, the default language.	You can install your native language character set from the <i>Multilingual Support</i> CD that was shipped with your system. For installation instructions, see " <a href="#">Advanced Features</a> ."
During a Terminal Services session to the NAS system, I mapped a network share from the NAS system. Now the system does not reboot correctly and hangs during shutdown.	Having a share mapped from the NAS system causes the system to hang during shutdown.	Make sure that when you map a share, you do not select <b>Reconnect at logon</b> . To disconnect the drive, right-click <b>My Appliance</b> on the NAS system desktop, and select <b>Disconnect Network Drive</b> . Click the share that you previously mapped in the <b>Disconnect Network Drive</b> window, and then click <b>OK</b> .  If you cannot log in to the NAS system, reboot the system. Then connect using Terminal Services and disconnect the drive. If Terminal Services does not work, try connecting a keyboard, monitor, and mouse directly to the NAS system. See " <a href="#">Configuring Your System Using a Keyboard, Monitor, and Mouse</a> " in "Initial Configuration."
The <b>Telnet</b> option in the NAS Manager does not allow me to enable Telnet on the NAS system, even though I have selected the check box next to <b>Enable Telnet access to this NAS system</b> on the <b>Telnet Administration Configuration</b> page.	This option is not enabled.	To enable Telnet on your NAS system, perform the following steps:  <ol style="list-style-type: none"> <li>1. From the NAS Manager primary menu, click <b>Maintenance</b>→<b>Terminal Services</b>.</li> <li>2. Log in to the NAS system as an administrator.</li> <li>3. If the <b>Advanced Administration Menu</b> is displayed, click <b>Exit</b> to close it.</li> <li>4. Right-click <b>My Appliance</b>.</li> <li>5. Click <b>Manage</b>.</li> <li>6. Double-click <b>Services and Applications</b>→<b>Services</b>.</li> <li>7. Locate and right-click <b>Telnet</b>, and then click <b>Start</b>.</li> </ol> Telnet starts on the NAS system.
I cannot connect to the NAS system using the IPX protocol.	IPX networks require that you assign an IPX network number to all clients. By default, the NAS system does not assign an IPX number to the network.	Change the IPX protocol on the NAS system to manually detect frame types. See " <a href="#">Configuring the IPX Protocol</a> " in "Advanced Features."
I am trying to install the Computer Associates ARCserve Remote Agent on the NAS system by mounting the CD share that contains the <i>Computer Associates ARCserve</i> CD. However, I am having trouble installing the program.	The Computer Associates installer does not work properly when installing from a CD share mounted on your NAS system.	To install the Computer Associates ARCserve Remote Agent, copy the CD contents to drive C of your NAS system. Then run the installer from the NAS system.
After restoring files from a backup, the modified dates of folders are inconsistent.	The modified dates of folders reflect either the date you performed the restore or the date the folder was modified.	Take no action. This is a design issue that occurs only with folders; the files' modified dates are consistent.
The <b>Advanced Administration Menu</b> does not display anymore.	You were not logged off of Terminal Services before you closed the <b>Terminal Services</b> window.	Log off Terminal Services by clicking the <b>Start</b> button on the NAS system and logging off.

Table 8-2. NAS Manager

Issue	Possible Cause	Resolution
I am trying to select the <b>Administer My Appliance</b> link on the opening page of the NAS Manager, but the link does not function properly.	The user account that you used to log in to the domain does not have administrator privileges. The link does not work for users without administrator privileges.	Type the address of the NAS Manager in your browser. For SSL connections, type: <code>https://servername:1279</code> or <code>https://IPaddress:1279</code>  For non-SSL connections, type: <code>http://servername:1278</code> or <code>http://IPaddress:1278</code>
I have just deleted a volume, and now I am unable to view my shares in the NAS Manager.	In the event that a volume with shares is deleted, the NAS Manager cannot display any shares until the shares that were directed to the deleted volume are removed.	Use Terminal Services Advanced Client to remove the shares for the deleted volume. Exit the NAS Manager, and restart the system. The shares should now be visible.
I have just added an HTTP share but cannot see it from the NAS Manager.	For security purposes, directory browsing is not enabled by default on an HTTP share directed to the same folder or volume as	To enable directory sharing for an HTTP share, from the NAS Manager <b>Maintenance</b> page, click <b>Terminal Services Advanced Client</b> , and then modify the Web sharing properties of the folder.

	another share.	
I have just changed the IP address of my system, and now I cannot administer it through the NAS Manager.	Although the IP address changed, your local host is still trying to communicate with the system using the old IP address. It takes <b>approximately 15 minutes for the IP address</b> to automatically update on most networks.	Close Microsoft Internet Explorer (or for Red Hat Linux only, Netscape Navigator 6.2.2 or later). Reconnect using the newly created IP address. Type: <code>https://IPaddress:1279</code> . It takes approximately 15 minutes for the DNS server to recognize the new IP address.
I can only see the first 100 items in the NAS Manager Web user interface.	The NAS Manager will only display 100 items per page.	To display the next 100 items, click the down-arrow icon at the top of the list.
In the NAS Manager, if I click <b>OK</b> and then click <b>Cancel</b> , it doesn't seem to cancel the operation.	Cancel does not dynamically stop an update to the system after you click <b>OK</b> .	If an operation has been performed in error, the system administrator must change the setting back manually.
When I select the <b>Check All</b> box and then deselect one or more choices on some screens in the NAS Manager, the <b>Check All</b> box remains selected.	The <b>Check All</b> box is not automatically deselected. However, this does not mean that all items in the list are selected.	This behavior does not affect functionality. The <b>Check All</b> box does not indicate what has specifically been selected or deselected.
I have changed the password for the administrator account; however, several minutes have passed and I have not been queried for the new password.	The NAS Manager does not automatically refresh the account information for the administrator while in the NAS Manager. Instead, it performs the refresh as a timed function.	The password was successfully changed. If you want to confirm that the new password is in effect, close the browser, and then reconnect. The new password should work, but the old one should not.
I am looking for a topic on the context-sensitive online help in the NAS Manager, but it says No Topic Available.	Some sections of the NAS Manager do not have context-sensitive help.	For information on a specific function, see the Windows Powered Help, which is available through Terminal Services by clicking <b>Windows Powered Help</b> on the <b>Advanced Administration Menu</b> , or see the appropriate section in this <i>Administrator's Guide</i> .
I tried to clear the FTP log or the Web (HTTP) Shares log in the <b>Maintenance</b> section of the NAS Manager, but I received an error message and the log was not cleared.	The logs are currently locked by the NAS system for the FTP service and to support the NAS Manager. The logs cannot be cleared in the NAS Manager.	Connect to the NAS system using Terminal Services and clear these logs by using MMC. You can access MMC by clicking <b>Computer Management</b> on the <b>Advanced Administration Menu</b> , which is available through Terminal Services.
While viewing the properties of a user, I selected the <b>General</b> tab. The fields for this user are now all blank.	You were already on the <b>General</b> tab and the page did not refresh properly.	Select <b>Cancel</b> or click <b>Back</b> on your browser. Then reselect the user for whom you wanted to view properties.
I added members to a local group using the NAS Manager, but when I click <b>OK</b> , the screen only refreshes.	You might have removed and then added the same member to the local group. This may cause the screen to refresh instead of update correctly.	Reselect the <b>Local Groups</b> tab in the NAS Manager primary menu. Then add or remove the appropriate members to or from the local group.
I cannot change the WINS addresses when I click <b>Network</b> on the NAS Manager primary menu, click <b>Network Interfaces</b> , and then click <b>WINS</b> in the <b>Tasks</b> list.	The NAS Manager grays out the <b>WINS Servers Configuration</b> page unless you set the <b>IP Address Configuration</b> page to <b>Use the following IP settings</b> .	To set the WINS addresses from the NAS Manager, click <b>Network</b> on the primary menu, click <b>Interfaces</b> , and click <b>IP</b> in the <b>Tasks</b> list. On the <b>IP Address Configuration</b> page, click the radio button for <b>Use the following IP settings</b> , and then type the IP address, Subnet mask, and the default gateway in the appropriate text boxes.

**Table 8-3. Dell ActiveArchive**

Issue	Possible cause	Resolution
I cannot access my Dell ActiveArchive™ persistent images from a UNIX® Network File System (NFS) or Macintosh client.	Only Microsoft Windows (CIFS) clients can access the persistent images stored in the <b>ActiveArchive</b> folders for each volume.	Access the <b>ActiveArchive</b> folders through the Windows client to perform data recovery.
The <b>XCOPY</b> command does not copy my persistent images.	<b>XCOPY</b> cannot read the persistent images on a volume.	Do not use <b>XCOPY</b> to copy persistent images. Copy the files manually in Windows Explorer.
After I take a new persistent image, the definition of the persistent image is blank, or the persistent image does not show at all in the persistent images list.	The NAS Manager must complete a refresh cycle before it can correctly show the persistent image.	If this is the first persistent image, wait several minutes and check again. If this is a subsequent persistent image, wait for the NAS Manager to complete a refresh or press <F5>.
When I click <b>Restore Defaults</b> on the <b>Global Settings</b> page in Dell ActiveArchive after taking a persistent image, it changes my cache file size and the area is grayed out.	After you take a persistent image, you cannot change the cache file size; therefore, clicking <b>Restore Defaults</b> does not change the cache file size. To verify the cache file size, look at the cache file size on the <b>Volume Settings</b> page. You should see that it has reverted back to the original cache file size that you set before taking a persistent image.	Take no action. Dell ActiveArchive is functioning as designed.
I get a permission error when I try to access my persistent images from an HTTP or FTP share.	Accessing the persistent image directory through HTTP or FTP is not supported.	If you need to access your persistent image directory, connect to the system through a Terminal Services Advanced Client session and use Windows Explorer in the NAS system to access them.
When the maximum number of persistent images (250 by default) has been reached and I continue to take more of them, lower-priority persistent images are overwriting the existing higher-priority persistent images.	If a persistent image is taken manually or by schedule, ActiveArchive takes the persistent image even if the maximum number of persistent images has been reached. Therefore, the new persistent image must overwrite an existing persistent image. By design, the new persistent image writes over the oldest, lowest-priority persistent image available, even if it is a higher-priority persistent image than the one currently being taken.	Take no action. ActiveArchive is functioning as designed.
I noticed that the date and time for the <b>ActiveArchive</b> directory changes every time I reboot my NAS system.	The <b>ActiveArchive</b> directory date and time are reset at each reboot. The new dates and times do not change the dates and times of your persistent images.	Take no action. This is the normal functionality of ActiveArchive.
I have deleted a persistent image, but when the <b>Persistent Images</b> page redisplay I can still see the persistent image. If I try to delete it again, I get a blank page.	In some environments, the <b>Persistent Images</b> page in the NAS Manager refreshes too quickly.	Wait a few seconds and refresh the page. You should see that the persistent image you deleted is no longer listed.

When I try to take a persistent image, a critical error message states that the snapshot could not be taken.	ActiveArchive may still be deleting or restoring a volume or taking another snapshot.	Wait a few minutes for the previous process to complete and then try again.
In the event log or on the <b>Status</b> page, a message states: An exception has occurred. The data contains the exception record.	This is a known issue.	Ignore this message. The NAS system is functioning normally.
After restoring a volume from a persistent image, I cannot mount to a share on that volume from a Linux client.	During the restore, the volume is dismounted.	From the NAS Manager, restart NFS, and then remount to a share on the volume.
The % symbol does not show in the ActiveArchive event logs.	ActiveArchive event log messages that tell you how full the cache file is and how close the system is to the maximum allowed snapshots are generated messages. These messages do not include the % symbol.	Take no action. The NAS system is functioning as designed.

**Table 8-4. Dell OpenManage Array Manager**

Issue	Possible cause	Resolution
After repairing a volume in the NAS Manager, one or more disks show as "missing" in Dell OpenManage™ Array Manager.	The repair does not actually delete the disks, although the disks are displayed as missing.	Take no action. Your NAS system is still operating correctly.

**Table 8-5. UNIX and Red Hat Linux**

Issue	Possible cause	Resolution
I cannot access the Terminal Services Advanced Client through the NAS Manager from my Red Hat Linux client system using the Netscape browser.	The Terminal Services Advanced Client is not supported by the Red Hat Linux operating system and does not work with the NAS Manager.	Use a Windows client system to manage the NAS system through a Terminal Services Advanced Client session.
While updating client access to an NFS share, the <b>No Access</b> option is displayed, but the <b>Root</b> option is not.	Only the <b>All Machines</b> category options are displayed during this update.	Add the appropriate clients, and then select <b>OK</b> . After you have added the client, navigate back to the <b>NFS</b> tab for this share and select the correct options for the individual <b>Client Machines</b> .
Every time I try to obtain a directory listing from an NFS client on the root of a system volume, I get an error message, such as <b>Permission Denied</b> .	The problem you are experiencing involves a <b>System Volume Information</b> directory created by Microsoft Index Server. The NFS service does not have access to this directory and returns an error message to the client when trying to list its properties.  This issue only occurs when sharing the root of a drive letter.	Ignore this error. The <b>System Volume Information</b> directory is not used by NFS clients or your system by default.
Sometimes I am unable to delete folders that have been used and that are shared to an NFS client.	This is a situation that occurs with NFS discretionary access lists (DACLS) and inheritance. When the folder to be shared is created, the only access control entry (ACE) created by default is <b>Everyone</b> with <b>Full Control</b> . When an NFS client creates a directory or a file in this directory (mounted share), Services for UNIX (SFU) creates a new DACL that replaces the inherited <b>Everyone</b> with <b>Full Control</b> ACE. This DACL contains an <b>Everyone</b> ACE with the appropriate UNIX file creation access and may contain two other ACEs for the mapped user and group. If this happens, the administrator of the Windows client cannot delete the file or directory unless that administrator takes ownership through the Windows system and changes the access.	As the administrator, use a Windows client system to take ownership and change the access to allow yourself to delete the share folders.  When you delete the NFS share folders, ensure that there are no open file handles for the share. If you are unsure, delete the share, and then restart NFS.
When updating client access to an NFS share, the <b>All Machines</b> client group is reset from the <b>No Access</b> access type to <b>Read-Write</b> access.	The NAS Manager might reset the <b>All Machines</b> client group to <b>Read-Write</b> when there are no clients that have read-only or read-write access.	Add a client that has read-write or read-only access, and then set the <b>All Machines</b> client group to <b>No Access</b> .
My NAS system is experiencing low NFS performance.	NFS write-back cache is disabled.	Enable NFS write-back cache to improve performance. See "Advanced Features" for more information.
The BIG5, EUC-KR, EUC-TW, GB2312-80, KSC5601, and Shift-JIS character encoding schemes for NFS shares cannot be specified in the NAS Manager.	The NAS Manager user interface supports only EUC-JP and ANSI character encoding for NFS shares.	Access the NAS system's desktop and modify the NFS share properties of the folder directly.
The NFS client group <b>All Machines</b> is reset to <b>No Access</b> when another client group is set with the same access permissions and root.	Setting a client group to use the same permissions as <b>All Machines</b> causes <b>All Machines</b> to be reset to <b>No Access</b> .	Access the NAS system's desktop and modify the NFS share properties of the folder directly.
I am getting inconsistent map definitions when I use the NAS Manager and the SFU MMC to create user name maps.	Modifications to user name maps are cached and may not take effect immediately.	Use only one tool to administer user name maps.

**Table 8-6. Macintosh and AppleTalk**

Issue	Possible cause	Resolution
I am getting event errors for Services for Macintosh.	Services for Macintosh are bound to the onboard network interface controller (NIC) by default. If this NIC has been	Bind the AppleTalk protocol to an enabled NIC. See "AppleTalk Protocol Adapter

	disabled, binding errors occur.	Binding" in "Advanced Features."
From a Macintosh client, users cannot modify or delete a file that a Windows client has accessed.	The time between clients and the system is not properly synchronized.	Make sure that clients have their time <b>synchronized to within 10 minutes of the time zone.</b>
I have rebooted my NAS system from a Macintosh client. Several minutes have passed and my NAS system has not rebooted or the page has not refreshed.	The most likely cause is that the NAS system has come back online, but the client screen has not refreshed because the NAS Manager does not automatically refresh the screen when the NAS system has finished rebooting.	Close Internet Explorer, and then reconnect to the NAS Manager. The NAS system should behave normally.
From a Macintosh client, I cannot connect to the administration part of the NAS Manager by using the <b>Administer This Appliance</b> link on the <b>HTTP Shares</b> page.	The internally generated certificate is not supported by Internet Explorer for Macintosh.	You can administer the NAS system by using the address <code>http://servername:1278</code> ; however, this is a nonsecure link.
After modifying properties of the AppleTalk protocol, File Services for Macintosh does not restart.	File Services for Macintosh can not establish communication to the local RPC service.	Restart the workstation service. See " <a href="#">Restarting Workstation Services</a> " in "Advanced Features."

**Table 8-7. Netscape Navigator**

Issue	Possible cause	Resolution
I cannot use the <b>Back</b> button in Netscape Navigator for the online help in the NAS Manager.	This feature is not supported.	Use the <b>Previous Topic</b> link to navigate back to earlier topics.
I get a password prompt when navigating through Local Groups in the NAS Manager using Netscape Navigator on Red Hat Linux.	The password prompt is generated by Netscape and does not require re-authentication. The administrator is being asked whether the password that was used to access this screen should be saved.	Select <b>Do not Prompt Me Again</b> , and this message will not display in the future.
I am using Netscape Navigator to administer my NAS system through the NAS manager. A long gray bar at the bottom of the screen is covering the <b>OK</b> and <b>Cancel</b> buttons.	The page has not finished loading.	Use one of the following resolutions: <ul style="list-style-type: none"> <li>1 Wait for the page to finish loading.</li> <li>1 Refresh the page several times.</li> </ul>

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## Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

• [Notes, Notices, and Cautions](#)

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### Notes, Notices, and Cautions



**NOTE:** A NOTE indicates important information that helps you make better use of your computer.



**NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



**CAUTION:** A CAUTION indicates a potential for property damage, personal injury, or death.

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## Initial Configuration

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [Configuring Your NAS System for the First Time](#)
  - [Other Documents You May Need](#)
- 

This section provides information necessary to perform the initial configuration of the system.

The NAS system is a "headless" system that is managed through the network; it can be operated without a keyboard, monitor, or mouse. The NAS system is configured and managed using the Web-based Dell™ PowerVault™ NAS Manager, which can be accessed from a client system on the same network. See the "[NAS Manager](#)" section in this guide for more information. For certain configuration tasks and for troubleshooting, you can connect a keyboard, monitor, and mouse.

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## Configuring Your NAS System for the First Time

You can configure your system in several ways, depending on whether Dynamic Host Configuration Protocol (DHCP) is installed on your network:

1. If DHCP is installed on your network, your system automatically configures the network settings. If you are unsure whether your network uses DHCP, contact your network administrator. See "[Configuring Your NAS System Automatically on a Network \(With DHCP\)](#)" in this section of the guide.
1. If DHCP is not installed on your network, you can configure your system using the Dell OpenManage™ Kick-Start utility. See "[Configuring Your System Using the Kick-Start Utility](#)" in this section of the guide.
1. You can use a keyboard, monitor, and mouse connected directly to the NAS system. See "[Configuring Your System Using a Keyboard, Monitor, and Mouse](#)" in this section of the guide.

## Configuring Your NAS System Automatically on a Network (With DHCP)

1. Connect one end of the power cable to the NAS system and the other end to an electrical outlet.
2. Connect one end of an Ethernet cable into one of the two NIC connectors on the back of your NAS system.

For more information about the location of system connectors, see the *User's Guide*.

3. Connect the other end of the Ethernet cable to a functioning Ethernet jack, and verify that the link LED on the NIC connector is illuminated.

If the LED is not illuminated, ensure that each end of the Ethernet cable is seated properly in the NIC connector and the Ethernet jack.

4. Push the power button to turn on the NAS system.

The NAS system retrieves the required information (the IP address, gateway subnet mask, and DNS server address) from a DHCP server on the network.

 **NOTE:** It may take several minutes for the NAS system to boot.

5. From a client system on the same network, launch Microsoft® Internet Explorer 5.5 or later (or for Red Hat® Linux only, launch Netscape Navigator 6.2.2 or later), type the default system name in the Web address field, and press <Enter>.

The default system name is DELLxxxxxx, where xxxxxx is the system's service tag number, which is located on the top of the system. For example, if your service tag number is 1234567, type `http://DELL1234567`.

 **NOTE:** If you cannot connect to the system through a Web browser, you must use another method to configure the IP address, gateway subnet mask, and DNS server. See "[Configuring Your NAS System for the First Time](#)" in this section of the guide.

6. Enter the default administrator user name and password for your system when prompted, and then click **OK**.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

7. Use the NAS Manager to begin setting up shares and volumes on the NAS system.

See the "[NAS Manager](#)" section in this guide for more information.

## Configuring Your System Using a Keyboard, Monitor, and Mouse

 **NOTE:** To perform this procedure, you need a unique static IP address, as well as a subnet and gateway address.

1. Connect one end of the power cable to the NAS system and the other end to an electrical outlet.
2. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

3. Push the power button to turn on the NAS system.

 **NOTE:** It may take several minutes for the NAS system to boot.

4. Log in to the NAS system.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

5. If the **PowerVault Advanced Administration Menu** appears, click **Exit**.
6. Right-click **Network Places** and select **Properties**.
7. Right-click **Local Area Connection** for the NIC that you will use to connect the NAS system to the network.
8. In the **Local Area Connection Properties** window, click **TCP/IP** and then click **Properties**.
9. Click **Use the following IP address**.
10. Enter the IP address, subnet, and gateway.
11. Click **OK** and restart the system when prompted.

For more information, see "[Configuring the Network Address for the NAS System](#)" in the "NAS Manager" section of this guide or your Microsoft Windows® operating system's online help.

For more information about configuring the second NIC, see "[Configuring Network Properties](#)" in the "NAS Manager" section of this guide.

## Configuring Your System Using the Kick-Start Utility

 **NOTE:** Perform the procedures in this section only if you cannot configure your NAS system using a DHCP server on the network. See "[Configuring Your NAS System Automatically on a Network \(With DHCP\)](#)" in this section of the guide.

1. Connect one end of the power cable to the NAS system and the other end to an electrical outlet.
2. Connect one end of an Ethernet cable into one of the two NIC connectors on the back of your NAS system.

For more information on the location of system connectors, see the *User's Guide*.

3. Connect the other end of the Ethernet cable to a functioning Ethernet jack.
4. From a client system on the same network, enable the Kick-Start utility and create your DHCP settings:
  - a. Insert the *Resource* CD into the CD drive of the client system.
  - b. When the *Resource* CD window displays, click **Dell OpenManage Kick-Start**.
  - c. Click **Run Dell OpenManage Kick-Start**.
  - d. If a security warning appears, click **Yes**.
  - e. When asked if you want to run the program, click **Yes**.

- f. At the bottom of the **Dell OpenManage Kick-Start** window, click **Setup**.
  - g. Click **Add**.
  - h. In the **Add Scope** window, type the following information and click **OK**:
    - 1 **Starting IP Address:** 10.40.10.10
    - 1 **Ending IP Address:** 10.40.10.20
    - 1 **Subnet:** 255.255.255.0
    - 1 **Gateway IP Address:** 10.40.10.1
-  **NOTE:** Ensure that the client system is on the same subnet as the NAS system. Because the NAS system is assigned an address on the 10.40.10.x subnet, the client system IP address must also be statically assigned to the 10.40.10.x subnet.
- i. Click **OK** to close the **Add Scope** window.
  - j. Click **Interfaces for DHCP Server** so that it is checked.
  - k. Click **OK** to close the **DHCP Server Setup** window.
5. Click **Enabled** at the bottom of the **Dell OpenManage Kick-Start** window to start the integrated DHCP server.
  6. Push the power button to turn on the NAS system.

After the system boots, it is displayed in the **Discovered Systems** list of the **Dell OpenManage Kick-Start** window.

-  **NOTE:** It may take several minutes for the NAS system to boot, depending on your configuration.
7. Click the NAS system in the **Discovered Systems** list.
  8. Click **Launch Configuration Tool** to launch the NAS Manager.

The **Configuring** icon is displayed for 5 minutes after you click **Launch Configuration Tool**. If the agent is still running after 5 minutes, the icon displays "Ready."

9. Use the NAS Manager to configure the NAS system's IP address.

See "[Configuring the Network Address for the NAS System](#)" in the "NAS Manager" section of this guide.

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## Other Documents You May Need

 The *System Information Guide* provides important safety and regulatory information. Warranty information may be included within this document or as a separate document.

- 1 The *Rack Installation Guide* included with your rack solution describes how to install your system into a rack.
- 1 The *Setting Up Your System* document provides an overview of initially setting up your system.
- 1 The *User's Guide* provides information about system features and technical specifications.
- 1 The *Installation and Troubleshooting Guide* describes how to troubleshoot the system and install or replace system components.
- 1 Documentation for any components you purchased separately provides information to configure and install these options.
- 1 Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

 **NOTE:** Always read the updates first because they often supersede information in other documents.

- 1 Release notes or readme files may be included to provide last-minute updates to the system or documentation or advanced technical reference material intended for experienced users or technicians.

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## NAS Manager

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The Dell™ PowerVault™ NAS Manager is a Web-based user interface that is the primary tool for configuring NAS systems. This section provides basic information on using the NAS Manager, including how to log on and navigate the interface, configuring network properties and IP addresses, creating users, using shares and disk quotas, and managing disks and volumes.

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## Determining if a NAS System Uses Software RAID or Hardware RAID

Your NAS system is available from Dell in either a software-RAID or a hardware-RAID hard-drive configuration. In a software-RAID hard-drive configuration NAS system, the RAID functionality is configured by the Microsoft® Windows® Powered operating system. The hard drives in a hardware-RAID hard-drive configuration NAS system are controlled by a RAID controller card installed in a PCI expansion slot inside the NAS system.

- ➔ **NOTICE:** The software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable between the two types of NAS systems. The hardware RAID hard-drive carriers have a "HW-RAID" identification label on them and the software RAID hard-drive carriers have a "SW-RAID" identification label.

The RAID hard-drive configuration of the NAS system affects some of the NAS Manager configuration procedures. Therefore, determine the RAID configuration of your NAS system before continuing with other sections in this guide.

Use one of the following methods to determine the RAID configuration:

1. Check the RAID hard drive configuration on the NAS system **System Version** screen.
  - a. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

- b. Click **Status**.
- c. Click **System Version**.

The **System Version** screen appears and the **Disk Configuration** row lists the system as either **Hardware RAID** or **Software RAID**.

1. Check if the system has a RAID controller card installed in a PCI expansion slot as explained in the *Installation and Troubleshooting Guide*. If so, the NAS system is hardware RAID. (A software-RAID NAS system does not have a RAID controller card installed in a PCI expansion slot.)

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## Logging in to the NAS Manager

To use the NAS Manager, you must be logged in as an administrator. You can log in only if the NAS system is on the network or if you are connected directly to the NAS system using a keyboard, monitor, and mouse.

To log in to the NAS Manager, perform the following steps:

1. Open a Web browser from a client system.

The NAS Manager supports clients running Microsoft Internet Explorer 5.5 or later (or Netscape Navigator 6.2.2 or later for the Red Hat® Linux operating system).

2. Type in the name of the NAS system in the Web address field, and then press <Enter>.

The default system name is Dellxxxxxxx, where xxxxxxx is the system's service tag number, which is located on the top of the system. For example, if your service tag number is 1234567, enter `http://DELL1234567`.

The NAS Manager is served on port 1279 and is accessed using the following Web address: `https://systemname:1279` or `https://system_ipaddress:1279`, where *systemname* is Dellxxxxxxx (xxxxxxx is the system's service tag number). For example, if your service tag number is 1234567, you would enter `https://DELL1234567:1279`. Port 1279 uses secure socket layer (SSL) to encrypt data going to and coming from the NAS system to provide data security.

 **NOTICE:** Although port 1278 can be used, it uses plain text authentication, which can be a significant security risk. Therefore, using port 1278 is not recommended.

3. When the **Enter Network Password** window displays, type the administrator user name and password and then click **OK**.

 **NOTE:** The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

4. Click **Administer this server appliance**.
5. When the **Security Alert** window displays, click **Yes**.
6. When the **Enter Network Password** window appears again, enter the same user name and password that you entered in [step 3](#), and then click **OK**.

You are now logged in to the NAS Manager.

## Default Administrator User Name and Password

When logging into the NAS system for the first time, you must enter an administrator user name and password. The default administrator user name for your NAS system is `administrator` and the default password is `powervault`.

---

## Basic Navigation

When navigating the NAS Manager, use the buttons within the program to go backward and forward.

The top of each page of the Web user interface (UI) displays a status area, as well as primary and secondary menu bars, and the body of each page displays specific content related to each functional area.

## Status Area

The following information is displayed in the top band of the NAS Manager Web UI:

- 1 System host name
- 1 System status, which displays the following status conditions:
  - o Normal (green text)
  - o Informational (grey text)
  - o Warning (yellow text)
  - o Critical (red text)

Clicking **Status: <status\_type>** takes you to the **Status** page.

- 1 Microsoft Windows Powered logo

## Primary Menu

The primary menu bar below the status area allows you to choose from the following menu items:

- 1 **Welcome** — Allows you to take a tour and set the administrator password, NAS system name, and default page.
  - 1 **Status** — Provides information about alerts and other status.
  - 1 **Network** — Provides access to basic network setup tasks such as setting the NAS system name, configuring properties of network interfaces, configuring global network settings, setting IP addresses and ports for the administration website, configuring Telnet, and changing passwords.
  - 1 **Disks** — Allows you to configure disks and volumes, set disk quotas, and create snapshots (or persistent images).
  - 1 **Users** — Enables you to create, edit, and delete local users and groups.
  - 1 **Shares** — Enables you to manage local folders and create or modify file shares.
  - 1 **Maintenance** — Allows you to perform maintenance tasks such as backup and restore, apply software updates, check logs, change the language of the NAS Manager, and access the Terminal Services Advanced Client.
  - 1 **MDM** — Allows you to configure multiple device management (MDM) settings.
  - 1 **Help** — Provides access to online Help for network attached storage.
- 

## Changing the NAS Manager Language

The NAS Manager is available in different languages. To change the NAS Manager language, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Language**.
4. Click the radio button next to the language you want to use.
5. Click **OK**.
6. Reboot the system when prompted.

The NAS system reboots, and the changes are complete after the reboot.

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## How to Find Online Help

The NAS Manager provides two kinds of help. The NAS Manager online help provides information about NAS Manager functionality and procedures. The Windows Powered operating system online help, which you can access through the Terminal Services on the **Maintenance** page, documents the functionality of the Windows Powered operating system.

Also, most other software applications have online help that you can access when you use those applications.

To access NAS Manager Help, use one of the following methods:

- 1 Click **Help** on the primary menu; the NAS Manager screen is replaced by a split **Help** screen that displays a table of contents on the left and topics on the right.
- 1 Click the question mark icon at the far right of the primary menu to access the context-sensitive help topic related to the current page.

To start Windows Powered help, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.

4. Log in to the NAS system.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

5. Perform one of the following procedures:
    1. From the **Start** menu, click **Help**.
    1. On the **Advanced Administration Menu**, click **Administrative Tools**, and then click **Windows Powered Help**.
- 

## Configuring Network Properties

Use the **Network** tab in the NAS Manager to configure the NAS system for the network. This section provides information for setting up your NAS system on the network, including naming the system, defining the IP address, and configuring the NIC.

### Naming the NAS System

By default, the NAS system uses your service tag number as the system name. To change the name of the NAS system, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Network**.
3. Click **Identification**.
4. Type a new name for the NAS system in the **Server appliance name** field.
5. Click **OK**.
6. Click **OK** to reboot, or click **Cancel**.

Until you reboot the system, the new name will not take effect. Use the new name when you connect to the NAS Manager.

### Configuring the Network Address for the NAS System

If you have a DHCP server on your network, you do not need to configure your NAS system's IP address because DHCP automatically assigns an address to the NAS system. If you do not have a DHCP server on your network, you must set the address for the NAS system through the NAS Manager.

 **NOTE:** To configure an IP address for another interface such as DNS, WINS, or AppleTalk, see your NAS Manager online help.

 **NOTE:** Before you configure the IP address on a network adapter, ensure that the NAS system is connected to the network through that adapter.

To configure the IP address, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Network**, and then click **Interfaces**.
3. Select the radio button beside the network connection that you want to configure.

 **NOTE:** If some of the text is missing due to column width, pass your cursor over the text in the column to see a pop-up window with a full description.

4. Click **IP** and select **Use the following IP settings**.
5. Enter the desired IP address, subnet mask, and default gateway.

If you do not have this information, contact your system administrator.

6. Click **OK**.

The network address setup is complete.

 **NOTE:** When you change the IP address, you may be unable to access the NAS Manager until you reboot the NAS system, or for approximately 15 minutes until the network recognizes the new IP address. You can also try to access the NAS system by typing `https://new_ip_address:1279` in the NAS Manager, where `new_ip_address` is the new address that you just set.

---

## Creating Users

A user is a person or group that has access to the shares on the NAS system. You create users after you configure the network properties of your NAS system.

### Creating a Single Local User

 **NOTE:** In a domain environment, you cannot create domain users.

1. Log in to the NAS Manager.
2. Click **Users**.
3. Click **Local Users**.
4. On the **Local Users on Server Appliance** page, click **New**.
5. Complete the information on the **Create New User** page.

 **NOTE:** In a domain environment, do not create local users that have the same user name as domain users unless the local user and domain user have identical passwords.

The **Home Directory** text box specifies a new directory that will be created and to which the user will have exclusive access permission. The directory name is the same as the user name and is located in the path specified.

6. Click **OK**.

### Creating a Group of Local Users

 **NOTE:** In a domain environment, you cannot create domain groups. However, you can add domain users to your local groups.

1. Log in to the NAS Manager.
2. Click **Users**.
3. Click **Local Groups**.
4. On the **Local Groups on Server Appliance** page, click **New**.
5. On the **Create New Group** page, enter the name and description of the group.
6. Click **Members**.
7. Select the members of the group by performing one of the following:
  1. In the **Add user or group** box, select a local user or group from the list, and then click **Add**.
  1. Type the domain and group name (`domain\group_name`) of a domain group or of a domain user account (`domain\user_name`) and then click **Add**.

 **NOTE:** If you are adding a domain group, you must also enter the user name and password that will allow you to add from that domain.

8. Click **OK**.
- 

## Using Shares

A share is a folder on the NAS system that is shared with other systems on the network, whether those systems are running a Windows, Novell® NetWare®, Macintosh, or UNIX® operating system.

A NAS system supports the following methods of sharing folders:

- 1 CIFS — The Common Internet File System protocol is used by clients running a Windows operating system.
- 1 NFS — The Network File System protocol is used by clients running UNIX.
- 1 FTP — The File Transfer Protocol is an alternative way of accessing a file share from any operating system.
- 1 HTTP — The Hypertext Transfer Protocol is the protocol for accessing a file share from Web browsers.
- 1 AppleTalk — The AppleTalk protocol is used by clients running a Macintosh operating system.
- 1 NetWare — The NetWare protocol is used by NetWare clients.

 **NOTE:** The AppleTalk and NetWare protocols are disabled by default on the NAS system. See the "[Advanced Features](#)" section of this guide for information about enabling these protocols.

## Adding a Share

To create a share, you must supply a share name that is different from all other shares on the system. This is the name that the client system uses to access the share. Some protocols also support the inclusion of a comment or brief description of the share. Additionally, you must enable at least one of the available protocols.

 **NOTICE:** To make the shares more fault-tolerant, create your data shares on the data drives.

To add a share, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Tasks** list on the **Shared Folders** page, click **New**.
5. Type the share name and share path.

 **NOTE:** Do not share the root directory of your system. Share only folders in the root directory. For example, do not share **d:\**; instead, share **d:\foldername**, where **foldername** is the name of the folder in the root directory.

6. If you entered a nonexistent folder in the **Share path**, click **Create folder if it does not already exist**.

 **NOTE:** The **Comment** field is ignored for NFS, FTP, and HTTP shares.

7. If desired, enter comments in the **Comments** box.
8. Check the appropriate box(es) to specify the types of protocols to enable.

If you want to use a protocol that is grayed out, you must first enable it on the NAS system. See the "[Advanced Features](#)" section in this guide for information about enabling the AppleTalk and NCP protocols.

9. Use the protocol tabs to configure the specific properties of each type of share.

 **NOTE:** Services for NetWare (SFN) are compatible with the Novell NetWare Bindery service for authentication and file access using the Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) network protocol. You must perform a NetWare logon to the NAS system using a NetWare client before you can connect to the NetWare shares.

10. Click **OK**.

## Modifying Share Properties

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Shared Folders** table, click the share you want to modify.
5. Click **Properties**.

The **Share Properties** page displays. Use this page to change the description of the share. You can also select the type of client from which the share is accessible.

6. Click **OK**.

## Removing a Share

When you remove a share, access to the share is removed; however, the actual files remain on the NAS system.

To remove a share, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Shared Folders** table, click the share that you want to delete.
5. Click **Delete**.

A confirmation dialog appears.

6. Click **OK** to confirm the deletion, or click **Cancel** to keep the share.

## Removing a Protocol From the Share

Because a share may have more than one protocol assigned, it is possible to remove a protocol from a share without removing the remaining protocols.

To remove one or more specific protocols from a share, perform the following steps:

1. Log in to the NAS Manager.
  2. Click **Shares**.
  3. On the **Shares** page, click **Shares**.
  4. In the **Shared Folders** table, click the share for which you want to remove a protocol.
  5. Click **Properties**.
  6. Uncheck the protocol(s) to remove it from the share.
  7. Click **OK** to confirm the protocol removal, or click **Cancel** to keep the protocol(s) for the share.
- 

## Disk Quotas

Disk quotas track and control the use of disk space for volumes. You can configure the volumes on your NAS system to:

1. Prevent further use of disk space and log an event when a user exceeds a specified disk space limit.
1. Log an event when a user exceeds a specified disk space warning level.

When you enable disk quotas, you can set both the disk quota limit and the disk quota warning level.

1. The disk quota limit specifies the amount of disk space a user is allocated within a specific volume.
1. The warning level specifies the point at which the event log displays that a user is nearing the quota limit within a specific volume.

For example, you can set a user's disk quota limit to 50 MB and the disk quota warning level to 45 MB. With these settings, the user can store no more than 50 MB on the volume. If the user stores more than 45 MB on the volume, you can set the disk quota system to log a system event to the event log.

In addition, you can specify a quota limit for users but allow the users to exceed that quota limit. When you enable quotas without limiting disk space, you can track disk-space use on a per-user basis without denying users access to a volume when they exceed that limit. It is also possible to specify whether the system logs an event when a user exceeds the quota warning level and quota limit.

## Enabling or Disabling Disk Quotas

To enable or disable quota management on a volume, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **Disk Quota**.
4. On the **Volumes and Quotas** page, click the volume to manage.
5. Click **Quota**.
6. On the **Default Quota for volume** page, click the appropriate check box to enable or disable quota management.
7. Select the quota size and settings for this volume.
8. Click **OK**.

## Adding Disk Quota Entries

The **Quota Entries** page allows you to add, delete, or configure disk quotas for any NAS system user.

When you enable disk quotas for an existing volume, volume usage is automatically tracked for new users from that point forward. However, existing volume users have no disk quotas applied to them. You can apply disk quotas to existing volume users by adding new quota entries in the **Quota Entries** window.

To add a new quota entry, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **Disk Quota**.
4. On the **Disk Quota** page, click the volume to manage.
5. Click **Quota Entries**.
6. Click **New**.
7. Select a local user from the list box, or type the name of a domain account in the text box (in the format *domain\_name\user\_name*).
8. To allow unlimited disk space usage, click the **Do not limit disk usage** radio button, and then go to step 10. Otherwise, go to step 9.
9. To limit disk space, perform the following steps:
  - a. Click the **Limit disk space to** radio button.
  - b. In the text box, enter a numerical value to specify the amount of disk space to assign to a particular user or group. Use the drop-down box to select kilobytes (**KB**), megabytes (**MB**), gigabytes (**GB**), terabytes (**TB**), petabytes (**PB**), or exabytes (**EB**).
  - c. Enter the amount of disk space that, when filled, triggers a warning to the user or group member that the used disk space is near the disk-capacity limit. Use the drop-down box to select **KB**, **MB**, **GB**, **TB**, **PB**, or **EB**.
10. Click **OK**.

## Modifying Quota Properties

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **Disk Quota**.
4. On the **Volumes and Quotas** page, click the volume to manage.
5. Click **Quota Entries**.
6. In the **Logon** list on the **Quota Entries** page for the selected volume, select a user account.
7. Click **Properties**.
8. On the **Quota entry for user** page, click the **Do not limit disk usage** radio button to allow unlimited disk use, or perform the following procedure to limit

disk space:

- a. Click the **Limit disk space to** radio button.
- b. In the text box, enter a numerical value to specify the amount of disk space to assign to a particular user or group. Use the drop-down box to select **KB**, **MB**, **GB**, **TB**, **PB**, or **EB**.
- c. Enter the amount of disk space that, when filled, triggers a warning to the user or group member that the used disk space is near the disk-capacity limit. Use the drop-down box to select **KB**, **MB**, **GB**, **TB**, **PB**, or **EB**.

 **NOTE:** Any previously entered warning level does not appear in the text box. However, the warning level is still set on the NAS system.

9. Click **OK**.

## Removing Disk Quota Entries

1. Log in to the NAS Manager.
  2. Click **Disks**.
  3. Click **Disk Quota**.
  4. On the **Volumes and Quotas** page, select the volume to manage.
  5. From the **Tasks** list, select **Quota Entries**.
  6. On the **Quota Entries** page, select the **Logon name** from which you want to remove the quota entry.
  7. On the **Tasks** list, select **Delete**.
  8. Click **OK**.
- 

## Using Logs

A log file stores messages, which are sometimes called events or event log entries, generated by an application, service, or operating system. The messages are used to track the operations performed by the system. Log files are usually plain text (ASCII) files with the **.log** file extension.

The NAS system provides access to the following logs:

- 1 Application log
- 1 FTP log
- 1 NFS log
- 1 Security log
- 1 System log
- 1 Web (HTTP) shares log
- 1 Web administration log

## Viewing Log Entry Details

You can view details from specific log files such as the date, time, source, event ID, description, and data.

To view log entry details, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Logs**.
4. On the **Logs** page, select the type of log you want to view.
5. Click the radio button next to the log entry you want to view.
6. In the **Tasks** list, click **Event Details** or **View Log** depending on the selected log type.
7. On the **Log Details** page, click **Up** and **Down** to scroll through the log files.
8. Click **Back** to close the **Log Details** page and return to the log entry list on the **Logs** page.

## Modifying Log Properties

For system, security, and application logs, you can specify the maximum log size and determine how the system handles log entries when the maximum capacity of the NAS system is reached.

To modify the properties of a log file, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Logs**.
4. On the **Logs** page, select the type of log you want to configure.
5. In the **Tasks** list, click **Log Properties**.
6. In the **Maximum log size** text box on the **Log Properties** page, enter the maximum size (in kilobytes) of the log.
7. Determine how you want the system to handle log file entries after the maximum log file size has been reached, and then click one of the following choices:
  - 1 **Overwrite events as needed** — The system writes over older events with new events as they occur.
  - 1 **Overwrite events older than \_\_\_\_ days** — The system retains the event entries for the specified number of days before the events can be written over by current event entries.
  - 1 **Do not overwrite events** — The system retains all events in the log and appends new events to the end of the file.
8. Click **OK**.

## Downloading Log Files

The NAS Manager allows you to download specific log files from your NAS system.

To download log files, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Logs**.
4. On the **Logs** page, select the type of log you want to download.
5. In the **Tasks** list on the **Log Type Log** page, click **Download Log**.
6. On the **Download Log Type Log** page, if available, select the file type that you want to download, and then click **Download Log**.
7. In the **File Download** dialog window, select **Save this file to disk**.
8. Specify a directory where the log will be saved, and then click **Save**.
9. Click **Close** to close the **File Download** dialog window after the download is complete.

## Viewing Downloaded Log Files

After downloading the log files, it is possible to view them in the following ways:

- 1 **.log** files — With a text editor such as Microsoft Notepad.
- 1 **.csv** files — With a text editor or with Microsoft Excel.
- 1 **.evt** files — With the Event Viewer. The Event Viewer can usually be found under **Administrative Tools** from the **Start** menu of a Windows 2000 system. In the **Event Viewer** window, click **Action** and then click **Open Log File**. Browse to the location of your log file, choose the log type of your file, and then click **Open**.

## Clearing Log Files

1. Log in to the NAS Manager.
2. Click **Maintenance**.

3. Click **Logs**.
  4. On the **Logs** page, select the type of log you want to clear.
  5. Select the specific log you want to clear, and then click **Clear** in the **Tasks** list.
  6. On the **Clear Log Confirmation** page, click **OK** to clear the log.
- 

## Multiple Device Management

Multiple Device Management (MDM) is a part of the NAS Manager functionality that allows you to run jobs on one or more NAS systems simultaneously. You can use MDM to perform tasks such as adding a user or retrieving system status information on multiple NAS systems from a single system.

 **NOTE:** MDM is disabled by default in your NAS system.

MDM is composed of two components: a device and a controller. A device is a system that executes jobs received from a controller and returns the job results to the controller. Jobs can be applied to individual devices or to a group of devices called *sets*. The purpose of the controller is to discover other MDM-enabled devices, manage ownership of devices, and manage jobs. To use MDM services, one of your NAS systems must be designated as a controller.

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## Configuring MDM on Your NAS System

From the **MDM** tab in the NAS Manager, use the **Multiple Device Management Settings** option to configure controllers and devices and to disable MDM services.

### Configuring an MDM Controller

When you configure your NAS system as an MDM controller, it becomes both a device and a controller for other MDM devices.

1. Log in to the NAS Manager.
2. Click **MDM**.
3. Click **Configure MDM**.

The **Multiple Device Management Settings** page is displayed and the **Configure MDM Type** tab is active.

4. Select **MDM Controller**.
5. Click **OK**.

The system automatically reboots.

### Configuring an MDM Device

Your NAS system can be configured as a device that can be controlled by any controller (*trust mode*) or as a device controlled only by a controller with a specific certificate (*certificate mode*). If you choose trust mode, the first controller that attempts to control the device becomes the device's controller. In certificate mode, only the system with the uploaded certificate can control the device.

To configure your NAS system as a device, perform the following steps:

1. Log in to the NAS Manager.
2. Click **MDM**.
3. Click **Configure MDM**.

The **Multiple Device Management Settings** page displays and the **Configure MDM Type** tab is active.

4. Select **MDM Device**.
5. Select one of the following **MDM Device** options:
  - 1 **Any controller** — Allows the system to be controlled by any MDM controller. Choosing this option puts the system in *trust mode*.
  - 1 **Only the controller with the following certificate** — Allows the system to be controlled only by an MDM controller with a specific certificate. Choosing this option puts the system in *certificate mode*. If you choose this option, you must first copy the required certificate from the MDM controller to your local system (client), and then upload the required certificate from your local system (client) to the NAS system (MDM device).

To upload the certificate, perform the following steps:

- a. Click **Upload Certificate**.
- b. In the **Upload Certificate File** window, type the name of the certificate file or click **Browse** to navigate to it.
- c. Click **Upload Certificate**.

The MDM controller certificate file is uploaded to the intended MDM device.

6. Click **OK**.

The system automatically reboots.

## Resetting MDM

Resetting MDM will disable the MDM feature and remove the MDM designation from your NAS system. After MDM has been reset, your system will no longer be designated as a device or controller.

 **NOTE:** If a system is controlled by another device, you must release control from that device before reconfiguring the system.

To reset MDM on your NAS system, perform the following steps:

1. Log in to the NAS Manager.
2. If the system is configured as a device, click **MDM**. If the system is figured as a controller, click **Controller**.
3. Click **Reset MDM**.
4. Click **OK**.

The system automatically reboots.

---

## Viewing MDM Device Status

When your NAS system is configured as an MDM device, you can use the NAS Manager to track the status of the system.

To view the status of an MDM device, perform the following steps:

1. Log in to the NAS Manager.
2. Click **MDM**.

The **MDM Agent Status** page displays the following information:

- 1 **Require Certificate** — **Yes** indicates that the system is operating in *certificate mode*. **No** indicates that the system is operating in *trust mode*.
- 1 **Certificate** — Indicates whether the certificate is installed.
- 1 **Controller** — Displays the host name of the last controller to take control of the system.

When an MDM device is powered down or is inaccessible from the network, it may take the controller several minutes to show the device as missing. If a system is inaccessible and the device status is not yet reported as missing, any jobs run on the system may show a pending status. These jobs may never complete. Also, when the device becomes accessible, it may take several minutes for the controller to report the device as active.

---

## Using the MDM Controller to Administer NAS Devices

The NAS Manager's MDM feature allows you to collectively administer several NAS devices in a data center. MDM also allows you to automate routine processes such as adding users and querying systems for status information.

From the NAS Manager **Controller** tab, you can run a job, view alerts and job history, take or release control of individual devices, group individual devices into sets, and administer multiple devices.

## Creating and Using MDM Sets

Use the **Create Sets** option from the NAS Manager **Controller** tab to create and manage sets and to administer individual devices contained in sets. The **Create Sets** option displays an Object/Task Selector that simultaneously lists up to 100 sets that can be sorted by selecting a column heading. You can also create or delete sets, modify set properties, or run a job on one or more sets.

To create a new set, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Create Sets**.
4. In the **Tasks** list, click **New**.
5. Type a name and description for the new set.
6. Select the members for the new set from the **Devices** or **Existing sets** list, and then click **Add**.
7. Click **OK**.

## Controlling MDM Devices

Use the **Control Devices** option from the NAS Manager **Controller** tab to create or delete device records, group devices into sets, take or release control of devices, modify device properties, or run jobs on one or more devices.

## Creating a New MDM Device Record

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Control Devices**.
4. In the **Tasks** list, click **Add Device**.
5. Type the name, optional description, and optional MAC addresses for the device you are adding.
6. Click **OK**.

## Grouping Devices Into a Set

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Control Devices**.
4. In the **Name** column of the Object/Task Selector on the **Devices** page, select one or more devices to group into a set.
5. In the **Tasks** list, click **Create Set**.
6. On the **Create Set** page, enter a name and description for the new set.
7. From the **Devices** or **Existing sets** lists, add any additional members for the new set.

8. Click **OK**.

## Taking Control of a Device

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Control Devices**.
4. In the **Device Name** column of the Object/Task Selector on the **Control Devices** page, select the device you want to control.
5. In the **Tasks** list, click **Take Control**.

If the operation completes successfully, the Object/Task Selector on the **Devices** page is redisplayed, and the status of the device chosen shows as **Active** (or **Missing** if the device did not respond to a heartbeat request).

If the operation did not complete successfully, an error page is displayed, giving you the option to retry or terminate the operation.

## Running an MDM Job

A job is an administration task executed on a single device or on all controlled devices in a set. Jobs can take many forms; they can be scripts executed on devices by the controller, or they can be special operations such as shutting down or rebooting a NAS system.

To run a job, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Run Jobs**.
4. In the **Tasks** list, click **Run**.
5. Follow the instructions in the Run Job Wizard.

## Running a Job Using Quick Run

If an MDM job already exists, use Quick Run to execute the job on another device or set.

To use Quick Run, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Run Jobs**.
4. Select a job and click **Quick Run**.

## Using MDM Job Templates

In addition to sample job scripts provided with the NAS Manager MDM services, you can create custom scripts that can be run remotely on one or more devices. These custom scripts are then incorporated into job templates that can be used later for running jobs.

## Creating a New Job Template

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **Run Jobs**.

4. In the **Tasks** list, click **New**.
5. Follow the instructions in the Job Template Wizard.

When the Job Template Wizard completes, the **Run Jobs** page displays.

## Running a New Job Template

1. Create a new job template as described in "[Creating a New Job Template](#)" in this section of the guide.

When the Job Template Wizard completes, the **Run Jobs** page displays.

2. In the Object/Task Selector of the **Run Jobs** page, select the new job template.
3. Click **Run**.
4. Follow the instructions in the Run Job Wizard.

## Using Sample MDM Scripts

Sample scripts are located in the `c:\MDMScripts` directory on your NAS system. They include scripts that join systems to a domain or workgroup, create users, verify a Microsoft OFE installation, or change user passwords. You can either run these scripts or make them part of a job template.

 **NOTE:** To see an example of how each script is used, type ? (question mark) in the parameter field and then run the job. The output shows script usage.

 **NOTE:** When script parameters include a password, the password must be entered for each job run. If a password is included in a template, the password will be replaced by an asterisk (\*). The script will not run until the asterisk (\*) is replaced with a valid password.

### JoinDomain.vbs Script

The **JoinDomain.vbs** script joins a specific NAS system or device set to a domain.

The parameters of the **JoinDomain.vbs** script to join a domain are:

```
-join <domainname> <username> -password <password>
```

Where `domainname` is the name of the domain, `username` is the name of a user on the domain, and `password` is the domain user's password.

The parameters of the **JoinDomain.vbs** script to join a workgroup are:

```
-workgroup <workgroupname>
```

where `workgroupname` is the name of the workgroup.

### CreateUser.vbs Script

The **CreateUser.vbs** script adds a user to a specific NAS system or device set.

The parameters of the **CreateUser.vbs** script are:

```
[-group <group>] <username> -password <password>
```

where `group` (optional) is the group to which the user is being added, `username` is the name of the new user, and `password` is the new user's password.

### IsQFEInstalled.vbs Script

The `IsQFEInstalled.vbs` script uses a QFE number for a parameter to validate the installation of QFE on a specific NAS system or on each system in a device set.

The parameters of the `IsQFEInstalled.vbs` script are:

```
<qfenumbe>
```

where `qfenumbe` is the "Q" number of a Microsoft QFE, such as Q111111.

### SetUserPassword.vbs Script

The `SetUserPassword.vbs` script sets or changes a user password.

The parameters of the `SetUserPassword.vbs` script are:

```
<username> -password <password>
```

where `username` is the name of the user whose password is being changed, and `password` is the new password.

## Viewing MDM Job Histories

Use the **View Job History** option to view summary information about jobs that have been run previously by the controller. From the **View Job History** page, you can view summary results from a specific job or summary information about alerts that have been generated on devices where alerts are enabled.

### Viewing Job Results

1. Log in to the NAS Manager.
2. Click **Controller**.
3. Click **View Job History**.
4. In the Object/Task Selector of the **View Job History** page, select the job that you want to view.
5. In the **Tasks** list, click **View Results**.

If the job was performed on a device set, the **View Results** page displays an Object/Task Selector list for each device in the set.

6. In the Object/Task Selector of the **View Results** page, select the device you that want to view.
7. In the **Tasks** list, click **Properties**.

### Viewing Alerts

 **NOTE:** To view alerts from an MDM device, the alerts for that device must be enabled. To enable alerts, go to **Control Device** under the **Controller** tab from the NAS Manager on the controller system. Select a controlled device and click **Properties**. Select **Yes** from the **Alerts Enabled** drop-down menu,

and then click **OK**.

1. Log in to the NAS Manager.
  2. Click **Controller**.
  3. Click **View Alerts**.
  4. Select the check box next to the alert you want to view.
  5. In the **Tasks** list, select **Alert Details**.
  6. On the **Alert Details** page, you can view information about the condition(s) that caused the alert, and then follow the instructions.
  7. Click **Clear Message** to delete the alert.
- 

## Shutting Down the NAS System

To shut down, restart, or schedule a shutdown of the NAS system using the NAS Manager, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Shutdown**.
4. Click **Shut Down, Restart**, or **Scheduled Shutdown**.
5. If you select **Scheduled Shutdown**, specify when the shutdown should occur, and then click **OK**.
6. On the **Confirmation** page, click **OK** to confirm the action.

If you choose to restart the NAS system, the **Restarting** page displays. When the NAS Manager detects that the NAS system has come back online, the NAS Manager automatically returns to the home page.

 **NOTE:** Do not refresh or perform any function in the NAS Manager until it comes back online. If you click **Refresh**, the NAS Manager might not automatically refresh after rebooting.

---

## Managing Disks

The NAS Manager allows you to list available disks, rescan for a disk, and view disk properties.

### Listing Available Software-RAID NAS System Disks and Viewing Properties

 **NOTE:** For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide.

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

2. Click **Disks**.
3. On the **Disks** page, click **Disks**.

The **Disks** page displays a list of the available disks and shows their status.

4. Click the disk whose properties you want to view and click **Properties**.

The **Properties** page displays the status, capacity, device type, and vendor for the selected disk.

### Rescanning for Software-RAID NAS System Disks

 **NOTE:** For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide.

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

2. Click **Disks**.
3. On the **Disks** page, click **Disks**.
4. In the **Physical Disks** column on the **Disks** page, select the disk to rescan.
5. In the **Tasks** list, click **Rescan**.
6. On the **Rescan** page, click **OK** to start the rescan.

## Listing Available Hardware-RAID NAS System Disks and Viewing Properties

 **NOTE:** For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide.

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

2. Click **Disks**.
3. On the **Disks** page, click **Disks**.

The **Disks** page displays a list of the hardware RAID card and shows its status and firmware revision.

4. In the **Tasks** list, click **Select**.

The **CERC ATA100/4ch Controller 0 Card** page displays a list of the available disks and their status.

5. Click a disk and click **Properties**.

The **Properties** page displays the status, capacity, device type, and vendor for the selected disk.

## Rescanning for Hardware-RAID NAS System Disks

 **NOTE:** For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide.

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

2. Click **Disks**.
3. On the **Disks** page, click **Disks**.

The **Disks** page displays a list of the hardware RAID card and its status and firmware revision.

4. In the **Tasks** list, click **Select**.

The **CERC ATA100/4ch Controller 0 Card** page displays a list of the available disks and shows their status.

5. In the **Physical Disks** column on the **Disks** page, select the disk to rescan.

6. In the **Tasks** list, click **Rescan**.
7. On the **Rescan** page, click **OK** to start the rescan.

---

## Managing NAS System Volumes

 **NOTICE:** This section provides instructions on how to use the NAS Manager to administer software-RAID and hardware-RAID NAS system volumes. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide. Ensure that you use the appropriate section for your NAS system's RAID configuration.

## Managing Software-RAID NAS System Volumes

A volume is an allocation of usable space on one or more physical disks. The NAS Manager allows you to reconfigure, repair, or view the properties of a volume in a software-RAID NAS system.

 **NOTE:** You can also create volumes in Array Manager. See "[Creating a Dynamic Volume](#)" in the "Advanced Disk and Volume Management" section of this guide.

The following sections provide instructions on how to reconfigure and repair software-RAID NAS system volumes.

### Reconfiguring a Software-RAID NAS System Volume

 **NOTICE:** Do not perform the volume reconfiguration and repair procedures in this section on a hardware-RAID NAS system. See "[Managing Hardware-RAID NAS System Volumes](#)" in this section of the guide to configure those volumes. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide.

1. Prior to reconfiguring the volume, manually remove all shares and persistent images.

 **NOTE:** If the volume is in use—for example, the volume is open in a browser window, the volume contains shares or snapshots, or another application is using the volume—a message displays stating that the operation has failed and that you need to use Array Manager. Ensure that you delete all shares and persistent images on that volume. The administrator can use Array Manager to force the deletion of the volume. See the "[Advanced Disk and Volume Management](#)" section of this guide for more information.

2. If during the deletion, the system messages that it cannot complete the deletion, then use Array Manager.

See "[Using Array Manager to Manage Your Disks and Volumes](#)" in the "Advanced Disk and Volume Management" section of this guide.

3. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

4. Click **Disks**.
5. Click **Volumes**.
6. In the **Volumes** column, select the volume that is to be reconfigured.

 **NOTICE:** Regardless of how many data drives exist, the reconfiguration procedure deletes all data and creates a single volume of the desired RAID group.

7. On the **Tasks** list, click **Reconfigure**.

 **NOTE:** **Reconfigure** appears only if all of the disks in the NAS system are functioning properly. If **Reconfigure** does not appear, one or more of your volumes is damaged and requires repair. See "[Repairing a Software-RAID NAS System Volume](#)" in this section of the guide.

8. Select the **New Layout**, which is either **Single RAID-5** or **Single RAID-0**.

 **NOTE:** RAID 0 volumes are not fault-tolerant and do not provide data protection if a drive fails.

9. Click **OK** to delete and reconfigure the volume.

 **NOTE:** If the volume is in use—for example, the volume is open in a browser window, the volume contains shares or snapshots, or another application is using the volume—a message displays stating that the operation has failed and that you need to use Array Manager. Ensure that you delete all shares and persistent images on that volume. The administrator can use Array Manager to force the deletion of the volume. See the ["Advanced Disk and Volume Management"](#) section of this guide for more information.

## Repairing a Software-RAID NAS System Volume

 **NOTICE:** This option is available only on software-RAID NAS systems. Hardware-RAID NAS systems perform this function automatically when a new blank hard drive is inserted into the system. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see ["Determining if a NAS System Uses Software RAID or Hardware RAID"](#) in this section of the guide.

If an operating system drive or a data drive fails, replace the drive, and use the NAS Manager to repair the volume to make it fault-tolerant again. However, if more than one drive fails, you must reinstall the operating system. See ["Software-RAID NAS System Hard-Drive Failures"](#) in the "Recovering and Restoring the System" section of this guide.

 **NOTE:** RAID 0 volumes are not fault-tolerant and cannot be repaired.

1. Remove the failed hard drive.
2. Insert a new hard drive ordered from Dell that is the same size as or larger than the failed drive.

 **NOTE:** The repair feature does not work if you insert a hard drive that is smaller than the failed drive.

3. Log in to the NAS Manager.

See ["Logging in to the NAS Manager"](#) in this section of the guide.

4. Click **Disks**.
5. Click **Volumes**.
6. Click **Repair**.

 **NOTE:** **Repair** appears only if the volume is damaged and you have placed a new drive in the system. The drive must be the same size as or larger than the failed drive.

7. Click **OK**.

 **NOTE:** The process of fully rebuilding the RAID volumes may take several hours.

## Viewing Software-RAID NAS System Volume Properties

1. Log in to the NAS Manager.

See ["Logging in to the NAS Manager"](#) in this section of the guide.

2. Click **Disks**.
3. Click **Volumes**.
4. In the **Volumes** column, select the volume whose properties you want to view.
5. On the **Tasks** list, click **Properties**.
6. Click **OK** to return to the **Volumes** window.

## Managing Hardware-RAID NAS System Volumes

A volume is an allocation of usable space on one or more physical disks. The NAS Manager allows you to reconfigure, rescan the bus, or view the properties of a volume in a hardware-RAID NAS system.

 **NOTE:** You can also create volumes in Array Manager. See ["Creating a Dynamic Volume"](#) in the "Advanced Disk and Volume Management" section of this guide.

The following sections provide instructions on how to reconfigure and view volume properties in a hardware-RAID NAS system. Information on the automatic volume repair function is also provided.

## Reconfiguring a Hardware-RAID NAS System Volume

- ➔ **NOTICE:** Do not perform the volume reconfiguration and repair procedures in this section on a software-RAID NAS system. See "[Managing Software-RAID NAS System Volumes](#)" in this section of the guide to configure those volumes. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide.

1. Before reconfiguring the volume, manually remove all shares and persistent images.

🔧 **NOTE:** Various errors will be displayed in the system event log if shares, persistent images, or both are present in the volume.

2. If during the deletion, the system messages that it cannot complete the deletion, use Array Manager.

See "[Using Array Manager to Manage Your Disks and Volumes](#)" in the "Advanced Disk and Volume Management" section of this guide.

3. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

4. Click **Disks**.
5. Click **Volumes**.
6. In the **Volumes** column, select the volume that is to be reconfigured.

- ➔ **NOTICE:** Regardless of how many data drives exist, the reconfiguration procedure deletes all data and creates a single volume of the desired RAID group.

7. On the **Tasks** list, click **Reconfigure**.

🔧 **NOTE:** **Reconfigure** appears only if all of the disks in the NAS system are functioning properly. If **Reconfigure** does not appear, one or more of your volumes is damaged and requires repair. See "[Repairing a Hardware-RAID NAS System Volume](#)" in this section of the guide.

8. Select the **New Layout**, which is either **Single RAID-5** or **Single RAID-0**.

🔧 **NOTE:** RAID 0 volumes are not fault-tolerant and do not provide data protection if a drive fails.

9. Click **OK** to delete and reconfigure the volume.

🔧 **NOTE:** If the volume is in use—for example, the volume is open in a browser window, the volume contains shares or snapshots, or another application is using the volume—a message displays stating that the operation has failed and that you need to use Array Manager. Ensure that you delete all shares and persistent images on that volume. The administrator can use Array Manager to force the deletion of the volume. See the "[Advanced Disk and Volume Management](#)" section of this guide for more information.

## Repairing a Hardware-RAID NAS System Volume

- 🔧 **NOTE:** A hardware-RAID NAS system automatically repairs a volume when a new blank hard drive is inserted. No user interaction is required. Ensure that the new hard drive is the same size as or larger than the failed drive. For instructions on how to determine if you have a software- RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in this section of the guide.

If one hard drive fails, replace the drive, and the RAID controller card automatically repairs the volume to make it fault-tolerant again. However, if more than one drive fails, the operating system must be reinstalled. For information about replacing drives in a hardware-NAS system see "[Replacing Hardware-RAID NAS System Hard Drives](#)" in the "Recovering and Restoring the System" section of this guide. The process may take several hours to complete.

## Viewing Hardware-RAID NAS System Volume Properties

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in this section of the guide.

2. Click **Disks**.
3. Click **Volumes**.
4. In the **Volumes** column, select the volume whose properties you want to view.

5. On the **Tasks** list, click **Properties**.
  6. Click **OK** to return to the **Volumes** window.
- 

## Using the PowerVault Advanced Administration Menu

The **Advanced Administration Menu** is a software application that provides links to advanced functionality in your NAS system. The menu runs automatically when you access your NAS system through Terminal Services.

To access the **Advanced Administration Menu**, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**, and then log in to the NAS system as an administrator.

 **NOTE:** The default administrative user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **Administrative Tools** or **System Management** to display the list of selectable options.
5. Click the tool or setting you want.
6. When you are finished using the **Advanced Administration Menu**, log off by clicking **Logoff** at the bottom of the **Advanced Administration Menu**.

The following tools are available through the **Advanced Administration Menu**:

- 1 **Broadcom Network Teaming** — Launches Broadcom Advanced Server Control Suite, which allows you to perform advanced functions on Broadcom NICs, such as setting up teaming and virtual LANs.
- 1 **Distributed File System** — Allows management of multiple network shares.
- 1 **Event Viewer** — Allows you to view events in your application log, security log, and system log.
- 1 **Network Tools** — Displays the **Network Tools Interface Utility**, which allows you to perform operations such as nslookup, ping, and tracertr.
- 1 **Performance Monitor** — Displays the Performance Monitor.
- 1 **Perform System State Backup** — Enables you to back up your system-state data.
- 1 **Retrieve Dell Service Tag** — Provides the Dell service tag number for your NAS system.
- 1 **Windows Powered Help** — Displays help for the Windows Powered operating system.
- 1 **Windows QFEs** — Displays the QFEs installed on the NAS system.
- 1 **Windows 2000 Backup/Recovery** — Launches Windows 2000 Backup and Recovery Tools.
- 1 **Computer Management** — Provides management for local or remote computers.
- 1 **Disk Management** — Launches Dell OpenManage Array Manager, which provides comprehensive storage management for your disks and volumes.
- 1 **Internet Information Services** — Provides management for Internet Information Services on the system.
- 1 **Local Security Settings** — Enables you to manually set security settings.
- 1 **Network Properties** — Displays the **Network and Dial-up Connections** window.
- 1 **NFS Cache** — Enables and disables the NFS write-back cache.
- 1 **Removable Storage** — Enables you to track or manage storage media and devices.
- 1 **Set Date/Time** — Allows you to set the date and time.
- 1 **Set Regional Options** — Displays the **Regional Options** window, which allows you to change the locale and language settings for the system.
- 1 **Task Manager** — Provides applications, processes, and performance information.
- 1 **Terminal Services Config** — Enables you to configure Terminal Services.

Click the **Language** link to change the language of the **Advanced Administration Menu** to Chinese, English, French, German, Japanese, or Spanish.

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## Advanced Disk and Volume Management

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [Drive Configurations](#)
- [Using Array Manager to Manage Your Disks and Volumes](#)
- [Disk Management](#)
- [Volume Management](#)
- [Working With Software-RAID NAS System Mirrors](#)

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This section provides information about the drives on your NAS system and how to use Dell OpenManage™ Array Manager to manage your disks and volumes and your physical hard drives.

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## Drive Configurations

The following subsections describe the following two NAS system drive configurations:

- 1 Software RAID — If your NAS system uses software RAID, see "[Software-RAID NAS System Drive Configuration](#)" in this section of the guide.
- 1 Hardware RAID — If your NAS system uses hardware RAID, see "[Hardware-RAID NAS System Drive Configuration](#)" in this section of the guide.

 **NOTE:** For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

## Software-RAID NAS System Drive Configuration

The NAS system with software RAID contains four IDE hard drives that are in a RAID configuration. Each drive contains both a copy of the operating system and one or more data partitions. See [Table 3-1](#) and [Figure 3-1](#). The working copies of the Microsoft® Windows® Powered operating system and boot sectors are installed on two hard drives in partitions that are RAID 1 (mirrored) partitions. An additional copy of the operating system is placed on the other two drives in RAID 1 partitions. Data can be stored on all four IDE hard drives in partitions that are configured as RAID 5 by default.

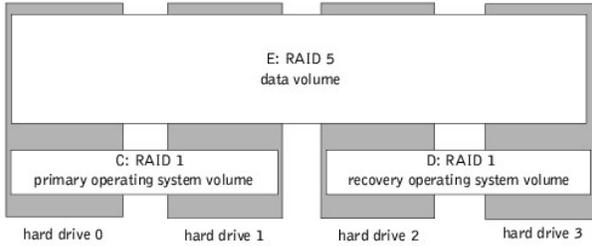
 **NOTE:** The software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable between the two types of NAS systems. The hardware RAID hard-drive carriers have a "HW-RAID" identification label and the software RAID hard-drive carriers have a "SW-RAID" identification label.

**Table 3-1. Software RAID Default Hard-Drive Partitions**

Volume	Hard Drives and RAID Layout	Description
C:	0 and 1: RAID 1	Primary operating system volume
D:	2 and 3: RAID 1	Recovery operating system volume
E:	0, 1, 2, and 3: RAID 5	Data volume

 **NOTE:** The data volume can be reconfigured as RAID 0. See "[Reconfiguring a Software-RAID NAS System Volume](#)" in the "NAS Manager" section of this guide.

**Figure 3-1. Software RAID Default Hard-Drive Partitions**



Each hard drive has front-panel LEDs that provide information about its RAID volume. See "Front-Panel Indicators" in the *Installation and Troubleshooting Guide* for the location of the LEDs. [Table 3-2](#) provides the front-panel RAID volume LED codes.

**Table 3-2. Front-Panel RAID Volume LED Codes**

Volume Condition	LED Status Indicator Pattern
The drive bay is empty.	Off
The RAID volume is online.	Steady green
The RAID volume is rebuilding.	Blinking green and amber
The RAID volume has failed.	Solid amber

## Hardware-RAID NAS System Drive Configuration

The NAS system with hardware RAID contains four IDE hard drives that are in a RAID configuration. Unlike the software-RAID NAS system where Windows Powered controls the hard drives, the drives in the hardware-RAID NAS system are controlled by a RAID controller card installed in a PCI expansion slot. All four IDE hard drives appear as only two volumes to the operating system. See [Table 3-3](#) and [Figure 3-2](#). The operating system and boot sectors are installed on one RAID 5 volume that is spanned across the four IDE hard drives. Data can be stored on the other RAID 5 volume that is also spanned across the four IDE hard drives.

**NOTICE:** The software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable between the two types of NAS systems. The hardware RAID hard-drive carriers have a "HW-RAID" identification label and the software RAID hard-drive carriers have a "SW-RAID" identification label.

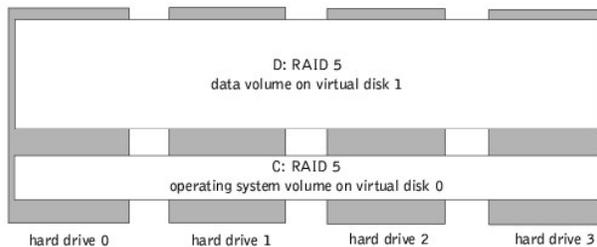
**NOTE:** RAID 1 hard-drive configurations are not supported on hardware-RAID NAS systems.

**Table 3-3. Hardware RAID Default Hard-Drive Partitions**

Volume	Hard Drives and RAID Layout	Description
C:	0, 1, 2, and 3: RAID 5	Primary operating system volume on virtual disk 0 (set at 5 GB by default)
D:	0, 1, 2, and 3: RAID 5	Data volume on virtual disk 1

**NOTE:** The data volume can be reconfigured as RAID 0. See ["Reconfiguring a Hardware-RAID NAS System Volume"](#) in the "NAS Manager" section of this guide.

**Figure 3-2. Hardware RAID Default Hard-Drive Partitions**



 **NOTE:** If two or more hard drives fail, the virtual disks must be recreated. See "[Recreating Virtual Disks](#)" in the "Recovering and Restoring the System" section of this guide for more information.

Each hard drive has front-panel LEDs that provide information about its drive status. See "Front-Panel Indicators" in the *Installation and Troubleshooting Guide* for the location of the LEDs. [Table 3-4](#) provides the hard-drive LED codes.

**Table 3-4. Front Panel Hard-Drive LED Codes**

Hard Drive Condition	LED Status Indicator Pattern
The drive bay is empty.	Off
The hard drive is online and prepared for operation.	Steady green
The hard drive is rebuilding.	Blinking green and amber
The hard drive has failed.	Solid amber

## Using Array Manager to Manage Your Disks and Volumes

Although Array Manager provides a comprehensive solution to storage management, use it for *advanced features* that cannot be performed from the **Disks** tab in the NAS Manager.

Array Manager allows you to configure your storage devices and the logical volumes contained in your system. Array Manager displays storage configuration in both a physical and a logical view. The physical view shows the physical connections between the storage devices. The logical view shows a logical representation of your storage as logical volumes.

## Launching Array Manager From the NAS Manager

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to the **Terminal Services** session as an administrator.

 **NOTE:** The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

5. From the **Advanced Administration Menu**, click **Disk Management** under **System Management**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

6. If an Array Manager window with buttons such as **Create Volume** or **Create Virtual Disk** is displayed, click the task you want to perform, or close the window to view the Array Manager Console.

## Array Manager Console

The Array Manager console display uses a tree view to display storage objects in the left pane of the window and tabbed views in the right pane to display additional information about storage objects. The following subsections provide more information about the left and right panes.

### Left Pane

The left pane shows objects that the Array Manager software detects. The major storage objects are the local system object, arrays, disks, and volumes. By clicking the plus sign (+) in front of a storage object, you can see the subordinate storage objects under that object.

1. **Arrays** represent the physical and logical storage subsystems connected to RAID controllers.

- 1 **Disks** represent the disks recognized by Windows Powered.
- 1 **Volumes** include dynamic RAID volumes created in Array Manager, primary and extended partitions, and logical drives associated with extended partitions.
- 1 **My Network Places, History, and Favorites** provide remote connection functionality not supported by the NAS system and should be ignored.

 **NOTE:** The software-RAID NAS system Dell-default configuration displays four disks and three volumes.

 **NOTE:** The hardware-RAID NAS system Dell-default configuration displays two virtual disks made of the four physical disks and two volumes.

## Right Pane

The right pane identifies the various objects and their status and displays any error conditions that might exist. The four tabbed views in the right pane include the following:

- 1 The **General** tab displays parameters based on the objects you select in the console's tree view.

The parameters for **Disks** are as follows:

- o **Name** is the name of the object.
- o **Status** can vary, depending on the object. Common status conditions are **Online, Healthy,** and **Resynching.**
- o **Type** identifies the object, such as **Dynamic Disk.**
- o **Disk Group** shows an entry for disks in a basic or dynamic group.
- o **Capacity** is the maximum size of the disk.
- o **Unallocated Space** is the amount of free hard-drive space still available.
- o **Graphical Layout** is a graphical representation of how much of the disk is being used.
- o **Progress** shows the current progress (percentage of completion) for tasks.
- o **Device** is the type of disk: All of the drives on the NAS system are IDE hard drives.

 **NOTE:** The hardware-RAID NAS system displays the drives in Array Manager as SCSI drives. This is normal device display behavior for that system.

- o **Port** identifies the controller card. A SCSI port has zero or more target IDs, and a target ID has one or more logical unit numbers (LUNs).
- o **LUN** is the logical unit number.
- o **Target** is the ID that uniquely identifies the disk on the controller card.
- o **Vendor** identifies the vendor on hardware objects.

The parameters for **Volumes** are as follows:

- o **Name** is the name of the object.
- o **Status** can vary, depending on the object. Common status conditions are **Online, Healthy,** and **Resynching.**
- o **Layout** identifies the object, such as **Dynamic Mirrored Volume** and **Dynamic Striped Volume.**
- o **Disk Group** shows an entry for disks in a basic or dynamic group.
- o **Capacity** is the maximum size of the disk.
- o **Free Space** is the amount of free hard-drive space still available.
- o **Progress** shows the current progress (percentage of completion) for tasks.
- o **File System** shows the type of file system.
- o **Graphical Layout** is a graphical representation of how much of the disk is being used.

- 1 The **Events** tab displays event log messages associated with storage objects.
- 1 The **Disk View** tab displays a graphical layout of the disks on your system, including CDs or other removable media.
- 1 The **DM View** tab is grayed-out on the Array Manager console.

---

## Disk Management

This subsection provides conceptual and procedural information about how Array Manager implements basic and dynamic disks.

The following topics are discussed:

- 1 Upgrading a basic disk to a dynamic disk
- 1 Reactivating dynamic disks
- 1 Merging foreign disks

## Upgrading a Basic Disk to a Dynamic Disk

 **NOTE:** Do not upgrade the operating system to a dynamic disk on a hardware-RAID NAS system. For instructions on how to determine if you have a software-RAID or a hardware- RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

### Basic and Dynamic Disks

Disks are any storage unit presented to Windows 2000 as a single contiguous block of storage. When using the Array Manager, you can use two types of disks—basic or dynamic.

Basic disks employ the traditional disk partitioning used by MS-DOS® and Microsoft Windows 95, Windows 98, and Windows NT® 4.0 operating systems. A basic disk can have up to four primary partitions or three primary partitions plus an extended partition. The extended partition can be subdivided into a number of logical drives.

Dynamic disks contain volume management databases comprising information about all other dynamic disks and volumes on a system. This information allows dynamic disks to support dynamic volumes, which are defined in the following subsection. Storage on a dynamic disk is divided into volumes instead of partitions.

### Basic and Dynamic Volumes

A volume is made up of portions of one or more physical disks. You can format a volume with a file system and access it by a drive letter. Like disks, volumes can be basic or dynamic.

Basic volumes refer to volumes created on basic disks. They include primary and extended partitions and logical drives on extended partitions.

Dynamic volumes are volumes created on dynamic disks. There are five types of dynamic volumes—simple, spanned, mirrored, striped, and RAID-5. However, you can expand only simple and spanned volumes using Array Manager. These are the only types of volumes that this document addresses. See the Array Manager online help for more information about mirrored, striped, and RAID-5 dynamic volumes.

To upgrade a basic disk to a dynamic disk, perform the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. Right-click the disk you want to upgrade and click **Upgrade Dynamic Disk**.

The Upgrade Disk Wizard provides information about upgrading.

3. Click **Next** to continue.

The system asks you to select the disks to upgrade.

4. Add the basic disks you want to upgrade to the list of dynamic disks and click **Next**.
5. Click **Finish**.

 **NOTE:** After a disk is upgraded to dynamic, it cannot be reverted back to basic unless all volumes on that disk are removed. Dell recommends that you do *not* revert a disk back to basic after data volumes are present.

## Reactivating Dynamic Disks

A dynamic disk might appear as a missing disk when it is corrupted, powered down, or disconnected. You can reactivate a dynamic disk to bring it back online by performing the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. Right-click the disk labeled **Missing** or **Offline dynamic disk**.
3. Click **Reactivate Disk** on the menu.

The disk is labeled **Online** after it has been reactivated.

---

## Volume Management

This subsection provides conceptual and procedural information about how Array Manager implements basic and dynamic volumes.

The following topics are discussed:

- 1 Volume overview
- 1 Checking partition or volume properties
- 1 Formatting a partition or volume
- 1 Deleting a partition or volume

## Volume Overview

A volume is a logical entity that is made up of portions of one or more physical disks. A volume can be formatted with a file system and can be accessed by a drive letter.

Like disks, volumes can be basic or dynamic. In Array Manager, basic volumes refer to all volumes that are not on dynamic disks. Dynamic volumes are logical volumes created from dynamic disks with Array Manager.

In your system, create all data volumes and dynamic volumes on dynamic disks.

## Checking Partition or Volume Properties

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. Right-click the partition or volume to be checked.
3. Select **Properties** from the context menu.

The **Properties** window displays.

4. Check the properties for your volume.

## Formatting a Partition or Volume

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. Right-click the volume or partition you want to format, and then click **Format**.
3. Select **NTFS** as the file system type.

 **NOTE:** Your NAS system supports only NTFS partitions. Formatting all partitions as NTFS allows for advanced features only available under that file system.

4. Enter a label for the volume.

The label appears on the Array Manager console. If a name has been selected, this name appears in the **Name** field. You can change the name by typing a different name.

5. Enter an allocation size or use the default, which is automatically selected.
6. Select the file system type and formatting options:
  - 1 **Quick format** — Formats the volume or partition without scanning for bad sectors in the volume or partition. Check the box to use this format method.
  - 1 **Enable file and folder compression** — This option is not supported on the NAS system.
7. Click **OK** to begin formatting.

A progress bar displays in the list view.

## Deleting a Partition or Volume

 **NOTICE:** You must delete all shares and persistent images from your volume before deleting it. If a volume is removed before all shares of that volume have been removed, the NAS Manager might not display shares correctly.

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. Right-click the designated volume, and then click **Delete Volume**.
3. Click **Yes** to delete or **No** to cancel.

The system deletes the volume immediately if you click **Yes**.

## Working With Dynamic Volumes

Dynamic volumes are volumes created on dynamic disks with Array Manager. This section discusses how to create and extend dynamic volumes.

### Creating a Dynamic Volume

 **NOTE:** To take advantage of all the system features such as defrag and encryption, Dell recommends that you use the default value of 64 KB for the allocation unit size when creating a virtual disk.

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. From the toolbar, click the **Create Volume** icon.

The Create Volume Wizard appears.

3. Click **Next**.

You must select whether to create a partition or a volume. Ensure that the **Dynamic Volume** button is selected.

The dynamic group to which the volume belongs is automatically created and appears selected.

4. Click **Next**.

You are prompted for the volume layout and size of the volume to create.

5. Click **Concatenated**, **Striped**, or **RAID-5**.
6. If you selected **Striped** or **RAID-5**, choose the **Number of Columns**.

The number of columns represents the number of disks to be used in the dynamic volume array.

7. Select **MB** (megabytes) or **GB** (gigabytes) and enter the size of the volume in **Total volume size** field, or use the **Query Max Size** button.

**Query Max Size** works differently, depending on whether you have one disk or multiple disks selected.

1. If you do not select a disk and click **Query Max Size**, the size shown in the **Total volume size** field is the maximum for all available disks.
1. If you select a disk or disks and click **Query Max Size**, the size indicated is the maximum size for the selected disk(s). However, if you click **Query Max Size** a second time, the size is the maximum for all available disks.

8. Click **Next**.
9. After all selections are made, verify your settings and click **Next**.
10. If you want to select a different disk for the volume you are creating, click **Modify** to display the **Modify Disks** dialog box.
11. Click the disk you want to change, select a disk from the **Disk** drop-down menu, and then click **OK**.
12. Click **Assign a drive letter**, select the drive letter, and then click **Next**.
13. Make sure **Format this volume** and **NTFS** are selected.
14. Type a volume label and an allocation unit size, if you chose to use a size other than the default.
15. Click **Next**, and then click **Finish**.

---

## Working With Software-RAID NAS System Mirrors

 **NOTICE:** This section applies only to software-RAID NAS systems. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

A mirrored volume is a volume that duplicates your data to two physical disks. A mirror provides redundancy by simultaneously writing the same data to two separate volumes that reside on different disks. If one of the disks fails, data continues to be written to and read from the unaffected disk.

This section discusses how to add, remove, or break a mirror.

### Adding a Mirror

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
3. In the left pane, right-click a volume name, and then click **Add Mirror**.

The Add Mirror Wizard is displayed.

4. Click **Next**.
5. Select **Custom Mode**, and then click **Next**.
6. Verify that the correct disk for mirroring the volume is selected. If the correct disk is not selected, click **Modify**, and then go to step 7. If the correct disk is selected, go to step 9.
7. From the **Modify Disk Selection** window, click the disk you want to change.

A drop-down box appears.

8. Click the arrow, select a different disk from the drop-down box, and then click **OK**.
9. Click **Next**, and then click **Finish** to create the mirror.

## Removing a Mirror

Removing a mirror from a volume removes or destroys the data from the selected mirror and leaves the other mirror intact. After you remove a mirror, the space on the disk used by the removed mirrored volume becomes unallocated space. The remaining (no longer mirrored) volume becomes a simple volume on the disk.

To remove a mirror, perform the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
3. In the left pane, right-click a volume name, and then click **Remove Mirror**.

The **Remove Mirror** window is displayed.

4. Select the mirror you want to remove, and then click **OK**.

## Breaking a Mirror

Breaking a mirror creates two simple volumes with individual drive letters. Each volume contains the data on the mirror at the time the mirror was broken. The data is no longer redundant, but it remains intact.

To break a mirror, perform the following steps:

1. Launch Array Manager.

See "[Launching Array Manager From the NAS Manager](#)" in this section of the guide.

2. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
3. In the left pane, right-click a volume name, and then click **Break Mirror**.

The confirmation message, *Are you sure you want to break the mirror?* is displayed.

 **NOTICE:** If you break the mirror, your data might not be fault-tolerant.

4. If you are sure you want to break the mirror, click **OK**.
-

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## Backing Up the System

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [System-State Backup](#)
  - [Backing Up Data Volumes](#)
  - [Backing Up Dell ActiveArchive™ Persistent Images](#)
- 

This section provides instructions on how to back up files on your system. Regularly backup, or have mirrors of, the following types of information:

- 1 System state — Files that contain configuration information about the NAS system. System-state files include the registry, COM+ class registration database, system boot files, users and groups information, and CIFS/NFS/Novell® NetWare®/Macintosh share data.
  - 1 Operating system — Files that are necessary to run the Microsoft® Windows® Powered operating system on the NAS system.
  - 1 Data files — The documents and other files that are not part of the operating system.
- 

## System-State Backup

Backing up the system state allows you to recover the system if an operating system reinstallation is required. Restoring your system state restores customized settings such as user information and share information.

System-state data includes the following:

- 1 Registry
- 1 COM+ class registration database
- 1 System boot files
- 1 Users and groups information
- 1 CIFS/NFS/Novell NetWare/Macintosh share data

For more information, see the online help for Windows 2000 Backup and Recovery Tools.

To ensure information about all shares is preserved, back up the following folders with the system-state data, if they exist:

- 1 C:\Documents and Settings\Administrator\Application Data
- 1 C:\Documents and Settings\All Users\Application Data
- 1 C:\Documents and Settings\Default User\Application Data
- 1 C:\Documents and Settings\SYSTEM\Application Data

## Backing Up System-State Data

Dell recommends that you regularly back up your system state. This action enables you to go back to the most recent state if an operating system reinstallation is required.

To back up system-state data, perform the following steps:

1. Log in to the NAS Manager as an administrator.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

2. Click **Maintenance**.
3. Click **Backup**.

4. In the **Log on to Windows** window, enter the administrator user name and password and click **OK**.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

The **Welcome to the Windows 2000 Backup and Recovery Tools** window displays.

 **NOTE:** If the **Windows 2000 Backup and Recovery Tools** window does not display, click **Maintenance**, and then click **Terminal Services**. On the Advanced Administration Menu, click **Administrative Tools** and then click **Windows 2000 Backup/Recovery**.

5. Click **Backup Wizard**.
6. In the **Backup Wizard** window, click **Next**.
7. In the **What to Back Up** window, click **Back up selected files, drives, or network data**, and click **Next**.
8. In the **Items to Back Up** window, click the **System State** check box in the **My Appliance** tree.
9. Click the check box for the following folders, if they exist:
  1. **C:\Documents and Settings\Administrator\Application Data**
  1. **C:\Documents and Settings>All Users\Application Data**
  1. **C:\Documents and Settings\Default User\Application Data**
  1. **C:\Documents and Settings\SYSTEM\Application Data**
10. In the **Where to Store the Backup** window, click **Browse**.
11. In the **Open** window, select the location to store your system-state backup file, enter the file name, and then click **Open**.

For fault tolerance, select a location that is not on the NAS system.

12. Click **Next** and then click **Finish**.

The backup begins and progress displays in the **Backup Progress** window.

13. When the backup is complete, click **Close**.

## Restoring System-State Data

To restore your system-state data, you must have previously backed up your system using the backup and recovery tools. See "[Backing Up System-State Data](#)" in this section of the guide.

 **NOTE:** If you are restoring system-state data after reinstalling the operating system, perform the procedure in "[Restoring System-State Data After Reinstallation](#)" in the "Recovering and Restoring the System" section of this guide.

To restore system-state data, perform the following steps:

1. Log in to the NAS Manager as an administrator.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

2. Click **Maintenance**.
3. Click **Backup**.
4. In the **Log on to Windows** window, enter the user name and password and click **OK**.

 **NOTE:** The default administrative user name is `administrator` and the default password is `powervault`.

The **Welcome to Windows 2000 Backup and Recovery Tools** window is displayed.

5. Click **Restore Wizard**.
6. In the **Restore Wizard** window, click **Next**.
7. In the **What to Restore** window, click (+) to expand the **File** tree, and then click to expand **Media created yyyy/mm/dd**, where `yyyy/mm/dd` is the year/month/date that you made the system-state backup.

8. Click the check box next to **System State** and any other application data folders that you backed up and then click **Next**.
9. Click **Finish**.
10. When the **Enter Backup File Name** window is displayed, click **OK**.

 **NOTE:** If your backup file is in a different location, click **Browse** and locate the file.

11. Restart the system after the restore process completes.

 **NOTE:** Windows must replace all locked files on the system; therefore, the process of restarting the system might take approximately 15 minutes to complete.

---

## Backing Up Data Volumes

To back up your volumes, you can use direct-attached local backups or network backups.

 **NOTE:** To perform a local tape backup, you must have a SCSI adapter card installed in the NAS system.

The following software is supported for direct-attached local backups:

1. Windows 2000 Backup and Recovery Tools
1. VERITAS™ Backup Exec® 9.0 for Windows Servers
1. Yosemite Technologies TapeWare 7.0

The following software is supported for remote network backups:

1. VERITAS Backup Exec 9.0 for Windows Servers
1. Yosemite Technologies TapeWare 7.0

## Windows 2000 Backup and Recovery Tools

Windows 2000 Backup and Recovery Tools allow you to back up your data volumes to a locally attached tape drive or to a file.

 **NOTE:** You must have a supported SCSI controller card and a tape device installed to back up your data volumes to tape.

You can access the Windows 2000 Backup and Recovery Tools by clicking the **Maintenance** tab on the NAS Manager primary menu and clicking **Backup** or by clicking **Windows 2000 Backup/Recovery Tools** on the **Advanced Administration Menu** under **Administrative Tools**.

For more information about the Windows 2000 Backup and Recovery Tools, see the Windows Powered Help. You can access Windows Powered Help by clicking **Windows Powered Help** in the **Advanced Administration Menu** under **Administrative Tools** or by clicking **Help** in the **Start** menu when using the Terminal Services Client.

## Installing Tape Device Drivers for Windows 2000 Backup and Recovery Tools

If you are using Windows 2000 Backup and Recovery Tools, you might need to install drivers for both tape drives and tape media changers.

 **NOTE:** Most of the tape device drivers are located in the `c:\dell\drivers` directory. However, always check the Dell Support website at [support.dell.com](http://support.dell.com) for updated drivers and patches.

### Installing Drivers for Dell PowerVault Tape Drives

1. Connect the Dell™ PowerVault™ tape drive, and then restart the system.
2. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to a Terminal Services Client session.
6. On the **Advanced Administration Menu** under **System Management**, click **Computer Management**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

7. Click **Computer Management** in the left pane.
8. Click **System Tools** in the left pane.
9. Click **Device Manager** in the left pane.
10. Click **Unknown Devices** in the right pane.

 **NOTE:** The tape device may also appear under **Other Devices**.

11. Double-click the tape device.
12. Click **Driver** in the pop-up window.
13. Click **Update Driver**.

The Upgrade Device Driver Wizard displays.

14. Click **Next**.
15. Click the radio button next to **Search for a suitable driver for my device (recommended)**, and then click **Next**.
16. In **Optional search locations**, click the check box next to **Specify a location**, and deselect the other check boxes.
17. Click **Next**.
18. In the path for **Copy manufacturer's files from**, specify the folder name that contains the device drivers.
19. Click **OK**, and then click **Next**.

The Upgrade Device Driver wizard searches the specified folder for the driver files.

20. Ensure that the wizard has selected the appropriate PowerVault tape device, and then click **Next**.
21. Click **Finish**.
22. Click **Close** to exit the driver properties dialog box.

## Installing Drivers for Dell PowerVault Tape Drive Media Changers

To install drivers for tape media changers when using Windows 2000 Backup and Recovery Tools, perform the following steps:

1. **Connect the Dell™ PowerVault™ tape device, and then restart the NAS system.**
2. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to a **Terminal Services Client** session.
6. In the **Advanced Administration Menu**, click **Computer Management** under **System Management**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

7. Click **Computer Management** in the left pane, and then click **System Tools**.
8. Click **Device Manager** in the left pane.

9. Click **Medium Changers** in the right pane.
10. Double-click **Unknown Medium Changer**.
11. Click **Driver** in the **Properties** window.
12. Click **Update Driver**.

The Upgrade Device Driver wizard is displayed.

13. Click **Next**.
14. Click the radio button next to **Search for a suitable driver for my device (recommended)**, and then click **Next**.
15. In **Optional search locations**, click the check box next to **Specify a location**, and deselect the other check box.
16. Click **Next**.

A dialog box displays with a field for you to enter the location of the device driver.

17. In the path for **Copy manufacturer's files from**, specify the folder name that contains the device drivers, and then click **OK**.
18. Click **Next**.

The Upgrade Device Driver wizard searches the specified folder for the driver files.

19. Ensure that the Upgrade Device Driver wizard has selected the appropriate PowerVault tape device, and then click **Next**.
20. Click **Finish**.
21. Click **Close**.

## VERITAS Backup Exec 9.0 for Windows Servers

 **NOTE:** Before installing the backup software, check the Dell Support website at [support.dell.com](http://support.dell.com) for the latest driver and software updates. You might need to install the updates after completing the procedures below.

### Installing VERITAS Backup Exec on the NAS System

 **NOTE:** VERITAS Backup Exec supports installation using Terminal Services and management using VERITAS Remote Administrator.

1. Share the CD drive on a remote system, mount that remote CD drive on the NAS system, and then insert the *VERITAS Backup Exec Installation* CD into the CD drive of the remote system.
2. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to the NAS system.
6. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
7. Follow the instructions in the documentation that came with your backup software.

 **NOTE:** After the software installation is complete, disconnect the network drive for the CD share before you reboot your system. To disconnect the network drive, right-click **My Appliance** on the NAS system desktop, and select **Disconnect Network Drive**. Click the CD share in the **Disconnect Network Drive** window, and then click **OK**.

### Installing VERITAS Backup Exec Remote Administrator on a Client System

1. Insert the *VERITAS Backup Exec Installation* CD in the CD drive of the client system.

The CD starts the software automatically.

2. If the CD does not start the software automatically, open Windows Explorer, right-click the CD drive that contains the VERITAS software, and select **Autoplay** from the menu.

3. Follow the instructions in the documentation that came with your backup software.

### Using VERITAS Backup Exec Remote Administrator

1. On the remote system, click the **Start** button, point to **Programs**, and then click **VERITAS Backup Exec for Windows Servers**.

The **Connect to Server** window displays.

2. Enter the name of the NAS system in the **Server** field.
3. Enter log-in information in the **Login Information** field and click **OK**.

The Remote Administrator now connects to the NAS system and allows you to use the Administration Console to operate the system. Use the Administration Console to manage all backup operations just as you would from the local application. See the VERITAS Backup Exec documentation for more information about how to use the software.

## Backup Software for Network Backups

You may back up your data volumes over the network to local area network (LAN)-attached backup servers. This backup requires that you already have a backup server on your network.

Dell recommends that you use backup software network accelerator agents to improve network backup performance.

### Installing Network Accelerator Agents

VERITAS Backup Exec accelerator agents can be installed remotely by installing the agent to the system from a remote system on the network.

See the documentation for your backup software for more information about how to install the network accelerator agents.

## Yosemite Technologies TapeWare 7.0

 **NOTE:** Before installing the backup software, check the Dell Support website at [support.dell.com](http://support.dell.com) for the latest driver and software updates. You might need to install the updates after completing the following procedures.

### Installing TapeWare on the NAS System

1. Share the CD drive on a remote system, mount that remote CD drive on the NAS system, and then insert the TapeWare installation CD into the CD drive of the remote system.
2. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to the NAS system.
6. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
7. Follow the instructions in the documentation that came with your backup software.

 **NOTE:** After the software installation is complete, disconnect the network drive for the CD share before you reboot your system. To disconnect the network drive, right-click **My Appliance** on the NAS system desktop, and select **Disconnect Network Drive**. Click the CD share in the **Disconnect Network Drive** window, and then click **OK**.

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## Backing Up Dell ActiveArchive™ Persistent Images

Backing up persistent images eliminates the possibility of files changing during the back up job. Persistent images always contain the data that existed when the persistent image was taken. However, backing up persistent images requires that you perform several steps and should be performed only by advanced backup administrators. Dell recommends that you use the available open file agents in VERITAS Backup Exec to back up your open files rather than backing up persistent images.

To back up a persistent image, perform the following steps:

1. Use the NAS Manager to create a persistent image.

See the "[Dell ActiveArchive](#)" section in this guide.

 **NOTE:** For increased performance, back up only read-only persistent images.

2. On the NAS Manager primary menu, click **Maintenance**.
3. Click **Terminal Services** and log in to the NAS system.
4. If the **PowerVault Advanced Administration** window displays, click **Exit**.
5. Double-click **My Appliance** and browse to the persistent image you created in [step 1](#).

Persistent images are located in the Dell ActiveArchive directory of the volume on which you created the persistent image in step 1.

6. Right-click the persistent image, and then click **Sharing**.
7. Click **Share this folder**.
8. Type the name of the share in the **Share name** field.
9. Click **Permissions**.
10. Set the required permissions in the **Permissions** window, and then click **OK**.
11. Click **OK** in the **Properties** window.
12. On the system that is running VERITAS Backup Exec, set up VERITAS Backup Exec so that it can back up user shares.

You can find this option in **Tools**→**Options** menu on the **Network** tab.

13. In the VERITAS Backup Exec **Backup Selections** window, browse to your NAS system under **Entire Network**.
14. Select the share name that you created in step 8 for your persistent image.
15. Deselect the **Persistent Storage Manager State** directory when performing persistent image backups.

This directory contains files needed for persistent images. However, to save space on your backup media, backing up the files is not recommended.

16. Click **Backup**.
17. Select **Run Now** to run the backup now or **Schedule** to schedule your backup job to run at a later time.

 **NOTE:** Although you are backing up your persistent image from a network share, it does not create network traffic if you are backing up to a local backup device.

## Limitations on Backing Up Persistent Images

- 1 You cannot do incremental or differential backups of persistent images.
- 1 You cannot use GFS rotation schemes when backing up persistent images.
- 1 You cannot schedule a backup of a persistent image.

You must perform a manual backup of persistent image files because each persistent image filename is unique in that it includes the date and time (hour-minute-second) that the persistent image was taken.

- 1 When you restore a persistent image, you must redirect the restore to a location other than the original persistent image location. A restore to the original location is not successful.

## Restoring Persistent Images From Tape Backup

1. On the system on your network that is running VERITAS Backup Exec, click the **Restore Selections** tab to bring up the window that lists your previous backup files.
  2. Browse to your backup of the persistent image that you want to restore, and then select it by clicking the check box next to it.
  3. Click **Restore**.
  4. Click the **Redirection** tab.
  5. Click the check box next to **Redirect Files**.
  6. Enter the drive letter and path where you want the files to be restored.
  7. Click **Run Now** to run the restore immediately or click **Schedule** to schedule your restore job to run at a later time.
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## Recovering and Restoring the System

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [Introduction to Software-RAID NAS System Recovery and Restoration Procedures](#)
- [Introduction to Hardware-RAID NAS System Recovery and Restoration Procedures](#)
- [Reinstalling the Operating System](#)
- [Restoring System-State Data After Reinstallation](#)
- [Restoring Initial System Setup](#)

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This section provides instructions on how to recover and restore a software-RAID NAS system and a hardware-RAID NAS system. The recovery and restoration procedures are different for each system type. If your NAS system uses software RAID, see "[Introduction to Software-RAID NAS System Recovery and Restoration Procedures](#)" in this section of the guide. If your NAS system uses hardware-RAID, see "[Introduction to Hardware-RAID NAS System Recovery and Restoration Procedures](#)" in this section of the guide.

For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

➡ **NOTICE:** Ensure that you use the correct recovery and restoration procedures for your NAS system RAID type.

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## Introduction to Software-RAID NAS System Recovery and Restoration Procedures

➡ **NOTICE:** If your NAS system uses hardware RAID, see "[Introduction to Hardware-RAID NAS System Recovery and Restoration Procedures](#)" in this section of the guide. Do not use the following procedures to recover and restore a hardware-RAID NAS system. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

This subsection provides instructions on how to recover the software-RAID NAS system if the operating system or a hard drive fails. Additionally, this section provides information for possible solutions that do not require restoring the operating system or hard drives.

Because your NAS system is designed to have redundancy, it can recover from certain hardware and software failures. In some situations, it can recover automatically, and in others, you must have administrator privileges and manually intervene to recover the NAS system.

Use the following methods in the order listed to restore your software-RAID NAS system:

1. Check all of the items in "[Troubleshooting Software-RAID NAS Systems](#)" in this section of the guide.
2. Follow the procedures described in "[Bootting From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives](#)" in this section of the guide.
3. Reinstall the operating system as described in "[Recovering From a Software-RAID Operating System Failure](#)" in this section of the guide.

## Troubleshooting Software-RAID NAS Systems

This section provides checks and solutions to try before you reinstall your operating system or replace a hard drive. Some of the checks require you to observe the LEDs on the front and back of the NAS system. For more information about the LEDs, see your *Installation and Troubleshooting Guide*.

- 1 **Does the power LED show that the NAS system is turned on?**

Ensure that the power cable connected to the NAS system and a power source and that the NAS system is turned on.

- 1 **Are the link LEDs on the back of the NAS system and any network switches to which it may be connected illuminated?**

Ensure that the Ethernet cable is securely connected to the NAS system and a functioning Ethernet jack.

- 1 **Are you using a standard Ethernet cable to connect to the network?**

Do not use a crossover cable.

1 **Have you allowed enough time for the NAS system to boot?**

The NAS system typically takes several minutes to boot.

1 **Does the NAS system boot completely?**

Connect a keyboard, mouse, and monitor to the NAS system, and observe the boot process.

1 **Are the LEDs for all four hard drives on the NAS system lit?**

If the LEDs are not all lit, you may have a failed hard drive. See "[Software-RAID NAS System Hard-Drive Failures](#)" in this section of the guide.

## Software-RAID NAS System Hard-Drive Failures

Your software-RAID NAS system has a mirror of the operating system on hard drives, which allows you to recover in most cases. Depending on which drive fails, use one of the procedures in [Table 5-1](#) to recover from a hard-drive failure.

➡ **NOTICE:** The software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable between the two types of NAS systems. The hardware RAID hard-drive carriers have a "HW-RAID" identification label and the software RAID hard-drive carriers have a "SW-RAID" identification label.

**Table 5-1. Software-RAID NAS System Hard-Drive Recovery Procedures**

Hard Drive That Failed	Necessary Action
Hard drive 0	Replace the failed hard drive. See " <a href="#">Replacing Software-RAID NAS System Hard Drive 0</a> " in this section of the guide.
Hard drive 1, 2, or 3	Replace the failed hard drive. See " <a href="#">Replacing Software-RAID NAS System Hard Drive 1, 2, or 3</a> " in this section of the guide.
Two or more hard drives fail	Replace the failed hard drives, and then follow the procedures in " <a href="#">Recovering From a Software-RAID Operating System Failure</a> " in this section of the guide.

## Software-RAID NAS System Software Failures

To recover from the following software failures, use one of the following procedures:

- 1 If the main operating system files are missing or corrupt, you must manually boot from the recovery operating system mirror hard drives 2 and 3. For instructions, see "[Bootling From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives](#)" in this section of the guide.
- 1 If the main operating system mirrored partition fails, you must manually boot from the recovery operating system mirror hard drives 2 and 3 and restore the original files to the main operating system hard drives 0 and 1. See "[Replacing Software-RAID NAS System Hard Drive 0](#)" in this section of the guide. After the system is running, you can boot the system back to the main operating system hard drives and then perform a system-state restore operation. See "[Restoring System-State Data After Reinstallation](#)" in this section of the guide.

## Replacing Software-RAID NAS System Hard Drives

This section provides the procedures for replacing hard drive 0, hard drives 1, 2, or 3, re-establishing the recovery operating system partitions, and booting from the recovery operating system mirror hard drives.

➡ **NOTICE:** The software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable between the two types of NAS systems. The hardware RAID hard-drive carriers have a "HW-RAID" identification label and the software RAID hard-drive carriers have a "SW-RAID" identification label.

### Replacing Software-RAID NAS System Hard Drive 0

1. Shut down the system.
2. Remove the front bezel.
3. Remove failed hard drive 0 from the NAS system.

See your *Installation and Troubleshooting Guide* for information about removing and replacing drives.

4. Remove working hard drive 1, and then insert it in the hard drive 0 location.
5. Insert a new hard drive in the hard drive 1 location.
6. Replace the front bezel.
7. Turn on the system.
8. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

9. Click **Disks**, and then click **Volumes**.
10. Click **Repair**.

 **NOTE:** If the repair button does not appear, then you do not have a drive the same size or larger than the failed drive, you did not have the drive in the system when the system booted, or you were not using a RAID 5 volume. Use Dell OpenManage™ Array Manager to repair or reconfigure your volumes. See "[Using Array Manager to Manage Your Disks and Volumes](#)" in the "Advanced Disk and Volume Management" section of this guide.

### Replacing Software-RAID NAS System Hard Drive 1, 2, or 3

1. Remove the front bezel.
2. Remove the failed hard drive from the NAS system.

See your *Installation and Troubleshooting Guide* for information about removing and replacing drives.

3. Insert a new hard drive in the same location.
4. Replace the front bezel.
5. Turn on the system, if it is not turned on already.

 **NOTE:** The NAS system takes approximately 5 minutes to boot completely.

6. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

7. Click **Disks**, and then click **Volumes**.
8. Click **Repair**.

 **NOTE:** If the repair button does not appear, then you do not have a drive that the same size or larger than the failed drive, you did not have the drive in the system when the system booted, or you were not using a RAID 5 volume. Use Array Manager to repair or reconfigure your volumes. See "[Using Array Manager to Manage Your Disks and Volumes](#)" in the "Advanced Disk and Volume Management" section of this guide.

### Recovering From a Software-RAID Operating System Failure

If the operating system for your software-RAID NAS system fails, recover data by booting from the recovery mirror hard drives, and then use one of the following methods to reinstall the operating system:

1. Reinstall the operating system using a dedicated client system running Microsoft® Windows® 2000
1. Reinstall the operating system using a system that is running Windows 2000 that is on the same LAN with a DHCP server or without a DHCP server
1. Use an existing Preboot Execution Environment (PXE) server

 **NOTICE:** The reinstallation procedure resets your NAS system to the Dell default settings and deletes all data on the NAS system. Before performing this procedure, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives](#)" in this section of the guide.

### Booting From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives

You might need the software-RAID NAS system to boot from the recovery operating system mirror so that you can perform a file restore on the main operating system mirror or access the data on the data partition and back it up to tape.

 **NOTE:** The recovery operating system mirror is intended as a temporary way to back up your data. After performing the backup, reinstall the operating system using the procedures in "[Reinstalling the Operating System](#)" in this section of the guide.

To boot from the recovery drive, perform the following steps:

1. Shut down the NAS system.
2. Remove the front bezel.
3. Swap hard drives 0 and 2 with each other.

See your *Installation and Troubleshooting Guide* for information about swapping drives.

4. Swap hard drives 1 and 3 with each other.
5. Replace the bezel.
6. Turn on the NAS system.

The NAS system boots from the operating system on hard drives 0 and 1.

 **NOTE:** Because the system boots using the recovery image operating system with the Dell default settings, any configuration information is lost. See "[Configuring Your NAS System for the First Time](#)" in the "Initial Configuration" section of this guide.

7. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

8. Back up your data and then reinstall the operating system. See "[Reinstalling the Operating System](#)" in this section of the guide for the operating system reinstallation procedures.

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## Introduction to Hardware-RAID NAS System Recovery and Restoration Procedures

 **NOTICE:** If your NAS system uses software RAID, see "[Introduction to Software-RAID NAS System Recovery and Restoration Procedures](#)" in this section of the guide. Do not use the following procedures to recover and restore a software-RAID NAS system. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

This section provides instructions on how to recover the hardware-RAID NAS system if the operating system or a hard drive fails. Additionally, this section provides information for possible solutions that do not require restoring the operating system or hard drives.

Because your NAS system is designed to have redundancy, it can recover from certain hardware and software failures. In some situations, it can recover automatically, and in others, you must have administrator privileges and manually intervene to recover the NAS system.

Use the following methods in the order listed to restore your hardware-RAID NAS system:

1. Check all of the items in "[Troubleshooting Hardware-RAID NAS Systems](#)" in this section of the guide.
2. Check the procedures in "[Hardware-RAID NAS System Hard-Drive Failures](#)" in this section of the guide.

## Troubleshooting Hardware-RAID NAS Systems

This section provides checks and solutions to try before you reinstall your operating system or replace a hard drive. Some of the checks require you to observe the LEDs on the front and back of the NAS system. For more information about the LEDs, see your *Installation and Troubleshooting Guide*.

- 1 **Does the power LED show that the NAS system is turned on?**

Ensure that the power cable connected to the NAS system and a power source and that the NAS system is turned on.

- 1 Are the link LEDs on the back of the NAS system and any network switches to which it may be connected illuminated?

Ensure that the Ethernet cable is securely connected to the NAS system and a functioning Ethernet jack.

- 1 Are you using a standard Ethernet cable to connect to the network?

Do not use a crossover cable.

- 1 Have you allowed enough time for the NAS system to boot?

The NAS system typically takes several minutes to boot.

- 1 Does the NAS system boot completely?

Connect a keyboard, mouse, and monitor to the NAS system, and observe the boot process.

- 1 Are the LEDs for all four hard drives on the NAS system lit?

If the LEDs are not all lit, you may have a failed hard drive. See "[Hardware-RAID NAS System Hard-Drive Failures](#)" in this section of the guide.

## Hardware-RAID NAS System Hard-Drive Failures

Your hardware-RAID NAS system uses RAID 5 parity-redundancy functions to recover the operating system and data in most cases. Depending on how many drives fail, use one of the procedures in [Table 5-2](#) to recover from a hard-drive failure.

-  **NOTICE:** The software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable between the two types of NAS systems. The hardware RAID hard-drive carriers have a "HW-RAID" identification label and the software RAID hard-drive carriers have a "SW-RAID" identification label.

Table 5-2. Hardware-RAID NAS System Hard-Drive Recovery Procedures

Hard Drive That Failed	Necessary Action
Hard drive 0, 1, 2, or 3	Replace the failed hard drive. See " <a href="#">Replacing One Hardware-RAID NAS System Hard Drive</a> " in this section of the guide.
Two or more hard drives fail	Replace the failed hard drives. See " <a href="#">Replacing Two or More Hardware-RAID NAS System Hard Drives</a> " in this section of the guide.

## Hardware-RAID NAS System Software Failures

Reinstalling the operating system on a hardware-RAID NAS system does not delete the data volume; therefore, a data recovery partition, which is available on a software-RAID NAS system, is not necessary. RAID 5 redundancy protection is provided by its ability to recover data through parity matching. Therefore, if the operating system files are missing or corrupt, the operating system must be reinstalled. See "[Recovering From a Hardware-RAID Operating System Failure](#)" in this section of the guide.

## Replacing Hardware-RAID NAS System Hard Drives

This section provides procedures for replacing hard drives 0, 1, 2, or 3. If a single hard-drive failed, see "[Replacing One Hardware-RAID NAS System Hard Drive](#)" in this section of the guide. If two or more hard drives failed, see "[Replacing Two or More Hardware-RAID NAS System Hard Drives](#)" in this section of the guide.

-  **NOTICE:** The software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable between the two types of NAS systems. The hardware RAID hard-drive carriers have a "HW-RAID" identification label and the software RAID hard-drive carriers have a "SW-RAID" identification label.

### Replacing One Hardware-RAID NAS System Hard Drive

1. Remove the front bezel.
2. Remove the failed hard drive from the NAS system.

See your *Installation and Troubleshooting Guide* for information about removing and replacing drives.

3. Insert a new hard drive in the same location.

 **NOTE:** Ensure that the new hard drive is the same size as or larger than the failed drive.

4. Replace the front bezel.
5. Turn on the system, if it is not already turned on.

 **NOTE:** The NAS system takes approximately 5 minutes to boot completely.

If the NAS system was turned on when the hard drive was replaced, the RAID controller card automatically rebuilds and recovers all data to the new hard drive. If the NAS system was turned off when the hard drive was replaced, you must manually start the rebuilding process.

To manually start the rebuilding process, perform the following steps:

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to the **Terminal Services** session as an administrator.

 **NOTE:** The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

5. From the **Advanced Administration Menu**, click **Disk Management** under **System Management**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

6. Double-click **Arrays** to expand its list.
7. Double-click **PERC Subsystem 1** to expand its list.
8. Double-click **CERC ATA100/4ch Controller 0** to expand its list.
9. Double-click **Array Group 0** to expand its list.
10. Right-click the hard drive that you replaced, and click **Rebuild**.

## Replacing Two or More Hardware-RAID NAS System Hard Drives

 **NOTICE:** Replacing two or more hard drives deletes all of the data on the hardware-RAID NAS system.

1. Shut down the NAS system.

See "[Shutting Down the NAS System](#)" in the "NAS Manager" section of this guide.

2. Remove the front bezel.
3. Remove the failed hard drives from the NAS system.

See your *Installation and Troubleshooting Guide* for information about removing and replacing drives.

4. Insert new hard drives in the same location as the failed hard drives.

 **NOTE:** Ensure that the new hard drives are the same size as or larger than the failed drives.

5. Replace the front bezel.

6. Recreate the virtual disks as explained in "[Recreating Virtual Disks](#)" in this section of the guide.

## Recreating Virtual Disks

1. Turn on the NAS system.
2. When prompted during POST, press <Ctrl><m> to start the CERC BIOS Configuration Utility.
3. Select **Configure** in the **Management Menu**.
4. Select **New Configuration** in the **Configure** screen.
5. Select **Yes** in the **Proceed** screen.
6. When the **New Configuration Select Array Menu** appears, press the <Spacebar> four times to select all four hard drives.
7. Press <Enter>.
8. Press <F10>.
9. Press the <Spacebar>.
10. Press <F10>.
11. Press <Enter> twice to select **RAID 5**.
12. Highlight **Size** and press <Enter>.
13. Type 5000 to specify a 5-GB partition and press <Enter>.
14. Highlight **Accept** and press <Enter>.
15. Press <Enter> five times to assign the remainder of the hard drive capacity to a second logical drive with a RAID 5 configuration.
16. Select **Yes** in the **Save Configuration** screen and press any key to continue.
17. Press <Esc> twice.
18. Select **Yes** in the **Exit** screen.
19. Reboot the NAS system.
20. See "[Recovering From a Hardware-RAID Operating System Failure](#)" in this section of the guide.

## Recovering From a Hardware-RAID Operating System Failure

If the operating system for your hardware-RAID NAS system fails, use one of the following methods to reinstall the operating system:

1. Reinstall the operating system using a dedicated client system running Windows 2000
1. Reinstall the operating system using a system running Windows 2000 that is on the same LAN with a DHCP server or without a DHCP server
1. Use an existing PXE server

## Recreating a Hardware-RAID NAS System Data Volume

If you have several operating system failures, you may need to recreate the RAID-5 data volume. After reinstalling the operating system, ensure that the RAID-5 data volume is present as explained in "Checking Partition or Volume Properties" in the "Advanced Disk and Volume Management" section of this guide. If the RAID-5 data volume is not present, recreate the volume as explained in the following steps:

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **System Management** and then click **Disk Management**.

The **Dell OpenManage Array Manager** screen appears.

5. Click the **Create Volume** button.

The **Create Volume Wizard** screen appears.

6. Click **Next**.
7. Ensure that **Dynamic Volume** is selected and click **Next**.
8. Click **Query Max Size**.
9. Click **Next**.
10. Click **Next** again.
11. Ensure that the drive letter is assigned as **D:** and click **Next**.
12. Ensure that **NTFS** is selected.
13. Check the **Perform a quick format** box.
14. Click **Next**.
15. Click **Finish**.

See "[Reinstalling the Operating System](#)" in this section of the guide for the operating system reinstallation procedures.

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## Reinstalling the Operating System

- ➡ **NOTICE:** This procedure resets your NAS system to the Dell default settings. It also deletes all data on the software-RAID NAS system (hardware-RAID NAS system data is not affected). Before performing this procedure on a software-RAID NAS system, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives](#)" in this section of the guide. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

Depending on your environment, you can use one of the following methods to reinstall the operating system:

- 1 Use a system running Windows 2000 on the network
- 1 Use an existing PXE server
- 1 Use a dedicated system running Windows 2000

## Using a Dedicated System Running Windows 2000

- ➡ **NOTICE:** This procedure resets your NAS system to the Dell default settings. It also deletes all data on the software-RAID NAS system (hardware-RAID NAS system data is not affected). Before performing this procedure on a software-RAID NAS system, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives](#)" in this section of the guide. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

### Requirements

- 1 Crossover cable (not provided with the NAS system)
- 1 Client system running Windows 2000 (Professional or Server Family) with a CD drive
- 1 *Resource* CD included with your NAS system
- 1 *Reinstallation* CD included with your NAS system

## Restoring Your NAS System to Preinstalled Settings

- ➡ **NOTICE:** This procedure deletes all of the data on your NAS system.

1. Shut down the NAS system, and do not turn it back on until instructed.

See "[Shutting Down the NAS System](#)" in the "NAS Manager" section of this guide.

2. Connect a crossover cable to the Ethernet port labeled "LAN 1" on the NAS system and the Ethernet port on a client system running Windows 2000.
3. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

4. Turn on the client system.
5. Log in to the client system with an account that has administrator privileges.
6. Enter a new user name `pv725` and the password `password`.
  - a. From the desktop of your client system, right-click **My Computer**, and then select **Manage**.
  - b. On the left side of the **Computer Management** window, double-click **Local Users and Groups**.
  - c. Right-click **Users** and select **New User**.
  - d. In the **New User** window, type `pv725` as the user name.
  - e. Type `password` for the password, and type it again in the **Confirm password** field.
  - f. Deselect the **User must change password at next logon** to clear the check box.
  - g. Click **Create** and click **Close**.
7. Change the name of the client system running Windows 2000 to `pv725rec`:
  - a. From the desktop of your client system, right-click **My Computer** and then select **Properties**.
  - b. In the **System Properties** window, click **Network Identification**.
  - c. Click **Properties**.
  - d. In the **Identification Changes** window, type `pv725rec` for the system name.
  - e. Click **OK**, but do not reboot when prompted.
  - f. Click **OK** to close the **Properties** window.
8. Change the IP address on the network adapter of the client system to 10.40.10.1 and the subnet mask to 255.255.255.0:
  - a. From the desktop of the client system, right-click **My Network Places** and select **Properties**.
  - b. In the **Network and Dial-up Connections** window, right-click the network adapter that you connected to the NAS system with a crossover cable in step 1, and click **Properties**.
  - c. In the **Local Area Connection Properties** window, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
  - d. Click **Use the following IP address**.
  - e. For IP address, type 10.40.10.1.
  - f. For subnet mask, type 255.255.255.0.
  - g. For gateway, type 10.40.10.1.
  - h. Click **OK** to close the **Internet Protocol (TCP/IP) Properties** window.
  - i. Click **OK** twice to close the **Local Area Connection Properties** window.
  - j. If you are prompted to reboot the client system, click **No**.
9. Create a share for the CD drive:
  - a. Log in to the client system with an account that has administrator privileges.
  - b. Double-click **My Computer**
  - c. Right-click the CD drive, and select **Sharing**.
  - d. Click **Share this folder**.
  - e. Type `CD` for the name of the share, and then click **OK** to confirm the share settings.
10. Install the Dell Reinstallation Console from the *Resource* CD:
  - a. Insert the *Resource* CD into the CD drive of your client system.

The **Dell PowerVault 725N Resource CD** window displays in a browser window.

 **NOTE:** If the CD does not run automatically, double-click the **start.bat** file on the CD.

- b. Click **Resources**.
- c. Click **Install Reinstallation Console**.
- d. When the **File Download** window displays, click **Open this file from its current location**, and then click **OK**.
- e. Click **Next** and follow the instructions on the screen.

- f. When prompted to reboot the client system, click **Yes**.

The *Resource* CD is no longer required; remove it from the client system.

11. Insert the *Reinstallation* CD into the client system's CD drive.
12. Turn on the NAS system.

The system must be turned on so that you can set the IP address using the Dell OpenManage™ Kick-Start utility.

13. Enable the Kick-Start utility and create your DHCP settings:
  - a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Dell OpenManage Kick-Start**.
  - b. When asked if you want to run the program, click **Yes**.
  - c. At the bottom of the **Dell OpenManage Kick-Start** window, click **Setup**.
  - d. Click **Add**.
  - e. In the **Add Scope** window, enter the following information and click **OK**:
    - 1 10.40.10.10 for **Starting IP Address**
    - 1 10.40.10.20 for **Ending IP Address**
    - 1 255.255.255.0 for **Subnet**
    - 1 10.40.10.1 for **Gateway IP Address**
  - f. Click **OK** to close the **Add Scope** window.
  - g. Click **Interfaces for DHCP Server**.
  - h. Click **OK** to close the **Setup** window.
  - i. Click **Enabled** at the bottom of the **Dell OpenManage Kick-Start** window to start the integrated DHCP server.
14. Start the Intel® PXE server and verify that the services are running:
  - a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Intel PXE Server**.
  - b. In the **PXE Configuration Utility** window, right-click the server name, **PV725REC**, and then select **Start/Stop Services**.
  - c. Verify that the proxy DHCP/Boot PXE and M/TFTP services are installed and running correctly by selecting **Stop** and then selecting **Start**.

If the services are running, ensure that the message **started** is displayed after you click **Start** and **stopped** is displayed after you click **Stop** on the indicator.

- d. Click **OK**.
15. Reboot the NAS system by pressing the power button for less than 2 seconds.
16. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

17. From the menu, select option 4, **Reinstallation**, and then type **y** to confirm the selection.
18. When the screen warns that you are going to reinstall and that it will erase data, type **y**.
19. Press **y** again to confirm the selection.

Depending on your configuration, this process could take several hours to complete. When the reinstallation is complete, the NAS system shuts down.

 **NOTE:** During the reinstallation, do not attempt to connect to your NAS system.

20. After the NAS system shuts down, reboot the system.

The system is set to the preinstalled settings.

21. Reconfigure the system.

See "[Configuring Your NAS System for the First Time](#)" in the "Initial Configuration" section of this guide.

## Using a Client System Running Windows 2000 on the Same Network

You can install the NAS system operating system whether the network has a DHCP server or not with a client system running Windows 2000 that is on the same network as the NAS system.

- ➔ **NOTICE:** This procedure resets your NAS system to the Dell default settings. It also deletes all data on the software-RAID NAS system (hardware-RAID NAS system data is not affected). Before performing this procedure on a software-RAID NAS system, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives](#)" in this section of the guide. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

## Reinstalling the Operating System on a Network With a DHCP Server

If your network has a DHCP server and you have a client system running Windows 2000 on the same network, use the following procedure to reinstall your NAS system's operating system.

- ➔ **NOTICE:** This procedure deletes all of the data on the software-RAID NAS system (hardware-RAID NAS system data is not affected). For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

If your network has a DHCP server, you need the following to reinstall the operating system:

- 1 Client system with a CD drive and a diskette drive that is running Windows 2000 (Professional or Server Family) on the same subnet as the NAS system

 **NOTE:** The system being used for the installation is *not* the DHCP server.

- 1 *Resource* CD included with your NAS system
- 1 *Reinstallation* CD included with your NAS system
- 1 Existing DHCP service in the LAN

To reinstall your NAS operating system, perform the following steps:

- ➔ **NOTICE:** This procedure deletes all of the data on your NAS system.

1. Shut down the NAS system, and do not turn it back on until instructed.

See "[Shutting Down the NAS System](#)" in the "NAS Manager" section of this guide.

2. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

3. Turn on the client system running Windows 2000.
4. Log in to the client system with an account that has administrator privileges.
5. Enter a new user name `pv725` and the password `password`:
  - a. From the desktop of your client system, right-click **My Computer**, and then select **Manage**.
  - b. On the left side of the **Computer Management** window, double-click **Local Users and Groups**.
  - c. Right-click **Users** and select **New User**.
  - d. In the **New User** window, type `pv725` as the user name.
  - e. Type `password` for the password, and type it again in **Confirm password**.
  - f. Deselect **User must change password at next logon** to clear the check box.
  - g. Click **Create** and click **Close**.
6. Create a share for the CD drive on the client system:
  - a. Double-click **My Computer**.
  - b. Right-click the CD drive, and select **Sharing**.

- c. Type **CD** for the name of the share, and then click **OK** to confirm the share settings.
7. Install the Dell Reinstallation Console from the *Resource CD*:
  - a. Insert the *Resource CD* into the CD drive of your client system.

The **Dell PowerVault 725N Resource CD** screen displays in a browser window.

 **NOTE:** If the CD does not run automatically, double-click the **start.bat** file on the CD.

- b. Click **Resources**.
  - c. Click **Install Reinstallation Console**.
  - d. When the **File Download** window displays, click **Open this file from its current location**, and then click **OK**.
  - e. Click **Next** and follow the instructions on the screen.
  - f. When prompted to reboot the client system, click **Yes**.
8. Create a reinstallation diskette from the *Resource CD*:
  - a. Ensure that the *Resource CD* is in the CD drive of your client system.
  - b. In the *Resource CD Main Menu* window displays, click **Resources**.
  - c. In the **Resources** window, click **Reinstallation Diskette**.
  - d. When the **File Download** window displays, click **Run this program from its current location**, and then click **OK**.
  - e. Click **Yes** if you receive a security warning.

An MS-DOS® screen appears and prompts you to insert a diskette into the diskette drive of the client system.

- f. Insert a formatted diskette into the diskette drive of your client system, and then press <Enter>.

The MS-DOS screen closes after the reinstallation diskette is made.

9. Edit the **go.bat** file for the renamed client system and CD drive:
  - a. In Windows Explorer, right-click the **go.bat** file on the diskette, and then select **Edit** to edit the file to the following variable value for your environment:

`\\server_name\share_name`, where *server\_name* is the name of the client system and *share\_name* is the name of the CD drive share (for example, `\\PV725\CD`)

- b. Save and exit the **go.bat** file.
10. Update the boot image:
  - a. If it is not still in the diskette drive, insert the reinstallation diskette that you created in [step 8](#) into the diskette drive of the networked client system running Windows 2000.
  - b. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Update boot image**.
  - c. Wait for the MS-DOS window to close, remove the diskette from the diskette drive, and then reboot the client system.
11. If the *Resource CD* is still in the CD drive, remove it.
12. Insert the *Reinstallation CD* in the CD drive.
13. Start the Intel PXE server and verify that the services are running.
  - a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Intel PXE Server**.
  - b. In the **PXE Configuration Utility** window right-click the system name, **PV725REC**, and then select **Start/Stop Services**.
  - c. Verify that the proxy DHCP/boot PXE and M/TFTP services are installed and running correctly by selecting **Stop** and then selecting **Start**.

If the services are running, on the indicator, ensure that **started** is displayed after you click **Start** and **stopped** is displayed after you click **Stop**.

- d. Click **OK**.
14. On the Intel PXE server software, configure the system to listen to the DHCP port by performing the following steps:
  - a. Right-click **proxyDHCP Server Name**, and select **Configure proxyDHCP Server**.
  - b. In the **Configure proxyDHCP Server** window, click the **Use DHCP Port for Listening** check box.
  - c. Close and reopen the PXE server software.
15. Turn on your NAS system.

16. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

17. From the menu, select option 4, **Reinstallation**, and then type *y* to confirm the selection.

The NAS system automatically reboots and begins the reinstallation process, which restores the NAS system back to the Dell default settings.

18. When the screen warns that you are going to reinstall and that it will erase data, type *y*.

19. Press *y* again to confirm the selection.

Depending upon your configuration, this process could take several hours to complete. When the reinstallation completes, the NAS system shuts down.

 **NOTE:** During the reinstallation, do not attempt to connect to your NAS system.

20. After the NAS system shuts down, reconfigure the system.

See "[Configuring Your NAS System for the First Time](#)" in the "Initial Configuration" section of this guide.

## Reinstalling the Operating System on a Network Without a DHCP Server

If your network does not have a DHCP server, you need the following items to reinstall the operating system:

- 1 Client system running Windows 2000 (Professional or Server Family) with a CD and diskette drive on the same subnet as the NAS system
- 1 *Resource* CD included with your NAS system
- 1 *Reinstallation* CD included with your NAS system
- 1 A range of available IP addresses

To reinstall your NAS operating system, perform the following steps:

 **NOTICE:** This procedure deletes all of the data on the software-RAID NAS system (hardware- RAID NAS system data is not affected). For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" the "NAS Manager" section of this guide.

1. Shut down the NAS system, and do not turn it back on until instructed.

See "[Shutting Down the NAS System](#)" in the "NAS Manager" section of this guide.

2. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

3. Turn on the client system.
4. Log in to the client system with an account that has administrator privileges.
5. Enter a new user name *pv725* and the password *password*.
  - a. From the desktop of your client system, right-click **My Computer** and then select **Manage**.
  - b. On the left side of the **Computer Management** window, double-click **Local Users and Groups**.
  - c. Right-click **Users** and select **New User**.
  - d. In the **New User** window, type *pv725* as the user name.
  - e. Type *password* in the **Password** field, and type it again in the **Confirm password** field.
  - f. Deselect **User must change password at next logon** to clear the check box.
  - g. Click **Create** and click **Close**.
6. Create a share for the CD drive on the client system:

- a. Double-click **My Computer**.
  - b. Right-click the CD drive, and select **Sharing**.
  - c. Type `c:` for the name of the share, and then click **OK** to confirm the share settings.
7. Install the Dell Reinstallation Console from the *Resource* CD:
- a. Insert the *Resource* CD into the CD drive of your client system.

The **Dell PowerVault 725N Resource CD** screen displays in a browser window.

 **NOTE:** If the CD does not run automatically, double-click the **start.bat** file on the CD.

- b. Click **Resources**.
  - c. Click **Install Reinstallation Console**.
  - d. When the **File Download** window displays, click **Open this file from its current location**, and then click **OK**.
  - e. Click **Next** and follow the instructions on the screen.
  - f. When prompted to reboot the client system, click **Yes**.
8. Create a reinstallation diskette from the *Resource* CD:
- a. Ensure that the *Resource* CD is in the CD drive of your client system.
  - b. In the *Resource* CD **Main Menu** window, click **Resources**.
  - c. In the **Resources** window, click **Reinstallation Diskette**.
  - d. When the **File Download** window displays, click **Run this program from its current location**, and then click **OK**.
  - e. Click **Yes** if you receive a security warning.

An MS-DOS® screen appears and prompts you to insert a diskette into the diskette drive of the client system.

- f. Insert a formatted diskette into the diskette drive of your client system, and then press <Enter>.

The MS-DOS screen closes after the reinstallation diskette is made.

9. Edit the **go.bat** file for the renamed client system and CD drive:
- a. In Windows Explorer, right-click the **go.bat** file on the diskette, and then select **Edit** to edit the file to the following variable value for your environment:

```
\\server_name\share_name, where server_name is the name of the client system and share_name is the name of the CD drive share (for example, \\PV725\CD)
```

- b. Save and exit the **go.bat** file.
10. Update the boot image:
- a. If it is not still in the diskette drive, insert the reinstallation diskette that you created in [step 8](#) into the diskette drive of the networked client system running Windows 2000.
  - b. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Update boot image**.
  - c. Wait for the MS-DOS window to close, and then remove the diskette from the diskette drive and the CD from the CD drive.
  - d. Reboot the client system.
11. If the *Resource* CD is still in the CD drive, remove it.
12. Insert the *Reinstallation* CD in the CD drive.
13. Enable the Kick-Start utility and create your DHCP settings:
- a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Dell OpenManage Kick-Start**.
  - b. When asked if you want to run the program, click **Yes**.
  - c. At the bottom of the **Dell OpenManage Kick-Start** window, click **Setup**.
  - d. Click **Add**.
  - e. In the **Add Scope** window, enter the IP network and subnet mask information.

If you are not sure about what to enter into these fields, contact your network administrator.

 **NOTE:** If you run the Kick-Start utility in a non-DHCP environment, then you must enter a gateway IP address.

- f. Click **OK**.
  - g. Click **Interfaces for DHCP Server**.
  - h. Click **OK**.
  - i. Click **Enabled** at the bottom of the **Dell OpenManage Kick-Start** window to start the integrated DHCP server.
14. Start the Intel PXE server and verify that the services are running:
- a. Click the **Start** button and point to **Programs**→ **Dell Reinstallation Console**→ **Intel PXE Server**.
  - b. In the **PXE Configuration Utility** window, right-click the server name, **PV725REC**, and then select **Start/Stop Services**.
  - c. Verify that the proxy DHCP/boot PXE and M/TFTP services are installed and running correctly by selecting **Stop** and then selecting **Start**.

If the services are running, the indicator displays **Started** after you click **Start** and **Stopped** after you click **Stop**.

- d. Click **OK**.
15. Turn on your NAS system.
16. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

17. From the menu, select option 4, **Reinstallation**, and then type *y* to confirm the selection.

The NAS system automatically reboots and begins the reinstallation process, which restores the NAS system back to the Dell default settings.

18. When the screen warns that you are going to reinstall and that it will erase data, type *y*.
19. Press *y* again to confirm the selection.

Depending on your configuration, this process could take several hours to complete. When the reinstallation completes, the NAS system shuts down.

 **NOTE:** During the reinstallation, do not attempt to connect to your NAS system.

20. After the NAS system shuts down, reconfigure the system.

See "[Configuring Your NAS System for the First Time](#)" in the "Initial Configuration" section of this guide.

## Using an Existing PXE Server

 **NOTICE:** This procedure resets your NAS system to the Dell default settings. It also deletes all data on the software-RAID NAS system (hardware-RAID NAS system data is not affected). Before performing this procedure on a software-RAID NAS system, attempt to boot from the operating system image on the mirrored hard drives. See "[Booting From the Software-RAID NAS System Recovery Operating System Mirror Hard Drives](#)" in this section of the guide. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

If your network has a PXE server, you need the following to reinstall the operating system:

- 1 Client system with a CD drive and a diskette drive that is running Windows 2000 (Professional or Server Family) on the same subnet as the NAS system
- 1 *Resource* CD included with your NAS system
- 1 *Reinstallation* CD included with your NAS system
- 1 An existing PXE server on the same network

To reinstall the main operating system with Dell default settings on hard drive 0 from an existing PXE server, perform the following steps:

1. Shut down the NAS system, and do not turn it back on until instructed.

See "[Shutting Down the NAS System](#)" in the "NAS Manager" section of this guide.

2. Insert the *Reinstallation* CD in to the CD drive on the PXE server.
3. Turn on the client system running Windows 2000.
4. Log in to the client system with an account that has administrator privileges.
5. Create a share for the CD drive on the client system:
  - a. Double-click **My Computer**.
  - b. Right-click the CD drive, and select **Sharing**.
  - c. Type `cd` for the name of the share, and then click **OK** to confirm the share settings.
6. Create a reinstallation diskette from the *Resource* CD:
  - a. Insert the *Resource* CD into the CD drive of your client system.
  - b. When the *Resource* CD **Main Menu** window displays, click **Resources**.
  - c. On the **Resources** window, click **Reinstallation Diskette**.
  - d. When the **File Download** window displays, click **Run this program from its current location**, and then click **OK**.
  - e. Click **Yes** if you receive a security warning.

An MS-DOS screen appears and prompts you to insert a diskette into the diskette drive of the client system.

- f. Insert a formatted diskette into the diskette drive of your client system, and then press <Enter>.

The MS-DOS screen closes after the reinstallation diskette is made.

7. Edit the reinstallation diskette for your environment:
  - a. From the client system, browse to the reinstallation diskette.
  - b. Right-click the file named **go.bat** on the reinstallation diskette, and then select **Edit** to edit the file to the following variable values for your environment:
    - 1 *SHARE*, where *SHARE* is the share resource for the *Reinstallation* CD in the form `\\pxe_server_name\cd_share_name`
    - 1 *USER*, where *USER* is the Windows user who is to access the share resource
    - 1 *PASSWD*, where *PASSWD* is the password for the user who is to access the share resource
8. Install the customized reinstallation diskette image, which you just created on your client system, on your PXE server.

For more information, see your PXE server documentation.

9. Connect a keyboard, monitor, and mouse to the NAS system.

For information about system connectors, see your *User's Guide*.

10. Turn on your NAS system.
11. On the keyboard connected to the NAS system, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

12. From the menu, select option 4, **Reinstallation**, and then type *y* to confirm the selection.

The NAS system automatically reboots and begins the reinstallation process, which restores the NAS system back to the Dell default settings.

13. When the screen warns that you are going to reinstall and that it will erase data, type *y*.
14. Press *y* again to confirm the selection.

Depending upon your configuration, this process could take several hours to complete. When the reinstallation completes, the NAS system shuts down.

 **NOTE:** During the reinstallation, do not attempt to connect to your NAS system.

15. After the NAS system shuts down, reconfigure the system.

See "[Configuring Your NAS System for the First Time](#)" in the "Initial Configuration" section of this guide.

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## Restoring System-State Data After Reinstallation

To restore your system-state data, you must have previously backed up your system using the backup and recovery tools. See "[Backing Up System-State Data](#)" in the "Backing Up the System" section of this guide.

 **NOTE:** If you are not restoring system-state data after reinstalling the operating system, perform the procedure in "[Restoring System-State Data](#)" in the "Backing Up the System" section of this guide.

To restore system-state data, perform the following steps:

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

2. Click **Maintenance**.
3. Click **Backup**.
4. In the **Log on to Windows** window, enter the same user name and password that you used to log in to the NAS Manager and click **OK**.

The **Welcome to Windows 2000 Backup and Recovery Tools** window is displayed.

5. Click **Restore Wizard**.
6. In the **Restore Wizard** window, click **Next**.
7. Click **Import File**.
8. In the **Backup File Name** window, click **OK** if the file and location are correct. Otherwise, click **Browse** and navigate to the correct backup file location.

 **NOTE:** If the .bkf file is in another system you must copy the file to the NAS system or map a share to the file before restoring.

9. In the **What to Restore** window, click (+) to expand the **File** tree, and then click to expand **Media created yyyy/mm/dd**, where **yyyy/mm/dd** is the year/month/date that you made the system-state backup.
10. Click the (+) next to **System State**.
11. In the **Backup File Name** window, click **OK** if the file and location are correct. Otherwise, click **Browse** and navigate to the correct backup file location.
12. Click **System State** so that it is checked, and check any other application data files that you backed up, and then click **Next**.
13. Click **Advanced**.
14. In the **Where to Restore** window, select **Original location** from the drop-down menu as the location to restore the files, and then click **Next**.
15. In the **How to Restore** window, click **Always replace the files on disk**, and then click **Next**.
16. In the **Advanced Restore Options** window, leave all check boxes unchecked and click **Next**.
17. Click **Finish**.
18. When the **Enter Backup File Name** window displays, click **OK**.

 **NOTE:** If your backup file is in a different location, click **Browse** and navigate to the file.

19. Click **Start Restore**.
20. When a message warns that the system restore will overwrite the current system state, click **OK**.
21. Click **OK** in the **Confirm Restore** window.
22. Restart the NAS system after the restore process completes.

 **NOTE:** Windows must replace all locked files on the system; therefore, the process of restarting the system might take approximately 15 minutes to complete.

---

## Restoring Initial System Setup

After the operating system is reinstalled on the system, the NAS system is returned to default settings. Ensure that you configure the system again to establish network communication. For more information about configuring your system, see the "[Initial Configuration](#)" section in this guide.

 **NOTE:** If you used the multilanguage user interface (MUI) before reinstalling the operating system, you must reinstall it.

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## Dell ActiveArchive

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

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- [Defragmenting a Volume Containing Persistent Images](#)

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Dell ActiveArchive™ allows the creation and preservation of persistent images of your NAS system's data volumes. The Dell ActiveArchive software can be configured using the NAS Manager.

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## Introduction to Persistent Images

A persistent image is a point-in-time copy of a disk volume. A persistent image contains an exact copy of the file system at the time the persistent image was created. If you change a file on the active file system after taking a persistent image, the persistent image contains the old version of the file. If an active file gets corrupted or deleted, you can restore the old version by copying the file from the latest persistent image or restoring the entire volume. Also, because the persistent image contains the contents of the file system when the persistent image was taken, you can perform a backup from the persistent image without stopping all I/O to the NAS system, thus eliminating the backup window required by other types of backup.

➡ **NOTICE:** Persistent images are temporary backups of your data that reside on the same volume as your data. If the volume becomes damaged and you lose your data, the persistent image is also lost. Therefore, persistent images do not replace regular backups of your volume.

## Cache File

The Dell ActiveArchive software stores changed data in a cache file. A cache file resides on each volume of your system. By default, the persistent image cache file is 20 percent of each volume. You can use the NAS Manager to change the percentage of the volume that is dedicated to the cache file.

📌 **NOTE:** You cannot take a persistent image of the operating system volumes.

## Cache Thresholds

The Dell ActiveArchive software has two thresholds that provide warnings when the cache file is approaching maximum capacity. The warning threshold logs an event in the event log and displays a warning in the NAS Manager status indicator when the cache file reaches the threshold (default is 80 percent full). The deletion threshold, which is labeled "Begin deleting images" in the NAS Manager, specifies the threshold at which the NAS Manager deletes the oldest persistent images with the lowest retention weights until the cache file is below the deletion threshold (default is 90 percent full). The NAS Manager indicates when it is necessary to delete persistent images to get below the threshold by displaying an error on the NAS Manager **Status** page.

## Persistent Image Retention Weights

When the ActiveArchive cache file reaches the deletion threshold, the system begins deleting files, depending on the retention weight (the deletion priority of the file) and age of the persistent image. The system first looks for the persistent image with the lowest retention weight in the cache file. It then deletes the oldest persistent image with the lowest retention weight until the cache file is below the deletion threshold. After all persistent images with the lowest retention weight have been deleted, Dell ActiveArchive looks for and deletes the oldest files with the next lowest retention weight.

## Persistent Image Considerations

When using persistent images, system performance might be degraded, depending on the rate your data is changing and the number of persistent images kept for each virtual disk. Read performance of the virtual disk remains constant, regardless of the presence of persistent images. Read performance of the persistent image is identical to that of the virtual disk. Write performance, however, might vary. Each initial write to a virtual disk area causes the Dell ActiveArchive software to rewrite the data to the persistent image cache file, and the initial write is slower if the data is being protected by a persistent image. Changes to data that is not protected by a persistent image does not cause a performance degradation.

## Storing Persistent Images

You can configure the NAS system to store a maximum of 250 persistent images per system; however, if you exceed the maximum, the oldest persistent image with the lowest retention weight is overwritten. This number of persistent images allows you to schedule multiple persistent images. (You should tailor your schedule depending on how the data is changing.) For example, you could implement a schedule similar to the following schedule:

- 1 Seven daily persistent images with a high priority
- 1 Two weekly persistent images with a medium priority
- 1 Two monthly persistent images with a low priority

This type of schedule gives you good snapshot coverage and ensures that your most recent data has the highest priority.

---

## Configuring the Persistent Image Global Settings

You can modify the various aspects of the persistent image environment by performing the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Global Settings**.
5. Configure the following options.

 **NOTE:** Before changing the image directory name, you must delete all existing persistent images.

- 1 **Maximum persistent images** — Specifies the maximum number of active persistent images per system, up to a maximum of 250. When the system has 250 persistent images stored, starting another persistent image overwrites the oldest persistent image with the lowest retention weight.
  - 1 **Inactive period** — Prior to starting a persistent image, the system waits for a period of relative inactivity on the volume being imaged. The default value for this period, which is 5 seconds, allows systems to start an image with a consistent file set and a minimal time-out. Experienced administrators may reduce or increase this value for system optimization. Reducing the inactive period allows persistent images to begin on systems where disk inactivity is rare, at the possible expense of synchronization problems within applications that are concurrently writing to multiple files.
  - 1 **Inactive time-out** — Specifies the amount of time the system continues to retry to create a persistent image (default time is 15 minutes). A persistent image cannot start until a period of relative inactivity, specified by **Inactive period**, occurs. If an interval longer than **Inactive time-out** passes before the persistent image can begin, the persistent image cannot be taken and an error is displayed in the NAS Manager status indicator and logged in the event log.
  - 1 **Image directory** — Specifies the directory name that is to be used for the persistent image mount point. Each persistent image appears as a subdirectory in the volume that is being imaged. The entire content of the volume, as it existed when the persistent image was created, appears under this directory.
6. If you need to re-establish the system defaults, click **Restore Defaults**.
  7. Click **OK** to update the global settings.
- 

## Configuring Persistent Image Volume Settings

You can modify volume settings by performing the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Volume Settings**.
5. Select the volume that you want to reconfigure.
6. Click **Configure**.
7. Use the appropriate menus to configure the following options.

 **NOTE:** Before changing the cache size, you must delete all persistent images on that volume.

- 1 **Warning threshold reached when** — Defines the percentage of cache space used that triggers warning messages to the system event log.
  - 1 **Begin deleting images when** — Defines the percentage of cache space used that triggers automatic deletion of the oldest persistent images with the lowest retention weight on the system. Automatic persistent image deletions are recorded in the system log.
  - 1 **Cache size** — Specifies the percentage of the volume that is allocated to the cache file. Increasing this value allows more and larger persistent images to be maintained. Ensure that adequate space is available on the persistent image files' location drive.
8. If you need to re-establish the system defaults, click **Restore Defaults**.
  9. Click **OK**.
- 

## Using Persistent Images

In addition to scheduling persistent images, you can take new persistent images on demand, delete existing persistent images, configure the persistent image environment, and set persistent image retention weights.

### Taking a New Persistent Image on Demand

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Persistent Images**.
5. In the **Tasks** list on the **Persistent Images** page, click **New**.
6. In the menu that is displayed, select the **Volume(s)** to preserve.

Consider the following when selecting the volume(s):

- 1 You can take persistent images only of volumes with drive letters, not volumes mounted to a directory (mount points).
- 1 If volumes are not protected by RAID 1 or RAID 5, or if volumes are frequently being added and removed, it is recommended that you make persistent images of individual volumes. Because multivolume persistent images are linked to each other, a multivolume persistent image may become inaccessible if one volume in the multivolume persistent image fails or is removed from the system.

 **NOTE:** To select multiple volumes, press and hold <Ctrl> and select all volumes that are to be included in the persistent image.

 **NOTE:** You cannot take a persistent image of the operating system volumes.

7. Select the **Read Only** or **Read/Write** attribute.
8. Select the retention weight for the persistent image.
9. Confirm the persistent image name.

You can use patterns in the persistent image name to differentiate your persistent images. For example if you use a pattern of **Snapshot.%i** and you take two persistent images, you have **Snapshot.1** and **Snapshot.2**. The default persistent image name pattern is **Snapshot %M-%D-%Y %H.%m.%s**. Valid pattern macros are as follows:

- 1 %M = Month
- 1 %D = Day
- 1 %Y = Year
- 1 %h = Hours in 12-hour format
- 1 %H = Hours in 24-hour format
- 1 %m = Minute
- 1 %s = Second
- 1 %i = Instance, which increments once per instance
- 1 %a = AM/PM
- 1 %W = Day of the week
- 1 %w = Three-letter day of the week
- 1 %% = Percent sign

10. Click **OK** to create the persistent image.

## Deleting a Persistent Image

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Persistent Images**.
5. Click the check box next to the persistent image that is to be deleted.
6. In the **Tasks** list, click **Delete**.
7. Click **OK** to delete the persistent image.

## Undoing Writes to a Read/Write Persistent Image

To undo writes to a read/write persistent image, you must select an item from the **Persistent Images** list and then click **Undo** in the **Tasks** list.

To undo persistent image writes, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click the persistent image to be restored to its original state.
5. In the **Tasks** list, click **Undo**.
6. Click **OK** to restore the image or **Cancel** to leave it intact.

## Setting Persistent Image Retention Weights and Read Only or Read/Write Attributes

To change the read only or read/write attribute or the retention weight (deletion priority) of an image, you must edit the persistent image properties by selecting an image from the **Persistent Image** list, and then clicking **Properties** in the **Tasks** list.

To edit the persistent image properties, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Persistent Images**.
5. Click the persistent image that you want to edit.
6. In the **Task** list, click **Properties**.
7. Select the **Read Only** or **Read/Write** attribute.
8. Select the retention weight.
9. Click **OK** to update the persistent image.

---

## Scheduling Persistent Images

When you click from the NAS Manager primary menu **Disks**→ **ActiveArchive**→ **Schedules**, the **Scheduled Persistent Image** page displays a list of all scheduled persistent images and associated tasks. Each scheduled persistent image is identified by the scheduled time, day, frequency, starting date, and target volume ID. Persistent images identified by time and date are located in the **ActiveArchive** directory. The **ActiveArchive** directory is located in the root of each ActiveArchive volume. Only the administrator can access the **ActiveArchive** directory. The files and folders in the persistent image directories have the same permissions as the files and folders on the original volume. Persistent image directories are used exactly the same way as conventional system volumes. Unlike conventional volumes, read-only persistent image images are static, recording the precise content of the originating volume at the time you created the

persistent image.

## Displaying the List of Persistent Images

The **Persistent Images** page displays all currently active persistent images. Each entry identifies the date and time that the persistent image was created and the volume it preserves. Select an individual persistent image by clicking its check box.

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Persistent Images**.

## Adding Persistent Images to the Schedule

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. In the **Tasks** list on the **Persistent Image Schedules** page, click **New**.
6. Use the menus to select the start time (**Start at**), the frequency at which to repeat the persistent image (**Repeat every**), the day to begin (**Begin**), the volume(s) to include, the image attributes (**Read-only** or **Read/Write**), the retention weight, number of images to save (per schedule), and the persistent image name.

 **NOTE:** To select multiple volumes, press and hold <Ctrl> and select all volumes that are to be included in the persistent image.

 **NOTE:** You cannot take a persistent image of the operating system volumes.

 **NOTE:** If volumes are not protected by RAID 1 or RAID 5, or if volumes are frequently being added and removed, it is recommended that you make persistent images of individual volumes. Because multivolume persistent images are linked to each other, a multivolume persistent image may become inaccessible if one volume in the multivolume persistent image fails or is removed from the system.

You can use patterns in the persistent image name to differentiate your persistent images. For example if you use a pattern of **Snapshot.%i** and you take two persistent images, you have **Snapshot.1** and **Snapshot.2**. The default persistent image name pattern is **Snapshot %M-%D-%Y %H.%m.%s**. Valid pattern macros are as follows:

- 1 %M = Month
- 1 %D = Day
- 1 %Y = Year
- 1 %h = Hours in 12-hour format
- 1 %H = Hours in 24-hour format
- 1 %m = Minute
- 1 %s = Second
- 1 %i = Instance, which increments once per instance
- 1 %a = AM/PM
- 1 %W = Day of the week
- 1 %w = Three-letter day of the week
- 1 %% = Percent sign

7. Click **OK** to save the new scheduled persistent image.

## Deleting a Persistent Image Schedule

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. On the **Persistent Image Schedules** page, click the check box next to the scheduled persistent image to be deleted.

6. In the **Tasks** list on the **Persistent Image Schedules** page, click **Delete**.
7. Click **OK** to delete the item or click **Cancel** to leave the item intact.

## Editing the Properties of a Persistent Image Schedule

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. Click the persistent image schedule you want to change.
6. In the **Tasks** list on the **Persistent Image Schedules** page, click **Properties**.
7. Use the appropriate menus to select or change the starting time, the frequency at which to repeat the persistent image (**Repeat every**), the day to begin, the volume(s) to include, the image attributes (**Read-only** or **Read/Write**), retention weight, the number of images to save (per schedule), and the image name.

 **NOTE:** To select multiple volumes, press and hold <Ctrl> and select all volumes that are to be included in the persistent image.

 **NOTE:** You cannot take a persistent image of the operating system volumes.

 **NOTE:** If volumes are not protected by RAID 1 or RAID 5, or if volumes are frequently being added and removed, it is recommended that you make persistent images of individual volumes. Because multivolume persistent images are linked to each other, a multivolume persistent image may become inaccessible if one volume in the multivolume persistent image fails or is removed from the system.

8. Click **OK** to modify the schedule or **Cancel** to leave the schedule intact.
- 

## Accessing Stored Persistent Images

 **NOTE:** Only Windows clients (CIFS) can access Dell ActiveArchive persistent images.

 **NOTE:** The name of the utility that creates persistent images is Dell ActiveArchive. The name of the directory where Dell ActiveArchive persistent images are stored is **ActiveArchive**.

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to a **Terminal Services Advanced Client** session.
5. If the **PowerVault Advanced Administration Menu** window is displayed, click **Exit**, and then click **OK** to close it.
6. Use Microsoft® Windows® Explorer to navigate to the **ActiveArchives** directory on the volume root.

## Accessing Directories, Folders, and Files

By default, administrators can access the **ActiveArchives** directory in the root of each volume. Each persistent image is displayed separately with a date and time stamp showing when the persistent image occurred. The administrator can browse the persistent image as if it were a standard volume. Each persistent image is mounted as a volume on the file system to allow access by clients. Persistent images are created as read-only or write-only.

Persistent image directories are used in the same way that conventional directories are used. The files and folders in the persistent image directories have the same permissions as the files and folders on the original volume. All persistent images are persistent and survive system power losses or reboots.

## Allowing User Access to Persistent Images

The files and folders within a persistent image are identical to the permissions on the original files and folders. However, by default, the **ActiveArchives** directory is restricted to administrator access only. To allow users to access the persistent images, the system administrator must modify the permissions for the **ActiveArchives** directory.

Use the NAS Manager to change the **ActiveArchives** directory permissions by performing the following steps:

1. Log in to the NAS Manager as an administrator.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to a **Terminal Services Advanced Client** session.
5. Open Windows Explorer.
6. Select the drive on the left side.
7. Right-click the **ActiveArchive** directory, and then click **Properties**.
8. Click **Security**, and then click **Add**.
9. Click specific users or groups or type the individual users or group names to add individual users or groups, and then click **OK**.

 **NOTE:** To ensure that all persistent image files do not inherit the same permissions as the ActiveArchive directory, under **Permissions**→**Security**→**Advanced**, be sure the **Reset permissions on all child objects and enable propagation of inheritable permissions** is not checked.

10. Give the selected members **Read** and **List Folder Contents** permissions.
11. Click **OK**.

After setting the permissions for the **ActiveArchive** directory, perform the following procedure to allow the user access to a share on the directory:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. On the **Shares** page, click **Shares**.
4. In the **Tasks** list on the **Shared Folders** page, click **New**.
5. Type the share name **ActiveArchives** and path `volume_letter:\ActiveArchives`, where *volume\_letter* is the volume of the persistent images.

 **NOTE:** Ignore the **Comment** field for NFS, FTP, and HTTP shares.

6. Check the **Microsoft Windows (CIFS)** box.
7. Click **CIFS Sharing** and add the users that you want to have access to persistent images.
8. Click **OK**.

Users can access persistent images from a Windows 2000 client by performing the following steps:

1. Right-click **My Appliance**, and select **Map Network Drive**.
2. Map to the ActiveArchives directory as a user that has permissions to the ActiveArchives share.
3. For **Folder**, type `\\Dellxxxxxxx\ActiveArchives`, where Dellxxxxxxx is the name of the NAS system.

The default system name is Dellxxxxxxx, where xxxxxx is the system's service tag number. For example, if your service tag number is 1234567, enter `http://DELL1234567`.

4. Use Windows Explorer to navigate to the **ActiveArchive** directory on the newly mapped drive.

## Naming Files in Microsoft Windows Explorer

Windows Explorer has a limitation of 255 characters in a filename, including the path. When you make a persistent image, the entire path and filename are stored in addition to the Dell ActiveArchive default path and persistent image name. The default Dell ActiveArchive naming convention would result in a name such as the following:

```
Drive_Letter:\ActiveArchives\Snapshot 01-01-2001 12.00.00\Path_and_Filename
```

The original path and filename and the Dell ActiveArchive default path might exceed the 255-character limit and become inaccessible through Windows Explorer.

If a file becomes inaccessible because of the 255-character limit, perform the following steps to ensure that you can access long path and file names in Windows Explorer:

1. Create a share for the desired snapshot folder. For example:

```
E:\ActiveArchives\Snapshot 01-01-2001 12.00.00\
```

2. Access that share through the desired client.

The path and filename no longer include the additional directory information, which shortens the path and filename to the original character length. You can now access the file through Windows Explorer.

---

## Restoring Volumes From an Existing Persistent Image

To restore a volume(s) from a persistent image, you must select the persistent image to be restored. Ensure that you select the persistent image carefully because any activity that occurred after the persistent image was taken is lost.

- ➔ **NOTICE:** Restoring a volume restores the volume back to its state at the time the persistent image was made. This restore destroys all data on the volume and replaces it with the data from the persistent image.
- ➔ **NOTICE:** A volume is dismounted during a restore. All reads and writes to a volume that occur during the restore process are denied. Therefore, you must stop all I/O traffic to a volume while restoring it.

To restore volumes from a persistent image, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Restore Persistent Images**.
5. Click the persistent image that is to be restored.
6. Click **Restore**.
7. Click **OK** to restore the volumes protected by the persistent image, or click **Cancel** to leave the volume intact.

📌 **NOTE:** Restoring persistent images that contain multiple volumes restores all of the volumes in the persistent image. If you want the ability to restore a single volume, you must take single volume persistent images.

➔ **NOTICE:** If you delete a share from a volume after a snapshot is taken, that share will not be accessible after you restore the snapshot. For example, if you create a persistent image of volume E, which has a share called "users," and you later delete "users," when you restore volume E, the "users" share will not be accessible, although the directory will still exist and contain the files.

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## Changing the Dell ActiveArchive Event Log Language

Applying a selected language changes the graphical user interface to that language, but it does not change the language in which the Dell ActiveArchive event log messages are generated. The messages are generated in English unless you run a batch file to change the language to one of the following supported languages:

- 1 English
- 1 French
- 1 German
- 1 Japanese
- 1 Spanish

To change the language in which the event log messages are generated, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.

4. Log in to the system as administrator.
  5. If the **Advanced Administration Menu** is open, click **Exit**, and then **OK** to close it.
  6. Open the Microsoft Windows Explorer, expand the hard drive C directory and the **Dell** directory.
  7. Open the **AArchive\_Langpatch** directory.
  8. Double-click the appropriate batch file, such as the **english.bat** file for English or the **japanese.bat** file for Japanese.
  9. After the batch file has run, reboot your system.
- 

## Defragmenting a Volume Containing Persistent Images

-  **NOTICE:** Defragmenting a volume containing persistent images without using the following procedure can corrupt your persistent images and degrade your system performance.
-  **NOTICE:** To defragment a volume, you must delete all persistent images on that volume.
-  **NOTE:** If you do not have persistent images on your volume, this procedure does not apply.

To defragment a volume containing persistent images, perform the following steps:

1. Log in to the NAS Manager.
  -  **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.
2. Click **Disks**.
3. Click **ActiveArchive**.
4. Click **Schedules**.
5. Select a scheduled persistent image, and then click **Delete**.
6. Repeat until all scheduled persistent images are deleted.
7. Click **Back**.
8. Click **Persistent Images**.
9. Select a persistent image, click **Delete**, click **OK**, and then click **OK**.
10. Repeat until all persistent images are deleted.
11. Click **Maintenance**.
12. Click **Terminal Services**.
13. Log in to the NAS system.
14. If the **Advanced Administration Menu** appears, click **Exit**, and then **OK** to close it.
15. Double-click **My Appliance**.
16. Right-click the drive that you want to defragment, and click **Properties**.
17. Click **Tools**.
18. Click **Defragment Now**.

The **Defragmentation** window displays.

19. Click **Defragment**.

You are notified when defragmentation is complete.

20. Exit **Terminal Services Client**.
21. Reschedule your persistent images for this volume.



## Advanced Features

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

- [Updating the BIOS](#)
- [Installing Multilanguage User Interface \(MUI\) Support](#)
- [Installing and Configuring Support for Other Languages](#)
- [Network Adapter Teaming](#)
- [Services for UNIX](#)
- [File Server for Macintosh](#)
- [Services for Novell NetWare](#)
- [Microsoft Directory Synchronization Services](#)
- [Using Secure Sockets Layers](#)
- [Microsoft Management Console](#)

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This section includes descriptions of advanced features that cannot be performed from the Dell™ PowerVault™ NAS Manager.

To perform the procedures in this section, you must use the Terminal Services Advanced Client. To access the Terminal Services Advanced Client, perform the following steps:

1. Log in to the NAS Manager.
2. From the NAS Manager, click **Maintenance**.
3. Click **Terminal Services**.
4. Log on as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

---

## Updating the BIOS

 **NOTE:** Do not reboot or turn off the system while updating the BIOS.

To update the BIOS, you must first copy the BIOS file to the NAS system and then update it using Terminal Services.

 **NOTE:** See the Dell Support website at [support.dell.com](http://support.dell.com) for the latest BIOS updates for your system.

## Copying the BIOS to the NAS System

1. Using a Web browser, connect to the PowerVault NAS Manager and create a shared folder on the NAS system. See "[Adding a Share](#)" in the "NAS Manager" section of this guide.
2. From a client system running the Microsoft® Windows® 2000 operating system, map the share you created in step 1.
  - a. Right-click **My Computer** and select **Map Network Drive**.
  - b. Specify the drive letter and folder for the connection and click **OK**.
  - c. Enter the name of the NAS system and the name of the share you created in step 1 and click **OK**.
  - d. In the **Map Network Drive** window, click a different user name.
  - e. In the **Connect As** window, enter a user name and password to connect to the NAS system with administrator privileges, and then click **OK**.
  - f. Click **Finish**.
3. Download the latest BIOS file from [support.dell.com](http://support.dell.com) and copy it to the share.
4. Disconnect the share from the client system.
  - a. Right-click **My Computer** and select **Disconnect Network Drive**.
  - b. Select the share that you want to disconnect and click **OK**.

## Running the BIOS Update Utility

1. Log into the NAS Manager.
2. On the NAS Manager primary menu, click **Maintenance**.
3. Click **Terminal Services**.

4. Log in to the Terminal Services session as an administrator.
5. If the **Advanced Administration Menu** is open, click **Exit**, and then **OK** to close it.
6. Open Windows Explorer, and expand the directory **C:\Del\BIOS Flash Utility**.
7. Double-click the **WinSFI.exe** file to start the BIOS Update Utility.
8. In the **File** drop-down menu, select **Load File to Update BIOS**.
9. When the **Open** window appears, use the folder's navigation icons to navigate to the NAS system's desktop, and select the share folder in which you placed the downloaded BIOS file.
10. Click **Open**.
11. When a message appears asking if you are sure you want to update the BIOS, click **Yes**.

The utility erases the current BIOS, opens the new updated BIOS file, and programs the system to accept the new BIOS file (a status bar at the bottom of the window provides progress information).

12. When a message appears stating that the flash ROM update is complete and that you need to restart your system, click **OK**.
13. Restart the NAS system.

---

## Installing Multilanguage User Interface (MUI) Support

 **NOTE:** Installing the MUI for your language automatically installs the appropriate language locale.

The NAS system allows you to change languages for its Microsoft Windows Powered operating system's user interface. The MUI allows the NAS system to display Windows Powered operating systems menus, dialogs, and help files in multiple languages. The supported MUI languages are simplified Chinese, traditional Chinese, Dutch, English, French, German, Italian, Japanese, Korean, Spanish, and Swedish. You must install a language MUI from the *Multilingual Support CD* before it can be used on the system.

 **NOTE:** Installing and configuring the operating system MUI does not affect the language used by the NAS Manager.

1. Log in to the NAS Manager.

See "[Logging in to the NAS Manager](#)" in the "NAS Manager" section of this guide.

2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Close the **Advanced Administration Menu** by clicking **Exit**.
5. Double-click **My Appliance** on the NAS desktop.
6. If this is a new system, perform the following steps, and then go to step 8. Otherwise, go to step 7.
  - a. Double-click **Local Disk C:** to open the root directory.
  - b. Double-click the **localization** directory.
  - c. Double-click the **muisetup.exe** file to configure the language.
7. If you performed the reinstallation procedure on your system, perform the following steps:
  - a. In the **Sharing** tab on the **Compact Disk Properties** page, click the radio button next to **Share this folder** to share the CD drive, and then insert the *Multilingual Support CD* that came with your NAS system into your remote client system's CD drive.
  - b. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
  - c. Browse to the mapped drive, and then double-click the CD icon to launch the *Multilingual Support CD*'s Web interface.
  - d. Click the **Install Multilanguage User Interface (MUI) Support** link to launch the Multilanguage File Installation installer program.
8. In the installer window, select the languages to be installed, and select the default MUI language from the menu.
9. Click **OK** to perform the installation.
10. If the **Insert Disk** window appears, you must perform the following steps:
  - a. Click **OK**.
  - b. In the **Files needed** window, click **Browse**, browse to the **i386** directory on the *Multilingual Support CD* or in the **C:\localization** directory (which does not exist if you reinstall the operating system), and then click **Open**.
  - c. If the **Insert Disk** window displays, click **OK** to allow the operating system to find the required files for installation.

11. Disconnect the mapped network drive from the CD share that you mapped in step 7.
12. After the installation is complete and you have disconnected the network drive, you must reboot your system.

## Applying the MUI Language

After a MUI language has been installed, you can apply it to any user by performing the following steps:

1. From a client system, log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Log in to the system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

5. On the **Advanced Administration Menu**, click **System Management**, and then click **Set Regional Options** to launch the **Regional Options** control panel.
6. On the **General** tab, select the MUI language from the **Your locale (location)** drop-down menu, and then click **Apply**.
7. Log off and log in to the system again for the new language MUI to take effect.

---

## Installing and Configuring Support for Other Languages

 **NOTE:** Install additional language locales only if your preferred language is not available with MUI support or you need additional locale support.

The Windows Powered operating system that comes installed on your NAS system can be configured to support reading and writing documents in a number of languages. To install the software required to support a specific language, perform the following steps:

1. Insert the *Multilingual Support* CD into the NAS system's CD drive.
2. From a client system, log in to the NAS Manager.
3. Click **Maintenance**.
4. Click **Terminal Services**.
5. Log in to the system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

6. Close the **Advanced Administration Menu** by clicking **Exit** and then clicking **OK**.
7. Double-click **My Appliance** on the NAS desktop.
8. If this is a new system from Dell, perform the following steps, and then go to [step 10](#). If you are performing this procedure after reinstalling your operating system, go to [step 9](#).
  - a. Double-click **Control Panel**.
  - b. Double-click **Regional Options**.
9. If you performed the reinstallation procedure on your system, perform the following steps:
  - a. In Windows Explorer on a remote system, right-click the CD drive, and then click **Sharing**. In **Sharing** tab on the **Compact Disk Properties** page, click the radio button next to **Share this folder** to share the CD drive, and then insert the *Multilingual Support* CD that came with the NAS system into your remote system CD drive.
  - b. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
  - c. Browse to the mapped drive, and then double-click the *Multilingual Support* CD icon to launch the *Multilingual Support* CD's Web interface.
  - d. Click the **Install Language Locales Not Supported by MUI** link to launch the **Regional Options** control panel.
10. From the **Language Settings for the System** panel, select the languages to be configured.
11. Set the default language for the system by clicking **Select default...** and selecting the appropriate language from the menu, and then click **OK**.
12. Click **Apply** to complete the operation.
13. If the **Insert Disk** window appears, you must perform the following steps:
  - a. Click **OK**.
  - b. In the **Files needed** window, click **Browse**, browse to the **i386** directory on the *Multilingual Support* CD or in the **C:\localization** directory (which does not exist if you reinstall the operating system), and then click **Open**.

- c. Click **Open**, and then click **OK** from the **Insert Disk** window to allow the operating system to find the required files for installation.
14. After the installation is complete, if applicable, disconnect the mapped network drive from the CD share that you mapped in [step 7](#).
15. Reboot your system.

 **NOTE:** For more information about language settings, see the Microsoft Windows Powered operating system's online help.

---

## Network Adapter Teaming

Network adapter teaming allows the system to use the combined throughput of multiple network ports in parallel to increase performance or to provide fault tolerance. Network adapter teaming on your NAS system supports the following technologies:

- 1 Link Aggregation
- 1 Fast EtherChannel (FEC)
- 1 IEEE 802.3ad

 **NOTE:** When creating or removing network adapter teams, the IP address of the NAS system's LAN connections changes. To prevent disconnection from the NAS system during team configuration, connect a keyboard, monitor, and mouse to the NAS system when creating or removing teams. See the "[Initial Configuration](#)" section of this guide before configuring your teams.

## Smart Load Balancing (SLB)

SLB balances IP traffic across multiple adapters in a bi-directional manner. With SLB, all adapters on the team have separate MAC addresses. SLB provides automatic fault detection and dynamic failover to other team members or to a hot standby member. This is done independently of the layer 3 protocol (IP, IPX, Net BEUI). It works with existing layer 2 and 3 switches.

## Link Aggregation (802.3ad)

This mode supports Link Aggregation through static configuration and conforms to the IEEE 802.3ad specification. Configuration software allows you to statically configure which adapters they want to participate in a given team. Future releases will support LACP. If the link partner is not correctly configured for 802.3ad link configuration, errors are detected and noted. With this mode, all adapters in the team are configured to receive packets for the same MAC address. The outbound load-balancing scheme is determined by our BASP driver. The team's link partner determines the load-balancing scheme for inbound packets.

## Generic Link Aggregation (Trunking)

This mode is very similar to 802.3ad in that all adapters in the team need to be configured to receive packets for the same MAC address. However, this mode does not provide LACP or marker protocol support. This mode supports a variety of environments where the NICs' link partners are statically configured to support a proprietary trunking mechanism. For instance, this mode could be used to support Lucent's "OpenTrunk" or Cisco's Fast EtherChannel (FEC). Basically, this mode is a "light" version of the 802.3ad link aggregation. This approach is much simpler in that there is not a formalized link aggregation control protocol. As with the other modes, the creation of teams, and the allocation of physical adapters to various teams, is done statically via user configuration software.

Trunking supports load balancing and failover for both outbound and inbound traffic.

## Failover Teaming

Failover Teaming provides redundant adapter operation in the event that a network connection fails. When multiple Gigabit Ethernet Adapters are installed in the same server, they can be paired into Teams. Each team must have at least one adapter, but can support up to eight adapters. The number of teams is limited by the number of adapters that are installed.

If the primary adapter in a team is disconnected because of failure of the adapter, cable, or switch port, the secondary team member becomes active, redirecting both inbound and outbound traffic originally assigned to the primary adapter. Sessions will be maintained, causing no impact to the user.

## Creating Network Teams Using the Broadcom Advanced Server Control Suite

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the Terminal Services session as `administrator`.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Broadcom Network Teaming**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

The **Broadcom Advanced Server Control Suite** window displays.

5. Click **Load Balance/Virtual LAN**.
6. Click **Create Team**.
7. Enter the team name and select the appropriate team mode.

The types of team include **Smart Load Balance and Fail Over**, **Generic Trunking (FEC/GEC)**, and **Link Aggregation (IEEE 802.3ad)**.

8. Click **OK**.
9. Select the team name in the **Configuration** box.
10. Select an unassigned adapter to add to the team, and then click the arrow adjacent to the **Team Members** list to add the adapter.
11. Repeat step 10 for the second adapter.
12. Click **OK**.

## Removing Broadcom Adapter From a Network Team

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the Terminal Services session as `administrator`.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Broadcom Network Teaming**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

The **Broadcom Advanced Server Control Suite** window displays.

5. Click **Load Balance/Virtual LAN**.
6. Select the team name in the **Configuration** box.
7. Select an adapter in the **Team Members** list, and then click the arrow adjacent to **Load Balance Members** to remove the adapter.
8. Click **OK**.

## Changing the Network Team Mode Using the Broadcom Advanced Server Control Suite

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the Terminal Services session as `administrator`.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Broadcom Network Teaming**.

 **NOTE:** If the **Advanced Administration Menu** does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

The **Broadcom Advanced Server Control Suite** window displays.

5. Click **Load Balance/Virtual LAN**.
6. Right-click the team name in the **Configuration** box, and then click **Properties**.
7. Select the new type of team and click **OK** to apply the change.

The types of team include **Smart Load Balance and Fail Over**, **Generic Trunking (FEC/GEC)**, and **Link Aggregation (IEEE 802.3ad)**.

8. Click **OK** to complete the change.

For more information, see your Broadcom Advanced Server Control Suite help.

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## Services for UNIX

Services for UNIX® (SFU) provides the tools needed to integrate UNIX and Windows networks by leveraging existing UNIX network resources and expertise. SFU includes more than 60 of the most common UNIX command line utilities to provide a familiar environment for UNIX users and administrators.

Server for NFS (network file system) allows you to leverage your existing UNIX network resources for UNIX clients.

SFU provides important tools to enhance and simplify the administration of your network.

- 1 Telnet Server enables character- and script-based remote administration of Windows 2000 and Windows NT®-based servers from a variety of clients.
- 1 Microsoft Management Console (MMC) snap-in enables a consistent and central management point for all SFU functionality.
- 1 ActivePerl enables existing and new scripts to use the Windows Management Interface (WMI) to automate network administration tasks.
- 1 User Name Mapping associates Windows and UNIX user names, which allows users to connect to NFS resources without having to log in to UNIX systems separately.

## Server for Network File System (NFS)

SFU provides a robust Server for NFS that can be used to provide disk resources from systems running Windows NT and Windows 2000 to any system on your network that supports NFS. To administer Server for NFS, set the following options from the SFU MMC console:

- 1 **User Mapping** is the name of the mapping server to use.
- 1 **Auditing** is the size and location of the logging file and the operations to audit.
- 1 **Locking** is the grace period for locks and a list of current locks.
- 1 **Client Groups** is used to group client systems for easier setting of permissions.

See [Table 7-1](#) for information on the utilities provided with SFU.

## UNIX Utilities

Table 7-1. UNIX Utilities Provided With SFU

Category	Utility
File and directory utilities	basename, cp, diff, dirname, dos2unix, find, ln, ls, mkdir, mount, mv, paste, pwd, rm, rmdir, sdiff, split, tee, touch, uniq, uuencode, uuencode, umount
Text utilities	cat, cut, grep, egrep, fgrep, head, more, printf, sed, sort, tail, tr, vi, wc
Programming utilities	perl, od, sh, strings
Security utilities	chmod, chown, su
Process and general	cron, crontab, date, du, kill, nice, printenv, ps, rcmd, renice, sleep, atr, top, uname, wait, which, xargs

## Telnet Server

The Telnet server works optimally for most installations. It accepts logins from a variety of clients, including the Telnet clients shipped with Windows 2000, Windows NT, Windows 95, and Windows 98, as well as a variety of character mode terminal clients from virtually any operating system. In addition, it can be configured to meet specific site requirements such as improving security, simplifying logins, and supporting stream or console mode.

### Authentication

The SFU Telnet server supports Windows NT LAN Manager (NTLM) for authentication of client logins. NTLM allows users to be automatically authenticated to the Telnet server based on their Windows NT login. This makes using Telnet completely transparent to users, while ensuring that clear text passwords do not pass over the network. However, NTLM must be supported on the client side of the login as well.

When users are logged in to a system that is using NTLM login, they are restricted to local drives on that system. If they need to map network resources, they can do so by explicitly mapping with full credentials.

### Administration

The Telnet server is administered using the SFU MMC snap-in or the **tnadmin** program.

The following options are available:

- 1 **Authentication** gives you the choice of **NTLM** or **Username/Password**.
- 1 **Auditing** allows you to set event logging to a separate log file or to the event log and to specify what events to log.
- 1 **Server Settings** allows you to set the following options:
  - o Maximum number of simultaneous connections.
  - o Maximum number of failed login attempts.
  - o Map <Alt> to <Ctrl><a>.
  - o Telnet port.
  - o **Console** or **Stream** for mode of operation.
  - o **Default Domain Name** is the domain name that is automatically added to the login username. The default is ".", which disables this feature.
  - o **Idle Session Timeout** is the time until an idle session is forcibly disconnected.
  - o **Terminate all programs when disconnecting** or **Continue to run programs started with the command bgjob**.
- 1 **Sessions** allows you to see data about the currently active sessions (such as user, domain, system, and logon date/time) and to either send a message to the session or terminate it.

## Services for UNIX MMC Console

SFU includes a single MMC for managing all of SFU. The MMC provides a cohesive management interface that allows you to administer all systems on the network from any console. Further, since SFU supports the Windows management interface (WMI), management can be scripted from the command line.

You can access the MMC Console by selecting **Computer Management** under **System Management** on the **Advanced Administration Menu**. See "[Using the PowerVault Advanced Administration Menu](#)" in the "NAS Manager" section of this guide.

## ActiveState ActivePerl 5.6

SFU includes ActiveState's ActivePerl 5.6, a full-featured port of Perl 5.6 and Perl Script to Windows Powered operating systems. Among other improvements, ActivePerl 5.6 includes support for `fork()` emulation at the interpreter level, improving the portability of scripts and modules. ActivePerl also provides full support for the Windows Script Host, making ActivePerl an excellent tool for system administration tasks.

## User Name Mapping

User Name Mapping provides mapping of names between the UNIX and Windows environments. You can configure User Name Mapping from the SFU MMC Console or by using the NAS Manager to configure properties for the NFS Sharing Protocol. With User Name Mapping, you can create simple maps between Windows Powered user accounts and corresponding UNIX accounts. You can also use the Advanced Map feature to map accounts with dissimilar names. Because UNIX user names are case-sensitive, and Windows Powered operating system names are not, the use of User Name Mapping can greatly simplify maintaining and managing accounts in the two environments. User Name Mapping uses Network Information Service (NIS) or local Personal Computer Network File System (PCNFS) user and group files to authenticate users. Also, User Name Mapping supports bidirectional one-to-many mapping, allowing you to map a single UNIX or Windows Powered operating system account to multiple accounts in the other environment. For example, you can map more than one administrative account in a Windows Powered operating system to the UNIX root account.

## Special Mappings

By default, the root user for the UNIX client is mapped to an unmapped user. This setting is commonly known as "root squashing." When an NFS authentication request is made for a user name mapped to an unmapped user, the result is an anonymous UID and GID (typically -2 and -1, respectively). Any files created by such a user will show file ownership as an anonymous Windows user.

 **NOTE:** To prevent SFU from performing root squashing for specific NFS shares, the UNIX root user and group must be mapped to the Windows administrator user and group. The "access type" for the NFS share's permissions must also be set to root for each applicable client or client group.

To create user and group name maps, perform the following steps:

1. Log in to the NAS Manager.
2. From the NAS Manager, click **Shares**.
3. Click **Sharing Protocols**.
4. Click **NFS Protocol**, and then click **Properties**.
5. Click **User and Group Mappings**.
6. Use the **User and Group Mappings** window to define your user and group maps.

## Configuration

To configure the type of server to be used to access UNIX user and group names, perform the following steps:

1. On the **User and Group Mappings** window, click **General**.
2. Click **Use NIS server**, or click **Use password and group files** to select the server type.
3. Depending on whether you use an NIS server or password and group files, perform one of the following steps:
  1. For password and group files, specify the location and filename of the UNIX password file and UNIX group file.

 **NOTE:** The UNIX password file and group file formats must conform to the UNIX standard for these files.

1. For NIS server, type the NIS domain and, optionally, the name of the NIS server.
4. Click **OK** to apply the configuration.

## Defining Maps

To define simple maps in SFU, perform the following steps:

1. In the **User and Group Mappings** window menu, click **Simple Mappings**.
2. Click **Enable Simple Mapping**.
3. Specify the **Windows Domain**.
4. Click **OK** to create the maps.

If you are defining explicit maps, you create user and group maps individually. To create explicit maps, perform the following steps:

1. On the **User and Group Mappings** window menu, click **Explicit User Mapping** to create user maps, or click **Explicit Group Mapping** to create group

maps.

2. Specify the **Windows Domain**. If the server is configured as **PCNFS**, go to step 4.
3. Click **List UNIX Users** or **List UNIX Groups**.

This action refreshes your UNIX users or groups selection.

4. Create map entries by selecting a Windows user or group and a UNIX user (UID) or group (GID) from the list and clicking **Add**.
5. Click **OK** to create the maps.

## Basic Scenarios

For UNIX and Windows NT User Name Mapping, an NIS Server must already exist in the UNIX environment, or UNIX user and group files must exist on the PowerVault NAS system. User Name Mapping associates UNIX users and groups to Windows NT users and groups. You can use two types of maps, simple and explicit. Simple maps define a one-to-one relationship between the same user names and groups. Explicit maps define a relationship between dissimilar user names and groups.

### Workgroup

In the workgroup scenario, you configure User Name Mapping locally on the NAS system. All maps are contained on this system.

### Domain

In the domain scenario, you configure NFS Authentication on all domain controllers. The NT Authentication Service installation program must be installed on the domain controller and available in the **DomainUtils** share on the NAS system.

To install the NT Authentication Service on a domain controller, perform the following steps:

1. Log in to the domain controller as an administrator.
2. Map the NAS system's **DomainUtils** share.
3. Run **sfucustom.msi**, which is located in the **Services for Unix** directory.

## Filename Character Translation

Although Windows and UNIX file systems do not allow certain characters in filenames, the characters that are prohibited by each operating system are not the same. For example, a valid Windows filename can not contain a colon (:), but a UNIX filename can. If a UNIX user attempts to create a file in an NFS share and that file contains an illegal character in its name, the attempt will fail.

You can use filename character translation to replace characters that are not allowed in a file system by mapping them to characters that are valid. To enable filename character translation, create a text file that maps Windows to UNIX characters, and then modify the registry entry that specifies the path and name of the translation file.

The filename character translation text file is a list of mapped characters in the following format, such as the following:

```
0xnn : 0xnn [ ; comment ]
```

where *nn* is the hexadecimal value of the character

The entry for a map from the UNIX character ":" to the Windows character "-" in the filename character translation text is as follows:

0x3a : 0x2d ; Map ':' (0x3a) to '-' (0x2d)

To map the character combination "()" to the character "^", add the following entry:

0x28 0x29 : 0x5e ; Map '()' to '^'

To specify the path and name of the filename character translation text file for Server for NFS to use, modify the following registry key to contain the path and filename of the character translation file:

HKLM\SOFTWARE\Microsoft\Server for NFS\CurrentVersion\Mapping\CharacterTranslation

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## File Server for Macintosh

File Server for Macintosh (FSM) provides the tools needed to integrate Macintosh and Windows networks by leveraging existing Macintosh network resource and expertise. FSM is disabled by default on the NAS system. See "[Enabling the AppleTalk Protocol](#)" in this section of the guide for information about enabling FSM.

## Enabling the AppleTalk Protocol

The AppleTalk protocol is disabled on the NAS system by default. You must enable the AppleTalk protocol for Macintosh clients to access the NAS system.

To enable the AppleTalk protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **AppleTalk Protocol**, and then click **Enable**.

## Disabling the AppleTalk Protocol

To disable the AppleTalk protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **AppleTalk Protocol**, and then click **Disable**.

## Configuring the AppleTalk Protocol

To configure the AppleTalk protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **AppleTalk Protocol**, and then click **Properties**.
5. In the **AppleTalk Service Properties** window, type the logon message the users will see at logon, click the **Security** check box if you allow workstations to save passwords and select the type of authentication to be used, and specify the number of concurrent sessions that are allowed.
6. Click **OK** to complete the configuration.

## Adapter Bindings

FSM can bind to only one network adapter. By default, it is bound to the embedded 10/100TX Network Adapter. To change the binding in systems with multiple network adapters, the AppleTalk protocol properties for the network adapter to be used by AppleTalk must be modified to accept inbound connections.

## AppleTalk Protocol Adapter Binding

To modify the AppleTalk protocol adapter binding for systems with multiple network adapters, perform the following steps from the NAS Manager:

1. Log in to the NAS Manager.
2. Click **Network**.
3. Click **Interfaces**.
4. Click the radio button next to an enabled adapter to bind the AppleTalk protocol.

 **NOTE:** The AppleTalk protocol must bind to an adapter that is enabled, regardless of whether the File Server for Macintosh is disabled.

5. On the **Tasks** menu, click **AppleTalk**.
6. Click the check box next to **Enable inbound AppleTalk connections on this adapter**.
7. Optionally, if you use AppleTalk zones, select the appropriate zone in the drop-down box.
8. Click **OK**.

## Microsoft UAM Volume

A user authentication map (UAM) is a software program that prompts users for an account name and password before they log in to a server. The Macintosh Chooser has a standard UAM built in that uses the clear-text password or Apple's RandNum Exchange method of security.

Microsoft Authentication offers an additional level of security because the password is used as a key to encrypt a random number. If the system administrator has determined that encryption is an important security measure, you may be asked to use Microsoft Authentication in addition to Microsoft UAM authentication.

## Requirements

To use Microsoft UAM 5.01, you must have a Macintosh client running AppleShare Client 3.8 or later or Macintosh 8.5 or later operating system. If you do not meet the minimum requirements, the Microsoft UAM Installer installs the old Microsoft UAM 1.0 module. If you upgrade your system software, you need to run the Microsoft UAM Installer again.

## Installing User Authentication

Log in to the Microsoft UAM Volume on the system to access the **MS UAM** file, and then drag this file to the **AppleShare Folder** in your **System** folder.

To access the Microsoft Authentication files on the system, perform the following steps:

1. Create a user with a password of less than eight characters.
  - a. Log in to the NAS Manager.
  - b. Click **Users**.
  - c. Click **Local Users**.
  - d. Click **New**.
  - e. Complete the information in the **Create New User** window and click **OK**.

 **NOTE:** The password can be no longer than eight characters. Passwords longer than eight characters cannot be used when mapping an Apple share without a UAM.

2. Click **Chooser** on the **Macintosh Apple** menu.
3. Double-click the **AppleShare** icon, and then click the **AppleTalk** zone in which the system with Services for Macintosh resides.

Ask your system administrator if you are not sure of the zone.

4. Select the system from the list of file servers, and click **OK**.
5. Click **Registered User**.
6. Enter the user name and password you created in step 1, and then click **OK**.
7. Select the **Microsoft UAM Volume**, and then click **OK**.
8. Close the **Chooser** dialog box.

To install the authentication files on the Macintosh workstation, perform the following steps:

1. Double-click **Microsoft UAM Volume** on the Macintosh desktop.
2. Double-click the **Microsoft UAM Installer** file on the Microsoft UAM volume.
3. Click **Continue** in the **Installer Welcome** screen.

The installer reports whether the installation succeeds.

If the installation succeeds, Macintosh users of this workstation are offered Microsoft Authentication when they connect to the system.

## Restarting Workstation Services

If File Services for Macintosh cannot establish communications to the local RPC service, you may need to restart the Workstation Service.

To restart the Workstation Service, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the NAS system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **System Management**, and then click **Computer Management**.
5. Click **Services and Application**.
6. Double-click **Services**.
7. Right-click **Workstation** in the **Services** window, and select **Restart**.
8. Confirm that you want to restart the Workstation Services.

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## Services for Novell NetWare

Services for NetWare (SFN) are compatible with Novell® NetWare® Bindery service for authentication and file access using the internetwork packet exchange/sequenced packet exchange (IPX/SPX) network protocol. Services for NetWare are disabled by default. See "[Enabling Services for NetWare](#)" in this section of the guide.

## Enabling Services for NetWare

The NetWare protocol is disabled on the NAS system by default. You must enable the NetWare protocol for NetWare clients to access the NAS system.

To enable the NetWare protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **NetWare Protocol**, and then click **Enable**.



**NOTE:** For the NAS system, the default NetWare supervisor user name is `supervisor`, and the password is `powervault`. Change the user name and password to ensure security.

## Disabling Services for NetWare Protocol

To disable the NetWare protocol, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Shares**.
3. Click **Sharing** Protocols.
4. Click **NetWare Protocol**, and then click **Disable**.

## Configuring the NWLink IPX/SPX Compatible Protocol

To configure this protocol, you need the internal network number, frame type, and network number.

### Internal Network Number

Internal network numbers are used for internal routing and are generally needed only for servers. You should not need to change this option on your system.

### Frame Type and Network Number

Frame types define the packet formats that are used by different networks. It is important that all systems in a network have the same frame type so that they can communicate with the rest of the network.

When you are configuring your system, it attempts to automatically detect the frame type for the client system. In most cases, this is successful. However, the automatic detection feature occasionally selects an inappropriate frame type, usually because more than one frame type exists on the network. If this happens, manually set the frame type to match the one specified on your system running NetWare.



**NOTE:** If more than one frame type exists, you should select the one that is detected first. For example, if the frame types Ethernet 802.2 and Ethernet 802.3 are bound to the same segment, configure frame type Ethernet 802.2. The order of detection is Ethernet 802.2, Ethernet 802.3, Ethernet II, and then Ethernet SNAP.

## Configuring the IPX Protocol

By default, the IPX protocol is configured on the NAS system to automatically detect frame types. To use the IPX protocol, you must change your NAS system's IPX properties to manually detect frame types.

To configure the IPX protocol to manually detect frame types, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the NAS system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** displays. If it does not display, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **System Management**, and then click **Network Properties**.
5. In the **Network and Dial-up Connections** window, right-click the network adapter used by the NAS system and select **Properties**.
6. In the **Local Area Connection Properties** window, click **NWLink/IPX/NetBIOS Compatible Transport Protocol**, and click **Properties**.
7. In the **NWLink/IPX/NetBIOS Compatible Transport Protocol** window, select **Manual Frame type detection**.
8. Click **Add**.
9. In the **Manual Frame Detection** window, select a frame type, enter a network number for the IPX network, and then click **OK**.
10. Click **OK**.
11. Click **OK** to close the **Local Area Connection** window.
12. Close the **Network and Dial-Up Connections** window.

The IPX protocol is now configured on the NAS system to manually detect frame types.

---

## Microsoft Directory Synchronization Services

Microsoft Directory Synchronization Services (MSDSS) allows you to synchronize a wide variety of data stored in the Active Directory service with Novell Directory Service (NDS) and NetWare 3.x binderies.

MSDSS is a highly flexible service that helps Novell users to perform the following tasks:

- 1 Adopt Windows 2000 Server and the Active Directory service
- 1 Reduce directory management through two-way synchronization
- 1 Migrate NDS and bindery information to Windows 2000 Server

MSDSS supports two-way synchronization with NDS and one-way synchronization with NetWare 3.x binderies to provide a complete directory interoperability solution. MSDSS also supports password synchronization and provides a directory migration service.

MSDSS allows NetWare users to deploy Active Directory without having to replace existing directories or bear the cost of managing two separate directories. As a result, users have the flexibility to:

- 1 Consolidate directory management when multiple directories are required
- 1 Manage accounts from either directory
- 1 Use directory-enabled applications, devices, and services based on the Windows 2000 Active Directory service

MSDSS is easy to use and makes synchronization and Active Directory setup easy through its management interface. It is fully featured to allow users a choice of management, synchronization, and migration options.

MSDSS supports all major systems running NetWare and most Novell directories and binderies, and it includes support for IPX/SPX and TCP/IP network protocols.

## Windows 2000 MSDSS Domain Controller

To implement MSDSS, you must install the Windows 2000 Server operating system and the MSDSS software (available on the *Microsoft Services for NetWare*

Version 5 CD) on at least one system. In Windows 2000, when you promote a system running Windows 2000 Server to an Active Directory server, it becomes a domain controller. You use this domain controller to configure Active Directory, install MSDSS, and then import information from the existing NetWare environment.

The larger the environment, the more new servers you need. If you are planning to have more than one domain, then you need new hardware for the first domain controller in each domain.

You must also install Novell Client Access software on the MSDSS server or servers. MSDSS uses Novell Client Access to authenticate and to access NDS. While accessing NDS, it authenticates, but does not use a license. MSDSS also uses Novell Client Access to map one directory's contents to another, taking into account the fact that the object classes in Novell's NDS or bindery directories are different from Active Directory object classes. Novell Client Access is also required to use the File Migration utility to migrate files.

You can install Novell Client Access in four modes: **IP only**, **IPX only**, **IP and IPX combined**, and **IP with IPX Compatibility Mode**. Most NetWare environments still use IPX. MSDSS works in all the modes because it uses Novell Client Access to access the lower layers.

If you are migrating NDS, you can import the user and group information from one NDS server to the MSDSS server because you have one user database per tree. You can then migrate the file system. Remember that each Novell server has its own file system, which is not replicated to other servers (whereas NDS is replicated to other servers). After the files are migrated, you can uninstall NDS from the server to provide more space for the Windows 2000 Server operating system.

## Outline of the MSDSS Deployment Procedure

The next two sections describe the procedures for implementing MSDSS in a smaller (local area network [LAN] only) or larger (wide area network [WAN]) network. You should adapt the guidelines to suit your environment and goals.

### Small Environment

A small company with a LAN-based, simple network is often a likely candidate for a quick migration. After doing all the preparations described in the previous section, perform the following steps (adjusted, if necessary, to your situation):

1. Back up your NetWare system and user data.
2. Install and configure a Windows 2000 domain controller (see the documentation that came with your operating system software).
3. Install the Novell Client for Windows 2000 from the Novell website at [www.novell.com/download](http://www.novell.com/download).
4. Replace services or applications that require NDS with software that is compatible with Active Directory. (Remove NDS applications before you begin using MSDSS, except for ZENworks, which can be replaced by IntelliMirror at any time.)
5. Install MSDSS from the system **DomainUtils** share.

 **NOTE:** To access MSDSS software, map a network drive to `\\Dellxxxxxx\DomainUtils`, where `xxxxxx` is the system's service tag number. For example, if your service tag number is 1234567, type `http://DELL1234567`.

6. Log in to the NDS tree or bindery server as **administrator**.
7. Log in to the appropriate Windows 2000 domain as a member of the Domain Admins group.
8. On the MSDSS server, open the Help files, and then print out the procedures "To perform a one-time migration" and "To migrate files."
9. Click the **Start** button, and then point to **Programs**→ **Administrative Tools**→ **Directory Synchronization** to start MSDSS.
10. Follow the instructions as described in the Help printout, "To perform a one-time migration." The prompts guide you through the following steps:
  - a. Right-click **MSDSS** in the console tree, and then click **New Session** to start the New Session Wizard.
  - b. Specify whether objects are to be copied from NDS or Bindery.
  - c. Click **Migration**.
  - d. If you plan to migrate files as well as directory objects, click the **Migrate Files** check box.

You must also run the File Migration utility.

- e. Specify the path to the Active Directory container in which you want to copy items.
- f. Accept the default domain controller in which to store the migration log.
- g. Specify the NDS Container or Bindery Container from which to copy items.
- h. Provide the name and password of the Novell administrative account.

- i. On the **Initial Reverse Synchronization** page, specify the password options (such as **Set passwords to the user name.**)

When you are performing a migration, this page does not include the option to actually perform an initial reverse synchronization, but it is the page where you specify which password option you want to use.

- j. Set **synchronization mode** to **default object mapping** or to **custom object mapping**.
- k. If you selected **custom object mapping**, you are prompted to manually establish one-to-one relationships between pairs of objects.
- l. Click **Finish**.

After the user accounts are migrated, you can migrate the file system (migrating the users before the files allows you to migrate file-system permissions). Follow the instructions in the Help printout, "To migrate files." The prompts guide you through the following steps:

1. To start the File Migration Utility, click the **Start** button and point to **Programs→ Administrative Tools→ File Migration Utility**.
1. To view mapping relationships, click **View Maps**.
1. To view mapped access rights for the users, groups, organization units, and organizations to be migrated, click **Access Rights**.

The **NDS Modify** option converts, by default, to **Read** because it does not have an equivalent NDFS right. You might want to click the **Write** check box to allow read/write access.

1. On the **Step 2 — Security Accounts** tab, verify that you are logged on with the correct Active Directory, NDS, or Bindery credentials.
1. On the **Step 3 — Source and Target** tab under **Source (NDS/Bindery)**, click the volume or directories from which you want to migrate files. Under **Target (Active Directory)**, click the shares or directories to which you want to migrate files, click the **Map** button, and then click **Next**.

If the NDS or Bindery volume you selected in the source tree displays **Unavailable**, then you are not currently logged in to that tree or Bindery server. Log in, and then press <F5> after reselecting the volume to view the directories within the displayed volume.

1. On the **Step 4 — Log File** tab, select your logging options, and then click **Next**.
1. On the **Step 5 — Scan** tab, click **Scan**, and then click **Next**.

The utility scans all source volumes and counts and displays the number of directories and files in each. It ensures that proper access has been given to each source volume, directory, and file. If any errors occur, the utility displays them under **NetWare scan logs** and **Windows scan logs**, respectively. You can select a number of acceptable errors; if this number is exceeded, the process aborts, allowing you to return to previous steps to correct the errors.

1. On the **Step 6 — Migrate** tab, click **Migrate**.

Manually migrate (or use third-party utilities to migrate) object security permissions and system accounts, printer objects, application objects, and other objects that MSDSS does not migrate from Bindery or NDS to Active Directory. (MSDSS migrates NetWare user accounts, groups, and distribution lists for Bindery and NDS, and, for NDS only, MSDSS also migrates NDS organizational units and organizations.)

1. Upgrade your system(s) running NetWare to the Windows 2000 Server or Professional operating system.
2. On each Windows desktop in your NetWare network, uninstall Novell Client Access.

You must configure the desktops to join the Windows 2000 domain.

3. Optionally, upgrade client systems (workstations) running NetWare to the Windows 2000 Professional operating system.
4. Configure all client systems (both Windows and non-Windows), to **join the Windows 2000 domain**.

Ensure that the users know how to handle their password the first time they log in (for possible password options, see "MSDSS Password Management" in "MSDSS Deployment: Understanding Synchronization and Migration") at [www.microsoft.com](http://www.microsoft.com).

## Medium-Sized or Large Environment

An organization large enough to have WAN links probably selects to synchronize its networks temporarily while performing a gradual migration over time (up to 3 months for a large network), or it prefers to use synchronization to establish a mixed Novell/Windows 2000 network on a long-term basis. If you plan a staged migration, one-way synchronization is often the appropriate choice.

After doing all the preparation described above, perform the following steps (adjusted, if necessary, to your situation):

1. Back up your NetWare user and system data.

2. Install and configure a Windows 2000 domain controller (see the documentation that came with your operating system software).
3. Install the Novell Client for Windows 2000 from the Novell website at [www.novell.com/download](http://www.novell.com/download).
4. Install MSDSS from the NAS system **DomainUtils** share.

 **NOTE:** To access MSDSS software, map a network drive to `\\Dellxxxxxx\DomainUtils`, where `xxxxxx` is the system's service tag number. For example, if your service tag number is 1234567, type `http://DELL1234567`.

5. Log in to the NDS tree or Bindery server with administrative credentials.
6. Log in to the appropriate Windows 2000 domain as a member of the **Domain Admins** group.
7. On the MSDSS server, open the Help files, and then print out the steps (briefly summarized below) for "To perform a one-way synchronization" or "To perform a two-way synchronization."
8. Click the **Start** button, point to **Programs**→ **Administrative Tools**→ **Directory Synchronization** to start MSDSS, and then allow the prompts to guide you through the following tasks:
  - a. Start the New Session Wizard (right-click **MSDSS** in the console tree).
  - b. Select **Novell Bindery** or **Novell Directory Services (NDS)** for one-way synchronization, or select **Novell Directory Services (NDS)** for two-way synchronization.
  - c. Select **One-way synchronization (from Active Directory to NDS or Bindery)** or select **Two-way synchronization (from Active Directory to NDS and back)**.
  - d. Specify the path to the **Active Directory** container into which you want to copy items.
  - e. Accept the default domain controller in which to store the session database.
  - f. Specify the NDS Container or Bindery Container from which to copy items.
  - g. Provide the name and password of the Novell administrative account.
  - h. On the **Initial Reverse Synchronization** page, select **Perform an initial reverse synchronization**.
  - i. Still on the **Initial Reverse Synchronization** page, specify the password options (such as **Set passwords to the user name**).
  - j. On the **Object Mapping Scheme** page, click **Default** (to accept the default mapping for each source and target directory pair) or **Custom** (for NDS only), and then click **Object Mapping Table** (to specify objects for which you want to establish a one-to-one relationship, regardless of the object location in either directory tree).
 

MSDSS does not support custom object mapping for bindery.
  - k. Still on the **Object Mapping Scheme** page, click **Filters** if you want to configure a filter for this synchronization session.
  - l. On the **Session Name** page, accept the default session name or specify a new name.
  - m. Click **Finish**.
9. If you selected one-way synchronization, perform all user, group, and NDS organizational unit container (OU) object management from Active Directory. If you established two-way synchronization, you can now manage user, group, and OU objects from either Active Directory or NDS.
10. If you plan long-term coexistence between Active Directory and NetWare, you are now finished, unless you want to migrate a subset of users, systems, and/or files. If you plan to continue by migrating in stages from NetWare to Active Directory, perform the following tasks in the time-frame that is convenient for you:
  1. Install and configure File and Print Services for NetWare (to allow NetWare clients access to files and printers on Windows 2000 servers) and Gateway Services for NetWare (to allow Windows clients access files and printers on NetWare servers).
  1. Replace services or applications that require NDS with commensurate software compatible with Active Directory. Perform large conversions (such as GroupWise to Exchange) as separate projects.
  1. Migrate the pilot group of users and their files (adapt instructions from the migration steps are provided in "[Small Environment](#)" in this section of the guide.). Get the pilot group's feedback, and then set a schedule to migrate additional groups of users, according to the priorities you have established.
  1. Migrate the rest of the users as appropriate (for example, if you migrate the set of applications they use, it is time to migrate them also).

For more information, see the Novell website at [support.novell.com/servlet/Knowledgebase](http://support.novell.com/servlet/Knowledgebase) and the Windows 2000 website at [www.microsoft.com/windows2000](http://www.microsoft.com/windows2000).

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## Using Secure Sockets Layers

This section explains how secure sockets layers (SSL) are used in the NAS system. It also explains how to use your own certificate, if you have one, and how to regenerate your certificate.

## Introduction to SSL Certificates

Certificates contain information used to establish system identities over a network. This identification process is called authentication. Although authentication is similar to conventional forms of identification, certificates enable Web servers and users to authenticate each other before establishing a connection to create more secure communications. Certificates also contain encryption values, or keys, that are used in establishing an SSL connection between the client and server. Information, such as a credit card number, sent over this connection is encrypted so that it cannot be intercepted and used by unauthorized parties.

Two types of certificates are used in SSL. Each type has its own format and purpose. *Client certificates* contain personal information about the clients requesting access to your site, which allows you to positively identify them before allowing them access to the site. *Server certificates* contain information about the server, which allows the client to positively identify the server before sharing sensitive information.

## Server Certificates

To activate your Web server's SSL 3.0 security features, you must obtain and install a valid server certificate. Server certificates are digital identifications containing information about your Web server and the organization sponsoring the server's Web content. A server certificate enables users to authenticate your server, check the validity of Web content, and establish a secure connection. The server certificate also contains a *public key*, which is used in creating a secure connection between the client and server.

The success of a server certificate as a means of identification depends on whether the user trusts the validity of information contained in the certificate. For example, a user logging on to your company's website might be hesitant to provide credit card information, despite having viewed the contents of your company's server certificate. This might be especially true if your company is new and not well known.

For this reason, certificates are sometimes issued and endorsed by a mutually trusted, third-party organization, called a certification authority. The certification authority's primary responsibility is confirming the identity of those seeking a certificate, thus ensuring the validity of the identification information contained in the certificate.

Alternatively, depending on your organization's relationship with its website users, you can issue your own server certificates. For example, in the case of a large corporate intranet handling employee payroll and benefits information, corporate management might decide to maintain a certificate server and assume responsibility for validating identification information and issuing server certificates. For more information, see "[Obtaining a Server Certificate From a Certification Authority](#)" in this section of the guide.

## PowerVault 725N NAS System Certificate

By default, your NAS system has a self-generated and self-signed certificate. The configured SSL port is 1279.

 **NOTE:** For non-SSL communication, use port 1278. This port is not a secure port and all text is sent in plain text over the network.

## Using a Custom Certificate

If a certification authority is present in the network, the administrator can choose to change the default certificate for your NAS system. The administrator must use the wizards to first request a certificate and then apply it to the NAS system.

## Obtaining a Server Certificate From a Certification Authority

 **NOTE:** If you are replacing your current server certificate, the Internet Information Server (IIS) continues to use the old certificate until the new request has been completed.

Find a certification authority that provides services that meet your business needs, and then request a server certificate.

 **NOTE:** For the latest list of certification authorities supporting IIS, see the Microsoft Security website. In the **By Category** list, select **Certification Authority Services**.

To obtain a server certificate, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**, and then click **Terminal Services**.
3. Log in to the NAS system as an administrator.

 **NOTE:** The default administrative user name is `administrator` and the default password is `powervault`.

The **Advanced Administration Menu** is displayed. If it is not displayed, double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.

4. Click **System Management**, and then from the list, click **Internet Information Services**.
5. Navigate to and right-click the **Administration** folder, and then select **Properties**.
6. Under **Secure Communications** on the **Directory Security** property sheet, click **Server Certificate** to access the Web Server Certificate Wizard.
7. Use the Web Server Certificate Wizard to create a certificate request.
8. Send the certificate request to the certification authority.

The certification authority processes the request and sends you the certificate.

 **NOTE:** Some certification authorities require you to prove your identity before processing your request or issuing you a certificate.

9. Use the Web Server Certificate Wizard to install your certificate.

For more information about SSL, see the Internet Information Server online help.

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## Microsoft Management Console

You can use Microsoft Management Console (MMC) to create, save, and open administrative tools (called MMC consoles) that manage the hardware, software, and network components of your Microsoft Windows operating system.

To launch MMC:

1. Log in to the NAS Manager.
2. From the NAS Manager, click **Maintenance**.
3. Click **Terminal Services**.
4. Log on as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

5. Double-click the **Advanced Administration Menu** icon on the desktop of the NAS system.
6. Click **System Management**.
7. Click **Computer Management**.

The **Computer Management** window appears and displays a list of MMC programs.

## Using MMC to Enable HTTP Directory-Browsing Privileges

By default, Hypertext Transfer Protocol (HTTP) directory-browsing privileges are disabled to HTTP shares directed to the same folder or volume as another share. To enable HTTP directory-browsing privileges using MMC, perform the following steps:

1. Launch MMC as explained in "[Microsoft Management Console](#)" in this section of the guide.
2. Double-click **Services and Applications** to expand its list.
3. Double-click **Internet Information Services** to expand its list.
4. Double-click **Shares** to expand its list.
5. Right-click the desired share and click **Properties**.

The share's properties window appears.

6. Click the **Directory** tab.
7. Check the **Directory browsing** box.
8. Click **Apply**.
9. Click **OK**.

## Using MMC to Enable FTP Write Privileges

File Transfer Protocol (FTP) write privileges to the NAS system's default FTP site are disabled by default. To enable write privileges to the default FTP site using MMC, perform the following steps:

1. Launch MMC as explained in "[Microsoft Management Console](#)" in this section of the guide.
2. Double-click **Services and Applications** to expand its list.
3. Double-click **Internet Information Services** to expand its list.
4. Right-click **Default FTP Site** and click **Properties**.

The **Default FTP Site Properties** window appears.

5. Click the **Home Directory** tab.
6. Check the **Write** box in the **FTP Site Directory** area.
7. Click **Apply**.
8. Click **OK**.

## Using MMC to Delete FTP Shares

To delete FTP shares using MMC, perform the following steps:

1. Launch MMC as explained in "[Microsoft Management Console](#)" in this section of the guide.
2. Double-click **Services and Applications** to expand its list.
3. Double-click **Internet Information Services** to expand its list.
4. Double-click **Default FTP Site** to expand its list.
5. Right-click on the share you want to delete and click **Delete**.

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## Troubleshooting

### Dell™ PowerVault™ 725N NAS Systems Administrator's Guide

● [Tools and Techniques](#)

● [Troubleshooting](#)

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This section provides suggestions for and information about alternative troubleshooting tools and techniques.

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## Tools and Techniques

### Ping Your NAS System

If you are unable to connect to the NAS system using the NAS Manager, try to ping the NAS system. From a Microsoft client system, click the **Start** button, click **Run**, and then type `cmd`. At the command prompt in the `cmd.exe` window, type `ping system_name`, and then press <Enter>.

 **NOTE:** The default system name is `DELLxxxxxxx`, where `xxxxxxx` is the system's service tag number. For example, if your service tag number is 1234567, type `http://DELL1234567`.

If you can ping the NAS system but cannot access it through the NAS Manager, your NAS system might still be booting into Microsoft® Windows®, which normally takes about five minutes, and might not have started the Microsoft Internet Information Services (IIS).

 **NOTE:** It may take several minutes for the NAS system to boot.

### My Network Places

If you have a client system running Windows 2000 on the same subnet as the NAS system, double-click **My Network Places**. Browse through the network and locate your NAS system.

### System LEDs and Beep Codes

If your NAS system is not booting or responding properly, you can diagnose some problems using the system's LEDs and beep codes. For more information about the LEDs and beep codes, see your system's *Installation and Troubleshooting Guide*.

### Keyboard, Monitor, and Mouse

The NAS system is intended to operate as a "headless" device, meaning that you do not need to connect a keyboard, monitor, and mouse to the system to operate it. However, you can connect a keyboard, monitor, and mouse for troubleshooting, if necessary.

### Terminal Services

You can use the Terminal Services Advanced Client to connect to your NAS system from a client system. You can access Terminal Services Client through the NAS Manager or the **Start** menu.

To access Terminal Services from the NAS Manager, perform the following steps:

1. Log in to the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**.
4. Enter the administrator user name and password and click **OK**.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

## Troubleshooting

Use the following tables to help you troubleshoot various conditions that might occur on your NAS system:

- 1 [Table 8-1](#), "General Troubleshooting"
- 1 [Table 8-2](#), "NAS Manager"
- 1 [Table 8-3](#), "Kick-Start Utility"
- 1 [Table 8-4](#), "Dell ActiveArchive"
- 1 [Table 8-5](#), "Dell OpenManage Array Manager"
- 1 [Table 8-6](#), "UNIX and Red Hat Linux"
- 1 [Table 8-7](#), "Macintosh and AppleTalk"
- 1 [Table 8-8](#), "Netscape Navigator"
- 1 [Table 8-9](#), "Hardware-RAID NAS System Internal RAID Controller Card"

 **NOTE:** Some of the procedures refer to a software-RAID and a hardware-RAID NAS system. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

**Table 8-1. General Troubleshooting**

Issue	Possible Cause	Resolution
The NIC LED on the front panel of the NAS system is not lit.	A network connection problem exists.	<p>Ensure that a network cable is properly connected to one of the NIC connectors on the back panel of the NAS system. Do not use a crossover cable. If the NIC LED is still not lit, see "Troubleshooting an Integrated NIC" in your system <i>Installation and Troubleshooting Guide</i>.</p> <p>If the NIC LED is now lit, verify that a network cable is attached from the client system to the network and that the NIC LED on the client system is lit. If the NIC LED on the client system is not lit, see the client system documentation for information on troubleshooting the system's NIC.</p> <p>If the NIC LED on the client system is lit, run the <b>ping</b> command to verify that the client system can obtain the IP address of the NAS system. If the client can obtain the NAS system's IP address, reboot both the client system and the NAS system.</p> <p>If the client cannot obtain the NAS system's IP address, connect a keyboard, mouse, and monitor to the NAS system, reboot the NAS system, and run the <b>ipconfig</b> command to obtain the NAS system's IP address.</p>
The monitor screen is blank when connected to the NAS system.	The video cable may not be connected securely or the monitor may be faulty.	<p>Inspect the video cable connection and ensure that the cable is connected properly to the NAS system.</p> <p>Try to connect to the NAS Manager using a client system. If the client system is able to connect to the NAS Manager, replace the monitor.</p>
All four hard-drive operation LEDs on the NAS system are alternating blinking green and amber.	The green/amber flash pattern indicates that the RAID volumes are being rebuilt.	Wait at least 5 minutes, and then try to reconnect to the NAS system.
The NAS system may not be booting properly.	You may not be allowing enough time for the NAS system to boot or a system alert may be occurring.	<p>The NAS system requires at least 5 minutes to boot.</p> <p>Connect a monitor to the NAS system or use console redirection to view the boot routine of the system. If a system alert occurs (system message, beep code, or amber hard-drive LEDs) during boot, see "Indicators, Messages, and Codes" in the <i>Installation and Troubleshooting Guide</i> for information on resolving the problem.</p>
POST does not occur when the system is turned on or rebooted, but a beep code is heard.	A number of conditions can cause a beep code during POST.	Write down the number of beeps, and see "Indicators, Messages, and Codes" in the <i>Installation and Troubleshooting Guide</i> for information on resolving the problem.
POST does not occur when the NAS system is turned on or rebooted, and a beep code does not occur.	The BIOS may need to be updated, or a memory module or microprocessor needs to be reseated or replaced.	Without disconnecting the power source, reboot the NAS system by pressing <Ctrl><Alt><Delete>. You may need to repeat this key combination several times. If the system now POSTs, upgrade the BIOS to the latest version. See " <a href="#">Updating the BIOS</a> " in the "Advanced

		<p>Features" section of this guide.</p> <p>If the system still does not POST, try booting the system with each individual memory module. See the <i>Installation and Troubleshooting Guide</i> for more information. If the system does not boot with a certain memory module installed, then that module is defective.</p> <p>If the system does not POST with any of the memory modules, reset the processor as explained in the <i>Installation and Troubleshooting Guide</i>. If the system does not boot, try replacing the processor with a working processor. If the system does not boot, the system board may be defective. See "Getting Help" in the system <i>Installation and Troubleshooting Guide</i>.</p>
I have several hard drive-related events in the event logs.	A hardware RAID hard-drive carrier may be installed in the software-NAS system, or vice versa.	<p>Software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable.</p> <p>If you have a software-RAID NAS system, ensure that the hard-drive carrier does not have a "HW-RAID" identification label on it.</p> <p>If you have a hardware-RAID NAS system, ensure that the hard-drive carrier does have a "SW-RAID" identification label on it.</p>
I have several hard drive-related events in the event logs and I am using the correct hard-drive carrier.	BIOS version A06 or later may not be installed.	Download the latest BIOS from <a href="http://support.dell.com">support.dell.com</a> . See " <a href="#">Updating the BIOS</a> " in the "Advanced Features" section of this guide for more information.
I do not know the name of my NAS system.	The name of the NAS system can be viewed in <b>My Network Places</b> .	Double-click <b>My Network Places</b> on the desktop of the client system and look for NAS system name. The default name for the NAS system is DELLxxxxxx, where xxxxxx is the system's service tag. For example, if the service tag is 1234567, the system name is DELL1234567. You can find the service tag on the top cover of the NAS system.
I cannot connect to or ping the NAS system after turning it on.	The NAS system has not finished booting.	<p>Wait at least 5 minutes for the NAS system to finish booting.</p> <p><i>If your NAS system uses software RAID and you still cannot connect, attempt the procedures in "<a href="#">Troubleshooting Software-RAID NAS Systems</a>" in the "Recovering and Restoring the System" section of this guide.</i></p> <p><i>If your NAS system uses hardware RAID and you still cannot connect, attempt the procedures in "<a href="#">Troubleshooting Hardware-RAID NAS Systems</a>" in the "Recovering and Restoring the System" section of this guide.</i></p>
I just created a new volume on my system but cannot see the volume on Windows Explorer through Terminal Services.	Terminal Services cannot update to show a new volume during the session in which it was created.	Log off Terminal Services. When you reconnect to Terminal Services, the volume should be visible.
I see the following error message in the event log:  WMI ADAP was unable to load the winspool.drv performance library due to an unknown problem within the library: 0x0	This issue is with the WDAP Performance library and is documented on Microsoft's website.	<p>Connect to the system via Terminal Services Advanced Client, and then open a local command prompt. Type the following command: WINGMT/CLEARADAP. When the prompt returns, type WINGMT/RESYNCPERF &lt;wingmt service PID&gt;. The &lt;wingmt service PID&gt; number is available in the Task Manager. To launch Task Manager:</p> <ol style="list-style-type: none"> <li>1. From the NAS Manager primary menu, click <b>Maintenance</b>→<b>Terminal Services</b>.</li> <li>2. Log in to the NAS system as an administrator.</li> <li>3. If the <b>Advanced Administration</b> screen does not automatically appear, double-click the <b>Advanced Administration Menu</b> icon on the desktop of the NAS system.</li> <li>4. Click <b>System Management</b>→<b>Task Manager</b>.</li> </ol>
I have just brought up my new NAS system on the network, but I am unable to upload files using FTP even though I am the administrator.	By default, users do not have write privileges on the default FTP site.	See " <a href="#">Using MMC to Enable FTP Write Privileges</a> " in the "Advanced Features" section of this guide.
I have deleted an FTP share and folder from my NAS system. However, when I use Terminal Services to confirm the removal, I can still see the shared folder in the FTP section of the MMC.	By default, this folder is not deleted by the NAS Manager.	Manually remove this listing from the listed shared folders in the FTP section of the MMC. See " <a href="#">Using MMC to Delete FTP Shares</a> " in the "Advanced Features" section of this guide.
After using Terminal Services to connect to my NAS system, I am unable to type using my native language.	The NAS system is set to English, the default language.	You can install your native language character set from the <i>Multilingual Support</i> CD that was shipped with your system. For installation instructions, see the " <a href="#">Advanced Features</a> " section in this guide.
During a Terminal Services session to the NAS system, I mapped a network share from the NAS system. Now the system does not reboot correctly and hangs during restart.	Having a share mapped from the NAS system causes the system to hang during restart.	<p>Ensure that when you map a share, you do not select <b>Reconnect at logon</b>. To disconnect the hard drive, right-click <b>My Appliance</b> on the NAS system desktop, and select <b>Disconnect Network Drive</b>. Click the share that you previously mapped in the <b>Disconnect Network Drive</b> window, and then click <b>OK</b>.</p> <p>If you cannot log in to the NAS system, reboot the system. Then, connect using Terminal Services and disconnect the hard drive. If Terminal Services does not work, try connecting a keyboard, monitor, and mouse directly to the NAS system. See "<a href="#">Configuring Your System Using a Keyboard, Monitor, and Mouse</a>" in the "Initial Configuration" section of this guide.</p>
The <b>Telnet</b> option in the NAS Manager does not allow me to enable Telnet on the NAS system, even though I have selected the check box next to <b>Enable Telnet access to this NAS system</b> on the <b>Telnet Administration Configuration</b> page.	Telnet service is not enabled.	<p>To enable Telnet on your NAS system, perform the following steps:</p> <ol style="list-style-type: none"> <li>1. From the NAS Manager primary menu, click <b>Maintenance</b>→<b>Terminal Services</b>.</li> <li>2. Log in to the NAS system as an administrator.</li> <li>3. If the <b>Advanced Administration Menu</b> is displayed, click <b>Exit</b> to close it.</li> <li>4. Right-click <b>My Appliance</b>.</li> <li>5. Click <b>Manage</b>.</li> </ol>

		<p>6. Double-click <b>Services and Applications</b>→ <b>Services</b>.</p> <p>7. Locate and right-click <b>Telnet</b>, and then click <b>Start</b>.</p> <p>Telnet starts on the NAS system.</p>
I cannot connect to the NAS system using the IPX protocol.	IPX networks require that you assign an IPX network number to all clients. By default, the NAS system does not assign an IPX number to the network.	Change the IPX protocol on the NAS system to manually detect frame types. See " <a href="#">Configuring the IPX Protocol</a> " in the "Advanced Features" section of this guide.
After restoring files from a backup, the modified dates of folders are inconsistent.	The modified dates of folders reflect either the date you performed the restore or the date the folder was modified.	Take no action. This is a design issue that occurs only with folders; the files' modified dates are consistent.
The <b>Advanced Administration Menu</b> does not display anymore.	You were not logged off of Terminal Services before you closed the <b>Terminal Services</b> window.	Double-click the <b>Advanced Administrator</b> icon on the desktop of the NAS system.
The NAS system is attached to a DHCP network, but I cannot connect to it through the NAS Manager.	The DHCP server may have issued a new DHCP address to the NAS system.	<p>If the NAS system has been powered down for a period of time predetermined by the DHCP server, the NAS system acquires a new DHCP address from that server. The DHCP server may not have yet replicated the new address with the NAS system name.</p> <p>Wait approximately 15 minutes for the address to be replicated and then try connecting again or try connecting to the NAS system again using the IP address.</p>
I cannot connect to the NAS system using a static IP address.	You may be using the wrong address syntax.	<p>Ensure that you are correctly entering the address in the syntax described in "<a href="#">Logging in to the NAS Manager</a>" in the "NAS Manager" section of this guide.</p> <p>If you used the Kick-Start utility to set up the NAS system, then enter the IP address that you used during the Kick-Start setup.</p>
A NAS system has been moved to a new network or new subnet and I cannot connect.	The connection settings may need to be refreshed.	<p>If the NAS system is using DHCP, open a command line on the system and use the ipconfig utility to release and renew the IP address.</p> <p>If DHCP is not being used, verify that all NAS system <b>Network Interfaces</b> settings are correct.</p>

**Table 8-2. NAS Manager**

Issue	Possible Cause	Resolution
I am unable to log in to NAS Manager.	The user name and password are incorrectly being entered or may have been changed.	<p>Ensure that you are correctly typing the user name and password. The password is case-sensitive; for example, the default password <code>powervault</code> must be lower-case letters.</p> <p>If the NAS system was installed by another person, verify that the user name and password were not changed during installation.</p> <p>If the NAS system has been connected to a domain, contact the domain administrator and verify that the user name and password were not changed.</p>
I am trying to select the <b>Administer My Appliance</b> link on the opening page of the NAS Manager, but the link does not function properly.	The user account that you used to log in to the domain does not have administrator privileges. The link does not work for users without administrator privileges.	<p>Type the address of the NAS Manager in your browser. For SSL connections, type: <code>https://servername:1279</code> or <code>https://IPaddress:1279</code></p> <p>For non-SSL connections, type: <code>http://servername:1278</code> or <code>http://IPaddress:1278</code></p>
I have just deleted a volume, and now I am unable to view my shares in the NAS Manager.	In the event that a volume with shares is deleted, the NAS Manager cannot display any shares until the shares that were directed to the deleted volume are removed.	Use Terminal Services Advanced Client to remove the shares for the deleted volume. Exit the NAS Manager, and restart the system. The shares should now be visible.
I have just added an HTTP share but cannot see it from the NAS Manager.	For security purposes, directory browsing is not enabled by default on an HTTP share directed to the same folder or volume as another share.	See " <a href="#">Using MMC to Enable HTTP Directory-Browsing Privileges</a> " in the "Advanced Features" section of this guide.
I have just changed the IP address of my system, and now I cannot administer it through the NAS Manager.	Although the IP address changed, your local host is still trying to communicate with the system using the old IP address. It takes <b>approximately 15 minutes for the IP address to automatically update</b> on most networks.	Close Microsoft Internet Explorer (or for Red Hat Linux only, Netscape Navigator 6.2.2 or later). Reconnect using the newly created IP address. Type: <code>https://IPaddress:1279</code> . It takes approximately 15 minutes for the DNS server to recognize the new IP address.
I can only see the first 100 items in the NAS Manager Web user interface.	The NAS Manager will only display 100 items per page.	To display the next 100 items, click the down-arrow icon at the top of the list.
In the NAS Manager, if I click <b>OK</b> and then click <b>Cancel</b> , it doesn't seem to cancel the operation.	Cancel does not dynamically stop an update to the system after you click <b>OK</b> .	If an operation has been performed in error, the system administrator must change the setting back manually.
When I select the <b>Check All</b> box and then deselect one or more choices on some screens in the NAS Manager, the <b>Check All</b> box remains selected.	The <b>Check All</b> box is not automatically deselected. However, this does not mean that all items in the list are selected.	This behavior does not affect functionality. The <b>Check All</b> box does not indicate what has specifically been selected or deselected.
I have changed the password for the administrator account; however, several minutes have passed and I have not been queried for the new	The NAS Manager does not automatically refresh the account information for the administrator while in the NAS Manager. Instead, it performs the refresh as a timed	The password was successfully changed. If you want to confirm that the new password is in effect, close the browser, and then reconnect. The new password should work, but the old one should not.

password.	function.	
I am looking for a topic on the context-sensitive online help in the NAS Manager, but it says No Topic Available.	Some sections of the NAS Manager do not have context-sensitive help.	For information on a specific function, see the Windows Powered Help, which is available through Terminal Services by clicking <b>Windows Powered Help</b> on the <b>Advanced Administration Menu</b> , or see the appropriate section in this guide.
I tried to clear the FTP log or the Web (HTTP) Shares log in the <b>Maintenance</b> section of the NAS Manager, but I received an error message and the log was not cleared.	The logs are currently locked by the NAS system for the FTP service and to support the NAS Manager. The logs cannot be cleared in the NAS Manager.	Connect to the NAS system using Terminal Services and clear these logs by using MMC. You can access MMC by clicking <b>Computer Management</b> on the <b>Advanced Administration Menu</b> , which is available through Terminal Services.
While viewing the properties of a user, I selected the <b>General</b> tab. The fields for this user are now all blank.	You were already on the <b>General</b> tab and the page did not refresh properly.	Select <b>Cancel</b> or click <b>Back</b> on your browser. Then reselect the user for whom you wanted to view properties.
I cannot change the WINS addresses when I click <b>Network</b> on the NAS Manager primary menu, click <b>Network Interfaces</b> , and then click <b>WINS</b> in the <b>Tasks</b> list.	The NAS Manager grays out the <b>WINS Servers Configuration</b> page unless you set the <b>IP Address Configuration</b> page to <b>Use the following IP settings</b> .	To set the WINS addresses from the NAS Manager, click <b>Network</b> on the primary menu, click <b>Interfaces</b> , and click <b>IP</b> in the <b>Tasks</b> list. On the <b>IP Address Configuration</b> page, click the radio button for <b>Use the following IP settings</b> , and then type the IP address, Subnet mask, and the default gateway in the appropriate text boxes.

**Table 8-3. Dell OpenManage Kick-Start Utility**

Issue	Possible Cause	Resolution
The Dell Reinstallation Console fails to install when I am using the Dell OpenManage™ Kick-Start utility.	The Dell Reinstallation Console is being saved to a drive.	Do not save the Dell Reinstallation Console to a drive—run the reinstallation directly from the <i>Resource</i> CD.
During reinstallation, I cannot connect to a PXE server.	Incorrect cabling or the PXE service may need to be started (or restarted).	Ensure that the NAS system and the PXE server are connected with a crossover cable or that the NAS system and the PXE server are connected to the same network and subnet with an Ethernet cable.  Ensure that the NAS system is powered on, and then start (or restart) the PXE service:  <ol style="list-style-type: none"> <li>1. Open the PXE configuration utility.</li> <li>2. Right-click &lt;server name&gt;.</li> <li>3. Click <b>Start/Stop Services</b> to see if the service is started or stopped.</li> </ol> If the service is stopped, click <b>Start Service</b> . If the service is started, click <b>Stop Service</b> , and then click <b>Start Service</b> .
During reinstallation, I click <b>OK</b> in the Kick-Start utility <b>Add Scope</b> window and error message "At least one IP interface must be selected" appears. I click <b>OK</b> to the error message, but it reappears.	The <b>Interfaces for DHCP Server</b> box is not checked.	Click <b>Interfaces for DHCP Server</b> so that it is checked, and then click <b>OK</b> to the error message.
During reinstallation, I have confirmed that the Kick-Start utility scope and setup settings are correct, but when I click <b>Enable</b> to start the utility, it fails to start and binding alert messages appear.	The Kick-Start utility has become corrupt.	Close the Kick-Start utility program and restart it. Then reboot the NAS system.
During reinstallation, a directly-attached client system cannot contact the Kick-Start utility.	The NAS system and the client system are not on the same IP subnet.	Set both the client system and the NAS system on the same subnet.

**Table 8-4. Dell ActiveArchive**

Issue	Possible cause	Resolution
I cannot access my Dell ActiveArchive™ persistent images from a UNIX® Network File System (NFS) or Macintosh client.	Only client systems running Microsoft Windows (CIFS) can access the persistent images stored in the <b>ActiveArchive</b> folders for each volume.	Access the <b>ActiveArchive</b> folders through the Windows client system to perform data recovery.
The <b>XCOPY</b> command does not copy my persistent images.	<b>XCOPY</b> cannot read the persistent images on a volume.	Do not use <b>XCOPY</b> to copy persistent images. Copy the files manually in Windows Explorer.
After I take a new persistent image, the definition of the persistent image is blank, or the persistent image does not show at all in the persistent images list.	The NAS Manager must complete a refresh cycle before it can correctly show the persistent image.	If this is the first persistent image, wait several minutes and check again. If this is a subsequent persistent image, wait for the NAS Manager to complete a refresh or press <F5>.
When I click <b>Restore Defaults</b> on the <b>Global Settings</b> page in Dell ActiveArchive after taking a persistent image, it changes my cache file size and the area is grayed out.	After you take a persistent image, you cannot change the cache file size; therefore, clicking <b>Restore Defaults</b> does not change the cache file size. To verify the cache file size, look at the cache file size on the <b>Volume Settings</b> page. You should see that it has reverted back to the original cache file size that you set before taking a persistent image.	Do not take action. Dell ActiveArchive is functioning as designed.
I get a permission error when I try to access my persistent images from an HTTP or FTP share.	Accessing the persistent image directory through HTTP or FTP is not supported.	If you need to access your persistent image directory, connect to the system through a Terminal Services Advanced Client session and use Windows Explorer in the NAS system to access them.
When the maximum number of persistent images (250 by default) has been reached and I continue to take more of them,	If a persistent image is taken manually or by schedule, ActiveArchive takes the persistent image even if the maximum number of persistent images has been reached. Therefore, the new persistent image must	Take no action. ActiveArchive is functioning as designed.

lower-priority persistent images are overwriting the existing higher-priority persistent images.	overwrite an existing persistent image. By design, the new persistent image writes over the oldest, lowest-priority persistent image available, even if it is a higher-priority persistent image than the one currently being taken.	
I noticed that the date and time for the <b>ActiveArchive</b> directory changes every time I reboot my NAS system.	The <b>ActiveArchive</b> directory date and time are reset at each reboot. The new dates and times do not change the dates and times of your persistent images.	Take no action. This is the normal functionality of ActiveArchive.
I have deleted a persistent image, but when the <b>Persistent Images</b> page redispays I can still see the persistent image. If I try to delete it again, I get a blank page.	In some environments, the <b>Persistent Images</b> page in the NAS Manager refreshes too quickly.	Wait a few seconds and refresh the page. You should see that the persistent image you deleted is no longer listed.
When I try to take a persistent image, a critical error message states that the snapshot could not be taken.	ActiveArchive may still be deleting or restoring a volume or taking another snapshot.	Wait a few minutes for the previous process to complete and then try again.
In the event log or on the <b>Status</b> page, a message states: An exception has occurred. The data contains the exception record.	This is an informative message only.	Ignore this message. The NAS system is functioning normally.
After restoring a volume from a persistent image, I cannot mount to a share on that volume from a client system running Red Hat Linux.	During the restore, the volume is dismounted.	From the NAS Manager, restart NFS, and then remount to a share on the volume.
The % symbol does not show in the ActiveArchive event logs.	The event log messages that tell you how full the cache file is and how close the system is to the maximum allowed snapshots are generated messages. The messages do not include the % symbol.	Do not take action. The NAS system is functioning as designed.

**Table 8-5. Dell OpenManage Array Manager**

Issue	Possible cause	Resolution
After repairing a software-RAID NAS system volume in the NAS Manager, one or more disks show as "missing" in Dell OpenManage Array Manager.	The repair does not actually delete the disks, although the disks are displayed as missing.	Do not take action. Your software-RAID NAS system is still operating correctly. If desired, you can use Array Manager to remove the missing disk. To launch Array Manager: <ol style="list-style-type: none"> <li>1. From the NAS Manager primary menu, click <b>Maintenance</b>→<b>Terminal Services</b>.</li> <li>2. Log in to the NAS system as an administrator.</li> <li>3. If the <b>Advanced Administration</b> screen does not automatically appear, double-click the <b>Advanced Administration Menu</b> icon on the desktop of the NAS system.</li> <li>4. Click <b>System Management</b>→<b>Disk Management</b>.</li> </ol>

**Table 8-6. UNIX and Red Hat Linux**

Issue	Possible cause	Resolution
I cannot access the Terminal Services Advanced Client through the NAS Manager from my client system running Red Hat® Linux using the Netscape browser.	The Terminal Services Advanced Client is not supported by the Red Hat Linux operating system and does not work with the NAS Manager.	Use a Windows client system to manage the NAS system through a Terminal Services Advanced Client session.
While updating client access to an NFS share, the <b>No Access</b> option is displayed, but the <b>Root</b> option is not.	Only the <b>All Machines</b> category options are displayed during this update.	Add the appropriate clients, and then select <b>OK</b> . After you have added the client, navigate back to the <b>NFS</b> tab for this share and select the correct options for the individual <b>Client Machines</b> .
Every time I try to obtain a directory listing from an NFS client on the root of a system volume, I get an error message, such as <b>Permission Denied</b> .	The problem you are experiencing involves a <b>System Volume Information</b> directory created by Microsoft Index Server. The NFS service does not have access to this directory and returns an error message to the client when trying to list its properties.  This issue only occurs when sharing the root of a drive letter.	Ignore this error. The <b>System Volume Information</b> directory is not used by NFS clients or your system by default.
Sometimes I am unable to delete folders that have been used and that are shared to an NFS client.	This is a situation that occurs with NFS discretionary access lists (DACLS) and inheritance. When the folder to be shared is created, the only access control entry (ACE) created by default is <b>Everyone</b> with <b>Full Control</b> . When an NFS client creates a directory or a file in this directory (mounted share), Services for UNIX (SFU) creates a new DACL that replaces the inherited <b>Everyone</b> with <b>Full Control</b> ACE. This DACL contains an <b>Everyone</b> ACE with the appropriate UNIX file creation access and may contain two other ACEs for the mapped user and group. If this happens, the administrator of the Windows client cannot delete the file or directory unless that administrator takes ownership through the Windows system and changes the access.	As the administrator, use a Windows client system to take ownership and change the access to allow yourself to delete the share folders.  When you delete the NFS share folders, ensure that there are no open file handles for the share. If you are unsure, delete the share, and then restart NFS.
When updating client access to an NFS share, the <b>All Machines</b> client group is reset from the <b>No Access</b> access type to <b>Read-Write</b> access.	The NAS Manager might reset the <b>All Machines</b> client group to <b>Read-Write</b> when there are no clients that have read-only or read-write access.	Add a client that has read-write or read-only access, and then set the <b>All Machines</b> client group to <b>No Access</b> .
My NAS system is experiencing low NFS	NFS write-back cache is disabled.	Enable NFS write-back cache to improve performance. See " <a href="#">Using</a>

performance.		<a href="#">the PowerVault Advanced Administration Menu</a> in the "NAS Manager" section of this guide for more information.
The BIG5, EUC-KR, EUC-TW, GB2312-80, KSC5601, and Shift-JIS character encoding schemes for NFS shares cannot be specified in the NAS Manager.	The NAS Manager user interface supports only EUC-JP and ANSI character encoding for NFS shares.	Access the NAS system's desktop and modify the NFS share properties of the folder directly.
The NFS client group <b>All Machines</b> is reset to <b>No Access</b> when another client group is set with the same access permissions and root.	Setting a client group to use the same permissions as <b>All Machines</b> causes <b>All Machines</b> to be reset to <b>No Access</b> .	Access the NAS system's desktop and modify the NFS share properties of the folder directly.
I am getting inconsistent map definitions when I use the NAS Manager and the SFU MMC to create user name maps.	Modifications to user name maps are cached and may not take effect immediately.	Use only one tool to administer user name maps.

**Table 8-7. Macintosh and AppleTalk**

Issue	Possible cause	Resolution
I cannot create AppleTalk shares on a new NAS system.	AppleTalk protocol is not enabled by default on new or reinstalled systems.	Enable AppleTalk protocol on new systems or systems that have been reinstalled as explained in " <a href="#">Enabling the AppleTalk Protocol</a> " in the "Advanced Features" section of this guide.
I am getting event errors for Services for Macintosh.	Services for Macintosh are bound to the onboard network adapter by default. If this network adapter has been disabled, binding errors occur.	Bind the AppleTalk protocol to an enabled NIC. See " <a href="#">AppleTalk Protocol Adapter Binding</a> " in the "Advanced Features" section of this guide.
From a Macintosh client, users cannot modify or delete a file that a Windows client has accessed.	The time between clients and the system is not properly synchronized.	Ensure that clients have their time synchronized to within <b>10 minutes of the time zone</b> .
I have rebooted my NAS system from a Macintosh client. Several minutes have passed and my NAS system has not rebooted or the page has not refreshed.	The most likely cause is that the NAS system has come back online, but the client screen has not refreshed because the NAS Manager does not automatically refresh the screen when the NAS system has finished rebooting.	Close Internet Explorer, and then reconnect to the NAS Manager. The NAS system should behave normally.
From a Macintosh client, I cannot connect to the administration part of the NAS Manager by using the <b>Administer This Appliance</b> link on the <b>HTTP Shares</b> page.	The internally generated certificate is not supported by Internet Explorer for Macintosh.	You can administer the NAS system by using the address <a href="http://servername:1278">http://servername:1278</a> ; however, this is a nonsecure link.
After modifying properties of the AppleTalk protocol, File Services for Macintosh does not restart.	File Services for Macintosh can not establish communication to the local RPC service.	Restart the workstation service. See " <a href="#">Restarting Workstation Services</a> " in the "Advanced Features" section of this guide.
A user cannot access an AppleTalk share.	The share may need to be authenticated for the user.	If Apple Authentication is used, create a user and assign an 8-character (or less) password for authentication.  If Microsoft Authentication is used, ensure that the correct user name and password are being used. The user may also not have the correct privileges to access the share. Passwords greater than 8-characters are not supported without a Microsoft Authentication agent.

**Table 8-8. Netscape Navigator**

Issue	Possible cause	Resolution
I cannot use the <b>Back</b> button in Netscape Navigator for the online help in the NAS Manager.	This feature is not supported.	Use the <b>Previous Topic</b> link to navigate back to earlier topics.
I get a password prompt when navigating through Local Groups in the NAS Manager using Netscape Navigator on Red Hat Linux.	The password prompt is generated by Netscape and does not require re-authentication. The administrator is being asked whether the password that was used to access this screen should be saved.	Select <b>Do not Prompt Me Again</b> , and this message will not display in the future.
I am using Netscape Navigator to administer my NAS system through the NAS manager. A long gray bar at the bottom of the screen is covering the <b>OK</b> and <b>Cancel</b> buttons.	The page has not finished loading.	Use one of the following resolutions: <ul style="list-style-type: none"> <li>1 Wait for the page to finish loading.</li> <li>1 Refresh the page several times.</li> </ul>

 **NOTE:** [Table 8-9](#) provides hardware-RAID NAS system-specific troubleshooting information for its internal RAID controller card. Disregard this information if you have a software-RAID NAS system. For instructions on how to determine if you have a software-RAID or a hardware-RAID NAS system, see "[Determining if a NAS System Uses Software RAID or Hardware RAID](#)" in the "NAS Manager" section of this guide.

**Table 8-9. Hardware-RAID NAS System Internal RAID Controller Card**

Issue	Possible cause	Resolution
The system hangs during the boot process after installation.	The RAID controller card or its cable may not be properly connected.	Ensure that the RAID controller card is properly installed in the PCI expansion slot and the cable is properly connected to both the card and the backplane. See the <i>Information Update for Systems With Hardware RAID</i> document for more information.
One of the hard drives in the array fails often.	One of the hard drives may be faulty.	Connect a keyboard, mouse, and monitor to the NAS system. Check the hard drive error counts using the CERC BIOS Configuration Utility. Select <b>Objects→ Physical Drive</b> . After the <b>Physical Drive Selection Menu</b> displays, press <F2> to view the hard drive errors.  Format the hard drive.  Rebuild the hard drive.  If the hard drive continues to fail, replace it with another hard drive with the same or greater capacity.  Check the system BIOS for S.M.A.R.T. hard-drive errors.
Pressing <Ctrl><M> in a <b>Console Redirection</b> window does not display the CERC BIOS Configuration Utility	The <Ctrl><M> utility requires a keyboard, mouse, and monitor connection to the hardware-RAID NAS system.	Connect a keyboard, mouse, and monitor to the NAS system and try again.
I cannot flash or update the RAID controller card.	The wrong firmware was downloaded from <a href="http://support.dell.com">support.dell.com</a> , the card is not properly seated, or the card's cable is not properly inserted.	Download the correct firmware from <a href="http://support.dell.com">support.dell.com</a> .  Reseat the card in its PCI expansion slot and reseat its cable connections. See the <i>Information Update for Systems With Hardware RAID</i> document for more information.
I cannot see my data volume.	The data volume may have been deleted.	Recreate the data volume as explained in " <a href="#">Recovering From a Hardware-RAID Operating System Failure</a> " in the "Recovering and Restoring the System" section of this guide.
Firmware Initializing... appears and remains on the screen.	The RAID controller card may not be properly seated.	Reseat the card in its PCI expansion slot. See the <i>Information Update for Systems With Hardware RAID</i> document for more information.
When I boot the system, the following BIOS boot error occurs:  Adapter BIOS Disabled. No Logical Drives Handled by BIOS	The RAID controller card BIOS is disabled.	Connect a keyboard, mouse, and monitor to the NAS system and use the CERC BIOS Configuration Utility to enable the RAID controller card BIOS. To start the CERC BIOS Configuration Utility, press <Ctrl><m> during POST.
When I boot the system, the following BIOS boot error occurs:  Host Adapter at Baseport xxxx Not Responding	The BIOS cannot communicate with the firmware on the RAID controller card.	Reseat the card in its PCI expansion slot. See the <i>Information Update for Systems With Hardware RAID</i> document for more information.
When I boot the system, the following BIOS boot error occurs:  Configuration of NVRAM and drives mismatch.  Run View/Add Configuration option of Configuration Utility.  Press any key to run the Configuration Utility.	The configuration stored in the RAID controller card does not match the configuration stored on the hard drives.	Press a key to run the CERC BIOS Configuration Utility.  Select <b>Configure→ View/Add Configuration</b> from the <b>Management Menu</b> .  Use <b>View/Add Configuration</b> to examine both the configuration in the non-volatile random access memory (NVRAM), and the configuration stored on the hard drives. Resolve the problem by selecting one of the configurations.
When I boot the system, the following BIOS boot error occurs:  1 Logical Drive Failed	A logical hard drive failed to sign on.	Ensure that all physical hard drives are properly connected and are powered on.  Connect a keyboard, mouse, and monitor to the NAS system and run the CERC BIOS Configuration Utility see if any physical hard drives are not responding. Reconnect, replace, or rebuild any hard drive that is not responding
When I boot the system, the following BIOS boot error occurs:  x Logical Drives Degraded	An x number of logical hard drives signed on in a degraded state.	Ensure that all physical hard drives are properly connected and are powered on.  Connect a keyboard, mouse, and monitor to the NAS system and run the CERC BIOS Configuration Utility and see if any physical hard drives are not responding. Reconnect, replace, or rebuild any hard drive that is not responding.
When I boot the system, the following BIOS boot error occurs:  1 Logical Drive Degraded	A logical drive signed on in a degraded state.	Ensure that all physical hard drives are properly connected and are powered on.  Connect a keyboard, mouse, and monitor to the NAS system and run the CERC BIOS Configuration Utility and see if any physical hard drives are not responding. Reconnect, replace, or rebuild any hard drive that is not responding.
When I boot the system, the following BIOS boot error occurs:  Unresolved configuration mismatch between disks and NVRAM on the adapter	The configuration stored in the NVRAM of the RAID controller card does not match the configuration stored on the hard drives.	Press a key to run the CERC BIOS Configuration Utility.  Select <b>Configure→ View/Add Configuration</b> from the <b>Management Menu</b> .  Use <b>View/Add Configuration</b> to examine both the configuration in NVRAM and the configuration stored on the hard drives. Select one of the configurations.
I replaced a failed hard drive with another hard drive, but it does not start	The capacity of the replacement hard drive may be smaller than the capacity of the	Ensure that the capacity of the replacement hard drive is the same or greater than the failed hard drive.

rebuilding.	failed hard drive.	
I replaced a failed hard drive with another hard drive of the same capacity, but it will not start its rebuilding process.	The NAS system may have been turned off when you replaced the hard drive.	If the NAS system is turned off when a hard drive is replaced, the rebuilding process must be manually started. See " <a href="#">Replacing One Hardware-RAID NAS System Hard Drive</a> " in the "Recovering and Restoring the System" section of this guide.
I have several hard drive-related events in the <b>event</b> logs.	BIOS version A06 or later may not be installed.	Download the latest BIOS from <a href="#">support.dell.com</a> . See " <a href="#">Updating the BIOS</a> " in the "Advanced Features" section of this guide for more information.
I have several hard drive-related events in the <b>event</b> logs, and my BIOS version is correct.	A software RAID hard-drive carrier may be installed in the hardware-RAID NAS system.	Software RAID and hardware RAID hard-drive carriers operate differently and are not interchangeable. Ensure that the hard-drive carrier has a "HW-RAID" identification label on it.
I have several hard drive-related events in the <b>event</b> logs, my BIOS version is correct, and I am using correct hard-drive carriers.	Incorrect RAID controller card firmware may be installed.	Download the latest RAID controller card firmware from <a href="#">support.dell.com</a> .
I replaced my RAID controller card (or hard-drives or RAID controller card cable), and now I cannot boot or reinstall the operating system.	The volume or boot configuration has been deleted.	Recreate the virtual disks and then reinstall the operating system. See " <a href="#">Recreating Virtual Disks</a> " in the "Recovering and Restoring the System" section of this guide.

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