

# Dell™ PowerVault™ 715N NAS Appliance System 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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# Introduction

## Dell™ PowerVault™ 715N NAS Appliance System Administrator's Guide

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This section provides an overview of the Dell™ PowerVault™ 715N network attached storage (NAS) appliance features, as well as the information necessary to perform the initial configuration of the system.

This system is a "headless" system that is managed through the network; it operates without a keyboard, monitor, or mouse. This system is managed and monitored via a Web-based user interface, the NAS Manager, that runs on another system on the same network. For certain configuration tasks and for troubleshooting, you can also manage this system from another system connected through the serial port using a HyperTerminal session.

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## Boot Process

The NAS appliance, which is a rack-mounted system, has four integrated drive electronics (IDE) hard drives that are in a redundant array of independent disks (RAID) configuration. Each drive contains both a copy of the operating system and one or more data partitions (see [Table 1-1](#)). 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 1-1. Hard Drive Partitions**

Volume	Disks and RAID Layout	Description
C:	0 and 1: RAID 1	Primary operating system volume (3 GB)
D:	2 and 3: RAID 1	Recovery operating system volume (3 GB)
E:	0, 1, 2, and 3: RAID 5	Data volume (remaining space on all hard drives)

The boot sequence is as follows:

- Operating system hard drive 0
  - Operating system hard drive 1
  - Operating system hard drive 2/3
- 

## System Configuration

You can perform most configuration tasks through the NAS Manager, which is a Web-browser interface to the NAS appliance. The NAS Manager menus consist of common management tasks grouped under tabs on a menu bar. Each tab on the main menu bar has an associated secondary menu bar associated with it. The secondary menu bar lists the tasks you can perform from that page. The NAS Manager allows you to perform routine administrative tasks such as shutdown, restart, new share creation, and set user configuration. The NAS Manager home page displays a status indicator and provides a link to the **Messages** page, which contains details about logged events.

You can access the Terminal Services Advanced Client from the NAS Manager to perform tasks not available directly through the NAS Manager. See "[Advanced Features](#)" for more information.

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# Administrator User Name and Password

To log on to the NAS Manager, you must enter the administrator user name and password. The default administrator user name is `administrator` and the default password is `powervault`. To change the user name and password, click **Set Administrator Password** in the **Welcome** window.

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## Basic Configuration


This section includes information to enable you to get your system up and running. You must set the basic configuration from another system that has a keyboard, monitor, and mouse. After you set the basic configuration, you can use the NAS Manager to set passwords, local users, shares, and so on.

-  **NOTICE:** If you do not use the Dell OpenManage™ Kick-Start utility to configure your system, you must disable the Kick-Start utility immediately. If the Kick-Start utility is enabled, the system logs in automatically as administrator, which creates a security risk. The Kick-Start utility also takes up system resources by constantly checking for configuration information. For more information, see "[Disabling the Kick-Start Utility](#)."


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

- If DHCP is installed on your network, your system automatically configures the network settings.
- If DHCP is not installed on your network, you can configure your system using a serial connection or the Dell OpenManage Kick-Start utility.

## Configuring Your System With DHCP


-  **NOTICE:** If you do not use the Kick-Start utility to configure your system, you must disable the Kick-Start utility immediately. If the Kick-Start utility is enabled, the system logs in automatically as administrator, which creates a security risk. The Kick-Start utility also takes up system resources by constantly checking for configuration information. For more information, see "[Disabling the Kick-Start Utility](#)."

When the system is turned on for the first time, it invokes the DHCP client to get parameters (the Internet protocol (IP) address, gateway subnet mask, and domain naming system (DNS) server address) from a DHCP system. The default system name ("Dellxxxxxx," where xxxxxx is the system's service tag number) is entered as the DNS server name. Connect to the system using Microsoft Internet Explorer 5.01 or later (or for Red Hat Linux only, using Netscape Navigator 6.1 or later) by entering the system name in the Web browser.

-  **NOTE:** Microsoft Internet Explorer 4.0 may be used only with Windows NT® 4.0 with Service Pack 4 or later.

If DHCP fails, you must set the IP address, gateway subnet mask, and DNS server using either a serial connection or the Kick-Start utility with DHCP on a remote system.


You can configure the system using the NAS Manager. The NAS Manager is served on port 1279 and is accessed by the URL, **https://<systemname | system\_ipaddress>:1279**, where *systemname* is the DELL<service\_tag>. Port 1279 uses secured socket layers (SSL) to encrypt data going to and coming from the NAS appliance 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.

In a system without a DNS server, you can use Internet Explorer (or for Linux only, use Netscape 6.1 or later) to search for the default hostname of the system ("Dellxxxxxx," where xxxxxx is the system's service tag number).

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

## Configuring Your System Using a Serial Connection

-  **NOTICE:** If you do not use the Kick-Start utility to configure your system, you must disable the Kick-Start utility immediately. If the Kick-Start utility is enabled, the system logs in automatically as administrator, which creates a security risk. The Kick-Start utility also takes up system resources by constantly checking for configuration information. For more information, see "[Disabling the Kick-Start Utility](#)."

 **NOTE:** You must be logged in as `administrator` to perform these steps.

On a system running Windows 2000, perform the following steps to connect to the NAS Manager through the administration port:

1. Connect the serial cable included with your system from the client system you are using for configuration to the administration port (serial port 1) on your NAS appliance.
2. Click the **Start** button, point to **Settings**, and then click **Control Panel**.
3. In the **Control Panel**, click **Phone and Modem Options**.
4. On the **Modems** tab, click **Add** for the **Add/Remove Hardware Wizard**.
5. Click the **Don't detect my modem; I will select it from a list** checkbox, and then click **Next**.
6. In the **Manufacturers** menu, click **(Standard Modem Types)**.
7. In the **Models** menu, click **Communications cable between two computers**, and then click **Next**.
8. Click the **Selected ports** radio button, select the appropriate communication port from the list, and then click **Next**.
9. Click **Finish** to close the **Add/Remove Hardware Wizard**, and then click **OK** to close the **Phone and Modem Options** dialog box.
10. On the desktop, right-click **My Network Places**, and then click **Properties**.
11. In the **Properties** window, double-click **Make New Connection**.

The **Network Connection Wizard** displays.

12. Click **Next**.
13. Select the radio button for **Connect Directly To Another Computer**, and then click **Next**.
14. Select the radio button for **Guest**, and then click **Next**.
15. In the menu, select the COM port that you are using, and then click **Next**.
16. Click **Only for myself**, and then click **Next**.
17. Enter the name of the connection, and then click **Finish**.

After you configure your direct serial connection, the **Connect <name of connection>** window displays.


18. Click **Properties**.
19. On the **General** tab, under **Select a Device**, select **Communication cable between two computers**.
20. Click **Configure**.

This selection opens the **Modem Configuration** window.

21. In the **Maximum Speed (bps)** menu, click **115200**.
22. Set **Flow Control** to **Xon/Xoff**.
23. Click **OK** to close the **Modem Configuration** window.
24. Click **OK** to close the **Connect** window.

The **Connect** box prompts you for a user name and password.


25. Enter the **User Name** and **Password** that you assigned to your system.

 **NOTE:** The default User Name is `administrator` and the default password is `powervault`.


26. Click **Connect**.

This action connects the system you are using for configuration.

27. Start the Web browser on the system you are using to configure the NAS appliance.
28. Type the name of the system.
29. Enter the **User Name** and **Password** that you have assigned when prompted, and then click **OK**.

 **NOTE:** The default User Name is `administrator` and the default password is `powervault`.

30. When the main screen appears, click **Administer this server appliance**, and then click **OK** to accept the security certificate.
31. Enter the **User Name** and **Password** that you assigned to your system when prompted, and then click **OK**.

 **NOTE:** The default User Name is `administrator` and the default password is `powervault`.


The **PowerVault NAS Manager** displays.


## Configuring Your System Using the Kick-Start Utility


The Kick-Start utility is software shipped with your system. This utility is used to define the initial network configuration of a system, which makes the system available on the network for complete configuration using the NAS Manager. This utility is intended for customers who have one or more systems to configure but do not want to use the default DHCP assigned address and system name.

A NAS appliance requires configuration information before it can function.

You can supply configuration information by using the Remote Kick-Start utility (a browser-based Java applet) to save the configuration information and send it to one or more systems across an IP network from another system on the same IP subnet.

 **NOTE:** The system you use to create configuration files must be running Windows 2000 and Microsoft Internet Explorer 5.01.

 **NOTE:** The Remote Kick-Start utility provides an integrated DHCP service that can supply a temporary IP address to discovered NAS appliances that you add to your network before configuring them. If your network already provides DHCP services, the Remote Kick-Start utility detects this and does not turn on the integrated DHCP service.

 **NOTE:** Ignore all references to using a diskette on the NAS appliance in the Kick-Start utility help files. Also, do not use the **Write Diskette** button in the Remote Kick-Start utility. Using a diskette on the PowerVault 715N NAS appliance is not supported.

## Configuring NAS Appliances Remotely

You can remotely configure one or more NAS appliances, which provides information to the NAS appliance from another system on the same network IP subnet.

**Table 1-2. Kick-Start Utility Configuration Overview**

<b>Step 1</b> Use this guide and the <i>Resource</i> CD included with your system.	<b>Step 2</b> Record the following information:	
	NIC 0: IP Address NIC 0: Subnet Mask NIC 0: Gateway NIC 1: IP Address NIC 1: Subnet Mask NIC 1: Gateway Host Name DNS Server Administrator/Root Password Additional User/Password (if	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

any)

**Step 3**  
**Perform the following remote IP network configuration procedure:**

- a. Ensure that the appliance is connected to an IP network by going to a workstation on your network, inserting the *Resource* CD, and running the Remote Kick-Start utility.
- b. Enter information collected in step 2, and save the configuration.
- c. Select a NAS appliance, select the configuration, and click **Apply**.
- d. Start the NAS Manager in a browser from a remote workstation using **https://myappliance:1279**, where *myappliance* is your system name.

## Starting the Remote Kick-Start Utility

The first step in configuring one or more NAS appliances remotely is to start the Remote Kick-Start utility on another system. On a system running Microsoft Internet Explorer 5.01 or higher, perform the following steps:

1. If the remote system does not have the Kick-Start utility installed, insert the *Resource* CD into the CD drive on that system. Otherwise, double-click the Kick-Start utility icon on the desktop.

The *Resource* CD main menu appears automatically. If it does not appear, double-click **My Computer** on the desktop, right-click the CD drive, and then click **Autoplay**.

2. On the main menu, click **Dell OpenManage Kick-Start** or click the **Kick-Start** tab.
3. Click **Dell OpenManage Kick-Start 2.1**.

A confirmation message asks whether you want to grant permission for a Java applet from Dell to access your system.

4. Click **Yes** to grant permission and complete the remaining configuration tasks.

The **Kick-Start** window appears where you can create, view, and save configurations by name. You can then apply them to selected NAS appliances that have been discovered on the network or save the configurations on your local hard drive. The following procedures explain how to perform these tasks.



**NOTE:** The Remote Kick-Start utility provides an integrated DHCP service that can supply a temporary IP address to discovered NAS appliances that you add to your network before configuring them. If your network already provides DHCP services, the Remote Kick-Start utility detects this and does not turn on the integrated DHCP service.

## Creating Configurations

After you start the Kick-Start utility, you are ready to prepare the configuration information that you will apply to one or more NAS appliances. You apply this data using an IP network.

You can save configurations by name and assign them an order within a named set, such as **config001**, **config002**, and so on. Also, you can view or edit configurations.

To prepare configuration information, perform the following steps:

1. Double-click **Defined Configurations**.
2. Click **PowerVault NAS Appliance**.
3. Click **New** in the **Remote Kick-Start** window.


The **Configurations List** changes to display the **Configuration Form**.

4. Select or type the following configuration information:
  - **Configuration Name** — Each configuration file you create must have a name. Using the + (plus) and – (minus) buttons beside the name, you can change the three-digit number that is appended to this name. This number allows you to create and save an *ordered set* of configuration files. An ordered set of configuration files can be used to apply configurations in sequence to a group of NAS appliances.
  - **Time Zone** — You can change the time zone by selecting an entry from this list. This is a required field.

- **Language** — You can change the default system language and locale by selecting a language in the drop-down list. This field is required.

 **NOTE:** This change does not install the Multilanguage User Interface (MUI). To install the MUI or other languages besides those that are listed in the **Kick-Start** menu, use the *Multilingual Support* CD.

- **Ethernet Port 0** — This port is the built-in Ethernet port on your system closest to the outside edge of the system. You can optionally enter the IP address information for this port. Enter the IP address, subnet mask, and the default gateway IP address. The Kick-Start utility ensures that you have entered all portions of an IP address and checks for a valid IP subnet mask. (Optional field — if you do not complete this field, the system uses DHCP to obtain an IP address.)
- **Ethernet Port 1** — This port is the built-in Ethernet port on your system closest to the middle of the system. You can optionally enter the IP address information for this port. Enter the IP address and subnet mask. The gateway IP address is optional. The Kick-Start utility ensures that you have entered all portions of an IP address and checks for a valid IP subnet mask. (Optional field — if you do not fill in this field, the system uses DHCP to obtain an IP address.)

 **NOTE:** The Kick-Start utility Ethernet 0 matches Windows Local Area Connection, and Ethernet 1 matches Local Area Connection 2.


- **DNS IP Addresses** — You can optionally enter one or two DNS IP addresses. The Kick-Start utility ensures that you have entered all portions of an IP address.
- **Host/Machine Name and Domain** — The host/machine name is required. It is composed of a base host name and a DNS Domain name. Domain indicates a DNS domain (for example, **dell.com**) and does not indicate a Windows domain. The domain name is optional.
- **Administrator Password** — This field is required. You must enter the administrator password twice, and it must be at least six characters long. For security purposes, the password does not appear on the screen, but each character of the password displays as an asterisk (\*) placeholder.
- **User Name and Password** — You can optionally enter a user login name and password (enter the password twice). For security purposes, the password cannot be seen on the screen, but each character of the password displays as an asterisk (\*). Passwords of less than six characters are not accepted.

5. Click **Save** when you finish.
6. Repeat this process to create and save another configuration if you want to configure more than one NAS appliance. Click the + or – buttons to increment or decrement the series number at the right of the configuration name to create an ordered set that use the *same name*.


You are ready to apply the configuration to the NAS appliance using an IP network connection.

## Configuring NAS Appliances Over an IP Network

If you are configuring multiple NAS appliances on the same IP subnet as the system you use to run the Remote Kick-Start utility, this is probably the fastest configuration method. After starting the Remote Kick-Start utility and creating configurations, perform the following steps.

 **NOTE:** If you are configuring the NAS appliance after performing the reinstallation procedure, you must wait for the RAID 5 regeneration process to complete before the NAS appliance is displayed in the **Discovered Dell Systems List**. You can determine the current status of the NAS appliance through the NAS Manager using the **Disks—> Volume** option. This process can take several hours, depending on your system's configuration.


1. Select the NAS appliance you want to configure from the **Discovered Dell Systems List**. If it does not appear, scroll down and click the **Integrated DHCP Server** check box, and then wait a few seconds for the system to be assigned a temporary IP address and discovered by the Remote Kick-Start utility.

 **NOTE:** You must configure the DHCP scope before using the embedded DHCP server. See "Using the Integrated DHCP Server" in the Kick-Start utility online help for more information about configuring the DHCP scope.

2. Select an existing configuration file from the list.

3. Click a NAS appliance in the **Discovered Dell Systems List**, and then click **Apply**.

If the configuration was successful, the status of the NAS appliance in the **Remote Kick-Start** window changes to a check mark icon.

 **NOTE:** If more than one Remote Kick-Start utility runs on your network, you can reserve the right to configure a system by locking it first. To do this, select the system in the **Discovered List**, and then click **Lock**.

## Disabling the Kick-Start Utility

If you do not use the Kick-start utility to configure your system, you must disable it immediately. If the Kick-Start utility is enabled, the system logs in automatically as administrator, which creates a security risk. The Kick-Start utility also takes up system resources by constantly checking for configuration information.

To disable the Kick-Start utility, perform the following steps:

1. From the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log on to the system as an administrator.
4. Click the **X** on the top, right-hand corner of the **Kick-Start** window.

A **Warning** window displays that asks whether you want the Dell OpenManage Kick-Start configuration tool to run automatically each time the system starts.

5. Click **No**. If you click **Yes**, the Kick-Start utility closes; however, it runs again the next time the system reboots.

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## Warranty and Return Policy Information

Dell Computer Corporation ("Dell") manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry-standard practices. For information about the Dell warranty for your system, see your *System Information* document.

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## Other Documents You Might Need

In addition to this *System Administrator's Guide*, the following documentation is included with your system:

- The *NAS appliance User's Guide*, which describes system features, technical specifications, and device drivers.
- The *NAS appliance Installation and Troubleshooting Guide*, which provides instructions for installing system hardware and includes troubleshooting and diagnostic procedures for testing your system.
- Supporting system documentation on the *NAS appliance Resource CD*, which includes information about all the option cards and software installed.
- Your *System Information* document, which provides basic information about your system, including safety, regulatory, and warranty information.

You might also have one or more of the following documents:

- Documentation that is included with options you purchase separately from the system. This documentation includes information that you need to configure and install these options in your system.
- Technical information files—sometimes called "readme" or "release notes" files—that might be installed on the CDs that came with your system to provide last-minute updates about technical changes to the system or advanced technical reference material intended for experienced users or technicians.
- Information updates that are sometimes included with the system to describe changes to the system or software documentation. Always read the updates before consulting any other documentation. The updates often contain information that supersedes the information in the other documents.



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# NAS Manager

## Dell™ PowerVault™ 715N NAS Appliance System Administrator's Guide

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The Dell™ PowerVault™ NAS Manager is a Web-based user interface that is the primary way to configure NAS appliances. This section describes basic navigation of the NAS Manager. See "[How to Find Online Help](#)" for more information.

 **NOTE:** To use the NAS Manager, you must be logged in as administrator. The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

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## Basic Navigation

The NAS Manager displays when you access a PowerVault 715N NAS appliance from Microsoft® Internet Explorer 5.01 or later (or for Red Hat Linux only, Netscape Navigator 6.1 or later) Web browser.

 **NOTE:** *Microsoft Internet Explorer 4.0 may be used only in Windows NT® 4.0 with Service Pack 4 or later. All other browsers are not supported.*

When navigating the NAS Manager, use the browser buttons to go backward and forward. In addition, you can use the two associated menu bars.

The top of each page of the interface is composed of a status area, as well as primary and secondary menu bars. The body of each page of the Web user interface (UI) is composed of the content area.

## Status Area

The following information displays from left to right:

- Logo
- System host name
- System status

The status might be:

- Normal (green text)
- Informational (grey text)
- Warning (yellow text)
- Critical (red text)

Clicking **Status: <status type>** sends you to the **Status—> Information** page.

- Microsoft Windows® Powered logo

## Primary Menu

The primary menu has the following tabs:

- **Welcome** — Allows you to take a tour, set the administrator password, set a server appliance name, and set the default page.
  - **Status** — Provides information about alerts and other status.
  - **Network** — Provides access to basic network setup tasks such as setting the appliance name, configuring properties of network interfaces, configuring global network settings, setting IP addresses and ports for the administration website, configuring Telnet, and changing passwords.
  - **Disks** — Allows you to configure disks and volumes, set disk quotas, and take persistent images.
  - **Users** — Enables you to manage local users and groups.
  - **Shares** — Enables you to manage local folders and create or modify file shares.
  - **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.
  - **Help** — Provides access to Windows Help for network attached storage.
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## How to Find Online Help

The NAS Manager provides two kinds of help. The NAS Manager online help documents NAS Manager content. The Windows 2000 Help, which you can access through the Terminal Services on the **Maintenance** page, documents Windows 2000 content.

To access help in the NAS Manager, select one of two methods:

- When you click **Help** on the primary menu, the NAS Manager screen is replaced by a split-screen **Help** screen that has the **Table of Contents** of help topics on the left and the topic content on the right.
- Click the **?** icon at the far right of the primary menu to access the context-sensitive help topic related to the page you are on.

In addition to the online help for your system, you can also access help for Microsoft Windows 2000 through Terminal Services.

To start Windows 2000 Help, perform the following steps:

1. On the NAS Manager main menu, click **Maintenance**.
  2. Click **Terminal Services**.
  3. Log on to the system.
  4. Perform one of the following procedures:
    - From the **Start** menu, click **Help**.
    - On the **PowerVault Advanced Administration Menu**, click **Administrative Tools**, and then click **Windows Powered Help**.
- 

## Using Shares

A folder on your NAS appliance can be shared with other systems on the network, whether those systems are running a Microsoft Windows operating system or a UNIX® operating system.

A NAS appliance supports the following methods of sharing folders:

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

When you create a share on the appliance, you can enable any or all of the listed protocols. You can add and manage shares from the NAS Manager.

## Managing Shares

The **Shares** page allows users to create, delete, or configure a variety of network folders. The **Shares** page displays a **Shared Folders** table that has the following columns:

- **Share Name** lists each shared folder by name.

To create, delete, or configure the properties of a given share, click the radio button next to the name of the share you want to modify.


- **Share Path** displays the share path.
- **Type** indicates the share type:
  - **W = Windows (CIFS)**
  - **U = UNIX (NFS)**
  - **F = FTP**
  - **H = HTTP**
  - **A = Apple (AppleTalk)**
  - **N = NetWare (NCP)**
- **Comment** displays a brief description of the share, if the share has been provided.
- **Tasks** lists the tasks that can be performed for each selected item.

Use this table to select a share, and then click the task you want to perform from the **Tasks** list (located to the right of the table).

## Adding a Share

To create a share, you must supply a share name (the name of the directory on the NAS appliance that is to be shared) that is unique from all other shares on the system. 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.

Although a single user interface is provided for creating a share for all protocols, it actually creates a separate share for each protocol. You can remove a share for one protocol without removing the share for the other protocols; however, this process can be quite confusing. Therefore, it must be done carefully.

 **NOTICE:** Do not create any data shares on the operating system partition. Using the reinstallation process destroys all data on the operating system partition.


To add a share, perform the following steps:

1. On the NAS Manager primary menu, click **Shares**.
2. In the **Tasks** list on the **Shared Folders** page, click **New**.
3. On the **General** tab, enter the share name, share path, and, if you want, a brief description of the share in the

**Comment** field.

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

4. Check the appropriate box(es) to specify which types of protocols to enable. The available options are **Microsoft Windows (CIFS)**, **UNIX (NFS)**, **FTP**, **Web HTTP**, **Novell NetWare**, or **Apple Macintosh**.
5. Use the protocol tabs to configure the specific properties of each type of share.

 **NOTE:** 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. You must log on to the NAS appliance using a Netware client before you can connect to the NetWare shares.

6. Click **OK**.

## Modifying Share Properties

Use the **Shares** page to view and modify share properties.

To modify share properties, perform the following steps:

1. On the NAS Manager primary menu, click **Shares**.
2. On the **Shares** page, click **Shares**.
3. In the **Object/Task Selector**, select the share for which you are modifying the properties.
4. On the **Shared Folders** page, in the **Tasks** list, click **Properties**.

The **General** property page displays. Use this page to change the name, path, and description of the share. You can also select the type of client from which the share is accessible.

5. Click **OK**.

## Removing a Share

You can remove shares entirely, or you can disable one or more protocols. When you remove a share, access to the share is removed; however, the actual files remain on the NAS appliance.

To remove a share and all protocols for that share, perform the following steps:

1. On the NAS Manager primary menu, click **Shares**.
2. On the **Shares** page, click **Shares**.
3. In the **Shared Name** list on the **Shared Folders** page, select the share that you want to remove.
4. In the **Tasks** list on the **Shared Folders** page, click **Delete**.

A confirmation dialog appears.

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

## Removing a Protocol From the Share

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

1. On the NAS Manager primary menu, click **Shares**.
2. On the **Shares** page, click **Shares**.
3. In the **Shared Name** list on the **Shared Folders** page, select the share for which you want to modify properties.

4. In the **Tasks** list on the **Shared Folders** page, click **Properties**.

The **General** property page displays.

5. Uncheck the protocol(s) to remove from the share.
6. Click **OK** to confirm the protocol removal, or click **Cancel** to keep the protocol(s) for the share.

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## Using the PowerVault Advanced Administration Menu

The PowerVault Advanced Administration Menu is a software application that is installed on your NAS appliance. It provides links to common administrative tools for your appliance. This menu automatically runs when you access the Terminal Services Advanced Client.

The **Advanced Administration Menu** provides the following information:

- **Administrative Tools** — Provides a list of tools that you can use to monitor the status of and to perform administrative tasks on your NAS appliance.
- **System Management** — Provides a list of tools that you can use to manage your NAS appliance.
- **Logoff** — Ends the Terminal Services Advanced Client session.
- **Exit** — Exits the Advanced Administration Menu and returns you to the NAS Manager desktop.

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

1. From the NAS Manager, click **Maintenance**.
2. Click **Terminal Services**, and then log on to the appropriate system.

The **Advanced Administration Menu** displays.

3. Click **Administrative Tools** or **System Management** to display the list of selectable options.
4. Click the tool or setting you want.

(See "[Retrieving Your Service Tag](#)" for an example of a system setting you can obtain using this procedure.)

## Retrieving Your Service Tag

1. On the **Advanced Administrative Menu**, click **Administrative Tools** to display the list of options.
2. Click **Retrieve Dell Service Tag** to display the service tag of the NAS appliance.

---

## Disk Quotas

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

- Prevent further disk space use and log an event when a user exceeds a specified disk space limit.
- 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.

- The disk quota limit specifies the amount of disk space a user is allowed to use.
- The warning level specifies the point at which the event log displays that a user is nearing his or her quota limit.

For example, you can set a user's disk quota limit to 50 megabytes (MB) and the disk quota warning level to 45 MB. With the 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 the users but allow the users to exceed that quota limit. Enabling quotas and not limiting disk space use is useful when you want to track disk space use on a per-user basis but do not want to deny users access to a volume when they exceed that limit. You can also specify whether the system should log an event when a user exceeds either their quota warning level or their quota limit.

## Enabling Disk Quota Management

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

1. On the primary menu of the NAS Manager, click **Disks**.
2. Click **Disk Quota**.
3. On the **Volumes and Quotas** page, select the volume to manage.
4. On the **Tasks** list, select **Quota**.
5. On the **Default Quota for <volume>** page, click the appropriate check box to enable or disable quota management.
6. Select the quota size and settings for this volume.
7. Click **OK**.

## Adding Disk Quota Entries

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

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

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

1. On the NAS Manager primary menu, click **Disks**.
2. On the **Disks** page, select **Disk Quota**.
3. On the **Disk Quota** page, select the volume to manage.
4. From the **Tasks** list, select **Quota Entries**.
5. On the **Tasks** list, select **New...**
6. Select a local user from the list box, or type the name of a domain account in the text box (using the <domain name\user name>).
7. To allow unlimited disk space usage, click the **Do not limit disk usage** radio button, and then go to step 9. Otherwise, go to step 8.
8. 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 indicate kilobytes (KB), megabytes (MB), gigabytes (GB), terabytes (TB), petabytes (PB), or exabytes (EB).
  - c. Enter the amount of disk space which, 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 indicate KB, MB, GB, TB, PB, or EB.
9. Click **OK**.

## Modifying Quota Properties

1. On the NAS Manager primary menu, click **Disks**.
2. On the **Disks** page, select **Disk Quota**.
3. On the **Disk Quota** page, select the volume to manage.
4. From the **Tasks** list, select **Quota Entries**.
5. In the **Logon** list on the **Quota Entries** page for the selected volume, select a user account.
6. On the **Tasks** list, click **Properties**.
7. 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 indicate KB, MB, GB, TB, PB, or EB.
  - c. Enter the amount of disk space which, 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 indicate KB, MB, GB, TB, PB, or EB.
8. Click **OK**.

## Removing Disk Quota Entries

1. On the NAS Manager primary menu, click **Disks**.
  2. On the **Disks** page, select **Disk Quota**.
  3. On the **Disk Quota** page, select the volume to manage.
  4. From the **Tasks** list, select **Quota Entries**.
  5. On the **Quota Entries** page, select the **Logon name** from which you want to remove the quota entry.
  6. On the **Tasks** list, select **Delete**.
  7. Click **OK**.
- 

## Using Logs

A log file is a file that 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 and usually have **.log** extensions.

You can use the PowerVault NAS Manager to access the log files.

## Managing Logs

You can use the Logs feature to download, view, clear, and configure several types of event logs that are provided by the system. The available logs are as follows:

- Application log
- FTP log
- NFS log
- Security log



System log

- Web (HTTP) shares log
- Web administration log

## Downloading Log Files

The **Download Log Files** page on the NAS Manager allows you to download specific log files to your NAS appliance.

1. On the PowerVault NAS Manager primary menu, click **Maintenance**.
2. On the **Maintenance** page, click **Logs**.
3. On the **Logs** page, select the type of log you want to download.
4. In the **Tasks** list on the *<Log Type> Log* page, click **Download Log . . .**
5. On the **Download <Log Type> Log** page, if available, select the file type you want to download, and then click **Download**.
6. In the **File Download** dialog window, select **Save this file to disk**.
7. Click **OK** to download the log file.

## Viewing Downloaded Log Files

1. On the NAS Manager primary menu, click **Maintenance**.
2. On the **Maintenance** page, click **Terminal Services**.
3. Log on to a **Terminal Services Advanced Client** session.
4. On the **Terminal Services** desktop, right-click **My Appliance** and select the **Manage** menu item.

The **Computer Management** window opens.

5. In the left column of the **Computer Management** window, select **Event Viewer**.
6. In the right column of the **Computer Management** window, select the log you want to view.

## Viewing Log Entry Details

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

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

## Modifying Log Properties

You can specify the maximum log size and determine how the system handles log entries when the maximum capacity of the server appliance is reached. To modify the properties of a log file, perform the following steps:

1. On the PowerVault NAS Manager primary menu, click **Maintenance**.
2. On the **Maintenance** page, click **Logs**.
3. On the **Logs** page, select the type of log you want to configure.
4. In the **Tasks** list, click **Log Properties**.
5. In the **Maximum log size** text box on the **Log Properties** page, enter the maximum size (in kilobytes) of the log.
6. 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:
  - **Overwrite events as needed** — The system writes over older events with new events as they occur.
  - **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.
  - **Do not overwrite events** — The system retains all events in the log and appends new events to the end of the file.
7. Click **OK**.

## Clearing Log Files

To clear specific log files, perform the following steps:

1. On the NAS Manager primary menu, select **Maintenance**.
  2. On the **Maintenance** page, select **Logs**.
  3. On the **Logs** page, select the type of log you want to clear.
  4. In the **Tasks** list, click **Clear Log**.
  5. On the **Clear Log Confirmation** page, click **OK** to clear the log.
- 

## Using Other Languages

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

1. On the NAS Manager primary menu, select **Maintenance**.
2. On the **Maintenance** page, click **Language**.
3. Click the radio button next to the language you want to use.

For example, click the radio button for Japanese if you want to use Japanese.

4. Click **OK**.
- 


## Shutting Down the NAS Appliance


To shut down, shut down and restart, or schedule a shut down of the NAS appliance from the NAS Manager, perform the following steps:

1. On the NAS Manager primary menu, select **Maintenance**.
2. On the **Maintenance** page, click **Shutdown**.
3. Click the action you want to perform.
4. For **Shut Down** and **Restart**, proceed to step 5. For **Scheduled Shutdown**, specify when the shut down should occur, and then click **OK**.

5. On the **Confirmation** page, click **OK** to confirm the action.

If you selected to restart the NAS appliance, the **Restarting** page displays.

 **NOTE:** While the **Restarting** page displays, the NAS Manager checks periodically to determine whether the appliance is back online. If the NAS Manager detects that the appliance has come back online, it automatically returns the NAS Manager to the home page.

 **NOTE:** If you shut down your system by pressing the power button, press but do not hold down the button to get a normal shutdown. For an emergency shutdown, hold down the power button for approximately 5 seconds. An emergency shutdown causes any redundant dynamic volumes to regenerate when the system starts again.


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## Managing Volumes

The NAS Manager allows you to reconfigure a volume and view the properties of a volume.


 **NOTE:** For managing your internal hard drives, see "[Advanced Disk and Volume Management](#)."

## Reconfiguring a Volume

 **NOTICE:** Do *not* reconfigure the RAID 1 operating system volumes on any of the hard drives. Reconfiguring the volumes destroys the operating system, requiring you to do a complete operating system reinstallation.

 **NOTICE:** Reconfiguring a data volume deletes all data on the existing volume and creates a new volume using the next available drive letter that uses all of the available space.

1. Prior to reconfiguring the volume, manually remove all shares and persistent images.
2. On the NAS Manager primary menu, select **Disks**.
3. On the **Disks** page, select **Volumes**.
4. In the **Volumes** column, select the volume for which you want to view properties.
5. On the **Tasks** list, click **Reconfigure ...**.
6. Select the **New Layout**, which is either **RAID-5** or **RAID-0**.
7. Click **OK to delete and reconfigure the volume**.

 **NOTE:** If the volume is in use, 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.

## Viewing Volume Properties

1. On the NAS Manager primary menu, select **Disks**.
  2. On the **Disks** page, select **Volumes**.
  3. In the **Volumes** column, select the volume for which you want to view properties.
  4. On the **Tasks** list, click **Properties....**
  5. Click **OK to return to the Volume list**.
- 

## Managing Disks

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



**NOTE:** You cannot hot swap hard drives on the Dell PowerVault 715N NAS Appliance. You must turn off the system before removing or inserting a hard drive. For information about removing and inserting a hard drive, see "Installing Hard Drives" in the *Installation and Troubleshooting Guide*.

## Listing Available Disks

1. On the NAS Manager primary menu, click **Disks**.
2. On the **Disks** page, click **Disks**.

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

## Rescanning for Disks

1. On the NAS Manager primary menu, select **Disks**.
2. On the **Disks** page, select **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.

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# Advanced Disk and Volume Management

## Dell™ PowerVault™ 715N NAS Appliance System Administrator's Guide

- [Using the Array Manager to Manage Your Disks and Volumes](#)
- [Managing Hard Drives](#)
- [Reinstalling the PowerVault 715N Operating System](#)

Advanced disk and volume management provides information about using the Dell OpenManage™ Array Manager to manage your disks and volume and your physical hard drives.


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


Although the 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. You can access the Array Manager through the Terminal Services Advanced Client 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.

Array Manager provides a single console for the disk and volume configuration from which you can display and manage all of your storage information in a graphical environment.

 **NOTE:** You cannot hot swap hard drives on the Dell™ Powervault™ 715N NAS Appliance.

## Launching Array Manager From the NAS Manager

 **NOTE:** To use the NAS Manager, you must be logged in as administrator. The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

To launch the Array Manager from the NAS Manager, perform the following steps:

1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log into the **Terminal Services** session.
4. From the **PowerVault Advanced Administration Menu**, click **Disk Management** under **System Management**.

## 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 sections provide more information about the left and right panes.

### Left Pane

The left pane shows objects 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.

- Disks represent the disks recognized by the Microsoft® Windows® Powered operating system.
- Volumes include dynamic RAID volumes created in Array Manager, primary and extended partitions, and logical drives associated with extended partitions.

- **My Network Places**, **History**, and **Favorites** provide remote connection functionality not supported by the PowerVault 715N 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 system's right-pane console view include the following tabs:

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

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

- **Name** is the name of the object.
- **Status** can vary, depending on the object. Common status conditions are **Online**, **Healthy**, and **Resynching**.
- **Type** identifies the object, such as **Dynamic Disk**.
- **Disk Group** shows an entry for disks in a basic or dynamic group.
- **Capacity** is the maximum size of the disk.
- **Unallocated Space** is the amount of free hard drive space still available.
- **Graphical Layout** is a graphical representation of how much of the disk is being used.
- **Progress** shows the current progress (percentage of completion) for tasks.
- **Device** is the type of disk: small computer system interface (SCSI), integrated drive electronics (IDE), and so on.
- **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).
- **LUN** is the logical unit number.
- **Target** is the SCSI ID that uniquely identifies the disk on the controller card.
- **Vendor** identifies the vendor on hardware objects.

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

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

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

# Disk Management

This section describes conceptual and procedural information about how Array Manager implements basic and dynamic disks.

The following topics are discussed:

- Upgrading a basic disk to a dynamic disk
- Reactivating dynamic disks
- 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 Dell OpenManage Array Manager. These are the only types of volumes that this document addresses. See the Dell OpenManage Array Manager online help for more information about mirrored, striped, and RAID-5 dynamic volumes.

### Simple and Spanned Dynamic Volumes

Simple dynamic volumes are dynamic volumes that contain disk space from only one dynamic disk. You can expand them to contain more space on the same disk or to include disk space from additional dynamic disks. If a simple volume is expanded to include multiple disks, it becomes a spanned volume. You can then expand the volume to include more disks, if necessary.

Because only dynamic disks can be used for online volume extension, Dell recommends that you use Array Manager to upgrade all data disks on your system to dynamic. The upgrade includes new disks, which are added to the system as basic disks.

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

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

The **Upgrade Disk Wizard** provides information about upgrading.

2. Click **Next** to continue.

The system asks you to select the disks to upgrade.

3. Add the basic disks you want to upgrade to the list of dynamic disks and click **Next**.
4. 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. Right-click the disk labeled **Missing** or **Offline dynamic disk**.
2. Click **Reactivate Disk** on the menu.

Labeled the disk "Online" after the disk is 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. From the PowerVault NAS Manager, log on to the Terminal Services Advanced Client.
2. Launch the Dell OpenManage Array Manager by clicking the **System Management** in the **Advanced Administration Menu**, and then clicking **Computer Management**.

Foreign disks appear in the disk list and graphical views as **Foreign**.

3. Right-click a foreign disk and click **Merge Foreign Disks**.

The **Merge Foreign Disk Wizard** displays.

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

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

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

## Volume Management

This section describes conceptual and procedural information about how Array Manager implements basic and dynamic volumes.

The following topics are discussed:

- Volume overview
- Checking partition or volume properties
- Formatting a partition or volume
- 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. Only the operating system drive should remain basic because of system recovery limitations.

## Checking Partition or Volume Properties


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

The **Properties** window displays.

3. Check the properties for your volume.

## Formatting a Partition or Volume

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

 **NOTE:** The PowerVault 715N supports only NTFS partitions. Formatting all partitions as NTFS allows for advanced features only available under that file system.

3. 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.


4. Enter an allocation size or use the default, which is automatically selected.
5. Select file system type and formatting options:

- **Quick format** — Formats the volume or partition without scanning for bad sectors in the volume or partition. Check this box to use this format method.
- **Enable file and folder compression** — Used only if you selected NTFS format. Check this box to use this format method.

6. Click **OK** to begin formatting.

A progress bar displays in the list view.

## Delete 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. Right-click the designated volume, and then click **Delete Volume**.
2. 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. From the toolbar, click the **Create Volume** icon.

The **Create Volume Wizard** appears.

2. Click **Next**.

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

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

3. Click **Next**.

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

4. Select the concatenated dynamic volume types.
5. Provide a size in megabytes or gigabytes.
6. Click **Next**.


When you create the volume, a **Query Max Size** button displays. **Query Max Size** works differently, depending on whether you have one disk or multiple disks selected.

- If you do not select a disk and click **Query Max Size**, the size shown in the **Total volume size** entry field is the maximum for all available disks.
- 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.

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

You can select a different disk for the volume you are creating.

8. Click **Modify** to display the **Modify Disks** dialog box.
9. Click the disk you want to change, and then click the arrow to select a disk from the drop-down menu.
10. Select a drive letter.
11. Click **Next**.
12. Format the volume using **NTFS** as the volume type.
13. Select an allocation unit size, if you chose to use a size other than the default.
14. Select the file system type and, if needed, a formatting option.

 **NOTE:** Selecting the **Quick format** option formats the disk without checking for bad sectors.

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

## Extending a Dynamic Simple or Spanned Volume

You can extend a volume only if the following statements are true:

- The volume is formatted as **NTFS**.
- The volume was originally created on a dynamic disk.

- Unallocated space exists on a dynamic disk onto which a volume can be extended.

You cannot extend a volume if any of the following statements are true:

- The volume is formatted as **FAT** or **FAT32**.
- The volume is using software RAID (striped, mirrored, or RAID 5 volume).
- Unallocated space is unavailable on a dynamic disk.

After a volume is extended, it cannot be mirrored or striped using software RAID. You cannot delete any portion of a spanned volume without deleting the entire spanned volume.

1. Right-click the simple or spanned volume you want to extend, and then click **Extend Volume**.

The selected volume appears in the dialog box along with its current size.

2. Enter the amount to extend the volume and click **OK**.

Ignore any system messages that you might see while the volume extends. You do not have to run any special utilities.

3. Click **OK**.

The volume now shows the size of the extended volume.

## Working With Mirrors

Array Manager allows you to create mirrors of your volumes. This section discusses how to add, remove, or break a mirror.

### Adding a Mirror

To add a mirror, perform the following steps:

1. From the PowerVault NAS Manager, log on to the Terminal Services Advanced Client.
2. Launch the Dell OpenManage Array Manager by clicking the **System Management** in the **Advanced Administration Menu**, and then clicking **Computer Management**.
3. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
4. In the left pane, right-click a volume name, and then click **Add Mirror ...**

The **Add Mirror Wizard** displays.

5. Click **Next**.
6. Select **Custom Mode**, and then click **Next**.
7. Verify that the correct disk that is to mirror the volume is selected. If the correct disk is not selected, click **Modify**, and then go to step 8. If the correct disk is selected, go to step 10.
8. From the **Modify Disk Selection** window, click the disk you want to change.

A drop-down list box arrow appears.

9. Click the arrow, select a different disk from the drop-down list box, and then click **OK**.
10. Click **Next**, and then click **Finish** to create the mirror.

### Removing a Mirror

1. From the PowerVault NAS Manager, log on to the Terminal Services Advanced Client.

2. Launch the Dell OpenManage Array Manager by clicking the **System Management** in the **Advanced Administration Menu**, and then clicking **Computer Management**.
3. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
4. In the left pane, right-click a volume name, and then click **Remove Mirror ...**.


The **Remove Mirror** window displays.

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

## Breaking a Mirror

1. From the PowerVault NAS Manager, log on to the Terminal Services Advanced Client.
2. Launch the Dell OpenManage Array Manager by clicking the **System Management** in the **Advanced Administration Menu**, and then clicking **Computer Management**.
3. In the **Dell OpenManage Array Manager** window, click the **Volumes** folder to expand it.
4. 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.

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

---

## Managing 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 and turn off the PowerVault 715N NAS appliance.
2. Remove the front bezel from the NAS appliance.
3. Remove the failed hard drive 0 from the NAS appliance.
4. Remove the 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 appliance.
7. Boot the NAS appliance.
8. Connect a client management system to the NAS appliance using the network Ethernet connection or the COM port.
9. Depending on the method of connection, log on to the NAS appliance using an Internet browser or a HyperTerminal session.

If you are using the COM port for console redirection, see "[Using Console Redirection](#)" in the "[Advanced Features](#)" section.

10. From the PowerVault NAS Manager, log on to the **Terminal Services Advanced Client**.
11. Launch the Dell OpenManage Array Manager by clicking the **System Management** in the **Advanced Administration Menu**, and then clicking **Computer Management**.

 **NOTICE:** If the system displays a disk named **Missing Disk** in the disk section of Array Manager, do *not* delete this disk using Array Manager.

12. In the **Array Manager** window, find the new hard drive I, which displays as a basic disk instead of a dynamic disk.
13. Right-click **Disk 1**, and then click **Upgrade to Dynamic**.
14. Right-click **Disk 0**, and then click **Add Mirror**.

The main operating system mirror is synchronized.

15. Right-click your RAID 5 data volume (shown as dynamic striped volume), and click **Repair**.
16. From the window, select the new hard drive (the only hard drive displayed in the options).

The RAID 5 data volume is synchronized. The synchronization might take several hours, depending on your system configuration.

## Replacing Hard Drive 1, 2 or 3

1. Shut down and turn off your NAS appliance.
2. Remove the front bezel from the NAS appliance.
3. Take the failed hard drive out of the unit.
4. Insert a new hard drive in the same location.
5. Replace the front bezel on the NAS appliance.
6. Boot your system.
7. Connect a client management system to the NAS appliance using the network Ethernet connection or the COM port.
8. Depending on the method of connection, log on to the NAS appliance using an Internet browser or a HyperTerminal session.

If you are using the COM port for console redirection, see "[Using Console Redirection](#)" in the "[Advanced Features](#)" section.

9. From the PowerVault NAS Manager, log on to the Terminal Services Advanced Client.
10. Launch the Dell OpenManage Array Manager by clicking **System Management** in the **Advanced Administration Menu**, and then clicking **Computer Management**.

 **NOTICE:** If the system displays a disk named **Missing Disk** in the disk section of Array Manager, do *not* delete this disk using Array Manager.

11. In the **Array Manager** window, find the new hard drive, which displays as a basic disk instead of a dynamic disk.
12. Right-click **Disk x**, where disk x is the hard drive you replaced, and then click **Upgrade to Dynamic**.
13. Depending which hard drive your are replacing, perform one of the following procedures:

- If the new hard drive is disk 1, right-click **Disk 0**, and then click **Add Mirror**.

The main operating system mirror is synchronized.

- If the new hard drive is disk 2, right-click **Disk 3**, and then click **Add Mirror**.

The recovery operating system mirror is synchronized.

- If the new hard drive is disk 3, right-click **Disk 2**, and then click **Add Mirror**.

The recovery operating system mirror is synchronized.

14. Right-click your RAID 5 data volume (shown as dynamic striped volume), and click **Repair**.
15. From the window, select the new hard drive (the only hard drive displayed in the options).

The RAID 5 data volume is synchronized. The synchronization might take several hours, depending on your system configuration.

## Re-establishing the Recovery Partition

This procedure re-establishes the recovery operating system mirror. The recovery operating system mirror is used to recover the NAS appliance if the main operating system partition fails or is corrupted.

1. In the Dell OpenManage Array Manager window, right-click **Disk 2**, and then click **Remove Mirror** to remove the existing recovery mirror between **Disk 2** and **Disk 3**.
2. Right-click **Disk 0**, and then click **Break Mirror** to break the main mirror between **Disk 0** and **Disk 1**.

For more information about breaking a mirror, see "[Breaking a Mirror](#)" in this section.

3. Right-click **Disk 0**, and then click **Add Mirror** to create a mirror between **Disk 0** and **Disk 2**.

For more information about adding a mirror, see "[Adding a Mirror](#)" in this section.

This mirror is used as the template for re-establishing the recovery operating system partitions.

4. After the mirror creation is complete, break the mirror between **Disk 0** and **Disk 2** created in step 3.
5. Right-click **Disk 0**, and then click **Add Mirror** to create a mirror between **Disk 0** and **Disk 1**.
6. When the mirror creation is complete, reboot your NAS appliance.
7. When the NAS appliance is running, right-click **Disk 2**, and then click **Add Mirror** to create a mirror between **Disk 2** and **Disk 3**, which re-establishes your recovery operating system mirror.

## Booting From the Recovery Operating System Mirror Hard Drives

You might need the NAS appliance to boot from the recovery operating system mirror so you can perform the following steps:


1. Perform a file restore on the main operating system mirror.
2. Access the data on the data partition and back it up to tape.

Two different procedures allow the NAS appliance to boot from the recovery operating system mirror. One procedure requires the administrator to physically swap the hard drives in the NAS appliance. The other procedure requires that the system administrator connect a system with HyperTerminal through a null-modem cable directly to the NAS appliance, and then change the BIOS boot sequence.

### Swapping the Physical Hard Drives

1. Turn off the NAS appliance.
2. Remove the front bezel from the NAS appliance.
3. Swap hard drives 0 and 2 with each other.
4. Swap hard drives 1 and 3 with each other.
5. Turn on the NAS appliance.


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

 **NOTE:** Because the system boots using the recovery image operating system with the Dell default settings, it identifies itself on the network by its Dell service tag number. Therefore, when using your browser, you must access the system by its Dell service tag number. You can find the service tag number in the **Hardware Monitor** screen of the BIOS Setup utility. See your User's Guide for information about using the BIOS Setup utility. If your network does not have DHCP, you must reconfigure the system with the Dell OpenManage Kick-Start utility.

## Using a Directly Connected System With HyperTerminal and a Null-Modem Cable

1. Turn off the NAS appliance.
2. Connect the null-modem cable between the COM port of the NAS appliance and the client system that you are using to manage the NAS appliance.
3. On the client system, start the HyperTerminal application (or VT100 equivalent), and then set the parameters to the following:
  - **Bits per second** to **115,200**
  - **Data bits** to **8**
  - **Stop bits** to **1**
  - **Parity** to **N**
  - **Flow control** to **Xon/Xoff**
4. Turn on the NAS appliance.
5. In the **HyperTerminal** window, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.


 **NOTE:** If you use a version of Microsoft Windows 2000 operating system earlier than Service Pack 2, the function keys do not work. You must press <Esc><2>.

6. Select **2**, and then type *y* to confirm the selection.

The system boots to the recovery operating system mirror on hard drives 2 and 3.

---

## Reinstalling the PowerVault 715N Operating System

 **NOTICE:** Use this procedure only when the operating systems on all of the hard drives have failed and you have replaced all of the hard drives with new hard drives. The procedures in this section resets your configuration to the Dell default settings.

To reinstall your main operating system with Dell default settings on hard disk 0, use one of the following installation methods:

- Using an existing Preboot Execution Environment (PXE) server
- Using a dedicated Windows 2000 system
- Using a Windows 2000 system that is on the same LAN
  - With a DHCP server
  - Without a DHCP server

 **NOTICE:** If you have your data drives configured as RAID 0, performing the steps deletes your data.

## Using an Existing PXE Server

## Requirements

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

## Procedure

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

1. Create a reinstallation diskette image from the *Resource* CD.

The Reinstallation Diskette utility is located in the **Resources** section of the *Resource* CD.

2. Insert the *Reinstallation* CD in to the CD drive on the PXE server.
3. Right-click the CD drive, click **Sharing**, and then on the **Sharing** tab, select **Share this folder** to make the CD drive a share.
4. Right-click the **go.bat** file name on the *Reinstallation* diskette, and then select **Edit** to edit the file to the following variable values for your environment:
  - a. *SHARE*, where *SHARE* is the share resource for the *Reinstallation* CD in the form \\server\_name\\share\_name.
  - b. *USER*, where *USER* is the Windows user who is to access the share resource.
  - c. *PASSWD*, where *PASSWD* is the password for the user who is to access the share resource.
5. Install the customized reinstallation diskette image, which you just created, in your PXE server.

For more information, see your PXE Server documentation.

6. Connect the null-modem cable between the COM port on the NAS appliance and the Windows 2000 client system.
7. Open the Windows 2000 HyperTerminal application, and then configure it with the correct settings:
  - Set to the correct local COM port
  - **Bits per second** to **115,200**
  - **Flow control** to **Xon/Xoff**

8. Turn on your NAS appliance.
9. In the **HyperTerminal** window, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.



**NOTE:** If you use a version of Microsoft Windows 2000 operating system earlier than Service Pack 2, the function keys do not work. You must press <Esc><2>.

10. From the menu, select **option 3 (Reinstallation)**, and then type *y* to confirm the selection.


The NAS appliance automatically reboots. This stage of the process takes approximately 30 minutes to complete. After this stage, the NAS appliance becomes visible on the network and the PowerVault NAS Manager is accessible.


If the NAS appliance detects new drives, it automatically starts rebuilding the recovery operating system partition and the data volume.

11. Use the NAS Manager **Disk** and **Volume** tabs to monitor the status of the rebuild.



By default, the data volume is configured as a RAID 5 volume. If you prefer RAID 0, use the NAS Manager to reconfigure the volume to RAID 0. If you perform this operation, all data on your RAID 5 volume is lost.

 **NOTE:** Rebuilding the RAID 5 volume can take several hours, depending on your system configuration. While the rebuilding of the data volume (RAID 5) occurs, the volume is available to the user.

 **NOTICE:** Do not change the name of the system until the volume rebuild process is complete because changing the name requires a reboot that destroys your data. Do not establish a Terminal Services Advanced Client session until the RAID 5 rebuild is completed.

12. Use the Kick-Start utility to reconfigure the NAS appliance after the RAID 5 volume has finished rebuilding and the NAS appliance is displayed in the **Discovered Dell Systems List** in the **Kick-Start** window.

## 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 appliance, you can install the NAS appliance operating system whether the network has a dynamic host control protocol (DHCP) server.

### Network Does Not Have a DHCP Server

#### Requirements

- Null-modem cable included with your NAS appliance
- Windows 2000 (Professional or Server Family) client system on the same subnet as the NAS appliance
- *Resource* CD included with your NAS appliance
- *Reinstallation* CD included with your NAS appliance
- A range of available IP addresses

#### Procedure

To reinstall the main operating system with Dell default settings on hard disk 0, perform the following steps:

1. On a Windows 2000 client system that is on the same network as the NAS appliance, log on as `administrator`.
2. Determine the name of the networked Windows 2000 client system, and then make a note of it for later use.
3. Create a new user with the name `pv715` and the password set to `password`.
4. Create a reinstallation diskette from the *Resource* CD.

The Reinstallation Diskette utility is located in the **Resources** section of the *Resource* CD.

5. Right-click the **go.bat** file name on the *Reinstallation* diskette, and then select **Edit** to edit the file to the following variable value for your environment:
  - a. *SHARE*, where *SHARE* is the share resource for the *Reinstallation* CD in the form `\\server_name\\share_name`.
6. Install the Dell Reinstallation Console from the *Resource* CD by performing the following steps.

The Dell Reinstallation Console is located in the **Resources** section of the *Resource* CD.

- a. Insert the *Reinstallation* diskette that you created in step 4 in the diskette drive of the networked Windows 2000 client system.
- b. After finishing the installation, click the **Start** button and point to **Programs—> Dell Reinstallation Console—> Update boot image**.
- c. Remove the diskette from the diskette drive, and then reboot your system.

7. Insert the *Reinstallation* CD in the CD drive.
8. From Windows Explorer or **My Computer**, right-click the CD drive, select **Share**, type CD for the name of the share, and then click **OK** to confirm the share settings.
9. Connect the null-modem cable between the COM ports in the NAS appliance and the Windows 2000 client system.
10. Start the Dell OpenManage Kick-Start utility and perform the following steps:
  - a. When prompted to **Load**, click **Yes** to confirm.
  - b. Select **Setup** and configure the range of available IP addresses.

You must have a minimum of three IP addresses available in the range of addresses.

- c. Click the **Enable** checkbox.
11. Start the Intel® PXE Server by performing the following steps:
  - a. Right-click the server name in the GUI, and then select **Start/Stop Services....**
  - b. Verify the **Services** are installed correctly by selecting **Stop** and **Start**.

The indicator displays **Started**.

12. Open the Windows 2000 client system HyperTerminal application, and then perform the following steps:
  - a. Set the system to use the correct local COM port.
  - b. Set **Bits per Second** to **115,200** and **Flow Control** to **Xon/Xoff**.
  - c. Select **Connect**.
13. Turn on your NAS appliance.
14. In the **HyperTerminal** window, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.



**NOTE:** If you use a version of Microsoft Windows 2000 operating system earlier than Service Pack 2, the function keys do not work. You must press <Esc><2>.

15. From the menu, select **option 3 (Reinstallation)**, and then type *y* to confirm the selection.

The NAS appliance automatically reboots. This stage of the process takes approximately 30 minutes to complete. After this stage, the NAS appliance becomes visible on the network and the PowerVault NAS Manager is accessible.

If the NAS appliance detects new drives, it automatically starts rebuilding the recovery operating system partition and the data volume.

16. Use the NAS Manager **Disk** and **Volume** tabs to monitor the status of the rebuild.

By default, the data volume is configured as a RAID 5 volume. If you prefer RAID 0, use the NAS Manager to reconfigure the volume to RAID 0. If you perform this operation, all data on your RAID 5 volume is lost.




**NOTE:** Rebuilding the RAID 5 volume can take several hours, depending on your system configuration. While the rebuilding of the data volume (RAID 5) occurs, the volume is available to the user.



**NOTICE:** Do not change the name of the system until the volume rebuild process is complete because changing the name requires a reboot that destroys your data. Do not establish a Terminal Services Advanced Client session until the RAID 5 rebuild is completed.

17. Use the Kick-Start utility to reconfigure the NAS appliance after the RAID 5 volume has finished rebuilding and the NAS appliance is displayed in the **Discovered Dell Systems List** in the **Kick-Start Utility** window.

## Network Has a DHCP Server

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

## Requirements

- Null-modem cable included with your NAS appliance.
- Windows 2000 (Professional or Server Family) client system on the same subnet as the NAS appliance.
- *Resource* CD included with your NAS appliance.
- *Reinstallation* CD included with your NAS appliance.
- Existing DHCP service in the LAN.

## Procedure

To reinstall the main operating system with Dell default settings on hard disk 0, perform the following steps:

1. On a Windows 2000 client system that is on the same network as the NAS appliance, log on as administrator.
2. Determine the name of the networked Windows 2000 client system, and then make a note of it for later use.
3. Create a new user with the name `pv715` and the password set to `password`.
4. Create a reinstallation diskette from the *Resource* CD.

The Reinstallation Diskette utility is located in the **Resources** section of the *Resource* CD.

5. Right-click the **go.bat** file name on the *Reinstallation* diskette, and then select **Edit** to edit the file to the following variable value for your environment:
  - a. *SHARE*, where *SHARE* is the share resource for the *Reinstallation* CD in the form `\\server_name\share_name`.
6. Install the Dell Reinstallation Console from the *Resource* CD by performing the following steps.

The Dell Reinstallation Console is located in the **Resources** section of the *Resource* CD.


- a. Insert the *Reinstallation* diskette that you created in step 4 in the diskette drive of the networked Windows 2000 client system.
  - b. After finishing the installation, click the **Start** button and point to **Programs—> Dell Reinstallation Console—> Update boot image**.
  - c. Reboot your system.
7. Insert the *Reinstallation* CD in the CD drive.
  8. From Windows Explorer or **My Computer**, right-click the CD drive, select **Share**, type `CD` for the name of the share, and then click **OK** to confirm the share settings.
  9. Connect the null-modem cable between the COM ports in the NAS appliance and the networked Windows 2000 client system.
  10. Start the Dell OpenManage Kick-Start utility and perform the following steps:
    - a. When prompted to **Load**, click **Yes** to confirm.
    - b. Do *not* click the **Enable** checkbox. If the **Enable** checkbox is selected, click it to deselect it.
  11. Start the Intel PXE Server by performing the following steps:
    - a. Right-click the server name in the GUI, and then select **Start/Stop Services....**

- b. Verify the **Services** are installed correctly by selecting **Stop** and **Start**.

The indicator displays *Started*.

12. On the Intel PXE Server software, configure the system to listen to the DHCP port by performing the following steps:
  - a. Right-click the *<proxyDHCP Server>* Name, and select **Configure proxyDHCP Server**.
  - b. In the new window under the tab **proxyDHCP**, click the **Use DHCP Port for Listening** checkbox.
  - c. Restart the PXE server.
13. Open the Windows 2000 client system HyperTerminal application, and then perform the following steps:
  - a. Set the system to use the correct local COM port.
  - b. Set **Bits per Second** to **115,200** baud and **Flow Control** to **Xon/Xoff**.
  - c. Select **Connect**.
14. Turn on your NAS appliance.
15. In the **HyperTerminal** window, press *<F2>* immediately after you see the following message:

Press *<F2>* to enter the Function Select menu.

 **NOTE:** If you use a version of Microsoft Windows 2000 operating system earlier than Service Pack 2, the function keys do not work. You must press *<Esc><2>*.


16. From the menu, select **option 3 (Reinstallation)**, and then type *y* to confirm the selection.


The NAS appliance automatically reboots. This stage of the process takes approximately 30 minutes to complete. After this stage, the NAS appliance becomes visible on the network and the PowerVault NAS Manager is accessible.

If the NAS appliance detects new drives, it automatically starts rebuilding the recovery operating system partition and the data volume.

17. Use the NAS Manager **Disk** and **Volume** tabs to monitor the status of the rebuild.

By default, the data volume is configured as a RAID 5 volume. If you prefer RAID 0, use the NAS Manager to reconfigure the volume to RAID 0. If you perform this operation, all data on your RAID 5 volume is lost.

 **NOTE:** Rebuilding the RAID 5 volume can take several hours, depending on your system configuration. While the rebuilding of the data volume (RAID 5) occurs, the volume is available to the user.

 **NOTICE:** Do not change the name of the system until the volume rebuild process is complete because changing the name requires a reboot that destroys your data. Do not establish a Terminal Services Advanced Client session until the RAID 5 rebuild is completed.

18. Use the Kick-Start utility to reconfigure the NAS appliance after the RAID 5 volume has finished rebuilding and the NAS appliance is displayed in the **Discovered Dell Systems List** in the **Kick-Start** window.

## Using a Dedicated Windows 2000 System

### Requirements

- Crossover cable included with your NAS appliance
- Null-modem cable included with your NAS appliance
- Windows 2000 (Professional or Server Family) client system (dedicated for the duration of the installation process)
- *Resource* CD included with your NAS appliance
- *Reinstallation* CD included with your NAS appliance

## Procedure

To reinstall the main operating system with Dell default settings on hard disk 0, perform the following steps:

1. On a Windows 2000 client system that is dedicated to the NAS appliance during the reinstallation, log on as administrator.
2. Create a new user with the name `pv715` and the password set to `password`.
3. Change the name of the Windows 2000 client system to `pv715rec`.
4. Change the IP address to `10.40.10.1` and Net mask to `255.255.255.0`.
5. Install the Dell Reinstallation Console from the *Resource* CD.

The Dell Reinstallation Console is located in the **Resources** section of the *Resource* CD.

6. Reboot the client system.
7. Insert the *Reinstallation* CD in the CD drive of the client system.
8. From Windows Explorer or **My Computer**, right-click the CD drive, select **Share**, type `CD` for the name of the share, and then click **OK** to confirm the share settings.
9. Connect the crossover cable between the network interface controllers (NICs) in the NAS appliance and the Windows 2000 client system.
10. Connect the null-modem cable between the COM ports in the NAS appliance and the Windows 2000 client system.
11. Start the Dell OpenManage Kick-Start utility, and then perform the following steps:
  - a. When prompted to **Load**, click **Yes** to confirm.
  - b. Click the **Enable** checkbox.
12. Start the Intel PXE Server by performing the following steps:
  - a. Right-click the server name, **pv715rec**, in the GUI, and then select **Start/Stop Services....**
  - b. Verify the **Services** are installed correctly by selecting **Stop** and **Start**.

The indicator displays *Started*.

13. Open the Windows 2000 client system HyperTerminal application, and then perform the following steps:
  - a. Set the system to use the correct local COM port.
  - b. Set **Bits per Second** to **115,200** baud and **Flow Control** to **Xon/Xoff**.
  - c. Select **Connect**.
14. Turn on your NAS appliance.
15. In the **HyperTerminal** window, press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.



**NOTE:** If you use a version of Microsoft Windows 2000 operating system earlier than Service Pack 2, the function keys do not work. You must press <Esc><2>.


16. From the menu, select **option 3 (Reinstallation)**, and then type `y` to confirm the selection.


The NAS appliance automatically reboots. This stage of the process takes approximately 30 minutes to complete. After this stage, the NAS appliance becomes visible on the network and the PowerVault NAS Manager is accessible.

If the NAS appliance detects new drives, it automatically starts rebuilding the recovery operating system partition and the data volume.

17. Use the NAS Manager **Disk** and **Volume** tabs to monitor the status of the rebuild.

By default, the data volume is configured as a RAID 5 volume. If you prefer RAID 0, use the NAS Manager to reconfigure the volume to RAID 0. If you perform this operation, all data on your RAID 5 volume will be lost.

 **NOTE:** Rebuilding the RAID 5 volume can take several hours, depending on your system configuration. While the rebuilding of the data volume (RAID 5) occurs, the volume is available to the user.

-  **NOTICE:** Do not change the name of the system until the volume rebuild process is complete because changing the name requires a reboot that destroys your data. Do not establish a Terminal Services Advanced Client session until the RAID 5 rebuild is completed.

18. Use the Kick-Start utility to reconfigure the NAS appliance after the RAID 5 volume has finished rebuilding and the NAS appliance is displayed in the **Discovered Dell Systems List** in the **Kick-Start** window.

## Recovering RAID 5 Data After Reinstalling the Operating System

Use this process if you have reinstalled the operating system and have an existing data volume in a RAID 5 configuration.

1. From the PowerVault NAS Manager, log on to the Terminal Services Advanced Client.
2. Launch the Dell OpenManage Array Manager by clicking **System Management** in the **Advanced Administration Menu**, and then clicking **Computer Management**.
3. Right-click the **Mirror** for the D: drive containing the recovery operating system on **Disk 2** and **Disk 3**, and then select **Delete**.
4. Right-click the C: drive, select **Add Mirror**, and then select **Disk 2** when asked to specify a disk.

 **NOTE:** At this point, the C: drive (**Disk 0**) is **Dynamic**. If the Array Manager reports it as **Basic**, upgrade it to **Dynamic** before continuing.

5. After the process finishes, right-click the C: drive, select **Break Mirror**, and then select **Disk 2**.

The system displays a **Volume D:** in **Disk 2**.

6. Right-click **Volume C: (Disk 0)**, select **Add Mirror**, and then select **Disk 1** when asked for a disk.
7. Right-click **Volume D: (Disk 2)**, select **Add Mirror**, and then select **Disk 3** when asked for a disk.
8. Right-click the **Data Volume**, select **REPAIR**, and then select **Disk 0** when you are prompted to specify a disk.

This step re-establishes the RAID 5 data volume.

When this process completes, the system is back to the original Dell default configuration and can recover from hardware and software errors.

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# System Recovery, Backup, and Restore

## Dell™ PowerVault™ 715N NAS Appliance System Administrator's Guide

- [Recovery From System Failure](#)
- [System-State Backup and Restore](#)
- [Supported Backup Software](#)
- [Using Backup Software](#)
- [Backing Up Persistent Images](#)
- [Installing Tape Device Drivers for Windows 2000 Backup and Recovery Tools](#)

This section provides instructions on how to recover from a system failure and how to back up and restore the system state. The following topics are discussed:

- Recovery from system failure
- System-state backup and restore
- Supported Backup Software
- Using Backup Software
- Third-party backup software for network backups
- Backing up persistent images
- Installing tape device drivers for Microsoft® Windows® 2000

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## Recovery From System Failure

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

### Hardware Failures

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

- If hard drive 0 fails, the system automatically boots from hard drive 1. To replace the failed hard drive, follow the procedures in "[Replacing Hard Drive 0](#)" in the "[Advanced Disk and Volume Management](#)" section.
- If hard drive 1 fails, the system automatically boots from hard drive 0. To replace the failed hard drive, follow the procedures in "[Replacing Hard Drive 1, 2 or 3](#)" in the "[Advanced Disk and Volume Management](#)" section.
- If hard drive 2 or 3 fails, the system automatically boots from the mirror hard drive 0 and 1. Hard disks 2 and 3 form the recovery operating system mirror. To replace the failed hard drive, follow the procedures in "[Replacing Hard Drive 1, 2 or 3](#)" in the "[Advanced Disk and Volume Management](#)" section.
- If hard drives 0, 1, 2, and 3 fail, you must reinstall new hard drives and the operating system. To replace the failed hard drives and reinstall the operating system, follow the procedures in "[Advanced Disk and Volume Management](#)."

### Software Failures

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

- If files in the main operating system files are missing or corrupt, you must have administrator privileges and manually boot from the recovery operating system mirror hard drives 2 and 3. For instructions, see "[Replacing Hard Drive 0](#)" in the "[Advanced Disk and Volume Management](#)" section. After the system is running, you, as the administrator, can boot the system back to the main operating system hard drives, and then perform a system-

state restore operation. For instructions, see "[Restoring System-State Data](#)."

- If the main operating system mirrored partition fails, you must have administrator privileges and 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. For instructions, see "[Replacing Hard Drive 0](#)" in the "[Advanced Disk and Volume Management](#)" section. After the system is running, you, as the administrator, can boot the system back to the main operating system hard drives, and then perform a system-state restore operation. For instructions, see "[Restoring System-State Data](#)."

## Initial System Setup

After the operating system is reinstalled on the system, make sure you configure the system again to establish network communication. For information about configuring your system, see "[Basic Configuration](#)" in "[Introduction](#)."

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## System-State Backup and Restore

Integrated Windows 2000 backup and recovery tools allow administrators to back up and restore the system-state data.


System-state data includes the following:

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

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.

 **NOTE:** You must back up your system-state data to a remote system hard drive to allow you to restore your system state after reinstalling the operating system.

## Backing Up System-State Data

 **NOTE:** To use the NAS Manager, you must be logged in as administrator. The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

1. Click **Maintenance**.
2. Click **Terminal Services**.
3. Log on to the Terminal Services session.
4. Go to the **PowerVault Advanced Administration Menu**.
5. Select **Administrative Tools**, and then click **Perform System State Backup**.


The **Performing System State Backup** window displays.

6. Click **OK** to continue.
7. Select the location to store your system-state backup, and then click **OK**.

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.

## Restoring System-State Data



 **NOTE:** To restore your system-state data, you must have previously backed up your system using the System-State Backup tool on the **Advanced Administration Menu** or from Windows 2000 backup and recovery tools.

1. Click **Maintenance**.
2. Click **Backup**.
3. Log on to the NAS appliance as `administrator`.
4. Click **Restore Wizard**.

The **Restore Wizard** window displays.

5. Click **Next**.
6. Click **Import File**.

The **Backup File Name** window displays.

You must import the file because your system is not aware of previous backups after you complete a reinstallation.

7. Click **Browse**.

The **Select file to catalog** window displays.

8. Browse for your file.
9. After locating your file, click **OK**.
10. When the **Backup File Name** window displays, click **OK**.

The **What to Restore** window displays.

11. Click the + symbol next to **File**.
12. Click the + symbol next to **Media Created on**.
13. Click the + symbol next to **System State**.

You are prompted for your backup file location.

14. If the location is correct, click **OK**; otherwise, browse to the correct backup file location.
15. Click the checkbox next to **System State**.
16. Click **Next**.
17. Click **Advanced**.

The **Where to Restore** window displays.

18. On the **Restore files to** drop-down menu, select **Original Location** to restore the files to the same location they occupied when they were backed up.
19. Click **Next**.


The **How to Restore** window displays.

20. Click **Always replace the file on disk**.
21. Click **Next**.

The **Advanced Restore Options** window displays.

22. Leave all checkboxes unchecked.
23. Click **Next**.

24. Click **Finish** to initiate the restore process
25. Restart your system after the restore process completes.

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

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## Supported Backup Software

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

### Direct-Attached Local Backups

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

- Windows 2000 Backup and Recovery Tools
- VERITAS® Backup Exec® 8.5 and 8.6 for Windows NT® and Windows 2000

### Network Backups

The following software is supported for network backups.

- VERITAS® Backup Exec® 8.5 and 8.6 for Windows NT® and Windows 2000
  - Computer Associates® ARCserve/IT™
    - ARCserve/IT 2000 for Windows NT and Windows 2000
    - ARCserve/IT 6.61 for Red Hat Linux 7.0
- 

## Using Backup Software

The following software is supported for making your backups.

### 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 a file.

 **NOTE:** You must have a supported SCSI card installed and a tape drive 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.

### Using the VERITAS Backup Exec


The following information explains how to install and use the VERITAS Backup Exec software for local backups.

#### Installing VERITAS Backup Exec


You must first install VERITAS Backup Exec on the Dell™ PowerVault™ NAS appliance, and then install VERITAS Remote Administrator on a remote system.

 **NOTE:** Before installing the backup software, see <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 Appliance

 **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 appliance, and then insert the *VERITAS Backup Exec* CD in the CD drive of the remote system.
2. From the NAS Manager, click **Maintenance**, and then click **Terminal Services**.
3. Log on to the NAS appliance.
4. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
5. 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.

## Installing VERITAS Backup Exec Remote Administrator on the Remote System

1. Insert the *VERITAS Backup Exec* CD in the CD drive of the remote system.

The CD starts the software automatically.

2. If the CD does not start the software automatically, open Microsoft Windows Explorer and right-click the CD drive that contains the VERITAS software.
3. Select **Autoplay** from the menu.
4. 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 appliance 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 your 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 and Computer Associates ARCserve network accelerator agents can both 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 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 only be performed 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 correctly to ensure that you can restore it properly, perform the following steps:

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

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

2. On the NAS Manager primary menu, click **Maintenance**, and then click **Terminal Services**.
3. Log on to the system.
4. Using the Windows Explorer, 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.


5. Right-click the persistent image, and then click **Sharing...**
6. Click the radio button adjacent to **Share this folder**.
7. Enter a name for the share in the **Share name** text box.
8. Click **Permissions**.
9. Set the required permissions in the **Permissions** window, and then click **OK**.
10. Click **OK** in the **Properties** window to finish the share creation process.
11. 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.

12. In the VERITAS Backup Exec **Backup Selections** window, browse to your NAS appliance under **Entire Network**.
13. Select the share name that you created for your persistent image.
14. 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.

15. Click **Backup**.
16. 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

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

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

- 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 in the text boxes next to **Restore to drive** and **Restore to path**.
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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## 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 see the <http://support.dell.com> website for updated drivers and patches.

## Installing Drivers for PowerVault Tape Drives

1. Connect the Dell PowerVault tape device, and then restart the system.
2. Connect to the PowerVault NAS Manager.
3. Click **Maintenance**, and then click **Terminal Services**.
4. Log on to a Terminal Services Client session.
5. On the **Advanced Administration Menu** under **System Management**, click **Computer Management**.

6. Click **Computer Management** in the left pane.
7. Click **System Tools** in the left pane.
8. Click **Device Manager** in the left pane.
9. Click **Unknown Devices** in the right pane.
10. Double-click **Unknown Tape Device**.
11. Click **Driver** in the pop-up 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 checkbox for **Specify a location**.

Deselect the other checkboxes.

16. Click **Next**.

The **Properties** dialog box displays.

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

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

19. Make sure the wizard has selected the appropriate PowerVault tape device, and then click **Next**.
20. Click **Finish**.
21. 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 machine.
2. Connect to the PowerVault NAS Manager.
3. Click **Maintenance**, and then click **Terminal Services**.
4. Log on to a **Terminal Services Client** session.
5. In the **Advanced Administration Menu**, click **Computer Management** under **System Management**.
6. Click **Computer Management** in the left pane, and then click **System Tools**.
7. Click **Device Manager** in the left pane.
8. Click **Medium Changers** in the right pane.
9. Double-click **Unknown Medium Changer**.
10. Click **Driver** in the **Properties** window.
11. Click **Update Driver**.

The **Upgrade Device Driver Wizard** displays.

12. Click **Next**.
13. Click the radio button next to **Search for a suitable driver for my device (recommended)**, and then click **Next**.
14. In **Optional search locations**, click the checkbox for **Specify a location**.

Deselect the other checkbox.

15. Click **Next**.

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

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

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

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

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# Dell ActiveArchive

## Dell™ PowerVault™ 715N NAS Appliance System Administrator's Guide

- [Introduction to Persistent Images](#)
- [Scheduling Persistent Images](#)
- [Using Persistent Images](#)
- [Accessing Stored Persistent Images in Dell ActiveArchive](#)
- [Restoring Volumes From an Existing Persistent Image](#)
- [Changing the Dell ActiveArchive Event Log Language](#)

Dell ActiveArchive™ allows the creation and preservation of persistent images of Dell PowerVault™ 715N system data volumes. The Dell ActiveArchive software is available for all PowerVault 715N systems. It can be configured by using the NAS Manager.


This section provides information about the following topics:

- Introduction to persistent images
- Scheduling persistent images
- Adding persistent images to the schedule
- Deleting a persistent image schedule
- Editing the properties of a persistent image schedule
- Taking a new persistent image on demand
- Deleting a persistent image
- Undoing writes to a read/write persistent image
- Configuring the persistent image global settings
- Setting persistent image retention weights and read only or read/write attributes
- Accessing store persistent images in Dell ActiveArchive
- Restoring volumes from an existing persistent image

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## Introduction to Persistent Images


A persistent image is a point-in-time copy of a disk volume. Unlike conventional volumes, the information in the persistent image is static. 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. 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 file servers, 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, you lose your data, including the persistent image. 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 or the recovery operating system drives (C: or D:).

## Cache Thresholds


The Dell ActiveArchive software has two thresholds that provide warnings when the cache file is approaching maximum capacity. The **Cache Full Warning Threshold** logs an event in the event log and displays an error in the NAS Manager status indicator when the cache file reaches the threshold (default is 80 percent full). The **Cache Full Threshold**, which is labeled **Begin deleting images** in the NAS Manager, specifies the threshold where the PowerVault NAS Manager deletes the oldest persistent images with the lowest retention weights until the cache file is below the **Cache Full Threshold** (default is 90 percent full).

## Persistent Image Retention Weights

When the system reaches the **cache full threshold**, the system starts deleting files, depending on the retention weight and age of the persistent image. The system first looks for the persistent image with the lowest retention weight in the cache file and deletes the oldest persistent image with the retention weight. After all persistent images with the lowest retention weight have been deleted, Dell ActiveArchive looks for and deletes the oldest files with the next higher 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.

 **NOTICE:** If you use one of the recovery processes to reinstall your operating system, your persistent images are deleted.

## Storing Persistent Images

You can store up to 250 persistent images per volume; however, if you exceed 250 persistent images, 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:


- Seven daily persistent images with a high priority
- Two weekly persistent images with a medium priority
- 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.

## Accessing Directories, Folders, and Files

By default, administrators can access the **ActiveArchive** 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.

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.

 **NOTE:** The **ActiveArchive** directory is a hidden folder. You must configure your system to view hidden files and folders to view your **ActiveArchive** directory.

## 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 **ActiveArchive** directory is restricted to administrator access only. To allow users to access the persistent images, the system administrator must modify the permissions for the **ActiveArchive** directory.

Use the PowerVault NAS Manager to change the **ActiveArchive** directory permissions by performing the following steps.



**NOTE:** To use the PowerVault NAS Manager, you must be logged in as administrator. The PowerVault NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

1. On the NAS Manager primary menu, click the **Maintenance** tab.
2. Click **Terminal Services**.
3. Log on to a **Terminal Services Advanced Client** session.
4. Open the **Windows Explorer**.
5. Select the drive on the left side.
6. Right-click the **ActiveArchive** directory, and then click **Properties**.
7. Click the **Security** tab, and then click **Add...**
8. Click specific users or groups or type the individual users or group names to add individual users or groups, and then click **OK**.
9. Give the selected members **Read** and **List Folder Contents** permissions.
10. Click **OK**.

Repeat the steps for the **ActiveArchive** directory on each volume the users can access. You do not need to change the permissions of the persistent images and their subdirectories. The files and folders retain the original files' and folders' permissions.

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## Scheduling Persistent Images

When you click **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 are identified by time and date, and 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 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 current active persistent images. Each entry identifies the date and time the persistent image was created and the volume it preserves. Select an individual persistent image by clicking the radio button to the left of the description.

1. On the NAS Manager primary menu, click **Disks**, and then click **ActiveArchive**.
2. Click **Persistent Images**.

## Adding Persistent Images to the Schedule

1. On the NAS Manager primary menu, click **Disks**, then click **ActiveArchive**.
2. Click **Schedules**.
3. In the **Tasks** list on the **Persistent Image Schedules** page, click **New...**
4. Use the menus to select the **Starting time**, the frequency at which to repeat the persistent image (**Repeat every frequency**), the **Beginning day**, the **Volume(s)**, the **Image Attributes** (**Read-only** or **Read/Write**), the

**Retention Weight**, **Number of images** (per schedule) **to save**, 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.

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:

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


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

## Deleting a Persistent Image Schedule

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

## Editing the Properties of a Persistent Image Schedule

1. On the NAS Manager primary menu, click **Disks**, and then click **ActiveArchive**.
2. Click **Schedules**.
3. In the **Tasks** list on the **Persistent Image Schedules** page, click **Properties...**
4. Use the appropriate menus to select the **Starting time**, the frequency at which to repeat the persistent image (**Repeat every frequency**), the **Beginning day**, the **Volume(s)**, the **Image Attributes** (**Read-only** or **Read/Write**), and the **Number of images** (per schedule) **to save**.

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

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

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## 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. On the NAS Manager primary menu, click **Disks**, and then click **ActiveArchive**.
2. Click **Persistent Images**.
3. In the **Tasks** list on the **Persistent Images** page, click **New...**
4. In the menu that is displayed, select the **Volume(s)** to preserve.



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

5. Select the Read Only or Read/Write attribute.
6. Select the **Retention Weight** for the persistent image.
7. Enter 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:

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

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

### Deleting a Persistent Image

1. On the NAS Manager primary menu, click **Disks**, and then click **ActiveArchive**.
2. Click **Persistent Images**.
3. On the **Persistent Images** page, click the check box next to the persistent image that is to be deleted.
4. In the **Tasks** list, click **Delete**.
5. 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. On the NAS Manager primary menu, click **Disks**.
2. Click **ActiveArchive**, and then click **Persistent Images**.
3. On the **Persistent Images** page, click the radio button next to the persistent image to be restored to its original state.
4. 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. On the NAS Manager primary menu, click **Disks**, and then click **Persistent Images**.
2. In the list of persistent images, click the checkbox next to the persistent image you are editing.
3. In the **Task** list, click **Properties....**
4. Select the Read Only or Read/Write attribute.
5. Select the **Retention weight**.
6. Click **OK** to update the persistent image.

## Configuring the Persistent Image Global Settings

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

1. On the NAS Manager primary menu, click **Disks**, and then click **ActiveArchive**.
2. Click **Global Settings**, and then configure the following options.



**NOTE:** Before changing the **Image Directory Name**, you must delete all existing persistent images.

- **Maximum Persistent Images** — Specifies the maximum number of active persistent images per volume, up to a maximum of 250. When the volume has 250 persistent images stored, starting another persistent image overwrites the oldest persistent image with the lowest retention weight.
- **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.
- **Inactive Time-Out** — Specifies the amount of time the server 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 the **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.
- **Image Directory Name** — Specifies the directory name which is to be used for the persistent image mount

point. Each persistent image appears as a subdirectory in the volume which is being imaged. The entire content of the volume, as it existed when the persistent image was created, appears under this directory.

3. If you need to re-establish the system defaults, click **Restore Defaults**.
4. Click **OK** to update the global settings.

## Configuring Persistent Image Volume Settings

You can modify volume settings by performing the following steps:

1. On the NAS Manager primary menu, click **Disks**, and then click **ActiveArchive**.
2. Click **Volume Settings**.
3. Click the radio button adjacent to the volume setting you want to change.
4. Click **Configure...**
5. Use the appropriate menus to configure the following options.



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

- **Cache Full Warning Threshold** — Defines the percentage of cache space used that triggers warning messages to the system event log.
- **Begin Deleting Images** — 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.
- **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.

6. If you need to re-establish the system defaults, click **Restore Defaults**.
7. Click **OK**.

---

## Accessing Stored Persistent Images in Dell ActiveArchive



**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**.



**NOTE:** The **ActiveArchive** directory is a hidden folder. You must configure your system to view hidden files and folders to view your **ActiveArchive** directory.

1. On the NAS Manager primary menu, click the **Maintenance** tab.
2. Click **Terminal Services**.
3. Log on to a **Terminal Services Advanced Client** session.
4. If the **PowerVault Advanced Administration Menu** window is displayed, click **Exit**, and then click **OK** to close it.
5. Right-click **My Appliance**.
6. Click **Map Network Drive** from the menu.
7. Map to the root of the ActiveArchives volume.



Use "\$" to specify the root of the volume. For example, in the **Folder** field, type \\<Dellxxxxxxx>\e\$, where <Dellxxxxxxx> is the name of the PowerVault 715N system and where e is the drive letter of the volume.

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

---


## 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 has occurred after the persistent image was taken is lost.

-  **NOTICE:** Restoring a volume restores the volume back to the state of the volume at the time the persistent image was made. This restore is a destructive process.
-  **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. On the NAS Manager primary menu, click **Disks**, then click **ActiveArchive**.
2. Click **Restore Persistent Images**.
3. On the **Persistent Images to Restore** page, click the radio button next to the persistent image that is to be restored.
4. In the **Tasks** list, click **Restore**.
5. 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.

 **NOTE:** If you want the ability to restore a single volume, you must take single volume persistent images.

---

## 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:

- English
- French
- German
- Japanese
- Spanish

To change the language in which the Event Log messages are generated, perform the following steps:

1. On the NAS Manager primary menu, click the **Maintenance** tab.
2. Click **Terminal Services** to create a Terminal Services Advanced Client session with the NAS appliance.
3. Log on to the system as an administrator.
4. If the **Advanced Administration Menu** is open, click **Exit**, and then **OK** to close it.
5. Open the Microsoft Windows Explorer, expand the C:\ hard drive directory and the **Dell** directory.
6. Open the **AArchive\_Langpatch** directory.
7. Double-click the appropriate batch file, such as the **english.bat** file for English or the **japanese.bat** file for

Japanese.

8. After the batch file has run, reboot your system.

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# Advanced Features

## Dell™ PowerVault™ 715N NAS Appliance System Administrator's Guide

- [Installing Multilanguage User Interface \(MUI\) Support](#)
- [Installing and Configuring Support for Other Languages](#)
- [Network Adapter Teaming](#)
- [Services for UNIX](#)
- [File Server for Macintosh](#)
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- [Defragmenting a Volume Containing Persistent Images](#)

This section includes descriptions of advanced features that cannot be performed from the Dell™ PowerVault™ NAS Manager menus. The following topics are discussed:

- 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 (MSDSS)
- Using secured socket layers
- SNMP considerations
- Using console redirection
- Defragmenting a volume containing persistent images

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.



**NOTE:** To use the NAS Manager, you must be logged in as administrator. The NAS Manager default administrator user name is `administrator` and the default password is `powervault`.

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

---

## Installing Multilanguage User Interface (MUI) Support

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



The PowerVault 715N NAS appliance allows you to change languages for its Microsoft Windows® Powered operating system's user interface. The MUI allows the PowerVault 715N 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 is available for use on the system. When you receive a PowerVault 715N NAS appliance from Dell, the root directory of the C: hard drive contains a **localization** directory, which contains all of the files included in the *Multilingual Support* CD. If you have performed the reinstallation procedure, this directory does not exist, and you must install a language MUI from the *Multilingual Support* CD.



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


1. 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 PowerVault 715N into your remote system CD drive.
2. From the remote system, connect to the NAS Manager.
3. On the NAS Manager primary menu, click the **Maintenance** tab, and then click **Terminal Services** to create a Terminal Services Advanced Client session with the appliance.
4. Log on to the system as an administrator.
5. Close the **PowerVault Advanced Administration Menu** by clicking **Exit**.
6. Double-click **My Appliance** on the NAS desktop.
7. If this is a new system from Dell, perform the following procedure, and then go to step 9. Otherwise, go to step 8.
  - 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.
8. If you performed the reinstallation procedure on your system, perform the following procedure.
  - a. In Windows Explorer on a remote client system, right-click the CD drive, and then click **Sharing**.
  - b. 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 your NAS appliance into your remote client system CD drive.
  - c. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
  - d. Browse to the mapped drive, and then double-click the CD to launch the *Multilingual Support* CD's Web interface.
  - e. Click the **Install Multilanguage User Interface (MUI) Support** link to launch the Multilanguage File Installation installer program.
9. In the installer window, select the languages to be installed. Next, from the menu, set the default MUI language.
10. Click **OK** to perform the installation.
11. At an **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 the **C:\localization** directory (if it exists), and then click **Open**.
  - c. If the **Insert Disk** window, click **OK** to allow the operating system to find the required files for installation.
12. Disconnect the mapped network drive from the CD share that you mapped in step 8c.
13. After the installation is complete and you have disconnected the network drive, you must reboot your system.

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

1. From the remote system, connect to the NAS Manager.

2. On the NAS Manager primary menu, click the **Maintenance** tab.
  3. Click **Terminal Services** to create a Terminal Services Advanced Client session with the NAS appliance.
  4. Log on to the system as an administrator.
  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 on to the system again for the new language MUI to take effect.
- 


## Installing and Configuring Support for Other Languages

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

The Windows Powered operating system that comes installed in the PowerVault 715N can be configured to support the ability to read and write documents in a number of languages. To install the software required to support a specific language, perform the following steps:

1. 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 PowerVault 715N into your remote system CD drive.
2. From the remote system, connect to the NAS Manager.
3. On the NAS Manager primary menu, click the **Maintenance** tab, and then click **Terminal Services** to create a Terminal Services Advanced Client session with the NAS appliance.
4. Log on to the system as administrator.
5. Close the **Advanced Administration Menu** by clicking **Exit**.
6. Double-click **My Appliance** on the NAS desktop.
7. If this is a new system from Dell, perform the following procedure, and then go to step 9. Otherwise, go to step 8.
  - a. Double-click **Control Panel**.
  - b. Double-click **Regional Options**.
8. If you performed the reinstallation procedure on your system, perform the following procedure.
  - a. In Windows Explorer on a remote client system, right-click the CD drive, and then click **Sharing**.
  - b. 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 your NAS appliance into your remote client system CD drive.
  - c. Map a network drive to the CD share, but *do not* select **Reconnect at logon**.
  - d. Browse to the mapped drive, and then double-click the *Multilingual Support CD* to launch the *Multilingual Support CD's* Web interface.
  - e. Click the **Install Language Locales Not Supported by MUI** link to launch the **Regional Options** control panel.
9. From the **Language Settings for the System** panel, select the languages to be configured.
10. Set the default language for the system by clicking **Select default...**, and then selecting the appropriate language from the menu. Click **OK**.
11. Click **Apply** to complete the operation.
12. If an **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 the **C:\localization** directory (if it exists), 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.
13. After the installation is complete, if applicable, disconnect the mapped network drive from the CD share that you mapped in step 7b.
  14. Reboot your system.

 **NOTE:** For more information, 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 appliance supports the following technologies:

- Adaptive Load Balancing (ALB) from Intel®
- Adapter Fault Tolerance (AFT) from Intel
- Link Aggregation
- Fast EtherChannel (FEC)
- IEEE 802.3ad

## Adaptive Load Balancing

ALB is a simple and efficient method for increasing the NAS appliance's network transmission throughput. The ALB software continuously analyzes transmission loading on each adapter and balances the load across the teamed ports as needed. Adapter teams configured for ALB also provide the benefits of adapter fault tolerance. To use ALB, the Ethernet ports on the NAS appliance must be linked to the same Ethernet switch.

## Adapter Fault Tolerance

AFT provides the safety of an additional backup link between the appliance and the hub or switch. If a hub, switch port, cable, or Ethernet port fails, you can maintain uninterrupted network performance. AFT is implemented with a primary adapter and a backup, or secondary, adapter. If the link to the primary adapter fails, the link to the secondary adapter automatically takes over.

## Link Aggregation

Link aggregation is a performance technology developed by Intel and others to increase your system's network throughput. Unlike ALB, link aggregation can be configured to increase both transmission and reception channels between your system and switch. Link aggregation works only with compatible Intel switches. To use link aggregation, the Ethernet ports of the NAS appliance must be linked to the same Intel Ethernet switch.

## Fast EtherChannel

FEC is a performance technology developed by Cisco Systems to increase your system's network throughput. Unlike ALB, FEC can be configured to increase both transmission and reception channels between your appliance and switch. FEC works only with compatible Cisco switches. To use FEC, the Ethernet ports of the NAS appliance must be linked to the same Cisco FEC-compatible switch.

## IEEE 802.3ad

IEEE 802.3ad is a performance technology standard that increases your system's network throughput. It is similar to the FEC standard developed by Cisco. However, whereas FEC works only with FEC-compatible Cisco switches, IEEE 802.3ad works with switches that support IEEE 802.3ad. To use IEEE 802.3ad, the Ethernet ports of the NAS appliance must be linked to the same IEEE 802.3ad switch.

## Creating Network Teams

Create network teams through the Network Teaming utility, Intel PROSet II. To access the Network Teaming utility from the NAS Manager, perform the following steps:

1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log on to the Terminal Services session as administrator.
4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Intel Network Teaming**.

The Network Teaming utility, Intel PROSet II, displays.

5. Click **Action**, click **Add to Team**, and then click **Create New Team...**

The **Teaming Wizard** displays.

6. Select the type of team to create, and then click **Next**.

The types of team include **Adapter Fault Tolerance**, **Adaptive Load Balancing**, **Fast EtherChannel\*/Link Aggregation**, and **IEEE 802.3ad**.

7. Select the adapters to include with this team, and then click **Next**.
8. Verify the team contains the appropriate members, and then click **Finish**.
9. If the team needs to be modified, click **Back**.

## Removing Network Teams

Remove network teams through the Network Teaming utility, Intel PROSet II. To access the Network Teaming utility from the NAS Manager, perform the following steps:

1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log on to the Terminal Services session as administrator.
4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Intel Network Teaming**.

The Network Teaming utility, **Intel PROSet II**, displays.

5. In the tree view, click the team to remove.
6. Click **Action**, and then click **Remove**.

## Removing an Adapter From a Network Team

Remove an adapter from a network team through the Network Teaming utility, Intel PROSet II. To access the Network Teaming utility from the NAS Manager, perform the following steps:

1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log on to the Terminal Services session as administrator.

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

The Network Teaming utility, Intel PROSet II, displays.

5. In the tree view, click the adapter to remove.
6. Click **Action**, and then click **Remove**.

## Changing the Network Team Mode

Change the network team mode through the Network Teaming utility, Intel PROSet II. To access the Network Teaming utility from the NAS Manager, perform the following steps:

1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log on to the **Terminal Services** session as administrator.
4. Under **Administrative Tools** on the **Advanced Administration Menu**, click **Intel Network Teaming**.

The Network Teaming utility, Intel PROSet II, displays.

5. In the tree view, click the team to modify.
6. Click **Action**, and then click **Change Team Mode**.
7. In the **Teaming Wizard**, select the type of team to create, and then click **Next**.

The types of team include **Fault Tolerance**, **Load Balancing**, **Fast EtherChannel\*/Link Aggregation**, and **IEEE 802.3ad**.

8. Click **OK** to close.

---

## Services for UNIX

Services for UNIX (SFU) provides the tools needed to integrate UNIX and Windows networks by leveraging existing UNIX network resource 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 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.

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

- **User Mapping** is the name of the mapping server to use.

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

## UNIX Utilities

[Table 6-1](#) lists UNIX utilities provided with SFU.

**Table 6-1. Categories of UNIX Utilities**

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, uumount
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. NTLM must be supported on the client side of the login as well, however.

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 options available are:

- **Authentication** gives you the choices of **NTLM** and **Username/Password**.
- **Auditing** enables you to set event logging to a separate log file, or the event log, and set what events to log.
- **Server Settings** enables you to set the following options:
  - Maximum number of simultaneous connections
  - Maximum number of failed login attempts
  - Map <Alt> key to <Ctrl><A>
  - Telnet port
  - **Mode of Operation** allows you to select **Console** or **Stream**.
  - **Default Domain Name** is the domain name that is automatically added to the login username. The default

is ".", which disables this feature.

- **Idle Session Timeout** is the time until an idle session is forcibly disconnected.
- **Terminate all programs when disconnecting** toggles with **Continue to run programs started with the command bgjob**.
- **Sessions** allows you to see data about the currently active sessions (such as **user**, **domain**, **system**, **logon date/time**) and either send a message to the session or terminate it.

## Services for UNIX MMC Console

SFU UNIX 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.

## 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 perform User Name Mapping either from SFU or by clicking **NFS** on the **Services** page of the NAS Manager.

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. Given that UNIX user names are case-sensitive, while 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.

In SFU, the Username Mapping Service and NT Authentication Service can be installed from the NAS appliance's share, **DomainUtils**.

To create User and Group Name Maps, access the **SFU Administration** window by performing the following steps:

1. From the NAS Manager, click **Maintenance**.
2. Click **Terminal Services**.
3. Log on to **Terminal Services** as administrator.
4. Close the **Advanced Administration Menu**.
5. Click the **Start** button and point to **Programs—> Administrative Tools—> Windows Services for UNIX**.
6. Click **Services for UNIX Administration**.

The **SFU Administration Console** displays.

7. Click **User Name Mapping**.

The **User Name Mapping on Local Computer** window displays. You can use this window to define your user 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 Name Mapping on local computer** page primary menu, click **Configuration**.



2. Click either **NIS** or **PCNFS** to select the server type.
3. If the server type is **PCNFS**, specify the location and file name 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.

4. Specify the refresh interval for synchronizing user and group information with the mapping service.
5. Click **Apply** to save the configuration.

## Defining Maps

To define simple maps in SFU, select the **Simple Maps** check box, and then perform the following steps:

1. Specify the **Windows Domain**. If the server is configured as **PCNFS**, go to step 4.
2. Specify the **NIS Domain**.
3. Optionally, specify the **NIS Server**.
4. Click **Apply** to create the maps.

If you are defining advanced maps, you create user and group maps individually. In the NAS Manager, select **Show User Maps** or **Show Group Maps**. To create advanced maps in SFU, deselect the **Simple Maps** check box and perform the following steps:

1. Specify the **Windows Domain**. If the server is configured as **PCNFS**, go to step 4.
2. Specify the **NIS Domain**.
3. Optionally, specify the **NIS Server**.
4. Create **User Map** or **Group Map** entries.
5. Click **List Windows Users** or **List Windows Groups**.
6. Click **List UNIX Users** or **List UNIX Groups**.

This action refreshes your UNIX and Windows users and groups selection.

7. Create map entries by selecting a Windows user/group and a UNIX user (UID)/group (GID) from the list and clicking **Add**.
8. Click **Apply** to create the maps.

## Map Maintenance

You can maintain your maps from the **User Name Mapping** tree of the **SFU** window. Map maintenance allows you to save currently defined maps and to restore saved maps.

To back up the currently defined maps, perform the following steps:

1. From the **SFU** window, click **User Name Mapping**.
2. Click **Map Maintenance**.
3. Specify a name and location of a file in which to back up the maps.
4. Click **Backup**.

To restore the previously backed up set of maps, perform the following steps:

1. From the **SFU** window, click **User Name Mapping**.
2. Click **Map Maintenance**.

3. Specify the name and location of the file that contains the saved maps.
4. Click **Restore**.

## Basic Scenarios

For UNIX and Windows NT Username Mapping, an NIS Server must already exist in the UNIX environment or a UNIX user and group file must exist on the PowerVault NAS appliance. Username Mapping associates UNIX users and groups to Windows NT users and groups. You can use two types of maps, simple and advanced. Simple maps define a one-to-one relationship between same name users and groups. Advanced maps define a relationship between dissimilar names and groups.

### Workgroup

In the Workgroup scenario, you configure Username Mapping locally on the PowerVault 715N system. All maps are contained on this system.

### Domain

In the Domain scenario, you configure Username Mapping on the domain controller. The Username Mapping Service and the NT Authentication Service must be installed on the Domain Controller. If multiple Domain Controllers are present, NT Authentication Service must be installed on each Domain Controller.

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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.

### Microsoft UAM Volume

A user authentication map (UAM) is a software program that prompts users for an account name and password before they log on to a server. The Macintosh **Chooser** has a standard UAM built in, which 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 might 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 newer or the Mac operating system (OS) 8.5 or newer 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 re-run the Microsoft UAM Installer.

### Installing User Authentication

Log on 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. Click **Chooser** on the **Macintosh Apple** menu.
2. 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.

3. Select the system from the list of file servers, and click **OK**.

4. Click **Registered User** or **Guest**, and then click **OK**.
5. Select the **Microsoft UAM Volume**, and then click **OK**.
6. Close the **Chooser** dialog box.

To install the authentication files on the Macintosh workstation, perform the following steps:

1. Double-click the **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 succeeded.

If the installation succeeded, Macintosh users of this workstation are offered Microsoft Authentication when they connect to the system.

## 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 Filers with multiple network adapters, perform the following steps from the NAS Manager:

1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Interfaces**.
3. Click the radio button next to the adapter you want to use for the AppleTalk protocol.
4. On the **Tasks** menu, click **AppleTalk**.
5. Click the check box next to **Enable inbound AppleTalk connections on this adapter**.
6. Optionally, if you use AppleTalk zones, select the appropriate zone in the drop-down box.
7. Click **OK**.

---

## Services for 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.

## Configuring the NWLink IPX/SPX Compatible Protocol

To configure this protocol, you need the internal network number, the frame type, and the network number.

### Internal Network Number

Internal network numbers are used for internal routing and are generally only needed 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, occasionally the automatic detection feature 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 that if more than one frame type exists, select the one that is detected first. For example, if frame type **Ethernet 802.2** and **Ethernet 802.3** are bound to the same segment, then configure frame type **Ethernet 802.2**. The order of detection is **Ethernet 802.2**, **Ethernet 802.3**, **Ethernet II**, and then **Ethernet SNAP**.

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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:

- Adopt Windows 2000 Server and the Active Directory service.
- Reduce directory management through two-way synchronization.
- 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:

- Consolidate directory management when multiple directories are required.
- Manage accounts from either directory.
- 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 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 today. 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 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 need to adapt the guidelines to suit your environment and goals.

## Small Environment

A small company with a LAN-based and uncomplicated network is often a likely candidate for a quick migration. After doing all the preparations described in the above 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 comes with your operating system software).
3. Install the Novell Client for Windows 2000 from the Novell website (<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 \\<Dellxxxxxxx>\DomainUtils, where <Dellxxxxxxx> is the name of the PowerVault 715N system.

6. Log on to the NDS tree or bindery server as administrator.
7. Log on 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 into 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 **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 select **custom object mapping**, you are prompted to manually establish one-to-one relationships between pairs of objects.

1. Click **Finish**.

After the user accounts are migrated, you can migrate the file system (migrating the users before the files allow you to migrate file-system permissions). Follow the instructions as described in the Help printout, "To migrate files." The prompts guide you through the following steps:

- To start the File Migration Utility, click the **Start** button and point to **Programs—> Administrative Tools—> File Migration Utility**.
- To view mapping relationships, click **View Maps**.
- To view mapped access rights for the users, groups, organization units, and organizations to be migrated, click **Access Rights**.

The **NDS Modify** right converts, by default, to **Read** because it does not have an equivalent NFS right. You might want to click the **Write** check box to allow read/write access.

- On the **Step 2 — Security Accounts** tab, verify that you are logged on with the correct Active Directory, NDS, or Bindery credentials.
- 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 indicates **Unavailable**, then you are not currently logged on to that tree or Bindery server. Log on, and then press <F5> after reselecting the volume to view the directories within the displayed volume.

- On the **Step 4 — Log File** tab, select your logging options, and then click **Next**.
- 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 respectively under **NetWare scan logs** and **Windows scan logs**. 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.

- 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 the users know how to handle their password the first time they log on (for possible password options, see "MSDSS Password Management" in "MSDSS Deployment: Understanding Synchronization and Migration") at <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 comes with your operating system software).
3. Install the Novell Client for Windows 2000 from the Novell website <http://www.novell.com/download/>.
4. Install MSDSS from the PowerVault 715N system **DomainUtils** share.



**NOTE:** To access MSDSS software, map a network drive to \\<Dellxxxxxxx>\DomainUtils, where <Dellxxxxxxx> is the name of the PowerVault 715N system.

5. Log on to the NDS tree or Bindery server with administrative credentials.
6. Log on 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 **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 (for NDS only) click **Custom**, 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.
    - i. 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 (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:
  - 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).
  - 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.

- 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.
- 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 <http://support.novell.com/servlet/Knowledgebase> and the Windows 2000 website at <http://www.microsoft.com/windows2000>.

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## Using Secured Socket Layers

This section explains how secured socket layers (SSL) are used in the NAS appliance. 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 that is 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 a Secure Sockets Layer (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 (CA). 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 715N Certificate

By default, the PowerVault 715N 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 CA is present in the network, the administrator can choose to change the default PowerVault 715N certificate. The administrator must use the wizards to first request a certificate, and then apply it to the appliance.



## Obtaining a Server Certificate From a Certification Authority

 **NOTE:** If you are replacing your current server certificate, the Internet Information Services (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. On the PowerVault NAS Manager primary menu, click **Maintenance**.
2. On the **Maintenance** page, click **Terminal Services**.
3. Log on to a Terminal Services Advanced Client session.
4. In the **Advanced Administration Menu**, click **System Management**, and then from the list, click **Internet Information Services**.
5. Navigate to and right-click the **Administration site** section, 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 CA 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 Services online help.

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## SNMP Considerations

Your NAS appliance uses the simple network management protocol (SNMP). The NAS Manager provides a method for configuring the community and agent properties.


### Configuring SNMP Community Properties


1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log in to the Terminal Services session.
4. Click the **Advanced Administration Tool** icon to access the **Advanced Administration Menu**.
5. From the **Advanced Administration Menu**, select **System Management**, and click **Computer Management**.
6. From the **Computer Management** console tree, click **Services and Applications**.
7. Click **Services**.
8. In the details pane, right-click **SNMP Service**.
9. From the **Action** menu, click **Properties**.


10. From the **Security** tab, click **Send authentication trap**.

Select this option if you want a trap message sent when authentication fails.

11. Select **Accepted community names**, and click **Add**.
12. Select **Community Rights**, and select a permission level for this host to process SNMP requests from the selected community.
13. To view a description of a dialog box item, right-click the item, and then click **What's This?**
14. In **Community Name**, type a case-sensitive community name, and then click **Add**.
15. In **SNMP Service Properties**, specify whether to accept SNMP packets from a host:
  - To accept SNMP requests from any host on the network, regardless of identity, click **Accept SNMP packets from any host**.
  - To limit acceptance of SNMP packets, click **Accept SNMP packets from these hosts**, click **Add**, type the appropriate host name, Internet protocol (IP) or Internetwork Packet eXchange (IPX) address, and then click **Add** again.


 **NOTE:** You can make changes to an entry by clicking the entry, and then clicking **Edit**. You can delete a selected entry by clicking **Remove**.

 **NOTE:** If you remove all the community names, including the default name `public`, SNMP does not respond to any community names presented. You can add additional community and host names as necessary.

 **NOTE:** If you change existing SNMP settings, your changes take effect immediately. You do not need to restart the SNMP service for your settings to take effect. If you are configuring SNMP for the first time, you must restart SNMP before the settings take effect.

## Configuring SNMP Agent Properties

1. On the NAS Manager primary menu, click **Maintenance**.
2. Click **Terminal Services**.
3. Log in to the Terminal Services session.
4. Click **Advanced Administration Menu**.
5. At the **Advanced Administration Menu**, select **System Management**, and click **Computer Management**.
6. Click **Services and Applications**.
7. Click **Services**.
8. In the details pane, right-click **SNMP Service**.
9. From the **Action** menu, click **Properties**.
10. Select the **Agent** tab, then select **Contact**, and type the name of the user or system administrator.
11. Select **Location**, and then type the physical location of the system or the contact.
12. In the **Service** panel, select the appropriate check boxes for this system, and then click **OK**.
13. To view a description of a dialog box item, right-click the item, and then click **What's This?**

 **NOTE:** If you change existing SNMP settings, your changes take effect immediately. You do not need to restart the SNMP service for your settings to take effect. If you are configuring SNMP for the first time, you must restart SNMP before the settings take effect.

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## Using Console Redirection

Console redirection allows you to maintain a NAS appliance from a client system by re-directing keyboard input and text output through the serial port. Graphic output is not redirected. This section describes the simplest connection possible: connecting to a system with a null modem cable.

## Minimum Hardware and Connection Requirements

To use console redirection, you must have the following ports:

- An available serial port (COM port) on a client system. (This port must not conflict with any other ports on the system.)
- Available serial port 1 (COM 1) on the NAS appliance.



**NOTE:** Console Redirection is enabled by default in the NAS appliance BIOS.

- A null-modem cable to connect the server to the client system.

## Setting Up Console Redirection

To set up console redirection to manage your NAS appliance, perform the following steps:

1. Using a null-modem serial cable, connect the client system to the NAS appliance.
2. Turn on the client system and set up a Hyperterminal connection.
  - a. Click the **Start** button and point to **Programs—>Accessories—>Hyperterminal—>Hyperterminal**.
  - b. Select **115200** for the **Bits per second**, **8** for **Data Bits**, **None** for **Parity**, **1** for **Stop Bits**, and **Xon\Xoff** for **Flow control**.
3. Restart the NAS appliance.

You can now use your client system to manage your NAS appliance. If you need to configure your BIOS settings, see "Entering the BIOS Setup Utility" in your *User's Guide*.

## Navigating With Console Redirection


Because of ANSI limitations, not all keys can be used with console redirection. [Table 6-2](#) shows keystroke combinations used for the version of Windows on your client system.

**Table 6-2. Console Redirection Keys**


Normal Keys (As They Appear on the Keyboard)	Keys Used for Windows 2000 Prior to Service Pack 2	Keys Used for All Other Windows Operating Systems
Home	<Esc><h>	<Esc><h>
End	<Esc><k>	<Esc><k>
Insert	<Esc><+>	<Esc><+>
Delete	<Esc><->	<Esc><->
Page Up	< Esc><?>	<Page Up>
Page Down	<Esc></>	<Page Down>
F1	<Esc><1>	<F1>
F2	<Esc><2>	<F2>
F3	<Esc><3>	<F3>
F4	<Esc><4>	<F4>
F5	<Esc><5>	<Esc><5>

F6	<Esc><6>	<Esc><6>
F7	<Esc><7>	<Esc><7>
F8	<Esc><8>	<Esc><8>
F9	<Esc><9>	<Esc><9>
F10	<Esc><0>	<Esc><0>
F11	<Esc><!>	<Esc><!>
F12	<Esc><@>	<Esc><@>
Up arrow	<Esc><w>	Up arrow
Right arrow	<Esc><a>	Right arrow
Left arrow	<Esc><d>	Left arrow
Down arrow	<Esc><x>	Down arrow
<Ctrl><Alt><Delete>	<Esc><Shift><r> <Esc><r> <Esc><Shift><r>  OR  <Esc><Shift><b>	<Esc><Shift><r> <Esc><r> <Esc><Shift><r>  OR  <Esc><Shift><b>

## Defragmenting a Volume Containing Persistent Images

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

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

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

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

1. On the NAS Manager primary menu, click **Disks**.
2. Click **ActiveArchive**.
3. Click **Schedules**.
4. Select a scheduled persistent image, and then click **Delete**.
5. Repeat until all scheduled persistent images are deleted.
6. Click **Back**.
7. Click **Persistent Images**.
8. Select a persistent image, and then click **Delete**.
9. Repeat until all persistent images are deleted.
10. Click **Maintenance**.
11. Click **Terminal Services**.
12. Log on to the system.
13. Click **Exit** to close the **Advanced Administration Menu**.
14. Double-click **My Appliance**.
15. Right-click the drive you are going to defragment.
16. 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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# Troubleshooting

## Dell™ PowerVault™ 715N NAS Appliance System Administrator's Guide

[Troubleshooting Tools and Techniques](#)

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## Troubleshooting Tools and Techniques

Because the Dell™ PowerVault™ 715N NAS Appliance is a "headless" system that does not have a keyboard, mouse or monitor, you must use other methods for troubleshooting issues and conditions. This section provides suggestions for and information about alternate troubleshooting tools and techniques.

### Console Redirection

Console redirection allows you to directly attach a client system to the NAS appliance for local management and troubleshooting. For more information about console redirection, see "[Using Console Redirection](#)" in the "[Advanced Features](#)" section.

### Serial Connection

You can directly attach a client system to your NAS appliance using a serial cable and the administration port to configure or troubleshoot your NAS appliance. For more information about using a serial connection, see "[Configuring Your System Using a Serial Connection](#)" in the "[Introduction](#)" section.

### Ping Your NAS Appliance

If you are unable to connect to the NAS appliance using the NAS Manager, try to ping the appliance. From a client system, click the **Start** button and click **Run**, and then type `cmd`. At the command prompt in the `cmd.exe` window, type `ping <system_name>`, and then press <Enter>. If you can ping the NAS appliance but cannot access it through the NAS Manager, your NAS appliance might still be booting into Microsoft® Windows® and might not have started the Microsoft Internet Information Services (IIS).

### My Network Places

If you have a Windows 2000 client system on the same subnet as the NAS appliance, double-click My Network Places. Browse through the network and locate your NAS appliance.

### System LEDs and Beep Codes

If your NAS appliance 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*.

### Terminal Services

You can use the Terminal Services Client to directly connect to your NAS appliance from a client system. Run Terminal Services Client, type the server name of your NAS appliance in the **Server** text box, and then click **Connect**.

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## Troubleshooting Issues

Use the following tables to help you troubleshoot various conditions that might occur on your NAS appliance.

## General

**Table 7-1. General Troubleshooting Issues**

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.	Exit from Terminal Services, and then reconnect. The volume should now be visible.
I am trying to select the <b>Administer My Appliance</b> link on the opening page of the PowerVault NAS Manager, but the link does not function properly.	The user account that you used to log on to the domain does not have administrator privileges. The link does not work for people without administrator privileges.	Type the address of the PowerVault NAS Manager manually in your browser. For non-SSL connections, type: <code>http://&lt;server-name or IP address&gt;:1278</code> . For SSL connections, type: <code>https://&lt;server-name or IP address&gt;:1279</code> .
I have just deleted a volume, and now I am unable to view my shares in the Dell PowerVault NAS Manager.	In the event that a volume with shares is deleted, PowerVault 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 PowerVault NAS Manager, and restart the system. The shares should now be visible.
I have just added an HTTP share but cannot see it from PowerVault 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 for security purposes.	To enable directory sharing for an HTTP share, from the PowerVault NAS Manager <b>Maintenance</b> page, click <b>Terminal Services Advanced Client</b> , and then modify the Web sharing properties of the folder.
I have just changed the IP address of my system, and now I cannot administrate it through PowerVault NAS Manager.	Although the IP address changed, your local host is still trying to communicate with the system using the old IP address.	Close Microsoft Internet Explorer (or for Linux only, Netscape 6.1 or later). Restart the PowerVault NAS Manager.
In PowerVault 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.
I see the following error message in the event log: WMI ADAP was unable to load the winspool.driv 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 syntax: <code>WINMGMT/CLEARADAP</code> . When the prompt returns, type: <code>WINMGMT/RESYNCPERF winmgmt service PID</code> .
When I select the <b>Check All</b> box, and then deselect one or more choices on some screens in the PowerVault NAS Manager, the <b>Check All</b> box remains selected	The <b>Check All</b> box does not automatically deselect, which does not indicate 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 PowerVault NAS Manager does not automatically refresh the account information for the administrator while in the PowerVault NAS Manager. Instead, it does the refresh as a timed function.	The password was successfully changed. If you want to confirm that the new password is in affect, close the browser, and then reconnect. The new password should work, but the old one should not.
I have just brought up my new NAS appliance 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 get to the MMC, click

		<b>Computer Management</b> on the <b>PowerVault 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 appliance. 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 PowerVault NAS Manager.	Manually remove this listing from the listed shared folders in the FTP section of the MMC.
I am looking for a topic on the context sensitive online help in the PowerVault NAS Manager, but it says No Topic Available.	Some sections of the PowerVault NAS Manager do not have context sensitive help.	For information relating to 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 PowerVault NAS Manager, but I received an error message and the log was not cleared.	The logs are currently locked by the NAS appliance for the FTP service and to support the PowerVault NAS Manager. The logs cannot be cleared in the PowerVault NAS Manager.	Connect to the NAS appliance using Terminal Services and clear these logs 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 in the <b>General</b> area and the page did not refresh properly.	Select <b>Cancel</b> or click <b>Back</b> on your browser. Next, reselect the user for whom you wanted to view properties.
I added members to a local group using the PowerVault 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 might cause the screen to refresh instead of update correctly.	Reselect the <b>Local Groups</b> tab in the PowerVault NAS Manager primary menu. Next, add or remove the appropriate members to or from the local group.
Console redirection shows that the dynamic host control protocol (DHCP) is available, but DHCP exits without getting an IP address	The Kick-Start utility DHCP option might not be enabled.	Ensure that the Kick-Start utility DHCP option is enabled.
The DHCP gets an IP address, and then displays MTFTP 224.0.1.2 followed by BD . . . .	The PXE service could not be contacted.	Stop, and then restart the PXE service.
Console redirection displays the message Can not find connection to the computer.	The Windows 2000 client system <b>PV715REC</b> is not available.	Ensure that the Windows 2000 client system with the system name <b>PV715REC</b> is available.
Console redirection displays the message Access denied.	The user named <b>PV715</b> might not exist or the incorrect password might have been used.	Ensure that the user named <b>PV715</b> exists and the password is <code>password</code> .
Console redirection displays the message File not found.	The <i>Reinstallation</i> CD might not be available or shared.	Ensure that the <i>Reinstallation</i> CD is inserted into the client system's CD drive and that the CD drive has been shared.
The BIOS does not see hard drive 0 because the hard drive has failed.	The hard drive has failed or the operating system files or boot record is missing or corrupt.	No immediate action is required. The NAS appliance can automatically boot from hard drive 1.
Hard disk 0 has failed, and I need to replace it with a new hard drive.	The hard drive has failed or the operating system files or boot record is missing or corrupt	Follow the steps in " <a href="#">Replacing Hard Drive 0</a> " in the " <a href="#">Advanced Disk and Volume Management</a> " section.
Hard disk 1, 2, or 3 has failed, and I need to replace it with a new hard drive.	The hard drive has failed or the operating system files or boot record is missing or corrupt	Follow the steps in " <a href="#">Replacing Hard Drive 1, 2 or 3</a> " in the " <a href="#">Advanced Disk and Volume Management</a> " section.
My NAS appliance lost power. When I turned it	During an unexpected	Take no action. Your NAS appliance is



<p>on and it came back up, I had to wait to access it. The system appeared to regenerate the RAID 5 and RAID 1 volumes.</p>	<p>shutdown and reboot, the NAS appliance cannot tell whether one or more write failures occurred. Therefore, following the reboot, the NAS appliance does a rebuild on all volumes and regenerates parity to make sure the files are consistent.</p>	<p>functioning as designed.</p>
<p>I inserted four new hard drives in the NAS appliance, and then reinstalled the operating system. The NAS appliance is up and running, and the LEDs are showing activity on the system. However, the NAS appliance does not display in the <b>Kick-Start utility</b> window.</p>	<p>The last step of the reinstallation process is to create the recovery partition and the data volume as RAID 5. The system does not display in the <b>Kick-Start utility</b> window until the RAID 5 synchronization is complete.</p>	<p>Wait until the RAID 5 synchronization is complete. You can check the current status of the RAID 5 synchronization by using the NAS Manager. On the NAS Manager primary menu, click <b>Disks</b>.</p>
<p>I cannot connect to or ping the NAS appliance after turning it on.</p>	<p>Hard drives 0 and 1 have failed or the operating system files or boot record are missing or corrupt.</p>	<p>Use one of two resolutions:</p> <ul style="list-style-type: none"> <li>• Swap hard disks 0 and 1 with hard disks 2 and 3. When your NAS appliance is running, follow the steps in "<a href="#">Re-establishing the Recovery Partition</a>" in the "<a href="#">Advanced Disk and Volume Management</a>" section.</li> <li>• Connect a client system to the NAS appliance using a null-modem cable. Reboot the NAS appliance, press &lt;F2&gt;, and then select <b>2 Factory Default Settings</b> from the menu. After the NAS appliance is running, follow the steps in "<a href="#">Re-establishing the Recovery Partition</a>" in the "<a href="#">Advanced Disk and Volume Management</a>" section.</li> </ul>
<p>After performing the steps in one of the two procedures in the previous troubleshooting issue that are required to re-establish the recovery operating system, I still cannot connect to or ping the NAS appliance.</p>	<p>Your hard drive main and recovery mirrors are not usable.</p>	<p>Perform the steps in "<a href="#">Reinstalling the PowerVault 715N Operating System</a>" in the "<a href="#">Advanced Disk and Volume Management</a>" section. If you have a backup of your data, restore it. If a backup is not available but your data was in a RAID 5 configuration, follow the steps in "<a href="#">Recovering RAID 5 Data After Reinstalling the Operating System</a>" in the "<a href="#">Advanced Disk and Volume Management</a>" section.</p>
<p>After using Terminal Services to connect to my NAS appliance, I am unable to type using my native language.</p>	<p>The NAS appliance is set to English, the default language.</p>	<p>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>."</p>
<p>I cannot get console redirection to work correctly. Only a few keys work on the keyboard and none of the keys work when trying to configure the BIOS.</p>	<p>&lt;Scroll Lock&gt; might be set on your keyboard.</p>	<p>Ensure the &lt;Scroll Lock&gt; light is turned off on the keyboard.</p>
<p>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.</p>	<p>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>.</p>	<p>To set the WINS addresses from the NAS Manager, click <b>Network</b> on the primary menu, click <b>Interfaces</b>, 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 <b>IP address</b>, <b>Subnet mask</b>, and the <b>Default gateway</b> in the appropriate</p>

		text boxes.
When I log on to the NAS appliance, the events are cleared from the log.	The Kick-Start utility clears the event logs when it runs.	If you have already configured the network settings on your NAS appliance, turn off the Kick-Start utility. As you shut down the Kick-Start utility, it asks you whether you want to run the Kick-Start utility automatically when the system starts. Select <b>No</b> .
From the NAS Manager primary menu, I click <b>Disks—&gt; Disk Quota</b> , click <b>Quota</b> in the <b>Tasks</b> list on the <b>Volumes and Quotas</b> page to open the <b>Default Quota for &lt;Volume_Name&gt;</b> page. I click <b>Enable quota management</b> , type a value in the text box and select a value from the drop-down menu in the <b>Set warning level to:</b> area, and then click <b>OK</b> . When I return to the <b>Default Quota for &lt;Volume_Name&gt;</b> page, the <b>Set warning level to:</b> text box is blank but the value in the drop-down menu is correct.	When you set the quota warning level, the level was actually set in the NAS appliance, even though the <b>Set warning level to:</b> text box is blank. This is a design issue that will be corrected in a later release.	Set the quota warning level to the value you want.
I have just installed an application on my NAS appliance by mapping a CD drive share from my appliance. Now it does not seem to reboot properly.	The NAS appliance is unsuccessfully trying to reconnect to the CD drive share.	Make sure that when you map a CD drive share, you do not select <b>Reconnect at logon</b> . Otherwise, you should unmap the CD drive share by opening your Windows Explorer, clicking <b>Tools —&gt; Disconnect Network Drive</b> , selecting the CD drive share, and then clicking OK.
The <b>Telnet</b> option in the NAS Manager does not allow me to enable Telnet on the NAS appliance, even though I have enabled the check box next to <b>Enable Telnet access to this appliance</b> on the <b>Telnet Administration Configuration</b> page.	This option is not enabled. This is a design issue that will be corrected in a later release.	To enable Telnet on your NAS appliance, perform the following steps: <ol style="list-style-type: none"> <li>1. From the NAS Manager primary menu, click <b>Maintenance—&gt; Terminals Services</b>.</li> <li>2. Log on to the NAS appliance as an administrator.</li> <li>3. If it is displayed, click <b>Exit</b> to close the <b>Advanced Administrator Menu</b>.</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—&gt; Services</b>.</li> <li>7. Locate and right-click <b>Microsoft Telnet Services</b>, and then click <b>Start</b>.</li> </ol> <p>Telnet starts on the NAS appliance.</p>

## Dell OpenManage Kick-Start Utility

**Table 7-2. Dell OpenManage Kick-Start Utility Troubleshooting Issues**

Issue	Possible cause	Resolution
The NAS appliance does not have a diskette drive; however, the Dell OpenManage™ Kick-Start utility's help files refer to diskettes and to a <b>Write Diskette</b> button. Also, the Kick-Start utility has a <b>Write Diskette</b> button.	The Kick-Start utility is designed to be used on several different systems, some of which support diskette drives. The PowerVault 715N NAS Appliance does not have or support diskette drives.	Ignore the references to diskettes and the <b>Write Diskette</b> button in the help files. Do not use the <b>Write Diskette</b> button.
After I enter the information required in the <b>Step3: Enter Configuration Information</b> window of the Kick-Start utility	If you do not enter all of the necessary information or if you enter a password that is too short, the Kick-	Fill in all the necessary information or type a longer password. The password must contain at least six characters.

running locally on my appliance, I click <b>Next</b> , and nothing happens.	Start utility ignores <b>Next</b> and waits until you complete the page properly.	
I configured the system using the Kick-Start utility, and I cannot open the PowerVault NAS Manager using a browser.	The system might not be connected to the network, or the network settings might not be correct.	Make sure that the system is connected to the network. If it is, then ensure that you entered a correct IP address in the <b>Kick-Start Application</b> menu. If the problem persists, use the serial port, as described in "Configuring Your System Using a Serial Connection" in the <i>User's Guide</i> , to access the PowerVault NAS Manager, and then ensure that the configuration settings are correct.

## Dell ActiveArchive

**Table 7-3. Dell ActiveArchive Troubleshooting Issues**

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 <b>ActiveArchive</b> folders through the Windows client to perform data recovery.
The <b>XCOPY</b> command does not copy my persistent images.	Dell ActiveArchive is enabled. <b>XCOPY</b> cannot read the persistent images on a volume.	Do not use <b>XCOPY</b> to copy persistent images.
After I take a new persistent image, the definition of the persisting image is blank or the persistent image does not show at all in the persistent images list.	If this is the first persistent image to be taken, Dell ActiveArchive is creating the cache file, which could take several minutes. If this is not the first persistent image, 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 appliance to access them.
My persistent images do not survive when I change the disk type from <b>Basic Disk</b> to <b>Dynamic Disk</b> .	All persistent images must be deleted before changing the disk type.	Delete all persistent images, and then change the disk type.
The % symbol does not show in the Dell ActiveArchive event logs.	The Dell 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 that do not include the % symbol.	Take no action. Your NAS appliance is functioning as designed.
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, Dell 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 the existing persistent image is a higher-priority persistent image.	Take no action. Dell ActiveArchive is functioning as designed.

I cannot see my persistent images.	Persistent images reside in the <b>ActiveArchive</b> directory, which is a hidden folder.	Configure your system to view hidden files and folders.
I cannot take persistent images of my file system.	The cache file is still being created.	Wait until the cache file is created, and then attempt to take the persistent image again. To confirm that the persistent image cache file has been created, check the <b>Status Area</b> of the <b>ActiveArchive</b> section of the PowerVault NAS Manager.
I cannot take persistent images of my file system.	The cache file is full.	Delete one or more persistent images until sufficient space is free in the cache file to create the additional persistent images.
I cannot take a persistent image of my C: or D: drive.	A persistent image cannot be taken of the C: or D: drive.	Taking a persistent image of the C: or D: drive is not supported.
I notice that the date and time for the <b>ActiveArchive</b> directory changes every time I reboot my NAS appliance.	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 Dell 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 PowerVault 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.

## Dell OpenManage Array Manager

**Table 7-4. Dell OpenManage Array Manager Troubleshooting Issues**

Issue	Possible cause	Resolution
Two of the IDE hard drives show as SCSI drives in the <b>Dell OpenManage Array Manager</b> window.	Your NAS appliance only supports IDE hard drives. The system is reporting the hard drive type incorrectly.	Take no action. This is a design issue that will be addressed in a later release.

## UNIX and Red Hat Linux

**Table 7-5. UNIX and Linux Troubleshooting Issues**

Issue	Possible cause	Resolution
I am unable to manage my disks and volumes from my Linux clients or from clients running the Netscape browser.	Managing disks and volumes from a Linux client or from any client that is running Netscape as its only browser is not supported.	Use a Windows client system with Internet Explorer 5.01 or later to manage your disks and volumes.
I cannot access the Terminal Services Advanced	The Terminal Services Advanced Client is not supported by the Linux operating system. It cannot work with the NAS Manager.	Use a Windows client system to manage the NAS appliance using a Terminal Services

Client through the NAS Manager from my Linux client system using the Netscape browser.		Advanced Client session.
I have just changed the IP address of my system, and now I cannot administrate it through PowerVault NAS Manager.	Although the IP address changed, your local host is still trying to communicate with the system using the old IP address.	For Linux only, close Netscape 6.1 or later. Restart the PowerVault NAS Manager.
While updating client access to an NFS share, the option to select <b>No Access</b> is displayed, but the option to select <b>Root</b> 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 has to do with 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 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 is by default <b>Everyone</b> with <b>Full Control</b> . When an NFS client creates a directory or a file in this directory (mounted share), the 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 possibly 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 you 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.

## Macintosh and AppleTalk

**Table 7-6. Macintosh and AppleTalk Troubleshooting Issues**

Issue	Possible cause	Resolution

I am getting event errors for Services for Macintosh.	Services for Macintosh are bound to the onboard network interface card (NIC) by default. If this NIC has been disabled, binding errors occur.	Bind the AppleTalk protocol to an enabled NIC. See "AppleTalk Protocol Adapter Binding."
From a Macintosh client, users cannot modify or delete a file that a Windows client has accessed.	The time is not properly synchronized between clients and the system.	Make sure that clients have their time synchronized within 10 minutes relative to the time zone.
I have rebooted my NAS appliance from a Macintosh client. Several minutes have passed and my NAS appliance has not rebooted or the page has not refreshed.	The most likely cause is that the NAS appliance has come back online but the client screen has not refreshed, because the PowerVault NAS Manager does not automatically refresh the screen when the NAS appliance has finished rebooting.	Close Internet Explorer, and then reconnect to the NAS Manager. The NAS appliance should behave normally.
From a Macintosh client, I cannot connect to the administration part of the PowerVault NAS Manager 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 appliance using the address <b>HTTP://&lt;servername&gt;:1278</b> ; however, this is a nonsecure link.

## Netscape Navigator

**Table 7-7. Netscape Navigator Troubleshooting Issues**

Issue	Possible cause	Resolution
I am unable to manage my disks and volumes from clients running the Netscape browser.	Managing disks and volumes from any client that is running Netscape as its only browser is not supported.	Use a Windows client system with Internet Explorer 5.01 or later to manage your disks and volumes.
I cannot use the <b>Back</b> button in Netscape Navigator for the online help in the PowerVault 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 PowerVault NAS Manager using Netscape Navigator on 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 does not be displayed in the future.
I am using Netscape Navigator to administer my NAS appliance through the PowerVault 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>• Wait for the page to finish loading.</li> <li>• Refresh the page several times.</li> </ul>

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