

Novell Open Enterprise Server

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NETWARE® GATEWAY
ADMINISTRATION GUIDE



Novell®

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About This Guide

This guide describes how to install and use the NFS* Gateway on NetWare® 6.5.

- Chapter 1, “Overview,” on page 7
- Chapter 2, “Installing and Setting Up the NFS Gateway,” on page 11
- Chapter 3, “Migrating NFS Gateway Shadow Files,” on page 19
- Chapter 4, “Showmount Utility for NetWare,” on page 21
- Chapter 6, “Managing NFS Gateway Volumes,” on page 25
- Chapter 7, “iManager-Based Administration,” on page 45
- Chapter 9, “Cluster-Enabling the NFS Gateway for NetWare 6.5,” on page 55
- Chapter 8, “Performance Tuning,” on page 49
- Chapter 10, “Interoperability,” on page 59
- Chapter 11, “Troubleshooting the NFS Gateway for NetWare 6.5,” on page 61
- Chapter 12, “NFS Gateway for NetWare 6.5 FAQs,” on page 65
- Chapter 13, “Error Messages,” on page 77

Audience

The guide is intended for both users and network administrators

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html and enter your comments there.

Documentation Updates

For the most recent version of the *XYZ Guide*, visit the [XYZ Web site \(http://www.novell.com/documentation/gw65\)](http://www.novell.com/documentation/gw65).

Additional Documentation

For documentation on other DirXML drivers, see the [Identity Manager Documentation Web site \(http://www.novell.com/documentation/lg/dirxmldrivers/index.html\)](http://www.novell.com/documentation/lg/dirxmldrivers/index.html).

Documentation Conventions

In Novell documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

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When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as Linux or UNIX, should use forward slashes as required by your software.

Overview

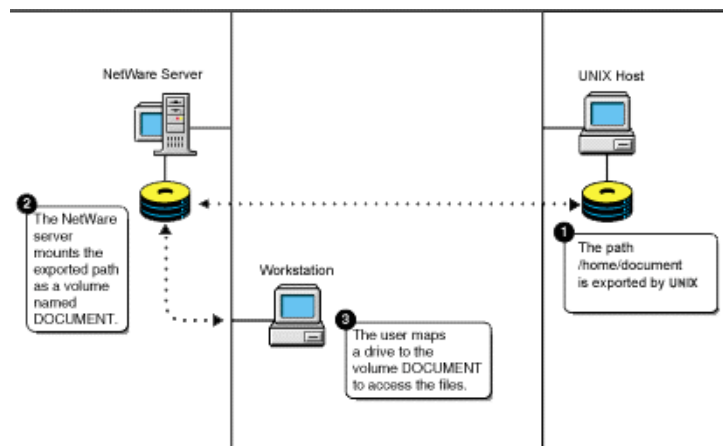
1

The NFS Gateway enables NetWare® servers to mount NFS file systems as virtual Novell Storage Services™ (NSS) volumes. Using the NFS Gateway, NetWare clients can transparently access files and directories on any NFS server system on the network.

The NFS Gateway is a Loadable Storage Services (LSS) module for NSS 3.x file systems on NetWare 6.5. The NFS Gateway mounts a shared UNIX directory as an NSS volume for NetWare users. The NFS Gateway for NetWare 6.5 has been redesigned to take advantage of the file system interface provided by NSS. This file system interface is crucial to the functioning of the NFS Gateway.

The following figure illustrates the NFS Gateway functionality.

Figure 1-1 NFS Gateway File Sharing Process



The communication between NFS Gateway and UNIX machines is over the NFS protocol. Both NFS version 2 and NFS version 3 are supported over UDP.

1.1 What's New

- Files and directories with Extended Attributes on the gateway volume are now supported. All file operations are now allowed on the files and directories having Extended Attributes. Attribute Shadow file has changed for this purpose.

Any existing shadow files in the system need to be migrated to this new format before using NFS Gateway.

For details, see [Chapter 3, “Migrating NFS Gateway Shadow Files,” on page 19.](#)

- By default, NFS gateway mounts a volume as read/write volume even if the remote NFS server exports the path as read only.

1.1.1 Features Available with this Product and NFS Gateway for NetWare 6

- The NFS Gateway has been completely redesigned for better performance and reliability.

For details of performance tuning, see [Chapter 8, “Performance Tuning,” on page 49](#).

For this release, the default values are tuned for NFS version 3 performance. However, if you use NFS version 2, then you must tune gymount parameters to avoid delays and timeout failures. For more details, see [Section 8.3, “Tuning for NFS Version 2,” on page 50](#).

- It has better scalability when compared to the existing NFS Gateway on NetWare 5.1.
- It incorporates the changes in the LSS interface for NSS 3.x.
- It is now SMP enabled.
- It provides dynamic mounting and dismounting of Gateway volumes over the UDP protocol.
- NFS Gateway volumes can be accessed through CIFS clients.

For details, see [Section 6.8, “Accessing NFS Gateway Volumes as CIFS Users,” on page 42](#).

- It provides interoperability with different flavors of NFS servers that are widely used in various user environments.

For details, see [“Interoperability” on page 59](#).

- File I/O handling is improved. All file I/O errors are now reported to the users connected through NCP™.
- Symbolic and hard links are now supported.
- Unicode* character support is enabled.
- The NFS Gateway is cluster-enabled for high availability and load balancing.

For details, see [Chapter 9, “Cluster-Enabling the NFS Gateway for NetWare 6.5,” on page 55](#).

- The logging feature enables viewing errors, information on the current operation, and warning messages.

The log messages specific to each volumes are saved as *shadowVolume/gateway/volumename.log*, where the shadowVolume is the volume used to store the shadow files and *volumename* is the volume specified in the gymount.

The general log messages for NFS Gateway are saved as *shadowVolume/gateway/system.log*, where the shadowVolume is the volume specified in the -shadowVolume parameter of nfs-gy.

For details, see [“logFileSize” on page 17](#), [“logLevel” on page 17](#), [“logVerbose” on page 17](#), and [“logFlushImmediate” on page 17](#).

- You can use the iManager-based administration utility to administer NFS Gateway.

For details, see the [Chapter 7, “iManager-Based Administration,” on page 45](#).

- You can upgrade this product from NFS Gateway for NetWare 6 to NFS Gateway for NetWare 6.5.
- Dynamic configuration is supported for both the nfs-gy and gymount parameters.

For details, see [Section 2.7, “Dynamically Configuring NFS Gateway Parameters,” on page 17](#) and [Section 6.6, “Dynamically Configuring NFS Gateway Volume Parameters,” on page 41](#).

- For Gateway volumes, you can specify whether or not to dynamically set RPC timeouts and maximum outstanding packets based on network behavior.

For details, see [dynamicRPCTimeout | noDynamicRPCTimeout](#) and [dynamicMOP | noDynamicMOP](#).

- The showmount utility for NetWare lets you view the list of exported and mounted paths.

For details, see [“Showmount Utility for NetWare” on page 21](#).

- For Gateway volumes, you can specify whether or not the NFS requests are enforced to go with anonUid and anonGid.

For details, see [forceAnonUidGid | noForceAnonUidGid](#).

- NFS Gateway for NetWare 6.5 has an install, which provides
 - A prompt to accept the product license.
 - Identifies the existence of this product and prompts for confirmation before overwriting .
 - Modifies btrieve configuration files for optimal performance of NFS Gateway
 - File backup support.
 - File restoration during uninstall.

For details, see [Section 2.2, “Installing the NFS Gateway,” on page 11](#).

1.2 What's Not Supported

- The NFS Gateway does not support NFS and the mount protocol over TCP.
- The NFS Gateway does not support the Network Lock Manager protocol and sparse files, so database files are also not supported.
- SUID is not supported.

For example, if the SUID bit is set for the executable file, then the files and directories created using this executable do not have the UID of the executable, but they will have the UID of the user who executes the executable file.

Installing and Setting Up the NFS Gateway

2

Perform the following tasks to set up the NFS Gateway:

1. [Meeting System Requirements \(page 11\)](#)
2. [Installing the NFS Gateway \(page 11\)](#)
3. [Configuring NFS Gateway for the First Time \(page 13\)](#)
4. [Loading the NFS Gateway \(page 14\)](#)
5. [Managing NFS Gateway Parameters \(page 15\)](#)
6. [Dynamically Configuring NFS Gateway Parameters \(page 17\)](#)
7. [Unloading the NFS Gateway \(page 18\)](#)

2.1 Meeting System Requirements

- Install NetWare® 6.5 Support Pack 2 and ensure that Native File Access for UNIX is installed.
- Make sure there is a minimum of 32 MB RAM to load the NFS Gateway with default parameter values.
- Make sure there is adequate free space on the volume where the shadow files are to be stored.
To determine free space requirements, refer to [Step 3c on page 14](#) in [Section 2.4, “Configuring NFS Gateway for the First Time,” on page 13](#).
- To list a large directory (typically with more than 30,000 entries), increase the shadowCacheSize parameter value.

For more information, refer to [Section 2.6, “Managing NFS Gateway Parameters,” on page 15](#).

2.2 Installing the NFS Gateway

After meeting the system requirements, you can proceed to install the NFS Gateway.

The NFS Gateway product upgrade from NetWare 6 Support Pack 3 to NetWare 6.5 Support Pack 2 is supported.

However, if you have a version of the gateway previous to NetWare 6 Support Pack 3, then you still need to reinstall the NFS Gateway because an NFS Gateway upgrade from NetWare 5.1 to NetWare 6.5 is not supported.

To install the NFS Gateway:

- 1 Stop the NFS services.
 - 1a Enter the nfsstop command at the console prompt.
 - 1b Unload nfsadmin and pkernel by entering the following commands at the console prompt:

```
unload nfsadmin
unload pkernel
```

- 2** Install the NFS Gateway using either NWCONFIG or the GUI install utility.
 - 2a** Select Install a Product Not Listed.
 - 2b** From the options displayed, select Press <F3> to Specify a Different Path.
 - 2c** Specify the directory path where you extracted the NFS Gateway package and where the product.ni is present.
Wait while the required installation files are copied.
 - 2d** On the Welcome page, click Next to display the License agreement.
 - 2e** Read and accept the license agreement.
 - 2f** Install the product license by browsing to or specifying the NFS Gateway license filename (*.nlf), then click Next.
or
Select Install without Licenses to proceed with the installation and install the license later by using either the NWADMIN utility or iManager.
 - 2g** Click Next, make sure that NFS Gateway for NetWare 6.5 is displayed, then click Finish.
Wait while the install copies new files and also backs up the existing files of Native File Access for UNIX.
To understand and resolve error messages displayed during the install, refer to install.txt located in the product installation directory.
 - 2h** (Conditional) If you have selected to install the product license in **Step 2f**, then on the authentication screen, provide the username (administrator or admin equivalent), password, and context.
This authenticates the administrator to the eDirectory™ tree where the license is to be installed.
 - 2i** Click View to read the Readme file, or click Close.
- 3** Installation of NFS Gateway Support Pack 1 for NetWare 6.5 automatically installs the latest NFS Gateway iManager plug-in or upgrades the existing plug-in. If the iManager version is 2.0.2, the NFS Gateway iManager plug-in is upgraded automatically. Restart the web server for the changes to take effect. If the iManager version is 2.5, the NFS Gateway iManager plug-in gets copied and the iManager home page displays the following note: "Notice: New iManager modules are available to install.". Click on the link and select NFSGYAdmin.npm to install.
To install the NFS Gateway plug-in (nfsgyadmin.npm located at NfsGy\tomcat\4\webapps\nps\packages of the product package) manually, complete the steps given in the [Downloading and Installing iManager Plug-in section of Novell iManager 2.x Administration Guide \(http://www.novell.com/documentation/lg/imanager20/imanager20/data/bnpta1r.html\)](http://www.novell.com/documentation/lg/imanager20/imanager20/data/bnpta1r.html).
For more information on administering the NFS Gateway using iManager, see **Chapter 7, "iManager-Based Administration,"** on page 45.
- 4** Restart the NetWare server.

2.3 Uninstalling the NFS Gateway

- 1** Stop the NFS Gateway using gystop.
- 2** Uninstall the NFS Gateway using either NWCONFIG or the GUI install utility.

2.4 Configuring NFS Gateway for the First Time

After you have installed the NFS Gateway, you need to configure it before using it. This section describes how to configure certain system settings for the NFS Gateway for the first time.

- 1 Change the bind order for the NetWare Server for NFS Gateway functionality.

Refer to [TID10070570 \(http://support.novell.com/cgi-bin/search/searchtid.cgi?/10070570.htm\)](http://support.novell.com/cgi-bin/search/searchtid.cgi?/10070570.htm), available at the Novell Support Web site.

- 2 (Conditional) The default value for the Largest UDP Packet Size parameter of NetWare is 33792. This is sufficient to read/write 32 KB of data to/from NFS Server. If your requirement is different from this, then set the value for the Largest UDP Packet Size parameter of NetWare based on the following guidelines:

- For the NFS Gateway, the following values are expected for Largest UDP Packet Size:
 - $4096 + 512 = 4608$ (minimum value expected for the NFS Gateway)
 - $8192 + 512 = 8704$
 - $16384 + 512 = 16896$
 - $32768 + 512 = 33280$

If you enter a value other than the valid values, but greater than 4609, then the nearest lower valid value is used.

For example, if you enter 7000, then 4608 is used.

- For calculating read/write transfer size, the NFS Gateway subtracts 512 bytes for the header from the Largest UDP Packet Size and uses the nearest 2^x value less than the result thus obtained.

IMPORTANT: Because the NFS Gateway uses the nearest 2^x value less than the value obtained after subtracting 512 from the Largest UDP Packet Size parameter, this can significantly reduce the read/write transfer size, if 512 is not added to the required parameter value.

For example, if Largest UDP Packet size = 16384, then the actual read/write transfer value used is 8192. This value (8192) is the 2^x value, nearest to $16384 - 512$.

Verify the readSize and WriteSize values used for a volume by entering the following at the system console prompt:

```
gymount -d -volparams [volumename]
```

-
- To modify the Largest UDP Packet Size parameter, load monitor.nlm, select Server Parameters > Communication, and then modify the parameter.

or

Enter the following command at the system console:

```
set largest UDP packet size = Required_read/write_size_value + 512>
```

- 3 The Btrieve* configuration file `sys:\system\bti.cfg` is updated with optimal values for Btrieve* settings during NFS Gateway installation. To modify the settings manually, follow the guidelines listed below.

3a Set the parameter `BalancedTrees = No`.

3b Increase the value of the `BackgroundThread` parameter.

This is to support large number of operations on a volume simultaneously.

For best performance, set this value based on the average number of mounted gateway volumes. A good standard to follow is to have four volumes for every I/O thread.

For example, if average number of mounted gateway volumes is 100, use $100/4 = 25$ I/O threads.

Specifying a value greater than 64 might negatively impact performance, but that depends on the system capabilities.

- 3c** Set the `cacheSize` parameter value (in KB) based on your requirements. This setting represents kilobytes (KB).

To determine your requirements:

- Estimate the **maximum shadow file size** of the shadow files for every volume.

Maximum Shadow File Size: The estimated size that the shadow file increases to, because of the directory operations.

For example, a volume with 50,000 entries will have a shadow file size of 94 MB. Use this benchmark to estimate the shadow file size.

- Calculate the **working data set size** for NFS Gateway.

Working Data Set Size: The sum of the **maximum shadow file size** of all gateway volumes active at any given time.

Refer to the following table for guidelines to set the `cacheSize` parameter based on your performance requirements.

Performance	CacheSize Value
Best	100% of the working data set size or 32768 KB (32 MB), whichever is greater.
Balanced	For good performance without excessive memory usage, use 20% to 30% of the working data set size or 32768 KB (32 MB), whichever is greater.
Minimum Requirement	10% of the working data set size or 32768 KB (32 MB), whichever is greater.

- 4** Make sure that system times of the NetWare server and the corresponding UNIX server are synchronized.

- 5** Restart the NetWare server for the btrieve configuration changes to take effect.

2.5 Loading the NFS Gateway

Text goes here

2.5.1 Using iManager

The NFS Gateway Properties page of iManager lets you start the NFS Gateway.

You can either modify the NFS Gateway properties or start with the default properties. For details, see [Section 7.2, “Modifying NFS Gateway Properties,” on page 45](#).

On the NFS Gateway Properties page, click Start to start the NFS Gateway.

The NFS Gateway status changes from Stopped to Running.

2.5.2 Using Gystart.ncf

- 1 (Optional) Customize `sys:\system\gystart.ncf`, which is the NetWare configuration file for the NFS Gateway, by adding additional parameters.

If you do not specify additional parameters, the NFS Gateway loads with default parameters.

For more information on the NFS Gateway parameters, refer to [Section 2.6, “Managing NFS Gateway Parameters,”](#) on page 15.

- 2 (Optional) Enable the NFS Gateway to mount a volume on startup by editing `sys:\system\gystart.ncf`.

Add the entry for `gymount` based on the example provided in `gystart.ncf`.

- 3 Start the NFS Gateway services by entering `gystart` at the console prompt.

2.6 Managing NFS Gateway Parameters

You can manager the NFS Gateway parameters using either iManager or the command line.

2.6.1 Using iManager

The NFS Gateway Properties page lets you view and edit the NFS Gateway general and log parameters.

For details, see [Section 7.2.4, “Viewing and Modifying the NFS Gateway Parameters,”](#) on page 46.

2.6.2 Using the Command Line

Use the following syntax at the command line to set the NFS Gateway parameters. These parameters apply to the NFS Gateway volumes mounted on the system.

```
nfsgy [-shadowCacheSize value] [-pageCacheSize value]
[-shadowVolume volumeName] [-logFileSize value] [-logLevel value] [-
logVerbose] [-logFlushImmediate]
```

Dynamic Configuration

The NFS Gateway supports dynamic configuration for certain parameters. This means that the changes made in these parameters are taken into effect automatically and there is no need to restart NFS Gateway for the changed parameters to take effect.

The following table describes the parameters. It also gives the default value and the valid range and mentions if dynamic configuration is supported for that parameter.

Parameter	Default	Description	Dynamic Configuration Support
shadowCacheSize	8	<p>Size of the shadow cache (in MB).</p> <p>Range = 8 to 32</p> <p>For improved performance, we recommend that you set the value to 32 MB.</p>	<p>Yes</p> <p>Can only be increased.</p>
pageCacheSize	8	<p>Size of the page cache (in MB).</p> <p>Range = 8 to system limit</p> <p>The maximum limit is based on the available system memory.</p> <p>For example, 8 MB of page cache size is adequate to hold up to 50,000 entries in a single directory. If the number of entries in a single directory is greater than 50,000, we recommend that you increase the pageCacheSize value.</p>	<p>Yes</p> <p>Can only be increased</p>
shadowVolume	sys:	<p>Specifies the name of the volume where shadow files are to be stored.</p> <p>The shadow files are stored in <i>shadowVolume</i>:\gateway directory.</p> <p>The shadow volume specified with the nsgy command is used if the <i>shadowVolume</i> parameter is not specified with the gymount command.</p> <p>The NFS Gateway does not load if the specified volume is not available.</p> <p>Do not use the mounted Gateway volumes as <i>ShadowVolume</i> when mounting another volume using gymount. For example, if vol1 is a mounted NFS Gateway volume, then do not execute the following:</p> <pre>gymount vol2 -shadowvolume vol1</pre> <p>When shadowVolume is not using the default of sys: and if the trustee information is lost when using a gateway volume in a cluster enabled environment, or using a newly mounted NSS volume as shadowVolume, then in the Chapter 11, "Troubleshooting the NFS Gateway for NetWare 6.5," on page 61 chapter, refer to the troubleshooting scenario.</p> <hr/> <p>IMPORTANT: Do not dismount or deactivate the volume that shadowVolume points to when the NFS Gateway is loaded. Doing so results in deactivation of volumes imported by the NFS Gateway.</p>	No

Parameter	Default	Description	Dynamic Configuration Support
logFileSize	4 MB	<p>Specifies the log file size (in MB).</p> <p>The maximum value can be 32 MB.</p> <p>If any invalid value is specified, then the default value is used.</p> <p>After the log file size reaches the set value, the contents of the log file (.log) file are backed up as the .bak file.</p> <p>The log messages specific to each volumes are saved as <i>shadowVolume/gateway/volumename.log</i>. The general log messages for the NFS Gateway are saved as <i>shadowVolume/gateway/system.log</i>.</p>	No
logLevel	1	<p>Specifies the logging level to be enabled for the volume.</p> <p>0, 1, 2, 4, and 8 are the valid log levels. The values indicate the following:</p> <p>0 = None (Logging is disabled)</p> <p>1 = Errors</p> <p>2 = Warning, Errors</p> <p>4 = Info, Warning, and Errors</p> <p>8 = Debug, Info, Warning, and Errors</p> <p>The logLevel = 8 is not recommended in typical cases. Use this only for debugging purposes.</p>	Yes
logVerbose	Disabled	Specifies the log verbose information.	Yes
logFlushImmediate	Disabled	<p>If specified, forces the log messages to be written to file immediately.</p> <p>If not set, the log messages are cached until the buffer is full.</p>	No

2.7 Dynamically Configuring NFS Gateway Parameters

Text goes here

2.7.1 Using iManager

You can dynamically configure NFS Gateway parameters on the NFS Gateway Properties page of iManager.

For details, see [Section 7.2.4, “Viewing and Modifying the NFS Gateway Parameters,”](#) on page 46.

2.7.2 Using the Command Line

NFS Gateway parameters cannot be dynamically configured using the command line.

2.8 Unloading the NFS Gateway

You can unload the NFS Gateway using either iManager or the command line.

2.8.1 Using iManager

The NFS Gateway Properties page lets you stop the NFS Gateway.

On the NFS Gateway Properties page, click Stop to stop the NFS Gateway. The NFS Gateway status changes from Running to Stopped.

2.8.2 Using the Command line

Unload NFS Gateway services by entering `gystop` at the console prompt.

IMPORTANT: When you use this command, the system stops NFS Gateway services without asking for any confirmation even if files in any of the gateway volumes are open.

Migrating NFS Gateway Shadow Files

3

After installing the NFS* Gateway Support Pack successfully, you need to migrate the attribute shadow files corresponding to the gateway volumes. Migration is required to retain the previously assigned NetWare® metadata such as trustees and permissions for files and directories.

3.1 Why Migrate

If the shadow files are not migrated to the new format, then it might have the following impact:

- Mounting gateway volumes from iManager, or executing gymount from the NetWare console or from gystart.ncf fails.
- Error messages such as `Old shadow file format found. Load "NFSGYMIG.NLM [<ShadowVolume:>]to migrate the shadow files.` displays on the logger screen.

3.2 Migration Utility Usage

To migrate attribute shadow files, run the `nfsgymig.nlm` using the migration utility, in the following format:

```
NFSGYMIG [ShadowVolume:] [ShadowVolume1:] [ShadowVolume2:] ...
```

where the default value of `ShadowVolume = sys:`

This utility migrates all the attribute shadow files corresponding to gateway volumes that are stored in this shadow volume.

For example, if there are two gateway volumes whose attribute shadow files are stored as `nssvol:\gateway\gyvo1\attrsh.shw` and `sys:\gateway\gyvo2\attrsh.shw`, then execute the migration utility as follows:

```
NFSGYMIG nssvol: sys:
```

This migrates the shadow files in `NSSVOL:\Gateway\` and `sys:\Gateway`.

To view the usage of the migration utility, execute

```
NFSGYMIG ?
```

This prints the migration utility usage on the logger screen.

While migrating, this utility logs information and errors corresponding to all the gateway volumes in `ShadowVolume` in `ShadowVolume:\gateway\nfsgymig.log`.

3.2.1 Backing Up Previous Shadow Files

The previous shadow files are backed up as `attrsh.bak` in their respective folders.

The attrsh.bak files are required if at any time you want to revert to the previous Support Pack. If you are sure you will never want to revert to the previous Support Pack, *only then* delete the attrsh.bak file.

3.2.2 Reverting to the Previous Support Pack

- 1** Rename the attrsh.bak file the previous shadow files backed up in their respective folders to attrsh.shw.
- 2** Revert to the previous Support Pack to retain the previously assigned NetWare metadata such as trustees and permissions for files and directories.

Showmount Utility for NetWare

4

The showmount utility for NetWare® lets you view the following lists of exported and mounted paths.

- List of exported paths
- All remote mount lists.

The entries will be in the format *host:directory*.

- List of remotely mounted directories
- List of clients that have remotely mounted the paths

To view the list of mounted volumes, enter the following at the system console prompt:

```
showmnt [-a | -d | -e] [hostname]
```

a: Lists all remote mounts in the format *host:directory*

d: Lists only directories that have been remotely mounted by clients

e: Lists the exported paths.

hostname: Specifies the NFS Server that provides the export or mount list. The default value for this parameter is the value returned by the hostname command.

NOTE: This utility might not work if the mount list or export list contains more than 200 entries.

Backing Up NFS Gateway Mounted Volumes

5

This section describes how to back up NFS Gateway mounted volumes.

Take a backup of respective exported folder on the UNIX or the Linux server.

For more information on taking backup on UNIX machine refer to the UNIX manual pages for the backing up on UNIX machine.

5.1 Usage

On NetWare 6.5, use the `trustbar.nlm` and back up the trustees of the files and directories on the volume.

```
trustbar [path] [xmlFile] [-options]
```

The following table describes the options that `trustbar` supports:

Option	Description
-H	Help
-B	Backs up trustees
-R	Restore trustees
-D	Delete trustees
-V	Verbose

For example, If `/home/user1` is unix exported path and `vol1:` is the respective NFS Gateway mounted volume on NetWare 6.5, then,

- 1 Back up `/home/user1` on the UNIX or Linux server.
- 2 On NetWare 6.5 command line execute the following:

```
trustbar vol1: sys:\etc\vol1\trustees.xml -B
```

All the trustees of files/directories on `vol1:` are backed up in `sys:\etc\vol1\trustees.xml` file

5.1.1 Recovering from Backup

- 1 Restore the backed up files on the UNIX or Linux server in the respective exported path.
- 2 Mount this exported path on the Netware 6.5 as NFS Gateway volume.
- 3 Use `trustbar.nlm` with appropriate XML file to restore the trustees of files/folders on the volume

Based on the above example where back up is already taken, restore the backed up files on `/home/user1` on UNIX server. Mount the `/home/user1` exported path on the Netware as `vol1:` NFS Gateway volume. Execute the following on the command line to restore all the trustees:

```
trustbar sys:\etc\vol1\trustees.xml -R
```


Managing NFS Gateway Volumes

6

The following topics are discussed in this section:

- [Managing Volume-Specific Mount Parameters \(page 25\)](#)
- [Dismounting a Gateway Volume \(page 36\)](#)
- [Trustee Settings \(page 37\)](#)
- [Mounting a Gateway Volume \(page 38\)](#)
- [Viewing NFS Gateway Volume Parameters \(page 41\)](#)
- [Dynamically Configuring NFS Gateway Volume Parameters \(page 41\)](#)
- [Configuring User Settings \(page 42\)](#)
- [Accessing NFS Gateway Volumes as CIFS Users \(page 42\)](#)

6.1 Managing Volume-Specific Mount Parameters

You can manage the NFS Gateway mount parameters by using either iManager or the command line.

6.1.1 Using iManager

The NFS Gateway Mount Parameters page of iManager lets you set the mount parameters for a new volume and also view and change mount parameters.

For details, see [Section 7.4, “Viewing and Modifying Mount Parameters,” on page 48](#).

6.1.2 Using Command Line

Use the following syntax to mount a volume:

```
gymount volumename IPAddress | hostname sharedPath [-shadowVolume value] [-nfsVersion value] [-mountUid value] [-mountGid value] [-anonUid value] [-anonGid value] [-rpcTimeout value][[-rpcRetries value] [-dynamicRPCTimeout | -noDynamicRPCTimeout] [-dirCompFreq value] [-umask value] [-readOnly | -readWrite] [-tossMetadata | -noTossMetadata] [-lowerCaseUnixNames|-noLowerCaseUnixNames] [-forceAnonUidGid|-noForceAnonUidGid] [-readSize value] [-writeSize value] [-maxOutstandingPackets value][dynamicMOP | -noDynamicMOP] [-showDotFiles | -hideDotFiles] [-logLevel value] [-logVerbose | -logNonVerbose] [-entryInNCF|-noEntryInNCF]
```

IMPORTANT: Load `nfsgy` with the required parameters *before* executing the `gymount` command. Otherwise, `gymount` auto loads `nfsgy` with default parameters.

Dynamic Configuration of Parameters on Mounted Volumes

Dynamic configuration means that the changes made in mount parameters are taken into effect automatically and there is no need to dismount a volume and mount it again for the changed parameters to take effect.

The NFS Gateway supports dynamic configuration for certain parameters of mounted volumes.

The following table describes the mount parameters, gives their default values, and specifies if dynamic configuration of that parameter is supported on mounted volumes.

Parameter	Default	Description	Dynamic Configuration Support
<i>volumename</i>	Mandatory (No default)	Name of the volume that you are mounting. Range: 2 to 15 characters. This parameter is mandatory.	No
<i>IPAddress</i> <i>hostname</i>	Mandatory for the first time	IP Address or hostname of the NFS Server you are importing the shared directory from. This parameter is mandatory unless the volume was previously mounted with the required syntax and <i>nfs-gy.nlm</i> has not been unloaded after that.	No
<i>sharedPath</i>	Mandatory for the first time	Absolute path of the shared directory in the NFS Server. This parameter is mandatory if you are mounting the volume for the first time after the NFS Gateway is loaded.	No

Parameter	Default	Description	Dynamic Configuration Support
shadowVolume	Value of <i>shadowVolume</i> option specified in the <code>nfs</code> command	<p>Specifies the name of the volume where shadow files are to be stored.</p> <p>The shadow files are stored in <i>shadowVolume</i>:<code>\gateway</code> directory.</p> <p>The gateway volume will not be mounted if the specified shadowVolume is not available.</p> <p>If not specified here, then if the <i>shadowVolume</i> was specified with the <code>nfs</code> command, that value is used.</p> <p>Do not use the mounted Gateway volumes as <i>ShadowVolume</i> when mounting another volume using <code>gymount</code>. For example, if <code>vol1</code> is a mounted NFS Gateway volume, then do not execute the following:</p> <pre>gymount vol2 -shadowVolume vol1</pre> <p>When shadowVolume is not using the default of <code>sys:</code> and if the trustee information is lost when using a gateway volume in a cluster enabled environment, or using a newly mounted NSS volume as shadowVolume, then in the Chapter 11, "Troubleshooting the NFS Gateway for NetWare 6.5," on page 61 chapter, refer to the troubleshooting scenario.</p> <hr/> <p>IMPORTANT: Do not dismount or deactivate the shadow volume specified at any time before the associated Gateway volumes are dismounted. Doing so results in deactivation of volumes imported by NFS Gateway.</p>	No
nfsVersion	3	<p>NFS protocol version that the volume is imported with.</p> <p>Valid value = 2 or 3</p> <p>We recommend using NFS version 3 because NFS Gateway for NetWare® 6.5 is optimized for this.</p> <p>If NFS version 3 is not supported by the NFS Server, then the volume is mounted with NFS version 2.</p> <p>If you use NFS version 2, then you must tune the <code>gymount</code> parameters based on Section 8.3, "Tuning for NFS Version 2," on page 50.</p>	No

Parameter	Default	Description	Dynamic Configuration Support
mountUid	0	<p>UID used for mounting the shared path.</p> <p>Valid Range: 0 to 2147483647</p> <p>The NFS Gateway also uses this parameter for UID, when NLM™ programs running on the server (for example, EDIT.NLM) access the NFS Gateway volume with NCP™ Connection Number = 0.</p>	Yes
mountGid	1	<p>GID used for mounting the shared path.</p> <p>Valid Range: 0 to 2147483647</p> <p>The NFS Gateway also uses this parameter for GID, when NLM programs running on the server (for example, EDIT.NLM) access the NFS Gateway volume with NCP Connection Number = 0.</p>	Yes
anonUid	55555	<p>UID used for users without a UNIX profile in eDirectory™.</p> <p>Valid Range: 0 to 2147483647</p> <p>The NFS Gateway also uses this parameter for a user with UID = 0 in the UNIX profile when root access is not given to the NetWare server.</p>	Yes
anonGid	55555	<p>GID used for users without UNIX profile in eDirectory.</p> <p>Valid Range: 0 to 2147483647</p>	Yes

Parameter	Default	Description	Dynamic Configuration Support
rpcTimeOut	1	<p>Time interval (in seconds) that the gateway waits for a response from the remote server.</p> <p>Valid Range: 1 to 2147483647</p> <p>If the network is heavily loaded or the remote NFS Server is slow in responding to NFS requests, set a high value for this parameter. You might use a value of 6, which is used by some of the other NFS clients.</p> <p>If the network is moderately loaded or the remote NFS server is fast enough to respond to NFS queries from the NFS Gateway, the default value of 1 is sufficient.</p> <p>We recommend you try different values to find which ones work best for your network settings.</p> <p>If dynamicRPCTimeout is enabled, then the timeout value used for RPC calls varies based on network behavior, with the value given by the user taken as the minimum value.</p>	Yes
rpcRetries	3	<p>Number of times each RPC request is retried, if the reply for a request does not come within the rpcTimeOut period.</p> <p>Valid Range: 1 to 2147483647</p> <p>With every RPC retry, the value of the rpcTimeOut for that packet doubles. For example, if the rpcTimeOut is set as 1, then in the second attempt of RPC request, the value of rpcTimeOut doubles to 2.</p>	Yes
dynamicRPCTimeout noDynamicRPCTimeout	dynamicRPCTimeout	Specifies whether to dynamically set RPC timeouts based on network behavior.	Yes
dirCompFreq	0	<p>Time (in seconds) after which all the cached shadow file contents for this directory are invalidated.</p> <p>Valid Range: 0 to 2147483647</p> <p>The default value of 0 indicates that cache is not invalidated until there is a change in the directory content in the NFS server.</p>	Yes
umask	022	<p>File mode creation mask for files and directories created from NFS Gateway.</p> <p>Valid Range: 000 to 777</p> <p>This value must be octal.</p>	Yes

Parameter	Default	Description	Dynamic Configuration Support
readOnly readWrite	readWrite	<p>Specifies if the Gateway volume is read-only or read/write.</p> <p>readOnly Usage: If a Gateway volume is mounted with the readOnly parameter, then the volume acts like a NSS ReadOnly volume, similar to a CD-ROM. Modifications, even in the admin mode, are not allowed either to the contents of the file, or to the file meta-data such as trustee rights, NetWare attributes. Using this parameter is not a common practice; it is more useful to use trustee rights management to control access.</p> <p>If the remote Unix server has exported the path as ro (read only), then by default, NFS Gateway mounts the volume as readWrite.</p> <p>All the file operations are restricted to read only by the remote Unix server, but the file's NetWare metadata operations are allowed. Therefore, to avoid unnecessary network traffic, if you have a remote path exported as ro (readOnly) and you do not want to mount the gateway volume as a NetWare ReadOnly volume, then you might want to limit the rights on the volume to RF (Read and FileScan).</p>	No
tossMetaData noTossMetaData	noTossMetadata (retain)	Invalidates or retains file metadata immediately after the file is closed.	Yes
lowerCaseUnixNames noLowerCaseUnixNames	noLowerCaseUnixNames (not enforced)	<p>Specifies if the file or directory created from NetWare must have lowercase filenames on UNIX.</p> <p>When you specify noLowerCaseUnixNames, the filenames created from NetWare side will have the case specified by client even on UNIX side.</p>	Yes
forceAnonUidGid noForceAnonUidGid	noForceAnonUidGid (not enforced)	<p>Specifies if all NFS requests will be forced to go with anonUid and anonGid.</p> <p>Even when you specify noForceAnonUidGid, if the user does not have UNIX profile, NFS requests will continue to go with anonUID and anonGid.</p>	Yes

Parameter	Default	Description	Dynamic Configuration Support
readSize	32	<p>Specifies the read transfer buffer size in KB.</p> <p>Valid values = 4, 8, 16, 32</p> <p>If you enter a value other than 4, 8, 16, or 32 but within the range of 4 to 32, then the lower valid value nearest to the value you enter is used.</p> <p>For example, if you enter 10, then 8 is used.</p> <p>If you enter an invalid value outside the range of 4 to 32, the default value is used.</p> <p>This parameter is applicable only for NFS version 3. If the NFS version is 2, then the value 4 is used.</p> <p>The NFS Gateway checks the following three values and uses the lowest to determine the actual read size to use:</p> <ul style="list-style-type: none"> • Largest UDP Packet Size (parameter in monitor.nlm > Server Parameters > Communications) • The preferred read size as specified by the remote NFS Server • The readSize specified by the gymount command <p>To ensure that read transfer buffer size is 32 KB of data, check for the following:</p> <ul style="list-style-type: none"> • The NFS Server has a read preferred size = 32 KB • The NFS Gateway gymount parameter readSize = 32 KB • The largest UDP packet size on NetWare = 33280 (32768 for data +512 for headers) or greater <p>The read size value used for RPC calls depends on the maximum UDP packet size defined by the system and the preferred read size of the NFS server. Therefore, the read size in use might differ from the value given by the user.</p> <p>Verify the parameter value in use, by using the command line utility or the iManager interface.</p>	Yes

Parameter	Default	Description	Dynamic Configuration Support
writeSize	32	<p>Specifies the write transfer buffer size in KB.</p> <p>Valid values = 4, 8, 16, 32</p> <p>If you enter a value other than 4, 8, 16, or 32 but within the range of 4 to 32, then the lower valid value nearest to the value you enter is used.</p> <p>For example, if you enter 10, then 8 is used.</p> <p>If you enter any invalid value outside the range of 4 to 32, the default value of 32 is used.</p> <p>This parameter is applicable only for NFS version 3. If NFS version 2 is specified, then the value 4 is used.</p> <p>The NFS Gateway checks the following three values and uses the lowest to determine the actual write size to use:</p> <ul style="list-style-type: none"> • Largest UDP Packet Size (parameter in monitor.nlm > Server Parameters > Communications) • The preferred write size as specified by the remote NFS Server • The writeSize specified by the gymount command. <p>To ensure that write transfer buffer size is 32 KB of data, check for the following:</p> <ul style="list-style-type: none"> • The NFS Server has a write preferred size = 32 KB • The NFS Gateway gymount parameter writeSize = 32 KB • The largest UDP packet size on NetWare = 33280 (32768 for data +512 for headers) or greater <p>The write size value used for RPC calls depends on the maximum UDP packet size defined by the system and the preferred write size of the NFS server. Therefore, the write size in use might differ from the value given by the user.</p> <p>Verify the parameter value in use, by using the command line utility or the iManager interface.</p>	Yes

Parameter	Default	Description	Dynamic Configuration Support
maxOutstandingPackets	8	<p>Specifies the maximum number of requests to an individual NFS server that can be concurrently outstanding before the NFS Gateway pauses in sending requests to that particular NFS server. An outstanding packet is an NFS request to which no reply has been received, nor has its timeout period expired.</p> <p>For example, if the maxOutstandingPackets = 64, then a maximum of 64 requests can be waiting for a response from an individual NFS server. This is irrespective of the number of Gateway volumes imported from that NFS server. If two or more NFS Gateway volumes are imported from the same NFS server, then the value specified in the first gymount command is used. That value is treated as a pool and shared between the two or more gateway volumes.</p> <p>If two NFS Gateway volumes refer to the same NFS server, then the value specified in the volume mounted first is used between the first and second volume together.</p> <p>Valid Range: 1 to 2147483647</p> <p>Consider the following when selecting a value for this parameter:</p> <ul style="list-style-type: none"> • If the number of NFS Server threads is high, then increase the value for this parameter. • If the NFS Server is low end (low configuration or less number of NFS Server threads), then decrease the value for this parameter. If it is high end, then increase the value for this parameter. • If the network performance is good, then select values 16 or 32; however, the value must not exceed the number of NFS Server threads. If the network performance is not good, then select the value 2 or 4. <p>If dynamicMOP parameter is set, then the value of maxOutstandingPackets for RPC calls varies according to network behavior, with the value given by the user taken as the maximum value.</p> <hr/> <p>IMPORTANT: Use the value 1 for this parameter with caution because it might negatively impact the performance of the NFS Gateway. The value 1 means each NFS request must be answered by the remote NFS server before the NFS Gateway sends another request.</p>	Yes

Parameter	Default	Description	Dynamic Configuration Support
dynamicMOP noDynamicMOP	noDynamicMOP	<p>Specifies whether to dynamically set the MOP (Maximum Outstanding Packets) based on network behavior.</p> <p>If you are unsure about the network behavior and about the ability of the server to handle many parallel requests and you prefer NFS Gateway to automatically take care of tuning the maxOutstandingPackets value, then enable this parameter.</p> <hr/> <p>IMPORTANT: Enabling dynamicMOP might significantly reduce the performance</p>	Yes

Parameter	Default	Description	Dynamic Configuration Support
showDotFiles hideDotFiles	showDotFiles	<p>Specifies whether to show or hide the hidden files/directories (beginning with dot(.)) of remote machine.</p> <p>If hideDotFiles is set, then you cannot access hidden files/directories.</p> <p>Do not attempt to dynamically update this parameter even by dismounting and mounting the volume again.</p> <p>When changing to using -hideDotFiles (or when changing back from -hideDotFiles to -showDotFiles), NFS Gateway does not automatically recalculate what should be hidden vs not hidden. All files whose information already exists in the shadow files remains hidden or not hidden, as they already were. New files will be effected by the new setting. This is because NFS Gateway cannot accurately determine whether user intervention has altered which files are expected to be hidden or not.</p> <p>If you want that an NFS Gateway volume start with a "clean slate" and totally re-evaluate which files should be hidden, then it is necessary to delete that volume's shadow files. Doing this wipes out the NetWare file system trustee rights assigned to that volume. Re-establish those by doing the following:</p> <pre>Execute GYSTOP.NCFDelete sys:\gateway\<volume_name>*.* Edit GYSTART.NCF and include - hideDotFiles on the appropriate GYMOUNT line.Execute GYSTART.NCFRe- assign any NetWare trustee assignments needed on that Gateway volume.</volume_name></pre>	No

Parameter	Default	Description	Dynamic Configuration Support
logLevel	value of <i>logLevel</i> optionh specified with <i>nfs</i> command	<p>Specifies the logging level to be enabled for the volume.</p> <p>0, 1, 2, 4 and 8 are the valid log levels. The values indicate the following:</p> <p>0 = None (Logging is disabled)</p> <p>1 = Errors</p> <p>2 = Warning, Errors</p> <p>4 = Info, Warning, and Errors</p> <p>8 = Debug, Info, Warning, and Errors</p> <p>The logLevel = 8 is not recommended in typical cases. Use this only for debugging purposes.</p> <p>If not specified here, then if the <i>logLevel</i> was specified with the <i>nfs</i> command, that value is used.</p>	Yes
logVerbose logNonVerbose	logNonVerbose	<p>Specifies whether to log verbose information or not.</p> <p>If not specified, the value specified with the <i>nfs</i> command is used.</p>	Yes
entryInNCF noEntryInNCF	noEntryInNCF	<p>Specifies whether to add gymount entry in the <i>gystart.ncf</i> file or not.</p> <hr/> <p>NOTE: noEntryInNCF is ignored when specified as a parameter of a gymount entry when editing <i>gystart.ncf</i>.</p>	Yes

6.2 Dismounting a Gateway Volume

You can dismount the NFS Gateway using either iManager or the command line.

6.2.1 Using iManager

The NFS Gateway Mounted Volumes page of iManager lets you disable/remove volumes.

For details, see [Step 4 on page 47](#) under [Viewing the NFS Gateway Mounted Volumes](#).

6.2.2 Using the Command Line

Dismount and deactivate the NFS Gateway volume by using the followingsyntax:

```
gyumount volumename [-forceDeactivate][[-disable|-remove]][-cleanup]
```

Volumename: The *volumename* to be dismounted. Dismounting a specific gateway volume does not disturb the state of other gateway volumes.

forceDeactivate: Deactivates the volume without prompting for open files. This causes loss of data in unsaved files in the volume that is being dismounted. Using this option is mandatory when you modify the **cluster unload script** to configure the gateway for **active/active cluster mode**.

By default, if any file in the specified gateway volume is open, then the gateway prompts you to confirm if the dismounting of the volume can be continued.

disable: Dismounts a volume and comments out (#) the corresponding gymount line for this volume in *gystart.ncf* file so that it is not mounted automatically when the gateway is restarted using *gystart*.

remove: Dismounts a volume, removes the corresponding gymount line for this volume from the *gystart.ncf* file, and also clear all cached information about this volume.

cleanup: Clears invalid entries present in the shadow file. Use this utility when the performance of NFS Gateway is degrading and you observe that shadow file size is growing very large and you suspect invalid entries exist in the shadow file.

When using this option, the volume status can be any one of the following:

- Active
- Deactive
- Disabled

To abort the utility when the cleanup is in progress, enter the unload gymount command at the command prompt.

The utility reads each record from the database file, looks up the corresponding file or directory in the remote machine and, if the entry does not exist, it deletes the entry from the shadow file.

The invalid files or directories that this utility deletes are logged into a log file located at *shadowvolume:/gateway/gylvolname.log* file.

For information on using this utility for improving NFS Gateway performance, see [Section 8.9, “Using the Cleanup Utility,”](#) on page 54.

6.3 Trustee Settings

You can assign trustees and modify or delete their rights to files or directories on a NFS Gateway volume using any one of the following:

- ConsoleOne®
- NetWare Administrator (nwadmn32.exe)
- Novell Client™
- Rights.exe by mapping a drive to the NFS Gateway volume over NCP™.

6.4 Mounting a Gateway Volume

Before you mount a volume, we recommend that you understand the mounting process of `gymount.nlm` in two scenarios:

- [Mounting Volumes for the First Time \(page 38\)](#)
- [Subsequent Mounting When `NfsGy.nlm` Is Still Loaded \(page 40\)](#)

For syntax and parameter information, see [Section 6.1, “Managing Volume-Specific Mount Parameters,” on page 25](#).

6.4.1 Mounting Volumes for the First Time

This section describes the effect of mounting a volume for the first time in the following scenarios:

- [When Mandatory Parameters Are Specified \(page 38\)](#)
- [When Mandatory Parameters and Some Optional Parameters Are Specified \(page 39\)](#)
- [When Only `Volumename` Is Specified \(page 40\)](#)

When Mandatory Parameters Are Specified

When all the mandatory parameters are specified with the `gymount` command, the volume is mounted using those parameters. The rest of the parameters use default values, unless `nfsGy` has been loaded with nondefault parameters that override the `gymount` default values.

For example, the following syntax mounts `GWVol3` with mandatory parameters:

```
gymount GWVOLv3 172.16.0.0 /home/xyz
```

This mounts the `GWVol3` with the mandatory parameters that are specified and it uses the default values for the parameters that have not been specified.

The following table lists the volume attributes for each parameter.

Parameters	Volume Attributes
<i>Volumename</i>	GWVOLv3
<i>IPAddress</i>	172.16.0.0
<i>sharedPath</i>	/home/xyz
<i>shadowVolume</i>	Default = sys:
<i>nfsVersion</i>	Default = 3
<i>mountUID</i>	Default = 0
<i>mountGid</i>	Default = 1
<i>anonUid</i>	Default = 55555
<i>anonGid</i>	Default = 55555
<i>rpcRetries</i>	Default = 3
<i>rpcTimeOut</i>	Default = 1

Parameters	Volume Attributes
dynamicRPCTimeout nodynamicRPCTimeout	Default = dynamicRPCTimeout
dirCompFreq	Default = 0
umask	Default = 022
readOnly readWrite	Default = readWrite
tossMetaData noTossMetaData	Default = noTossMetadata
lowerCaseUnixNames noLowerCaseUnixNames	Default = noLowerCaseUnixNames
forceAnonUidGid noForceAnonUidGid	Default = noForceAnonUidGid
readSize	Default = 32
writeSize	Default = 32
maxOutstandingPackets	Default = Infinite
dynamicMOP noDynamicMOP	Default = noDynamicMOP
showDotFiles hideDotFiles	Default = showDotFiles
logLevel value	Default = 1 (Errors)
logVerbose logNonVerbose	Default = logNonVerbose
entryInNCF noEntryInNCF	Default = noEntryInNCF

When Mandatory Parameters and Some Optional Parameters Are Specified

When you specify some of the optional parameters, the rest of the optional parameters use their default values, unless `nfsy` has been loaded with nondefault parameters that override the `gymount` defaults.

For example, the following syntax mounts `Volume22` with some of the optional parameters:

```
gymount Volume22 172.16.0.0 /home/xyz -nfsVersion 3 -rpcTimeOut 8
-lowerCaseUnixNames -readSize 16 -writeSize 16 -maxOutstandingPackets
64 -logLevel 4
```

The following table lists the volume attribute for each parameter.

Parameters	Volume Attributes
<i>VolumeName</i>	volume22
<i>IPAddress</i>	172.16.0.0
<i>sharedPath</i>	/home/xyz
shadowVolume	Default = sys:
nfsVersion	3
mountUID	Default=0
mountgid	Default = 1

Parameters	Volume Attributes
anonUid	Default = 55555
anonGid	Default = 55555
rpcRetries	Default = 3
dynamicRPCTimeout nodynamicRPCTimeout	Default = dynamicRPCTimeout
rpcTimeOut	8
dirCompFreq	Default = 0
umask	Default = 022
readOnly readWrite	Default = readWrite
tossMetaData noTossMetaData	Default = noTossMetadata
lowerCaseUnixNames nolowerCaseUnixNames	lowerCaseUnixNames
forceAnonUidGid noForceAnonUidGid	Default = noForceAnonUidGid
readSize	16
writeSize	16
maxOutstandingPackets	64
dynamicMOP noDynamicMOP	Default = noDynamicMOP
showDotFiles hideDotFiles	Default = showDotFiles
logLevel	4 (Info, Warning and Errors)
logVerbose logNonVerbose	Default = logNonVerbose
entryInNCF noEntryInNCF	Default = noEntryInNCF

When Only Volumename Is Specified

If you specify only the *Volumename*, the volume does not mount because *IPAddress* and *sharedPath* parameters are mandatory when mounting the volume for the first time.

For example, the volume does not mount if you use the following syntax to mount GWVol12 without specifying the IP address or the shared path:

```
gymount GWVol12
```

6.4.2 Subsequent Mounting When NfsGy.nlm Is Still Loaded

This section describes the effect of mounting a volume after the first time when *nfsGy.nlm* is still loaded in the following scenarios:

- [When Mandatory Parameters Are Specified \(page 41\)](#)
- [When Mandatory Parameters and Some Optional Parameters Are Specified \(page 41\)](#)
- [When Only Volumename Is Specified \(page 41\)](#)
- [When Mandatory and All Optional Parameters Are Specified \(page 41\)](#)

For a description of the mount parameters, refer to [Section 6.1, “Managing Volume-Specific Mount Parameters,”](#) on page 25.

When Mandatory Parameters Are Specified

The volume is mounted with the new parameters specified.

When Mandatory Parameters and Some Optional Parameters Are Specified

The volume is mounted with the new values of parameters that are specified. The parameters that are not specified in this mount but were specified in the first mount remain unchanged.

When Only Volumename Is Specified

The volume is mounted successfully with the same parameter values as specified in the previous mount.

The parameter values specified in the previous mount are retained when the NFS Gateway is still loaded. However, if you unload and reload the NFS Gateway, then the parameter values are not retained and you must specify the mandatory parameters along with the volume name.

When Mandatory and All Optional Parameters Are Specified

The parameters specified in the previous mount are overwritten and the volume is mounted with the new set of mount parameters.

6.5 Viewing NFS Gateway Volume Parameters

You can view the mount parameters using either iManager or the command line.

6.5.1 Using iManager

The NFS Gateway Mounted Volumes page lets you view NFS Gateway mount parameters.

For details, see [Section 7.3, “Viewing the NFS Gateway Mounted Volumes,”](#) on page 47.

6.5.2 Using the Command Line

To view volume parameters of gateway volumes, enter the following at the system console prompt:

```
load gymount -d -volparams [volumename]
```

This prints the parameters of all the *volumename* that you specify on the logger screen.

If you do not specify the *volumename*, then the command prints the volume parameters of all gateway volumes on the logger screen.

6.6 Dynamically Configuring NFS Gateway Volume Parameters

You can dynamically configure the NFS Gateway volume parameters using either iManager or the command line.

6.6.1 Using iManager

You can dynamically configure NFS Gateway volume parameters on the NFS Gateway Mounted Volumes page of iManager.

For details, see [Section 7.4, “Viewing and Modifying Mount Parameters,”](#) on page 48.

6.6.2 Using the Command Line

You can dynamically configure NFS Gateway volume parameters by using the `gymount` command. Specify the new parameter values that need to be changed along with the `gymount` command of a *volumentame*.

For the list of parameters that are dynamically configurable, see [Section 6.1.2, “Using Command Line,”](#) on page 25.

For example, to change the `rpcTimeOut` parameter value to 8, execute the following command:

```
gymount Volume22 -rpcTimeOut 8
```

6.7 Configuring User Settings

To set the required UNIX profile for NFS Gateway users who are eDirectory Users or Groups, use either the migration utility or ConsoleOne available through Native File Access for UNIX.

6.7.1 Using the Migration Utility

The migration utility reads in text files and creates NIS maps in eDirectory. This can be useful to populate UNIX profiles for large numbers of users and groups, even if having an NIS server on NetWare is not the goal.

You can either use `makenis`, the file-based migration utility, or through ConsoleOne

For details on using the migration utility, see the [Working with UNIX Machines](#) section of the *Native File Access Protocols Administration Guide* (<http://www.novell.com/documentation/lg/nw65/native/data/ahzvcai.html#ahzvcai>)

6.7.2 Setting a UNIX Profile Using ConsoleOne

Using ConsoleOne you can add and modify the information of a User or Group object that already exists in eDirectory.

For details on setting UNIX profile using ConsoleOne, see [Working with UNIX Machines](#) section of *Native File Access Protocols Administration Guide* (<http://www.novell.com/documentation/lg/nw65/native/data/ahzvcai.html#ahzvcai>)

6.8 Accessing NFS Gateway Volumes as CIFS Users

To allow a CIFS user to access an NFS Gateway volume, you need to set the simple password for the user. To do this, go to NFAP Security in NetWare Remote Manager.

For more details, see the *Novell Native File Access Protocols Installation and Administration Guide* (<http://www.novell.com/documentation/nw65/native/data/hz8pck9v.html>).

iManager-Based Administration

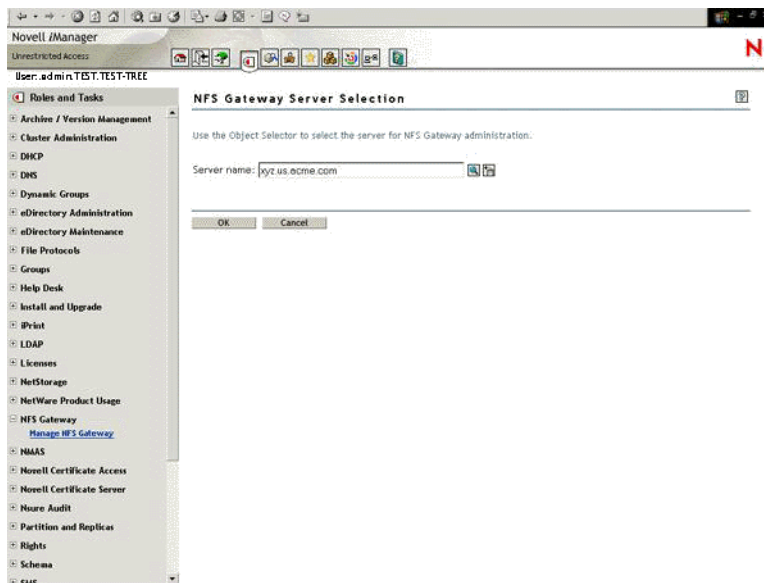
7



Using iManager, you can perform the following tasks to administer the NFS Gateway:

- [Selecting the NFS Gateway Server \(page 45\)](#)
- [Viewing the NFS Gateway Mounted Volumes \(page 47\)](#)
- [Modifying NFS Gateway Properties \(page 45\)](#)
- [Viewing and Modifying Mount Parameters \(page 48\)](#)

7.1 Selecting the NFS Gateway Server

- 1 In iManager, click NFS Gateway > Manage NFS Gateway to display the NFS Gateway Server Selection page.



- 2 Use  to select the Server object in the same eDirectory™ tree for which you want to modify the NFS Gateway properties. You can also select a remote server in the tree.
Use  to access the list of servers administered in the recent past.
- 3 Specify the server name, then click OK to display the NFS Gateway Properties page.
or
Click Cancel to return to the Novell iManager page.

7.2 Modifying NFS Gateway Properties

The NFS Gateway Properties page lets you start or stop the NFS Gateway and also lets you view and edit the NFS Gateway general and log parameters.

7.2.1 Starting the NFS Gateway

On the NFS Gateway Properties page, click Start to start the NFS Gateway. Gystart.ncf is executed on the server console.

The NFS Gateway status changes from Stopped to Running.

7.2.2 Stopping the NFS Gateway

On the NFS Gateway Properties page, click Stop to stop the NFS Gateway. Gystop.ncf is executed on the server console.

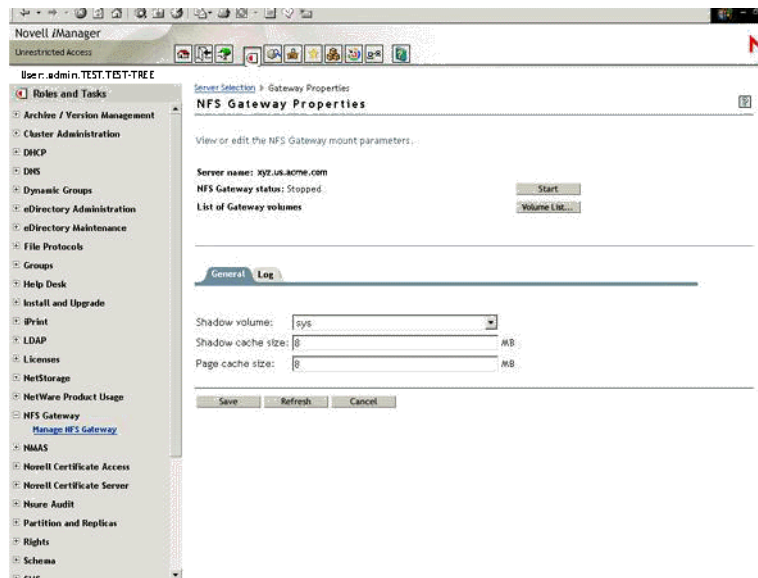
The NFS Gateway status changes from Running to Stopped.


7.2.3 Viewing the List of Gateway Volumes

Click Volume list to display the NFS Gateway Mounted Volumes page that displays the list of NFS Gateway volumes.


7.2.4 Viewing and Modifying the NFS Gateway Parameters

- 1 On the General tab, specify the values for Shadow Volume, Shadow Cache Size, and Page Cache Size.



Click  for online help on parameters.

- 2 Click the Log tab and make the required changes.

Click  for online help on parameters.

- 3 Click Save to save the changes in the sys:\system\gystart.ncf file.

The Save button is displayed when the NFS Gateway status = Stopped.

or

Click Apply to save the changes in the sys:\system\gystart.ncf file and dynamically put them into effect without stopping the gateway.

The Apply button is displayed when the NFS Gateway status = Running.

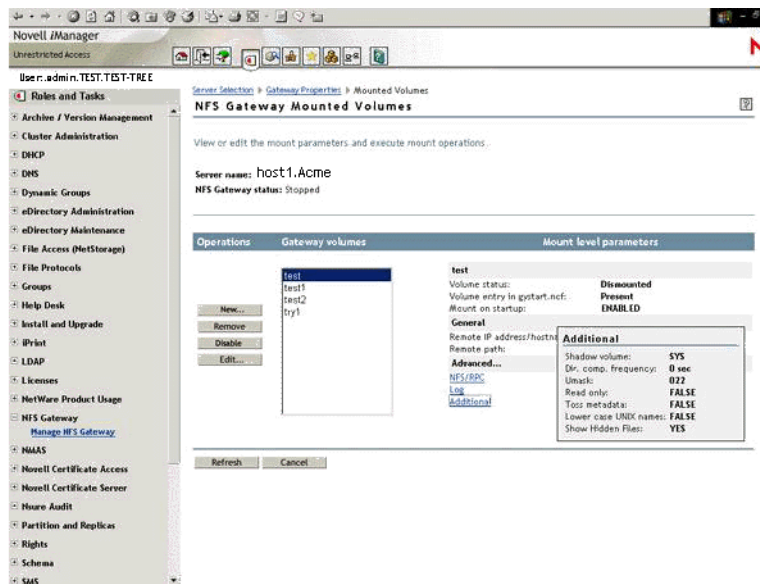
or

Click Cancel to discard the changes and return to the NFS Gateway Server Selection page.

7.3 Viewing the NFS Gateway Mounted Volumes

The NFS Gateway Mounted Volumes page lets you view and edit the list of NFS Gateway mounted volumes, view the mount parameters, and execute mount operations.

- 1 On the NFS Gateway Mounted Volumes page, select a volume from the List of Gateway volumes.



- 2 View the mount level parameters of the selected volume. You can view mount status, general parameters, and advanced parameters.
- 3 In the Advanced section, click the NFS/RPC, Log, or Advanced links to display a list showing the NFS/RPC, Log, or Additional parameters of the selected volume.
- 4 In the Operations section, click any of the following operations buttons to perform the required operation:

Button	Description
New	Allows you to import a new Gateway volume.
Remove	Removes the volume from the gystart.ncf file and dismounts it if it is mounted.
Enable or Disable	Disables or enables the selected volume in the gateway volume list. It updates the gystart.ncf file and also mounts or dismounts the volume if gateway is running


Edit	Displays the NFS Gateway mount parameters page that allows you to modify volume parameters.
------	---

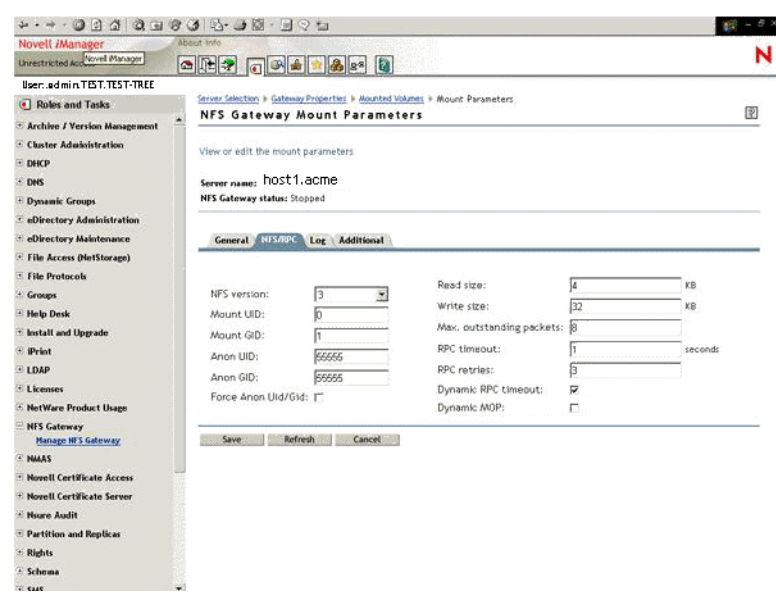
- 5 Click Refresh to refresh the user interface with the Gateway parameters from the back end.
or
Click Cancel to return to NFS Gateway Properties page.



7.4 Viewing and Modifying Mount Parameters

The NFS Gateway Mount Parameters page lets you set the mount parameters for a new volume and also view and change mount parameters for existing volumes.

- 1 Click the General tab of the NFS Gateway Mount Parameters page, then specify the values for the fields.

Click  for online help on parameters.
- 2 Click the NFS/RPC tab, then specify the values for the fields.



- 3 Click the Log tab, then specify the values for the fields.
Click  for online help on parameters.
- 4 Click the Additional tab, then specify the values for the fields.
Click  for online help on parameters.
- 5 Click OK to save the changes.
or
Click Cancel to discard the changes and return to the NFS Gateway Mounted Volumes page.

You can optimize the NFS Gateway performance by tuning the mount parameters to suit the requirements of your network and machine configuration.

- For information on dynamic tuning of certain parameters, refer [Section 8.1, “Dynamic Tuning,”](#) on page 49
- If you are using NFS version 2, tune the gymount parameters based on [Section 8.3, “Tuning for NFS Version 2,”](#) on page 50.
- Complete the steps in [Section 2.4, “Configuring NFS Gateway for the First Time,”](#) on page 13.
- Configure the NFS Gateway parameters `ShadowCacheSize` and `PageCacheSize` based on [Section 2.6, “Managing NFS Gateway Parameters,”](#) on page 15.
- Tune the mount parameter combination of `rpcTimeout`, `MaxOutstandingPackets`, `readSize`, and `writeSize` based on [Section 8.4, “Mount Parameters Combinations,”](#) on page 51.
- Tune for NFS Gateway usage based on [Section 8.6, “NFS Gateway Usage,”](#) on page 53.
- Tune the NSS parameters based on [Section 8.7, “Modifying NSS Settings,”](#) on page 53.
- Use the cleanup utility based on [Section 8.9, “Using the Cleanup Utility,”](#) on page 54.

8.1 Dynamic Tuning

NFS Gateway for NetWare 6.5 has the ability to dynamically tune certain parameters to help ensure successful communication.

8.1.1 Dynamic Tuning of RPC Timeout

The RPC timeout (`-rpcTimeout` parameter on GYMOUNT) value is dynamically adjusted based on network conditions. NFS Gateway will not adjust this setting below that which the administrator sets, but it will adjust it higher when round-trip communication between NetWare and the remote UNIX or Linux system shows a pattern of taking more time. This feature is enabled by default, but can be turned off with the GYMOUNT `-noDynamicRPCTimeout` parameter.

8.1.2 Dynamic Tuning of Max Outstanding Packets

Dynamic tuning of Max Outstanding Packets (`-maxOutstandingPackets` parameter of GYMOUNT) is also available, although it is not enabled by default.

The default `-maxOutstandingPackets` setting (8) is already somewhat conservative, but if network timeouts are experienced while doing reads or writes on an NFS Gateway volume, enabling the dynamic tuning (`-dynamicMOP`) will significantly eliminate risk of those timeouts.

Rather than requiring the administrator to permanently lower the `-maxOutstandingPackets` setting, the dynamic tuning can lower that setting on-the-fly, and then raise it afterwards as the trend of successful communication builds. With this feature enabled, when a retransmission becomes necessary, NFS Gateway will lower the setting by 50% in order to reduce load on the LAN or remote server. Potentially, if more than one retransmission are occurring, this feature can adjust -

maxOutstandingPackets from the administrative setting (default 8) down to 1. It will adjust back up quickly during periods of successful communication. This feature is disabled by default.

NOTE: When using -dynamicMOP, some fluctuations in performance might be noted, as the system adjusts the rate at which it is sending requests to the remote system.

8.1.3 Verifying Dynamic Parameter Levels

To see a snap shot of the level these dynamic parameters have reached, give the following system console command and check the logger screen for output.

```
gymount -d -volparams [volumename]
```

This displays the current dynamically reached parameter values rather than the administrative setting. For tuning other parameters, or if you feel it is necessary to manually tune -rpcTimeout or -maxOutstandingPackets, the other sections of this chapter gives tips and suggestions.

8.2 Maximum Outstanding Packets and NFS Server Threads

The maxOutstandingPackets parameter specifies the maximum number of requests to an individual NFS server that can be concurrently outstanding before the NFS Gateway pauses in sending requests to that particular NFS server. The optimal value for this parameter is highly dependant on the number of NFS Server threads available.

If the number of NFS Server threads is high, then increase the value for the maxOutstandingPackets parameter.

For example, if the number of NFS Server threads = 4, then maxOutstandingPackets parameter can be set to 4 or less to avoid delays and timeout failures.

8.3 Tuning for NFS Version 2

For this release, the default values are tuned for NFS version 3 performance. If you use NFS version 2, tune the following gymount parameters to avoid delays and timeout failures:

- Decrease the value of the **maxOutstandingPackets parameter** to 4.
- Increase the value of the **rpcTimeOut parameter** higher than the default value of 1. A useful starting value for the parameter is 4.

Using Linux NFS Server

When you use NFS version 2 on Linux*, NFS Server needs tuning in particular. Apart from the above guidelines, we recommend that you increase the number of NFS server threads.

For more information on increasing NFS server threads, refer to the nfsd (8) man page of Linux.

8.4 Mount Parameters Combinations

Tuning the mount parameter combination of `rpcTimeOut`, `MaxOutstandingPackets`, `readSize`, and `writeSize` based on the network load, UNIX machines, and hardware significantly increases NFS Gateway performance.

You can vary the combination of mount parameters based on your network resources.

- **Optimal Network:** Retain the default values of `rpcTimeout`, `maxOutstandingPackets`, `readSize`, and `writeSize` parameters.
- **Highly Used Network/Slow UNIX machine:** Increase the value of the `rpcTimeout` parameter and decrease the values of `maxOutstandingPackets`, `readSize`, and `writeSize` parameters.

You can tune the combination of mount parameters in the following ways:

Tuning the Read Performance

- Change the `maxOutstandingPacket` parameter value and leave the `readSize` and `writeSize` parameter values constant at 32.

The following table shows an example of the time taken for a read operation with varying `maxOutstandingPackets` value:

<code>maxOutstandingPackets</code>	Time in Seconds
2147483647	30
1	135
10	24
20	25
12	25
11	25
9	31
8	44

Observation

In this example, `maxOutstandingPackets = 10` gives the best result.

- Change the `readSize` parameter value, keeping `maxOutstandingPackets` value at 10 (the optimal value from the table above).

The following table shows an example of the read operation with varying `readSize`:

<code>readSize</code>	Average Time in Seconds
32	25
16	40.5

readSize	Average Time in Seconds
8	29
4	35

Observation

In this example, for read operations readSize = 32, and maxOutstandingPackets = 10 gives the best result.

Tuning the Write Performance

- Change the maxOutstandingPackets parameter value and leave readSize and writeSize parameter values constant at 32.

The following table shows an example of the write operation with varying maxOutstandingPackets value:

maxOutstandingPackets	Time in Seconds
2147483647	28
1	37
10	25
50	27
12	28
9	28
6	30

Observation

In this example, maxOutstandingPackets = 10 gives the best result.

- Change the writeSize parameter value and keeping maxOutstandingPackets value constant at 10 (the optimal value from the table).

The following table shows an example of the write operation with varying writeSize:

writeSize	Average Time in Seconds
32	25
16	31
8	28.6
4	31

Observation

In this example, for write operations, `writeSize = 32`, and `maxOutstandingPackets = 10` gives the best result.

8.5 Read/Write Operations

- To improve the performance of read operations, such as listing or copying from the gateway volumes, increase the value of the `readSize` parameter when executing read operations.
- To improve the performance of write operations, such as copying to the gateway volume, increase the value of the `writeSize` parameter when executing write operations.

IMPORTANT: Setting the `readSize` or `writeSize` parameter to a high value might negatively impact the network performance. If you see any such negative impact, set the `readSize` or `writeSize` parameter to a lower value.

8.6 NFS Gateway Usage

- If there are more frequent directory operations, you can improve the performance of directory operations by increasing the value of the `ShadowCacheSize` parameter.
- If there are more frequent file operations, you can improve the performance of file operations by increasing the value of the `PageCacheSize` parameter.

8.7 Modifying NSS Settings

To optimize the performance, modify the following NSS settings using the system console before you start using the NFS Gateway.

- Set the `BufferFlushTimer` parameter = 1

This forces NSS to flush the buffer cache to the NFS server after one second, which is the earliest possible time.

- Set the `ClosedFileCacheSize` parameter based on the system memory

For example, if the `ClosedFileCacheSize` parameter value = 100,000 then the memory can hold up to 100,000 metadata of files or directories at any point of time.

If there are more than 100,000 entries in a directory, we recommend that the `ClosedFileCacheSize` parameter value be increased.

8.8 Enhancing Directory Operations and File Read/Write Performance

The size of `pageCache` directly impacts the file read/write performance. To increase the value of the `pageCachesize` parameter:

- 1 Unload NFS gateway by executing `gystop`.
- 2 Set the value of the `pageCachesize` parameter based on the requirement.

For more details, refer to the `pageCachesize` parameter description in Section 2.6, “Managing NFS Gateway Parameters,” on page 15.

The following parameters have an impact on the directory operations:

- **pageCacheSize:** When pageCache is set to 8 MB, a directory containing 50,000 entries can be listed. Use this example to calculate the size of pageCache required to operate on your largest directory. For more details, refer to the [pageCachesize parameter description in Section 2.6, “Managing NFS Gateway Parameters,” on page 15.](#)
- **shadowCacheSize:** Refer to the guidelines mentioned in [Section 2.6, “Managing NFS Gateway Parameters,” on page 15](#) to tune this parameter.
- **Btrieve CacheSize:** Refer to the guidelines mentioned in [Section 2.4, “Configuring NFS Gateway for the First Time,” on page 13.](#)

3 Reload nfsgr.nlm.

Import the volume using NFS version 3.

8.9 Using the Cleanup Utility

The cleanup utility does a cleanup of invalid entries in the shadow file.

NFS Gateway performance benefits when you use this utility. Consider the following guideline in determining when to use it:

- When the performance of NFS Gateway is degrading, you observe that shadow file size is growing very large, and you suspect invalid entries exist in the shadow file.

Invalid entries can exist in the shadow file when the remote paths are not mounted as Gateway volumes, but they are directly accessible to UNIX users. In such cases, there is a possibility of certain files or directories being deleted without the knowledge of NetWare NFS Gateway. However, the entries corresponding to those files or directories continue to exist in the shadow file; these entries are invalid and should be deleted with the cleanup utility.

For details on using the cleanup utility, see [Dismounting a Gateway Volume.](#)

Cluster-Enabling the NFS Gateway for NetWare 6.5

9

You can configure the NFS Gateway for NetWare® 6.5 in either active/passive or active/active modes of Novell® Cluster Services™.

9.1 Prerequisites

- ❑ Install and set up Novell Cluster Services.

For step-by-step information on setting up Novell Cluster Services, refer to [Installation and Setup \(http://www.novell.com/documentation/nw65/orionenu/data/hc8jxt45.html\)](http://www.novell.com/documentation/nw65/orionenu/data/hc8jxt45.html) in the *Novell Cluster Services Administration Guide*.

- ❑ The NFS Gateway for NetWare 6.5 is installed on every node in the cluster.

For details on installing NFS Gateway for NetWare 6.5, see [Chapter 2, “Installing and Setting Up the NFS Gateway,” on page 11](#).

9.2 Active/Passive Mode

In the active/passive cluster mode, the NFS Gateway for NetWare 6.5 runs on a single cluster node at a time. For example, if the node where the NFS Gateway for NetWare 6.5 is installed fails, the gateway starts on another specified node in the cluster, and gateway volumes on the failed server fail over to other nodes in the cluster.

Cluster enabling in this mode has the following advantages:

- High availability of gateway volumes.
- The shadow files for the entire cluster are located in *shared_volume_name* (the NSS volume that is mounted on a shared disk where you will store the shadow files), so the user access control is common across the cluster.

9.2.1 Configuring in Active/Passive Mode

- 1 Copy the files `sys:/system/gystart.ncf` and `sys:/system/gystop.ncf` to *shared_volume_name*:/system directory where *shared_volume_name* is in the same pool where the shadow volume is pointing.
- 2 Edit *shared_volume_name*:/system/gystart.ncf and enter the *shared_volume_name* in the shadowVolume parameter of the `nfs` command to store shadow files on the a shared volume.

Use the following command syntax:

```
nfs -shadowVolume shared_volume_name [-shadowCacheSize value]  
[-pageCacheSize value][-logFileSize value][-logLevel value][-  
logVerbose] [-logFlushImmediate]
```

For details on `nfs` parameters, see [Section 2.6, “Managing NFS Gateway Parameters,” on page 15](#).

- 3 Make sure of the following:
 - There is at least a single NSS volume on the resource.
 - All the volumes to be mounted using gymount are present in the gystart.ncf file.
- 4 Take the resource status offline, then add the following at the end of the existing load script:


```
shared_volume_name:/system/gystart
```

The load script specifies the commands to start the resource or service on a server, or to mount the volume on a server.

Use NetWare Remote Manager or ConsoleOne® to modify the load/ nload script.
- 5 Add the following at the beginning of the unload script:


```
shared_volume_name:/system/gystop
```

The unload script specifies how the application or resource should terminate.
- 6 Bring the cluster resource online.

The NFS Gateway is now configured to work in the active/passive cluster mode.

IMPORTANT: In a cluster-enabled environment, make sure that the NFS Gateway volume name (the *volumentame* parameter of gymount and gymount) does not exceed eight characters.

9.3 Active/Active Mode

In active/active cluster mode, services of the NFS Gateway for NetWare 6.5 are available on all nodes in a cluster.

For example, if a server hosting the NFS Gateway volume on a specific server fails, it will transparently fail over to any other node in the cluster.

Cluster enabling in this mode has the following advantages:

- Provides faster recovery after a failure
- Provides effective load balancing

9.3.1 Configuring in Active/Active Cluster Mode

Active/active mode is the recommended configuration because it provides faster recovery after a failure. Active/active mode signifies that the NFS Gateway is running simultaneously on multiple servers in the cluster. If a server fails, the cluster volumes mounted on that server fail over to other servers in the cluster and users retain access to files and directories.

- 1 In individual cluster nodes/servers that will run NFS Gateway, edit the autoexec.ncf file and add the following to the end of the file:

```
nfsgy [options...]
```

For details on nfsgy options, [Section 2.6, “Managing NFS Gateway Parameters,” on page 15](#).

- 2 Take the shared resource status offline.
- 3 Make sure of the following:
 - There is at least a single NSS volume on the resource.

- All nodes have uniform NFS Gateway (nfs-gy) parameters.
- 4 Modify the load and unload scripts of the shared resource to contain the list of mounted NFS Gateway volumes whose shadow files are to be stored on any of the NSS volumes of this shared resource.

- 5 Add the following syntax to the end of load script of shared resource:

```
gymount volumename IPAddress sharedPath -shadowVolume  
shared_volume_name [options]
```

For details on gymount options, see “Using iManager” on page 25.

- 6 Add the following at the beginning of unload script of the shared resource:

```
gyumount volumename -forceDeactivate
```

IMPORTANT: The -forceDeactivate option is mandatory.

- 7 Bring the cluster resource online.

The NFS Gateway is now configured to work in the active/active cluster mode.

IMPORTANT: In a cluster-enabled environment, make sure that NFS Gateway volume name (the *volumename* parameter of gymount and gyumount) does not exceed eight characters.

Interoperability

10

The NFS Gateway for NetWare[®] 6.5 interoperates with the following NCP[™]/CIFS clients and remote NFS servers.

NCP/CIFS Clients

Protocol	Clients
NCP over IP	Windows NT*
	Windows 2000
	Windows XP
NCP over IPX [™]	Windows NT
	Windows 98
CIFS	Windows 95
	Windows 2000

Remote NFS Servers

NOTE: The NFS Gateway usage is not limited to the NFS Servers listed here. This list indicates only the NFS Servers tested by Novell[®].

NFS Version	Remote NFS Server
Versions 2 and 3	Solaris 8 for Intel
Versions 2 and 3	Solaris 8 for SPARC*
Versions 2 and 3	Red Hat* Linux* 8.0
Versions 2 and 3	HP-UX* 11.0
Versions 2 and 3	FreeBSD* 4.5
Versions 2 and 3	NetApp F87
Versions 2 and 3	SUSE [®] 8.2
Version 2	IBM* - AIX*
Version 2	UnixWare* 7.1.0

Troubleshooting the NFS Gateway for NetWare 6.5

11

This section presents some common troubleshooting scenarios you might encounter when using the NFS Gateway for NetWare 6.5 and how to resolve them.

- “Reducing mount time while troubleshooting mount failures” on page 61
- “Maximum NFS Gateway volumes that can be mounted at a time” on page 62
- “Unable to mount volumes although several volumes have been mounted /dismounted previously and no error message is displayed on the logger screen” on page 62
- “Handling server abends” on page 62
- “The NFS Gateway hangs on loading without any error message” on page 62
- “Dismounting a Gateway volume takes a long time when network connectivity to the UNIX server is lost” on page 63
- “When using an NFS Gateway volume, the client times out with the message "The specified network name is no longer available"" on page 63
- “Even after renaming the target directory from UNIX, the symbolic link directory continues to display previous contents” on page 63
- “Trustee information is lost when using a Gateway volume in a cluster enabled environment or using a newly mounted NSS volume as a shadowVolume” on page 63
- “In the gystart.ncf file, the nfs-gy entry is added even if nfs-gy has not been executed” on page 64
- “NFS Gateway is not using the NFS-GY.NLM parameters specified in GYSTART.NCF” on page 64
- “Uninstall is not removing NFS Gateway from the server” on page 64
- “The text and the buttons in the NFS Gateway iManager Plug-in are not aligned properly” on page 64
- “Unable to mount volumes with message "Old shadow file format found. Load "NFS-GYMIG.NLM [<ShadowVolume:>]" to migrate the shadow files."” on page 64

11.1 Troubleshooting

Reducing mount time while troubleshooting mount failures

Problem: The gymount operation can take some time to finish retrying and might time out before giving the final results. During retry, the NFS Gateway displays the following messages:

```
GYMOUNT for volume volume_name is experiencing a
problem with Mount Version MountVersion. Retrying
with Mount version MountVersion -1...
```

Explanation: While mounting a volume, gymount uses twice the value specified for the rpcRetries and rpcTimeOut parameters.

Action: Decrease the values for the rpcTimeOut and rpcRetries parameters to speed up the mount.

After the problem is resolved, reset the values as before to ensure good fault tolerance.

Maximum NFS Gateway volumes that can be mounted at a time

Problem: **Error code 4099** might display.

Explanation: A NetWare® Server can have 255 volumes mounted simultaneously, including the NFS Gateway, NSS, and traditional volumes.

Unable to mount volumes although several volumes have been mounted / dismounted previously and no error message is displayed on the logger screen

Possible Cause: After installing the NFS Gateway, 1024 volumes have been mounted and dismounted over a period of time.

Action: The following steps clear the metadata that NetWare stores for the files and directories on the gateway volumes. This information is automatically rebuilt except for NetWare file system trustee rights. Reassign these rights.

- 1 Execute gystop.ncf.
- 2 Delete voltable.shw and the directories in *shadowVolume:\Gateway*.
- 3 Execute gystart.ncf to load *nfsgy* and mount the volumes using gymount.
Manually execute gymount for any additional volumes that are not handled by gystart.ncf.
- 4 Reassign file system trustees to Gateway volumes.

Handling server abends

Explanation: NFS Gateway shadow files can be corrupted when a Serverabend happens.

Action: The following steps clear the metadata NetWare stores for the files and directories on the Gateway volumes. This information is automatically rebuilt except for NetWare file system trustee rights. You need to reassign these.

- 1 Execute gystop.ncf.
- 2 Delete all files and directories in *shadowVolume:\Gateway*.
- 3 Execute gystart.ncf to load *nfsgy.nlm* and gymount volumes. (Manually execute gymount for any additional volumes that are not handled by gystart.ncf).
- 4 Reassign file system trustees to Gateway volumes.

The NFS Gateway hangs on loading without any error message

Explanation: The NFS Gateway hangs if you load it when port 111 is being used by another application.

Action: Verify that port 111 is not being used by any application before loading the NFS Gateway, because the NFS Gateway requires port 111 for the Port Mapper.

TIP: Port 111 can safely be in use by Native File Access for UNIX before starting the NFS Gateway, because both use the same Port Mapper (pkernel.nlm). However, if pkernel is not loaded, then nothing should be listening on TCP or UDP port 111.

Dismounting a Gateway volume takes a long time when network connectivity to the UNIX server is lost

Explanation: The dismount is slow because the Gateway tries to save file and directory metadata information to the UNIX server for files that are accessed through the Gateway volume.

When using an NFS Gateway volume, the client times out with the message "The specified network name is no longer available"

Possible Cause: The directory that is in use might have a large number of entries (about 100,000).

Action: List the contents of the directory. After listing, you can execute the required operations.

Action: If the problem persists, edit `sys:\system\bti.cfg`, increase the value of the BackgroundThread parameter, and then restart NetWare server for the new value to take effect.

Even after renaming the target directory from UNIX, the symbolic link directory continues to display previous contents

Action: On a NetWare server, complete the following:

- 1 Go to the parent directory of the symbolic link directory.
- 2 Execute `dir`.
- 3 Execute `cd` to the symbolic link directory.

The symbolic link directory must display the updated contents.

If the updated contents do not display, retry these steps.

Unable to create a directory from the NFS Gateway side using a name that was deleted from the UNIX side and a message indicates "directory *directory_name* already exists"

Action: From the NetWare server or NetWare client, get a refreshed listing of the parent directory. Then you can create a new subdirectory with the required name.

Trustee information is lost when using a Gateway volume in a cluster enabled environment or using a newly mounted NSS volume as a shadowVolume

Possible Cause: The error message **"Unable to initialize shadow files"** on page 78 is displayed.

Explanation: Btrieve does not support more than eight characters for Gateway *volumename* when the shadowVolume is an NSS volume which is mounted after loading nwmkde.nlm.

Action: Make sure that the **volumename parameter** does not exceed eight characters.

or

Make sure to complete the the action specified to resolve the error message **“Unable to initialize shadow files”** on page 78.

In the gystart.ncf file, the nfs gy entry is added even if nfs gy has not been executed

Explanation: If nfs gy has not been executed and it does not exist in the gystart.ncf file, then an nfs gy with default parameters is written into gystart.ncf before the the first gymount is executed.

NFS Gateway is not using the NFSGY.NLM parameters specified in GYSTART.NCF

Possible Cause: In gystart.ncf, the nfs gy entry is present after a gymount entry.

Explanation: In gystart.ncf, make sure that the load command for nfs gy, with all the desired parameters, comes before any gymount command.

Uninstall is not removing NFS Gateway from the server

Explanation: The product is deleted from the product database. However, at times specific files do not get deleted

Action: Delete the files manually, if required.

The text and the buttons in the NFS Gateway iManager Plug-in are not aligned properly

Explanation: Your browser supports various 'Text Size' settings. NFS Gateway iManager Plug-in works best with the 'Text Size' set to Medium.

Action: Set the 'Text Size' of your browser to 'Medium'.

Unable to mount volumes with message "Old shadow file format found. Load "NFSGYMIG.NLM [<ShadowVolume:>]" to migrate the shadow files."

Problem: The format of Attribute Shadow file has changed.

Explanation: Any existing shadow files in the system must be migrated to the new format before using NFS Gateway.

Action: For details on the usage of migration utility, refer **Chapter 3, “Migrating NFS Gateway Shadow Files,”** on page 19.

NFS Gateway for NetWare 6.5 FAQs

12

This section discusses the frequently asked questions (FAQs) in the following categories that the users and system administrators might have while using the NFS Gateway for NetWare® 6.5.

- “Installing and Uninstalling the NFS Gateway” on page 65.
- “Loading and Unloading the NFS Gateway” on page 65.
- “General Issues” on page 67
- “Importing and Mounting a Volume” on page 68.
- “UNIX Profile, Permissions, and Root Access Issues” on page 70.
- “File Read/Write Issues” on page 71.
- “Timestamp and File Content Synchronization Issues” on page 73.
- “Performance and Scalability Issues” on page 74.

12.1 Installing and Uninstalling the NFS Gateway

This section discusses FAQs relating to installing and uninstalling the NFS Gateway.

During installing or uninstalling, I see several setDateErrors on the logger screen. What do these errors imply?

Action: You can ignore these errors. They do not affect functionality in any way.

I have upgraded to the NFS Gateway for NetWare 6.5 from NetWare NFS Services 3.0. The installed products list in the NetWare server continues to display the previous NFS Gateway product. What does this imply?

Explanation: The entry NFS-GWY 1.0.5 for the previous product in the products list is not removed, but the product is upgraded.

Action: You can make sure that the product is upgraded by verifying that there is an entry for the NFS Gateway for NetWare 6.5 in the product list.

Although gymount failed for a volume, a directory with the name *volume_name* is created in `sys:\gateway`. What should I do?

Action: You can delete the directory named *volumename* located at `sys:\gateway`.

12.2 Loading and Unloading the NFS Gateway

This section discusses FAQs relating to loading and unloading the NFS Gateway.

What should I do when the message "Could not get license for NFS Gateway" displays when I try to load NFS Gateway?

Action: Use iManager or the Novell® Client™ to install the NFS Gateway license that comes with the product.

What should I do when the NFS Gateway fails to load and displays the message "The module NFSGY has an invalid version number of x. It should be y"?

Action: Make sure to install NetWare 6.5 Support Pack 2.

What do I need to do when the NFS Gateway fails to load and displays the message "The module NFSGY has an incompatible API version number of x. It should be y"?

Action: Make sure to install NetWare 6.5 Support Pack 2.

What do I need to do when the NFS Gateway fails to load and displays the message "The module NFSGY has an incompatible snap date of x. It should be y"?

Action: Make sure to install NetWare 6.5 Support Pack 2.

Why does the NFS Gateway fail to load and displays the message "Could not create directory *dirname*"? What do I need to do?

Possible Cause: The volume specified for the shadowVolume parameter is not mounted.

Possible Cause: The volume specified for the shadowVolume parameter does not have enough space.

Possible Cause: The volume specified for the shadowVolume parameter is read-only.

Action: Provide a different volume name for the shadowVolume parameter of nfsgy.

Why is the system hanging when I attempt to unload the NFS Gateway? Can I avoid this?

Possible Cause: Directory I/O or File I/O operations are taking place.

Action: Before unloading nfsgy.nlm, disconnect Gateway users from the NetWare server.

Why do I receive a message such as "Module did not release *n* resources" when I try to load the NFS Gateway?

Possible Cause: The NIS_ADMIN_OBJECT_CONTEXT parameter might not be set in the sys:/etc/nfs.cfg configuration file.

Action: Run the schinst.nlm administration utility or manually set the parameter.

When I unload the NFS Gateway, it gives a memleak. Why does this happen?

Possible Cause: The contents of nfs.cfg might be lost and the file size displays 0 bytes.

Action: Restore the nfs.cfg file by manually running the schinst utility.

The syntax is schinst -n. The schinst takes the administrator's FDN and password as input for extending the schema.

If Native File Access for UNIX was running, then restart the services by executing `nfsstop` and `nfsstart` commands at the server console.

12.3 General Issues

This section discusses FAQs relating to general NFS Gateway issues.

What can I do if the server abends because of a CPU hog or hangs when I list files/directories of an NFS Gateway volume?

Action: Complete the following steps:

- 1 Increase the value of the `CacheSize` parameter in `sys:/system/bti.cfg`.
For details, refer to [Step 3c on page 14](#).
- 2 Increase the value of the `shadowCacheSize` parameter of `nfsgy`.
For details, refer to [Section 2.6, “Managing NFS Gateway Parameters,” on page 15](#).
- 3 Restart the server for the change to take effect.

Although the file time stamp has changed on the NFS Server, I am unable to view the updated timestamp of the same file on NFS Gateway. How can I resolve this?

Action: Enable the `tosMetaData` parameter of `gymount` to ensure that the refreshed timestamp is displayed every time.

This might have a negative impact on the performance as the metadata of the file has to be fetched every time.

How often should I use the cleanup utility?

Explanation: Use this utility when the performance of NFS Gateway is degrading, and shadow file size is growing very large and you suspect invalid entries exist in the shadow file.

For details refer [Section 8.9, “Using the Cleanup Utility,” on page 54](#).

How do I abort the cleanup utility when it is in progress?

Action: Execute `unload gymount` at the command prompt.

After I use the cleanup utility for a volume, the size of the shadow file grows although it reports that it has deleted all stale records from the file. Why does this happen?

Explanation: This is because of the behavior of the `btrieve` database. However, the deleted space is reused. If you create and delete same number of files again, you will not see the filesize increasing.

Why is the cleanup utility displaying a wrong value for the initial number of records in the shadow file?

Explanation: The utility is functioning correctly; only display is erroneous. You can ignore the value displayed.

Why am I seeing some files beginning with dot(.) in Windows Explorer even though I have set hideDotFiles for a volume?

Explanation: Some dotted files might have got created or renamed from the Windows client. NFS Gateway will not add, modify, or delete the hidden attribute for such files.

Or

The administrator might have toggled the parameter showDotFiles or hideDotFiles while reloading NFS Gateway without deleting the shadow files.

Action: Delete the shadow files and reload NFS Gateway with hideDotFiles as a parameter to the gymount command. On doing this, NFS Gateway adds hidden attributes to all the files that begin with dot (.).

While executing the SCHINST -n, what does the message “Error: Unable to login. Error Code : 35076” imply? This is displaying even when the Schema is fine and nfauser object has been recreated.

Explanation: This implies that the server's /etc/hosts file does not contain the simple host name (server name).

Action: To resolve this, do the following:

- 1 Make sure that the server's /etc/hosts file contains the simple host name (server name).

For example, if the format is

```
10.1.2.3 server1.domain.com
```

then change the entry to,

```
10.1.2.3 server1.domain.com server1
```

- 2 Restart the server and schinst should work fine.

12.4 Importing and Mounting a Volume

This section discusses FAQs relating to importing and mounting a volume using the NFS Gateway.

Why does the mount fail when I give a gymount command specifying only the volumename?

Explanation: If you are giving the gymount command first time after nfs-gateway is loaded, then the *volumename*, *IP address | Hostname*, and *sharedPath* parameters are mandatory. The NFS Gateway preserves parameters of a volume only till NFS Gateway is loaded, therefore subsequent mounting when nfs-gateway is still loaded will work even on specifying *volumename* only.

For further information, refer [Section 6.4, “Mounting a Gateway Volume,” on page 38](#).

Why am I unable to mount a volume even though I have specified all the mandatory parameters?

Possible Cause: You might have dismounted this volume using the DISMOUNT command.

Explanation: We recommend to use gymount and gymount commands to mount and dismount NFS Gateway volumes.

Action: Use the MOUNT command to mount the volume which was dismounted using the DISMOUNT command.

Even though I have specified shadowVolume different from sys:, the NFS Gateway continues to create shadow files in the sys:\Gateway directory. Why?

Possible Cause: This happens if the shadowVolume specified is _ADMIN.

Action: Specify any volume other than _ADMIN for the shadowVolume parameter.

Why does importing a volume using gymount fail with the message "Error while mounting the volume volume_name"?

Possible Cause: There might be a network error.

Possible Cause: The mount daemon might not be running on the remote server.

Possible Cause: The IP address provided for importing might be invalid.

Possible Cause: The path to be imported might not have been shared from remote server.

Possible Cause: If the NFS server is running on a FreeBSD OS, the path must be shared with root access to this NetWare machine.

I tried mounting a large number of NFS Gateway volumes through gystart.ncf. However, only a few volumes are mounted and error messages are displayed for remaining volumes. How do I mount all the volumes?

Action: Mount the NFS Gateway volumes manually using the system console, or edit gystart.ncf and introduce a delay between each gymount command. For example:

```
gymount gwvol1 222.223.224.225 /home1
delay 6 [This introduces a delay of 6 seconds]
gymount gwvol2 222.223.224.225 /home2
```

Why do the values of maxOutstandingPackets and dynamicMOP parameters of different volumes mounted from the same NFS server become the same for all volumes after sometime in the gystart.ncf file?

Explanation: The maxOutstandingPackets and dynamicMOP for the various volumes mounted from the same NFS server are maintained as the same for all these volumes.

Action: To see the correct value of maxOutstandingPackets use 'gymount -d -volparams [volumeName]' or refer to the volume parameters in the NFS Gateway iManager plug-in. To get these values into gystart.ncf, click Refresh in the NFS Gateway iManager plug-in.

How can I verify the mount parameters of a gateway volume?

Action: View the volume parameters of the gateway volume on the logger screen by entering the following at the system console prompt:

```
load gymount -d -volparams [volumename]
```

If the *volumename* is not specified, then the parameters of all gateway volumes are printed on the logger screen.

Why can't I view the list of shared paths on the remote UNIX server in the NFS Gateway Mount Parameters screen of iManager?

Explanation: The remote UNIX Server might have a large number of export entries that require mounting over TCP support. However, NFS Gateway supports mounting only over UDP.

Action: Manually type the path that you would like to mount.

12.5 UNIX Profile, Permissions, and Root Access Issues

This section discusses FAQs relating to UNIX profile, permissions, and root access issues.

At times, exporting from UNIX does not work with DNS names. Can I resolve this?

Explanation: This happens because the UNIX machine is unable to resolve the DNS name of the NetWare server.

Action: In the `/etc/hosts` file of UNIX machine, verify whether the corresponding entry for the DNS name is present.

When I do directory listing, I cannot view the contents of the directory and the directory size is displayed as 0 bytes. Can I resolve this?

Explanation: The user might not have adequate UNIX permissions to list the directory.

Action: Modify the UNIX permissions to view the directory contents.

Why do the files and subdirectories that the user is creating have the UID = 55555 and GID = 55555?

Possible Cause: The Novell eDirectory™ user's UNIX profile is not updated with the UID/GID.

Possible Cause: If the UID = 0 in the UNIX profile, then the root access to the NetWare server might not have been given from the remote server while sharing the path over NFS.

Action: Verify if an NFS Gateway volume has the root access by entering the following command at the system console prompt:

```
gymount -d -volparams [volumename]
```

Along with the parameters of all the NFS Gateway volumes displayed in the logger screen, you can also view the Root Access parameter with its value Yes or No.

Even though I have shared a path with root access to the NetWare machine, the files created by the user with UID = 0 continue to have the UID = 5555. What should I do?

Explanation: Most of the UNIX NFS servers require the machine name specified for root access to be present in /etc/hosts.

Action: Complete the following steps:

- 1 Add the NetWare machine name along with its DNS name and IP address in the /etc/hosts file of the machine where the NFS server is hosted.
- 2 Reshare the path from NFS server.
- 3 Dismount and remount the volume on the NetWare machine using gymount.nlm and gymount.nlm, respectively.

Why do the NFS Gateway volumes mounted with anonUID=-2 /60001(nobody) and anonGID=-2 /60001(nobody) deactivate upon execution of certain directory I/O operations?

Possible Cause: Some NFS servers have access check problems with UID=-2/60001 and GID=-2/60001.

Action: Do not use -2 or 60001 for the anonUID and anonGID parameters.

Even though I have updated the UNIX profile for a user, the NFS Gateway is creating directory entries with UID = 5555 and GID = 5555 or previous UID/GID. What should I do?

Possible Cause: You might have updated the UNIX profile after loading nfs-gy.

Explanation: NFS Gateway uses NDSILIB to access eDirectory user's UNIX profiles, and ndsilib does not immediately reflect the changes in user profiles.

Action: Enter the NDSILIB cache refresh command at the system console prompt to refresh the cache. By default, the NDSILIB cache is refreshed every two hours.

12.6 File Read/Write Issues

This section discusses FAQs relating to file read/write.

Why am I unable to select Copy Inhibit for any of the files in Gateway volume?

Explanation: Copy Inhibit (CI) is disabled for all the files in gateway volume, so you cannot select it.

Why do the messages "Access denied" or "An attached device is not functioning" display when a user tries to open a file in read mode?

Possible Cause: The user might not be a trustee of the file or the trustee might not have sufficient rights.

Action: Add the user as a trustee to the file and provide sufficient access to read the file.

Possible Cause: The user might not have sufficient UNIX permissions.

Action: Complete the following steps:

- 1 Identify the User's UID/GID in his or her UNIX profile in eDirectory.
If the UNIX profile for the user does not exist, create it.
- 2 Identify whether the user's UNIX access is coming from user, group, or other permissions.
- 3 Grant the read permission to the appropriate entity (user, group, or other).

Possible Cause: The user's UNIX profile might be set with UID = 0.

Action: Verify for root access by entering the following command at the system console prompt:

```
gymount -d -volparams [volumename]
```

If root access is not given, make sure that the world/other group has the Read permission.

Possible Cause: The file might be a special file such as block device, character device, or symbolic links file.

Problem: If the file is a special file, then it is not possible to either open it or read its contents.

Why does the message "Access denied" display when a user tries to open a file in read-write mode or write to a file?

Possible Cause: The user might not be a trustee of the file or might not have sufficient rights.

Action: Add the user as a trustee and provide sufficient rights to the file.

Possible Cause: The user might not have sufficient UNIX permissions.

Action: Complete the following steps:

- 1 Identify the user's UID/GID in his or her UNIX profile in eDirectory.
If the UNIX profile for the user does not exist, create it.
- 2 Identify whether the user's UNIX access is coming from user, group, or other permissions.
- 3 Grant the read/write permission to the appropriate entity (user, group, or other).

Possible Cause: The volume might have been mounted as read-only.

Action: Dismount and remount the volume with read/write mode using gymount.nlm and gymount.nlm.

Possible Cause: The path might have been shared as read-only from the NFS server.

Action: Reshare the path as read-write and dismount and remount the volume using gymount.nlm and gymount.nlm.

Possible Cause: The user's UNIX profile might be set with UID = 0.

Action: Verify for root access by entering the following command at the system console prompt:


```
gymount -d -volparams [volumename]
```

If root access is not given, make sure that the world/other group has the Read permission.

Possible Cause: The file might be a special file such as block device, character device, or symbolic links file.

Problem: If the file is a special file, then it is not possible to either open it or read its contents.

Is file I/O error messaging feature enabled for CIFS users?

Explanation: No. Currently only NCP™ users are notified of file I/O errors.

Does a file I/O NCP error message imply that my file write failed?

Explanation: No. Up to five users who recently accessed a particular file receive an error message for any file I/O error of any of the five users. To know about your file write status, manually check its contents.

What can I do if the file I/O hangs without any error message?

Explanation: It could be because of a network error. It might take up to one and a half minutes for the error message regarding the network error to display.

A symbolic link directory has converted to a file with read-only attribute. What does this imply?

Explanation: The target directory that the symbolic link is pointing to does not exist.

Why am I unable to access files or directories on Gateway volumes with lengthy pathnames from NCP or CIFS clients?

Explanation: Files with a pathname length greater than 243 characters are not accessible from the NCP/CIFS client.

I am unable to copy a file and the message such as “Cannot copy <filename>: Cannot find the specified file. make sure you specify the correct path and filename” is displaying. How can I resolve this?

Action: Refer [TID 10071550 \(http://support.novell.com/cgi-bin/search/searchtid.cgi?10071550.htm\)](http://support.novell.com/cgi-bin/search/searchtid.cgi?10071550.htm) for possible cause and solution.

12.7 Timestamp and File Content Synchronization Issues

This section discusses FAQs relating to timestamp and file content synchronization.

Even though I save the file contents and close the file, it takes some time for the changes to be visible from other clients attached to the remote server. How can I resolve this?

Action: If you are accessing the NFS Gateway volume over an NCP client, complete the following to resolve this:

- 1 In the Advanced Properties of Novell Client, set File Commit = On.
- 2 In Novell Storage Services™ (NSS), set BufferFlushTimer = 1 (second).

IMPORTANT: This action might have a negative impact on the write performance during large file writes.

At times, I cannot view the file content modifications that I made on the remote server when I access it from an NFS gateway volume. How can I resolve this?

Action: For NCP clients, set FileCache = Off.

Action: Make sure that the system time of the NetWare server and the corresponding UNIX machine are synchronized.

How can I view the latest time stamps of files or subdirectories every time that I list a directory?

Action: During volume mounting using gymount, decrease the value of the dirCompFreq parameter of gymount. The minimum value is 1 second.

IMPORTANT: This action will have a negative impact on the directory listing performance.

12.8 Performance and Scalability Issues

This section discusses FAQs relating to the performance and scalability issues.

Even though the NFS Gateway volume is mounted over NFS version 3, the clients attached to it time out while listing a directory containing more than 50,000 entries. What should I do?

Action: Increase the value of the pageCachesize parameter:

- 1 Unload the NFS Gateway by executing gystop.
- 2 Reload nfsgy with a larger pageCacheSize.
- 3 To do this, modify gystart.ncf (or anywhere nfsgy is being loaded, including directly at the console prompt). After modifying the NCF file, execute it to reload nfsgy.nlm.

For more details, refer to the [pageCachesize parameter description](#) in [Section 2.6, “Managing NFS Gateway Parameters,”](#) on page 15.

Action: If increasing the pageCachesize does not have any impact, try increasing the value of the CacheSize parameter in sys:\system\bti.cfg.

Refer to the guidelines mentioned in [Section 2.4, “Configuring NFS Gateway for the First Time,”](#) on page 13.

Why does the client time out when I look up certain entries in a large directory?

Possible Cause: The entries must be the last few entries in a large directory, and it must be the first lookup in the directory for which shadow entries do not exist.

Action: Completely rebuild shadow entries for the volume:

- 1 After importing the volume, load toolbox.nlm on the server.
- 2 Using toolbox.nlm, change the current working directory to the root directory of the volume imported.
- 3 Create the shadow entries for all directories in the volume by executing dir /s, the recursive directory browsing command of toolbox.nlm.

What do I need to do when multiple directories of an NFS Gateway volume are scanned from multiple clients simultaneously and clients time out with a "Network path not available" message. How can I resolve this?

Action: Increase the value of the shadowCachesize parameter:

- 1 Unload the NFS Gateway by executing gystop.
- 2 Set the value of the shadowCachesize parameter based on the performance requirement.

For more details, refer to the [shadowCachesize parameter](#) in [Section 2.6, "Managing NFS Gateway Parameters,"](#) on page 15.

- 3 Reload nfsgy.nlm.

Action: If increasing the shadowCachesize does not have any impact, increase the CacheSize in sys:\system\bti.cfg. Refer to the guidelines mentioned in [Section 2.4, "Configuring NFS Gateway for the First Time,"](#) on page 13.

What should I do when the message "CacheAllocator out of available memory" displays?

Possible Cause: The pageCacheSize parameter of nfsgy command is set to a high value with respect to the available system memory.

Action: Decrease the value of the pageCacheSize on the memory available on your server.

Possible Cause: The value of the NSS ClosedFileCacheSize is set very high with respect to the available system memory.

Action: Decrease the value of NSS ClosedFileCacheSize based on the memory available on your server.

What is the impact of setting the SGID bit on a directory?

Explanation: File operations such as copy and create on this directory will take a longer time.

When working with certain NFS Servers, directory creation fails although it seemed to be working. Why does this happen?

Explanation: Certain NFS Servers have a upper limit on holding subdirectories in a directory. For example, Red Hat Linux 8.0 can hold 32,000 subdirectories in a directory and Solaris 8.0 can hold 32,767 subdirectories in a directory.

I see incorrect behaviour on NFS Gateway volume while creating/listing of hidden files/directories.

Action: If showDotFiles is disabled, do not create files beginning with dot (.) from the client/Netware application.

Why does gymount command in NCF file lead to inconsistent behaviour of gateway volumes?

Possible Cause: The gymount command is executing even before the corresponding gymount completes as the commands in gystart.ncf file may not be executed in sequence.

Action: We recommend not to use gymount in gystart.ncf file.

This section discusses the NFS Gateway error messages.

13.1 NFS Gateway Error Messages

This section discusses the error messages that you might encounter while using NFS Gateway and suggests ways to resolve them.

9906: Could not initialize NFS Gateway

Possible Cause: The `sys:\etc\hosts` file on the server where NFS Gateway is running does not contain an entry for its own primary IP address.

Action: Ensure that the primary (first bound) IP address of the NetWare[®] server is present in the `sys:\etc\hosts` file.

Error mounting *volume_name*, status = 4099

Possible Cause: At this time, 255 volumes (including the NFS Gateway, NSS, and traditional volumes) have been mounted.

Action: Dismount the volumes that are not utilized to mount the required *volume_name*.

NFSGY ERROR: Failed writing part of the file *volume_name:\path\file*. Error Code: 300. Remote Server has timed out. Save your data to another location and then contact system administrator to fix the problem.

Possible Cause: The remote server might have timed out because of network problems or because the NFS Server is unable to handle many parallel requests.

Action: Resolve the network problems or change the value for the `maxOutstandingPackets` parameter based on the description for “`maxOutstandingPackets`” on page 33.

If you are unsure about the network behavior and about the ability of the server to handle many parallel requests and you prefer NFS Gateway to automatically take care of tuning the `maxOutstandingPackets` value, then enable the `dynamicMOP` parameter. Enabling `dynamicMOP` might significantly reduce the performance.

If you are using NFS version 2, see [Section 8.3, “Tuning for NFS Version 2,”](#) on page 50.

Unable to open the shadow file. Cleanup not done.

Possible Cause: The shadow file has been opened by another application.

Possible Cause: The corresponding `gymount` entry does not exist in the `gystart.ncf` file.

Action: Complete the following:

- 1 Close the shadow file.
- 2 Add the corresponding gymount entry in the gystart.ncf file.
- 3 Execute the **cleanup utility**.

File Error

Source: Cleanup utility screen.

Possible Cause: The shadow file might have been corrupted.

Possible Cause: The corresponding gymount entry does not exist in the gystart.ncf file.

Action: Complete the following:

- 1 Close the shadow file.
- 2 Add the corresponding gymount entry in the gystart.ncf file.
- 3 Execute the **cleanup utility**.

Unable to initialize shadow files

Possible Cause: ShadowVolume (NSS volume on which shadow files are stored) was mounted after NWMKDE.NLM was loaded, and the Gateway volume name is more than eight characters.

Action: Execute the following before restarting GYSTART

```
BTRV UNLINK  
  
UNLOAD BSPXCOM.NLM  
  
UNLOAD BTCPCOM.NLM  
  
UNLOAD NWMKDE.NLM  
  
LOAD NWMKDE.NLM  
  
LOAD BTCPCOM.NLM  
  
LOAD BSPXCOM.NLM  
  
BTRV LINK
```

To avoid seeing this issue from next time the server is started, make sure that autoexec.ncf has the following load order:

```
MOUNT ALL  
  
...  
  
BSTART.NCF
```