

# Novell Apple<sup>\*</sup> Filing Protocol for Linux<sup>\*</sup> Administration Guide

## Novell<sup>®</sup> Open Enterprise Server

OES 2 SP1

December 2008

[www.novell.com](http://www.novell.com)



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# About This Guide

This guide describes how to use the Novell® Apple Filing Protocol (AFP) service on a Novell Open Enterprise 2 SP 1 Linux Server to access and manage Macintosh\* systems.

This guide is divided into the following sections:

- ♦ Chapter 1, “Overview of AFP,” on page 11
- ♦ Chapter 2, “What's New,” on page 13
- ♦ Chapter 3, “Planning for AFP,” on page 15
- ♦ Chapter 4, “Installing and Setting Up AFP,” on page 17 .
- ♦ Chapter 5, “Administering the AFP Server,” on page 23
- ♦ Chapter 6, “Migrating AFP from NetWare to OES 2 SP1 Linux,” on page 31
- ♦ Chapter 7, “Running AFP Services in a Virtualized Environment,” on page 33
- ♦ Chapter 8, “Configuring AFP with Novell Cluster Services for an NSS File System,” on page 35
- ♦ Chapter 9, “Working with Macintosh Computers,” on page 39
- ♦ Chapter 10, “Monitoring the AFP Server,” on page 45
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- ♦ Chapter 12, “Troubleshooting AFP,” on page 49
- ♦ Chapter 13, “Security Guidelines for AFP,” on page 53
- ♦ Appendix A, “Command Line Utilities,” on page 55
- ♦ Appendix B, “Comparing of AFP on NetWare and AFP on Linux,” on page 57

## Audience

The audience for this document is network administrators. This documentation is not intended for users of the network.

## Documentation Updates

For the most recent version of the *Novell AFP Linux Administration Guide*, see the [AFP For Linux Administration Guide for OES 2.0](http://www.novell.com/documentation/oes2/) (<http://www.novell.com/documentation/oes2/>)

## Feedback

We want to hear your comments and suggestions about this guide and the other documentation included with Novell OES. Please use the User Comment feature at the bottom of each page of the OES online documentation.

## Additional Documentation

For information about AFP on NetWare®, see the *OES 2 SP1: AFP, CIFS, and NFS for NetWare (NFAP) Administration Guide*

## Documentation Conventions

In this 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 UNIX \*, should use forward slashes as required by your software.

# Overview of AFP

# 1

Novell® Open Enterprise Server (OES) 2 SP1 provides the Novell Apple Filing Protocol (AFP) for Linux operating systems. AFP is a network protocol that offers file services for Mac\* clients. OES 2 SP1 Linux currently supports AFP version 3.1.

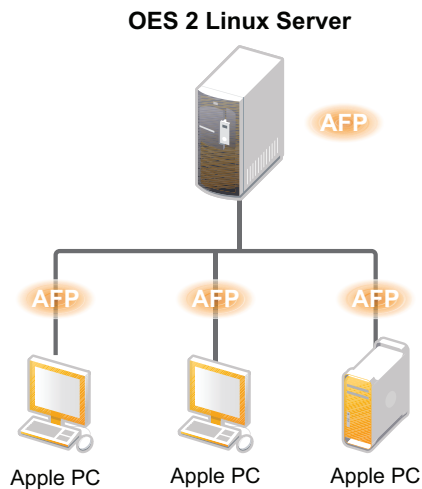
- ♦ [Section 1.1, “Understanding AFP,” on page 11](#)
- ♦ [Section 1.2, “AFP and Universal Password,” on page 12](#)
- ♦ [Section 1.3, “AFP Features and Capabilities,” on page 12](#)
- ♦ [Section 1.4, “What’s Next,” on page 12](#)

## 1.1 Understanding AFP

Novell AFP (Apple Filing Protocol) lets Macintosh workstations access and store files on OES 2 SP1 Linux servers without installing any additional software. The AFP software is installed as part of OES 2 on the OES 2 SP1 Linux server and provides out-of-the-box network access. You can connect the network cable, start the Macintosh computer, and you have access to servers on your network.

Novell AFP enables the Linux server to use the same protocol as the client workstation to copy, create, delete, move, save, and open files on a Macintosh workstation.

**Figure 1-1** *Novell AFP Overview*



Enabling native protocols on a Linux server means that users can access files on the network, map network drives, and create shortcuts to the Linux servers by using the native methods available in their specific operating systems. Macintosh users can use Chooser or the Go menu to access network files and even create aliases. On a Linux server, the native protocols running on the server enable users to copy, delete, move, create, save, and open network files—just like they would if they were working locally.

AFP also provides integration with Novell eDirectory™. Consolidation of user management through eDirectory simplifies network administration. All users who need access to the network are represented in eDirectory through User objects, which enables you to easily and effectively assign trustee rights, control access, and manage all user objects from a single location on the network.

## 1.2 AFP and Universal Password

Universal Password helps in management of password-based authentication schemes. The Universal password is not enabled by default. Each AFP user must be Universal Password enabled to be able to log in to the AFP server.

For details on Universal Password, see [Novell Password Management \(http://www.novell.com/documentation/password\\_management32/pwm\\_administration/index.html?page=/documentation/password\\_management32/pwm\\_administration/data/bookinfo.html\)](http://www.novell.com/documentation/password_management32/pwm_administration/index.html?page=/documentation/password_management32/pwm_administration/data/bookinfo.html)

## 1.3 AFP Features and Capabilities

AFP has many features that can help you manage users, workstations, and networks.

- ♦ AFP parameter configuration and administration through iManager.
- ♦ Support for Mac OS\* 10.3, 10.4 and 10.5.
- ♦ Integration with Novell eDirectory.
- ♦ Migration capability from NetWare® to Linux.
- ♦ Cross-Protocol File Locking support between AFP and NCP™.
- ♦ Auditing and Monitoring support.
- ♦ Support for Unicode\* filenames.
- ♦ Support for Universal Passwords longer than 8 characters.
- ♦ Clustering support for high availability.

## 1.4 What's Next

For information on new features in this release of AFP see, [Chapter 2, “What's New,” on page 13](#)

# What's New

# 2

This section describes additions to the Novell® Apple Filing Protocol (AFP) service for the Novell Open Enterprise Server 2 SP1 Linux platform and for maintaining feature parity with the existing solution on the NetWare® platform.

- ♦ **Installation through YaST:** Predefined system of installing the AFP service along with the associated dependencies.
- ♦ **Secure authentication mechanism:** DHX authentication provides a secure way to transport clear-text passwords of up to 64 characters to the server for further processing.
- ♦ **Administering and Configuring parameters:** Ability to administer and configure the AFP server through iManager.
- ♦ **Auditing support:** Helps you keep check on the authentication process and any changes that occur to the configuration parameters of the server.
- ♦ **Monitoring support:** Helps you assess the performance of the AFP server.
- ♦ **Migrating to Linux platform:** Ability to migrate the AFP service from NetWare to Linux.
- ♦ Man pages for the following binaries:
  - ♦ **afpdtreset**
  - ♦ **afpstat**
  - ♦ **afptcpd**
  - ♦ **afpbind**
  - ♦ **migafp**



# Planning for AFP

# 3

This section describes requirements and guidelines for using the Novell® Apple Filing Protocol (AFP) for Novell Open Enterprise Server (OES) 2 SP1 Linux servers.

- ♦ [Section 3.1, “Supported Platforms,” on page 15](#)
- ♦ [Section 3.2, “Requirements,” on page 15](#)
- ♦ [Section 3.3, “Unsupported Service Combinations,” on page 15](#)
- ♦ [Section 3.4, “What’s Next,” on page 16](#)

## 3.1 Supported Platforms

Before installing AFP, ensure that your system meets the following requirements.

- ♦ [Section 3.1.1, “Server Requirements,” on page 15](#)
- ♦ [Section 3.1.2, “Client Requirements,” on page 15](#)

### 3.1.1 Server Requirements

- ☐ OES 2 SP1 Linux

### 3.1.2 Client Requirements

- ☐ Mac 10.3
- ☐ Mac 10.4
- ☐ Mac 10.5

## 3.2 Requirements

- ☐ If your eDirectory™ replica is stored on an eDirectory server earlier than 8.8.3, make sure that you upgrade the server by using the [Security Services 2.0.6 patch \(http://download.novell.com/Download?buildid=LY1bZMAom6k~\)](http://download.novell.com/Download?buildid=LY1bZMAom6k~).

## 3.3 Unsupported Service Combinations

Do not install any of the following service combinations on the same server with Novell AFP. Although not all of the combinations cause pattern conflict warnings, Novell does not support any of the combinations shown.

- ☐ SUSE® Linux Enterprise Server (SLES) 10 - Samba
- ☐ Netatalk
- ☐ Novell Domain Services for Windows
- ☐ Xen\* Virtual Machine Host Server

## 3.4 What's Next

To proceed with installation of AFP, see [Chapter 4, “Installing and Setting Up AFP,”](#) on page 17



# Installing and Setting Up AFP

# 4

This section describes how to install and configure the Novell® Apple Filing Protocol (AFP) on a Novell Open Enterprise Server (OES) 2 SP1 Linux server.

- ♦ [Section 4.1, “Installing AFP during the OES 2 SP 1 Installation,” on page 17](#)
- ♦ [Section 4.2, “Installing AFP after the OES 2 SP 1 Installation,” on page 20](#)
- ♦ [Section 4.3, “Verifying the Installation,” on page 20](#)
- ♦ [Section 4.4, “What’s Next,” on page 21](#)

## 4.1 Installing AFP during the OES 2 SP 1 Installation

YaST uses a predefined system of installing components along with the associated dependencies. For a service to function properly, all the dependent products must be installed. Pattern deployment provides patterns for different services. Selecting a pattern automatically selects and installs its dependencies.

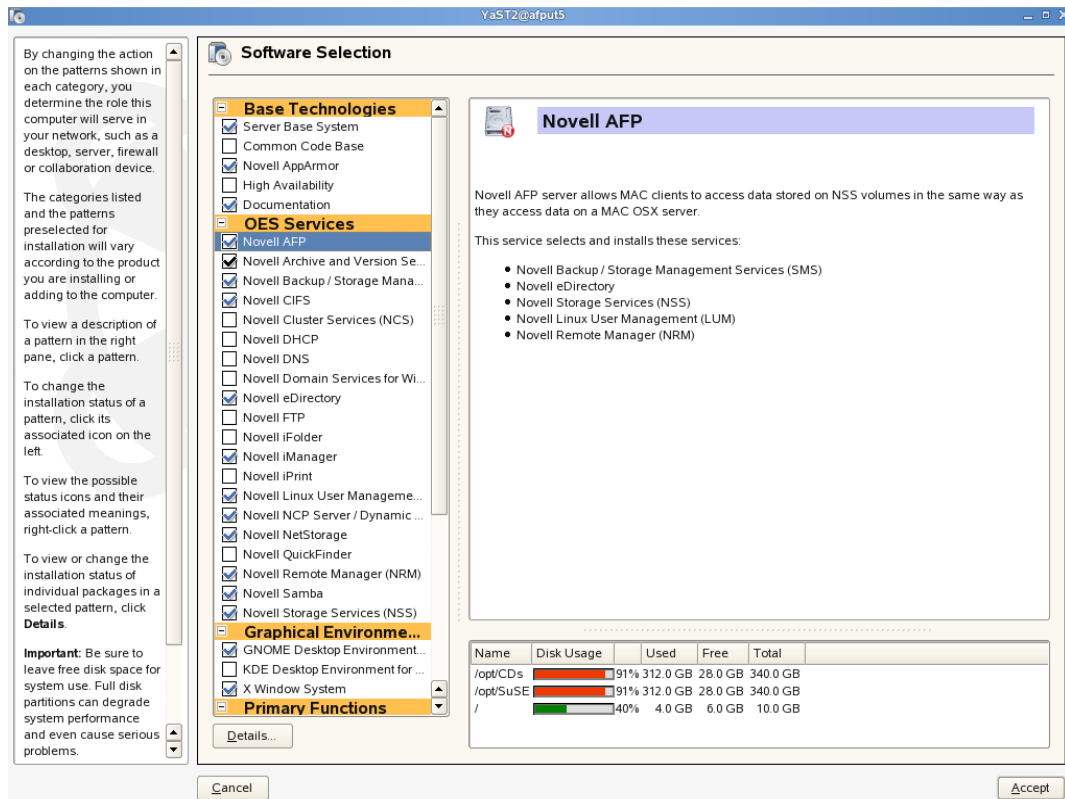
- 1 In the YaST install for OES, on the *Installation Settings* page, click *Software* to go to the *Software Selections and System Tasks* page.

For information about the entire OES 2 Linux installation process, see the [OES 2 SP1: Linux Installation Guide](#).

- 2 From the *OES Services* option, select *Novell AFP*. Click *Accept*.

The following additional services are automatically selected:

- ♦ Novell Backup / Storage Management Services (SMS)  
SMS helps back up file systems or applications on NetWare® and SUSE® Linux Enterprise Server (SLES) to removable tape media or other media for off-site storage.
- ♦ Novell eDirectory  
eDirectory supports authentication of users.
- ♦ Novell Linux User Management (LUM)  
LUM is a directory-enabled application that simplifies and unifies the management of user profiles on Linux-based platforms.
- ♦ Novell Storage Services (NSS)  
Novell Storage Services™ helps you manage pools, and volumes on a Novell Open Enterprise Server 2 server.
- ♦ Novell Remote Manager (NRM)  
NRM for Linux is a browser-based utility that you can use to manage one or more Linux servers from a remote location.



3 To configure the AFP service, fill in the fields on the Configuration page.

Configuration Parameter	Details
<i>AFP Proxy User</i>	<p>Select <i>Use existing user as AFP Proxy user</i> to allow the user to use an existing proxy user to configure the AFP service.</p> <p>Select <i>Create a new AFP Proxy user</i> to allow the user to create a new proxy user to configure the AFP service.</p>
<i>AFP Proxy User Name</i>	<p>Specify the FQDN (fully qualified distinguished name) of the AFP proxy user.</p> <p>For example: cn=user, o=novell</p> <p><b>NOTE:</b> This user is granted rights to read the passwords of any users, including non-AFP users, that are governed by any of the password policies you select in the Novell AFP Service Configuration page.</p>
<i>AFP Proxy User Password</i>	Specify the password to authenticate to the AFP server.

Configuration Parameter	Details
<i>eDirectory Context</i>	Specify the context for the AFP server.  The context defines the position of an object within the directory tree structure. It is a list of container objects leading from the object to the root of the tree.  Specifying the context preempts the need to specify the FQDN (fully qualified distinguished name) of the user.
<i>Credential Storage Location</i>	Specify where the user credentials of the AFP proxy server are to be stored.  For security reasons, the default and recommended method of credential storage is CASA.

- 4 Click *Next* to continue with the AFP services installation.

---

**NOTE:** If the subcontainer admin user is used to configure the AFP service, ensure that the subcontainer admin has create permissions on the password policies container.

---

## 4.2 Installing AFP after the OES 2 SP 1 Installation

If you did not install Novell AFP services during the OES 2 SP1 installation, you can install it later.

- 1 In the YaST install for OES, on the *Installation Settings* page, click *Software* to go to the *Software Selections and System Tasks* page.
- 2 From the *OES Services* option, select *Novell AFP*. Click *Accept*.  
After the install is finished, YaST displays a summary page indicating that AFP configuration is enabled. All the configured services are disabled in this page.
- 3 Select *AFP* to proceed with the configuration.
- 4 Specify the configuration details according to instructions in [Step 3 on page 18](#)
- 5 Click *Next* to continue.

## 4.3 Verifying the Installation

After the installation is done, you can verify that it succeeded using the following procedure:

- 1 Check for the following files in the `/etc/opt/novell/afptcpd` directory:
  - ♦ `afpdirxct.conf`
  - ♦ `afptcpd.conf`
  - ♦ `afpvols.conf`
- 2 Check the `afpdirxct.conf` file for the context added during installation.
- 3 (Conditional) If CASA is specified as the credential storage location, execute the `CASAccli` command at the console prompt to make sure that `casa-afp` is present in the CASA store.

The output of the `CASAccli` command is as follows:

```
# CASAccli -g -n afp-casa
```

Getting afp-casa

Name: afp-casa

Key: Password (\*\*\*\*\*)

Key: CN (\*\*\*\*\*)

**4** (Conditional) If a local file is specified as the credential storage location, check for the `/opt/novell/afptcpd/afppwd` file.

**5** Check for the `/usr/share/mof/novell-afp-providers/AFPServices.mof` file.

**6** Check for the following libraries under `/usr/lib/cmpi` on a 32-bit system and `/usr/lib64/cmpi` on a 64-bit system:

`libAFPConfigProvider.so`

`libAFPConfigProvider.so.1`

`libAFPConfigProvider.so.1.0.0`

`libAFPContextProvider.so`

`libAFPContextProvider.so.1`

`libAFPContextProvider.so.1.0.0`

`libAFPServicesProvider.so`

`libAFPServicesProvider.so.1`

`libAFPServicesProvider.so.1.0.0`

`libAFPVolumeProvider.so`

`libAFPVolumeProvider.so.1`

`libAFPVolumeProvider.so.1.0.0`

## 4.4 What's Next

For details on administering the AFP service, see [Chapter 5, “Administering the AFP Server,”](#) on [page 23](#).



# Administering the AFP Server

# 5

You can use Novell® iManager to change the configuration of your AFP server after AFP services have been installed on Novell Open Enterprise Server 2 (OES 2) SP1 Linux. The AFP configuration details are stored in a configuration file on the Linux server, and iManager provides an easy interface for changing the configuration details.

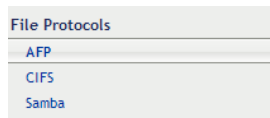
- ♦ “Selecting a Server to Manage” on page 23
- ♦ Section 5.2, “Configuring General Parameters,” on page 24
- ♦ Section 5.3, “Configuring Volume Details,” on page 28
- ♦ Section 5.4, “Configuring Context Details,” on page 29

## 5.1 Selecting a Server to Manage

- 1 Open an Internet browser and enter the URL for iManager.

The URL is `https://server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.



- 2 Enter your username and password.
- 3 In the left pane, locate and select the *AFP* task.







- 4 Use one of the following methods to select a server in the tree where you are logged in:
  - ♦ In the *Server* field, type the Novell eDirectory distinguished server name for the server you want to manage, then press the Tab key or click somewhere on the page outside of the *Server* field to confirm your selection. For example:  
`afpserver.novell`
  - ♦ Click the *Search* icon to open the eDirectory Object Selector. Browse or search the list to locate the server you want to manage, then click the server name.
  - ♦ Click the *Object History* icon to select a server you have recently managed.
- 5 Wait for iManager to retrieve information about that server and display the appropriate information to the task page you are in. It might take several seconds to retrieve the information, depending on the size of the data in the server.

The status of the server is displayed in the status bar below the *Server* text field.

**Table 5-1** AFP Server Status

Button	Description
	Indicates that the AFP server is stopped. To start the server, click 

Button	Description
	Indicates that the AFP server is up and functional. To stop the server, click  .
	Click this button to view log details of the AFP server.
	Click this button to save and load the configuration changes on the AFP server. This saves and loads configuration changes for all the parameters except for <i>Authentication Mode</i> and <i>Reconnect Period</i> . Any change in these two parameters will require restarting of the AFP server.  Reload doesn't affect the existing client connections to the AFP server.

## 5.2 Configuring General Parameters

The general parameters help you define the security and rights features of the AFP server.

- 1 Start your browser (Internet Explorer 5 or later, Firefox, etc.) and specify the URL for iManager.

The URL is `https://server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.

- 2 Enter your username and password.
- 3 In the left column, select *File Protocols*, then click *AFP*.
- 4 Select the *General* tab.

The following details are displayed:

- ♦ [Section 5.2.1, “Security and Rights,” on page 24](#)
- ♦ [Section 5.2.2, “Threads and Connections,” on page 25](#)
- ♦ [Section 5.2.3, “Version and Logging,” on page 26](#)
- ♦ [Section 5.2.4, “Other Parameters,” on page 27](#)

### 5.2.1 Security and Rights

The Security and Rights parameters let you define and set access permissions for the AFP server.

**Security and Rights**

☐ Rename and Delete Inhibit

☐ Allow Guest Login

☒ World No Rights Management

Sharing Rights: All ▼

Authentication Mode: Diffie-Hellman ▼



**Table 5-2** *Security and Rights Configuration Parameters*

Setting	Description
<i>Rename and Delete Inhibit</i>	If this option is enabled, users are not permitted to rename or delete files from their home directories. To permit users to rename or delete files from their home directories, leave this option deselected.
<i>Allow Guest Login</i>	Select this option to allow users to log in as a guest.
<i>World No Rights Management</i>	Select this option to let users set permissions and give access to network directories and their contents to everyone (world). If this option is not selected, the AFP server ignores the Set Rights' requests coming from Macintosh clients, so the users cannot set permissions to give access to others.
<i>Sharing Rights</i>	Select this option to turn off fetching rights for the owner, groups, and everyone. Returns a set of default rights when queried.
<i>Authentication Mode</i>	Indicates the authentication mechanism to use. The supported methods are:  Two-Way Random Key Exchange Cleartext Random Exchange Diffie Hellman

## 5.2.2 Threads and Connections

These parameters help you define the processing capabilities of the AFP server.

Threads and Connection		
Minimum Threads:	<input type="text" value="3"/>	(Minimum:3)
Maximum Threads:	<input type="text" value="32"/>	(4 - 32768)
Reconnect Period: *	<input type="text" value="1440"/>	(2-1440 Minutes)

**Table 5-3** *Threads and Connections Configuration Parameters*

Setting	Description
<i>Minimum Threads</i>	Indicates the minimum number of threads that should be set for the <code>afptcpd</code> daemon to start.  The default value is 3. This value is set during installation.

Setting	Description
<i>Maximum Threads</i>	<p>Indicates the maximum number of threads that the AFP server can support.</p> <p>The maximum number of threads that can be supported is 32768.</p>
<i>Reconnect Period</i>	<p>Indicates the number of minutes the AFP server waits before attempting to reconnect.</p> <p>The minimum waiting time is 2 minutes and can extend up to 24 hours.</p>

### 5.2.3 Version and Logging

These parameters help you define the logging capabilities of the AFP server.

**Version and Logging**

AFP Version: All ▼

☒ Enable Log

☒ Enable Status

☒ Enable Debug

☒ Enable Error

☐ Auditing

AFP makes use of `syslog` daemon for logging. This daemon keeps track of the log file that it writes to in the event of renaming the log file or changing the location of log file.

**Table 5-4** *Version and Logging Configuration Parameters*

Setting	Description
<i>AFP Version</i>	<p>Indicates the version of the clients that AFP can support.</p> <p>If you select <i>All</i>, AFP client versions 2.2, 3.0 and 3.1 are supported.</p>
<i>Enable Log</i>	<p>Select this option to turn the logging feature on and add an entry to the log file.</p> <p>When logging is activated, AFP log and error messages are written to the <code>/var/log/afptcpd/afptcp.log</code> file.</p>
<i>Enable Status</i>	<p>Select this option if you want error messages to be recorded in the <code>/var/log/afptcpd/afptcp.log</code> file.</p>

Setting	Description
<i>Enable Debug</i>	Select this option if you want debug messages to be recorded in the <code>/var/log/afptcpd/afptcp.log</code> file.
<i>Enable Error</i>	Select this option if you want error messages to be recorded in the <code>/var/log/afptcpd/afptcp.log</code> file.
<i>Auditing</i>	Select this option check the authentication process and any changes that occur to the configuration parameters of the AFP server. Details of any changes that occur are recorded in the <code>/var/log/audit/audit.log</code> file

## 5.2.4 Other Parameters

These parameters let you define the search parameters and unload behavior of the AFP server.

### Other

- ☐ Off Spring Count
- ☐ Unload Time Check
- ☐ Cross Protocol Lock

**Table 5-5** *Other Parameters*

Setting	Description
<i>Offspring Count</i>	<p>When this option is turned on, the AFP server returns the exact count of the files and directories (offspring) in the directory.</p> <p>For example: If there are 80 files and directories inside a subdirectory and the Offspring Count option is turned on, the AFP server returns 80 as the result.</p> <p>When this option is turned off and the client requests an offspring count, the AFP server looks to see if there are any files or folders in the target folder. If the folder is empty, the AFP server returns 0. If the AFP server finds at least one file or folder, the AFP server returns a default value and not the actual offspring count. This behavior improves the performance of the AFP server.</p> <hr/> <p><b>NOTE:</b> With this option enabled, the non-empty folders cannot be deleted. This option is not valid in OES2 SP2 release.</p>
<i>Unload Time Check</i>	Select this option to have the AFP server do a check on the active programs before it attempts to unload.

Setting	Description
<i>Cross Protocol Lock</i>	This option ensures that a file is updated correctly before another user, application, or process can access it. Enable this option if you want to check for simultaneous access to avoid inconsistencies.

## 5.3 Configuring Volume Details

The logical volumes you create on NSS storage pools are called NSS volumes.

NSS volumes are identified by the machine name and volume name combination. For instance, if you create a volume titled AFP\_Volume on a server named ACME, the volume name is represented as ACME.AFP\_Volume. The Volume Name Management feature helps you specify an alternate name for the NSS volume. For instance, you can represent ACME.AFP\_Volume as AFP\_Volume. This is mandatory in a cluster setup where you need to identify volumes without the machine name prefix.

Use the following tasks to administer AFP volume names:

- ♦ [Section 5.3.1, “Adding a New Volume Name,” on page 28](#)
- ♦ [Section 5.3.2, “Editing an Existing Volume Name,” on page 28](#)
- ♦ [Section 5.3.3, “Deleting a Volume Name,” on page 29](#)
- ♦ [Section 5.3.4, “Resetting the Desktop,” on page 29](#)

### 5.3.1 Adding a New Volume Name

- 1 Start your browser (Internet\* Explorer 5 or later, Firefox\*, etc.) and specify the URL for iManager.  
The URL is `https://server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.
- 2 Enter your username and password.
- 3 In the left column, select *File Protocols*, then click *AFP*.
- 4 Select the *Volume* tab. Click the *Object Selector* button, then select the server for which you want to specify new volume names.
- 5 Select *Add*. This opens the Add New Volume dialog box.
- 6 Click the *Object Selector* button, then select an existing volume. If you want to see the volumes you selected earlier, click the *Object History* icon.
- 7 Specify a name for the selected NSS volume. This changes the volume name visible to the AFP clients.
- 8 Click *OK* to save the changes.

### 5.3.2 Editing an Existing Volume Name

- 1 Start your browser (Internet Explorer 5 or later, Firefox, etc.) and specify the URL for iManager.  
The URL is `https://server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.

- 2 Enter your username and password.
- 3 In the left column, select *File Protocols*, then click *AFP*.
- 4 Select the *Volume* tab, then use the *Object Selector* button to select the server for which you want to specify new volume names.  
The volumes created on the server are displayed.
- 5 Select the volume you want to modify and click *Edit*.
- 6 Specify a new name for the shared volume. This changes the volume name visible to the AFP clients.
- 7 Click *OK*.

### 5.3.3 Deleting a Volume Name

- 1 Start your browser (Internet Explorer 5 or later, Firefox, etc.) and specify the URL for iManager.  
The URL is `https://server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.
- 2 Enter your username and password.
- 3 In the left column, select *File Protocols*, then click *AFP*.
- 4 Select the *Volume* tab. Use the *Object Selector* to select the server you want to modify.  
The volumes created on the server are displayed.
- 5 Select the volume name you want to remove and click *Delete*.
- 6 Click *OK*.

### 5.3.4 Resetting the Desktop

- 1 Start your browser (Internet Explorer 5 or later, Firefox, etc.) and specify the URL for iManager.  
The URL is `https://server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.
- 2 Enter your username and password.
- 3 In the left column, select *File Protocols*, then click *AFP*.
- 4 Select the *Volume* tab. Use the *Object Selector* to select the server you want to modify.  
The volumes created on the server are displayed.
- 5 Select the volume for which you want to reset the desktop, then click the *Reset Desktop* option.

## 5.4 Configuring Context Details

Context defines the position of an object within the Directory tree structure. It is a list of container objects leading from the object to the root of the tree.

Specifying the context preempts the need to specify the FQDN (fully qualified distinguished name) of the user.

A context search file allows Macintosh users to log in to the network without specifying their full context. The context search file contains a list of contexts that are searched when no context is provided or the object cannot be found in the provided context. When the Macintosh user enters a username, the server searches through each context in the list until it finds the correct user object.

- ♦ [Section 5.4.1, “Adding a New Context,” on page 30](#)
- ♦ [Section 5.4.2, “Removing an Existing Context,” on page 30](#)

## 5.4.1 Adding a New Context

- 1 Start your browser (Internet Explorer 5 or later, Firefox, etc.) and specify the URL for iManager.

The URL is `https://server_ip_address/nps/manager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.

- 2 Enter your username and password.
- 3 In the left column, select *File Protocols*, then click *AFP*.
- 4 Select the *Contexts* tab. Use the *Object Selector* to select the server you want to modify.  
The contexts created on the server are displayed.
- 5 Click *Add*. This opens the Add New Context dialog box.
- 6 Specify a context name or browse to select an existing context.
- 7 Click *OK* to save the changes.

## 5.4.2 Removing an Existing Context

- 1 Start your browser (Internet Explorer 5 or later, Firefox, etc.) and specify the URL for iManager.

The URL is `https://server_ip_address/nps/manager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.

- 2 Enter your username and password.
- 3 In the left column, select *File Protocols*, then click *AFP*.
- 4 Select the *Contexts* tab. Use the *Object Selector* to select the server you want to modify.  
The contexts created on the server are displayed.
- 5 Select the context you want to delete.

To remove all of the contexts in the list, click the top-level check box, then click *Delete*.

To remove one or more contexts, click the check boxes next to them, then click *Delete*.

# Migrating AFP from NetWare to OES 2 SP1 Linux

# 6

The Open Enterprise Server (OES) 2 SP1 Migration Tool has a plug-in architecture and is made up of Linux command line utilities with a GUI wrapper. You can migrate AFP to an OES 2 SP1 Linux server through the GUI Migration Tool or through the command line utilities.

To get started with migration, see “[Overview of the Migration Tools](#)” in the *OES 2 SP1: Migration Tool Administration Guide*

For more information on migrating AFP, see “[Migrating AFP from NetWare to OES 2 SP1 Linux](#)” in the *OES 2 SP1: Migration Tool Administration Guide*





# Running AFP Services in a Virtualized Environment

# 7

AFP services run in a virtualized environment just as they do on a physical NetWare<sup>®</sup> server, or on a physical server running Open Enterprise Server (OES) 2 SP1 Linux, and require no special configuration or other changes.

To get started with virtualization, see “[Introduction to Xen Virtualization](#)” in the *Virtualization: Getting Started* guide.

For information on setting up virtualized NetWare, see “[Setting Up Virtual Machines](#)” in the *Virtualization: Getting Started* guide and “[NetWare Virtual Machines](#)” in the *Virtualization: Guest Operating System Guide*.

For information on setting up virtualized OES 2 SP1 Linux, see “[Setting Up Virtual Machines](#)” in the *Virtualization: Getting Started* guide and “[OES Linux Virtual Machines](#)” in the *Virtualization: Guest Operating System Guide*.



# Configuring AFP with Novell Cluster Services for an NSS File System

# 8

Novell® Apple Filing Protocol can be used in a cluster environment with Novell Cluster Services™ on your Novell Open Enterprise Server 2 (OES 2) SP1 Linux server.

- ♦ [Section 8.1, “Benefits of Configuring AFP for High Availability,” on page 35](#)
- ♦ [Section 8.2, “Configuring AFP in a Cluster,” on page 35](#)

## 8.1 Benefits of Configuring AFP for High Availability

When you configure AFP in an OES 2 SP1 cluster, resources can be dynamically switched or moved to any server in the cluster. Resources can be configured to automatically switch or be moved in the event of a server failure, or they can be moved manually to troubleshoot hardware or balance the workload.

An equally important benefit of implementing AFP in a cluster setup is that you can reduce unplanned service outages as well as planned outages for software and hardware maintenance and upgrades.

Before you attempt to implement this solution, familiarize yourself with how Cluster Services works. For information, see the *OES 2 SP1: Novell Cluster Services 1.8.5 for Linux Administration Guide*

## 8.2 Configuring AFP in a Cluster

Configuring or enabling AFP and making it available in a cluster environment requires you to perform the following tasks:

- ♦ [Section 8.2.1, “Identifying the Nodes to Host the AFP Service,” on page 35](#)
- ♦ [Section 8.2.2, “Installing Novell Cluster Services,” on page 36](#)
- ♦ [Section 8.2.3, “Creating Shared NSS Pools,” on page 36](#)
- ♦ [Section 8.2.4, “Reviewing Load and Unload Scripts,” on page 37](#)

### 8.2.1 Identifying the Nodes to Host the AFP Service

- 1 Install the AFP server on all the nodes in cluster or on the nodes identified for running AFP. For instructions on installing, see [Chapter 4, “Installing and Setting Up AFP,” on page 17](#).
- 2 Restart the AFP server.
- 3 Continue with [Section 8.2.2, “Installing Novell Cluster Services,” on page 36](#).

## 8.2.2 Installing Novell Cluster Services

- 1 Install Novell Cluster Services 1.8.4 on the OES 2 SP1 Linux server. For details, see “[Installing Novell Cluster Services on OES 2 Linux](#)”.
- 2 When you have finished installing Novell Cluster Services, continue with [Section 8.2.3](#), “[Creating Shared NSS Pools](#),” on page 36.

## 8.2.3 Creating Shared NSS Pools

You can create a pool by using iManager or the NSSMU utility. The shared partition is automatically created when you create the pool.

- ♦ “[Creating Shared Disk Partitions and Pools through iManager](#)” on page 36
- ♦ “[Creating Shared Disk Partitions and Pools through NSSMU](#)” on page 37

### Creating Shared Disk Partitions and Pools through iManager

- 1 Open an Internet browser and enter the URL for iManager.  
The URL is `https://server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.
- 2 Enter your username and password.
- 3 In the left pane, locate and select the *Storage > Volumes* task.
- 4 Specify a cluster server name or browse and select one, then click *New*.

**New Pool** ?

**Enter a name**

Pool names can have 2 to 15 characters and contain characters A to Z, 0 to 9, \_, !, @, #, \$, %, &, (, and ). Names cannot begin or end with the \_ (underscore) character, nor contain \_\_ (multiple underscores).

Name:

---

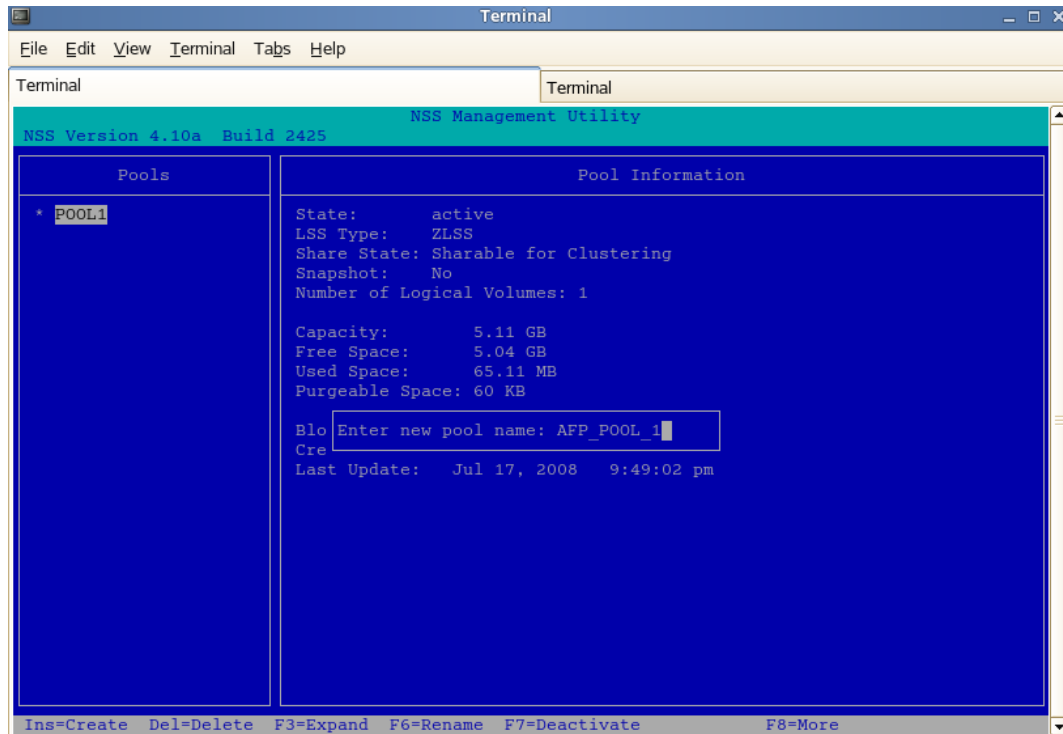
<< Back    Next >>    Cancel

- 5 Specify the new pool name and click *Next*.
- 6 Allocate the size of the pool and click *Next*.
- 7 Specify an IP address for the virtual server.  
Make sure you select AFP as the advertising protocol. You should also make sure that NCP™ is selected. NCP is essential to activate the NCP protocol on the cluster.

- 8 Click *Finish* to complete configuration of the pool.
- 9 Continue with “[Reviewing Load and Unload Scripts](#)” on page 37.

## Creating Shared Disk Partitions and Pools through NSSMU

- 1 From the NSSMU main menu, select *Pools*.



- 2 Select the device where you want the pool to be created.
- 3 Specify the name of the pool and the IP address of the virtual server.  
Make sure you select AFP as the advertising protocol. You should also make sure that NCP is selected. NCP is essential to activate the NCP protocol on the cluster.
- 4 Click *Apply* to complete configuration of the pool.
- 5 Continue with [Section 8.2.4, “Reviewing Load and Unload Scripts,”](#) on page 37.

## 8.2.4 Reviewing Load and Unload Scripts

Cluster resource load and unload scripts are automatically generated for pools when they are cluster-enabled. You can review the load and unload scripts for the AFP cluster by using the following procedure:

- 1 Open an Internet browser and enter the URL for iManager.  
The URL is `https:// server_ip_address/nps/imanager.html`. Replace *server\_ip\_address* with the IP address or DNS name of the Linux server running AFP.
- 2 Enter your username and password.

- 3 In the left pane, locate and select the *Cluster > Cluster Manager* task.
- 4 Select the cluster resource and click the *Scripts* tab. The Load and Unload scripts are displayed. Ensure that your load and unload scripts resemble the following examples:

### Load Script

```
# !/bin/bash
. /opt/novell/ncs/lib/ncsfuncsexit_on_error nss /poolact=POOLlexit_on_error
ncpcon mount VOL2=253exit_on_error ncpcon mount VOL2=254exit_on_error
add_secondary_ipaddress 192.68.0.0exit_on_error ncpcon bind -
-ncpservername=CLUSTER1_POOL1_SERVER --ipaddress=192.68.0.0exit_on_error
cluster_afp.sh add CLUSTER1_POOL1_SERVER 192.68.0.0#exit_on_error novcifs -
-add--vserver=.cn=CLUSTER1_POOL1_SERVER.ou=wgp.o=novell.l=blr.c=IN.t=JOE.-
-ip-addr=192.68.0.0exit 0
```

### Unload Script

```
# !/bin/bash. /opt/novell/ncs/lib/ncsfuncsignore_error cluster_afp.sh del
CLUSTER1_POOL1_SERVER 192.68.0.0ignore_error novcifs --remove-
-vserver=.cn=CLUSTER1_POOL1_SERVER.ou=wgp.o=novell.l=blr.c=IN.t=JOE.--ip
-addr=192.68.0.0ignore_error ncpcon unbind -
-ncpservername=CLUSTER1_POOL1_SERVER--ipaddress=192.68ignore_error
del_secondary_ipaddress 192.68.0.0ignore_error nss /pooldeact=POOLlexit 0
```

# Working with Macintosh Computers

# 9

This section contains the following information:

- ♦ [Section 9.1, “Administrator Tasks for Macintosh,” on page 39](#)
- ♦ [Section 9.2, “Macintosh End User Tasks,” on page 41](#)

## 9.1 Administrator Tasks for Macintosh

This section provides several ways to simplify your administration tasks and customize how Macintosh workstations interact with the network.

- ♦ [Section 9.1.1, “Configuring a Guest User Account,” on page 39](#)
- ♦ [Section 9.1.2, “Editing the Volume File,” on page 39](#)
- ♦ [Section 9.1.3, “Editing the Context Search File,” on page 40](#)
- ♦ [Section 9.1.4, “Editing the Configuration File,” on page 40](#)

### 9.1.1 Configuring a Guest User Account

AFP lets you configure a guest user account through iManager.

- 1 In Novell® iManager, click the *Roles and Tasks* button.
- 2 Click *Users > Create User*.
- 3 Specify a username and a last name for the user.
- 4 Specify the context for the user.
- 5 Click *OK* to save the changes.  
The guest user is now created.
- 6 After creation of the guest user, query for the user by using the *User > Modify User* task in iManager.
- 7 Remove the ability for the user to change the password by clicking *Restrictions*, then deselect *Allow User to Change Password*.
- 8 Enable the Guest account by adding the full eDirectory™ context of the Guest object to the context search file as described in [“Editing the Context Search File” on page 40](#).
- 9 Reload the AFP server to make the *Guest* button available on the login screen.  
To reload the AFP server through iManager, see [Section 5.1, “Selecting a Server to Manage,” on page 23](#).

### 9.1.2 Editing the Volume File

Information about volumes is stored in the `/etc/opt/novell/afptcpd/afpvols.conf` file.

To edit the `afpvols.conf` file to store volume information:

- 1 Use a text editor to open the `afpvols.conf` file.
- 2 On separate lines, enter the current name of the volume and the new name of the volume, separated by a space. For example:  

```
server1.sys System Volume  
server1.img Graphics
```
- 3 Unload and reload the AFP server by using the `rcnovell-afptcpd restart` command, or use **iManager** to reload the server.

### 9.1.3 Editing the Context Search File

A context search file allows Macintosh users to log in to the network without specifying their full context. The context search file contains a list of contexts that are searched when no context is provided or the object cannot be found in the provided context. When the Macintosh user enters a username, the server searches through each context in the list until it finds the correct user object.

Macintosh allows only 31 characters for the username. If the full eDirectory context and username are longer than 31 characters, you must use a search list to provide access.

If User objects with the same name exist in different contexts, the first one in the context search list is used.

To edit the context search file:

- 1 Using any text editor, edit the `afpdirctx.conf` file stored in the `/etc/opt/novell/afptcpd/` directory of the AFP server.
- 2 On separate lines, enter the contexts to search.  
For example, if you had users with full eDirectory distinguished names such as Robert.sales.acme, Maria.graphics.marketing.acme, Sophia.graphics.marketing, and Ivan.marketing.acme, then enter the following contexts in the `afpdirctx.conf` file:  

```
ou=sales.o=acme  
ou=graphics.ou=marketing.o=acme  
ou=marketing.o=acme
```
- 3 After you have made the changes, save the file.

When a Macintosh user logs in with a username and password, the system finds the context corresponding to the user object in the `afpdirctx.conf` file.

### 9.1.4 Editing the Configuration File

The AFP server configuration parameters are stored in the `/etc/opt/novell/afptcpd/afptcp.conf` file. After you install AFP Server, this configuration file has all the parameters, commented with their default values.

Your configuration file resembles the following example:

```
# Authentication module to use.  
  
# It is advisable not to use - cleartext - as the option # for this. The  
possible options currently are: # cleartext, random (random key exchange),  
two-way (two way random # key exchange), DHX (Diffie-Hellman exchange 2).
```



```
#
# AUTH_UAM <name>
AUTH_UAM DHX
#
# Minimum Number of threads that the daemon must always
# have waiting for work, notwithstanding the complimentary
# parameter - Maximum Number of threads (described next)
# This can not be more than MAX_THREADS parameter.
#
# MIN_THREADS <num>#
MIN_THREADS 3
```

## 9.2 Macintosh End User Tasks

When the Novell Apple Filing Protocol (AFP) is properly configured, the Macintosh users on your network can perform the following tasks:

- ♦ [Section 9.2.1, “Accessing Network Files,” on page 41](#)
- ♦ [Section 9.2.2, “Logging In to the Network As a Guest,” on page 42](#)
- ♦ [Section 9.2.3, “Changing Passwords from a Macintosh Computer,” on page 42](#)
- ♦ [Section 9.2.4, “Assigning Rights and Sharing Files from a Macintosh Computer,” on page 42](#)

### 9.2.1 Accessing Network Files

Macintosh users can use the Chooser option to access files and directories.

- 1** In Mac OS 8 or 9, click the *Apple* menu > *Chooser* > *AppleTalk* > *Server IP Address*.

or

In Mac OS X, click *Go* > *Connect to Server*.

- 2** Specify the IP address or DNS name of the OES 2 SP 1 Linux server, then click *Connect*.
- 3** Specify the username and password, then click *Connect*.
- 4** Select a volume to be mounted on the desktop.

Although you now have access to the files, mounting the volume to the desktop does not make it available after rebooting. You need to create an alias to make it available after rebooting.

- 5** (Optional) Create an alias to the desired volume or directory:

- 5a** Click the Linux server icon.

- 5b** Click *File* > *Make Alias*.

The alias icon appears on the desktop.

## 9.2.2 Logging In to the Network As a Guest

If the network administrator has set up the Guest User object account as described in “[Configuring a Guest User Account](#)” on page 39, Macintosh users can log in to the network as a Guest.

- 1 In Mac OS 8 or 9, click the *Apple* menu > *Chooser* > *AppleTalk* > *Server IP Address*.  
or  
In Mac OS X, click *Go* > *Connect to Server*.
- 2 Type the IP address or DNS name of the Linux server, then click *Connect*.
- 3 Click *Guest Login* > *Connect*.

The Guest user has rights to access network resources as configured by the network administrator.

## 9.2.3 Changing Passwords from a Macintosh Computer

Macintosh users can change their passwords. When they change the simple password, the eDirectory password is automatically synchronized.

- 1 In Mac OS 8 or 9, click the *Apple* menu > *Chooser* > *AppleTalk* > *Server IP Address*.  
or  
In Mac OS X, click *Go* > *Connect to Server*.
- 2 Type the IP address or DNS name of the Linux server, then click *Connect*.
- 3 Specify the username.
- 4 Click *Change Password*.
- 5 Type the old password and the new password, then click *OK*.

## 9.2.4 Assigning Rights and Sharing Files from a Macintosh Computer

Although using iManager is the recommended method for managing rights, Macintosh users have some file sharing and management capability through Chooser.

For more information on how to use iManager to set up and manage rights, see the .

- ♦ “[NSS Rights versus Macintosh Rights](#)” on page 42
- ♦ “[Owner Rights](#)” on page 43
- ♦ “[User / Group](#)” on page 44
- ♦ “[Everyone](#)” on page 44

### NSS Rights versus Macintosh Rights

Using Chooser/Finder to access network files and folders is fairly consistent with the Macintosh environment, but there are some differences between NSS and Macintosh file sharing. Macintosh users can view the sharing information about specific folders by clicking *Get Info/Sharing*.

- ♦ “[Inherited Rights and Explicit Rights](#)” on page 43
- ♦ “[Owner, User/Group, and Everyone Rights](#)” on page 43

## Inherited Rights and Explicit Rights

The Macintosh file system uses either inherited rights (which use the enclosing folder's privileges) *or* explicit rights (which assign rights to a group or user). A folder in the Macintosh file system cannot have both inherited and explicit rights.

NSS uses both inherited and explicit rights to determine the actual rights that a user has. NSS allows a folder (or directory) to hold file rights for multiple groups and users. Because of these differences, Macintosh users will find that access rights to folders and files might function differently than expected.

NSS uses inherited rights, so the *Macintosh Use Enclosing Folder's Privileges* option is automatically turned off. When a Macintosh user views the Get Info/Sharing dialog box for a NSS folder, only the User/Group assignments are visible if there is an explicit assignment on the folder. If the NSS folder inherits User/Group rights from a parent group or container, those rights are not displayed in the dialog box, nor is there any indication that the folder is inheriting rights from a group or container.

## Owner, User/Group, and Everyone Rights

Because NSS allows multiple groups and users to have rights to a single folder, users are not able to delete rights assignments by using the Apple Macintosh interface. Users can add assignments to allow basic file sharing, but more complex rights administration must be done through iManager. When specifying Owners, Users, and Groups, there is no way to select from current groups. You must specify the correct Linux name and context (fully distinguished eDirectory name).

---

**TIP:** No context is required if the context is specified in the context search file.

---

## Owner Rights

In the Apple File Sharing environment, an owner is a user who can change access rights. In the NSS environment, users can change access rights if they have been granted the Access Control right for the folder. In NSS, an owner means the user who created the file. An NSS owner has no rights by virtue of ownership. In the NSS environment, the owner is the current user if he has access control rights to the folder.

If the user has access control rights, then it is shown as the owner of the file. If the user does not have access control rights, the actual NSS owner is shown as the owner. However, for directories the NSS owner is always displayed.

In Apple File Sharing, there can be more than one owner. If you change the owner, access control rights are added to the new owner, but are not removed from the current owner. In NSS, there are two ways to have access control rights: 1) have the Access Control right and 2) have the Supervisor right. Adding a new owner only adds the Access Control right, not the Supervisor right. If the current owner already has the Supervisor right through other management utilities, that right remains. The Supervisor right also gives full file access rights. This means that if you are the current user and have the Supervisor right, you also have read/write access and you cannot change those rights.

Display only allows for one owner. If multiple users have file access rights, only the current user is shown in the *Owner* field.

## **User / Group**

Only one user or group can be displayed for a folder, although NetWare<sup>®</sup> allows multiple users and groups to be assigned file access rights.

If both users and groups have access to an NSS folder, groups are displayed before users. The group with the most access rights is preferred over groups with fewer access rights. Only users or groups with explicit rights (not inherited rights) are shown in the *User/Group* field. Users and groups with inherited rights are not shown in the dialog box, nor is there any indication that there are users and groups with inherited rights.

Rights set through this interface are inherited by the folder's subfolders. It is impossible to manage all inherited rights from the Macintosh interface. (Although it is not recommended, you could set the inherited rights filters from the management utilities to turn off inherited rights.)

## **Everyone**

Assigning rights to Everyone acts like the Macintosh user expects, with the exception that Everyone's rights are inherited. In NetWare, the object that represents the rights of any authenticated user is used to set Everyone's rights. Everyone's rights can change from folder to folder, but when they are set, they are inherited by subfolders.

The AFP server provides a monitoring feature for you to use.

- ♦ [Section 10.1, “Understanding the Monitoring Process,” on page 45](#)
- ♦ [Section 10.2, “Enabling Monitoring,” on page 45](#)
- ♦ [Section 10.3, “Viewing Logs through iManager,” on page 45](#)
- ♦ [Section 10.4, “Understanding Performance Parameters,” on page 46](#)

## 10.1 Understanding the Monitoring Process

The monitoring framework helps you assess the performance of the AFP server. The details provided by the AFP server logs are beneficial if you want to tune the performance of the server based on your needs. This framework records the following runtime information:


- ♦ Number of active threads in the AFP server
- ♦ Load capacity of the AFP server
- ♦ Query processing ability
- ♦ AFP server efficiency ratio

## 10.2 Enabling Monitoring

You enable monitoring through the command line interface by using the following command:

```
afpstat
```


## 10.3 Viewing Logs through iManager

- 1 In iManager, use one of the following methods to select a server in the tree where you are logged in:
  - ♦ In the *Server* field, type the Novell® eDirectory™ distinguished server name for the server you want to manage, then press the Tab key or click somewhere on the page outside of the *Server* field to enter your selection. For example:  
`afpserver.novell`
  - ♦ Click the *Search* icon to open the eDirectory Object Selector. Browse or search the list to locate the server you want to manage, then click the server name.
  - ♦ Click the *Object History* icon to select a server you have recently managed.  
Wait for iManager to retrieve information about that server and display the appropriate information to the task page you are in.
- 2 The status of the server is displayed in the status bar below the *Server* field. Click  to view the log details.

- 3 Select the *General* tab and scroll down to *Version and Logging*.
- 4 Select the *Enable Log* option. This option turns the logging feature on and adds an entry to the log file. When logging is activated, AFP log and error messages are written to the `/var/log/afptcpd/afptcp.log` file.

If you want to record the status, debug, and error messages in the `afptcp.log` file, ensure that the *Enable Status*, *Enable Debug*, and *Enable Error* options are selected.

## 10.4 Understanding Performance Parameters

When you click , the AFP server statistics window is displayed with the following information:

**Table 10-1** AFP Server Performance Parameters

Parameter	Description
Active Threads	Indicates the number of threads that are presently active on the AFP server.
Load Ratio	Indicates the ratio of the total number of active threads to the total number of threads in the AFP server.
Availability	Indicates the ratio of the total number of events required for creation of a new thread compared to the number of events required to execute an AFP task.
Efficiency Ratio	<p>The ratio of the total number of times that threads complete a task and then terminate themselves compared to the total number of times that threads complete a task.</p> <p>AFP always maintains a minimum number of threads in the pool. The minimum count of threads is set to 3 during installation, but you can modify it to increase the thread count in the pool. For more information on threads and connections, see <a href="#">Section 5.2, “Configuring General Parameters,” on page 24</a>.</p> <p>When the list of tasks to be executed by the AFP server is high and there are no idle threads in the thread pool, the AFP server creates a new pool of threads. After a thread finishes its assigned task, if it finds a minimum number of threads in the thread pool, the thread terminates itself. The AFP server maintains a record of such events.</p>
Connections	Number of AFP client sessions that are currently connected to the AFP server.

You can control the number of log entries shown at one time by specifying your preference in the corresponding text field.

For example: If you want to view the last 10 log entries of the AFP server, specify 10 in the *Latest Log Entries to display* field.

The AFP server provides a auditing feature for you to use.

- ♦ [Section 11.1, “Understanding the Auditing Process,” on page 47](#)
- ♦ [Section 11.2, “Enabling Auditing,” on page 47](#)
- ♦ [Section 11.3, “Viewing Auditing Information,” on page 48](#)

## 11.1 Understanding the Auditing Process

The auditing framework helps you to monitor the authentication process and track any changes that occur to the configuration parameters of the server. Details of any changes that occur are recorded in the `/var/log/audit/audit.log` file. The audit daemon keeps track of the changes to the `audit.log` file.

When the auditing option is enabled, the AFP server reports changes for the following events:

- ♦ AFP user login and logout events
- ♦ Changes to the configuration parameters of the following files:

```
afptcpd.conf
afpvols.conf
afpdirctx.conf
casaforafp.sh
```

## 11.2 Enabling Auditing

You can enable auditing either through the command line or through iManager.

- ♦ [Section 11.2.1, “Command Line,” on page 47](#)
- ♦ [Section 11.2.2, “iManager,” on page 47](#)

### 11.2.1 Command Line

To enable auditing support through command line, use the following command:

```
afptcpd - a
```

### 11.2.2 iManager

- 1 In iManager, use one of the following methods to select a server in the tree where you are logged in:

- ♦ In the *Server* field, type the Novell® eDirectory™ distinguished server name for the server you want to manage, then press the Tab key or click somewhere on the page outside of the *Server* field to enter your selection. For example:

```
afpserver.novell
```

- ♦ Click the *Search* icon to open the eDirectory Object Selector. Browse or search the list to locate the server you want to manage, then click the server name.
- ♦ Click the *Object History* icon to select a server you have recently managed.

Wait for iManager to retrieve information about that server and display the appropriate information to the task page you are in.

- 2 Select the *General* tab and scroll down to *Version and Logging*.
- 3 Select the *Auditing* option. This checks on the authentication process and any changes that occur to the configuration parameters of the AFP server are logged in `/var/log/audit/audit.log` file.
- 4 Click *OK* to save and apply the changes.

---

**IMPORTANT:** When you manually make changes to the configuration parameters in the configuration files, the changes do not take effect until you restart the server.

---

## 11.3 Viewing Auditing Information

To view the audit logs, open the `/var/log/audit/audit.log` file in a text editor.

Your log file resembles the following example:

```
*****

type=DAEMON_START msg=audit(1185934048.314:4312) auditd start, ver=1.2.9,
format=raw, auid=4294967295 pid=27992 res=success, auditd pid=2

type=CONFIG_CHANGE msg=audit(1185934048.418:4): audit_enabled=0 old=0 by
auid=4294967295
type=CONFIG_CHANGE msg=audit(1185934049.914:5):

audit_backlog_limit=256 old=64 by auid=4294967295
type=DAEMON_END msg=audit(1186036669.479:4313) auditd normal halt, sending
auid=0 pid=6208 subj=86036669.479:6): audit_enabled=0 old=0

type=DAEMON_START msg=audit(1186036762.687:1615) auditd start, ver=1.2.9,
format=raw, auid=4294967295 pid=3020 res=success, auditd pid=30

type=CONFIG_CHANGE msg=audit(1186036762.784:4): audit_enabled=0 old=0 by
auid=4294967295

*****
```



This section describes some issues you might experience with the Novell® Apple Filing Protocol (AFP) and provides suggestions for resolving or avoiding them.

- ♦ [Section 12.1, “AFP Login Issues,” on page 49](#)
- ♦ [Section 12.2, “Starting the AFP Server,” on page 49](#)
- ♦ [Section 12.3, “File Creation,” on page 50](#)
- ♦ [Section 12.4, “Displaying Volumes,” on page 50](#)
- ♦ [Section 12.5, “Log Messages,” on page 50](#)

For additional troubleshooting information, see the [Novell Support Web site \(http://support.novell.com\)](http://support.novell.com)

## 12.1 AFP Login Issues

- ♦ [Section 12.1.1, “Cannot See the Login Dialog Box,” on page 49](#)
- ♦ [Section 12.1.2, “AFP User Login to a Mac 10.5 Client Fails With a Connection Failed Error,” on page 49](#)
- ♦ [Section 12.1.3, “Invalid Username and Password Error,” on page 49](#)

### 12.1.1 Cannot See the Login Dialog Box

This error is displayed when the firewall is enabled on the AFP server.

To resolve this problem, use YaST to stop the firewall or set the firewall to allow connections from the client on TCP port 548.

### 12.1.2 AFP User Login to a Mac 10.5 Client Fails With a Connection Failed Error

This problem can be resolved by assigning appropriate access rights to the AFP user. The AFP user needs access permission to at least one of the volumes exported from the AFP server to resolve this issue.

### 12.1.3 Invalid Username and Password Error

If the credentials you have entered are correct, verify whether the `afpdirctx.conf` file has the context information for AFP users. The AFP server requires valid context information to resolve the typeless name user login.

## 12.2 Starting the AFP Server

- ♦ [Section 12.2.1, “Starting the AFP Daemon Failed,” on page 50](#)

## 12.2.1 Starting the AFP Daemon Failed

If you are not able to start the AFP daemon, check the status of the `xregd` daemon to see if it is running. To do this, execute the following command at the prompt:

```
rcnovell-xregd status
```

If the daemon is not up, execute the `rcnovell-xregd start` command to start the daemon.

## 12.3 File Creation

- ♦ [Section 12.3.1, “Failure to Create a File on a Mac Client,” on page 50](#)

### 12.3.1 Failure to Create a File on a Mac Client

This error is displayed when the server volume quota has exceeded its limits and a partially created file cannot be deleted.

To resolve this problem, terminate the AFP client by unmounting the volume where the partial file resides.

## 12.4 Displaying Volumes

- ♦ [Section 12.4.1, “Volumes Tab on a Mac 10.4 Client Displays an Empty Volume List,” on page 50](#)

### 12.4.1 Volumes Tab on a Mac 10.4 Client Displays an Empty Volume List

This problem can be resolved by assigning appropriate access rights to the AFP user. The AFP user needs access permission to at least one of the volumes exported from the AFP server to resolve this issue.

## 12.5 Log Messages

This section describes some commonly encountered log file messages and provides suggestions for resolving them.

- ♦ [Section 12.5.1, “nmasldap\\_get\\_password for user failed with error 1697,” on page 50](#)
- ♦ [Section 12.5.2, “nmas\\_ldap\\_get\\_password failed with error 1659,” on page 51](#)
- ♦ [Section 12.5.3, “NWDSResolveName failed to resolve supplied name <user name>,” on page 51](#)
- ♦ [Section 12.5.4, “zOpen on volume <VOLUME\\_NAME> failed,” on page 51](#)
- ♦ [Section 12.5.5, “AFP proxy user authentication failed,” on page 51](#)

### 12.5.1 nmasldap\_get\_password for user failed with error 1697

This error occurs because the eDirectory™ user is attempting to log in to an AFP server that is not part of any password policy or is not part of a password policy that is Universal Password enabled.

To resolve this error, use the *Password > Password Policies* task to assign the user to a valid password policy.

## 12.5.2 nmas\_ldap\_get\_password failed with error 1659

This error is logged when the eDirectory user attempting to log in to the AFP server is assigned to a policy that is enabled for Universal Password but its password is not synchronized with the NDS<sup>®</sup> password.

To resolve this error, use one of the following methods:

- Log in to an iManager server with the NDS password. Use the *Password > Password Policies* task to select the option to set the Universal Password.
- As an administrator of the AFP server, set the default authentication mechanism to *Cleartext* or *Diffie Hellman*. The AFP server uses the passwords to do the synchronization as part of background processing.

For all the subsequent login attempts, the Universal Password is synchronized with the NDS Password.

## 12.5.3 NWDSResolveName failed to resolve supplied name <user name>

During login, the AFP server requires an eDirectory context to build an FQDN for the username. This error message is logged when there is no matching context for the username.

To resolve this error, review the eDirectory contexts, using the details in “[Configuring Context Details](#)” on page 29.

## 12.5.4 zOpen on volume <VOLUME\_NAME> failed

This error message is seen when you attempt to log in to a Mac 10.5 machine without appropriate rights to the volumes.

To resolve this error, use iManager to set rights for the volumes. For information, see “[Using the Object View](#)” in the *Novell iManager 2.7 Administration Guide*

## 12.5.5 AFP proxy user authentication failed

This error occurs if the AFP proxy user entered during installation is an invalid user. It can also occur in cases where the AFP proxy user is valid but the password credentials entered during the installation do not match with the credentials stored in CASA or in a file.

To resolve this error, reconfigure AFP according to the instructions in “[Installing AFP after the OES 2 SP 1 Installation](#)” on page 20 and provide correct proxy credentials.



This section describes security issues and recommendations for the Novell® Apple Filing Protocol (AFP) for a Novell Open Enterprise Server 2 SP1 Linux server. It is intended for security administrators or anyone who is using AFP for Linux and is responsible for the security of the system. It requires a basic understanding of AFP protocol. It also requires the organizational authorization and the administrative rights to carry out the configuration recommendations.

- ♦ [Section 13.1, “Recommended Authentication Protocol,” on page 53](#)
- ♦ [Section 13.2, “Storing Credentials,” on page 53](#)
- ♦ [Section 13.3, “Intruder Detection,” on page 53](#)
- ♦ [Section 13.4, “Rights for the Proxy User,” on page 53](#)
- ♦ [Section 13.5, “Timeout Values,” on page 53](#)

## 13.1 Recommended Authentication Protocol

The recommended protocol for authentication is Diffie Hellman (DHX). It provides a secure way to transport clear-text passwords of up to 64 characters to the server for further processing.

Other authentication modes like Cleartext, Random Number Exchange, and the Two-Way Random Key Exchange protocol support only 8-character passwords. With these modes, if the eDirectory™ password is longer than 8 characters, any attempt to log in results in failure.

## 13.2 Storing Credentials

We recommend that you specify CASA as the credential storage location during configuration of the AFP service. This ensures that your credentials are safe.

## 13.3 Intruder Detection

Intruder Detection limits the number of unsuccessful login attempts. The AFP server does not support intruder detection, so if the AFP user does not log in successfully, the user is not locked out even if you have set intruder detection to ON in NMASTM.

## 13.4 Rights for the Proxy User

By default, the AFP proxy user does not have permission to read the passwords for users of a password policy. The AFP user can log in to the AFP server only when the AFP proxy user is granted rights to read the password in the password policy.

## 13.5 Timeout Values

The timeout values for the AFP server range from 2 minutes to 24 hours. The default timeout value is 24 hours. This default value can be reconfigured by setting the `RECONNECT_PERIOD` value in the `afptcpd.conf` file or by setting the *Reconnect period* option through iManager.

For more information on how to set the reconnect period value through iManager, see “[Threads and Connections](#)” on page 25.

To configure this value through CLI, start the AFP daemon by using - r option. For example:  
`afptcpd -r <reconnect period> OR afptcpd --reconnect-period =<reconnect period>`

# Command Line Utilities

# A

This section details the syntax and options for the following Novell® Apple Filing Protocol (AFP) utilities for Novell Open Enterprise Server 2 SP1 Linux.

- ♦ [Section A.1, “afpdreset,” on page 55](#)
- ♦ [Section A.2, “afpstat,” on page 55](#)
- ♦ [Section A.3, “afptcpd,” on page 55](#)
- ♦ [Section A.4, “afpbinding,” on page 55](#)
- ♦ [Section A.5, “migafp,” on page 56](#)

## A.1 afpdreset

Resets the desktop database on a volume.

### Syntax

```
afpdreset
```

## A.2 afpstat

Displays statistics for the afp daemon.

### Syntax

```
afpstat
```

## A.3 afptcpd

The daemon for the Novell AFP server.

### Syntax

```
afptcpd [options <parameters>]
```

## A.4 afpbinding

Allows cluster pool names and virtual IP addresses to be advertised through the AFP server.

### Syntax

```
afpbinding [add] <cluster pool name> <virtual IP address>
```

```
afpbinding [del] <cluster pool name> <virtual IP address>
```

## A.5 migafp

Migrates the AFP service from NetWare<sup>®</sup> to a Linux system.

### Syntax

```
migafp
```



# Comparing of AFP on NetWare and AFP on Linux

# B

This section compares features and capabilities of Novell® Apple Filing Protocol™ on the NetWare® and Linux platforms for Novell Open Enterprise Server 2 SP1 servers.

Feature Description	AFP for NetWare	AFP for Linux
Administering	Limited to starting and stopping the server.  See “ <a href="#">Enabling and Disabling AFP</a> ” in the <i>OES 2 SP1: AFP, CIFS, and NFS for NetWare (NFAP) Administration Guide</i>	Ability to configure AFP server parameters through iManager.  “ <a href="#">Administering the AFP Server</a> ” on page 23
File Names and Paths	sys:\etc\ctxs.cfg sys:\etc\afpvol.cfg sys:\etc\afptcp.log	/etc/opt/novell/afptcpd/afpdirxt.conf  /etc/opt/novell/afptcpd/afpvols.conf  /etc/opt/novell/afptcpd/afptcpd.conf  /var/log/afptcpd/afptcp.log
Installation	Customized installation during installation of NetWare 6.5.  See, “ <a href="#">Installing Novell Native File Access Protocols on a NetWare 6.5 Server</a> ” in the <i>OES 2 SP1: AFP, CIFS, and NFS for NetWare (NFAP) Administration Guide</i>	Installation through YaST along with associated dependencies.  “ <a href="#">Installing and Setting Up AFP</a> ” on page 17
Simple Password support	Yes	No
Universal Password	Yes . Limited to 8 characters.	Yes. Over 8 characters.
Migration support	Not Applicable	Support to migrate from NetWare to Linux.  “ <a href="#">Migrating AFP from NetWare to OES 2 SP1 Linux</a> ” on page 31
Mac versions supported	Classic Mac, Mac OS 10.3, 10.4 and 10.5	Mac OS 10.3, 10.4 and 10.5
Cross-Protocol Locking	Supported among AFP, CIFS, and NCP.	Supported between AFP and NCP.

Feature Description	AFP for NetWare	AFP for Linux
Authentication Methods	Cleartext	Cleartext
		Two-Way Random Key Exchange
		Random Exchange
		Diffie Hellman Exchange
Dynamic detection of volumes	Yes	Yes, but the AFP server needs to be reloaded.
Choosing volumes to be exported	Yes	No. Exports all the volumes.
Support for 64-bit architecture	No	Yes