

Novell Client™ for Linux

1.0

October 12, 2005

INSTALLATION AND ADMINISTRATION
GUIDE

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Novell Client 1.0 for Linux Installation and Administration Guide

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Contents

Contents	5
About This Guide	7
1 Understanding the Novell Client for Linux	9
Understanding How the Novell Client for Linux Differs from Novell Client for Windows 2000/XP	9
Understanding the Novell Client for Linux Virtual File System	10
Understanding When the Virtual File System Kernel Module Needs to Be Compiled	10
2 Installing the Novell Client For Linux	13
System Requirements	13
Package Requirements	13
Installing the Novell Client Using the Installation Script	13
Installing the Novell Client Using YaST	14
Installing the Novell Client Using XWindows	14
Installing the Novell Client from the Shell	15
Starting or Restarting the Novell Client for Linux	16
Uninstalling the Novell Client for Linux	16
Uninstalling Using the YaST Control Center	16
Uninstalling Using the Installation Script	17
3 Configuring the Novell Client for Linux	19
Using the Novell Client Configuration Wizard	19
Configuring Login Settings	20
Configuring Protocol Settings	21
Configuring Tray Application Settings	22
Configuring File Browser Settings	23
Configuring OpenSLP Settings	24
Using Configuration Files to Preconfigure the Novell Client	25
4 Managing Login	27
Setting Up Login Scripts	27
Setting Up Login Restrictions	27
Using OpenSLP to Simplify Login	28
Setting Up SLP	28
Troubleshooting SLP Configuration	29
5 Managing File Security	31
Checking File or Folder Rights	31
Changing Trustee Rights	32
Adding a Trustee	33
Removing a Trustee	34
Combining Multiple Trustees	34
A Compiling the Novell Client Virtual File System Kernel Module	37
Installing the Required Packages	37
Installing the Required Packages from XWindows	37

Installing the Required Packages from the Shell	38
Compiling the Novell Client Virtual File System Kernel Module	39
Compiling the Novell Client Virtual File System Kernel Module After a Kernel Update	39
Compiling the Novell Client Virtual File System Kernel Module on Workstations Running a Custom Kernel	39
B The Novell Client for Linux Commands	41
Shell Commands	41
GUI Utilities	42
Using the Novell Client for Linux Man Pages	42

About This Guide

This guide describes how to install and configure the Novell® Client™ for Linux software.

This guide is intended for network administrators and is divided into the following sections:

- ♦ Chapter 1, “Understanding the Novell Client for Linux,” on page 9
- ♦ Chapter 2, “Installing the Novell Client For Linux,” on page 13
- ♦ Chapter 3, “Configuring the Novell Client for Linux,” on page 19
- ♦ Chapter 4, “Managing Login,” on page 27
- ♦ Chapter 5, “Managing File Security,” on page 31
- ♦ Appendix A, “Compiling the Novell Client Virtual File System Kernel Module,” on page 37
- ♦ Appendix B, “The Novell Client for Linux Commands,” on page 41

Additional Documentation

For documentation on known issues, see the *Novell Client for Linux Readme*

For documentation on login scripts, see the *Novell Login Scripts Guide*.

For documentation on the Novell Client tray application, see the *Novell Client 1.0 for Linux User Guide*.

For documentation on the command terminal utilities, see the man pages associated with these utilities.

Documentation Updates

For the latest version of this documentation, see the [Novell Client online documentation \(http://www.novell.com/documentation/linux_client/index.html\)](http://www.novell.com/documentation/linux_client/index.html) Web site.

Documentation Conventions

In this documentation, a greater-than symbol (>) is used to separate actions within a step and items within 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.

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1

Understanding the Novell Client for Linux

The Novell® Client™ for Linux software allows users of Linux workstations to access and use all of the services available on servers running Novell eDirectory™. The Novell Client brings the full power, ease of use, manageability, and security of eDirectory to Linux workstations. The Novell Client for Linux fully supports NetWare®, OES, and eDirectory services and utilities on a Linux workstation, including security, file, and print services through Novell iPrint.

This section contains the following information:

- ♦ [“Understanding How the Novell Client for Linux Differs from Novell Client for Windows 2000/XP” on page 9](#)
- ♦ [“Understanding the Novell Client for Linux Virtual File System” on page 10](#)

Understanding How the Novell Client for Linux Differs from Novell Client for Windows 2000/XP

Using the Novell Client for Linux differs in a few ways from using the Novell Client for Windows*. For users and network administrators who are familiar with the Novell Client for Windows, knowing these differences can help the transition to Linux run more smoothly.

Installation and Upgrades

- ♦ The Novell Client for Linux can be installed and upgraded using either YaST or an installation script. For more information, see [Chapter 2, “Installing the Novell Client For Linux,” on page 13](#).
- ♦ There is no Automatic Client Upgrade available on Linux.
- ♦ The Client Configuration Wizard lets you set up a configuration file that can be used to preconfigure workstations during installation. For more information, see [“Using Configuration Files to Preconfigure the Novell Client” on page 25](#).

Logging In

- ♦ The Novell Client Login is not integrated into the initial workstation login. After you log in to the workstation, you must also log in from the Novell tray application. This means that there is no Novell username or password synchronization with the workstation username and password.
- ♦ When a user logs in to a local workstation and then opens a remote SSH session and logs in as the same user, the network resources that user has rights to are available to the user.
- ♦ The Novell Client for Linux can use the NMASTM login method to authenticate. However, the NMASTM login is not integrated in to the Novell Client for Linux login screen, so the default login sequence cannot be set in the Novell Client Login screen.

- ◆ The Novell Client for Linux uses OpenSLP, whereas the Novell Client for Windows uses Novell's implementation of SLP. The network administrator *must* set up OpenSLP before users can look up trees, contexts, and servers using the Browse buttons in the Novell Client Login window. If OpenSLP is not set up, the user must enter a username, tree, and context to connect to the network. See [Chapter 4, "Managing Login," on page 27](#) for more information.

Because Linux uses OpenSLP, the implementation is different and the user's experience is different. For more information, see ["Using OpenSLP to Simplify Login" on page 28](#).

- ◆ The Novell Client for Linux does not use the Dynamic Local User or Location Profiles that are available in Windows.

User Interface

Both a graphical user interface and command line utilities are available to complete client actions such as mapping drives, setting trustee rights, and copying files.

Login Scripts

Novell has been able to port the vast majority of login script functionality to the Linux platform. This means that the login scripts you create in your network work for both Windows users and Linux users with very little difference in functionality.

Some difference do exist, however. For example, mapped drives are implemented by creating symbolic links and search drives are not available on Linux. Other small differences are created by the inherent difference between Windows and Linux. All the differences and issues are listed in the [Novell Login Scripts Guide](#).

Understanding the Novell Client for Linux Virtual File System

The Novell Client for Linux differs from previous Novell Clients to enable it to work on the Linux platform. In Windows, the Novell Client loads a single binary that works on multiple operating system platforms without modifications. The Novell Client for Linux has a Virtual File System that consists of a kernel module (novfs.ko) that runs as part of the Linux kernel and a daemon (novfsd) that runs in the user space. Both components must be running on the workstation for the client to connect to the network.

The daemon can run on any of the [supported Linux platforms](#) without modification. The kernel module, however, is dependent on the kernel version and must be compiled to match the kernel on the workstation. When the Novell Client is installed, it compiles the kernel module during the installation process. If this process fails, the kernel module cannot load. It attempts to recompile when the workstation is restarted.

Understanding When the Virtual File System Kernel Module Needs to Be Compiled

The following is a list of the instances when you must compile the Novell Client Virtual File System Kernel Module (novfs.ko):

- ◆ You installed the Novell Client and received an error message. This generally occurs because all the required packages are not installed on a workstation. You must install these packages, compile the Novell Client Virtual File System Kernel Module (novfs.ko), and restart the workstation. See ["Package Requirements" on page 13](#) for more information.
- ◆ You have previously compiled the Novell Client Virtual File System Kernel Module (novfs.ko) and then made changes to the kernel.

- ◆ You have a custom kernel of any of the supported versions.
- ◆ Kernel updates are automatically pushed to the workstation via Red Carpet[®].

In all of these instances, you must recompile the Novell Client Virtual File System Kernel Module (novfs.ko) to ensure that it is compatible with the Linux kernel version on your workstation. However, when later shipping versions of NLD are provided by Novell, the Novell Client Virtual File System Kernel Module (novfs.ko) is installed and you do not need to recompile it because the module is included in the kernel.

For more information, see [Appendix A, “Compiling the Novell Client Virtual File System Kernel Module,” on page 37](#).

NOTE: If you patch the kernel for any reason, you must make sure that you have the required packages that correspond to the kernel patch. For a list of the required packages, see [“Package Requirements” on page 13](#). The Novell Client for Linux then recompiles when the workstation is restarted. Without the corresponding packages, the recompile fails.

Under certain conditions, your version of novfs.ko could be rolled back when you install a new kernel module. For example, if you download and install a patched version of novfs.ko, and then later install an NLD 9 SP2 update to your kernel, the Novell Client Virtual File System Kernel Module patch might be overwritten. You should then reinstall the novfs.ko patch and recompile the kernel in order to ensure that the kernel module and the kernel are compiled.

2

Installing the Novell Client For Linux

This section explains how to install the Novell® Client™ for Linux software on a workstation and includes the following information:

- ◆ [System Requirements \(page 13\)](#)
- ◆ [Installing the Novell Client Using the Installation Script \(page 13\)](#)
- ◆ [Installing the Novell Client Using YaST \(page 14\)](#)
- ◆ [Starting or Restarting the Novell Client for Linux \(page 16\)](#)
- ◆ [Uninstalling the Novell Client for Linux \(page 16\)](#)

For information on installing a preconfigured version of the Novell Client, see [“Using Configuration Files to Preconfigure the Novell Client” on page 25](#).

System Requirements

The Novell Client for Linux requires that the workstation be running one of the following:

- ◆ (Preferred) Novell Linux Desktop (NLD) 9 SP2 or later
IMPORTANT: Other versions of NLD might have problems because of missing packages.
- ◆ SUSE® Linux Professional 9.3

If workstations are not running NLD 9 SP2 or later, additional required packages must be installed. For more information, see [“Package Requirements” on page 13](#).

Package Requirements

The following packages must be installed on the workstation before you install the Novell Client for Linux:

- ◆ gcc
- ◆ kernel-source
- ◆ make

For information on using YaST to install these packages, see [“Installing the Required Packages” on page 37](#).

Installing the Novell Client Using the Installation Script

An installation script called `ncl_install` is provided in the Novell Client for Linux `.tar.gz` file (`novell-client-1.0-linux-nld9.tar.gz` or `novell-client-1.0-linux-suse9.3.tar.gz`) you download from [Novell Downloads \(http://download.novell.com\)](http://download.novell.com). This script can be used to install, verify

installation, display information, and uninstall the Novell Client directly from a command prompt using documented RPM commands. This same script is copied to the /opt/novell/ncl/bin directory during the installation of the Client for later use in verifying or uninstalling the Client.

Run these commands from the directory where you unarchived the Client download file or from /opt/novell/ncl/bin after the initial installation. You must be logged in as root to run these commands.

Table 1 ncl_install Commands

Command	Description
<code>./ncl_install install</code>	Installs the Novell Client for Linux.
<code>./ncl_install force</code>	Forces the installation of all the Novell Client for Linux packages.
<code>./ncl_install files</code>	Displays a list of all files related to the packages installed with the Novell Client for Linux.
<code>./ncl_install information</code>	Displays summary information for all installed Novell Client for Linux packages.
<code>./ncl_install verify</code>	Verifies the installation of all installed Novell Client for Linux packages.
<code>./ncl_install uninstall</code>	Uninstalls all Novell Client for Linux packages.

Installing the Novell Client Using YaST

You can install the Novell Client for Linux using YaST in either of the following ways:

- ◆ [“Installing the Novell Client Using XWindows” on page 14](#)
- ◆ [“Installing the Novell Client from the Shell” on page 15](#)

IMPORTANT: If you are updating the Novell Client software from a previous version, make sure you uninstall the previous version before you install (see [“Uninstalling the Novell Client for Linux” on page 16](#)). Also, make sure you have all the required packages (see [“System Requirements” on page 13](#)).

Installing the Novell Client Using XWindows

Installing the Novell Client using XWindows requires that you complete the following tasks in the order listed below:

1. [Adding the Novell Client Software to YaST using XWindows \(page 14\)](#).
2. [Installing from XWindows \(page 15\)](#).
3. [Starting or Restarting the Novell Client for Linux \(page 16\)](#)

Adding the Novell Client Software to YaST using XWindows

- 1 Launch the YaST Control Center.

NLD GNOME: Click System > Administrator Settings.

SUSE 9.3 GNOME: Click Desktop > YaST.

NLD and SUSE 9.3 KDE: Click the menu button > System > YaST.

- 2** If you are not logged in as root, type the root password, then click OK.
- 3** Click Software in the left column, then click Change Source of Installation in the right column.
- 4** Click Add.
- 5** Select the Novell Client source file location (Local Directory), specify the location, then click OK.

YaST also allows you to choose other installation sources such as FTP, HTTP, Samba, NFS, and DVD.

YaST adds the new installation source and displays it in the Software Source Media list.
- 6** Click Finish.
- 7** Continue with [“Installing from XWindows” on page 15.](#)

Installing from XWindows

- 1** Launch the YaST Control Center.
NLD GNOME: Click System > Administrator Settings.
SUSE 9.3 GNOME: Click Desktop > YaST.
NLD and SUSE 9.3 KDE: Click the menu button > System > YaST.
- 2** If you are not logged in as root, type the root password, then click OK.
- 3** Click Software in the left column, then click Install and Remove Software in the right column.
- 4** Click Selections in the Filter drop-down list.
- 5** Select the Novell Client for Linux check box to automatically select all of the packages for installation.
- 6** Click Accept to install all of the selected packages.

The installation begins.
- 7** Start the Novell Client for Linux.

See [“Starting or Restarting the Novell Client for Linux” on page 16.](#)

You can customize your Novell Client Options such as the placement of the Novell Client tray application on the Desktop or in the apps tray. This can be done from the Novell Client tray application. See [“Using the Novell Client Tray Application”](#) in the *Novell Client for Linux User Guide*.

Installing the Novell Client from the Shell

You can install or update the Novell Client from the shell. You must be logged in as root.

- 1** Launch the YaST Control Center by entering the following command in a terminal window:

```
/sbin/yast
```
- 2** Select Software, then select Change Source of Installation.
- 3** Select Add.
- 4** Select the Novell Client source file location (Local Directory), specify the location, then select OK.

YaST also allows you to choose other installation sources such as FTP, HTTP, Samba, NFS, and DVD.

YaST updates the new installation source and displays it in the Software Source Media list.

- 5** Select Finish, then select Install and Remove Software.
- 6** Select Selections in the Filter drop-down list.
- 7** Select Novell Client for Linux (the Plus (+) key appears next to the Novell Client for Linux package in the list), then press Enter.

- 8** Select Accept to update all the selected packages.

YaST displays the progress of the package installation.

- 9** After all the packages have been installed, select Quit to close the YaST Control Center.

- 10** Start the Novell Client for Linux.

See [“Starting or Restarting the Novell Client for Linux” on page 16](#).

Starting or Restarting the Novell Client for Linux

There are several ways to start or restart the Novell Client for Linux.

- ◆ **Restarting the Linux Workstation:** This is the best way to ensure that the Novell Client for Linux is completely restarted.
- ◆ **Manually Starting the Novell Client:** Open a terminal window and log in as root. From the /opt directory, enter one of the following commands:

- ◆ **New Installations:** `/opt/novell/ncl/bin/ncl_control start`

This command loads all Novell Client for Linux daemon modules.

- ◆ **Updates:** `/opt/novell/ncl/bin/ncl_control restart`

This command stops and then reloads all Novell Client for Linux daemon modules.

If either of these commands displays any errors, restart the Linux machine.

In addition, `/opt/novell/ncl/bin/ncl_control status` shows whether the NCL drivers are loaded properly or not, and `/opt/novell/ncl/bin/ncl_control stop` stops all Novell Client for Linux daemon modules.

The `ncl_control restart` command is run automatically at the end of the installation of the Novell Client packages.

Uninstalling the Novell Client for Linux

You can uninstall the Novell Client for Linux using either of the following methods:

- ◆ [“Uninstalling Using the YaST Control Center” on page 16](#)
- ◆ [“Uninstalling Using the Installation Script” on page 17](#)

Uninstalling Using the YaST Control Center

- 1** Launch the YaST Control Center.

NLD GNOME: Click System > Administrator Settings.

SUSE 9.3 GNOME: Click Desktop > YaST.

NLD and SUSE 9.3 KDE: Click the menu button > System > YaST.

- 2** Click Software in the left column, then click Install and Remove Software in the right column.
- 3** Click Selections in the Filter drop-down list.
- 4** Select the check box to the left of Novell Client for Linux until a trash can appears.
This automatically selects all of the packages that need to be deleted.
- 5** Click Accept to delete all of the selected packages.
YaST displays the progress of the uninstall.

Uninstalling Using the Installation Script

To uninstall the Novell Client for Linux using the installation script, enter **`./ncl_install uninstall`** in a terminal window. You can run this command from the directory where you unarchived the Client download file or from the `/opt/novell/ncl/bin` directory. You must be logged in as root to run this command.

3

Configuring the Novell Client for Linux

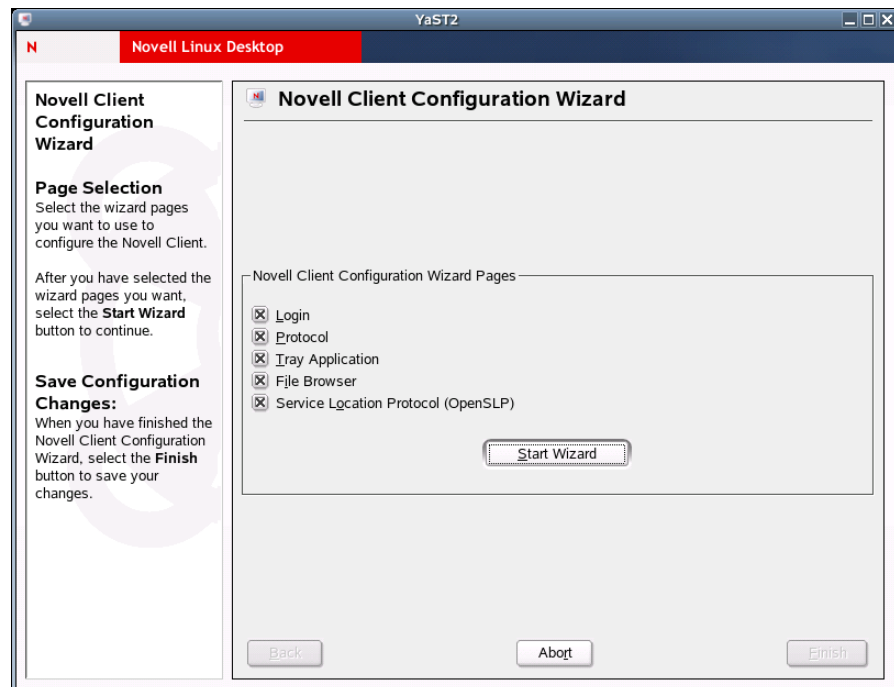
This section explains two ways that you can configure the Novell® Client™ for Linux settings on a workstation. Both methods let you configure the file browser, protocol, login, tray application, and SLP configuration settings available to Novell Client users.

- ◆ [Using the Novell Client Configuration Wizard \(page 19\)](#)
- ◆ [Using Configuration Files to Preconfigure the Novell Client \(page 25\)](#)

Using the Novell Client Configuration Wizard

The Novell Client for Linux includes a Novell Client Configuration Wizard to simplify the process of configuring your Novell Client.

- 1** Launch the Novell Client Configuration Wizard using either of the following methods:
 - ◆ In the Novell Client tray application, click System Settings.
 - ◆ In YaST, click Network Services > Novell Client.
- 2** Select the Client Configuration Wizard pages that contain the settings you want to configure.



You can configure the following settings:

- ◆ [Login](#)

- ◆ Protocol
- ◆ Tray Application
- ◆ File Browser
- ◆ Service Location Protocol (OpenSLP)

3 Click Start Wizard.

4 Follow the instructions in the left panel to configure Novell Client settings.

5 Click Finish.

6 Restart the workstation to ensure that the settings take effect.

7 If you made changes to the Protocol Settings page or the Service Location Protocol (OpenSLP) Settings page, reboot the machine for those changes to take effect.

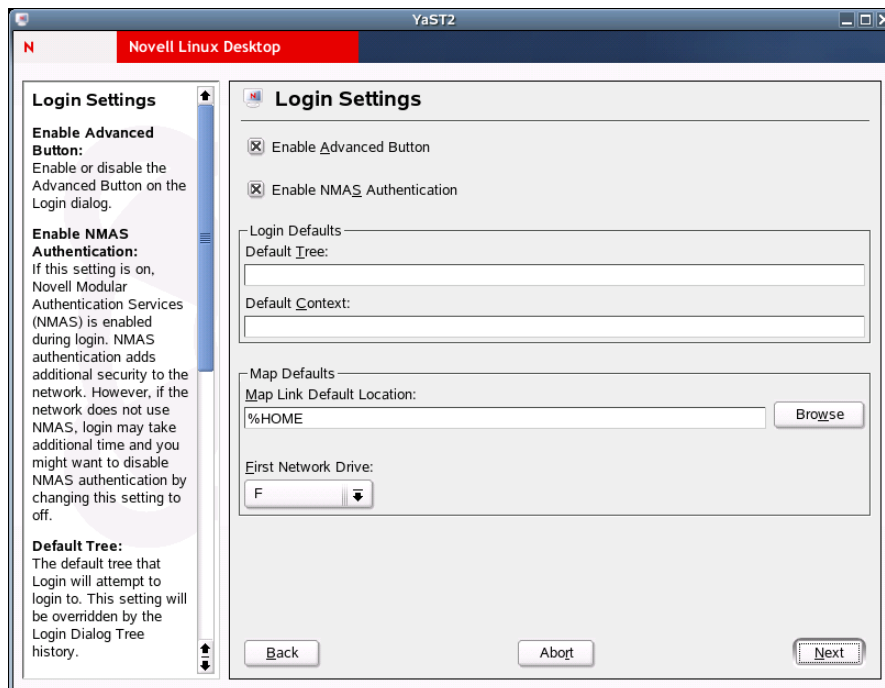
Any changes you make to the Novell Client settings are written to a set of configuration (.conf) files in the /etc/opt/novell/ncl directory. These files are then used by the Novell Client.

IMPORTANT: When the Novell Client software is uninstalled, these settings are not saved. You must configure the workstation again.

Configuring Login Settings

Use the Login Settings page in the Novell Client Configuration Wizard to configure the settings available to users in the Novell Login dialog box.

Figure 1 Login Settings Page in NLD



This page contains the following options:

- ◆ **Enable Advanced Button:** Enables or disables the Advanced Button on the Login dialog box. This option is selected by default.

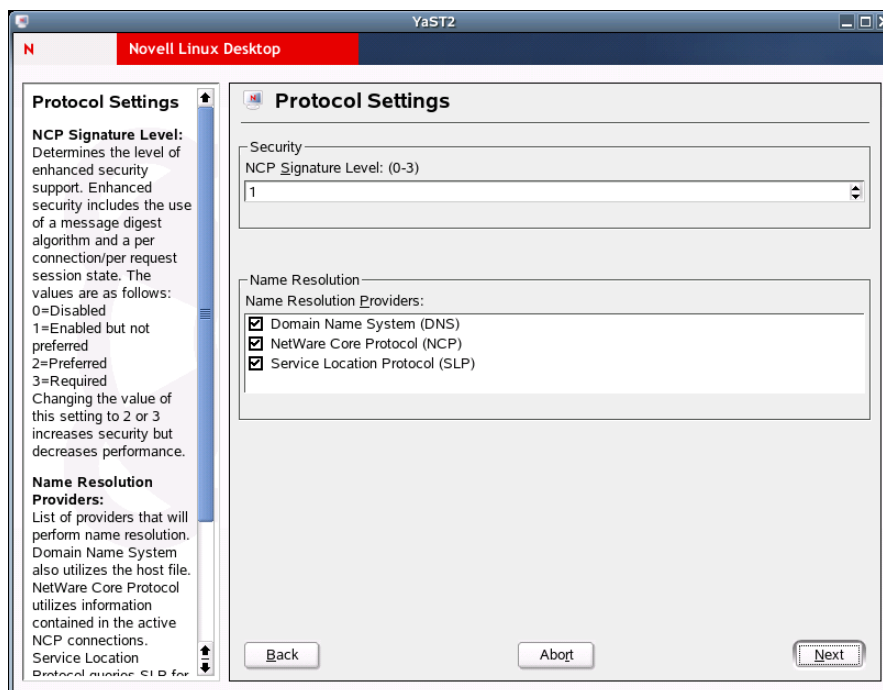
- ◆ **Enable NMAS Authentication:** Enables or disables Novell Modular Authentication Services (NMAST™) during login. NMAS authentication can add additional security to the network, but if the network does not use NMAS, login might take additional time, so you can disable NMAS authentication by disabling this setting. This option is selected by default.
- ◆ **Default Tree:** Specify the default tree that Login attempts to log in to. This setting is overridden by the Login Dialog Tree history.
- ◆ **Default Context:** Specify the default context that Login attempts to log in to. This setting is overridden by the Login Dialog Context history.
- ◆ **Map Link Default Location:** Specify the path to the directory where Map creates symbolic links to network resources. A value of %HOME (the default) causes Map to create symbolic links in the user's home directory.
- ◆ **First Network Drive:** Select the first letter for Map to use when creating symbolic links to network resources. This setting is used in commands such as Map *1 or Map next.

For more information on using the Novell Login dialog box, see “Logging In to the Network” in the *Novell Client for Linux User Guide*.

Configuring Protocol Settings

Use the Protocol Settings page in the Novell Client Configuration Wizard to determine the level of enhanced security support and select the providers to perform name resolution.

Figure 2 Protocol Settings Page in NLD



This page contains the following options:

- ◆ **NCP Signature Level:** Specify the level of enhanced security support. Enhanced security includes the use of a message digest algorithm and a per connection/per request session state. The values are as follows:

0=Disabled

1=Enabled but not preferred

2=Preferred

3=Required

Changing the value of this setting to 2 or 3 increases security but decreases performance.

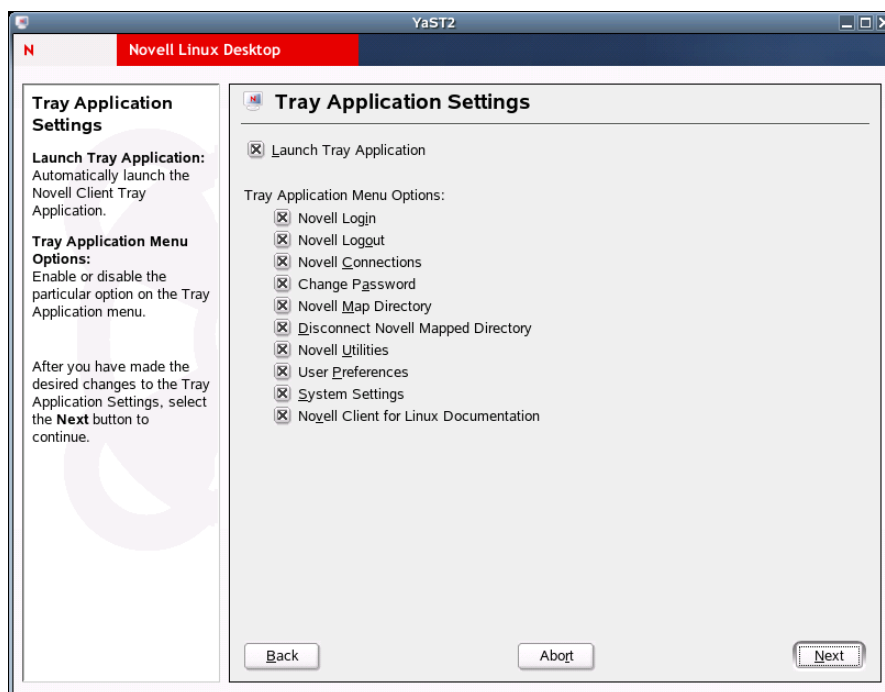
- ◆ **Name Resolution Providers:** Select the providers to perform name resolution. Domain Name System also uses the /etc/hosts file. NetWare® Core Protocol™ uses information contained in the active NCP™ connections. Service Location Protocol queries SLP for eDirectory™ and Bindery names.

If you make changes to the Protocol Settings page, you must reboot the workstation for those changes to take effect.

Configuring Tray Application Settings

Use the Tray Application Settings page in the Novell Client Configuration Wizard to automatically launch the Novell Client Tray Application when the desktop starts and to determine which options are available to users on the Tray Application menu.

Figure 3 Tray Application Settings Page in NLD



This page contains the following options:

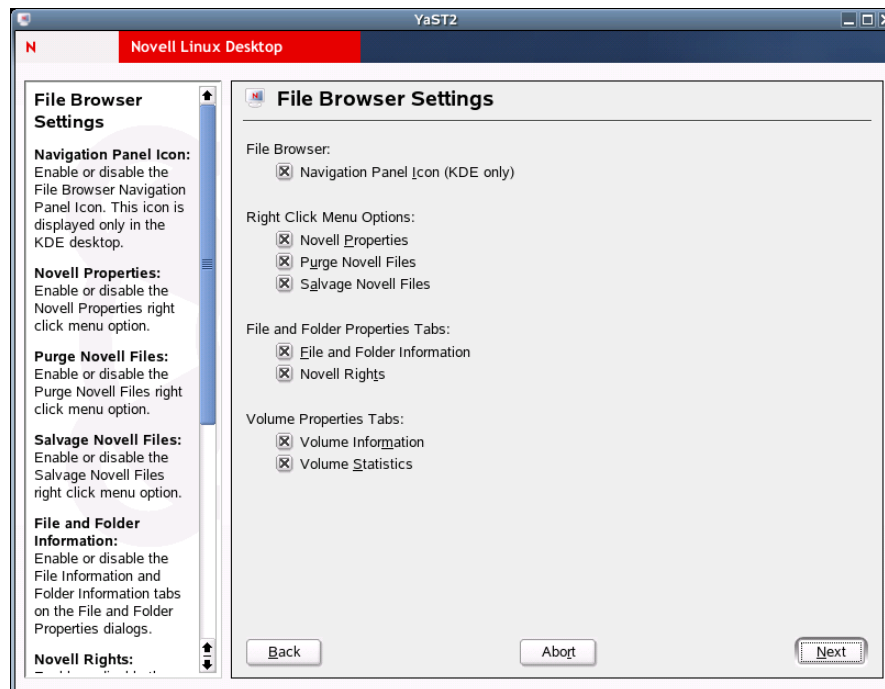
- ◆ **Launch Tray Application:** Select this option to automatically launch the Novell Client Tray Application.
- ◆ **Tray Application Menu Options:** Enables or disables the options available to users on the Tray Application menu.

For more information, see “Using the Novell Client Tray Application” in the *Novell Client for Linux User Guide*.

Configuring File Browser Settings

Use the File Browser Settings page in the Novell Client Configuration Wizard to specify which Novell Client options are available to users when they right-click Novell file system directories or files in a file manager, and which tabs are available on the Novell File, Folder, and Volume Properties pages.

Figure 4 File Browser Settings Page in NLD



This page contains the following options:

- ◆ **Navigation Panel Icon (KDE only):** Enables or disables the File Browser Navigation Panel Icon. This icon is displayed only in KDE.
- ◆ **Novell Properties:** Enables or disables the Novell Properties menu option when users right-click a Novell file system directory or file in a file manager.
- ◆ **Purge Novell Files:** Enables or disables the Purge Novell Files menu option when users right-click a Novell file system directory or file in a file manager.
- ◆ **Salvage Novell Files:** Enables or disables the Salvage Novell Files menu option when users right-click a Novell file system directory or file in a file manager.
- ◆ **File and Folder Information:** Enables or disables the File Information and Folder Information tabs on the File and Folder Properties pages (available when users right-click a Novell file system directory or file in a file manager and then click Novell Properties).
- ◆ **Novell Rights:** Enables or disables the Novell Rights tab on the File and Folder Properties pages (available when users right-click a Novell file system directory or file in a file manager and then click Novell Properties).

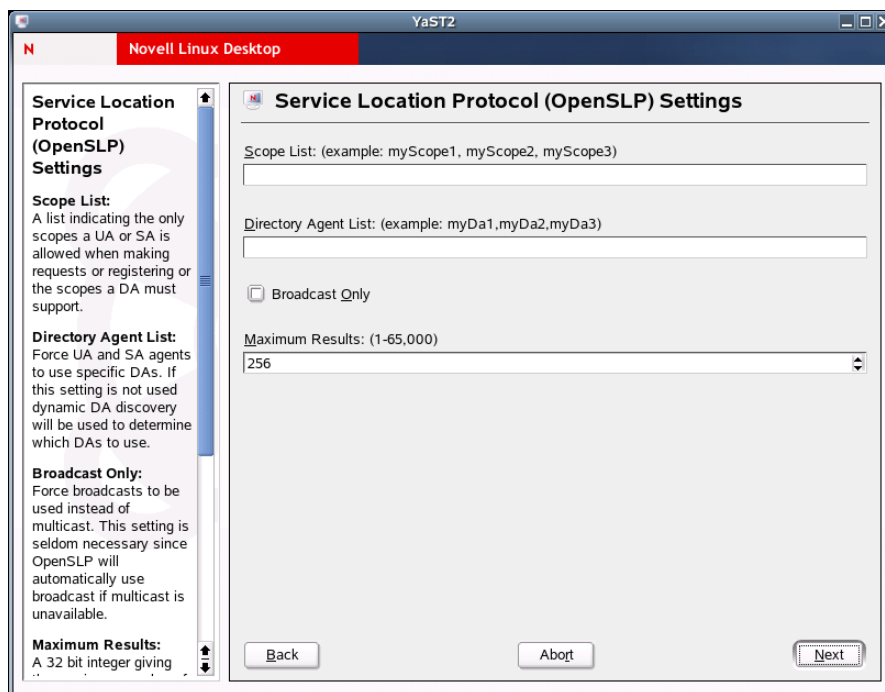
- ◆ **Volume Information:** Enables or disables the Volume Information tab on the Volume Properties page (available when users right-click a Novell file system volume in a file manager and then click Novell Properties).
- ◆ **Volume Statistics:** Enables or disables the Volume Statistics tab on the Volume Properties page (available when users right-click a Novell file system volume in a file manager and then click Novell Properties).

Configuring OpenSLP Settings

Use the Service Location Protocol (OpenSLP) Settings page in the Novell Client Configuration Wizard to specify where and how the Client requests network services.

In an IP-only network, the Novell Client needs a way to resolve the eDirectory tree, context and server names to an actual IP address of an eDirectory server that can provide authentication. On a simple LAN, the client can send an IP broadcast to discover this information, but on a multisite WAN, the SLP scope and Directory Agents must be listed.

Figure 5 Service Location Protocol (OpenSLP) Settings Page in NLD



This page contains the following options:

- ◆ **Scope List:** Specify the scopes a user agent (UA) or service agent (SA) is allowed when making requests or registering, or the scopes a directory agent (DA) must support.
- ◆ **Directory Agent List:** Specify the specific DAs that UA and SA agents must use. If this setting is not used, dynamic DA discovery is used to determine which DAs to use.
- ◆ **Broadcast Only:** Select this option to use broadcasting instead of multicasting. This setting is not usually necessary because OpenSLP automatically uses broadcasting if multicasting is unavailable.

SLP is designed to use IP multicasting; however, if any SLP Agent does not implement IP multicasting, then all Agents must use broadcasting to reach that Agent. If a DA does not support multicasting, we recommend using the Directory Agent List to configure that Directory Agent rather than using this option.

If the network does not contain a DA, IP servers must use their own SAs to specify the services that are available. If the SA does not support multicasting and if there are any services advertised by that SA that are needed by the UA on this machine, then use the Broadcast Only option.

Broadcasting has the disadvantage of being limited to the local LAN segment.

- ♦ **Maximum Results:** Specify a 32-bit integer giving the maximum number of results to accumulate and return for a synchronous request before the time-out, or the maximum number of results to return through a callback if the request results are reported asynchronously.

If you make changes to the Service Location Protocol (OpenSLP) Settings page, you must reboot the workstation for those changes to take effect.

For more information, see “[Using OpenSLP to Simplify Login](#)” on page 28, [SLP Fundamentals](#) (<http://www.novell.com/documentation/edir873/qsedir873/data/aksciti.html>), and the [OpenSLP](#) (<http://www.openslp.com>) Web site.

Using Configuration Files to Preconfigure the Novell Client

The Novell Client for Linux allows you to apply preconfigured client settings contained in one or more configuration (.conf) files. This option works similar to the unattend file that can be used to configure the Novell Client for Windows (see [Creating the Configuring File](#) (<http://www.novell.com/documentation/noclienu/noclienu/data/bu01sei.html#hn62kppa>) in the *Novell Client for Windows Installation and Administration Guide* for more information).

Preconfiguring the Novell Client for Linux requires the novell-client-conf.spec file and the make_novell-client-conf_rpm Bash script located in the /add-on/novell-client-conf subdirectory in the directory where you unarchived the Client download file.

- 1 Create the preconfigured settings using the Novell Client Configuration Wizard.
See “[Using the Novell Client Configuration Wizard](#)” on page 19.
- 2 Copy the appropriate .conf files to the /add-on/novell-client-conf directory.

Depending on the settings you preconfigured, copy one or more of the following files:

Conf File Path and Name	Configuration Settings
/etc/opt/novell/ncl/login.conf	Login settings
/etc/opt/novell/ncl/protocol.conf	Protocol settings
/etc/opt/novell/ncl/file_browser.conf	File browser settings
/etc/opt/novell/ncl/tray_app.conf	Novell Client Tray Application settings
/etc/slp.conf	SLP configuration settings

3 Run the `make_novell-client-conf_rpm` script to create a `novell-client-conf-version_number.platform.rpm` file (for example, `novell-client-conf-1.0.0-0.i586.rpm`) using all of the `.conf` files contained in the `/add-on/novell-client-conf` directory.

3a Make sure you are the root user.

3b Enter the following in a terminal window:

```
bash make_novell-client-conf_rpm
```

4 Install the preconfigured settings contained in `novell-client-conf-version_number.platform.rpm` using one of the following methods:

- ◆ **Install manually in a terminal window:** Enter `rpm -i novell-client-conf-version_number.platform.rpm` in a terminal window.
- ◆ **Install using the `ncl_install` script:** When you launch the `ncl_install` script (located in `/opt/novell/ncl/bin` or in the directory where you unarchived the Client download file), it looks for `novell-client-conf-version_number.platform.rpm` in the `/add-on/novell-client-conf` directory and adds it to the list of RPMs it installs as part of the Client.
- ◆ **Install with the Novell Client using YaST:** Add the location of the newly created `novell-client-conf-version_number.platform.rpm` to the list of Installation Sources in YaST (add a Local Directory in the Change Source of Installation option and point it to the directory containing `novell-client-conf-version_number.platform.rpm`). When the YaST install runs, `novell-client-conf-version_number.platform.rpm` is added as one of the RPMs in the Novell Client selection.

TIP: The Novell Client configuration settings on a workstation can be updated at any time using the YaST method.

The `.conf` files contained in the RPM are copied to the `/etc/opt/novell/ncl` directory, overwriting the files of the same name that already exist there. The installation then copies the `slp.conf` file to the `/etc` directory, overwriting that file as well.

TIP: Backup copies of the existing files are made in the same directory so that you can revert to the old files if you need to.

4

Managing Login

You can customize the client login environment with the following tasks to suit your network and have greater control over what users can access during login:

- ♦ [Setting Up Login Scripts \(page 27\)](#)
- ♦ [Setting Up Login Restrictions \(page 27\)](#)
- ♦ [Using OpenSLP to Simplify Login \(page 28\)](#)

For more information, see “[Logging In to the Network](#)” and “[Logging Out of a Network Location \(Server or Tree\)](#)” in the *Novell Client for Linux User Guide*.

Setting Up Login Scripts

When a user successfully logs in to the network, one or more login scripts are executed that automatically set up the workstation environment. Login scripts are similar to batch files and are executed by Novell® Login. You can use login scripts to map drives to Novell file system volumes and directories, display messages, set environment variables, and execute programs or menus.

Login scripts were originally created for use with the Novell Client™ for Windows. However, the Novell Client for Linux can take advantage of the majority of the functionality available in Windows. This means that the login scripts you created for Windows workstations can also be used with Linux workstations without modification, so you need to administer only one set of login scripts.

Because login scripts are very flexible and dynamic, offer a high degree of customization, and are cross-platform, you should customize the scripts to optimize workstation login to your network. For more information on setting up login scripts, see the *Novell Login Scripts Guide*.

Setting Up Login Restrictions

Login restrictions are limitations on user accounts that control access to the network. These restrictions can be set by an administrator in Novell iManager for each user’s eDirectory™ User object and include the following:

- ♦ Requiring a password
You can specify its minimum length, whether it must be changed and how often, whether it must be unique, and whether the user can change it.
- ♦ Setting the number of logins with an expired password and the number of incorrect login attempts allowed

When a user violates login restrictions by entering an incorrect password or exceeding the number of logins with an expired password, the account is disabled and no one can log in using that username. This prevents unauthorized users from logging in.

- ◆ Setting account limits such as an account balance or expiration date
- ◆ Limiting disk space for each user by specifying the maximum blocks available for each user on a volume
- ◆ Specifying the number of simultaneous connections a user can have
- ◆ Specifying (by node address) which workstations users can log in on
- ◆ Restricting the times when users can log in (you can assign all users the same hours or you can restrict users individually)

For specific information on setting these restrictions, see the online help located in Novell iManager.

Using OpenSLP to Simplify Login

The service location protocol (SLP) was developed so that networking applications such as the Novell Client for Linux could discover the existence, location, and configuration of networked services in enterprise networks. Without SLP, users must supply the hostname or network address of the service that they want to access.

Because SLP makes the existence, location, and configuration of certain services known to all clients in the local network, the Novell Client for Linux can use the information distributed to simplify login. In the case of the Novell Client, having SLP set up allows users to see the trees, contexts, and servers available to them when they use the Novell Client for Linux Login screen. When they click the Browse button, a list of available trees, contexts, or servers appears and they can select the appropriate ones. For example, instead of remembering an IP address or DNS name for a server, users can select the server's name from a list of available servers.

SLP must be activated and set up on your Novell servers in order for the Novell Client to take advantage of it. For more information, see “SLP Services in the Network” in the *SUSE LINUX Enterprise Server 9 Administration Guide* (http://www.novell.com/documentation/oes/index.html?page=/documentation/oes/sles_admin/data/sec-net-slp.html#sec-net-slp).

SLP is not set up by default on Linux workstations. The Novell Client for Linux includes a Novell Client Configuration Wizard to simplify the process of configuring your SLP and other Novell Client configuration options. The Novell Client Configuration Wizard provides only basic SLP configuration because this is all that is required by the client. However, if other applications on your workstation require more advanced settings, you can modify the `/etc/slp.conf` file to set advanced settings.

For more information on advanced SLP configuration, see the [OpenSLP Web site](http://www.openslp.org) (<http://www.openslp.org>). In addition, the `/usr/share/doc/packages/openslp` directory contains documentation on SLP, including a README.SuSE file containing the SUSE® LINUX details, several RFCs, and two introductory HTML documents (*An Introduction to SLP* and *OpenSLP User's Guide*). RFC 2609 details the syntax of the service URLs used and RFC 2610 details DHCP via SLP.

Setting Up SLP

- 1** Launch the Novell Client Configuration Wizard using either of the following methods:
 - ◆ In the Novell Client tray application, click System Settings.
 - ◆ In YaST, click Network Services > Novell Client.
- 2** Select Service Location Protocol (OpenSLP), then click Start Wizard.

3 Specify the following SLP information for your network:

- ◆ **Scope List:** Specify the scopes a user agent (UA) or service agent (SA) is allowed when making requests or registering, or the scopes a directory agent (DA) must support.
- ◆ **Directory Agent List:** Specify the specific DAs that UA and SA agents must use. If this setting is not used, dynamic DA discovery is used to determine which DAs to use.
- ◆ **Broadcast Only:** Select this option to use broadcasting instead of multicasting. This setting is not usually necessary because OpenSLP automatically uses broadcasting if multicasting is unavailable.

SLP is designed to use IP multicasting; however, if any SLP Agent does not implement IP multicasting, then all Agents must use broadcasting to reach that Agent. If a DA does not support multicasting, we recommend using the Directory Agent List to configure that Directory Agent rather than using this option.

If the network does not contain a DA, IP servers must use their own SAs to specify the services that are available. If the SA does not support multicasting and if there are any services advertised by that SA that are needed by the UA on this machine, then use the Broadcast Only option.

Broadcasting has the disadvantage of being limited to the local LAN segment.

- ◆ **Maximum Results:** Specify a 32-bit integer giving the maximum number of results to accumulate and return for a synchronous request before the time-out, or the maximum number of results to return through a callback if the request results are reported asynchronously.

4 Complete the Novell Client Configuration Wizard.

5 Restart the workstation.

Troubleshooting SLP Configuration

If users cannot see a list of available trees, contexts, and servers when they use the Novell Client for Linux Login screen, use `slptool`, located in `/usr/bin`, to troubleshoot your SLP configuration.

After you start `slpd` (located in `/usr/sbin`), you should be able to issue a query for SLP service agents using the following command:

```
slptool findsrvs service:service-agent
```

This should display a list of the hosts that are running `slpd`, which indicates that OpenSLP is successfully installed and working. If you do not get a list, OpenSLP is not installed correctly or is not working. See [“Setting Up SLP” on page 28](#) for more information.

5

Managing File Security

Novell® Open Enterprise Server (OES) and NetWare® networks restrict access to network files and folders based on user accounts. For example, a user connected to the network using the Administrator account can delete or rename a file that other users can only open and edit.

The Novell file system keeps track of the rights that users have to files and directories on the network. When users try to access any file on the network, Novell File Services (NFS) either grants access or prohibits certain things that users can do with the file.

It is important to note that Linux file rights do not correlate with NFS file rights. When you copy a file from a Linux workstation to a Novell server, the only right that is preserved is the Read-Only attribute. This also occurs if you copy files from one server to another using any method other than NCPY at the command terminal.

For more information on the specific rights on NetWare and OES servers, see “File Services” (<http://www.novell.com/documentation/oes/implgde/data/filesvcs.html>) in the *Novell OES Planning and Implementation Guide*.

For additional information on file system attributes, see the *File Systems Management Guide for OES* (http://www.novell.com/documentation/oes/stor_filesys/data/hn0r5fzo.html).

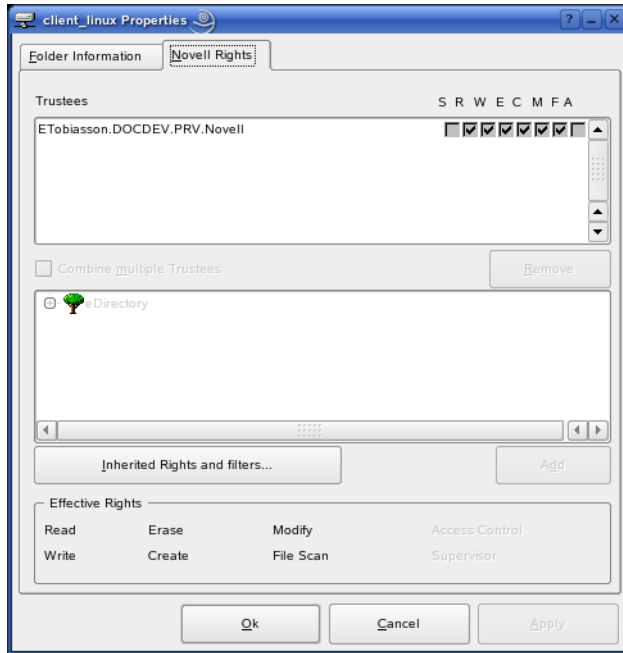
Rights are granted and revoked by creating trustee assignments. For more information, see “Changing Trustee Rights” on page 32.

This section explains the following:

- ♦ [Checking File or Folder Rights \(page 31\)](#)
- ♦ [Changing Trustee Rights \(page 32\)](#)
- ♦ [Combining Multiple Trustees \(page 34\)](#)

Checking File or Folder Rights

- 1** In a file manager, right-click a Novell file system directory or file.
- 2** Do one of the following:
 - ♦ **NLD GNOME:** Click Novell Properties.
 - ♦ **NLD and SUSE 9.3 KDE:** Click Actions > Novell Properties.
IMPORTANT: This feature is not available on SUSE® 9.3 GNOME.
- 3** Click the Novell Rights tab.



4 View the information.

The Trustees list shows the users or groups that have been granted rights to work with this file or folder. The trustees rights to the folder also apply to all the files and subfolders it contains unless the rights are explicitly redefined at the file or subfolder level.

The rights that each trustee has are shown by check marks under the letters. If you are viewing the properties of multiple files, the trustees and rights shown are the combined trustees and rights for all the files.

Effective Rights displays your rights for this file or folder. Users can receive rights in a number of ways, such as explicit trustee assignments, inheritance, and security equivalence (see [eDirectory Rights Concepts \(http://www.novell.com/documentation/edir873/edir873/data/fbachifb.html\)](http://www.novell.com/documentation/edir873/edir873/data/fbachifb.html) in the *Novell eDirectory 8.7.3 Administration Guide* for more information). Rights can also be limited by Inherited Rights Filters and changed or revoked by lower trustee assignments. The net result of all these actions—the rights a user can employ—are called *effective rights*.

5 To view a list of rights and filters inherited by this file or directory, click Inherited Rights and Filters.

All rights assignments on directories are inheritable. You can block such inheritance on individual subordinate items so that the rights aren't effective on those items, no matter who the trustee is. One exception is that the Supervisor right can't be blocked.

6 Click OK.

Changing Trustee Rights

The assignment of rights involves a trustee and a target object. The trustee represents the user or set of users that are receiving the authority. The target represents those network resources the users have authority over. You must have the Access Control right to change trustee assignments.

1 In a file manager, right-click a Novell file system directory or file.

2 Do one of the following:

- ♦ **NLD GNOME:** Click Novell Properties.
- ♦ **NLD and SUSE 9.3 KDE:** Click Actions > Novell Properties.

IMPORTANT: This feature is not available on SUSE 9.3 GNOME.

3 Click the Novell Rights tabbed page.

4 In the Trustees list, select the trustee whose rights you want to change.

5 Select or deselect the rights you want to assign for this trustee.

For each trustee in the list, there is a set of eight check boxes, one for each right that can be assigned. If a check box is selected, the trustee has that right. The following rights can be set for each trustee:

- ♦ **Read:** For a directory, grants the right to open files in the directory and read the contents or run the programs. For a file, grants the right to open and read the file.
- ♦ **Write:** For a directory, grants the right to open and change the contents of files in the directory. For a file, grants the right to open and write to the file.
- ♦ **Erase:** Grants the right to delete the directory or file.
- ♦ **Create:** For a directory, grants the right to create new files and directories in the directory. For a file, grants the right to create a file and to salvage a file after it has been deleted.
- ♦ **Modify:** Grants the right to change the attributes or name of the directory or file, but does not grant the right to change its contents (changing the contents requires the Write right).
- ♦ **File Scan:** Grants the right to view directory and file names in the file system structure, including the directory structure from that file to the root directory.
- ♦ **Access Control:** Grants the right to add and remove trustees for directories and files and modify their trustee assignments and Inherited Rights Filters.
- ♦ **Supervisor:** Grants all rights to the directory or file and any subordinate items. The Supervisor right can't be blocked by an Inherited Rights Filter. Users with this right can grant or deny other users rights to the directory or file.

6 Click OK.

Trustee assignments override inherited rights. To change an Inherited Rights Filter, click Inherited Rights and Filters.

Adding a Trustee

When you add a trustee to a Novell file system directory or file, you grant a user (the trustee) rights to that directory or file. You must have the Access Control right to add a trustee.

1 In a file manager, right-click the Novell file or directory that you want to add a trustee to.

2 Do one of the following:

- ♦ **NLD GNOME:** Click Novell Properties.
- ♦ **NLD and SUSE 9.3 KDE:** Click Actions > Novell Properties.

IMPORTANT: This feature is not available on SUSE 9.3 GNOME.

3 Click the Novell Rights tab.

- 4** In the tree diagram, locate the eDirectory™ user object that you want to add as a trustee, then click Add.
- 5** Set the rights for this user by selecting the boxes under the letters on the right of the Trustees list.

The following rights can be set for each trustee:

- ◆ **Read:** For a directory, grants the right to open files in the directory and read the contents or run the programs. For a file, grants the right to open and read the file.
- ◆ **Write:** For a directory, grants the right to open and change the contents of files in the directory. For a file, grants the right to open and write to the file.
- ◆ **Erase:** Grants the right to delete the directory or file.
- ◆ **Create:** For a directory, grants the right to create new files and directories in the directory. For a file, grants the right to create a file and to salvage a file after it has been deleted.
- ◆ **Modify:** Grants the right to change the attributes or name of the directory or file, but does not grant the right to change its contents (changing the contents requires the Write right).
- ◆ **File Scan:** Grants the right to view directory and file names in the file system structure, including the directory structure from that file to the root directory.
- ◆ **Access Control:** Grants the right to add and remove trustees for directories and files and modify their trustee assignments and Inherited Rights Filters.
- ◆ **Supervisor:** Grants all rights to the directory or file and any subordinate items. The Supervisor right can't be blocked by an Inherited Rights Filter. Users with this right can grant or deny other users rights to the directory or file.

- 6** Click OK.

Removing a Trustee

When you remove a trustee of a Novell file system directory or file, you delete a user's rights to that directory or file. You must have the Access Control right to remove a trustee.

- 1** In a file manager, right-click the Novell file or directory whose trustee you want to remove.
- 2** Do one of the following:
 - ◆ **NLD GNOME:** Click Novell Properties.
 - ◆ **NLD and SUSE 9.3 KDE:** Click Actions > Novell Properties.
- IMPORTANT:** This feature is not available on SUSE 9.3 GNOME.
- 3** Click the Novell Rights tabbed page.
- 4** In the Trustees list, select the trustee you want to remove.
- 5** Click Remove, then click OK.

Combining Multiple Trustees

As an administrator, you might need to apply the same trustee assignments to a group of selected files. You can combine trustee assignments by selecting the Combine Multiple Trustees option on the Novell Rights page.

For example, Kim is a trustee of FILEA and FILEB. Kim has Read, File Scan, and Access Control rights for FILEA and Read and File Scan rights for FILEB. Nancy has Read and File Scan rights for FILEA.

If you give a new user named Michael the Read, Write, and File Scan rights for both FILEA and FILEB and, at the same time, you want to give similar trustee rights for Kim and Nancy, you would select Combine Multiple Trustees. The following would then be true:

- ♦ Kim has Read and File Scan rights to both FILEA and FILEB. Her Access Control right is lost because the combined rights are based on the rights given to Michael.
- ♦ Nancy has Read and File Scan rights to both FILEA and FILEB. She has gained Read and File Scan rights to FILEB because the combined rights are based on the rights given to Michael.
- ♦ Michael has Read, Write, and File Scan rights to both FILEA and FILEB.

To combine multiple trustees:

- 1** In a file manager, select all the Novell files or directories that you want to combine rights for.
- 2** Right-click the files or directories, then select one of the following:
 - ♦ **NLD GNOME:** Click Novell Properties.
 - ♦ **NLD and SUSE 9.3 KDE:** Click Actions > Novell Properties.
IMPORTANT: This feature is not available on SUSE 9.3 GNOME.
- 3** Click the Novell Rights tab.
- 4** Click Combine Multiple Trustees, then click OK.

A

Compiling the Novell Client Virtual File System Kernel Module

If you have updated the kernel on your workstation, you must compile the Novell® Client™ Virtual File System Kernel Module so that it works with the updated kernel. Compiling the Novell Client Virtual File System Module kernel requires the following steps:

1. Ensure that the right packages are installed on your workstation so that the kernel module can be compiled.

See [“Installing the Required Packages” on page 37](#).

2. (Conditional) Install the Novell Client software so that the kernel module pieces are on the workstation.

See [“Installing the Novell Client For Linux” on page 13](#).

NOTE: If you installed the Novell Client for Linux and the installation failed, you do not need to repeat this step.

3. Compile the Novell Client Virtual File System Kernel Module.

See [“Compiling the Novell Client Virtual File System Kernel Module” on page 39](#).

4. Restart the workstation.

Installing the Required Packages

You can install the required packages from the YaST Control Center in either of the following ways:

- ♦ [“Installing the Required Packages from XWindows” on page 37](#)
- ♦ [“Installing the Required Packages from the Shell” on page 38](#)

Installing the Required Packages from XWindows

- 1** Launch the YaST Control Center.
NLD GNOME: Click System > Administrator Settings.
SUSE 9.3 GNOME: Click Desktop > YaST.
NLD and SUSE 9.3 KDE: Click the menu button > System > YaST.
- 2** If you are not logged in as root, type the root password, then click OK.
- 3** Click Software in the left column, then click Change Source of Installation in the right column.
- 4** Click Search in the Filter drop-down list.
- 5** Type `gcc` in the Search field, then click Search.

- 6** Select the gcc package for installation.
- 7** Type **kernel-source** in the Search field, then click Search.
- 8** Select the kernel-source package for installation.

WARNING: The version of the kernel-source package you select for installation must match the version of the kernel currently installed on the Linux machine.
- 9** Type **make** in the Search field, then click Search.
- 10** Select the make package for installation.
- 11** Click Accept to install all of the selected packages.

YaST displays the progress of the package installation.
- 12** (Conditional) If a message informs you that other package selection have been made to resolve dependencies, click Continue.
- 13** (Conditional) If a message prompts you to insert a Novell Linux Desktop or SUSE Linux Professional CD, put the CD in the CD-ROM drive, then click OK.
- 14** After all the packages have been installed, click Close to close the YaST Control Center.

Installing the Required Packages from the Shell

- 1** Launch the YaST Control Center by entering the following command in a terminal window:


```
/sbin/yast
```
- 2** Select Software, then select Change Source of Installation.
- 3** Select Filters > Search.
- 4** Type **gcc** in the Search Phrase field, then press Enter.
- 5** Select the gcc package for installation, then press Enter.

The Plus (+) sign appears next to the gcc package in the list.
- 6** Select Filters > Search.
- 7** Type **kernel-source** in the Search Phrase field, then press Enter.
- 8** Select the kernel-source package for installation, then press Enter.

The Plus (+) sign appears next to the kernel-source package in the list.

WARNING: The version of the kernel-source package you select for installation must match the version of the kernel currently installed on the Linux machine.
- 9** Select Filters > Search.
- 10** Type **make** in the Search Phrase field, then press Enter.
- 11** Select the make package for installation, then press Enter.
- 12** Select Accept to install all of the selected packages, then press Enter.

YaST displays the progress of the package installation.
- 13** (Conditional) If a message prompts you to insert the Novell Linux Desktop or SUSE Linux Professional CD, put the CD in the CD-ROM drive and then press Enter.
- 14** After all the packages have been installed, select Quit to close the YaST Control Center.

Compiling the Novell Client Virtual File System Kernel Module

Depending on whether or not you have a standard kernel that has been updated or a custom kernel that needs to have the Novell Client Virtual File System Kernel Module added, the steps for compiling the module differ.

- ◆ [“Compiling the Novell Client Virtual File System Kernel Module After a Kernel Update” on page 39](#)
- ◆ [“Compiling the Novell Client Virtual File System Kernel Module on Workstations Running a Custom Kernel” on page 39](#)

Compiling the Novell Client Virtual File System Kernel Module After a Kernel Update

If you have updated the kernel on the workstation, you must compile the Novell Client Virtual File System Kernel Module so that it works with the updated kernel.

1 In a terminal window, log in as root.

2 Enter the following command:

```
cd /opt/novell/ncl/src/novfs
```

3 Enter the following command:

```
./mk_novfs
```

The Novell Client Virtual File System Kernel Module is updated to match your updated kernel.

Compiling the Novell Client Virtual File System Kernel Module on Workstations Running a Custom Kernel

If you have a custom kernel on the workstation, you must compile the Novell Client Virtual File System kernel module so that it works with the custom kernel.

1 In a terminal window, log in as root.

2 Enter the following command:

```
cd /opt/novell/ncl/src/novfs
```

3 Enter the following command:

```
./m
```

The Novell Client Virtual File System Module is updated to match your custom kernel.

B

The Novell Client for Linux Commands

The Novell® Client™ for Linux provides a set of command line utilities that let you start and stop the Novell Client daemon, install and uninstall the Novell Client for Linux, load the Novell Client for Linux tray application, list active connections for the currently logged-in user, copy files and directories to and from Novell file systems, display or modify the attributes of files and directories on Novell file systems, log a user in to or out of a Novell file server or eDirectory™ tree, map a local file system to a remote file system on a Novell file server, and display or modify a user's trustee assignments or inherited rights filter for volumes, directories, or files.

The utilities are located in the `/opt/novell/ncl/bin` directory, and include the following:

- ◆ “Shell Commands” on page 41
- ◆ “GUI Utilities” on page 42

Shell Commands

Table 2 The Novell Client for Linux Shell Commands

Utility	Description	Syntax
<code>ncl_tray</code>	Loads the Novell Client for Linux tray application and allows customization of the tray interface.	<code>ncl_tray basic_options Qt_options KDE_options</code>
<code>nwconnections</code>	Lists active connections for the currently logged-in user.	<code>nwconnections [--] [-v] [-h]</code>
<code>nwcopy</code>	Copies files and directories to and from Novell file systems.	<code>nwcopy flags -p source_path -t target_path</code>
<code>nwflag</code>	Displays or modifies the attributes of files and directories on Novell file systems.	<code>nwflag {-a -n} {-w -e eDir object + - attr modifier} [-s] [-d -f] [--] [-v] [-h] URI1 {URI2} {URI3} ...</code>
<code>nwlogin</code>	Logs a user in to a Novell file server or an eDirectory tree.	<code>nwlogin [-u string] [-p string] [-t string] [-c string] [-s string] [-r] [-L path] [-P path] [-2 string] [-3 string] [-4 string] [-5 string] [--] [-v] [-h]</code>
<code>nwlogout</code>	Logs the user out of a Novell or eDirectory tree.	<code>nwlogout {-s string -t string} [-f] [--] [-v] [-h]</code>
<code>nwmap</code>	Creates a mapping (mount) from a local file system to a remote file system on a Novell file server.	<code>map -d drive -s server -v volume -f filespec</code> or <code>map options parameters drive:=path local_path:=remote_path</code>
<code>nwrights</code>	Displays or modifies a user's trustee assignments or inherited rights filter for volumes, directories, or files.	<code>nwrights flags -r + -rights_list -o user_or_group_object -p network_path</code>

GUI Utilities

Table 3 The Novell Client for Linux GUI Utilities

Utility	Description
gnwconnections	Displays the Novell Connections dialog box, which lets you see what servers and trees you are logged in to, refresh connections, set a specific tree as your primary connection, or log out of a tree or server. For more information on using this dialog box, see “ Viewing Your Network Connections ” in the <i>Novell Client for Linux User Guide</i> .
gnwlogin	Displays the Novell Login dialog box. For more information on using this dialog box, see “ Logging In to the Network ” in the <i>Novell Client for Linux User Guide</i> .
gnwservers	Displays a dialog box showing the servers you are logged in to
gnwtrees	Displays a dialog box showing the eDirectory trees you are logged in to.

Using the Novell Client for Linux Man Pages

Each of the utilities has a man page associated with it that contains information on the utility, such as a definition, usage, and samples. There is a known bug related to the manpath environment variable on both NLD and SUSE® Linux Professional. The `ncl_man` utility has been provided for convenience until the manpath bug is resolved. You should use the `ncl_man` command (instead of the traditional `man` command) to view NCL-related man pages. To do this, enter the following in a terminal window the first time you want to view a Novell Client for Linux man page:

```
/opt/novell/ncl/bin/ncl_man
```

This modifies the MANPATH to allow the Novell Client man pages to be displayed. You can then access the man page for a specific Novell Client for Linux utility by entering the following:

```
ncl_man utility_name
```

For example:

```
ncl_man ncl_tray
```

In the man pages, use the PgUp and PgDn keys to move up and down. Use the Home and End keys to move between the beginning and the end of a document. To exit a man page, press q. You can learn more about the man command by entering `man man` in a terminal window.

You can also enter `utility_name --help` in a terminal window to access a help page for the utility.