

# **Novell Remote Manager for Linux Administration Guide**

## **Open Enterprise Server 2 SP3**

August 6, 2012

**Novell.**

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# About This Guide

This guide describes how to access and use Novell Remote Manager on a host that is running the Linux operating system. This guide includes the following information:

- ♦ Chapter 1, “Overview of Novell Remote Manager for Linux,” on page 9
- ♦ Chapter 2, “What's New,” on page 13
- ♦ Chapter 3, “Migrating Novell Remote Manager from OES 1 NetWare to OES 2 Linux,” on page 21
- ♦ Chapter 4, “Managing a Virtualized Linux Server with Novell Remote Manager,” on page 23
- ♦ Chapter 5, “Setting Up Novell Remote Manager for Linux,” on page 25
- ♦ Chapter 6, “Accessing Novell Remote Manager for Linux,” on page 27
- ♦ Chapter 7, “Changing the Configuration,” on page 33
- ♦ Chapter 8, “Diagnosing Problems,” on page 39
- ♦ Chapter 9, “Viewing File Systems,” on page 45
- ♦ Chapter 10, “Managing Linux,” on page 61
- ♦ Chapter 11, “Managing Hardware,” on page 73
- ♦ Chapter 12, “Using Group Operations,” on page 79
- ♦ Chapter 13, “Tasks Quick Reference,” on page 93
- ♦ Chapter 14, “Security Considerations,” on page 97
- ♦ Appendix A, “HTTPSTKD Configuration File Options,” on page 103
- ♦ Appendix B, “Novell Remote Manager Packages,” on page 113
- ♦ Appendix C, “Documentation Updates,” on page 115

## Audience

This guide is intended for network administrators.

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## Documentation Updates

For the most recent version of the *Novell Remote Manager Administration Guide for Linux*, visit the [Open Enterprise Server online documentation Web site \(http://www.novell.com/documentation/oes2/index.html?page=/documentation/oes2/mgmt\\_remotemgr\\_nw\\_lx/data/front.html#bktitle\)](http://www.novell.com/documentation/oes2/index.html?page=/documentation/oes2/mgmt_remotemgr_nw_lx/data/front.html#bktitle).





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# 1 Overview of Novell Remote Manager for Linux

Novell Remote Manager for Linux is a browser-based utility that you can use to manage one or more Linux servers from a remote location.

You can use Novell Remote Manager to monitor your server's health, change the configuration of your server, or perform diagnostic and debugging tasks.

The advantages of using Novell Remote Manager for server management are that:

- ♦ It does not require a special client.
- ♦ It provides a graphical interface that makes interpreting diagnostic information much more comprehensive and easier to manage.
- ♦ It provides added functionality that is not available in the other management utilities.

This section explains the following:

- ♦ [Section 1.1, "Benefits of Using Novell Remote Manager," on page 9](#)
- ♦ [Section 1.2, "Other Management Utilities," on page 10](#)
- ♦ [Section 1.3, "What's Next," on page 10](#)

## 1.1 Benefits of Using Novell Remote Manager

Organizations usually don't have a technician physically located at the server when it needs attention. Servers are frequently placed in remote or distributed locations and, in the case of service providers, at many different companies. The ability to centrally monitor, diagnose, and repair (or preventively avoid) server problems is a significant advantage. It is also a major benefit to be able to provide technical service from any location—any point in the world—across the Internet.

Novell Remote Manager provides IT staff and service providers the ability to monitor and control a complete selection of server controls and functions through a standard Web browser.

The management power and flexibility now available simplifies network administration and allows fewer staff to effectively manage more resources. Novell Remote Manager lets you do the following:

- ♦ Securely access and manage a Linux server from any location. With proper login credentials and Internet access, administrators can control servers from any location.
- ♦ Group servers for collective management, allowing you to manage multiple servers through the same interface and application.
- ♦ Quickly locate and assess problems. An intuitive graphical user interface provides a control dashboard with indicators for server health and status.
- ♦ Manage servers comprehensively. Novell Remote Manager provides control for viewing or managing Linux servers, directories, processes, and hardware.

While using Novell Remote Manager, you can perform the following major tasks:

- ♦ Monitor and manage your server's health
  - ♦ Monitor the health status of one or more servers
  - ♦ Build a group of servers and items to be monitored together
  - ♦ Access server and configuration logs
- ♦ Configure your server
  - ♦ View information about all hardware adapters, hardware resources, and processor data
  - ♦ Upload and replace files
  - ♦ Monitor memory resources
  - ♦ Access files
  - ♦ Shut down or reset a server
- ♦ Troubleshoot server problems
  - ♦ Find high memory users
  - ♦ Monitor server processes

## 1.2 Other Management Utilities

Novell Remote Manager does not replace other management utilities that are available in Open Enterprise Server. For an understanding of which utilities are best for the task you need to perform, see “[OES Utilities and Tools](#)” in the *OES 2 SP3: Planning and Implementation Guide*.

## 1.3 What's Next

Now that you have learned some of the benefits of using Novell Remote Manager, use the information in [Table 1-1](#) to help you access and use it.

**Table 1-1** *Information About Novell Remote Manager*

For Information About	See
Accessing and understanding the layout of Novell Remote Manager	<a href="#">“Accessing Novell Remote Manager for Linux” on page 27</a>
Determining whether Novell Remote Manager for Linux is compatible with other operating systems and how it fits in your current network	<a href="#">“Migrating Novell Remote Manager from OES 1 NetWare to OES 2 Linux” on page 21</a>
Managing a virtualized OES 2 Linux server with Novell Remote Manager.	<a href="#">“Setting Up Novell Remote Manager for Linux” on page 25</a>
Installing Novell Remote Manager for Linux	<a href="#">“Setting Up Novell Remote Manager for Linux” on page 25</a>
Changing the configuration of Novell Remote Manager	<a href="#">“Changing the Configuration” on page 33</a>
Using Novell Remote Manager to monitor and manage your OES Linux and NetWare servers	<ul style="list-style-type: none"><li>♦ <a href="#">“Diagnosing Problems” on page 39</a></li><li>♦ <a href="#">“Viewing File Systems” on page 45</a></li><li>♦ <a href="#">“Managing Linux” on page 61</a></li><li>♦ <a href="#">“Managing Hardware” on page 73</a></li><li>♦ <a href="#">“Using Group Operations” on page 79</a></li></ul>
Things to consider for setting up your system in a secure environment.	<a href="#">“Security Considerations” on page 97</a>



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# 2 What's New

This section identifies the features that were added in Novell Remote Manager (NRM) for Linux since its release in Open Enterprise Server 2 Linux.

- ♦ [Section 2.1, “What’s New \(May 2012 Patches\),” on page 13](#)
- ♦ [Section 2.2, “What’s New \(November 2011 Patches\),” on page 13](#)
- ♦ [Section 2.3, “What’s New \(September 2011 Patches\),” on page 14](#)
- ♦ [Section 2.4, “What’s New \(April 2011 Patches\),” on page 15](#)
- ♦ [Section 2.5, “What’s New \(OES 2 SP3 Linux\),” on page 16](#)
- ♦ [Section 2.6, “What’s New \(OES 2 SP2 Linux\),” on page 16](#)
- ♦ [Section 2.7, “What’s New \(OES 2 SP1 Linux\),” on page 16](#)
- ♦ [Section 2.8, “What’s New \(OES 2 Linux\),” on page 17](#)

## 2.1 What’s New (May 2012 Patches)

In addition to bug fixes, the following enhancement is available in the May 2012 Scheduled Maintenance patches for OES 2 SP3:

- ♦ [Section 2.1.1, “NCP Server Plug-In: NCP Trustee Report,” on page 13](#)

### 2.1.1 NCP Server Plug-In: NCP Trustee Report

Under *Manage NCP Services*, the new *NCP Trustee Report* option allows you to generate a trustee report for a specified NSS volume, including Dynamic Storage Technology shadow volumes comprised of two NSS volumes. You can display the last trustee report in the Web browser, or send the report to the email addresses that you have pre-configured for Novell Remote Manager. A trustee report shows the rights settings by folder for each user or group that is a trustee on the NSS volume. For information, see [Section 9.5, “Generating and Viewing NCP Trustee Reports for NSS Volumes,” on page 58](#).

## 2.2 What’s New (November 2011 Patches)

In addition to bug fixes, the following changes were made to Novell Remote Manager in the OES 2 SP3 November 2011 Scheduled Maintenance patch:

- ♦ [Section 2.2.1, “HttpOnly Command,” on page 14](#)
- ♦ [Section 2.2.2, “InventoryResolveNonLumOwnerName Command,” on page 14](#)
- ♦ [Section 2.2.3, “Inventory Reports,” on page 14](#)
- ♦ [Section 2.2.4, “VNC Consoles,” on page 14](#)

## 2.2.1 HttpOnly Command

The `HttpOnly` configuration option is available in the Novell Remote Manager `/etc/opt/novell/httpstkd.conf` file. By default, Novell Remote Manager sets an HTTP-only cookie attribute that specifies that the cookie is not accessible through a script. This helps mitigate the risk of cross-site scripting. For information, see [Appendix A, “HTTPSTKD Configuration File Options,” on page 103](#).

## 2.2.2 InventoryResolveNonLumOwnerName Command

The `InventoryResolveNonLumOwnerName` configuration option is available in the Novell Remote Manager `/etc/opt/novell/httpstkd.conf` file. This allows you to choose whether the inventory of a Novell Storage Services (NSS) volume reports the names of owners as the Nobody user if their Novell eDirectory user names are not enabled with Linux User Management. By default, this option is set to false (not resolved) in order to give you faster performance for an inventory of files on an NSS volume. For information, see [Section A.6, “InventoryResolveNonLumOwnerName Command,” on page 108](#).

## 2.2.3 Inventory Reports

- The *View File Systems > NCP Volumes Inventory* option allows you to view a list of NCP volumes and generate inventories for them.
- The Volume Information page for a volume provides an *Inventory* option to generate an inventory. This provides the same output as running *View File System > General File Inventory* for Linux paths and for *View File Systems > NCP Volumes Inventory* for NCP volumes.
- An inventory report is saved when you run an inventory on an NCP volume. You can view the last saved report by going to the *Manage NCP Services > Volume Inventory Reports* page and clicking the *View Last Report > Display* option for the volume. The saved report provides the same statistics as running *View File Systems > NCP Volumes Inventory*. Graphics are not available in a saved report.
- You can email a saved NCP volume inventory report to addresses that are configured in the `/etc/opt/novell/httpstkd.conf` file. To send the report, go to the *Manage NCP Services > Volume Inventory Reports* page and click the *Email Report > Send* option for the volume.
- In a file inventory for NSS volumes, the *File Owner Profile* reports the eDirectory identity of the file owner without requiring the users to be enabled with Linux User Management (LUM). For information, see [Section 9.4, “Generating Inventories for Directories or NCP Volumes,” on page 51](#).

## 2.2.4 VNC Consoles

The root user can view VNC consoles from within Novell Remote Manager. This capability requires that the `HttpOnly` security feature be disabled in the `/etc/opt/novell/httpstkd.conf` file.

## 2.3 What’s New (September 2011 Patches)

In addition to bug fixes, Novell Cluster Services added support for OES 2 SP3 services and file systems on the SUSE Linux Enterprise Server (SLES) 10 SP4 operating system. You can upgrade to SLES 10 SP4 by using the `move-to-sles10-sp4` patch in the SLES patch channel.

## 2.4 What's New (April 2011 Patches)

In addition to bug fixes, the following changes were made to Novell Remote Manager in the OES 2 SP3 April 2011 Scheduled Maintenance patch:

- ♦ [Section 2.4.1, "SSL Key Cipher Strength," on page 15](#)
- ♦ [Section 2.4.2, "Inventory Reports," on page 15](#)
- ♦ [Section 2.4.3, "Open Connections," on page 15](#)
- ♦ [Section 2.4.4, "Salvage and Purge for NSS Volumes," on page 15](#)
- ♦ [Section 2.4.5, "Share Information," on page 15](#)
- ♦ [Section 2.4.6, "View File System Listing," on page 16](#)

### 2.4.1 SSL Key Cipher Strength

You can set the cipher strength for the SSL Key in the `/etc/opt/novell/httpstk.conf` file. For information, see [Section A.9, "SSL Key Cipher Strength Command," on page 111](#).

### 2.4.2 Inventory Reports

- ♦ On the Volume Information page, the *Inventory* option generates a report with statistics about the files stored on the selected volume.
- ♦ In a file inventory for NSS volumes, the *File Owner Profile* reports the eDirectory identity of the file owner without requiring the users to be enabled with Linux User Management (LUM). For information, see [Section 9.4, "Generating Inventories for Directories or NCP Volumes," on page 51](#).

### 2.4.3 Open Connections

On the Manage NCP Services > Connection Information page, the *Open File Information* list now links to the file and lock details for each file that is held open by connection number.

### 2.4.4 Salvage and Purge for NSS Volumes

The following capabilities were added for salvaging and purging deleted files for NSS volumes where the Salvage attribute is enabled:

- ♦ The *Salvageable File List* option allows you to view a list of deleted files that are available for salvage or purge on the volume.
- ♦ The *Purge* option allows you to purge a deleted file.
- ♦ The *Salvage* option allows you to recover a deleted file.
- ♦ The *Purge all files* allows you to purge all deleted files on a selected volume.

### 2.4.5 Share Information

On the Share Information page, the following capabilities were added:

- ♦ The *Inventory* option generates a report with statistics about the files stored on a selected volume.

- ♦ Additional details about the volume are displayed, such as size and namespace.
- ♦ The *Create Subdirectory* option allows you to create subdirectories on an NSS volume.
- ♦ The *Delete Directory and Contents* option allows you to recursively delete a selected folder and its contents.
- ♦ The *Rename Directory* option allows you modify the name of a selected directory.
- ♦ The *Compression* option shows whether the Compression attribute is enabled for the NSS volume.

## 2.4.6 View File System Listing

On the View File System Listing page for a volume, the following capabilities were added:

- ♦ The *Text Search* option allows you to search the content of files for a specified text string.
- ♦ The *File Search* option allows you to search for a file on the selected volume.
- ♦ The *Inventory* option generates a report with statistics about the files stored on a selected volume.
- ♦ The *Upload* option allows you to upload a file to the selected volume.

## 2.5 What's New (OES 2 SP3 Linux)

There were bug fixes for the OES 2 SP3 Linux release. No new features were added.

## 2.6 What's New (OES 2 SP2 Linux)

There were bug fixes for the OES 2 SP2 Linux release. No new features were added.

## 2.7 What's New (OES 2 SP1 Linux)

The features in this section were added to Novell Remote Manager for Linux in OES 2 SP1 Linux.

Area of Service	Functionality	For More Information
Root user access versus admin user access	For security reasons, while logged in to NRM as the Admin user or equivalent eDirectory user, the user's <code>root</code> privileges are now limited to only those needed to manage NRM.	<a href="#">Section 6.2, "Accessing Novell Remote Manager," on page 27</a> <a href="#">Section 14.1, "Security Features," on page 97</a>



## 2.8 What's New (OES 2 Linux)

The features in this section were added to Novell Remote Manager for Linux since its initial release in OES 1 Linux.

- ♦ [Section 2.8.1, "What's New \(OES 2 Linux\)," on page 17](#)
- ♦ [Section 2.8.2, "What's New \(OES 1 SP2 Linux\)," on page 17](#)
- ♦ [Section 2.8.3, "What's New \(OES 1 SP1 Linux\)," on page 19](#)

### 2.8.1 What's New (OES 2 Linux)

The features in this section were added to Novell Remote Manager for Linux in the initial release of OES 2 Linux:

Area of Service	Functionality	For More Information
Health Monitor	On the Health Monitor page, you can view the online or offline status of the services running on your OES 2 Linux server.  You can also change the online or offline status of these services.	<a href="#">"Monitoring Overall Server Health or the Health of a Specific Item" on page 39.</a>
Installation	When you add OES 2 to a server, Novell Remote Manager is no longer installed by default like it was in OES 1. Novell Remote Manager has its own pattern and it is selected for installation with all other OES 2 patterns.	<a href="#">"Setting Up Novell Remote Manager for Linux" on page 25.</a>
Manage Linux, Scheduled Task	You can schedule a task using a cron job.	<a href="#">"Scheduling cron Jobs to Run on the Server" on page 69.</a>
All	You can use Novell Remote Manager to access and manage virtualized OES 2 Linux servers.	<a href="#">"Managing a Virtualized Linux Server with Novell Remote Manager" on page 23.</a>

### 2.8.2 What's New (OES 1 SP2 Linux)

The features in this section were added to Novell Remote Manager for Linux in OES 1 SP2 Linux:

Area of Service	Functionality	For More Information
View File System (Home)	On the home page, you can view the percent of free space available on each mounted physical devices or external file systems that have actual disk space. Available disk space on virtual file systems is not shown.  You can also view the details of the file system on the Information Page for each mounted system on the device. The <i>Unmount</i> button was moved to this page.	<a href="#">"Viewing Mounted Devices and Performing Actions on Them" on page 46.</a>

Area of Service	Functionality	For More Information
View File System	<p>The <i>General File Inventory</i> link in this section provides a page where you can get an inventory of all the files from the <code>root</code> directory or browse to a specific subdirectory and generate a file inventory of all the files in the selected subdirectory.</p> <p>This same functionality is available by clicking the <i>Inventory</i> link when browsing the file system from the <i>View File System</i> link.</p> <p>The <i>Volume Inventory</i> link in this section provide a list of all NCP mounted volumes. When you click the volume name link from this page, an inventory report of all the files from the root of that volume is generated.</p> <p>From these generated reports, you can also perform actions on the files or directories such as moving, copying, deleting, and renaming.</p>	<a href="#">"Generating Inventories for Directories or NCP Volumes" on page 51.</a>
Use Group Operation	<p>If you want to scan the network for specific services, access the Network Discovery page and specify the host and ports that should be scanned for. After discovering the items on the network, you can click the item and add it to the current group for future monitoring.</p> <p>Using this feature can help you to quickly gather the information you need to create monitoring groups.</p>	<a href="#">"Discovering Items on the Network to Monitor" on page 89.</a>

## 2.8.3 What's New (OES 1 SP1 Linux)

The features in this section were added to Novell Remote Manager for Linux in OES 1 Linux SP1:

Area of Service	Functionality	For More Information, see
Configure	Added configuration options for controlling which users can log in to Novell Remote Manager and specifying which languages the browser supports for Novell Remote Manager.	<ul style="list-style-type: none"><li>♦ <a href="#">“Accessing and Editing the HTTPSTKD Configuration File” on page 34</a></li><li>♦ <a href="#">“HTTPSTKD Configuration File Options” on page 103.</a></li></ul>
View File System (Home)	Left navigation frame includes collapsible categories that are remembered for the next time you log in. This lets you display the Novell Remote Manager features that you use most often and hide the ones that you don't.	<a href="#">“Navigation Frame” on page 31</a>
Diagnose, Health Monitor	CPU usage process information is now reporting the correct information.	<a href="#">“Diagnosing Problems” on page 39</a>
Access	Network services now has a selection for installing the Novell Remote Manager services. This lets you install Novell Remote Manager after the server installation and performs the proper configuration steps that weren't performed if you installed the packages separately.	<a href="#">“Setting Up Novell Remote Manager for Linux” on page 25</a>
Manage Linux, VNC Consoles	If VNC services are configured on the server, you can access the VNC console screens by clicking the <i>VNC Consoles</i> link under the <i>Manage Linux</i> heading in the navigation frame. Then click the <i>1024 X 728</i> button on the VNC Console Screens page.	<a href="#">“Accessing VNC Consoles” on page 61</a>



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# 3 Migrating Novell Remote Manager from OES 1 NetWare to OES 2 Linux

This section contains information about the following:

- ♦ [Section 3.1, “Coexistence,” on page 21](#)
- ♦ [Section 3.2, “Migration,” on page 21](#)

## 3.1 Coexistence

This section provides information regarding the compatibility and coexistence of Novell Remote Manager for Linux with existing networks containing NetWare or Linux platforms.

### 3.1.1 Compatibility

When you create a group, you can get server health status from a NetWare server running NetWare 6.0 or later or from a Linux server running Novell Open Enterprise Server 1 or Open Enterprise Server 2.

You can access the Novell Remote Manager on Linux only on servers with OES services installed. See [“System Requirements” on page 27](#).

### 3.1.2 Coexistence Issues

Monitoring on Linux servers that are not running the owcimomd module can report only an Up/Down status.

## 3.2 Migration

There is no need to migrate Novell Remote Manager from NetWare to Novell Remote Manager for Linux. Novell Remote Manager is selected for installation when any pattern from Open Enterprise Server is installed.

You can combine server groups for monitoring OES NetWare and OES Linux servers. You can save the group file locally or to an eDirectory object. See [“Saving a Group” on page 84](#) and [“Accessing an Existing Group” on page 85](#).

Configuring Novell Remote Manager is somewhat different on an OES Linux server than an OES NetWare server. See [“Changing the Configuration” on page 33](#).

Not all tasks that are available in Novell Remote Manager for NetWare are available on Novell Remote Manager for Linux, such as IP Address Management; however, you have the functionality to monitor the server health for individual servers or groups of servers, the ability to load and unload programs, and access console screens.

---

# 4 Managing a Virtualized Linux Server with Novell Remote Manager

Using Novell Remote Manager for Linux to access and manage a virtualized OES 2 Linux server is the same in every way as accessing and managing a physical OES 2 Linux server and requires no special configuration or other changes.

To get started with virtualization, see “[Introduction to Xen Virtualization](http://www.novell.com/documentation/sles10/book_virtualization_xen/data/sec_xen_basics.html)” ([http://www.novell.com/documentation/sles10/book\\_virtualization\\_xen/data/sec\\_xen\\_basics.html](http://www.novell.com/documentation/sles10/book_virtualization_xen/data/sec_xen_basics.html)) in the *Virtualization with Xen* ([http://www.novell.com/documentation/sles10/book\\_virtualization\\_xen/data/book\\_virtualization\\_xen.html](http://www.novell.com/documentation/sles10/book_virtualization_xen/data/book_virtualization_xen.html)) guide.

For information on setting up virtualized OES 2 Linux, see “[Installing, Upgrading, or Updating OES on a Xen-based VM](#)” in the *OES 2 SP3: Installation Guide* guide.





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# 5 Setting Up Novell Remote Manager for Linux

This section contains the following information:

- ♦ [Section 5.1, “Installing Novell Remote Manager During the Initial Server Installation,” on page 25](#)
- ♦ [Section 5.2, “Installing Novell Remote Manager After the Initial Server Installation,” on page 25](#)

## 5.1 Installing Novell Remote Manager During the Initial Server Installation

To install Novell Remote Manager during the OES 2 installation or while adding OES 2 on an existing server, select the Novell Remote Manager (NRM) pattern to install Novell Remote Manager.

It does not require any additional configuration during the installation and does not display on the Installation Settings page. For information on changing the configuration after the installation is complete, see [Chapter 7, “Changing the Configuration,” on page 33](#)

For a list of RPMs that it installs, see [Appendix B, “Novell Remote Manager Packages,” on page 113](#).

## 5.2 Installing Novell Remote Manager After the Initial Server Installation

If you did not install Novell Remote Manager when you first installed OES 2 Linux, do the following to install and configure Novell Remote Manager:

- 1 Open YaST.
- 2 Click *Open Enterprise Server > OES Install and Configuration*.
- 3 Select the Novell Remote Manager (NRM) pattern.  
Selecting this pattern automatically selects the Novell Linux User Management (LUM) and Novell Backup/Storage Management Services (SMS) patterns.
- 4 (Conditional) If you want only the Novell Remote Manager pattern installed, deselect the Novell Linux User Management (LUM) and Novell Backup/Storage Management Services (SMS) patterns.  
If you have only Novell Remote Manager installed, then you can log in to Novell Remote Manager only as user `root` or a local Linux user.  
If you log in as a local Linux user, you can see only the information that the user you log in as has rights to view.
- 5 Click *Accept*.

- 6 If necessary, complete any required information for other services selected on the Novell Open Enterprise Server Configuration summary page. When all the settings on the Novell Open Enterprise Server Configuration summary page are set as desired, click *Next*.

The necessary files are installed and configuration of the services are completed.

No additional configuration during the installation for Novell Remote Manager is required. For information on changing the configuration after the installation is complete, see [Chapter 7, “Changing the Configuration,”](#) on page 33.

For a list of RPMs that it installs, see [Appendix B, “Novell Remote Manager Packages,”](#) on page 113.

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# 6 Accessing Novell Remote Manager for Linux

This section includes information about the following:

- ♦ [Section 6.1, “System Requirements,” on page 27](#)
- ♦ [Section 6.2, “Accessing Novell Remote Manager,” on page 27](#)
- ♦ [Section 6.3, “Starting or Stopping HTTPSTKD,” on page 29](#)
- ♦ [Section 6.4, “Understanding the Layout of Novell Remote Manager,” on page 29](#)
- ♦ [Section 6.5, “Accessing Online Help,” on page 32](#)
- ♦ [Section 6.6, “Accessing Novell Web Pages,” on page 32](#)

## 6.1 System Requirements

- ☐ Mozilla Firefox 1.0, Microsoft Internet Explorer 6 or later, Mozilla 1.7 (SLES 9 SP1 and Linux Professional 9.2), KDE 3.2 Konqueror (limited functionality), or Safari 1.2 (limited functionality)
- ☐ The HTTPSTKD package loaded and running on the server. This package is selected for installation by the Novell Remote Manager pattern. The Novell Remote Manager (NRM) pattern is selected for installation when you install any of the Open Enterprise Server 2 patterns on Linux unless you deselect it.

For information on installing Novell Remote Manager, see [Chapter 5, “Setting Up Novell Remote Manager for Linux,” on page 25](#).

For package details, see [“Novell Remote Manager Packages” on page 113](#).

- ☐ To view the graphical displays in the file system inventory report, the Sun Java 1.4.2 plug-in (`java-1_4_2-sun-plugin.rpm`) must be installed on the machine you use to access Novell Remote Manager, and the browser must have Java and Javascript enabled.

## 6.2 Accessing Novell Remote Manager

- 1 Open a Web browser.
- 2 Point the browser to the URL of the server you want to manage by entering the following in the Address (URL) field:

```
http://server's_TCP/IP_address:8008
```

For example:

```
http://172.16.123.11:8008
```

If you have Domain Name Services (DNS) installed on your network for server name-to-IP address resolution, you can also enter the server's DNS name instead of the IP address.

**3** Accept the SSL certificate.

You need to have SSL 2.0 and SSL 3.0 (where available) enabled in your browser. Otherwise, the browser displays an error indicating that the page cannot be displayed.

**4** When the login dialog box appears, provide the required information.

Log in as user `root`, a local Linux user, or as an eDirectory user that is Linux User Management enabled.

If you have Linux User Management enabled in your tree and have it installed and configured on the local server, you can log in to Novell Remote Manager using your eDirectory credentials. For instructions on enabling Linux, see [“Setting Up Linux Computers to Use eDirectory Authentication”](#) in the *OES 2 SP3: Novell Linux User Management Administration Guide*.

If you log in as a local Linux user or as a non-Admin eDirectory user, you can see only the information that the user you log in as has rights to view.

Two specific things to remember when logging in as an eDirectory user to Novell Remote Manager:

- ♦ For users to log in as user Admin or equivalent, the Admin user must either be associated to the group that has the Supervisor right for the Entry Rights property for the UNIX Workstation object or have the Supervisor right for the Entry Rights to the NCP object that represents the Linux server in the eDirectory tree.

---

**IMPORTANT:** When eDirectory users who have the Supervisor right to one of these objects are logged in to the server with their eDirectory user names, they are granted limited `root` user privileges so they can modify only the configuration files necessary for configuring NRM or any other files that NRM has been assigned rights to allow modifying.

---

If eDirectory and LUM are installed on the local server, the eDirectory user Admin can log in to Novell Remote Manager using its fully distinguished name (`admin.context`) because this user is enabled for Linux User Management by default in this case.

- ♦ For non-Admin users to log in using eDirectory credentials, they must be users enabled for Linux User Management.

Users who are enabled for Linux User Management have a Linux Profile tab on their Modify User page in iManager and an eDirectory object that is associated with the UNIX Workstation object that represents the Linux server.

You can use iManager or the LUM command line utility `namuseradd` to enable users for Linux User Management. For instructions, see [“Overview”](#) in the *OES 2 SP3: Novell Linux User Management Administration Guide*.

The Admin user has limited file system rights equivalent to `root` that are needed to modify only the configuration files necessary for configuring NRM or any other files that NRM has been assigned rights to allow modifying. For a list of these files, see [Section 14.1, “Security Features,” on page 97](#). The user Admin or equivalent user has access according to the Linux and LUM file rights to all other files.

After logging in, your session for Novell Remote Manager remains open until you close all your browser windows at that workstation.

## 6.3 Starting or Stopping HTTPSTKD

When you install and configure the Novell Remote Manager pattern on Open Enterprise Server (OES) 2 on Linux server, Novell Remote Manager is started by default.

A script for starting and stopping the Novell Remote Manager/Linux components is in `/etc/init.d/novell-httpstkd`. Enter the following commands at a console shell prompt to perform the desired action:

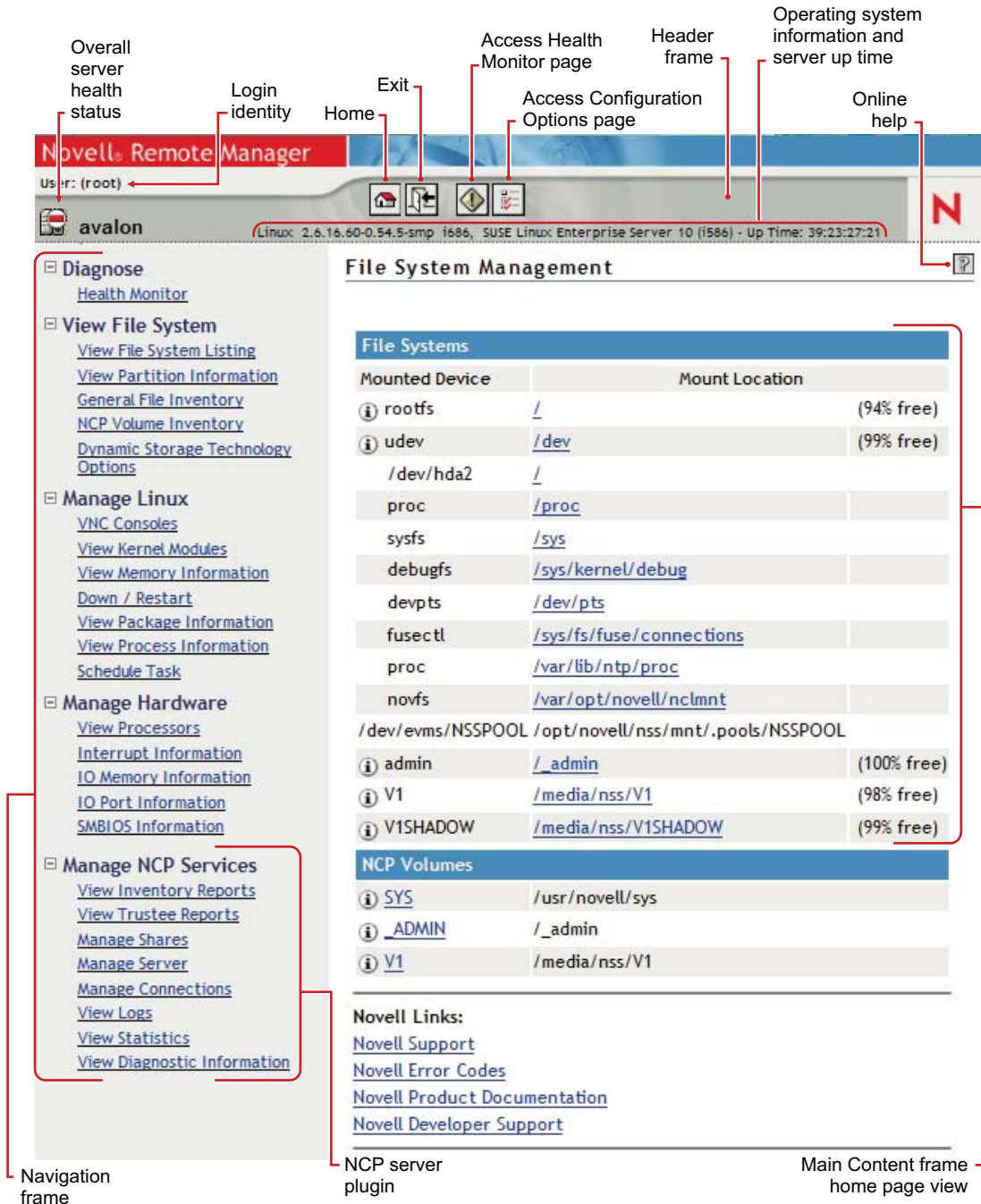
**Table 6-1** *Commands for Starting, Stopping, or Checking the Status of Novell Remote Manager*

Task	Command
To see whether the module is running	<code>rcnovell-httpstkd status</code>
	or
	<code>/etc/init.d/novell-httpstkd status</code>
To restart HTTPSTKD	<code>rcnovell-httpstkd restart</code>
	or
	<code>/etc/init.d/novell-httpstkd restart</code>
To start HTTPSTKD	<code>rcnovell-httpstkd start</code>
	or
	<code>/etc/init.d/novell-httpstkd start</code>
To stop HTTPSTKD	<code>rcnovell-httpstkd stop</code>
	or
	<code>/etc/init.d/novell-httpstkd stop</code>

## 6.4 Understanding the Layout of Novell Remote Manager

The Web pages for Novell Remote Manager have three main frames: the header frame (top), the navigation frame (left), and the main content frame (right). They also contain the *Overall Health Indicator* and online help.





**Figure 6-1** Layout of Novell Remote Manager



## Header Frame

Contains general information about the server as well as links to the Health Monitor and Configuration pages and an *Exit* link to close the browser window. The File System Management page is considered the Home page.

The general information about the server includes the following:

- ♦ Overall server health status as one of the following:
  - ♦ Green (good) 
  - ♦ Yellow (suspect) 
  - ♦ Red (bad) 
  - ♦ White with black X (no connection) 
- ♦ Server name
- ♦ Name of the user you are logged in to Novell Remote Manager as
- ♦ Version of the operating system running on the server and the amount of time the server has been running

## Navigation Frame

Lists general tasks that you can do using Novell Remote Manager as well as links to specific pages for performing those tasks. The left navigation frame includes collapsible categories that are remembered for the next time you log in. This lets you display the Novell Remote Manager features that you use most often and hide some of the ones that you do not.

The links in the navigation frame change depending on the plug-in programs that are installed on the server.

---


**IMPORTANT:** When working in Novell Remote Manager, using the browser's *Back* button can result in unintended actions being re-sent to the server. Ensure that you use the navigation links provided in the tool.

---


## Main Content Frame

The information in this frame changes depending on which link you click in the header or navigation frame.

## Overall Health Indicator


Shows the overall health for the server as determined by the selections on the Health Monitoring page. Clicking the *Server Health* icon  also takes you to the Health Monitoring page where you can view or configure the specifics of the server's health.

## Online Help

When a *Help* icon  appears in the upper right corner of a page in the main content frame, you can view help for the page that is displayed.

## 6.5 Accessing Online Help

Online help, which provides detailed information and instructions for using Novell Remote Manager features, is available for most management tasks and settings.

To access the online help, click the *Help* icon  on the upper right portion of the page or next to the specific item link.

## 6.6 Accessing Novell Web Pages

Novell Links on the Home (File System Management) page provide quick access to the following:


- ♦ *Novell Support Web* page (<http://www.novell.com/support/supportcentral/supportcentral.do?id=m1>) links directly to the Novell Support Web site, where you can get current server patch kits and updates or find troubleshooting information. You can also access this link by clicking the word *Novell* in the upper-right area of the header frame.
- ♦ *Novell Error Codes documentation Web* page (<http://www.novell.com/documentation/nwec/index.html>) links directly to the information about Novell Error Codes, including what they mean and possible causes and actions for them.
- ♦ *Novell Product Documentation Web* page (<http://www.novell.com/documentation>) links directly to the product documentation for all shipping Novell products.
- ♦ *Novell Developer Support Web* page ([http://developer.novell.com/wiki/index.php/Developer\\_Support](http://developer.novell.com/wiki/index.php/Developer_Support)) links directly to the Novell Developer Support Web site, where you can find tips and suggestions beyond the basics for managing, troubleshooting, and diagnosing your server.



# 7 Changing the Configuration

When Novell Remote Manager (NRM) is installed, it sets up a small Web server on your server. The interface and module is called HTTPSTKD. Its basic configuration parameters that allow it to work are set.

You might need to configure Novell Remote Manager after the initial installation for a variety of reasons. For example, you might want to bind additional IP addresses to HTTPSTKD, set up stronger security, set up mail notification for health events, or extend the eDirectory schema for Group Monitoring.

You can perform these tasks using the options on the Novell Remote Manager Configuration Options page. To access this page, click the *Configure*  icon in the header frame.

**Figure 7-1** The Novell Remote Manager Configuration Options Page

**Novell Remote Manager Configuration Options**

**HTTP Interface Management**  
**WARNING:** You must restart httpstkd in order to apply changes in these config files.  
[Edit httpstkd config file](#)  
[Edit httpstkd PAM config file](#)

**Daemon Restart**

**HTTP Logs**  
[View last 100 log entries](#)  
[View entire log](#)

**Novell Remote Manager Certificate Management**  
httpstkd has been configured to use an OpenSSL generated certificate.  
[View Certificate\(s\)](#)  
[Configure httpstkd to use the YAST CA Certificate](#)

**Novell Remote Manager Schema Management**  
Disabled: You must be logged in as a eDirectory user with admin rights to apply Novell Remote Manager schema extensions.

**httpstkd Daemon Core File : Disabled**

On this page you can perform the following tasks:

- ♦ [Section 7.1, “Accessing and Editing the HTTPSTKD Configuration File,” on page 34](#)
- ♦ [Section 7.2, “Accessing and Editing the HTTPSTKD PAM Configuration File,” on page 35](#)
- ♦ [Section 7.3, “Restarting the HTTPSTKD Daemon,” on page 36](#)
- ♦ [Section 7.4, “Viewing the HTTP Logs,” on page 36](#)
- ♦ [Section 7.5, “Viewing and Creating Certificates for Novell Remote Manager,” on page 36](#)
- ♦ [Section 7.6, “Extending the eDirectory Schema for Novell Remote Manager Group Operations,” on page 37](#)

## 7.1 Accessing and Editing the HTTPSTKD Configuration File

Anytime you want to change the following interactions with Novell Remote Manager, access the `/etc/opt/novell/httpstk.conf` file and make the applicable changes:

**Table 7-1** Information for Changing the Functionality of Novell Remote Manager

Functionality	Information On How to Change
Which network board Novell Remote Manager is bound to or add additional IP address that it is bound to	<a href="#">“Address and Port Commands” on page 103</a>
The certificates Novell Remote Manager is using for authentication	<ul style="list-style-type: none"><li>♦ <a href="#">“Viewing and Creating Certificates for Novell Remote Manager” on page 36</a></li><li>♦ <a href="#">“Address and Port Commands” on page 103</a></li></ul>
The cipher strength of the SSL key that is used to access Novell Remote Manager	<a href="#">“SSL Key Cipher Strength Command” on page 111</a>
The <code>HttpOnly</code> attribute for cookies in a response header	<a href="#">“HttpOnly Command” on page 107</a>
The <code>InventoryResolveNonLumOwnerName</code> option for resolving names of NSS volume file owners if their eDirectory user names are not LUM enabled	<a href="#">“InventoryResolveNonLumOwnerName Command” on page 108</a>
Which plug-ins are loaded	<a href="#">“Load Command” on page 110</a>
Which workstations can access Novell Remote Manager	<a href="#">“Filtering Commands” on page 106</a>
Whether email notification is sent for health monitoring or who receives it	<a href="#">“Email Notification Commands” on page 106</a>
Which users can log in to Novell Remote Manager	<ul style="list-style-type: none"><li>♦ <a href="#">“Disable Auto LUM Command” on page 104</a></li><li>♦ <a href="#">“Supervisor Only Command” on page 111</a></li></ul>
The language the browser supports	<a href="#">“Language Commands” on page 109</a>

To access and edit this file:

- 1 Click the *Configure* icon  in the navigation frame.
- 2 Click *Edit Httpstk.conf File*.

- 3 Make the changes.
- 4 Click *Save Changes*.

or

With an editor that saves files to a UNIX format, edit the `/etc/opt/novell/httpstkd.conf` file.

After making changes to this file and saving it, restart the HTTPSTKD daemon. See [“Restarting the HTTPSTKD Daemon” on page 36](#).


## 7.2 Accessing and Editing the HTTPSTKD PAM Configuration File

Linux uses PAM (Pluggable Authentication Modules) in the authentication process as a layer that mediates between user and application. PAM modules are available on a system-wide basis, so they can be requested by any application.

Every program that relies on the PAM mechanism has its own configuration file in the directory `/etc/pam.d/program_name`. These files define the PAM modules that are used for authentication. In addition, there are global configuration files for most PAM modules under `/etc/security` directory, which define the exact behavior of these modules (examples are `pam_env.conf`, `pam_pwcheck.conf`, `pam_unix2.conf`, and `time.conf`). Every application that uses a PAM module actually calls a set of PAM functions, which then processes the information in the various configuration files and returns the results to the calling application.

This file controls the authentication to Novell Remote Manager on an OES Linux server. The default configuration should work. If you want to change the way your users authenticate to Novell Remote Manager, you can edit this file.

To access and edit this file:

- 1 Click the *Configure* icon  in the navigation frame.
- 2 Click *Edit Httpstkd PAM Config File*.
- 3 Make the changes.
- 4 Click *Save Changes*.

or

With an editor that saves files to a UNIX format, edit the `/etc/pam.d/httpstkd` file.

These are the lines that enable Novell Remote Manager integration with user management:

```
auth      sufficient /lib/security/pam_nam.so
account   sufficient /lib/security/pam_nam.sos
password  sufficient /lib/security/pam_nam.so
session   optional  /lib/security/pam_nam.so
```

After making changes to this file, restart the HTTPSTKD daemon. See [“Restarting the HTTPSTKD Daemon” on page 36](#).

For more information about the PAM configuration file and the options available, see [“Authentication with PAM” in the SUSE Linux Enterprise Server 10 Installation and Administration Guide](#) ([http://www.novell.com/documentation/sles10/sles\\_admin/data/cha\\_pam.html](http://www.novell.com/documentation/sles10/sles_admin/data/cha_pam.html)).

## 7.3 Restarting the HTTPSTKD Daemon

After making changes to the HTTPSTKD configuration file or the HTTPSTKD PAM configuration file, restart the HTTPSTKD daemon.

To restart the HTTPSTKD daemon, click *Restart Httpstkd* on the Novell Remote Manager Configuration Options page.

You can also restart it manually. See [“Starting or Stopping HTTPSTKD” on page 29](#).


## 7.4 Viewing the HTTP Logs

The Novell Remote Manager Configuration Options page contains a link for all the HTTPSTK-related messages contained in the `var/log/messages` file.

This information is valuable for seeing who logged in through Novell Remote Manager, when they logged in, the pages being viewed, log failures, and so on.

You can view the last 100 entries of the log or the entire log.

To view this log:

- 1 Click the *Configure* icon  in the navigation frame.
- 2 Under the *HTTP Logs* heading, click either *View Last 100 Log Entries* or *View Entire Log*.

The logging to this file is controlled by the Syslog options. To change these default syslog options, edit the `etc/sysconf/syslog` file.

## 7.5 Viewing and Creating Certificates for Novell Remote Manager

Novell Remote Manager uses the default certificates created during the installation to secure access through it to the server. This certificate is bound to the first network board found in the server configuration.

During the install of eDirectory on a new server installation, there is a check box to have all HTTP services use an eDirectory certificate. HTTPSTKD uses that certificate if this check box is selected or the YAST CA certificate if it is not selected. On upgrades, the check box in eDirectory is not selected, so certificates that were previously used are maintained.


You can create new certificates and modify the `/etc/opt/novell/httpstkd.conf` file to use any certificates other than the default certificate file for any reason. You should create a new certificate in cases such as the following:

- ♦ The default certificate does not meet the level of security required by your organization
- ♦ The default certificate was bound to a DHCP address
- ♦ You have changed the server's IP address
- ♦ You want to bind a new certificate to a different network board

To view the certificates being used:

- 1 Click the *Configure* icon  in the navigation frame.
- 2 Under the Novell Remote Manager Certificate Management heading, click *View Certificate(s)*.

To create a new certificate:


- 1 Click the *Configure* icon  in the navigation frame.
- 2 Under the *Novell Remote Manager Certificate Management* heading, click *Create Certificate*.
- 3 On the *Create a Certificate for Novell Remote Manager* page, specify the required information in the *Certificate Information* fields.

This creates a new certificate and automatically replaces the current certificate at `/etc/opt/novell/httpstkcd/server.pem`.

If you want to create the certificate in a different location or with a different name, change the filename or path in the *Certificate File* field.

- 4 Click *Create*.
- 5 (Conditional) If you changed the name of the certificate file or the path to it from the default location, edit the `/etc/opt/novell/httpstkcd.conf` before restarting HTTPSTKD.
- 6 Restart HTTPSTKD by clicking the *Restart Httpstkcd* button on the Novell Remote Manager Configuration Options page.

To bind Novell Remote Manager to an additional IP address to or to a different certificate:

- 1 Click the *Configure* icon  in the navigation frame.
- 2 Click *Edit Httpstkcd Config File*.
- 3 In the Address and Port portion of the file, specify the new IP address or certificate path and name.

For example, if you had two network boards that you wanted to bind Novell Remote Manager to, you would create or have two separate certificates and then make these entries in the `/etc/opt/novell/httpstkcd.conf` file:

```
addr 192.27.1.123:8008
addr 192.27.1.123:8009 keyfile=/etc/opt/novell/httpstkcd/server.key certfile=/
etc/opt/novell/httpstkcd/server1.pem

addr 192.27.1.124:8008
addr 192.27.1.124:8009 keyfile=/etc/opt/novell/httpstkcd/server.key certfile=/
etc/opt/novell/httpstkcd/server2.pem
```

You can put the certificate in any location as long as the entry in the `/etc/opt/novell/httpstkcd.conf` points to the correct location and filename.

## 7.6 Extending the eDirectory Schema for Novell Remote Manager Group Operations

When you use Group Operations and want to save the groups that you have created, Novell Remote Manager requires you to save the file on the server locally or assign it to an eDirectory object.

Before you can save it to an eDirectory object, you must extend the eDirectory schema to access the attributes for Novell Remote Manager group operations at least once in the eDirectory tree that you are saving to.

You can do this easily by clicking either the *Extend the NDS Schema for NRM* link on the Novell Remote Manager Configuration Options page any time before you create a group or the link in the failure error message displayed when saving the group. As with all schema extensions, you must have the necessary rights to extend the schema.

The message `NDS schema extension complete` is displayed on this page when the operation is done. Then you can save the group.

---

# 8 Diagnosing Problems

Novell Remote Manager for Linux includes several tools to assist you in monitoring the health and status of your server. When you are familiar with the normal health and status of your server, diagnosing problems with your server becomes easier.

Performing the following tasks can help you to become familiar with the health and status of your servers:

- ♦ [Section 8.1, “Monitoring Server Health,” on page 39](#)
- ♦ [Section 8.2, “Troubleshooting a Suspect or Bad Health Status,” on page 42](#)

## 8.1 Monitoring Server Health

Monitoring the health of your server can help prevent it from getting to a state in which your users cannot access the server or the data on it. Monitoring your server’s health involves the following tasks:


- ♦ [Section 8.1.1, “Monitoring Overall Server Health or the Health of a Specific Item,” on page 39](#)
- ♦ [Section 8.1.2, “Configuring the Items to Monitor,” on page 42](#)
- ♦ [Section 8.1.3, “Configuring Email Notification for Server Health Status,” on page 42](#)

### 8.1.1 Monitoring Overall Server Health or the Health of a Specific Item





Using Novell Remote Manager, you can monitor the server’s overall health and the health of a specific item.

- ♦ [“Health Status” on page 39](#)
- ♦ [“Health Status Refresh Rate” on page 41](#)
- ♦ [“Operating System Health” on page 41](#)
- ♦ [“Services Health” on page 42](#)

#### Health Status

The server’s overall health is indicated by the color of the circle displayed next to the *Server* icon  in the header frame for Novell Remote Manager. The following table lists and explains each health status that might be displayed.

**Table 8-1** Server Health Status













Icon	Server Health Status	Explanation
	Good	All parameters included in the server's health configuration list are good.
	Suspect	The status of one or more of the parameters included in the server's health configuration list is suspect or has a minor problem.
	Bad	The status of one or more of the parameters included in the server's health configuration list is bad or has a critical problem.
	Lost connection	The connection to the server from Novell Remote Manager has been lost.

The server's overall health is determined by items that are selected in the *Include* list on the detailed Server Health page as shown in [Figure 8-1](#). By default, all items are selected.













































**Figure 8-1** Server Health Page

**Health Monitor**

Page Refresh Rate:

Operating System							
Status	Description	Current	Peak	Max	Info	Include	Notify
	<a href="#">CPU Utilization</a>	0	0	100		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<a href="#">Process Count</a>	113	123	N/A		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<a href="#">Physical Memory</a>	346 MB	* 346 MB	1,011 MB		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<a href="#">Swap Memory</a>	2,055 MB	* 2,055 MB	2,055 MB		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<a href="#">Virtual Memory</a>	2 MB	* 2 MB	2 MB		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<a href="#">LAN Collisions</a>	0	0	N/A		<input checked="" type="checkbox"/>	<input type="checkbox"/>

\*Low Value

Services					
Status	Description	Mode	Info	Include	Notify
	network	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	novell-tomcat5	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	apache2	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	novell-xregd	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	postfix	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	dhcpcd	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	novell-smdrd	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	syslog	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	smb	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	novell-ipsmd	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	nfsserver	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	portmap	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	novell-idsd	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	smbfs	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	nmb	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	novell-nss	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	sshd	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	tomcat5	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	slpd	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	novell-xsrvd	Running		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	named	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	vsftpd	Stopped		<input checked="" type="checkbox"/>	<input type="checkbox"/>



If the status of any item that is selected in the *Include* list changes to yellow (suspect) or red (bad), the health status indicator light in the header frame changes to indicate there is a problem. If more than one item changes, the worst status indicates the server's overall status. When the status for all items returns to green (good), then the health light indicator changes back to green (good).

## Health Status Refresh Rate

The server's health status, reported by the health status indicator, is updated every five seconds, but the graphic refreshes only if the status changes.

- ♦ To modify the refresh rate, select a rate from the *Page Refresh Rate* drop-down menu, then click *Begin Refresh*. The selected refresh rate applies to this page only, and persists until you modify the value.
- ♦ To stop refreshing the page, select *Stop Refresh*. The page does not refresh until you click *Begin Refresh*.
- ♦ To begin refreshing after stopping, select *Begin Refresh*. The last used refresh rate is applied automatically when it begins.

## Operating System Health

The *Operating System* table on the Server Health page shows the health status (green/good, yellow/suspect, or red/bad) for all known components of the operating system, as well as current, peak, and maximum values. When an item is not selected in the *Include* list, it is not included when determining the overall server health and the values for *Status*, *Current*, *Peak*, and *Max* are not displayed.

The following items in the *Operating System* table are key indicators of your server's health:

- ♦ CPU Utilization (for each processor, if there is more than one)
- ♦ Process Count
- ♦ Available Memory
- ♦ Physical, Swap, and Virtual Memory
- ♦ LAN Collisions



---

**IMPORTANT:** You must click the *Apply Settings* button below the *Operating System* table to apply your changes to values in that table. If you leave the page without applying the changes, the settings return to their saved values.

---

In this release, you cannot change the thresholds for the *Suspect* and *Critical* values of these indicators. See the online help for each parameter to see the set thresholds.

To access the Health Monitoring page, click one of the following links:

- ♦  Overall server health status indicator icon
- ♦  Health Monitor icon in the header frame
- ♦ Diagnose > Health Monitor link in the navigation frame

## Services Health

The *Services* table on the Server Health page also shows the health status of the services installed on the server as well as their online or offline status. When a service is offline, the health status of the service is not included in the server's overall health whether or not it is selected in the *Include* list.

The mode indicates that the server is running or stopped. To change the mode of the service, click the mode link for that service. The mode page opens for the service where you can start, stop, or restart the service by clicking the applicable button.

You can modify the *Include* and *Notify* settings in the *Services* table by selecting and deselecting the check boxes in those columns, then clicking *Apply Settings* below the table.

---

**IMPORTANT:** You must click the *Apply Settings* button below the *Services* table to apply your changes to values in that table. If you leave the page without applying the changes, the settings return to their saved values.

---

### 8.1.2 Configuring the Items to Monitor

As stated in the previous section, the server's overall health is determined by items that are selected in the *Include* list on the detailed Server Health page. By default, all of the items are selected.

Therefore, if you have a server that has specific parameters that you know will cause a suspect or bad status and you want to be notified only when other parameters have changed, you can remove the items with the suspect or bad parameters from the *Include* and *Notify* lists by deselecting them and clicking *Apply Settings*. You need to apply the settings for the Services items separately from the Operating System items.

### 8.1.3 Configuring Email Notification for Server Health Status

Rather than manually checking the status, you can configure Novell Remote Manager to send an email to notify you when the server's health status changes to any value other than green (good).

- 1 Select the *Notify* check box for the item on the Server Health page.
- 2 Specify the required information for email notification in the `/etc/opt/novell/httpstkd.conf` file.

You can edit this file via the link provided on the Configuration Options page.

- 3 After changing the `/etc/opt/novell/httpstkd.conf` file, restart HTTPSTKD.

Click the *Restart HTTPSTKD* button on the Configuration Options page or execute the following command in a console shell on the Linux server:

```
rcnovell-httpstkd restart
```

## 8.2 Troubleshooting a Suspect or Bad Health Status

When the health status of an item changes from good to a suspect or bad state, you can look at the specific item and check the online help for suggested remedies.

- 1 Access the Server Health page.
- 2 Look for the specific health item that has changed status.

- 3 View the information for the item that has changed by clicking the *Info* icon ⓘ for the item.


This information outlines the specific health criteria (thresholds) for green, yellow, or red statuses in that component. It also provides suggestions in some cases for what might be going wrong in that component if a yellow or red indicator is displayed.

- 4 Perform the recommended or appropriate action for the health item that has changed.



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# 9 Viewing File Systems

The *Home* icon  and *View File Systems* section in Novell Remote Manager for Linux include the following links to these pages:

**Table 9-1** *Links for Viewing File System Information*

Link	Page Displayed
<i>Home</i> icon	File System Management
<i>View File System Listing</i>	Directory Listing of / (root) directory
<i>View Partition Information</i>	Partition Information

From these pages you can perform the following tasks:

- ♦ [Section 9.1, “Viewing Mounted Devices and Performing Actions on Them,” on page 46](#)
- ♦ [Section 9.2, “Browsing File Systems and Performing Actions on Them,” on page 47](#)
- ♦ [Section 9.3, “Viewing Partition Information,” on page 51](#)
- ♦ [Section 9.4, “Generating Inventories for Directories or NCP Volumes,” on page 51](#)
- ♦ [Section 9.5, “Generating and Viewing NCP Trustee Reports for NSS Volumes,” on page 58](#)

## 9.1 Viewing Mounted Devices and Performing Actions on Them

The File System Management page is the home page for Novell Remote Manager.

**Figure 9-1** File System Management Page with Information Pages

The screenshot displays the File System Management interface. On the left, three panels provide detailed information for specific file systems, each with a red arrow pointing to its corresponding entry in the main table on the right.

**File System Information (Top Panel):**

File System: /dev/hda2	
Mount Point	/
Type	ext3
Size	31GB
In Use	3.3GB
Free Space	<div><div></div></div> (88%, 26G Free)

**File System Information (Middle Panel):**

File System: AP/.CORE_OS.DEV.NOVELL	
Mount Point	/mnt/users
Type	ncfs
Size	228GB
In Use	71GB
Free Space	<div><div></div></div> (69%, 157G Free)

**SYS Share Information (Bottom Panel):**


Information															
Description	Value														
File system path	/usr/novell/sys														
File system type	EXT3														
NCP volume ID	0														
Status	mounted online														
Local cache	<table border="1"><thead><tr><th>Parameter</th><th>Value</th></tr></thead><tbody><tr><td>trustee count</td><td>2</td></tr><tr><td>cached files</td><td>2</td></tr><tr><td>evicted files</td><td>0</td></tr><tr><td>cached folders</td><td>35</td></tr><tr><td>cache retrieved</td><td>122</td></tr><tr><td>cache retrieved locked</td><td>2</td></tr></tbody></table>	Parameter	Value	trustee count	2	cached files	2	evicted files	0	cached folders	35	cache retrieved	122	cache retrieved locked	2
Parameter	Value														
trustee count	2														
cached files	2														
evicted files	0														
cached folders	35														
cache retrieved	122														
cache retrieved locked	2														

**File System Management (Main Table):**

Mounted Device	Mount Location	
① rootfs	/	(88% free)
/dev/root	/	
proc	/proc	
sysfs	/sys	
devpts	/dev/pts	
tmpfs	/dev/shm	
/dev/dvd	/media/dvd	
/dev/fd0	/media/floppy	
usbfs	/proc/bus/usb	
① AP/.CORE_OS.DEV.NOVELL	/mnt/code	(18% free)
① AP/.CORE_OS.DEV.NOVELL	/mnt/users	(69% free)
① DR/.CORE_OS.DEV.NOVELL	/mnt/data	(63% free)

**NCP Volumes**

① SYS	/usr/novell/sys

You can access this page by clicking the *Home* icon  (*File System*) link in the header frame.

The File System Management page provides a list of the server's mounted devices. The devices that are shown are from the Linux mountable file, which is a list of other file systems mounted on this host's file system.

You can view the percent of free space available on all mounted physical devices or external file systems that have actual disk space. Available disk space on virtual file systems is not shown. For information about how NSS reports space usage for volumes, see "[Guidelines for Sizing Volumes](#)" in the [OES 2 SP3: NSS File System Administration Guide for Linux](#).

To view specific information about each mounted physical device or external file system that has actual disk space, click the *Info* icon ⓘ on the left. Clicking the *Info* icon ⓘ displays one of the following types of pages:

- **File System Information.** This page shows the mount point, the file system type, the size of the mount point and the space in use. Clicking the *Unmount* button on this page, unmounts the remote file system shown. The *Unmount* button is available only on remotely mounted file systems such as NFS, NCP, and Samba.
- **NCP Share Information.** This page shows the volumes underlying file system type, mount point and status, and cache information.

You can browse any of these file systems by clicking the link in the *Mount Location* column. At this point, you can perform any of the tasks listed for browsing the servers file system. See [“Browsing File Systems and Performing Actions on Them” on page 47](#).

## 9.2 Browsing File Systems and Performing Actions on Them

On the Directory List page, you can view the Linux POSIX file system and NSS file system from mount points or local partitions; browse directories and files; view and change attributes, directories, and files; and edit, delete, or rename files.

To access this page, click *View File System > View File System Listing* in the navigation frame.

**Figure 9-2** Directory List Page



The screenshot shows a web interface for a Directory List. At the top, there are navigation links: Upload, Text Search, File Search, and Inventory. Below these is a table titled "Folder Listing:". The table has five columns: Info, Name, Size, Date and time, and Attributes. The rows list various file system directories and files, including ., bin, boot, code, data1, dev, etc, home, lib, media, mnt, opt, proc, and root. Each row includes a folder icon in the Info column, the name in the Name column, the size in the Size column, the date and time in the Date and time column, and the attributes in the Attributes column.

Info	Name	Size	Date and time	Attributes
	.	N/A	Nov 14, 2005, 4:00:26 AM	N/A
	bin	N/A	Aug 29, 2005, 5:03:10 PM	d rwx r.x r.x
	boot	N/A	Aug 29, 2005, 5:09:01 PM	d rwx r.x r.x
	code	N/A	Jan 01, 1986, 12:00:00 AM	d rwx r.x r.x
	data1	N/A	Aug 29, 2005, 4:43:32 PM	d rwx r.x r.x
	dev	N/A	Nov 14, 2005, 11:00:54 AM	d rwx r.x r.x
	etc	N/A	Nov 28, 2005, 3:35:14 PM	d rwx r.x r.x
	home	N/A	Nov 22, 2005, 8:33:25 AM	d rwx r.x r.x
	lib	N/A	Aug 29, 2005, 4:56:27 PM	d rwx r.x r.x
	media	N/A	Jun 30, 2004, 12:43:37 PM	d rwx r.x r.x
	mnt	N/A	Jun 30, 2004, 12:43:37 PM	d rwx r.x r.x
	opt	N/A	Aug 29, 2005, 5:03:56 PM	d rwx r.x r.x
	proc	N/A	Nov 14, 2005, 3:59:45 AM	d r.x r.x r.x
	root	N/A	Nov 28, 2005, 11:01:40 AM	d rwx ... ..

The following table describes the actions necessary to access directories, files, and file and directory attributes from the Directory List page.

**Table 9-2** *Directory List Page Tasks and Procedures*

Tasks	Procedures
Browse to a mount point, volume, directory, or local partition	Click the <i>link_for_the_mount_point</i> , <i>volume</i> , <i>directory</i> , or <i>local partition</i> under the <i>Name</i> column.
Move down the directory tree	Click the <i>directory_name</i> link.
Move up the directory tree	Click the <i>double_dots</i> (..) link.
Re-sort the list by name, size, or date and time.	Click the <i>column heading</i> that has a <i>Sort</i> icon ▼ next to it. The default sort for this listing is by the directory or file name.
View or change the attributes of a directory	Click the <i>Attributes</i> link.

The *Size* column for a directory lists the size of all files and subdirectories in that directory.

Clicking the *Attributes* link opens the Directory Information page where you can view or change the attributes of the directory. For more information, see [“Viewing Details about Directories and Performing Actions on Them” on page 48](#) and [“Viewing the Details of a File and Performing Specific Actions” on page 50](#).

Viewing attributes on NSS volumes, directories, and files conveys the status of the NSS file system directory and file attributes: Hidden (H), Read Only (Ro), Read/Write (Rw), and Execute (X). You can view these settings in Novell Remote Manager for Linux as a combination of Read, Write, and Execute fields for the User, Group, and Other categories. Although it appears that you can control these attributes using the selections on the Directory Information page, the selections do not actually control the conventional POSIX settings for NSS directories and files.

To set directory and file attributes for NSS, use Novell Client or Novell NetStorage. For more information, see [“Viewing Key NSS Directory and File Attributes as Linux POSIX Permissions” in the OES 2 SP3: File Systems Management Guide](#).


From the Directory Listing page, you can perform the following tasks.

- ♦ [Section 9.2.1, “Viewing Details about Directories and Performing Actions on Them,” on page 48](#)
- ♦ [Section 9.2.2, “Uploading a File to the Server,” on page 49](#)
- ♦ [Section 9.2.3, “Downloading a File from the Server to a Local Workstation,” on page 49](#)
- ♦ [Section 9.2.4, “Searching for Text in Files,” on page 50](#)
- ♦ [Section 9.2.5, “Viewing the Details of a File and Performing Specific Actions,” on page 50](#)
- ♦ [Section 9.2.6, “Viewing Individual Files,” on page 51](#)

## 9.2.1 Viewing Details about Directories and Performing Actions on Them

- 1 Click the *View File System > View File System Listing* link in the navigation frame or click a *Mount\_Location\_name* link on the *Home* page.
- 2 On the Directory list page, browse to the directory you want to search in by clicking the *directory\_name* link.



- 3 From the directory listing, click the *Folder Information* icon  to the left of the directory or subdirectory you want to view information about or change the attributes of.
- 4 On the Directory Information page that is displayed, view the information or select/deselect the check box for the attributes that you want to change.
- 5 Click OK.
- 6 When viewing the details of a directory from the Directory Information page, you can also rename the directory, create a subdirectory, create a symbolic link to the selected directory, or delete the directory and its contents by completing the required information and clicking the applicable button.

Delete Directory and Contents	
Rename Directory	<input type="text" value="/home"/>
Create Subdirectory	<input type="text"/>
Create Symbolic Link	<input type="text"/>

## 9.2.2 Uploading a File to the Server

If you have rights to write to the current directory that you are viewing via Novell Remote Manager, you can use the *Upload* link to copy a file from your local machine or any other network directory to the currently selected directory.

You can upload only one file at a time. The file's date and time are changed when performing this task.

To perform this task:

- 1 Click the *View File System > View File System Listing* link in the navigation frame or click a *Mount\_Location\_name* link on the *Home* page.
- 2 On the Directory list page, browse to the directory you want to upload a file to by clicking the *directory\_name* link.
- 3 In the directory listing, click the *Upload* link at the top of the Directory listing page.
- 4 Browse to and select the file that you want to upload.
- 5 Click *Upload*.

## 9.2.3 Downloading a File from the Server to a Local Workstation

When you are browsing the server's file system via Novell Remote Manager, you can download any file to your local machine by clicking the *filename* and then saving the file to your local workstation.

- 1 Click the *View File System > View File System Listing* link in the navigation frame or click a *Mount\_Location\_name* link on the *Home* page.
- 2 On the Directory/File List page, browse to or search for the file that you want to download.
- 3 Click the *filename* link.

- 4 When prompted, save the target file to the desired location.

If the file opens rather than prompting you to save it, you can use the browser features to save the file.

## 9.2.4 Searching for Text in Files

On the Directory Listing page, you can do a GREP-type search (it accepts GREP wildcard characters) through the files in the current directory as well as subdirectories to find text in a file.


- 1 Click the *View File System > View File System Listing* link in the navigation frame or click a *Mount\_Location\_name* link on the *Home* page.
- 2 On the Directory list page, browse to the directory you want to search in by clicking the *directory\_name* link.
- 3 Click the *Text Search* link.
- 4 Specify the content, filename, or extension you want to search for and select whether you want to match the case.
- 5 (Optional) If you want to search all subdirectories as well, select *Search Subdirectories*.
- 6 Click *Search*.

If nothing is found, no files are listed under the search instructions.

If the search instructions are not valid, the page showing the directory you wanted to search is returned.


If the search instructions are valid, the results are displayed on a page with the search instructions.

In the display results, you can

- ♦ Click the filename link to view or download the file.
- ♦ Click the *File Information* icon  to view information about the file; change the attributes to it; or edit (conditional), rename, or delete the file.

If the file is a simple text file or a file with an extension listed in the `/opt/novell/nrm/nrmedit.txt` file, you can also edit the file by clicking the *Edit File* button.

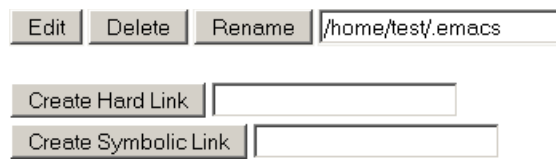
## 9.2.5 Viewing the Details of a File and Performing Specific Actions

- 1 Click the *View File System Listing* link in the navigation frame or click a *Mount Location* name link on the *Home* page.
- 2 On the Directory list page, browse the directories to the file, then click the *File* icon  to the left of the filename.
- 3 On the File Information page that is displayed, view the information or specify the information required for the applicable task, and then click the applicable button for the task you want to perform.

For Attributes management, click the attributes that you want to select/deselect and then click *OK*.

For file management, use the *Edit*, *Delete*, or *Rename* buttons. The *Edit* button is available only on simple text files or files with the extensions listed in the `/opt/novell/nrm/nrmedit.txt` file.

If you want to save the file with an ANSI or UTF-8 encoding, select the appropriate option and click OK.



Edit Delete Rename /home/test/.emacs

Create Hard Link

Create Symbolic Link

## 9.2.6 Viewing Individual Files

If your browser is set up to recognize a certain file extension (for example, .txt), you can browse to and click a file of that type to view it directly in Novell Remote Manager. Otherwise, you can download any file to your local machine by clicking the *filename* and then saving it to a local workstation and opening it there.

## 9.3 Viewing Partition Information

If you need to get information about how a partition is laid out, you can get this information from the Partition Information page. This page shows you the major and minor numbers of the partition, the number of blocks in the partition, and its name.

To view partition information, click *View Partition Information* in the navigation frame.

**Figure 9-3** Example Partition Information Page

Partition Information			
major	minor	#block	name
3	0	39121488	hda
3	1	2096451	hda1
3	2	4096575	hda2
3	3	1	hda3
3	5	1052226	hda5
3	6	31872928	hda6

## 9.4 Generating Inventories for Directories or NCP Volumes

With this feature, you can inventory NCP mounted volumes, or general file system directories or subdirectories as well as view graphs, profiles, reports, and key statistics about each of these items, including space usage trends.

---

**IMPORTANT:** To view the graphical displays in the inventory report, the Sun Java plug-in must be installed on the browser you use to access Novell Remote Manager, and the browser must have Java and Javascript enabled.

---

Generating this report can take a while, depending on the number of files and folders in the specified directory path. There is no facility to view previous inventory scans as there was on NetWare.

With a few clicks, you get available space trend graphs; profiles for file types, file owner, last accessed, last modified, creation time, and file size; and links to specific reports for each of these. You can also customize the scan to look for specific file information.

The *File Owner Profile* gathers the ownership statistics as follows:

- ♦ For OES 2 SP3 plus the latest patches, the file inventory gathers information from the NSS management interface. If the eDirectory user name is available from the NSS management interface, the file owner is reported as the eDirectory user name such as `jsmith`. Otherwise, the owner is reported as the `nobody` user. It is not required to enable the users with Linux User Management (LUM) to get the file owner's name.
- ♦ For OES 2 SP2 and earlier, the file inventory gathers file ownership information from the POSIX ownership field that the file system reports to be the file owner. If an eDirectory user name is LUM-enabled, the NSS and NCP volumes report the real user name to Linux, such as `jsmith`, and the POSIX ownership field reports the actual user. For non-LUM-enabled users, the file system reports the user name as either `root` or `nobody`, depending on the user's permissions when accessing the file system. In order to effectively use the *File Owner Profile* feature to retrieve the eDirectory user name, you must LUM-enable the users.

This section includes the following tasks:

- ♦ [Section 9.4.1, "Generating an File Inventory Report," on page 53](#)
- ♦ [Section 9.4.2, "Generating a Volume Inventory Report," on page 54](#)
- ♦ [Section 9.4.3, "Viewing a Saved NCP Volume Report," on page 55](#)
- ♦ [Section 9.4.4, "Emailing a Saved NCP Volume Report," on page 55](#)
- ♦ [Section 9.4.5, "Generating a Customized Report," on page 56](#)

## 9.4.1 Generating an File Inventory Report

To generate an inventory report for a the entire server or any subdirectory including mounted NCP volumes:

- 1 Click *View File System Listing > Inventory*.

This opens the General File Inventory page. By default the / (root) directory is selected.

### General File Inventory

---

Choose Subdirectory to Inventory:

 / 

Browse Subdirectories:

[.](#)  
[..](#)  
[bin](#)  
[dev](#)  
[etc](#)  
[lib](#)  
[mnt](#)  
[opt](#)  
[srv](#)  
[tmp](#)  
[sys](#)  
[var](#)  
[usr](#)  
[boot](#)  
[code](#)  
[home](#)  
[proc](#)  
[sbin](#)  
[root](#)  
[data1](#)  
[media](#)  
[windows](#)

- 2 From this point you can do the following:

Click the *Start Scan* button to generate an inventory of the entire server (the default selection is the / [root] subdirectory).

or

Select a subdirectory to generate a report from by clicking the *subdirectory\_name* links until the desired subdirectory appears in the *Scan* field, then clicking the *Scan* button.

### General File Inventory

---

Choose Subdirectory to Inventory:

 /etc/xinetd.d

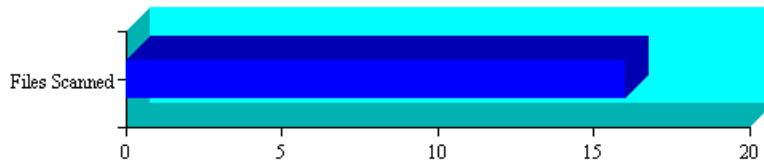
Browse Subdirectories:

[.](#)  
[..](#)

If you are viewing the File System Listing page for the desired directory, you can generate the same reports by clicking the *Inventory* link on this page.

A report similar to the following is generated.

#### General File Inventory



#### Inventory Report for: /home/test

[File type profiles](#)  
[File owner profiles](#)  
[Last modified profiles](#)  
[Last accessed profiles](#)  
[Change time profiles](#)  
[File size profiles](#)  
[Links to specific reports](#)  
[Custom Directory Tree Scan](#)

Key Statistics	Totals
Total Subdirectories:	6
Total Files:	16
Space In Use:	0 MB
File Types:	4
Soft Link Files:	0
Soft Link Subdirectories:	0

#### File type profiles:

[Data Tables:](#)

### File Types (By Bytes In Use)



At this point, you can click any of the links to the left of the *Key Statistics* table to move quickly to the generated information or you can create a custom report. See [“Generating a Customized Report” on page 56](#).

## 9.4.2 Generating a Volume Inventory Report

To quickly generate a inventory report for a mounted NCP volume:

- 1 Click *View File System > NCP Volume Inventory*.

This opens the Volume Inventory page that shows all mounted volumes available for inventory.

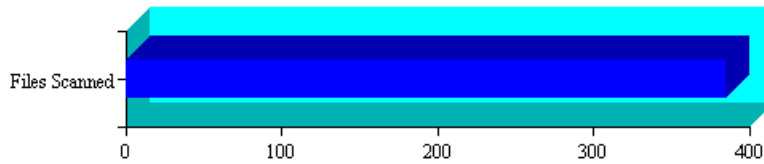
#### Volume Inventory

NCP Volumes available for Inventory	
Volume	Mount Point
<a href="#">SYS</a>	(/usr/novell/sys)
<a href="#">NCPVOL</a>	(/home)

- 2 Click the *volume\_name* link to generate an inventory of the volume selected.

A report similar to the following is generated.

#### Volume Inventory



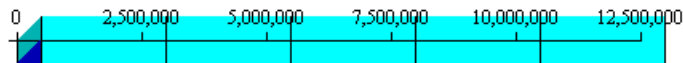
Inventory Report for: /usr/novell/sys

[File type profiles](#)  
[File owner profiles](#)  
[Last modified profiles](#)  
[Last accessed profiles](#)  
[Change time profiles](#)  
[File size profiles](#)  
[Links to specific reports](#)  
[Custom Directory Tree Scan](#)

Key Statistics	Totals
Total Subdirectories:	35
Total Files:	385
Space In Use:	21 MB
File Types:	12
Soft Link Files:	0
Soft Link Subdirectories:	0

[File type profiles:](#)  
[Data Tables:](#)

#### File Types (By Bytes In Use)



At this point, you can click any of the links to the left of the *Key Statistics* table to move quickly to the generated information or you can create a custom report. See [“Generating a Customized Report” on page 56](#).

### 9.4.3 Viewing a Saved NCP Volume Report

An inventory report is saved when you run an inventory on an NCP volume. You can view the last saved report by going to the *Manage NCP Services > Volume Inventory Reports* page and clicking the *View Last Report > Display* option for the volume. The saved report provides the same statistics as running *View File Systems > NCP Volumes Inventory*. Graphics are not available in a saved report.

### 9.4.4 Emailing a Saved NCP Volume Report

You can email a saved NCP volume inventory report to addresses that are configured in the `/etc/opt/novell/httpstkd.conf` file. To send the report, go to the *Manage NCP Services > Volume Inventory Reports* page and click the *Email Report > Send* option for the volume.

## 9.4.5 Generating a Customized Report

After generating an inventory report for a volume or directory, you can create a customized scan to report more specific information and perform additional actions on the files such as move, copy, or delete files selected in the report.

- 1 Create the initial report as specified in [“Generating an File Inventory Report” on page 53](#) or
- 2 In the generated report, click the *Custom Directory Tree Scan* link.

A page similar to the following is returned.

### Custom Directory Tree Scan

Search Pattern:

File Owner Restriction:

#### Time Stamp Restrictions:

##### Time Stamp:

- ☐ Last Modified Time
- ☐ Last Accessed Time
- ☐ Last Changed Time

##### Range:

- ☐ Within Last Day
- ☐ 1 Day - 1 Week
- ☐ 1 Week - 2 Weeks
- ☐ 2 Weeks - 1 Month
- ☐ 1 Month - 2 Months
- ☐ 2 Months - 4 Months
- ☐ 4 Months - 6 Months
- ☐ 6 Months - 1 Year
- ☐ 1 Year - 2 Years
- ☐ More than 2 Years

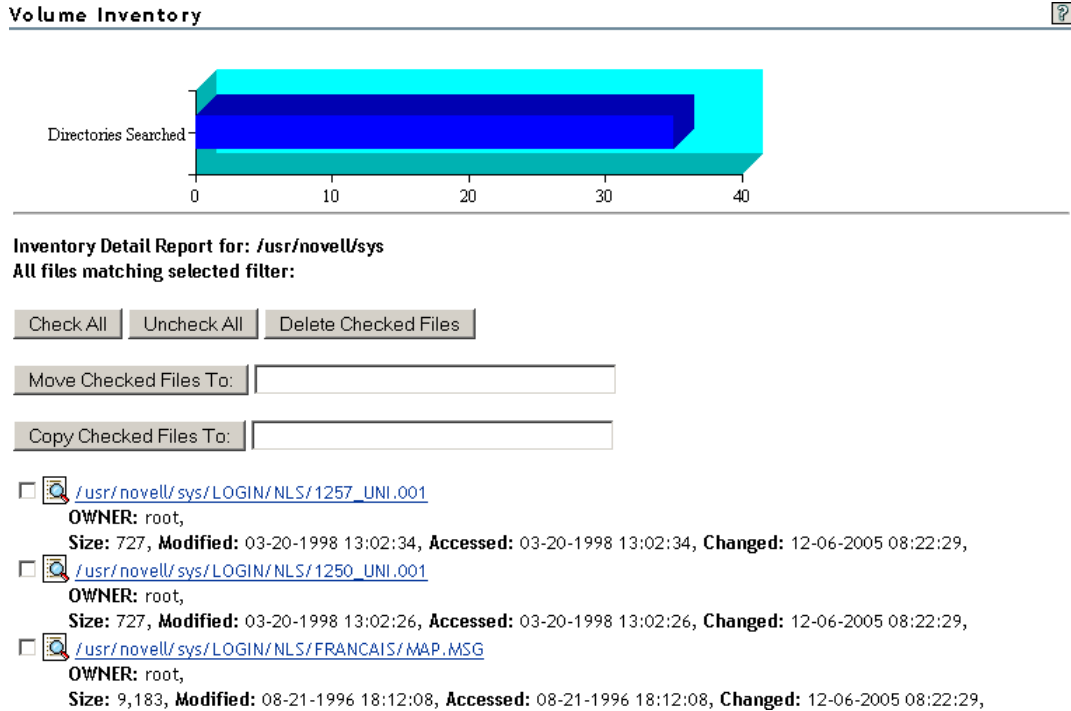
#### File Size Restriction:

- ☐ Less than 1KB
- ☐ 1 KB - 4 KB
- ☐ 4 KB - 16 KB
- ☐ 16 KB - 64 KB
- ☐ 64 KB - 256 KB
- ☐ 256 KB - 1 MB
- ☐ 1 MB - 4 MB
- ☐ 4 MB - 16 MB
- ☐ 16 MB - 64 MB
- ☐ 64 MB - 256 MB
- ☐ More than 256 MB

- 3 Type the specific search criteria in the *Search Pattern* field.  
\*.\*/ is the default entry.
- 4 Select the desired settings in the *File Owner Restriction* drop-down box.  
*None* is the default selection.
- 5 Select the check boxes desired to customize the report by *Time Stamp* or *File Size* restrictions.  
No restrictions is the default setting.
- 6 Click *Start Scan*.



A page similar to the following is returned.



## Performing Actions on Files from Custom Reports

After a custom report is generated, you can perform the following actions on the files listed in the report.

- ♦ [“Moving Selected Files” on page 57](#)
- ♦ [“Copying Selected Files” on page 57](#)
- ♦ [“Deleting Selected Files” on page 58](#)
- ♦ [“Opening or Downloading a File” on page 58](#)
- ♦ [“Managing Individual Files” on page 58](#)

### Moving Selected Files

- 1 From the generated report, select the check box to the left of each file that you want to move. If you want to move all the files in the list, click the *Check All* button.
- 2 Specify the path where you want to move the selected files to in the field to the right of the *Move Checked File To* button.
- 3 Click the *Move Checked File To* button.

### Copying Selected Files

- 1 From the generated report, select the check box to the left of each file that you want to copy. If you want to copy all the files in the list, click the *Check All* button.
- 2 Specify the path where you want to copy the selected files to in the field to the right of the *Copy Checked File To* button.
- 3 Click the *Copy Checked File To* button.


## Deleting Selected Files

- 1 From the generated report, select the check box to the left of each file that you want to delete. If you want to delete all the files in the list, click the *Check All* button.
- 2 Click the *Delete Checked Files* button.

## Opening or Downloading a File

- 1 From the generated report, select the *filename* link for the file you want to open or download.
- 2 From the resulting dialog box, select *Open With* or *Save to Disk*, then click *OK*.

## Managing Individual Files

- 1 From the generated report, click the *File Information*  icon.
- 2 Perform the desired actions by entering the required information in the applicable field and clicking the applicable button.

Edit	Delete	Rename	<input type="text" value="/home/test/.emacs"/>
Create Hard Link	<input type="text"/>		
Create Symbolic Link	<input type="text"/>		

## 9.5 Generating and Viewing NCP Trustee Reports for NSS Volumes

Under *Manage NCP Services*, the new *NCP Trustee Report* option allows you to generate a trustee report for a specified NSS volume. This includes Dynamic Storage Technology shadow volumes that are comprised of two NSS volumes. You can display the last trustee report in the Web browser, or send the report to the e-mail addresses that you have pre-configured for Novell Remote Manager. A trustee report shows the rights settings by folder for each user or group that is a trustee on the NSS volume.

- ♦ [Section 9.5.1, “Generating an NCP Trustee Report,” on page 58](#)
- ♦ [Section 9.5.2, “Viewing a Saved NCP Trustee Report,” on page 59](#)
- ♦ [Section 9.5.3, “Emailing a Saved NCP Trustee Report,” on page 59](#)

### 9.5.1 Generating an NCP Trustee Report

- 1 Log in to Novell Remote Manager as the root user.
- 2 In the left navigation panel, select *Manage NCP Services* > *NCP Trustee Report*.

NCP Trustee Reports 			
Volume	View Last Report	Generate Report	Email Report
V3	<a href="#">Display</a>	<a href="#">Create</a>	<a href="#">Send</a>
V2	<a href="#">Display</a>	<a href="#">Create</a>	<a href="#">Send</a>
V1	<a href="#">Display</a>	<a href="#">Create</a>	<a href="#">Send</a>

- 3 On the NCP Trustee Reports page, locate the NSS volume in the list, then click its *Create* link in the *Generate Report* column.
- 4 View the NCP Trustee Report.

A volume's trustee report shows the rights settings by folder for each user or group that is a trustee on the NSS volume. For example, the following trustee report shows the rights for a folder in a Dynamic Storage Technology shadow volume.

#### Shadow Volume Trustee Report



Primary Volume Tree: /media/nss/V1

Shadow Volume Tree: /media/nss/V1SHADOW

Report generated on Fri Mar 16 18:28:14 2012

[/media/nss/V1/folderjim](#)

Rights: \_RWCEMFA    User / Group .CN=nonlumuser2.O=novell.T=TULIP.

Elapsed Time(seconds): 14

## 9.5.2 Viewing a Saved NCP Trustee Report

You can view the last saved trustee report for an NSS volume. The saved report provides the same trustee rights information that was available when the report was created.

- 1 Log in to Novell Remote Manager as the `root` user.
- 2 In the left navigation panel, select *Manage NCP Services* > *NCP Trustee Report*.
- 3 Locate the NSS volume of interest in the list, then click its *Display* link in the *View Last Report* column.

## 9.5.3 Emailing a Saved NCP Trustee Report

You can email an NCP volume's trustee report to addresses that are configured in the `/etc/opt/novell/httpstkd.conf` file. For information about setting up email addresses for Novell Remote Manager, see [Section A.3, "Email Notification Commands,"](#) on page 106.

- 1 Log in to Novell Remote Manager as the `root` user.
- 2 In the left navigation panel, select *Manage NCP Services* > *NCP Trustee Report*.
- 3 Locate the NSS volume of interest in the list, then click its *Send* link in the *Email Report* column.



---

# 10 Managing Linux

The Manage Linux section in Novell Remote Manager (NRM) for Linux includes the following links to these pages from which you can perform the following tasks:

**Table 10-1** *Manage Linux Section Tasks, Links, and Pages*

Task	Link	Page Displayed	For More Info, See
Access VNC Console screens	<i>VNC Consoles</i>	VNC Consoles Screens	<a href="#">“Accessing VNC Consoles” on page 61</a>
View Kernel Modules Information	<i>View Kernel Modules</i>	Kernel Module Listing	<a href="#">“Viewing Kernel Modules” on page 63</a>
View Memory Information and turn swapping on and off.	<i>View Memory Information</i>	View Memory Config	<a href="#">“Viewing Memory Information” on page 64</a>
Shut down and restart the host	<i>Down/Restart</i>	Down/Reset Options	<a href="#">“Shutting Down and Restarting the Host” on page 65</a>
Manage packages	<i>View Package Information</i>	Package Information	<a href="#">“Managing Packages” on page 66</a>
Manage processes	<i>View Process Information</i>	Process Information	<a href="#">“Managing Processes” on page 68</a>
Schedule cron jobs to run	Schedule Task	Schedule Task	<a href="#">“Scheduling cron Jobs to Run on the Server” on page 69</a>

## 10.1 Accessing VNC Consoles

If VNC services are configured on the server, you can access the VNC consoles screens by clicking the *VNC Consoles* link under the *Manage Linux* heading in the navigation frame. Then click the 1024 X 728 button on the VNC Console Screens page.

---

**IMPORTANT:** The accessibility to the VNC consoles via Novell Remote Manager for Linux is limited to user root; it is not available to user Admin.

You must disable the HttpOnly setting in the `/etc/opt/novell/httpstkd.conf` file in order to enable the VNC console display.

---

If VNC services are not configured, you can configure them as follows:

- 1 In YaST2, log in as the `root` user, then click *Network Services > Remote Administration*.
- 2 On the Remote Administration page, select the following options:
  - ♦ *Allow Remote Administration*
  - ♦ *Open Port in Firewall*
- 3 Click *Finish*.
- 4 Restart the display manager by entering the following command at the command line:  

```
rcxdm restart
```

This form of remote administration is less secure than SSH; therefore, we recommend using this feature only in a secure environment (behind a firewall).

Clicking the *VNC Consoles* link opens a Java applet in a secondary browser window. The following table explains what you can do from this window.

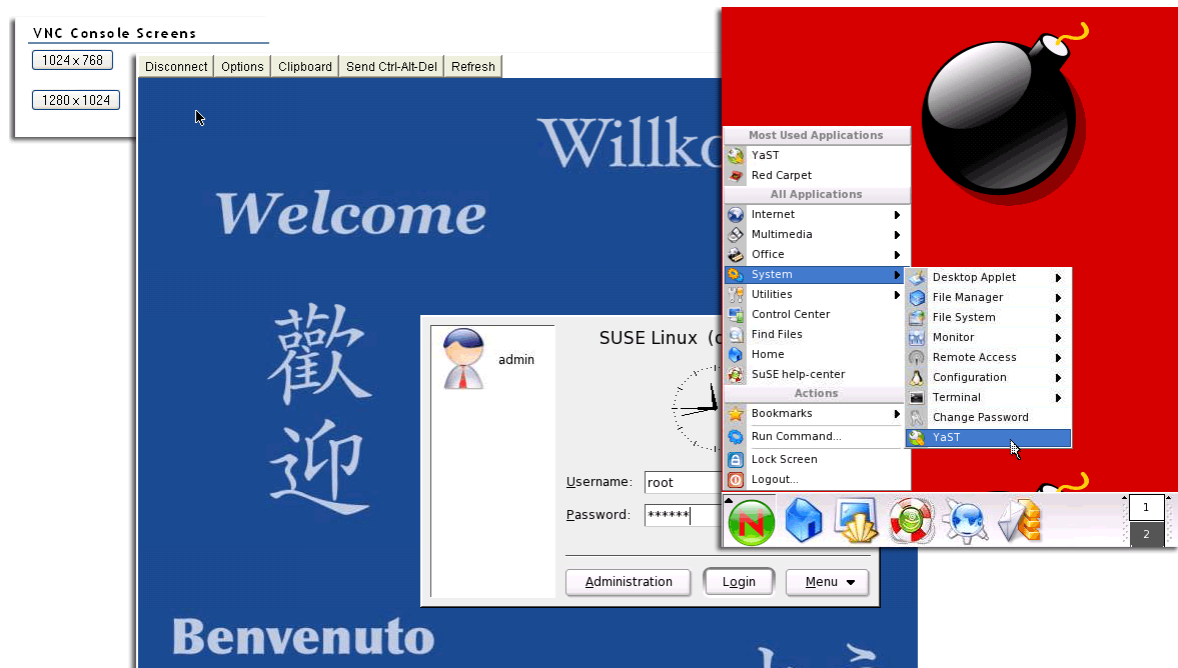
**Table 10-2** VNC Console Page Tasks and Procedures

Task	Procedure
Use any of the screens listed as though you were at the server console.	Use the keyboard or mouse as though you were at the server console.
Disconnect from the console.	Click the <i>Disconnect</i> button on this page.
Change any of the VNC client options currently selected.	Click the <i>Options</i> button.
Access the VNC client clipboard and cut or paste any commands that you might want to execute in a active terminal shell.	Click the <i>Clipboard</i> button.
Restart the server.	Click the <i>Send Ctrl+Alt+Del</i> button.
Refresh the current screen you are viewing.	Click the <i>Refresh</i> button.

Figure 10-1 illustrates a user accessing YaST on a remote server from the user's desktop browser. To access YaST on the remote server, the user did the following:

- 1 Clicked the *VNC Consoles* link in the navigation frame.
- 2 Clicked the *1024 X 728* button on the VNC Consoles Screens page.
- 3 Logged into Linux.
- 4 Clicked *N > System > YaST*.

**Figure 10-1** Example Access of YaST through NRM VNC Console Screens Linux on a KDE Desktop.



## 10.2 Viewing Kernel Modules

Clicking the *View Kernel Modules* link in the navigation frame displays the Kernel Module Listing page. On this page you can view the status of the modules that have been compiled into the Linux kernel on this system. Printing this page can be useful to document your system as you make changes or upgrades to it in the future.

The information shown on this page is equivalent to the information in the `lsmod` shell command plus the Live information or equivalent to viewing the `proc/modules` file.

**Figure 10-2** Example Kernel Module Listing Page

Kernel Module Listing					?
Kernel Module Information					
Name	Memory	Use Count	Module Users/Configuration Info	Live	
ncpfs	57760	1		0xfad76000	
edd	9368	0		0xfacc5000	
joydev	10304	0		0xfacc1000	
sg	35744	0		0xfad5b000	
st	39452	0		0xfad50000	
sr_mod	16292	0		0xfacbc000	
ide_cd	36740	0		0xfad46000	
cdrom	37148	2	sr_mod ide_cd	0xfad3b000	
nvrnm	8456	0		0xfac84000	
snd_seq_oss	31360	0		0xfac6e000	
snd_seq_midi_event	7680	1	snd_seq_oss	0xfac6a000	
snd_seq	55312	4	snd_seq_oss snd_seq_midi_event	0xfacdf000	

## 10.3 Viewing Memory Information

Clicking the *View Memory Information* link in the navigation frame displays the View Memory Config page. On this page you can view the following information about the memory in the server. The amount values are shown in bytes.

- ♦ Used and unused amounts of physical memory
- ♦ Amount of memory in buffer cache
- ♦ Amount of memory used by the file system cache  
This value is determined by subtracting the SwapCache from the PageCache (disk cache) amounts.
- ♦ Amount of total memory that can be used by the system.  
This value is determined by subtracting the physical RAM from the kernel binary code.
- ♦ Amount of swap space in use and available.
- ♦ The *Total Swap File Size* link goes to a Swap File Information page that provides a very quick snapshot of every swap filename, type of swap space, and total and used sizes (in kilobytes) on the server including the following information:
  - ♦ The Priority column is useful when multiple swap files are in use and some of them are preferred over others, such as if they are on faster hard disks. The lower the priority, the more likely the swap file will be used.
  - ♦ The Active column shows a *Yes* or *No* status, indicating whether the Swap file is active or not. Clicking the link toggles swapping on or off for the listed device.

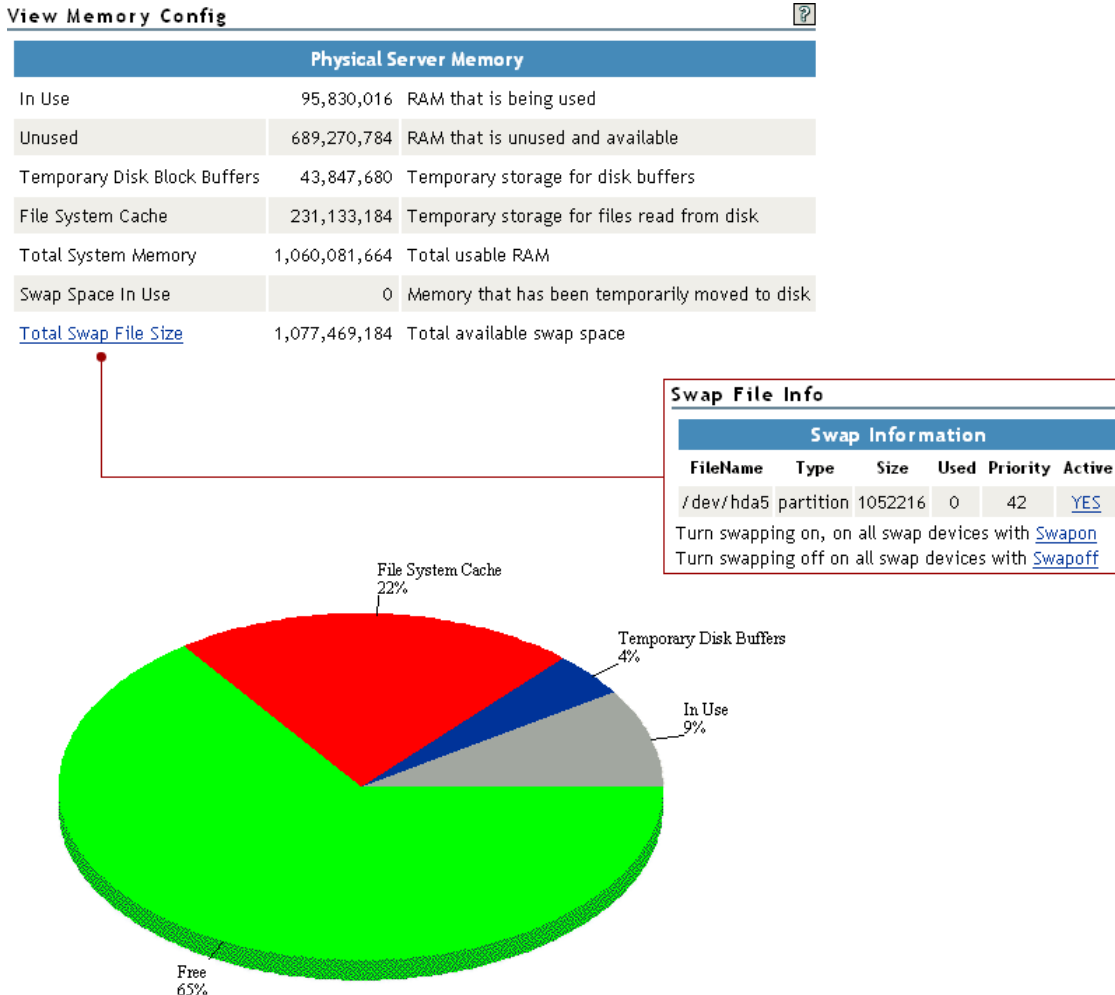


- ♦ Two additional links turn swapping on or off for all devices.

If you add a swap file to a device, you need to add an entry to the `/etc/fstab` file to make the `swapon` or `swapoff` links work correctly.

This information is also in the `/proc/swaps` file.

**Figure 10-3** Example View Memory Config Page



## 10.4 Shutting Down and Restarting the Host

Clicking the *Down/Restart* link in the navigation frame displays the Down/Reset Options page. You can use these options to shut down or reset the host.

The following table describes the specific actions of each option.

**Table 10-3** Down/Reset Options Page Options and Actions

Option	Action
Down	Forces the host to shut down immediately.
Reset	Forces the host to shut down immediately, then warm boots the computer.

Using either of the options additionally forces the host to perform the following actions:

- ◆ Update the cache buffers to disks
- ◆ Close all open files

**WARNING:** If files are open and changes have not been saved to the host, some data loss might occur. Users might need to save changes locally until the host is started again.


- ◆ Update the appropriate file system tables
- ◆ Exit the host from the network
- ◆ Unmount all file systems

# 10.5 Managing Packages

Clicking the *View Package Information* link displays the Packing Information page. On this page you can view the following information about each package that is installed on the system:

- ◆ *Name*
- ◆ *Group*
- ◆ *Version*
- ◆ *Release*
- ◆ *Vendor*

Figure 10-4 Example Package Information Page

Package Information 

Package Information		Install	Search (case sensitive)		
Name	Group	Version	Release	Vendor	
<a href="#">3ddiag</a>	System/Base	0.716	116.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">aaa_base</a>	System/Fhs	9	29.20	SuSE Linux AG, Nuernberg, Germany	
<a href="#">aaa_base_novell</a>	System/Fhs	0.0.1	3	(none)	
<a href="#">aaa_skel</a>	System/Fhs	2004.6.8	0.2	SuSE Linux AG, Nuernberg, Germany	
<a href="#">aalib</a>	System/Libraries	1.4.0	279.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">acl</a>	System/Filesystems	2.2.21	54.4	SuSE Linux AG, Nuernberg, Germany	
<a href="#">acroread</a>	Productivity/Publishing/PDF	5.010	4.2	SuSE Linux AG, Nuernberg, Germany	
<a href="#">alsa</a>	System/Libraries	1.0.3	41.3	SuSE Linux AG, Nuernberg, Germany	
<a href="#">apache2</a>	Productivity/Networking/Web/Servers	2.0.49	27.21	SuSE Linux AG, Nuernberg, Germany	
<a href="#">apache2-jakarta-tomcat-connectors</a>	Productivity/Networking/Web/Frontends	5.0.19	29.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">apache2-worker</a>	Productivity/Networking/Web/Servers	2.0.49	27.21	SuSE Linux AG, Nuernberg, Germany	
<a href="#">arts</a>	Productivity/Multimedia/Sound/Players	1.2.1	35.4	SuSE Linux AG, Nuernberg, Germany	
<a href="#">ash</a>	System/Shells	0.4.18	56.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">at</a>	System/Daemons	3.1.8	898.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">atk</a>	System/Libraries	1.4.1	128.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">attr</a>	System/Filesystems	2.4.16	1.2	SuSE Linux AG, Nuernberg, Germany	
<a href="#">audiofile</a>	System/Libraries	0.2.5	37.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">autofs</a>	System/Daemons	3.1.7	900.1	SuSE Linux AG, Nuernberg, Germany	
<a href="#">autovast2</a>	System/YaST	2.9.52	0.2	SuSE Linux AG, Nuernberg, Germany	

On the View Package Information page and subsequent pages, you can perform these tasks using the following procedures:

**Table 10-4** View Package Information Page Tasks and Procedures

Tasks	Procedures
Sort the listed packages by name, group, or vendor	Click the <i>Sort</i> icon ▼ at the top of the applicable column.  The default sort is by name.
View more detailed information about an installed package	Click the link for the applicable package under the <i>Name</i> column.
Remove an installed package	<ol style="list-style-type: none"> <li>1. Click the <i>link for the package</i> under the <i>Name</i> column.</li> <li>2. Click <i>Remove</i>.</li> </ol>
Install a new package that you have downloaded to the host	<ol style="list-style-type: none"> <li>1. Click <i>Install</i>.</li> <li>2. Browse to the location where you uploaded the package to. The browse starts at the root of the host.</li> <li>3. Click <i>Install</i>.</li> </ol> <p>The selected package's file path is transferred to the <i>RPM File Path</i> field on the Package Installation page.</p> <p>When the <i>Install</i> button is clicked on the View Package Information page, Novell Remote Manager attempts to install the specified RPM file using the Linux RPM utility.</p>

The following figure shows a sample of the details you see when you click the *package\_name* link.

**Figure 10-5** Detailed Information Page for the 3ddiag Example Package

### 3ddiag

```

Name      : 3ddiag                Relocations: (not relocatable)
Version   : 0.716                Vendor: SuSE Linux AG, Nuernberg, Germany
Release   : 116.1               Build Date: Thu Jul 1 06:46:41 2004
Install date: Wed Jan 26 08:59:05 2005   Build Host: millikan.suse.de
Group     : System/Base          Source RPM: 3ddiag-0.716-116.1.src.rpm
Size      : 47076                License: GPL
Signature : DSA/SHA1, Thu Jul 1 06:47:54 2004, Key ID a84edae89c800aca
Packager  : http://www.suse.de/feedback
Summary   : A Tool to Verify the 3D Configuration
Description :
With 3Ddiag you can verify the 3D configuration.
```

Authors:

-----

Stefan Dirsch  
Distribution: SuSE SLES-9 (i586)

Remove

## 10.6 Managing Processes

Clicking the *View Process Information* link in the navigation frame displays the Process Information page. On this page, you can view a list of all the processes as well as their state in the host and perform the actions listed in the following table.

**Table 10-5** *Process Information Page Tasks and Procedures*

Tasks	Procedures
Sort the process by name (in alphabetical order by default), by process ID, by CPU Usage, or by Memory Usage	Click the <i>Sort</i> icon ▼ at the top of the applicable column.
View more specific information about a listed process	Click the <i>link for the</i> applicable process under the <i>Name</i> column.
Kill a process	<ol style="list-style-type: none"><li>1. Click the link for the applicable process under the <i>Name</i> column.</li><li>2. Click <i>Kill</i>.</li></ol>

The process information is obtained from the `stat` file that is available for each process ID in the `/proc` directory. Process information can also be retrieved at the command line by using the Linux `top` command.

[Table 10-6 on page 68](#) describes the parameters reported for each process.

**Table 10-6** *Process Information*

Parameter	Description
Name	The process name.
Owner	The process owner; the user who started the process.
ID (Status)	The process ID of the task, and the current state of the task. The states are Sleep (S), Running (R), Traced (T), or Zombied (Z). These states are modified by a trailing < for a process with a negative nice value, N for a process with positive nice value, and W for a swapped-out process (this does not work correctly for kernel processes).
CPU Usage %	The task's share of the CPU time since the last screen update, expressed as a percentage of total CPU time per processor.
Priority	The priority of the task.
Run Time	The total CPU time the task has used since it started.
Physical Memory	The physical memory value is the amount of physical memory in bytes that the task is using. The value in parentheses (%) is the percentage of RAM memory that this represents. The Linux <code>top</code> command reports this information in kilobytes.
Virtual Memory	The virtual memory is the amount of memory in bytes that the task is using to hold the code, data, and stack space memory. The Linux <code>top</code> command reports this information in kilobytes. Virtual Memory is the value reported by the <code>RSS</code> switch for the <code>top</code> command.

Figure 10-6 Example Process Information Page

Process Information							
<div>Stop Refresh</div>							
Process Information							
Name	Owner	ID (Status)	CPU Usage %	Priority	Run Time	Physical Memory (%)	Virtual Memory
<a href="#">aio/0</a>	root	10 (Sleep)	0.0%	9	0:00.00	0 (0.0%)	0
<a href="#">cron</a>	root	4429 (Sleep)	0.0%	16	0:00.00	708608 (0.0%)	1617920
<a href="#">events/0</a>	root	3 (Sleep)	0.0%	5	0:00.11	0 (0.0%)	0
<a href="#">httpstkd</a>	root	2612 (Sleep)	0.0%	16	0:10.87	6807552 (0.0%)	135266304
<a href="#">hwscand</a>	root	3140 (Sleep)	0.0%	15	0:00.00	430080 (0.0%)	1441792
<a href="#">init</a>	root	1 (Sleep)	0.0%	16	0:05.01	249856 (0.0%)	602112
<a href="#">kacpid</a>	root	4 (Sleep)	0.0%	13	0:00.00	0 (0.0%)	0
<a href="#">kblockd/0</a>	root	5 (Sleep)	0.0%	5	0:00.00	0 (0.0%)	0
<a href="#">khelper</a>	root	6 (Sleep)	0.0%	5	0:00.00	0 (0.0%)	0
<a href="#">khubd</a>	root	2290 (Sleep)	0.0%	15	0:00.00	0 (0.0%)	0
<a href="#">klogd</a>	root	2541 (Sleep)	0.0%	16	0:00.00	606208 (0.0%)	1544192
<a href="#">kseriod</a>	root	678 (Sleep)	0.0%	25	0:00.00	0 (0.0%)	0
<a href="#">ksoftirqd/0</a>	root	2 (Sleep)	0.0%	34	0:00.00	0 (0.0%)	0
<a href="#">kswapd0</a>	root	9 (Sleep)	0.0%	25	0:00.00	0 (0.0%)	0
<a href="#">master</a>	root	4264 (Sleep)	0.0%	17	0:00.00	1478656 (0.0%)	4276224

## 10.7 Scheduling cron Jobs to Run on the Server

Rather than entering commands on the command line to run a cron job at a specific time, you can use a form on the Schedule Task page to schedule cron jobs—that is, to execute commands or scripts (groups of commands) automatically at a specified time/date—that you want to run at this server. Any cron job is valid.

Scheduling a task creates a cron job and stores it in the `/etc/cron.d` directory. The command is specified to run with the name of whatever user name you are logged in with when you add the command. The user name must have the necessary permissions to perform the command you add.

---

**IMPORTANT:** When you set up cron commands, ensure that you log into Novell Remote Manager as the root user, or with a user name that has the necessary permissions to execute the command.

---

If no mail service is configured, you might find the output of your commands in the local mailbox directory as a plain text file. By default, this is `/var/spool/mail/root`.

**Figure 10-7** Schedule Task Page for Scheduling Cron Jobs

Schedule Task

Currently Scheduled CRON Jobs:

Create a new scheduled command:

(REQUIRED) Description:

Command to Execute:

Start Time:

00 : 02

Start Day:

Thursday (for weekly commands)

September 20 (for one time or monthly commands)

To schedule this timed command, click Submit

To reset the form, click Reset

To create a new scheduled command:

- 1 Complete the required information on the Schedule Task page.

Field	Information to Provide
<i>Description</i>	<p>Enter a brief description of the command you want to run.</p> <p>64 character limit</p> <p>Example:</p> <p>Send message to log out daily at 10 p.m.</p> <p>This description is displayed as the name of the scheduled job in the <i>Currently Scheduled CRON Jobs</i> list.</p>
<i>Command to Execute</i>	<p>Type the command exactly as you would at a command line.</p> <p>All cron job entry types are valid except for lists and step values.</p>
<i>Start Time</i>	Type the time you want the command to run.
<i>Start Day</i>	<p>If you want to run the command once a week, specify the day of the week, then place an asterisk * in the <i>Month</i> and <i>Day</i> fields.</p> <p>If you want to run the command only once or monthly, specify a <i>Month</i> and <i>Day</i> setting, then place an asterisk * in the <i>Day of the Week</i> field.</p> <p>If you want to run the command monthly, specify a <i>Day</i> setting, then place an asterisk * in the <i>Start Day</i> and <i>Month</i> fields.</p> <p>If you do not want to specify a value for a field, place an asterisk * in the field.</p>

- 2 Click *Submit*.

After you schedule a job, it is displayed at the top of the page under the *Currently Scheduled CRON Jobs* heading. Jobs that you create manually also display in the list.

To change the schedule of a job that you have already scheduled:

- 1 Click the link for the job you want to change.
- 2 Change the schedule.
- 3 Click *Submit*.

To delete the schedule of a job that you have already scheduled:

- 1 Click the link for the job you want to delete.
- 2 Click *Delete*.

To return the settings in the fields to the default settings of the current day and time, click *Reset*.





# 11 Managing Hardware

The *Manage Hardware* section in Novell Remote Manager (NRM) for Linux includes the following links to pages from which you can perform the following tasks:

**Table 11-1** *Manage Hardware Section Tasks, Links, and Pages*

Task	Link	Page Displayed	For More Info, See
View Processor information	<i>View Processors</i>	Processor Information	<a href="#">“Viewing Processors” on page 73</a>
View Interrupt information	<i>Interrupt Information</i>	Interrupts	<a href="#">“Viewing Interrupt Information” on page 74</a>
View memory I/O information	<i>IO Memory Information</i>	I/O Memory Information	<a href="#">“Viewing I/O Memory Information” on page 75</a>
View port I/O information	<i>IO Port Information</i>	IO Port Information	<a href="#">“Viewing I/O Port Information” on page 76</a>
View SMBIOS information	<i>SMBIOS Information</i>	SMBIOS Information	<a href="#">“Viewing SMBIOS Information” on page 77</a>

## 11.1 Viewing Processors

Clicking the *View Processors* link under the *Manage Hardware* heading in the navigation frame displays the Processor Information page. On this page you can view information about each processor on this host.

Information about the processor speed as well as the local cache sizes is useful in determining how much work a processor can do.

This information is equivalent to the information you would see in the `/proc/cpuinfo` file.

**Figure 11-1** Example Processor Information Page

Processor Information		?
processor : 0		
vendor_id	GenuineIntel	
cpu family	15	
model	3	
model name	Intel(R)	
Pentium(R)	134555524	
4 CPU 3.00GHz		
stepping	3.000000.3	
cpu MHz	2993 .171	
flags	fpu vme de pse tsc msr pae mce cx8 sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe pn1 monitor ds	

In a virtualized environment, the processor information is reported from the perspective of the server where you connected.

- ♦ **Host Server:** When you connect to Novell Remote Manager by using the host server IP address, the report contains information about all processors on the system.
- ♦ **Guest Server:** When you connect to Novell Remote Manager by using the guest server IP address, the report contains information about the physical hardware in use, but only for the number of processors you assign to the virtual machine.

The guest server reports the same information about a processor as if it owned the actual hardware on the server. The Virtual Machine Monitor component of the virtualization software emulates a complete hardware environment in the virtual machine for the guest server. The guest server OS is unaware that it shares the hardware resources with other virtual machines and the host.

The actual usage statistics of the physical processors are not known by Novell Remote Manager. You could use the Virtual Machine Manager to see that type of information.

## 11.2 Viewing Interrupt Information

Clicking the *Interrupt Information* link under the *Manage Hardware* heading in the navigation frame displays the Interrupts page, which includes the following:

**Table 11-2** Interrupts Page

Category	Information Displayed
Interrupt	Interrupt number or name of an interrupt that might be generated.
CPU number	Number of interrupts that have occurred on a given processor.
Route-Trigger Method	How the interrupt is being delivered to the processor and the method of interrupting the processor.
Device	Name of the device driver that is generating the interrupt.

Figure 11-2 Example Interrupt Information Page

Interrupts

Interrupt Information			
Interrupt	CPU0	Route-Trigger Method	Device
0:	4,084,188	XT-PIC	timer
1:	1,132	XT-PIC	i8042
2:	0	XT-PIC	cascade
5:	0	XT-PIC	ehci_hcd
8:	2	XT-PIC	rtc
9:	93,026	XT-PIC	acpi, libata, eth0, uhci_hcd
10:	0	XT-PIC	uhci_hcd, Intel ICH5
11:	0	XT-PIC	uhci_hcd, uhci_hcd
12:	4,630	XT-PIC	i8042
14:	16,200	XT-PIC	ide0
15:	77	XT-PIC	ide1
NMI:	0		
LOC:	0		
ERR:	0		
MIS:	0		

### 11.3 Viewing I/O Memory Information

Clicking the *IO Memory Information* link under the *Manage Hardware* heading in the navigation frame displays the I/O Memory Information page, which includes the following:

Table 11-3 I/O Memory Information Page

Category	Information Displayed
Memory Address	I/O memory range that a given device is using.
Device Description	A description of the device that is using a given I/O memory range.

**Figure 11-3** Example I/O Memory Information Page

I/O Memory Information	
Memory Address	Device Description
00000000-0009ffff	System RAM
000a0000-000bffff	Video RAM area
000d1000-000d3fff	Extension ROM
000f0000-000fffff	System ROM
00100000-3ff73fff	System RAM
00100000-002ffe16	Kernel code
002ffe17-003afdff	Kernel data
3ff74000-3ff75fff	ACPI Non-volatile Storage
3ff76000-3ff96fff	ACPI Tables
3ff97000-3fffffff	reserved
e8000000-efffffff	0000:00:00.0
f0000000-f7ffffff	PCI Bus #01
f0000000-f7ffffff	0000:01:00.0
f0000000-f1ffffff	vesafb
fcfe0000-fcffffff	0000:02:0c.0

## 11.4 Viewing I/O Port Information

Clicking the *IO Port Information* link under the *Manage Hardware* heading in the navigation frame displays the I/O Port Information page, which includes the following:

**Table 11-4** IO Port Information Page

Category	Information Displayed
IO Address	Shows the I/O port range that a given device is using.
Device Description	Shows the name of the device that is using a given I/O port range.

**Figure 11-4** Example I/O Port Information Page

#### I/O Port Information

I/O Port Information	
IO Address	Device Description
0000-001f	dma1
0020-0021	pic1
0040-005f	timer
0060-006f	keyboard
0070-0077	rtc
0080-008f	dma page reg
00a0-00a1	pic2
00c0-00df	dma2
00f0-00ff	fpu
0170-0177	ide1
01f0-01f7	ide0
02f8-02ff	serial
0376-0376	ide1
03c0-03df	vesafb
03f6-03f6	ide0

## 11.5 Viewing SMBIOS Information

Clicking the *SMBIOS Information* link under the *Manage Hardware* heading in the navigation frame displays the SMBIOS Information page. On this page, you can view details about the BIOS hardware in each host without physically removing the hardware cover. You also have access to information that is available only through the management system.

Each link shows the type of device that is available in the BIOS of the host computer.

You might see information types such as the following. The types displayed vary depending on the hardware in your system.

- ♦ BIOS
- ♦ System
- ♦ Base Board
- ♦ System Enclosure or Chassis
- ♦ Processor
- ♦ Cache
- ♦ Port Connector
- ♦ System Slots
- ♦ On Board Device

- ♦ OEM Strings
- ♦ BIOS Language
- ♦ System Event Log
- ♦ Physical Memory Array
- ♦ Memory Device
- ♦ Memory Array Mapped Address
- ♦ Memory Device Mapped Address
- ♦ Hardware Security
- ♦ System Boot

Selecting an information type displays information contained within SMBIOS for the type selected. For example, to see all the BIOS information, click the *BIOS Information* link. See [Figure 11-5](#).

**Figure 11-5** Example SMBIOS and BIOS Information Pages

The screenshot shows a web interface for SMBIOS information. On the left, under the heading "SMBIOS Information", there is a list of "Information Type" links. The "BIOS Information" link is selected, indicated by a red dot and a red line pointing to the main content area. The main content area displays the "BIOS Information" table.

Name	Value
BIOS Vendor	Dell Computer Corporation
BIOS Version	A04
BIOS Release Date	01/15/2004
BIOS Characteristics	PCI is supported
	Plug and Play is supported
	APM is supported
	BIOS is Upgradeable (Flash)
	BIOS shadowing is allowed
	ESCD support is available
	Boot from CD is supported
	Selectable Boot is supported
	EDD (Enhanced Disk Drive) Specification is supported
	Int 13h - Japanese Floppy for Toshiba 1.2 MB (3.5", 360 RPM) is supported
	Int 5h, Print Screen Service is supported
	Int 9h, 8042 Keyboard services are supported
	Int 14h, Serial Services are supported
	Int 17h, Printer Services are supported
BIOS Characteristics Extension Byte 1	ACPI supported
	USB Legacy is supported

# 12 Using Group Operations

The *Use Group Operations* section in Novell Remote Manager (NRM) for Linux includes the following links to pages from which you can perform the following tasks:

**Table 12-1** *Use Group Operations Tasks, Links, and Pages*

Task	Link	Page Displayed	For More Information
Access an existing group	<i>Select Group</i>	Select Group	<a href="#">“Accessing an Existing Group” on page 85</a>
Build and configure a new monitoring group	<i>Configure New Group</i>	Group Monitoring Operations	<a href="#">“Building and Configuring a Monitoring Group” on page 80</a>
Change an existing group	<i>Select Group</i>	Select Group	<a href="#">“Changing an Existing Group” on page 85</a>
Define or edit Group Monitoring types	<i>NRM Health Types</i>	Novell Remote Manager Health Monitoring Engine (NRM Health Types)	<a href="#">“Defining or Editing Group Monitoring Types” on page 89</a>
Delete an existing group	<i>Select Group</i>	Select Group	<a href="#">“Deleting an Existing Group” on page 86</a>
Scan the network for items to monitor on the network.	<i>Configure New Group &gt; right-click &gt; click Network Discovery</i>	Network Discovery	<a href="#">“Discovering Items on the Network to Monitor” on page 89</a>
Generate and view server reports	<i>Configure New Group &gt; right-click &gt; click Save Group</i>	Group Monitoring Operations	<a href="#">“Generating and Viewing Server Reports” on page 86</a>
Save a new group	<i>Configure New Group &gt; right-click &gt; click Save Group</i>	Save Group	<a href="#">“Saving a Group” on page 84</a>
View group operations monitored items	<i>View Monitored Items</i>	Novell Remote Manager Health Monitoring Engine - Monitored Items	<a href="#">“Viewing Monitored Items” on page 87</a>
View group operations defined NRM health types	<i>NRM Health Types</i>	Novell Remote Manager Health Monitoring Engine - NRM Health Types	<a href="#">“Viewing Group Monitoring Types” on page 87</a>

Using the group features involves performing one or more of the following tasks:

1. [Building and Configuring a Monitoring Group \(page 80\)](#).
2. (Optional) [Saving a Group \(page 84\)](#).

You only need to perform this step if you want to use the group at a later time.

3. [Generating and Viewing Server Reports \(page 86\)](#).

The monitoring operations start immediately. Other tasks, such as running reports require additional steps.

4. (Conditional) [Accessing an Existing Group \(page 85\)](#).

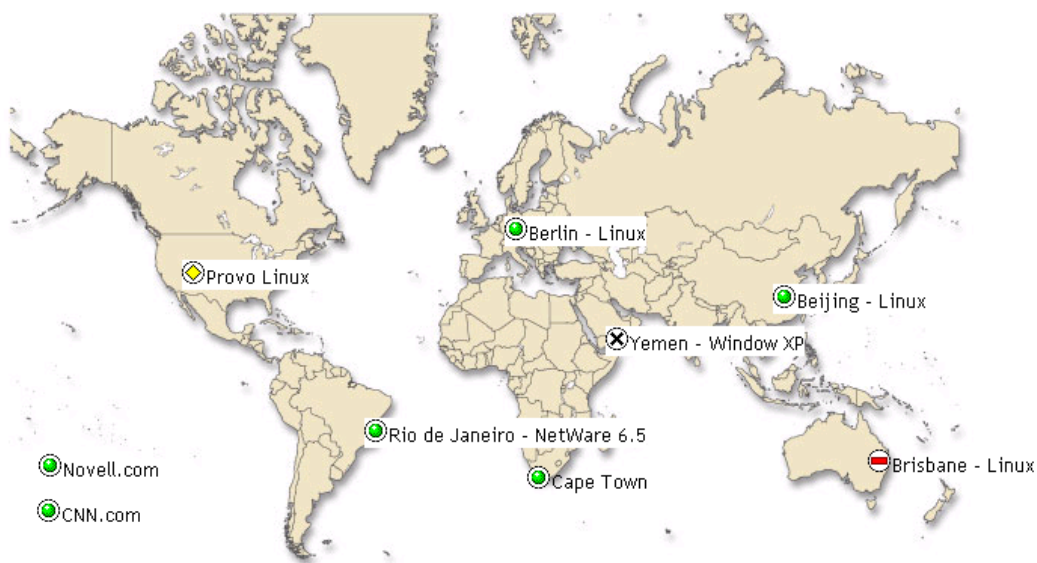
## 12.1 Building and Configuring a Monitoring Group

Novell Remote Manager lets you build and configure groups of items for monitoring Linux server or NetWare server health, as well as providing various statistics for servers running other operating systems. A few of the preconfigured monitoring item types are NRM Health Status for a single server or a group of servers, Ping to a specific port, IP connectivity, LDAP Directory Root Search, and status of connectivity to a Web page.

Monitoring items can be defined and represented by an icons on a page as shown in the following figure. The icons can represent a single item or a group of items.

**Figure 12-1** NRM Server Health Example Group


**Example Group**



To build and configure a new monitor group:

- 1 Click the *Configure New Group* link in the navigation frame.
- 2 Right-click the Group Monitoring Operations page.

---

**TIP:** If your browser does not support right-click functionality, try double-clicking the Reports icon  in the upper right corner of the page.

---

You should see a pop-up similar to the following:



- Add Item
- Configure New Group
- Full Screen
- Group Configuration
- Network Discovery
- Refresh
- Save Group
- Select Group
- Show Hidden Items
- NRM Reports & Operations

3 Click *Add Item*, and do the following:

3a Complete the Monitoring Item Configuration form.

**Add New Monitor Item** ?

Monitoring Item Configuration			
Name	<input type="text"/>	Monitoring Type	NRM Health Monitor <span>▼</span>
Item Address/URL	<input type="text"/>	Port	8008
Hide Normal Status	<input type="checkbox"/>		
Text Color	Default <span>▼</span>	Text Background Color	Default <span>▼</span>
Use single sign on NRM credentials	<input type="checkbox"/>		
User Name	<input type="text"/>	Password	* <input type="text"/>
<input type="button" value="Add"/>		<input type="button" value="Cancel"/>	

For each item you add to a group or want to change from the default setting (health monitor), complete the following options on the Monitoring Item Configuration form.

Option	Details
Name	Provide a descriptive name for the item.

Option	Details
<i>Monitoring Type</i>	<p>Specify one of the following types:</p> <ul style="list-style-type: none"> <li>♦ <b>Label:</b> Text information to use as a label on the group monitor display. Lets you identify each group specifically as needed.</li> <li>♦ <b>LDAP Directory Root Search:</b> Shows the response when trying to ping port 389 of the specified LDAP server. Credentials are not used. This is useful to monitor the status of your LDAP servers in your network.</li> <li>♦ <b>NRM Group:</b> Shows the health status of a group of servers. Lets you access the specific health page for each server in the group.</li> <li>♦ <b>NRM Health Monitor:</b> Shows the health status of each server in the group. Lets you access the specific health page for each server in the group.</li> <li>♦ <b>Ping (ICMP):</b> Shows the response when sending ping requests to the specified DNS name or IP address.</li> <li>♦ <b>TCP/IP Port Query:</b> Shows response activity of a designated TCP/IP service. This query attempts to make a TCP connection to the specified address and port. Returns green (good) health if any services is listening. For example, you could set up a health monitoring item to tell you whether your GroupWise server is still listening for logins from clients. The only states that are returned are green (good), which means the connection was successful, and red (bad), which means the connection was not successful.</li> <li>♦ <b>Web page:</b> Shows the response when trying to download a Web page from the specified URL. You need to put the second part of the address only.</li> </ul>
<i>Item Address/URL</i>	<p>Specify the IP address for the server that you want to monitor or ping, or specify the URL for the Web page that you want to download.</p> <p>The address can be an IP address or DNS name.</p> <p>You do not need to specify the HTTP:// portion of a URL</p>
<i>Hide Normal Status</i>	<p>When selected, only items that are in an abnormal state are displayed.</p> <p>If you want to monitor all statuses, leave the check box deselected.</p>
<i>Text Color</i>	Black is the default. You can select any other color from the drop-down list.
<i>Port</i>	The default is provided. You can type a different port to use.
<i>Use Single Sign on NRM Credentials</i>	<p>When selected (default), the credentials used to access this items' data are the same as the credentials that the user logged into Novell Remote Manager with.</p> <p>When deselected, enter the credential necessary to access the item in the User Name and Password fields.</p>
<i>Text Background Color</i>	Clear is the default. You can select any other color in the drop-down list.

You can also define your own monitoring types or edit the default defined health types by editing the XML data in `/opt/novell/nrm/NRMGroupHealthInfo` file. For more information, see [“Defining or Editing Group Monitoring Types” on page 89](#).

**3b** Click *Add*.

- 3c** Drag the monitor items to the desired location.
- 3d** Repeat [Step 3a](#) through [Step 3c](#) for each item that you add.
- 4** (Optional) If you want to change any of the following, change the configuration of the group:
- ♦ The label for the group
  - ♦ The graphic displayed
  - ♦ The refresh rate
  - ♦ The suspect and critical email notification for the group
- 4a** Right-click the customized Group page, then click *Group Configuration*.
- 4b** Complete the fields as desired on the Group Operations Configuration form.

Group Operations Configuration		E-mail Options	
<b>Display Options</b> Monitor Page Title <input type="text"/> Background Graphic <input type="text" value="NRMDefaultGroupMap.JPG"/> <input type="button" value="v"/> Refresh Rate <input type="text" value="30"/> Seconds		Suspect Server Health E-mail Notification <input type="checkbox"/> First notification wait period <input type="text" value="0"/> Minutes Additional notification wait period <input type="text" value="0"/> Minutes Critical Server Health E-mail Notification <input type="checkbox"/> First notification wait period <input type="text" value="0"/> Minutes Additional notification wait period <input type="text" value="0"/> Minutes	
<input type="button" value="Apply"/>			

Option	Description
<i>Display</i>	<p>The display options let you control the following:</p> <ul style="list-style-type: none"> <li>♦ <b>Monitor Page Title:</b> Specify a title to be shown at the top of the monitor page in the header area when the page is built.</li> <li>♦ <b>Refresh Rate:</b> Specify the number of seconds between status queries to the server.</li> <li>♦ <b>Background Graphic:</b> Select a graphic from the drop-down list for the monitor items to be displayed on. This option can be helpful if you want to show specific locations of the item being monitored.</li> </ul> <p>If you want to add a customized graphic, add it to the <code>/opt/novell/nrm/NRMGroupMaps</code> directory.</p>
<i>Email</i>	<p>The email notification options control how and when email notifications are sent when the server health changes. Email notifications are sent to the addresses in the mail notification list using the mail servers set in the <code>/etc/opt/novell/httpstkcd.conf</code> file.</p>

- 4c** Click *Apply*.
- 5** Perform the desired task, or save the group and perform the task later.
- In this release, the only task you can perform on Linux servers is to compare the server up times.

- 6 (Optional) If you want to reuse the group, save the group.
  - 6a Right-click the *customized Group* page, then click *Save Group*.

We recommend using a name that represents the group you built.
  - 6b (Conditional) If you haven't saved any groups, you might need to extend the schema for NRM group operations before you can save the group.

Extending the schema is required only once per eDirectory tree. If the host is connected to a pre-existing NetWare 6.5 or later network, then extending the schema is not necessary.
  - 6c Click *Save Group* and perform the required steps to save the group to a local server or save it and associate it with an eDirectory object.

See ["Saving a Group" on page 84](#).

## 12.2 Saving a Group

You can save the configuration of the group so you can access this page again without completing the configuration options. You can save a group to the local server or associate with an eDirectory object and save it.

### 12.2.1 Saving the Group to the Local Server

- 1 While viewing the group you just created or edited, right-click the *customized Group* page, then click *Save Group*.
- 2 In the *Group Name* field, specify a name for the group or select a group name that you want to replace from the group list.

We recommend using a name that represents the group you built.
- 3 Click *Save Group*.

This saves the group to a file with that name in the `/opt/novell/nrm/NRMGroups` directory.

### 12.2.2 Saving the Group and Associating It with an eDirectory Object

You can save a group and associate it with a User or Group eDirectory object. This is helpful when you want to access the configuration and you don't want to save the configuration to a specific server (for example, if the server is down but you want it to be part of the operation or if you want to run the operation while one of the servers is not functioning properly).

Only one group can be associated to an object.

- 1 While viewing the group you just created or edited, right-click the *customized Group* page, then click *Save Group*.
- 2 In the *Make This the Group Monitor for This Object* field, specify a User or Group object that you want to associate this group with.

You can browse to the user or group by clicking the *Browse* link icon or by typing the full content name of the object.
- 3 Click *Save Group*.

## 12.3 Accessing an Existing Group

After a group has been saved to the server, you can access the group again to run reports or change the attributes of the group.

- 1 Click the *Select Group* link in the navigation frame.
- 2 On the Server Group page, select the desired group from the drop-down list.
- 3 Click *Build Group*.

## 12.4 Changing an Existing Group

After accessing an existing group (see [“Accessing an Existing Group” on page 85](#)), you might want to change it using one of the following procedures.

**Table 12-2** *Changing an Existing Group Tasks and Procedures*

If you want to	Then
Change the configuration of an existing group.	<ol style="list-style-type: none"><li>1. Select the group.</li><li>2. Right-click the page, then click <i>Group Configuration</i>.</li><li>3. Make the desired changes in the Group Operations Configuration form.</li><li>4. Click <i>Apply</i>.</li><li>5. Save the group. (See <a href="#">“Saving a Group” on page 84.</a>)</li></ol>
See the details of the server health or the monitoring type.	<ol style="list-style-type: none"><li>1. Select the group.</li><li>2. Select the item you want to see the details for.</li><li>3. Double-click the <i>Health Status</i> icon.</li></ol>
Edit an existing item in the group.	<ol style="list-style-type: none"><li>1. Select the group.</li><li>2. Select the item you want to edit.</li><li>3. Right-click the selected item.</li><li>4. Click <i>Edit</i>.</li></ol>
Delete a server or monitor item from a group.	<ol style="list-style-type: none"><li>1. Select the group.</li><li>2. Select the item you want to delete.</li><li>3. Right-click the selected item.</li><li>4. Click <i>Delete</i>.</li></ol>
Change the display to a full screen in your browser window.	<ol style="list-style-type: none"><li>1. Select the group.</li><li>2. Right-click the page.</li><li>3. Click <i>Full Screen</i></li><li>4. When you are finished viewing the group, close the browser window.</li></ol>

## 12.5 Deleting an Existing Group

To delete a group:

- 1 Click the *Select Group* link in the navigation frame.
- 2 On the Server Group page, select the desired group from the drop-down list.
- 3 Click *Delete Group*.

## 12.6 Generating and Viewing Server Reports

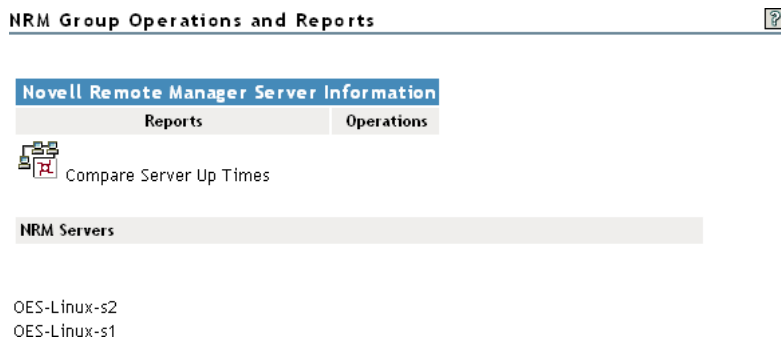
Running Server Comparison reports on a group of servers can help you in determine which servers need to be updated or have configurations changed, why operations on that server might be sluggish, or which servers are receiving the most action.

In this release, you can run only one report, the [“Compare Server Up Time Report” on page 86](#).

### 12.6.1 Compare Server Up Time Report

Run this report to see which servers might need replacing or tuning to keep them running longer. This report gives you an idea how long each server in the group has been running without being restarted.

- 1 Build the monitor group or select a group previously saved.  
See [“Building and Configuring a Monitoring Group” on page 80](#) or [“Accessing an Existing Group” on page 85](#).
- 2 Right-click the customized Group page.
- 3 Click *NRM Reports & Operation*.



- 4 Click *Compare Server Up Times*.  
A report similar to the following is returned.

Server Up Time Report	
Server	Up Time
 OES-Linux-s2	16 days 06 hours 05 minutes 46 seconds
 OES-Linux-s1	14 days 22 hours 58 minutes 08 seconds
 Server has been up less than one hour.	
 Server has been up less than one day.	

## 12.7 Viewing Monitored Items

If you have several groups defined and you want to see which items are being monitored from this server without opening each group, click *View Monitored Items*.

This page lists all of the items currently being monitored by the Novell Remote Manager health monitoring engine on this server.

If an item has not been monitored for more than 3 minutes, it is removed from the list.

**Table 12-3** *Health Monitoring Engine Monitored Items*

Column	Description
Status	Shows the health indicator icon for the item
Item Name	The name assigned to the item when it was defined in a Novell Remote Manager health monitoring group.
Type	The type of item being monitored, such as NRM health, ping status, web download.
Address	The third column is the address that Novell Remote Manager uses to check the items health status.
Last Check Time	The last time that a Novell Remote Manager group requested the health status of this item.
Monitoring Start Time	The that health monitoring was started for this item.

If this server's utilization is high due to the monitoring occurring on this server, you might consider moving some of the monitoring to another location.

## 12.8 Viewing Group Monitoring Types

Clicking the *NRM Health Types* link in the navigation frame displays the Novell Remote Manager Health Monitoring Engine - NRM Health Types content. This page gives you an overview of the Group Monitoring types that are defined on the current host. The legend shows the statuses you might see when you are monitoring groups of hosts with various monitored items and is a graphical view of the items defined in the `/opt/novell/nrm/NRMGroupHealthInfo` file.

**Figure 12-2** The Default NRM Health Monitoring Engine - NRM Health Types Content Definitions

**Novell Remote Manager Health Monitoring Engine**



Health type defines used for Group Operations health monitoring on this machine.

NRM Health Types				
Health Type	Type String	Platform	Health Test	Default Port
NRM Health Monitor	NRM	All	NRM Health State	8008
NRM Item Health States		Icon	Value	Return Value
			1	HEALTH_STATUS_GREEN
			3	HEALTH_STATUS_YELLOW
			4	HEALTH_STATUS_UNKNOWN
			5	HEALTH_STATUS_RED
			7	HEALTH_STATUS_CANT_CONNECT
				Item Click
				NRM Health Page
				NRM Health Page
				NRM Health Page
				NRM Health Page
				NRM Health Page
Health Type	Type String	Platform	Health Test	Default Port
Label	LABEL	All	n/a	
Health Type	Type String	Platform	Health Test	Default Port
NRM Group	GROUP	All	Group Items Health	
NRM Group Health States		Icon	Value	Return Value
			1	HEALTH_STATUS_GREEN
			3	HEALTH_STATUS_YELLOW
			4	HEALTH_STATUS_UNKNOWN
			5	HEALTH_STATUS_RED
			7	HEALTH_STATUS_CANT_CONNECT
				Item Click
				Expand Group
				Expand Group
				Expand Group
				Expand Group
				Expand Group
Health Type	Type String	Platform	Health Test	Default Port
Ping(ICMP)	PING	Linux	ping -c1 -W1 %ITEM_ADDR   grep "bytes from" 1>/dev/null	
PING Health States		Icon	Value	Return Value
			0	HEALTH_STATUS_UP
			Not 0	HEALTH_STATUS_CANT_CONNECT
				Item Click
				ping -c4 %ITEM_ADDR
				ping -c4 -W1 %ITEM_ADDR
Health Type	Type String	Platform	Health Test	Default Port
Web Page	WEB_PAGE	Linux	wget --tries=1 --spider %ITEM_ADDR:%ITEM_PORT 2>/dev/null	80
WEB_PAGE Health States		Icon	Value	Return Value
			0	HEALTH_STATUS_UP
			Not 0	HEALTH_STATUS_CANT_CONNECT
				Item Click
				http://%ITEM_ADDR:%ITEM_PORT
				wget --tries=1 --spider %ITEM_ADDR:%ITEM_PORT



## 12.9 Defining or Editing Group Monitoring Types

If you want to add a Group Monitoring type to the group monitoring that is not defined or change the label of any of the predefined types, you can access the `/opt/novell/nrm/NRMGroupHealthInfo` file and make changes to it.

Each item is defined between the beginning and ending `NRM_Health_Item_Definition` XML tags as shown below.

```
<NRM_Health_Item_Definition>
  <Type_Name>PING</Type_Name>
  <Display_Name>Ping(ICMP)</Display_Name>
  <Platform>Linux</Platform>
  <Health_Test>
    <Command_Line>
      ping -c1 -W1 %ITEM_ADDR | grep "bytes from" 1>/dev/null
    </Command_Line>
    <Result>
      <Value>0</Value>
      <Result_Icon>/sys/login/NRMcanping.gif</Result_Icon>
      <Return_Value>HEALTH_STATUS_UP</Return_Value>
      <Click_Command>ping -c4 %ITEM_ADDR</Click_Command>
    </Result>
    <Result>
      <!Value>0</!Value>
      <Return_Value>HEALTH_STATUS_CANT_CONNECT</Return_Value>
      <Click_Command>ping -c4 -W1 %ITEM_ADDR</Click_Command>
    </Result>
  </Health_Test>
</NRM_Health_Item_Definition>
```

## 12.10 Discovering Items on the Network to Monitor

If you want to scan the network for specific services, you can access the Network Discovery page and specify the host and ports that should be scanned for. After discovering the items on the network, you can click the item and add it to the current group for future monitoring.

Using this feature can help you to quickly gather the information you need to create monitoring groups.

To access this page, do the following:

- 1 In the navigation frame, click *Use Group Operations > Configure New Group* or *Select Group*.
- 2 Right-click the applicable group page displayed.
- 3 Ensure that the browser you are using will accept pop-ups.
- 4 Click *Network Discovery*.

The Network Discovery page is displayed:

**NetWork Discovery**

**Network Scan Parameters**

DNS Name/IP Address137.65.59.103Subnet Mask255.255.255.0

**Select a Network Discovery Method**

Scan available Hosts(ping/ICMP Echo)Subnet Scan

Scan for Web Servers(port 80)Web Server Scan

Scan for LDAP Servers(port 389)LDAP Server Scan

Scan for Novell Remote Manager Servers(port 8008/8009)NRM Agent Scan

Scan for Services(user supplied port)Service Scan port:

To perform the scan, do the following:

- 1 Access the Network Discovery page.
- 2 Do the tasks specified in the following table:

The *Network Scan Parameter* fields determine which hosts or ports should be scanned.



The *DNS Name / IP Address* field is an IP address is used with the subnet mask to determine the range of IP addresses to be scanned. These fields default to the IP address of the current Novell Remote Manager host and a class C subnet mask. For example, if you wanted to scan for all the active hosts in the class B range of 137.65 subnet, you might set the IP address to 137.65.1.1 and the subnet mask to 255.255.0.0.

Instead of scanning for all hosts that respond on the network, you can scan for hosts with specific services available.

Task	Procedure
Scan the network for hosts that are responding to ICMP Echo Requests in the network within a specified subnet.	<ol style="list-style-type: none"><li>1. Accept the default IP address or DNS name and subnet mask information or change it.</li><li>2. Click <i>Subnet Scan</i>.</li></ol>
Scan the network for hosts with port 80 open and listening for connections (Web Servers) within a specified subnet.	<ol style="list-style-type: none"><li>1. Accept the default IP address or DNS name and subnet mask information or change it.</li><li>2. Click <i>Web Server Scan</i>.</li></ol>
Scan the network for hosts with port 389 open and listening for connections (LDAP Servers) within a specified subnet.	<ol style="list-style-type: none"><li>1. Accept the default IP address or DNS name and subnet mask information or change it.</li><li>2. Click <i>LDAP Server Scan</i>.</li></ol>
Scan the network for hosts with port 8009 open and listening for connections (Hosts with Novell Remote Manager configured for the default ports) within a specified subnet.	<ol style="list-style-type: none"><li>1. Accept the default IP address or DNS name and subnet mask information or change it.</li><li>2. Click <i>NRM Agent Scan</i>.</li></ol>
Scan the network for hosts with <i>user_defined_port</i> open and listening within a specified subnet.	<ol style="list-style-type: none"><li>1. Accept the default IP address or DNS name and subnet mask information or change it.</li><li>2. Click <i>Service Scan</i>.</li></ol>

After scanning for a desired service, a Network Discovery page is displayed showing results for all hosts with the ports.

You can do the following task with the information returned:

Task	Procedure
See more information about the scanned host.	<ol style="list-style-type: none"><li>1. Click the <i>Web Service More Info</i> icon  for the applicable host on the Network Discovery page.</li><li>2. View information on the page returned.</li></ol>
Add the host to the current group.	<ol style="list-style-type: none"><li>1. Click the <i>Add Item to Group</i> icon  for the applicable host on the Network Discovery page.</li><li>2. Complete the required information on the Add New Monitor Item page, then click <i>Add</i>.</li></ol> <p>Most of the information is completed by default.</p>



# 13 Tasks Quick Reference

The following table provides information about specific tasks you can perform using Novell Remote Manager. These references also link to more specific information in this guide.

**Table 13-1** Task Quick Reference List

Tasks	Link in Navigation frame or Other Location	For More Information
Build a group for monitoring	<i>Use Group Operations &gt; Configure New Group</i>	<a href="#">Building and Configuring a Monitoring Group (page 80)</a>
Cron job, schedule	Manage Linux > Schedule Task	<a href="#">"Scheduling cron Jobs to Run on the Server" on page 69</a>
Directory, change attributes of	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing Details about Directories and Performing Actions on Them (page 48)</a>
Directory, edit	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing Details about Directories and Performing Actions on Them (page 48)</a>
Directory, delete	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing Details about Directories and Performing Actions on Them (page 48)</a>
Directory, rename	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing Details about Directories and Performing Actions on Them (page 48)</a>
Directory, view detailed information about	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing Details about Directories and Performing Actions on Them (page 48)</a>
File, change attributes of	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing the Details of a File and Performing Specific Actions (page 50)</a>
File, download	<i>View File System &gt; View File System Listing</i>	<a href="#">Downloading a File from the Server to a Local Workstation (page 49)</a>
File, edit	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing the Details of a File and Performing Specific Actions (page 50)</a>
File, delete	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing the Details of a File and Performing Specific Actions (page 50)</a>

<b>Tasks</b>	<b>Link in Navigation frame or Other Location</b>	<b>For More Information</b>
File, rename	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing the Details of a File and Performing Specific Actions (page 50)</a>
Files, search for text in	<i>View File System &gt; View File System Listing</i>	<a href="#">Searching for Text in Files (page 50)</a>
File, upload	<i>View File System &gt; View File System Listing</i>	<a href="#">Uploading a File to the Server (page 49)</a>
File, view	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing Individual Files (page 51)</a>
File system, browse	<i>View File System &gt; View File System Listing</i>	<a href="#">Browsing File Systems and Performing Actions on Them (page 47)</a>
File system, perform action on	<i>View File System &gt; View File System Listing</i>	<a href="#">Browsing File Systems and Performing Actions on Them (page 47)</a>
Files, viewing details about	<i>View File System &gt; View File System Listing</i>	<a href="#">Viewing the Details of a File and Performing Specific Actions (page 50)</a>
Group operations, access an existing group	<i>Use Group Operations &gt; Select Group</i>	<a href="#">Accessing an Existing Group (page 85)</a>
Group operations, build and configure a new monitoring group	<i>Use Group Operations &gt; Configure New Group</i>	<a href="#">Building and Configuring a Monitoring Group (page 80)</a>
Group operations, change an existing group	<i>Use Group Operations &gt; Select Group</i>	<a href="#">Changing an Existing Group (page 85)</a>
Group operations, define or edit Group Monitoring types	<i>Use Group Operations &gt; NRM Health Types</i>	<a href="#">Defining or Editing Group Monitoring Types (page 89)</a>
Group operations, delete an existing group	<i>Use Group Operations &gt; Select Group</i>	<a href="#">Deleting an Existing Group (page 86)</a>
Group operations, discover items to monitor on the network.	<i>Use Group Operations &gt; Configure New Group &gt; right-click menu &gt; Network Discovery</i>	<a href="#">Discovering Items on the Network to Monitor (page 89)</a>
Group operations, generate and view server reports	<i>Use Group Operations &gt; Configure New Group &gt; right-click menu &gt; Save Group</i>	<a href="#">Generating and Viewing Server Reports (page 86)</a>
Group operations, save a new group	<i>Use Group Operations &gt; Configure New Group &gt; right-click menu &gt; Save Group</i>	<a href="#">Saving a Group (page 84)</a>
Group operations, view defined health types	<i>Use Group Operations &gt; NRM Health Types</i>	<a href="#">Viewing Group Monitoring Types (page 87)</a>
Group operations, view monitored items	<i>View Monitored Items</i>	<a href="#">Viewing Monitored Items (page 87)</a>
Host, shut down	<i>Manage Linux &gt; Down/Reset Options</i>	<a href="#">Shutting Down and Restarting the Host (page 65)</a>

<b>Tasks</b>	<b>Link in Navigation frame or Other Location</b>	<b>For More Information</b>
Host, restart	<i>Manage Linux &gt; Down/Reset Options</i>	<a href="#">Shutting Down and Restarting the Host (page 65)</a>
Interrupt information, view	<i>Manage Hardware &gt; Interrupt Information</i>	<a href="#">Viewing Interrupt Information (page 74)</a>
I/O Memory information, view	<i>Manage Hardware &gt; IO Memory Information</i>	<a href="#">Viewing I/O Memory Information (page 75)</a>
IO Port information, view	<i>Manage Hardware &gt; IO Port Information</i>	<a href="#">Viewing I/O Port Information (page 76)</a>
Kernel modules, view	<i>Manage Linux &gt; Kernel Module Listing</i>	<a href="#">Viewing Kernel Modules (page 63)</a>
Memory information, view	<i>Manage Linux &gt; View Memory Information</i>	<a href="#">Viewing Memory Information (page 64)</a>
Mounted devices, perform actions on them	<i>Home icon &gt; Info icon</i>	<a href="#">Viewing Mounted Devices and Performing Actions on Them (page 46)</a>
Mounted devices, view	<i>Home icon &gt; Info icon</i>	<a href="#">Viewing Mounted Devices and Performing Actions on Them (page 46)</a>
Packages, install	<i>Manage Linux &gt; Package Information</i>	<a href="#">Managing Packages (page 66)</a>
Packages, remove	<i>Manage Linux &gt; Package Information</i>	<a href="#">Managing Packages (page 66)</a>
Packages, view information about	<i>Manage Linux &gt; Package Information</i>	<a href="#">Managing Packages (page 66)</a>
Partition information, view	<i>View File System &gt; View Partition Information</i>	<a href="#">Viewing Partition Information (page 51)</a>
Process, kill	<i>Manage Linux &gt; Process Information</i>	<a href="#">Managing Processes (page 68)</a>
Process, view information about	<i>Manage Linux &gt; Process Information</i>	<a href="#">Managing Processes (page 68)</a>
Processors, view information about	<i>Manage Hardware &gt; View Processors</i>	<a href="#">Viewing Processors (page 73)</a>
Server health, configure email notification about status	<i>Health Monitor and Configuration Icon</i>	<a href="#">Configuring Email Notification for Server Health Status (page 42)</a>
Server health, configure item to monitor	<i>Diagnose &gt; Health Monitor</i>	<a href="#">Configuring the Items to Monitor (page 42)</a>
Server health, monitor health of a specific item	<i>Diagnose &gt; Health Monitor</i>	<a href="#">Monitoring Overall Server Health or the Health of a Specific Item (page 39)</a>
Server health, monitor overall health	<i>Diagnose &gt; Health Monitor</i>	<a href="#">Monitoring Overall Server Health or the Health of a Specific Item (page 39)</a>

<b>Tasks</b>	<b>Link in Navigation frame or Other Location</b>	<b>For More Information</b>
Server health, troubleshooting suspect or bad health status	<i>Diagnose &gt; Health Monitor</i>	<a href="#">Troubleshooting a Suspect or Bad Health Status (page 42)</a>
Server Group, monitor overall server health	<i>Use Group Operation &gt; Configure New Group or Select Group</i>	<a href="#">Building and Configuring a Monitoring Group (page 80)</a>
SMBIOS information, view	<i>Manage Hardware &gt; SMBIOS Information</i>	<a href="#">Viewing SMBIOS Information (page 77)</a>
Swap information, view	<i>Manage Linux &gt; View Memory Information</i>	<a href="#">Viewing Memory Information (page 64)</a>



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# 14 Security Considerations

This section contains information that helps you know whether you can use this utility in a secure environment and points you to information to help you set up access to your server so you can be certain that its contents are not compromised through the use of this utility.

For additional security implementation information, see “[Security](#)” in the *OES 2 SP3: Planning and Implementation Guide*.

The default settings for Novell Remote Manager for OES Linux are set so your network and information cannot be compromised. If you change settings from the default, please be aware of the consequences of your actions.

- ♦ [Section 14.1, “Security Features,”](#) on page 97
- ♦ [Section 14.2, “Security Characteristics,”](#) on page 99
- ♦ [Section 14.3, “Security Configuration,”](#) on page 99

## 14.1 Security Features

The following table contains the security features of Novell Remote Manager on OES Linux.

**Table 14-1** Security Features of Novell Remote Manager on OES Linux

Feature	Yes/No	Details
Users are authenticated	Yes	<p>Users must log in to Novell Remote Manager.</p> <p>Log in as user <code>root</code>, a local Linux user, or as a Novell eDirectory user that is Linux User Management enabled.</p> <p>The <code>root</code> user is authenticated locally, not through eDirectory. This allows the <code>root</code> user to manage server resources even if the eDirectory services are not available.</p> <p>For more information, see “<a href="#">Accessing Novell Remote Manager</a>” on page 27 and “<a href="#">Changing the Configuration</a>” on page 33.</p>

Feature	Yes/No	Details
Limited root user privileges for the Admin user	Yes	<p>User <code>root</code> can restrict all users from logging in, so the Admin user or Admin-equivalent user is not granted unlimited root privileges for security reasons. If the server is LUM enabled, the Admin user and users with rights equivalent to the Admin user have the limited <code>root</code> user privileges that are needed to modify only the configuration files necessary for configuring NRM or any other files that NRM has been assigned rights to allow modifying. The user Admin or equivalent user has access according to the Linux and LUM file rights to all other files.</p> <p>The Admin user or equivalent user needs <code>root</code> privileges to modify the following files in order to configure and manage NRM. The privileges are temporary and only for the task to be performed.</p> <pre>/etc/opt/novell/httpstkd.conf</pre> <pre>/etc/pam.d/httpstkd</pre> <p>The following file names are the names that are used as the description for a specified task:</p> <pre>/etc/cron.d/[task file name]</pre> <p>The following files may be the actual file or a symbolic link to the YAST or eDirectory certificates:</p> <pre>/etc/opt/novell/httpstkd/server.pem</pre> <pre>/etc/opt/novell/httpstkd/server.key</pre> <p>The following files are already modifiable by the Admin user:</p> <p>The first category has names that are whatever the user names the group that they create.</p> <pre>/opt/novell/nrm/NRMGroups/[nrm group names]</pre> <pre>/etc/opt/novell/nrmhconfig.conf</pre> <pre>/etc/opt/novell/nrmvchlthcfg.conf</pre>
Servers, devices, and services are authenticated	Yes	When gathering information with group operations, Novell Remote Manager authenticates to other servers.
Access to information is controlled	Yes	<p>Access to information is restricted to valid users who have rights to access the server through eDirectory or access rights to the local file system.</p> <p>The port for accessing the login dialog box must be open through a firewall if you want the server to be accessible outside the firewall. You can restrict access to specific workstations or a range of IP addresses.</p> <p>For more information, see <a href="#">“Accessing Novell Remote Manager” on page 27</a> and <a href="#">“Changing the Configuration” on page 33</a>.</p>
Roles are used to control access	No	Novell Remote Manager does not have role-based management.
Logging and security auditing is done	Yes	

Feature	Yes/No	Details
Data on the wire are encrypted by default	Yes	The following data are encrypted on the wire: <ul style="list-style-type: none"> <li>♦ Administration via browser UI</li> <li>♦ When logging in the administration is switching to the HTTPS protocol.</li> </ul>
Data is stored encrypted	No	
Passwords, keys, and any other authentication materials are stored encrypted	Yes	
Security is on by default	Yes	

## 14.2 Security Characteristics

Novell Remote Manager communicates using port 8008 and 8009. Port 8008 access the Login page, then all other communications take place through secure HTTP ports 8009. These default settings can be changed using options in the `/etc/opt/novell/httpstkd.conf` file.

The HTTPS communication uses SSL encryption. It uses the server certificate by default; however, you can reconfigure this setting if desired.

You can set the SSL key cipher strength by setting the `cipher strength` command in the `/etc/opt/novell/httpstkd.conf` file. We recommend that you set the cipher strength to high, which allows only 112-bit or greater encryption. By default it is set ALL, which allows any cipher strength. For information, see [Section A.9, “SSL Key Cipher Strength Command,” on page 111](#).

By default, Novell Remote Manager sets an `HttpOnly` cookie attribute that specifies that the cookie is not accessible through a script. This helps mitigate the risk of cross-site scripting. For information, see [Section A.5, “HttpOnly Command,” on page 107](#).

The Admin user and users with rights equivalent to user Admin have limited root user privileges that are needed to modify only the configuration files necessary for configuring NRM or any other files that NRM has been assigned rights to allow modifying. For a list of these files, see [Section 14.1, “Security Features,” on page 97](#). The user Admin or equivalent user has access according to the Linux and LUM file rights to all other files.

## 14.3 Security Configuration

The following table provides a summary of the options you can change to allow or limit access to the server through Novell Remote Manager.

**Table 14-2** Options for Changing or Limiting Access to a Server Through Novell Remote Manager

Issue/Feature	Recommendation	For More Information
SSL key cipher strength	High (112-bit or greater encryption)  The default setting is ALL, which allows any encryption level.	<a href="#">Section A.9, “SSL Key Cipher Strength Command,” on page 111</a>

Issue/Feature	Recommendation	For More Information
Let the root user access Novell Remote Manager with full management rights.	This is the default setting. The root user is the only user with full management rights in Novell Remote Manager.	<a href="#">"Accessing Novell Remote Manager" on page 27.</a>
Let all LUM-enabled eDirectory users access file system information in Novell Remote Manager.	All non-local user access is controlled by eDirectory and LUM. LUM-enabled eDirectory users can log in and view the file systems that they have the eDirectory rights and file system rights to see. These users (including Admin users and Admin-equivalent users) do not have management rights in Novell Remote Manager.	
Deny access to all non-LUM-enabled eDirectory users.	The eDirectory users that are not LUM enabled cannot access the server through Novell Remote Manager.  We recommend that the <code>root</code> user be the only local user created on the system. However, if local users log in to Novell Remote Manager, their access is limited to viewing the file systems that they have the local rights to see. The management features are not available to non- <code>root</code> local users.	
Let the root user access Novell Remote Manager with full management rights.	By default, only the root user and LUM-enabled eDirectory users can log in to Novell Remote Manager. Non-LUM-enabled eDirectory users cannot access the server through Novell Remote Manager.	<ul style="list-style-type: none"> <li>♦ <a href="#">"Changing the Configuration" on page 33.</a></li> <li>♦ <a href="#">"Accessing and Editing the HTTPSTKD Configuration File" on page 34.</a></li> </ul>
Deny access to all LUM-enabled eDirectory users, including the Admin user and Admin-equivalent users.	Set the <code>nolum</code> option in the <code>/etc/opt/novell/httpstk.conf</code> file and edit the <code>/etc/pam.d/httpstk</code> file.	
Deny access to all non-LUM-enabled eDirectory users.	Remove these lines:  <pre>auth sufficient /lib/security/pam_nam.so account sufficient /lib/security/pam_nam.so password sufficient /lib/security/pam_nam.so session optional /lib/security/pam_nam.so</pre> <p>When the <code>nolum</code> option is set, no LUM-enabled eDirectory user can access the server via Novell Remote Manager, including the Admin user and Admin-equivalent user. By default, non-LUM-enabled eDirectory users continue to be denied access. Only the <code>root</code> user has full management access to Novell Remote Manager.</p>	

Issue/Feature	Recommendation	For More Information
Let the <code>root</code> user access Novell Remote Manager with full management rights.	By default, only the <code>root</code> user and LUM-enabled eDirectory users can log in to Novell Remote Manager. Non-LUM-enabled eDirectory users cannot access the server through Novell Remote Manager.	<ul style="list-style-type: none"> <li>♦ <a href="#">“Changing the Configuration” on page 33.</a></li> <li>♦ <a href="#">“Accessing and Editing the HTTPSTKD Configuration File” on page 34.</a></li> </ul>
Restrict access for all LUM-enabled eDirectory users, except the Admin user and users with rights equivalent to Admin.	Set the <code>supervisoronly</code> option in the <code>/etc/opt/novell/httpstk.conf</code> file.	
Deny access to all non-LUM-enabled eDirectory users.	When the <code>supervisoronly</code> option is set, the Admin user and Admin-equivalent users are the only LUM-enabled eDirectory users that can log in to Novell Remote Manager. They can view the file systems that they have the eDirectory rights and file system rights to see. By default, non-LUM-enabled eDirectory users continue to be denied access. Only the <code>root</code> user has full management access to Novell Remote Manager.	
Restrict access to specific workstations or a range of IP address	Set the <code>filteraddr</code> and <code>filtersubnet</code> options in the <code>/etc/opt/novell/httpstk.conf</code> file.	<ul style="list-style-type: none"> <li>♦ <a href="#">“Changing the Configuration” on page 33.</a></li> <li>♦ <a href="#">“Accessing and Editing the HTTPSTKD Configuration File” on page 34.</a></li> </ul>
Remove access to the utility for all users	Stop the HTTPSTKD daemon.	<a href="#">“Starting or Stopping HTTPSTKD” on page 29.</a>




---

# A HTTPSTKD Configuration File Options

To control the behavior of Novell Remote Manager on Linux, you can specify the options listed in the HTTPSTKD configuration file in `/etc/opt/novell/httpstk.conf`. This information is in the default configuration file when installing a new server.

If you are upgrading your server, you might need to update or add the information and settings noted if you want the applicable functionality.

To edit the file, click the  *Configure* icon in the header frame.

The following options are available for controlling the behavior of Novell Remote Manager on Linux:

- ♦ [Section A.1, “Address and Port Commands,” on page 103](#)
- ♦ [Section A.2, “Disable Auto LUM Command,” on page 104](#)
- ♦ [Section A.3, “Email Notification Commands,” on page 106](#)
- ♦ [Section A.4, “Filtering Commands,” on page 106](#)
- ♦ [Section A.5, “HttpOnly Command,” on page 107](#)
- ♦ [Section A.6, “InventoryResolveNonLumOwnerName Command,” on page 108](#)
- ♦ [Section A.7, “Language Commands,” on page 109](#)
- ♦ [Section A.8, “Load Command,” on page 110](#)
- ♦ [Section A.9, “SSL Key Cipher Strength Command,” on page 111](#)
- ♦ [Section A.10, “Supervisor Only Command,” on page 111](#)

## A.1 Address and Port Commands

### Purpose

Specifies each address and port that HTTPSTKD opens and listens on.

Optionally, you can enable SSL on the port using the `keyfile` and `certfile` parameters.

### Syntax

```
addr ip_address:port_number
```

```
addr ip_address:port_number keyfile:key_file_path/name certfile:certificate_file_path/name
```

Option	Use
<i>IP_address</i>	One of the following: <ul style="list-style-type: none"> <li>♦ 0.0.0.0</li> <li>♦ The assigned static IP address of the node</li> </ul> A DNS name is not allowed.
<i>port/</i>	One of the following for public or secure: <ul style="list-style-type: none"> <li>♦ 8008 is the default public port</li> <li>♦ 8009 is the default secure port</li> <li>♦ any port not in use on the server</li> </ul> If you are accessing Novell Remote Manager outside a firewall, these ports must be open.
<i>keyfile_path/name</i>	keyfile=/etc/opt/novell/httpstkd/server.key is the default path and filename on a new OES server installation.
<i>certificate_path/name</i>	certfile=/etc/opt/novell/httpstkd/server.pem is the default path and filename on a new OES server installation.

## Examples

```
addr 0.0.0.0:8008
```

```
addr 0.0.0.0:8009 keyfile=/etc/opt/novell/httpstkd/server.key certfile=/etc/opt/novell/httpstkd/server.pem
```

## A.2 Disable Auto LUM Command

### Purpose

Only the `root` user has full management rights in Novell Remote Manager. The `root` user is a local superuser, and is not an eDirectory user. This allows the server to be managed even if the eDirectory authentication service is down.

Auto LUM lets eDirectory users that are enabled with Linux User Management (LUM) log in to Novell Remote Manager by using their eDirectory user names and passwords. For example, you can log in as user `Admin` or as a user with rights equivalent to `Admin` rather than logging in as user `root`. When LUM-enabled eDirectory users access Novell Remote Manager, they are allowed to view only the file systems that they have the eDirectory rights and file system rights to see.

---

**NOTE:** You can use the [supervisoronly](#) option to restrict access for LUM-enabled eDirectory users to only the `Admin` user and users with rights equivalent to the `Admin` user.

---

By default, the eDirectory users that are not LUM-enabled cannot access the server with Novell Remote Manager. They can view their files via NCP, CIFS, or AFP.



We recommend against creating local users other than the `root` user. However, if non-`root` local users access Novell Remote Manager, they must log in using the user name and password created on the local system. Only limited functionality is available. They can view only those file systems that they have the local access rights to see. The `nolum` option does not prevent the local-only users from logging in to Novell Remote Manager.

Use the `nolum` command to deny access to all LUM-enabled eDirectory users. By default, non-LUM-enabled eDirectory users continue to be denied access. Only the `root` user has full management access to Novell Remote Manager.

## Syntax

`nolum`

Option	Use
no setting	<p>This is the default setting.</p> <p>To perform all management functions, users must be logged in as user <code>root</code>.</p> <p>To view file system information, LUM-enabled eDirectory users can log in with their eDirectory user name and password. Non-LUM-enabled eDirectory users are denied access.</p> <p>To view local file system information only, non-<code>root</code> local users can log in with their locally created user names and passwords. We recommend against creating non-<code>root</code> local users.</p> <p>When the <code>nolum</code> command is not specified, HTTPSTKD checks its PAM configuration file at load time and adds the LUM configuration to it if LUM is installed but not already in its configuration.</p>
nolum	<p>To perform all management functions, users must be logged in as user <code>root</code>.</p> <p>LUM-enabled eDirectory users are denied access. Non-LUM-enabled eDirectory users are denied access.</p> <p>To view local file system information only, non-<code>root</code> local users can log in with their locally created user names and passwords. We recommend against creating non-<code>root</code> local users.</p> <p><b>IMPORTANT:</b> Setting this option does not disable LUM if it is already part of HTTPSTKD configuration.</p> <p>You can remove the auto LUM functionality by manually by editing <code>/etc/pam.d/httpstkd</code> and removing these lines:</p> <pre>auth sufficient /lib/security/pam_nam.so account sufficient /lib/security/pam_nam.so password sufficient /lib/security/pam_nam.so session optional /lib/security/pam_nam.so</pre>

## Example

`nolum`

## A.3 Email Notification Commands

### Purpose

Sets up email notification service in Novell Remote Manager.

You can specify up to two mail servers and up to eight recipients to receive email when a notification is specified in the Novell Remote Manager server health area. Use a separate command line for each server or email address.

### Syntax

```
mailserver IP_address
mailto email_address
```

Command	Use
no setting	Email notification is not configured. This is the default setting.
mailserver	Sends email notification to the specified mail server. You can specify up to two mail servers.
mailto	Sends email notification to the specified user. You can specify up to eight users.

### Example

The following commands send email notifications to mail servers `mail.bobs1bank.com` and `smtp.bobs1bank.com`:

```
mailserver mail.bobs1bank.com
mailserver smtp.bobs1bank.com
```

The following commands send email notifications to users Bob, George, and Mary from mailserver `bobs1bank.com`:

```
mailto bob@bobs1bank.com
mailto george@bobs1bank.com
mailto mary@bobs1bank.com
```

## A.4 Filtering Commands

### Purpose

Blocks access to Novell Remote Manager from all addresses except those specified by these `filteraddr` and `filtersubnet` commands.

### Syntax

```
filteraddr IP_address
filtersubnet IP_address subnet_mask
```

Command	Use
not specified	Allows access from any address. This is the default setting.
filteraddr	Allows access from specific addresses only.
filtersubnet	Allows access from any address on the specified network or subnet.

## Examples

The following command allows access only from address 192.168.20.1:

```
filteraddr 192.168.20.1
```

The following command allows access from only addresses 192.56.56.0 thru 192.56.59.255:

```
filteraddr 192.56.56.0 255.255.252.0
```

## A.5 HttpOnly Command

### Purpose

Novell Remote Manager sets an `HttpOnly` cookie attribute that specifies that the cookie is not accessible through a script. This helps mitigate the risk of cross-site scripting.

### Syntax

If the `HttpOnly` flag is included in the HTTP response header, the cookie cannot be accessed through client side script.

If you modify the setting, you must restart Novell Remote Manager.

```
HttpOnly <true|false>
```

Option	Use
true	Include <code>HttpOnly</code> as an attribute in the response header. This is the default setting.
false	Do not include <code>HttpOnly</code> in the response header.

To disable the `HttpOnly` attribute:

- 1 Log in to the server as the `root` user, then open a terminal console.
- 2 Stop the `httpstkd` daemon by entering  

```
rcnovell-httpstkd stop
```
- 3 Open the `/etc/opt/novell/httpstkd.conf` file in a text editor.
- 4 Review the potential security concerns for changing `HttpOnly` to `false`.
- 5 Change the setting from

```
HttpOnly true  
to
```

```
HttpOnly false
```

6 Save the file and exit the text editor.

7 Start the `httpstkd` daemon by entering

```
rcnovell-httpstkd start
```

## Examples

```
HttpOnly true
```

```
HttpOnly false
```

# A.6 InventoryResolveNonLumOwnerName Command

## Purpose

The `InventoryResolveNonLumOwnerName` command is used when you perform an inventory of NSS volumes and the file owner UID is set to the Nobody user. The Nobody user is reported when a file is owned by a Novell eDirectory user that is not enabled with Linux User Management (LUM).

## Syntax

If you modify the setting, you must restart Novell Remote Manager.

```
InventoryResolveNonLumOwnerName <false|true>
```

Option	Use
false	<p>The inventory does not resolve the user IDs of non-LUM-enabled file owners. The owner is reported as the Nobody user.</p> <p>This is the default setting. This provides faster performance for an inventory of files on an NSS volume when eDirectory users are not LUM enabled.</p>
true	<p>The inventory tries to resolve the user IDs of non-LUM-enabled file owners by using NSS APIs. This can result in a major performance impact for the inventory. The more non-LUM-enabled file owners the inventory encounters, the longer it takes to complete the inventory.</p>

## Examples

The following example does not resolve the user IDs of file owners that are not LUM enabled. This is the default setting. The non-LUM-enabled owners are reported as the Nobody user.

```
InventoryResolveNonLumOwnerName false
```

The following example resolves the user IDs of file owners that are not LUM enabled to the user name. The more non-LUM-enabled owners encountered, the longer the inventory can take.

```
InventoryResolveNonLumOwnerName true
```

## A.7 Language Commands

### Purpose

Sets up a mapping of HTTP Accept-Language header tags for Linux locales. These locales determine the languages in which the browser can view content through the Novell Remote Manager utility.

To see a list of possible locales on your Linux server, enter the following at a shell prompt:

```
locale -a
```

### Syntax

```
lang HTTP_language_string locale_string
```

Command	Use
lang	<p>Use the following settings:</p> <ul style="list-style-type: none"><li>♦ English: en en_US.UTF8</li><li>♦ US English: en-us en_US.UTF8</li><li>♦ Chinese Simplified: zh-cn zh_CN.UTF8</li><li>♦ Chinese Traditional: zh-tw zh_TW.UTF8</li><li>♦ Czech: cs cs_CZ.UTF8</li><li>♦ French: fr fr_FR.UTF</li><li>♦ German: de de_DE.UTF8</li><li>♦ Hungarian: hu hu_HU.UTF8</li><li>♦ Italian: it it_IT.UTF8</li><li>♦ Japanese: ja ja_JP.UTF8</li><li>♦ Polish: pl pl_PL.UTF8</li><li>♦ Portuguese-Brazil: pt pt_BR.UTF8</li><li>♦ Russian: ru ru_RU.UTF8</li><li>♦ Spanish: es es_ES.UTF8</li><li>♦ Slovak: sk sk_SK.UTF8</li></ul> <p>These are the default settings for this release.</p> <p>In this release, Novell Remote Manager supports English, Chinese Simplified, Chinese Traditional, Czech, French, German, Hungarian, Italian, Japanese, Polish, Portuguese-Brazil, Russian, Spanish, and Slovak.</p>

## Examples

The following commands set the browser languages for various languages such as English, French, Japanese, and Portuguese:

```
lang en      en_US.UTF8
lang en-us   en_US.UTF8
lang zh-cn   zh_CN.UTF8
lang zh-tw   zh_TW.UTF8
lang cs      cs_CZ.UTF8
lang cs-cz   cs_CZ.UTF8
lang fr      fr_FR.UTF8
lang fr-fr   fr_FR.UTF8
lang de      de_DE.UTF8
lang de-de   de_DE.UTF8
lang hu      hu_HU.UTF8
lang hu-hu   hu_HU.UTF8
lang it      it_IT.UTF8
lang it-it   it_IT.UTF8
lang ja      ja_JP.UTF8
lang ja-jp   ja_JP.UTF8
lang pl      pl_PL.UTF8
lang pl-pl   pl_PL.UTF8
lang pt      pt_BR.UTF8
lang pt-BR   pt_BR.UTF8
lang ru      ru_RU.UTF8
lang ru-ru   ru_RU.UTF8
lang es      es_ES.UTF8
lang es-es   es_ES.UTF8
lang sk      sk_SK.UTF8
lang sk-sk   sk_SK.UTF8
```

## More Information

If you are upgrading this server and you want to use this option, you need to add these parameters to the `/etc/opt/novell/httpstkd.conf` file for this server.

## A.8 Load Command

### Purpose

Loads plug-in files used by Novell Remote Manager.

### Syntax

```
load plug-in_file_path/name
```

Option	Use
<i>plug-in_file_path</i>	<code>/opt/novell/lib/</code> is the default path for Novell Remote Manager plug-in files.
<i>plug-in_filename</i>	<code>libnrm.so</code> is a default plug-in for Novell Remote Manager.

## Examples

```
load nrm.so
load /opt/novell/lib/libnrm.so
```

## A.9 SSL Key Cipher Strength Command

### Purpose

The Cipher command sets the bit strength for the SSL key that is required to access Novell Remote Manager. If you modify the setting, you must restart NRM.

### Syntax

```
cipher strength
```

Option	Use
all	Allows any negotiated encryption level. This is the default setting.
low	Allows less than 56-bit encryption.
medium	Allows 56-bit up to 112-bit encryption.
high	Allows 112-bit or greater encryption

### Example

The following example allows access to Novell Remote Manager only with encryption that is 112-bit or greater:

```
cipher high
```

You must restart Novell Remote Manager to apply the change.

## A.10 Supervisor Only Command

### Purpose

Disables access to the server through Novell Remote Manager for all users except `root`. If Linux User Management is enabled for Novell Remote Manager, eDirectory user Admin and eDirectory users with rights equivalent to user Admin also have access to the server through Novell Remote Manager and can perform the same tasks as user `root`.

### Syntax

```
supervisoronly
```

Option	Use
no setting	<p>This is the default setting.</p> <p>Local users and all LUM-enabled eDirectory users can log in to Novell Remote Manager.</p> <p>The non-root and non-admin users have limited access to the server through Novell Remote Manager. They can access only the server's file systems that they have rights to and can perform very limited tasks such as file upload and text search.</p>
supervisoronly	<p>Lets only user <code>root</code> and eDirectory user Admin and users with rights equivalent to Admin have access to the server through Novell Remote Manager. LUM must be set for eDirectory user access.</p>

## Example

```
supervisoronly
```

## More Information

If you are upgrading this server and you want to use this option, you need to add these parameters to the `/etc/opt/novell/httpstkd.conf` file for this server.



---

# B Novell Remote Manager Packages

The following table lists the packages that are installed when the Novell Remote Manage pattern is installed on an OES 2 Linux server.

**Table B-1** *Packages Contained in the Novell Remote Manager Pattern*

Package (RPM)	Description	Notes
novell-lum-providers	A set of CIM providers to facilitate the management of Linux User Management, which is a plug-in to PAM.	
novell-nrm	Novell Remote Manager, Web-based Linux machine management, and control interface.	Contains all the binaries and necessary components for Novell Remote Manager.
openwbem-xml-serviceproviders	A set of CIM providers that allow system services to be instrumented through a service description XML document.	<p>The XML service provider is essentially an XML framework that provides CIM instrumentation for system services. The providers that provide this framework run within the OpenWBEM CIMOM environment.</p> <p>This XML Service provider is a CIM provider that runs within the OpenWBEM CIMOM environment. It provides objects that represent services through the CIM interface, based on XML documents that describe the service. It also provides health information for the services by consuming the output of a command line that is specified in the service description XML document.</p>

The Novell Remote Manager pattern is selected for installation whenever any other OES 2 Linux pattern is selected for Linux installation. It is required only by packages installed with the Novell NCP Server/Dynamic Storage Technology.



---

# C Documentation Updates

To help you keep current on updates to the documentation, this section contains information on content changes that have been made in this *OES 2: Novell Remote Manager for Linux Administration Guide* since the initial release of Open Enterprise Server 2.

This document was updated on the following dates:

- [Section C.1, “August 6, 2012,” on page 115](#)
- [Section C.2, “June 21, 2012,” on page 116](#)
- [Section C.3, “May 31, 2012,” on page 116](#)
- [Section C.4, “November 30, 2011,” on page 117](#)
- [Section C.5, “April 8, 2011,” on page 118](#)
- [Section C.6, “February 11, 2011,” on page 119](#)
- [Section C.7, “December 2010 \(OES2 SP3\),” on page 119](#)
- [Section C.8, “January 29, 2010,” on page 120](#)
- [Section C.9, “November 9, 2009 \(OES 2 SP2\),” on page 120](#)
- [Section C.10, “March 3, 2009,” on page 120](#)
- [Section C.11, “December 2008,” on page 121](#)
- [Section C.12, “March 21, 2008,” on page 122](#)
- [Section C.13, “February 7, 2008,” on page 122](#)

## C.1 August 6, 2012

Updates were made to the following sections. The changes are explained below.

- [Section C.1.1, “HTTPSTKD Configuration File Options,” on page 115](#)

### C.1.1 HTTPSTKD Configuration File Options

Location	Change
<a href="#">Section A.5, “HttpOnly Command,” on page 107</a>	The configuration file name is <code>/etc/opt/novell/httpstkd.conf</code> . The command name <code>HttpOnly</code> is case sensitive.

## C.2 June 21, 2012

Updates were made to the following sections. The changes are explained below.

- ♦ [Section C.2.1, “Viewing File Systems,” on page 116](#)
- ♦ [Section C.2.2, “What’s New,” on page 116](#)

### C.2.1 Viewing File Systems

Location	Change
<a href="#">Section 9.5, “Generating and Viewing NCP Trustee Reports for NSS Volumes,” on page 58</a>	The NCP Trustee Report feature is for NSS volumes only, including DST shadow volumes comprised of two NSS volumes.

### C.2.2 What’s New

Location	Change
<a href="#">Section 2.1, “What’s New (May 2012 Patches),” on page 13</a>	The NCP Trustee Report feature is for NSS volumes only, including DST shadow volumes comprised of two NSS volumes.

## C.3 May 31, 2012

Updates were made to the following sections. The changes are explained below.

- ♦ [Section C.3.1, “Viewing File Systems,” on page 116](#)
- ♦ [Section C.3.2, “What’s New for Novell Remote Manager,” on page 116](#)

### C.3.1 Viewing File Systems

Location	Change
<a href="#">Section 9.5, “Generating and Viewing NCP Trustee Reports for NSS Volumes,” on page 58</a>	This section is new.

### C.3.2 What’s New for Novell Remote Manager

Location	Change
<a href="#">Section 2.1, “What’s New (May 2012 Patches),” on page 13</a>	This section is new.

## C.4 November 30, 2011

Updates were made to the following sections. The changes are explained below.

- ♦ [Section C.4.1, “Changing the Configuration,” on page 117](#)
- ♦ [Section C.4.2, “HTTPSTKD Configuration File Options,” on page 117](#)
- ♦ [Section C.4.3, “Security Considerations,” on page 117](#)
- ♦ [Section C.4.4, “Managing Linux,” on page 118](#)
- ♦ [Section C.4.5, “Viewing File Systems,” on page 118](#)
- ♦ [Section C.4.6, “What’s New for Novell Remote Manager,” on page 118](#)

### C.4.1 Changing the Configuration

Location	Change
<a href="#">Table 7-1 on page 34</a>	Added an entry for the <code>HttpOnly</code> command.
	Added an entry for the <code>InventoryResolveNonLumOwnerName</code> command.

### C.4.2 HTTPSTKD Configuration File Options

Location	Change
<a href="#">Section A.2, “Disable Auto LUM Command,” on page 104</a>	This section has been revised for clarity.
<a href="#">Section A.5, “HttpOnly Command,” on page 107</a>	This section is new.
<a href="#">Section A.6, “InventoryResolveNonLumOwnerName Command,” on page 108</a>	This section is new.

### C.4.3 Security Considerations

Location	Change
<a href="#">Section 14.2, “Security Characteristics,” on page 99</a>	Added information about the <code>HttpOnly</code> command.
<a href="#">Section 14.3, “Security Configuration,” on page 99</a>	The entries for <code>nolum</code> and <code>supervisoronly</code> have been revised for clarity.

## C.4.4 Managing Linux

Location	Change
<a href="#">Section 10.1, “Accessing VNC Consoles,” on page 61</a>	You must disable the <code>HttpOnly</code> setting in the <code>/etc/opt/novell/httpstkd.conf</code> file in order to enable the VNC console display.

## C.4.5 Viewing File Systems

Location	Change
<a href="#">Section 9.4.3, “Viewing a Saved NCP Volume Report,” on page 55</a>	This section is new.
<a href="#">Section 9.4.4, “Emailing a Saved NCP Volume Report,” on page 55</a>	This section is new.

## C.4.6 What’s New for Novell Remote Manager

Location	Change
<a href="#">Section 2.2, “What’s New (November 2011 Patches),” on page 13</a>	This section is new.

## C.5 April 8, 2011

Updates were made to the following sections. The changes are explained below.

- ♦ [Section C.5.1, “Changing the Configuration,” on page 118](#)
- ♦ [Section C.5.2, “HTTPSTKD Configuration File Options,” on page 119](#)
- ♦ [Section C.5.3, “Security Considerations,” on page 119](#)
- ♦ [Section C.5.4, “Viewing File Systems,” on page 119](#)
- ♦ [Section C.5.5, “What’s New for Novell Remote Manager,” on page 119](#)

### C.5.1 Changing the Configuration

Location	Change
<a href="#">Table 7-1 on page 34</a>	Added an entry for cipher strength.

## C.5.2 HTTPSTKD Configuration File Options

Location	Change
<a href="#">Section A.9, “SSL Key Cipher Strength Command,” on page 111</a>	This section is new.

## C.5.3 Security Considerations

Location	Change
<a href="#">Section 14.2, “Security Characteristics,” on page 99</a>	Added information about the Cipher command.

## C.5.4 Viewing File Systems

Location	Change
<a href="#">Section 9.4, “Generating Inventories for Directories or NCP Volumes,” on page 51</a>	File ownership information can now be retrieved for files on NSS volumes without needing to enable users with Linux User Management.

## C.5.5 What’s New for Novell Remote Manager

Location	Change
<a href="#">Section 2.4, “What’s New (April 2011 Patches),” on page 15</a>	This section is new.

## C.6 February 11, 2011

Changes were made for the fixes mentioned in [Section 2.4, “What’s New \(April 2011 Patches\),” on page 15](#).

## C.7 December 2010 (OES2 SP3)

This guide was updated to the Novell documentation standards for OES 2 SP3.

## C.8 January 29, 2010

Updates were made to the following sections. The changes are explained below.

- ♦ [Section C.8.1, “Accessing Novell Remote Manager for Linux,” on page 120](#)
- ♦ [Section C.8.2, “Viewing File Systems,” on page 120](#)

### C.8.1 Accessing Novell Remote Manager for Linux

Location	Change
<a href="#">Section 6.1, “System Requirements,” on page 27</a>	To view the graphical displays in the inventory report, Sun Java must be installed on the machine you use to access Novell Remote Manager, and the browser must have Java and Javascript enabled.

### C.8.2 Viewing File Systems

Location	Change
<a href="#">Section 9.4, “Generating Inventories for Directories or NCP Volumes,” on page 51</a>	Generating this report can take a while, depending on the number of files and folders in the specified directory path. There is no facility to view previous inventory scans as there was on NetWare.
<a href="#">Section 9.4, “Generating Inventories for Directories or NCP Volumes,” on page 51</a>	<b>IMPORTANT:</b> To view the graphical displays in the inventory report, Sun Java must be installed on the machine you use to access Novell Remote Manager, and the browser must have Java and Javascript enabled.

## C.9 November 9, 2009 (OES 2 SP2)

This guide was updated to the Novell documentation standards for OES 2 SP2.

## C.10 March 3, 2009

Updates were made to the following section. The changes are explained below.

### C.10.1 Managing Linux

Location	Change
<a href="#">Section 10.7, “Scheduling cron Jobs to Run on the Server,” on page 69</a>	<b>IMPORTANT:</b> When you set up cron commands, ensure that you log into Novell Remote Manager as the root user, or with a user name that has the necessary permissions to execute the command.



## C.11 December 2008

Updates were made to the following sections:

- ♦ [Section C.11.1, “Accessing Novell Remote Manager for Linux,” on page 121](#)
- ♦ [Section C.11.2, “Managing Linux,” on page 121](#)
- ♦ [Section C.11.3, “Security Considerations,” on page 121](#)
- ♦ [Section C.11.4, “Viewing File Systems,” on page 122](#)

### C.11.1 Accessing Novell Remote Manager for Linux

Location	Change
<a href="#">Section 6.2, “Accessing Novell Remote Manager,” on page 27</a>	The Admin user has limited file system rights equivalent to <code>root</code> that are needed to modify only the configuration files necessary for configuring NRM or any other files that NRM has been assigned rights to allow modifying. The user Admin or equivalent user has access according to the Linux and LUM file rights to all other files.
<a href="#">“Navigation Frame” on page 31</a>	<b>IMPORTANT:</b> When working in Novell Remote Manager, using the browser's Back button can result in unintended actions being re-sent to the server. Ensure that you use the navigation links provided in the tool.

### C.11.2 Managing Linux

Location	Change
<a href="#">Section 10.1, “Accessing VNC Consoles,” on page 61</a>	<b>IMPORTANT:</b> The accessibility to the VNC consoles via Novell Remote Manager for Linux is limited to user <code>root</code> ; it is not available to user Admin.

### C.11.3 Security Considerations

Location	Change
<a href="#">Section 14.1, “Security Features,” on page 97</a>	The Admin user has limited file system rights equivalent to <code>root</code> that are needed to modify only the configuration files necessary for configuring NRM or any other files that NRM has been assigned rights to allow modifying. The user Admin or equivalent user has access according to the Linux and LUM file rights to all other files.
<a href="#">Section 14.2, “Security Characteristics,” on page 99</a>	Same change as above.

## C.11.4 Viewing File Systems

Location	Change
<a href="#">Section 9.1, “Viewing Mounted Devices and Performing Actions on Them,” on page 46</a>	For information about how NSS reports space usage for volumes, see <a href="#">“Guidelines for Sizing Volumes”</a> in the <i>OES 2 SP3: NSS File System Administration Guide for Linux</i> .

## C.12 March 21, 2008

Edits were made to repair broken links. In addition, updates were made to the following sections:

- ♦ [Section C.12.1, “Diagnosing Problems,” on page 122](#)
- ♦ [Section C.12.2, “Managing Linux,” on page 122](#)

### C.12.1 Diagnosing Problems

Location	Change
<a href="#">Section 8.1, “Monitoring Server Health,” on page 39</a>	Information was added applying settings for the different tables, and for using the Refresh Rate feature. Information was reorganized for clarity.

### C.12.2 Managing Linux

Location	Change
<a href="#">Section 10.6, “Managing Processes,” on page 68</a>	<a href="#">Table 10-6 on page 68</a> describes the parameters that are reported on the Process Information page.

## C.13 February 7, 2008

Edits were made to repair broken links. In addition, updates were made to the following section:

- ♦ [Section C.13.1, “Managing Hardware,” on page 122](#)

### C.13.1 Managing Hardware

Location	Change
<a href="#">Section 11.1, “Viewing Processors,” on page 73</a>	Added information about processor information that is reported in a virtualized environment.