

Novell NetWare® 6

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NETWARE REMOTE MANAGER
ADMINISTRATION GUIDE



Novell®

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NetWare Remote Manager Administration Guide

NetWare[®] Remote Manager is a browser-based utility that you can use to manage your NetWare server from any network workstation running Netscape* 4.5 or later, or Internet Explorer 5 or later.

This documentation includes the following information:

- ♦ [Introducing NetWare Remote Manager \(page 9\)](#)
- ♦ [Accessing NetWare Remote Manager \(page 13\)](#)
- ♦ [Managing Servers Remotely \(page 23\)](#)
- ♦ [Troubleshooting Server Problems \(page 63\)](#)

Documentation Conventions

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

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1

Introducing NetWare Remote Manager

NetWare® Remote Manager (PORTAL NLM™) is a utility that provides most of the functionality of MONITOR, along with some functionality from other utilities available at the server console, but is available from a Web browser. You can use NetWare Remote Manager to monitor your server's health, change the configuration of your server, or perform diagnostic and debugging tasks.

For information on accessing, understanding the layout, and configuring NetWare Remote Manager, see [Chapter 2, “Accessing NetWare Remote Manager,” on page 13](#).

The following list includes some of the major tasks that you can perform with this utility.

Manage your server's health by

- ♦ [Monitoring the health status of one or more servers](#)
- ♦ [Building a group of servers that you can monitor together](#)
- ♦ [Accessing NDS eDirectory health and troubleshooting tools](#)

Configure your server by

- ♦ [Managing disk partitions](#)
- ♦ [Viewing information about all hardware adapters, hardware resources, and processor data](#)
- ♦ [Uploading and replacing NLM programs, LAN drivers, or disk drivers](#)
- ♦ [Monitoring system disk space and memory resources](#)
- ♦ [Accessing files on volumes and DOS partitions](#)
- ♦ [Managing server connections](#)

- ♦ [Configuring Set parameters](#)
- ♦ [Setting schedules for running console commands](#)
- ♦ [Shutting down, restarting, or resetting a server](#)

Troubleshoot server problems by

- ♦ [Finding CPU hogs](#)
- ♦ [Finding high memory users](#)
- ♦ [Tracing abend sources](#)
- ♦ [Locating server process hogs](#)
- ♦ [Finding disk space hogs](#)
- ♦ [Seeing who is using an open file](#)

New Features in NetWare 6

NetWare Remote Manager is the new name for the utility formerly known in NetWare 5.1 as NetWare Management Portal.

The overall look and feel for NetWare Remote Manager has been changed to conform with other Novell Web-based utilities, such as iMonitor and iManage. For more information about the layout of this utility, see [“Understanding the Layout of NetWare Remote Manager” on page 15](#).

The Navigation frames have been renamed and regrouped to better identify the tasks associated with the links.

New functionality for NetWare 6 (functionality added since the updates to the PORTAL NLM in the NetWare 5.1 Support Packs) includes the following:

- ♦ [Console Screens link on the Console Screens page](#)

From this link, you open a Java* applet that allows you to view and run all the console screens just as though you were using the keyboard at the server console.

- ♦ [Console Commands link](#)

From this link you can access a list of all the console commands. If you have always wanted to print a list of console commands and make your own notes about them, viewing and printing is now much easier.

- ◆ **Logging in**

The default front page for the non-logged-in user is gone. When you point your browser to the NetWare 6 server, you will see a Login window before seeing any page in NetWare Remote Manager. For more information, see [“Accessing NetWare Remote Manager” on page 14](#).

- ◆ **Admin and Non-admin view**

If you log in to NetWare Remote Manager as a user with the Supervisor right to the Server object, you can access and perform all management options. If you log in as a user without this right, you can only see the volumes, directories, and files that you have rights to. You can view files where you have read access rights and upload files into directories where you have write access. You will not be able to see or do any of the management functions.

- ◆ **Disk Partition Operations**

As an alternative to using ConsoleOne™ to create, change, or remove partitions, volumes, and pools, you can use the Disk Partition Operation features in NetWare Remote Manager. For more information, see [“Managing Disk Partitions” on page 38](#).

- ◆ **Profile CPU execution per NLM program**

On multiprocessor servers, you can now view how each NLM program is distributing its activity across the available CPU. For more information, see [“Viewing CPU Execution Profile Data by NLM” on page 29](#).

2

Accessing NetWare Remote Manager

This chapter includes the following information:

- ♦ [System Requirements \(page 13\)](#)
- ♦ [Accessing NetWare Remote Manager \(page 14\)](#)
- ♦ [Understanding the Layout of NetWare Remote Manager \(page 15\)](#)
- ♦ [Changing the Configuration of NetWare Remote Manager Views \(page 17\)](#)
- ♦ [Accessing Online Help \(page 21\)](#)
- ♦ [Accessing Novell Web Pages \(page 21\)](#)
- ♦ [System Requirements \(page 13\)](#)

System Requirements

- ☐ NetWare® 5.1 or later
- ☐ Netscape 4.5 or later, or Microsoft Internet Explorer 5 or later
- ☐ PORTAL and HTTPSTK NLM™ programs loaded on the server (These are loaded by default in the AUTOEXEC.NCF file.)

Accessing NetWare Remote Manager

To access NetWare Remote Manager, complete the following:

- 1 Open the Web browser at your workstation.
- 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`

For example:

`http://137.65.123.11`

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.

If the NetWare Enterprise Web Server or some other service that is using port 80 is installed on your server, you need to add the alternate port number 8008 at the end of the IP address to log in to NetWare Remote Manager. For example, if your server's IP address is 137.65.123.11, you would enter 137.65.123.11:8008 in the address field of your browser.

NOTE: The default alternate port number is 8008. If you have changed this value on the Configuration page, make sure you enter the new port number.

If you want to access NetWare Remote Manager from the outside of a firewall and the server's private address is unreachable except through Network Address Translation (NAT) or by proxy, do the following:

- ♦ Ensure that DNS is configured on your server.
- ♦ Change the load line for loading the HTTPSTK.NLM to the following in the AUTOEXEC.NCF file:

```
LOAD HTTPSTK.NLM /HOSTIDS:1 /SSL /KEYFILE:"SSL  
CERTIFICATEIP"
```

- 3 Accept the SSL certificate.

IMPORTANT: You must have SSL 2.0 and SSL 3.0 (where available) enabled in your browser. Otherwise, the browser will display an error indicating that the page cannot be displayed.

- 4 When the login dialog box from your browser appears, enter the required information.

To have access to all pages necessary to manage your server remotely, log in as a user with the Supervisor right to the Server object, usually user Admin or a user with rights equivalent to user Admin.

If the Set Bindery Context = line has been removed from the AUTOEXEC.NCF file, enter the full context of the user you are logging in as.

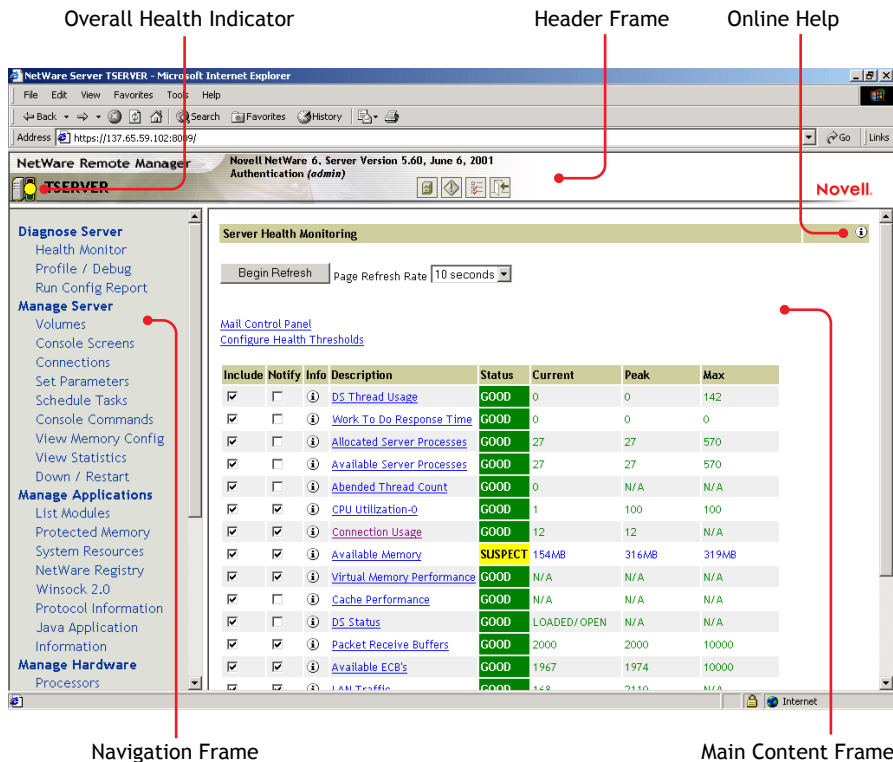
If you log in as a user without the Supervisor right to the Server object, you will see only pages that display the volumes, directories, and files that you have access to. You can view files (where you have read access) and upload files into directories where you have write access. You will not be able to see or do any of the management functions.

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

To log out of NetWare Remote Manager, close all your browser windows at the workstation you logged in from.

Understanding the Layout of NetWare Remote Manager

The Web page for NetWare Remote Manager has three main frames: the header frame (top), the navigation frame (left), and the main content frame (right).



The header frame contains general information about the server and links to the Volumes, Health Monitor, and Configuration pages and an Exit link to close the browser window. The Volumes page is considered the Home page. The Overall Health indicator also links to the Server Health Monitoring page.

The navigation frame lists general tasks that you can do using NetWare Remote Manager and links to specific pages for performing those tasks. The links in the navigation frame change depending on the NLM™ programs that are loaded on the server.

The information in the main content frame changes depending on which link you have clicked in the header or navigation frame.

If an information icon appears in the upper-right corner of the page, you can view help for the page that is displayed in the main content frame.

Changing the Configuration of NetWare Remote Manager Views

To access the NetWare Remote Manager Configuration Options page, log in to the server as a user with the Supervisor right to the Server object, and then click the Configure icon in the header frame.



From the NetWare Remote Manager Configuration Options page, you can:

- ◆ Toggle settings off or on for viewing hidden SET parameters, hidden console commands, or hidden files or folders; or you can toggle settings for viewing system files or folders.

These options let you control whether hidden SET parameters, console commands, or file and system folders and files appear in the lists on Web pages for NetWare Remote Manager or on the server console.

Viewing hidden parameters or system files and folders can be especially helpful when you are comparing the configuration of two similar servers.

You can change a hidden SET parameter or use console command using NetWare Remote Manager or using server console commands, whether or not the parameter is visible in the list.

Viewing hidden console commands can help you discover undocumented commands.

- ◆ Enable or disable the Accessibility option.

This option lets you control whether your browser's pages refresh or reload manually or automatically; the option also allows you to display the server's overall health status with text as well as color.

Enabling the accessibility options does the following:

- ◆ Removes the Refresh button or link from all pages.
- ◆ Disables the refreshing of the server's overall health status.
- ◆ Displays the server's overall health with color and with a text description of good, suspect, or bad.

If you have lost connection with the server, a Page Not Found error is displayed.

The status information on a specific page or the server's overall health does not change until you manually reload or refresh the overall browser view or the specific status page.

To change the browser display after changing the accessibility options, refresh or reload the Web page in the browser.

Whether the accessibility options are enabled or disabled, you can be notified of a change in the server's health status through e-mail notification.

You must set all other accessibility options using the options available in your Web browser.

- ♦ Enable or disable the Emergency (Sadmin user) account and set, change, or clear the password for this account.

If the server is in a state where Novell® eDirectory™ is not functioning correctly, you can log in to the server as this user and do all the necessary diagnostic and debugging tasks that do not require eDirectory.

- ♦ Control HTTP logging.

When instructed by Novell Technical ServicesSM, you can use the Turn Debug Screen On option to help debug a problem with the HTTPSTK module. You must also click the Turn Logger On button. The debug console screen journals debug information for the HTTP stack running on the server. This log shows every connection to your server and shows which pages are accessed with a time stamp. You can view information on every instance of any request from a workstation. By clicking this button, you effectively turn on the HTTP logging function.

If you want to view detailed information about the access to your server that was made using the HTTP command, click the View button for the View Current HTTP Log File option.

The log file contains the following information: an entry number; the date and time stamp in Greenwich Mean Time (GMT); host name; the program making the call; the level of the call (whether it's done by the server or by users); and a description of the entry itself with information including IP address of the source machine making the request, messages, status, etc.

If logging has been turned off, clicking this button will turn it on.

A plain text file of the log resides at SYS:\HTTPLOG.TXT; however, the information is much easier to understand when viewed using the View Current HTTP Log File option because it formats it in a table form. Also,

this file is not viewable while the logging is turned on unless you view it in NetWare Remote Manager. To view the file in its raw form, logging must be turned off so the file is no longer open.

The Reset Current HTTP Log File option clears the current log and begins a new one. Restarting the log is useful if you have made a configuration change to your server and want to begin a new logging session.

The Log Only Errors to Log File option controls whether only errors or all requests are logged to the file. When logging only errors to the file, it will take much longer to fill the file to its maximum size; however, casual access to the server is not tracked.

The HTTP Log File Rollover Size (in Megabytes) option sets a maximum size for the HTTP log file. If the available space on your volume SYS: is limited, you might want to limit the log file to a smaller size. If you want to gather more information over a longer period of time in the log file, you might want to increase the rollover size. When the file is full, the file is deleted and restarted. Automatic rollover guarantees that if logging is on, the log file always reflects the most recent activity on the server.

IMPORTANT: Nothing is written to this file unless logging is turned on.

- ♦ Adjust port parameters.

Adjusting the port parameters lets you control which ports HTTP will try to accept requests on. To return an entry to its previous setting without having to remember that setting or closing and reopening the page, click **Reset** before you click **Apply**.

- ♦ Change Minimum Startup Threads values.

The Change Minimum Startup Threads option lets you change from the default setting to any other number. At least one thread is required and other threads will be created as needed. These initial work threads will be built between the server and browser-based clients. Thus, initial communication begins with two listener threads and 32 work threads. If 32 work threads are used up, HTTPSTK will automatically create additional threads if needed. Each thread allocates a small piece of system memory when it is started. If memory is low on your server, you might want to set this number to 4 and let more threads be created as needed.

- ♦ Change TCP Keep Alive (in Seconds) default values.

The Change TCP Keep Alive (in Seconds) option lets you change the access time from the default value.

- ◆ Unload and reload the PORTAL or HTTPSTK NLM programs.

After you have made changes to the server that require the PORTAL.NLM or HTTPSTK.NLM to be restarted, or after you have loaded a newer version of these NLM programs on the server, click the applicable Restart button to unload and reload the module. A message appears asking if you are sure you want to restart the module, which temporarily disables this utility. While the reset is taking place, a page appears stating that the reset is taking place. When the reset is complete, the page refreshes to the Configuration page with the changed settings if you haven't changed the port settings.

IMPORTANT: If you have changed the port settings, remember to use the new numbers when accessing NetWare Remote Manager.

- ◆ Access the Mail Notification Control page.

From this page you can specify a primary mail server, an alternate mail server, up to eight users in the notification list, and a Mail From identification. You can control which items to be notified about on the Health Monitor page.

- ◆ Access the IP Address Access Control page.

From this page you can limit access to NetWare Remote Manager. You can specify IP addresses for workstations or specify a subnet and subnet mask for ranges of workstations that you want to give access from. Restricting access to specific IP addresses or specific subnets can assist you in securing remote access to your server from NetWare Remote Manager.

For example, if you have static IP addresses (which you could easily assign to the administrator's workstation), use the Allow Access Only from the Following IP Addresses option to control administration access. Only those workstations with a matching IP address can access NetWare Remote Manager.

If you want a little more flexibility in your IP address assignments, such as all IP addresses within a subnet mask range, use the Allow Access Only from the Following IP Subnets option. With this setting, the IP subnet mask and the IP address are compared with a logical AND statement. If the IP address matches the subnet specified, you can access NetWare Remote Manager; if the IP address does not match the subnet, you won't have access.

This approach works well if you are using DHCP to dynamically allocate IP addresses. In this scenario, you might not get the same address every time you call for an IP address. But because the allocated IP address will

fall within the subnet mask range, you will have access to NetWare Remote Manager. But remember, so will all other workstations that fall within the subnet mask range. To prevent people on the Internet or users of other subnets from accessing NetWare Remote Manager, set up your subnet mask so that only IS workstations can use the specified subnet mask.

Accessing Online Help

Online help, which provides detailed information and instructions for using NetWare Remote Manager features, is available for most management tasks and settings. To access the online help, click the Information icon  on the upper-right portion of the page or next to the specific item link.

Accessing Novell Web Pages

Novell Links on the home page (Volume page) provide quick access to the following:

- ♦ [Novell Support Web page \(http://support.novell.com/\)](http://support.novell.com/) links directly to the Novell support Web site where you can get current server patch kits or updates, or locate troubleshooting information. You can also access this link by clicking the word *Novell* in the upper-right portion of the header frame.
- ♦ [Novell Error Codes documentation Web page \(http://www.novell.com/documentation/lg/nwec/docui/index.html\)](http://www.novell.com/documentation/lg/nwec/docui/index.html) links directly to the information about Novell Error Codes: what they mean and possible causes and actions for each.
- ♦ [Novell Product Documentation Web page \(http://www.novell.com/documentation/\)](http://www.novell.com/documentation/) links directly to the product documentation for any shipping Novell product.
- ♦ [Novell Developer Support Web page \(http://developer.novell.com/support/\)](http://developer.novell.com/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.

Customizing the Home Page

You can add text, graphics, and custom links to the home (Volumes) page for NetWare Remote Manager by creating an HTML file named PRTLANNC.HTM and placing it in the server's SYS:\LOGIN directory. Any information in this file appears at the bottom of the home page.

Because this file is included in the HTML code that generates the front page, do *not* include the <body> and </body> tags.

This information is displayed only if you are logged in as a user with the Supervisor right to the Server object, usually user Admin or equivalent.

3

Managing Servers Remotely

This chapter includes instructions for the following tasks:

- ♦ [Viewing General Server Information \(page 23\)](#)
- ♦ [Diagnosing Server Problems \(page 24\)](#)
- ♦ [Managing Servers \(page 32\)](#)
- ♦ [Managing Applications \(page 50\)](#)
- ♦ [Managing Novell eDirectory \(page 60\)](#)
- ♦ [Managing Server Hardware \(page 57\)](#)
- ♦ [Using Server Groups \(page 61\)](#)
- ♦ [Accessing and Managing Other Servers \(page 62\)](#)

Viewing General Server Information

After accessing the server from your Web browser, you can view the following information about the server being accessed from the header frame of the NetWare[®] Remote Manager Web page:

- ♦ Server's name
- ♦ Server's overall health status: green (good), yellow (suspect), red (bad) or black (no connection)
- ♦ Version of NetWare running on the server
- ♦ The name of the user you are logged in to NetWare Remote Manager as

Diagnosing Server Problems

NetWare Remote Manager 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 will help you to become familiar with the health and status of your servers:

- ♦ [Monitoring Server Health \(page 24\)](#)
- ♦ [Profiling CPU Utilization and Accessing Additional Debug Options \(page 28\)](#)
- ♦ [Running and Viewing the Server Configuration Report \(page 30\)](#)

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.

Using NetWare Remote Manager, you can monitor the server's overall health and the health of specific item.

The server's overall health is indicated by the color of the circle displayed next to the server icon in the header frame for NetWare Remote Manager. Green means the server health is good. Yellow means that the server's health is suspect. Red means the server's health is bad or has a problem. If the circle goes black or a message is displayed that the page cannot be found, the connection to your server might be lost.

The server's overall health is determined by items that are selected in the Include list on the detailed Server Health Monitoring page. By default, all items are checked.

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 on the header frame changes to indicate there is a problem. If more than one item changes, the worst status will indicate 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).

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.

Monitoring Specific Health Indicators from the Server Health Monitoring Page

To access the Server Health Monitoring page, click the overall health status indicator or the Health Monitor link in the header frame or click the Health Monitor link in the navigation frame.



The Server Health Monitoring page shows the health status (green, good; yellow, suspect; or red, bad) for all known components of the system, as well as current, peak, and maximum values. When an item is not checked in the Include column, 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 are key indicators of your server's health. You can change the thresholds for the Suspect and Critical values of these indicators.

- ♦ Work to do response time
- ♦ Allocated server processes
- ♦ Available server processes
- ♦ Abended thread count (if the server has abended and recovered automatically)
- ♦ CPU utilization (for each processor, if there is more than one)
- ♦ Available memory
- ♦ Packet receive buffers
- ♦ Available ECBs

Additional items are tracked on the Server Health Monitoring page and are displayed depending on the NLM™ programs that are loaded on the server.

Configuring Health Thresholds

If you have a server that runs differently than normal, you might want to configure the suspect and critical threshold values to something other than the default.

To change the criteria for the suspect (yellow/suspect) and critical (red/bad), status indicators, do the following:

- 1** From the Server Health Monitoring page, click Configure Health Thresholds and then the Description name link for the item you want to change.
- 2** Enter the new Suspect or Critical value and click OK.

Configuring E-mail Notification for Server Health Status

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

When you want to be notified about the status of an item, do the following:

- 1** Check the Notify check box for that item on the Server Health Monitoring page.
- 2** Click the Mail Control Panel link on the Server Health Monitoring page.
- 3** Enter the required information on the Mail Notification Control page and then click Save.

A primary server and at least one user on the notification list is required.

- 4** Reload the PORTAL and HTTPSTK NLM programs from the NetWare Remote Manager configuration page.
 - 4a** Click the Configure link in the header frame.
 - 4b** Click each of the Restart links for restarting PORTAL.NLM and HTTPSTK.

Troubleshooting a Suspect or Bad Health Status

If the health status of your server changes to a suspect or bad state, do the following:

- 1** Access the Server Health Monitoring 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, red or 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.

Monitoring the General Health of a Group of Servers

NetWare Remote Manager lets you build and use server groups. When you build a server group, you can select Health Monitor and Group Operations and then build a Multiple Server Health Monitor page that

- ♦ Shows the overall health for each server in the group according to the key indicators selected for that server
- ♦ Lets you access the specific health page for any of the servers in the group

To build a Multiple Server Health Monitor page, do the following:

- 1 Click the Build Group link in the navigation frame.
- 2 Build the server group.
- 3 On the Server Group Operations page, complete the Health Monitor and Group Operations options.

For a description of the options, see the online help.

- 4 (Optional) If you want to use this server group later, save the group file by clicking the Save Group File button and entering a path and filename for the group. We recommend using a name that represents the group you built.

IMPORTANT: The specified path for the server group file must be a full path on the current server that contains the volume name as the first element. For example:

```
\SYS\Multiple Health Configuration  
VOL1\TEST\HLTHLIST.CFG
```

- 5 Click the Multiple Server Health Monitor button.

To view the Multiple Server Health Monitor page for a server group at a later time, do the following:

- 1** Click the Load Group File link in the navigation frame.
- 2** On the Server Group File page, enter the path or browse to the configuration file for the server group that you previously saved.
- 3** Click the Build Server Group button.

Profiling CPU Utilization and Accessing Additional Debug Options

The Profiling and Debug Information page lets you view information about active and suspended threads, their states, the owning NetWare Loadable Module™ (NLM) programs, and execution times.

To access the Profiling and Debug Information page, click the Profile / Debug link in the navigation frame.

This information can help you identify processes that might be running abnormally on a server, such as processes that use too much CPU time. Processes that run abnormally might cause the server to abend. Sometimes you can temporarily resolve high-utilization problems on the server by identifying the offending thread and its parent NLM, and then unloading and reloading the NLM.

From this page, you can do the following:

- ♦ [View the CPU execution profile data by thread \(default view\)](#)
- ♦ [Access the CPU execution profile data by NLM page](#)
- ♦ [Access the thread information page](#)
- ♦ [Access the Additional Debug Options page](#)

Viewing CPU Execution Profile Data by Thread

When you access the Profiling and Debug Information page, the Execution Profile Data by Thread table is the default view displayed.

The Thread Name column shows the name of the thread being executed. To get more information about a specific thread, click the thread-name link for that thread.

Thread ID and Thread State detailed information is provided mostly to assist code developers in identifying and debugging problems with their code. At the

administration level, this information is usually helpful in identifying problems with a specific NLM or with threads causing the server to hang or run slow.

If the thread was suspended by Abend Recovery, then the information includes details about the thread state at the time it was suspended.

To get information about the NLM program that owns the thread, click the NLM program name.

To profile where a thread is spending its time running, click the Execution Time link for that thread.

Viewing CPU Execution Profile Data by NLM

To view CPU Execution Profile Data by NLM, click the Profile CPU Execution by NLM link on the Profiling and Debug Information page.

In this view, you can see a 1/2-second profile of the server operating system as it is executing, the place where it is executing, and the NLM programs that the processor is spending its time in.

To see where the processor is spending time within a specific NLM, click the link in the Execution Time column for that NLM. For more information about the NLM program, click the name for the program.

If the server is idle, the main NLM programs listed will be LSL.NLM™ and the SERVER.NLM.

The percentage values shown in these tables are a detail of the overall sever's CPU utilization. If Processor 0 utilization is at 10 percent, the information on this page shows the breakdown of that 10 percent utilization.

Viewing Detailed Thread Information

To view a list of all the threads in the system, click the Thread Information link on the Profiling and Debug Information page.

This information is usually helpful in identifying problems with a specific NLM or with threads causing the server to hang or run slow.

To get more information about a specific thread, click the thread-name link for that thread.

Performing Additional Debug Options

If you are developing modules to run on NetWare and you want to access additional debug options, click the Additional Debug Options link on the Profiling and Debug Information page.

On the Additional Debug Options page, you can do the following tasks at the specific location while the server is still running:

- ♦ Profile processor execution
- ♦ Profile calls to a specific procedure
- ♦ Disassemble code
- ♦ Dump memory
- ♦ Dump stack information
- ♦ Profile processor misaligned memory references
- ♦ Profile processor branch taken or not taken mispredictions
- ♦ Profile processor partial register still clocks
- ♦ Profile processor L2 cache misses
- ♦ Profile processor divides
- ♦ Profile processor multiplies

Running and Viewing the Server Configuration Report

Running the server configuration report is especially helpful when you want to compare the configuration of two different servers or have a record of your server setting before making any changes.

This report can also be used by Novell Technical ServicesSM to help you diagnose problems with your server that might be caused by running outdated NLM programs. When you view the report, you can also print and save the report for your network documentation.

This report contains the following information:

- ♦ The contents of all .NCF, .BAT, .CFG, .BAT, ABEND.LOG files
- ♦ A file listing of the boot directory contents (usually C:\)
- ♦ A file listing of SYS:SYSTEM directory contents

- ♦ A list of SET parameters (including Hidden parameters) and current settings
- ♦ A list of all the modules currently running on the server
- ♦ A list of LAN driver configurations
- ♦ Storage device configuration information
- ♦ Volume statistics for volumes SYS: and _ADMIN

To run and view a Server Configuration report, click Run Config Report in the navigation frame and then click View Report on the Server Configuration Report page.

To send this report to someone from the Server Configuration Report page, enter the person's e-mail address in the e-mail address field and then click Send Report.

Before you can Send this report via e-mail, you must set up an e-mail server and complete the required information on the Mail Notification Control page. To access the Mail Notification Control Page, click the Configure icon in the navigation frame and the Access Mail Notification Control Page link on the NetWare Remote Manager Configuration Options page.

To print or save this report, view the report from the Server Configuration Report page and then print or save the results using your browser's features.

Managing Servers

Use the following links in the NetWare Remote Manager navigation frame to accomplish the following server management tasks:

Use this link	To do these tasks
Volumes	◆ Browse the server's file system ◆ View or change File Access Rights Attributes ◆ View details of directories or files and create, rename, or delete them ◆ View an individual file ◆ Upload a file to the server ◆ Download a file from the server to a local workstation ◆ Perform Text Searches ◆ Mount or dismount volumes ◆ Manage Disk Partitions
Console Screens	Access, view, and run the server console screens
Connections	◆ View current connections ◆ Clear specific connections ◆ Clear all not logged in connections ◆ View a list of files in use by any specific connection ◆ Broadcast messages to all users or to a specific user

Use this link	To do these tasks
SET Parameters	♦ View the SET parameter categories ♦ Access each SET parameter by category to view the SET parameter current value and associated help and change the SET value ♦ Save the settings to a text file on volume SYS: ♦ Control whether hidden SET parameters are viewable ♦ View SET parameters with settings that are different from the server default (modified) ♦ View SET parameters with values that have been changed on the server but that will reset to default values when the server is restarted (non persistent)
Schedule Tasks	Schedule server console commands to run at regularly scheduled intervals
Console Commands	♦ View a list of commands that can be executed at the server console and the associated help ♦ Sort the list of console commands by command name or the module that registered the command ♦ Access the Console Screens link to execute any of the commands

Use this link	To do these tasks
View Memory Config	♦ View general information about how your server is using its memory ♦ Access the Swap File Usage Information page where you can view information relating to the virtual memory page swapping system on the server, enable or disable swapping for a volume, and change the parameters for swapping virtual memory ♦ Access the NetWare Loadable Modules Information page where you can view which NLM program is using the most allocated memory ♦ Access the Virtual Memory Health Information page where you can view specific information about the server's virtual memory ♦ Access the Server Memory Pools Summary page where you can view information about each memory pool in the server ♦ Access the Traditional File System Cache Statistics page where you can view cache statistics for the traditional file system
View Statistics	Access and view statistics for the following information: ♦ Network Management ♦ Kernel ♦ LSL ♦ Media Manager
Down / Restart	Shut down, reset, or restart the server

Accessing and Managing Server Volumes and Partitions

The Volume Management page is the home page for NetWare Remote Manager.

You can access this page by clicking the Volumes link in the header frame or under Manage Server in the navigation frame.

The Volume Management page provides a list of the server's volumes, access to the server's DOS partitions, and the ability to perform partition management tasks. From this page, you can do the following:

- ♦ Browse the server's file system
- ♦ View or change file access rights attributes
- ♦ View details of directories or files and create, rename, or delete them
- ♦ View an individual file
- ♦ Upload a file to the server
- ♦ Download a file from the server to a local workstation
- ♦ Perform text searches
- ♦ Mount or dismount volumes
- ♦ Manage disk partitions

Browsing the Server's File System

Using NetWare Remote Manager, you can view the file system on volumes or DOS partitions; browse directories and files; view and change attributes of volumes, directories, and files; delete, create, or rename directories; and delete or rename files.

NOTE: Viewing or changing attributes on an NSS volume is not supported. However, you can view or change attributes of directories or files on an NSS volume.

To browse a volume or partition, click the link for the volume or DOS partition under the Name column.

To move down the tree, click the directory name.

To move up the tree, click the double dots.

To view or download a file, click the filename.

NOTE: The file size column for a directory lists the size of all files in that directory and any subdirectories.

Changing File Access Rights Attributes

Your eDirectory™ rights govern your access to directories and files on NetWare partitions. These rights also regulate your ability to copy files to and from any given directory. To access the server's DOS partition, change, or upload files to the server, you must have Supervisor right to the Server object.

When you browse through files and directories on the server's DOS partition, be aware that setting the Shareable attribute on a DOS file does not have any effect unless SHARE is loaded in DOS.

To view or change attributes of a directory or file from the Volume Management page, do the following:

- 1** Click the volume name link.
- 2** Browse to the directory or file you want to view or change the attributes of. View the attributes in the Attribute column.
- 3** To change the attributes, click the directory or file link under the Attributes column.
- 4** Check or uncheck the check box for the attribute you want to set and then click OK.

Viewing Details of Directories or Files and Creating, Renaming, or Deleting Them

To view the details about a directory, delete a directory and its contents, rename the directory, or create a subdirectory, do the following:

- 1** From the Volume Management page, click the volume name link, browse to the directory, and then click the folder (?) icon to left of the directory name.
- 2** From the information page that is displayed, view the information or enter the information required for the applicable task (if required), and then click the applicable button for the task you want to perform.

To view the details about a file or to delete or rename a file, do the following:

- 1** From the Volume Management page, click the volume, browse the directories to the file, and then click the file (?) icon to the left of the filename.
- 2** From the information page that is displayed, view the information or enter the information required for the applicable task, and then click the applicable button for the task you want to perform.

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 NetWare 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. (This also applies to the files on the server's DOS partition.)

Uploading a File to the Server

If you have rights to write to the current directory that you are viewing via NetWare Remote Manager, you can use the Upload button to copy a file from your local machine or any other mapped drive to that directory. You can upload only one file at a time.

Downloading a File from the Server to a Local Workstation

When you are browsing the server's file system via NetWare Remote Manager, you can download any file to your local machine by clicking the filename and then saving it to your local workstation. (This also applies to the files on the server's DOS partition.)

Performing Text Searches

To do a GREP-type search (accepts GREP wildcard characters) through the files in the current directory or its subdirectories, browse to the directory you would like to search in. Click the Text Search link. Specify the content, filename, or extension you would like to search for and check whether you would like to match the case and search subdirectories. Then click Search.

If the search instructions are valid, the results are display on a page with the search instructions. You can click the filename in the results list to view or download it. If nothing is found, no files will be listed under the search instructions.

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

Mounting and Dismounting Volumes

You can mount and dismount volumes by clicking the link in the Mounted status column for a given volume on the Volume Management page. You will be asked to confirm your choice before the volume dismounts.

You can also click the Mount Volume or Dismount Volume link displayed next to the volume on the Server Disk Partition Operations page.

If you choose to dismount volume SYS:, the icons used by NetWare Remote Manager (which reside in SYS:\LOGIN) might not display correctly. When you remount volume SYS: and reload the page, the icons will display correctly again.

Managing Disk Partitions

To create, change, or delete a logical (NSS) or traditional NetWare Partition Pool or volume, click the Disk Partitions link on the Volume page.

The Server Disk Partition Operations page displays the disk layout according to the physical connections in your server using indentation to indicate where a volume physically resides. You can see the adapters, devices, partitions, pools, and volumes at different levels of indentation. If free space is available for creating a new partition, pool or volume, you can also view it under each device. A link for creating a volume, mirroring a volume, adding a volume, or expanding a pool is displayed next to the devices, pools, or volumes listed.

To create a partition or pool, do the following:

- 1** Locate and click the Create link next to the free space on the device that you want to create the partition on.
- 2** Select the type of partition you want to create by clicking the applicable link.
- 3** Complete the required fields for the type of partition you are creating, and then click Create.

To expand a partition or pool, do the following:

- 1** Locate and click the Expand link next to the pool that you want to expand.
- 2** Select the Free Disk Space / Free Partition Space link with the space available that you want to use.
- 3** Enter the amount of space (in megabytes) that you want to use, and then click Expand.

To create a volume, do the following:

- 1** Locate and click the Create link next to the free space on the device that you want to create the volume on.
- 2** Select the type of volume to create.
- 3** Complete the required fields for the type of pool and volume, or partition and volume you want to create, and then click Create.

To mirror a partition, do the following:

- 1** Locate and click the Mirror link next to the partition you to want to mirror.
- 2** Locate and click a free disk space segment from the list displayed.
The operation will begin, and when it is complete the status “100% mirrored” will be displayed.

On the Server Disk Partition Operations page, you can also view and set the space quota set on each volume.

To change a space quota for a volume, do the following:

- 1** Locate and click the Space Quota link next to the volume you to want to change.
- 2** Click the Volume Space Quota link.
- 3** Enter the value (in megabytes) of the space size you want to specify, and then click Apply.
- 4** Confirm your decision by clicking OK.

Accessing and Running the Server Console Screens

From the Current Screens page, you can access any of the server console screens with the exception of the X Server - Graphical Console.

To access the Current Screens page, click the Console Screens link in the navigation frame.

Running the Server Console Screens from the Java Applet

To run any of the console screens through the browser as though you were at the server console keyboard and view the results, click the Console Screens link on the Current Screens page. Clicking this link runs a Java applet that opens a secondary browser window.

From this secondary browser window you can do the following:

- ♦ Cycle through the screens already loaded at the server console. To do this, click the >> or << button. (This functions the same as pressing Alt+Esc on the server console keyboard.) If you access the System Console screen from the applet window, you can load or unload any necessary module or enter any necessary console command.
- ♦ Display a list of current utilities that are running at the server console and the screens that are active. To do this, click the Screens List button. (This functions the same as pressing Ctrl+Esc on the server console keyboard.)
- ♦ Access any of the screens listed. To do this, enter the screen number at the console prompt or click the Left-or-Right arrow buttons at the top of the page.
- ♦ Display or remove the title of each screen while viewing the screen. To do this, click the Title Bar button. This will toggle the screen title on or off. (This functions the same as pressing Alt on the server console keyboard.)
- ♦ Access the Emergency Console. To do this, click the Emergency Console button on this page. (This functions the same as pressing Ctrl+Alt+Esc on the server console keyboard.) This console can be useful when the server console seems to hang. On the Emergency console, you can abort a volume mount or open a new console screen to issue necessary commands such as unloading modules or shutting down the server.
- ♦ Increase or decrease the font size of the screen displayed. To do this, click the Font+ or Font- button.

Viewing and Running the Console Screen from HTML Pages

Under the HTML Based Screen Pages heading on the Current Screen page, you can see a list of screens that are currently running on the server console.

When you click the link associated with each of these screens, you can view the screen and control the refresh rate only with the Page Refresh Rate drop-down list at the top of the window. The HTML page for the System Console screen also allows you to enter console commands to be executed at the server console.

You can control the refresh rate of the different server pages. Refresh on the System Console page is suspended when you click Execute Command Line.

Viewing Console Activity

You can now view on the Logger screen much of the information that used to be displayed on the System Console screen. This screen is scrollable and can be saved to a file. To access a list of commands for scrolling and saving to a file, press F1 while viewing the Logger screen.

Monitoring Connections to the Server

From the Connection Information page, you can do the following:

- ♦ **View connection information and all current connections**
- ♦ **Clear specific connections**
- ♦ **Clear all not-logged-in connections**
- ♦ **View a list of files in use by any specific connection**
- ♦ **Send a message to all users or to a specific user**

To access the Connection Information page, click the Connections link in the navigation frame.

Viewing Connection Information

The table in the Connection Manager on the Connection Information page displays the following information about connections:

- ♦ **Connection Slots Allocated** displays the number of slots currently allocated for use. As connection slots are required on this server that exceed the current number of slots displayed here, new slots are allocated. Depending on the server's memory, connection slots are usually allocated in blocks of 16. Connection slots are allocated as needed by users, NetWare Loadable Module (NLM) programs, and other services.
- ♦ **Connection Slots Being Used** displays the number of connection slots currently in use. As this number matches or exceeds the Connection Slots Allocated entry, more connection slots are allocated to the connection table.
- ♦ **Signing Level** displays the level at which NCP™ packet signature signing is set on the server. NCP packet signatures prevent packet forgery by requiring the server and the workstation to sign each NCP packet. A higher packet signature number impacts the performance of your server. At some point, the need for security might outweigh certain performance issues.

- ♦ **Login State** displays whether users are allowed to log in to the server. To disable users from being able to log in to the server (for server maintenance or other reasons), enter **DISABLE LOGIN** at the System Console prompt. To allow users to log in to the server, enter **ENABLE LOGIN** at the System Console prompt.

The table under the Connections heading on the Connection Information page displays the following information about connections:

- ♦ **Station** displays the connection number for each connection. Connection 0 is the connection used by the server. The server's operating system uses connection numbers to control each station's communication with other stations. Remote Manager does not distinguish connections that don't count against the server's connection limit.
- ♦ **Name** displays the name of the user, server, service, or login status and links to specific information about that user connection such as the login time, connection number, network address, login status, and files in use.
- ♦ **Clear Connection link** is displayed next to the connection name link for any connection that can be cleared.

Clearing All Not-Logged-In Connections

To clear all user connections that are open but not currently authenticated to the server, click the Clear All “Not Logged In” Connections link on the Connection Information page. The connections cleared can be NLM- or user-based.

You should be careful in clearing NLM-based connections because some backup NLM programs establish a connection during the server initialization process and maintain a Not Logged In connection to the server until it is time to log in and run the backup process. These types of NLM connections will not be able to re-establish a connection to the server unless the NLM is manually unloaded and reloaded at the server console, which might prevent it from functioning properly at the designated time of execution.

If a user reboots a workstation without properly logging out, the server sends a watchdog packet to that workstation to see if it is still communicating with the server. The server continues to send watchdog packets until the workstation logs in again and re-establishes its connection with the server, or until the watchdog drops the connection because of the lack of response from the workstation.

Clearing Specific Connections

If a user's workstation quits working, it usually leaves its connection to the server open and files open. To clear a specific connection like this and others, do the following:

- 1** Click the Connections link in the navigation frame to open the Connection Information page.
- 2** On the Connection Information page, locate the specific connection listed in the Connections table and then click the Clear Connection link next to the connection.

Viewing a List of Files in Use by Any Specific Connection

To view which files a specific connection has open, do the following:

- 1** Click the Connections link in the navigation frame to open the Connection Information page.
- 2** On the Connection Information page, locate the specific connection listed in the Connections table and then click the username link.

Sending Messages to Users

Before you shut down, reset, or restart your server for any reason, you might want to send a message to everyone connected to it.

To send a message to all of the users who are currently logged in to the server through Novell Client™ software, enter the message in the Broadcast Message to Everyone field on the Connection Information page and click Send.

You can enter up to 252 characters and spaces in the message. On Windows-based workstations, the message will appear in a pop-up dialog box at the workstation. Broken connections and users that are not logged in through Novell Client software will not receive the message.

To send a message to a specific user who is currently logged in to the server through Novell Client software, enter the message in the Send Message field on the Connection Information page for that user and click Send.

Viewing or Changing SET Parameters

From the Set Parameter Categories page, you can do the following:

- ♦ View the SET parameter categories

To access the Set Parameter Categories page, click the Set Parameters link in the navigation frame.

- ♦ Access each SET parameter by category to view the current value for the parameter or associated help and change the value

To view a setting for a specific parameter in a category, click the name of the category on the Set Parameter Categories page. To change the value for that parameter, click the parameter value link, change the value, and click OK.

We recommend you keep the settings at the default unless you are aware of the ramification of the changed value.

To view the help for each parameter, click the ? icon next to the parameter value link.

The help description for each parameter describes what the parameter controls, lists the range of values that can be set, shows the NLM program that owns the parameter, and lists the attributes for the file.

- ♦ Save the settings to a text file on volume SYS: to use as a reference

To save the settings to a text file on volume SYS:, enter a filename with the .TXT extension in the Save Setting to a File on Volume SYS: field, and then click Save.

- ♦ Control whether hidden SET parameters are viewable at the System Console prompt or in the SET parameters list in NetWare Remote Manager

To do this, click the View Hidden Set Parameter On or Off button on the Set Parameter Categories page.

- ♦ View SET parameters with settings that are different from the server default (modified)

To do this, click the View Modified Set Parameters button on the Set Parameter Categories page. This list does not include nonpersistent SET parameters. When diagnosing a server problem, you might want to review settings that have been changed from the server default values or compare them against a server that is working well. If you have more than one network administrator making changes to your server, using this feature will help you to know what changes have been made.

- ♦ View SET parameters with values that have been changed on the server but that will reset to default values when the server is restarted (nonpersistent)

To do this, click the View Non-persistent Set Parameters button on the Set Parameter Categories page. Nonpersistent SET parameters are those which are not stored in the NetWare Registry.

If you want the changes to nonpersistent Set parameters to be preserved when the server reboots, you should add a line in the server's AUTOEXEC.NCF file for setting the parameter.

Scheduling Tasks to Run at the Server

Rather than making a batch file to run specific console commands on the server at a certain time, you can use the links and the form on the Scheduled Console Commands page to schedule console commands to run.

To access the Scheduled Console Commands page, click the Schedule Task link in the navigation frame.

To schedule a console command, complete the information in the form and click Submit.

After scheduling a command, you can view and change the scheduled task until you delete the schedule. Any console command is valid and you can enter commands that execute NCF files, load NLM programs, send messages, etc.

To see a list of console commands and the associated help, click the Console Commands link.

To change an already scheduled console command, select it from the list of Currently Scheduled Console Commands, change the schedule, and then click Submit.

To delete a task, select the task from the list of Currently Scheduled Console Commands and click Delete.

Scheduled task lists are stored in the NetWare Registry, so they will be preserved when the server is rebooted.

Viewing Server Console Commands

To view a list of commands that can be executed at the server console, click the Console Commands link in the navigation frame.

To access the server console in order to execute any of these commands from NetWare Remote Manager, click the Console Screens link.

To view specific syntax or help for each command, click the Info icon next to the command. Several of the hidden console commands do not have any help associated with the command.

The default sorting method for this list of commands is by the command name. If you want the list to be sorted by the module that registered it, click the list heading Owner.

Viewing Memory Configurations

Viewing the general information can help you understand how your server is using memory and which programs are using it. Knowing how memory is used can help you determine whether to add more memory to your server to increase server performance or unload specific NLM programs that might be causing memory problems, or change other settings that might allow the server to use memory more proficiently.

To view general memory information, access the System Memory Information page by clicking the View Memory Config link in the navigation frame.

The following table describes each statistic shown on the System Memory Information page.

Statistics	Description
Total System Memory	Total amount of server memory.
Original Cache Memory	Amount of server memory after the NetWare operating system loads and allocates the memory it needs for its resources. The rest of the memory in the system is used for caching purposes.

Statistics	Description
Current Cache Memory	Amount of server memory after memory from the server cache pool is used by kernel NLM programs and virtual memory allocations.
File System Memory	Amount of server memory in use by the directory cache buffers in the traditional NetWare file system.
Reserved Swap Memory	The small footprint of reserved memory that allows the NetWare operating system to point to the physical location of the actual swap file.
Swap File Size	The amount of hard disk space that has been allocated as a virtual memory swap file. If you find that your server is swapping to virtual memory and its performance is suffering because of it, add more memory to the server. To view the swap file usage information, click the Swap File Size link.
NLM Memory	The total amount of memory allocated by the operating system to the NLM programs that are loaded on the server. To view the details of how each NLM program is using memory, click the NLM Memory link.
Virtual Memory Pages	Amount of virtual memory the operating system is using. To view the health information and other statistics for virtual memory, click the Virtual Memory Pages link.
Server Memory Pools Summary link	Accesses the Server Memory Pools page that shows information for all the memory pools on the server.

Statistics	Description
Traditional File System Cache Statistics link	Accesses the Traditional File System Cache Statistics page that shows cache statistics for the traditional file system. NSS cache statistics are not included in these statistics.
Current Memory Usage chart	Shows how NetWare server memory usage is divided between the NetWare server's cache, the virtual memory system, and kernel NLM programs.

Viewing System Statistics

Viewing statistics on your server can help you become familiar with how your server is running at the various levels listed. This information can also help you to know when to turn system alerts on or off. The following links on the Server Statistical Information page allow you to view this information:

- ♦ **Network Management Information link** accesses the Network Management Information page that shows a short list of network management IDs with their corresponding descriptions and current values.
- ♦ **Kernel Statistical Information link** accesses the Kernel Event Counter Information page that shows the number and type of events that occur during a sample period on a per-CPU basis.
- ♦ **LSL Statistical Information link** accesses the LSL Statistical Information page that shows the statistics generated and maintained by the Link Support Layer™ of the NetWare server.
- ♦ **Media Manager Statistical Information link** accesses the Media Manager Information page that monitors requests in the server's disk I/O subsystem (meaning those requests that actually cause access to disk media). File system requests that access the file cache are not monitored. Therefore, it is possible for these statistics to be at zero even when file requests are occurring.

To access the Server Statistical Information page and view these statistics, click the View Statistics link in the navigation frame, and then click the applicable link for the statistic you want to view.

Shutting Down, Resetting, or Restarting the Server

Options for shutting down, resetting, or restarting your server are on the Down Server Options page.

To access the Down Servers Options page, click the Down / Restart link in the navigation frame.

To shut down, restart, or reset (warm boot) the server, click the applicable action on the Down Servers Options page, and then confirm your choice.

Using any of these options makes the server shut down normally by writing all cache buffers to disk, closing all files, updating the appropriate Directory Entry and File Allocation Tables, exiting the network, and dismounting all volumes.

WARNING: If volumes are not dismounted normally, data loss could occur.

Resetting the server makes the server shut down normally and then warm boots the computer. To make the server load automatically after a RESET command and allow access to the server from NetWare Remote Manager, enter a line to run SERVER.EXE in the DOS AUTOEXEC.BAT file.

When the browser loses communication with NetWare Remote Manager, the overall health status indicator will display black with an X through it. When communication is re-established with the server, the normal health status will again display the server's status unless the accessibility options for manually refreshing the server are enabled.

If this page is displayed after a DOWN, RESTART, or RESET command has been issued to the server, you will be given the option to immediately restart or reset the server. This will bypass the normal shutting down of the server and allow you to immediately perform the selected operation.

Managing Applications

When managing applications on your server using NetWare Remote Manager, use the following links in the navigation frame to help you accomplish the following tasks:

Use this link	To do these tasks
List Modules	♦ View resource information about each module loaded on the server or in an address space ♦ Access more detailed information about a module, its flags, resources, and memory allocation as well as a button to unload the module ♦ Load an NLM program on the server ♦ View the search path for loading a module or .NCF file
Protected Memory	♦ Execute an .NCF file to load several modules into the same protected address space ♦ Load specific modules in protected address spaces ♦ View a list of modules loaded in a specific address space ♦ View or change the current memory protection SET parameter settings
System Resources	♦ View all resource tag types in the server operating system ♦ View specific details about each resource

Use this link	To do these tasks
NetWare Registry	♦ View key information from the NetWare registry for this server ♦ View operational information ♦ Run the consistency checker for the registry ♦ Flush the registry
Winsock 2.0	♦ View Winsock 2 NetWare settings and statics ♦ Diagnose and debug Winsock communications problems
Protocol Information	View general and specific information about each protocol running on the server

Managing NLM Programs

To view a list of NLM programs and manage them, access the NetWare Loadable Module Information page by clicking the List Modules link in the navigation frame.

From the NetWare Loadable Module Information page, you can do the following:

- ♦ View a list of all the NLM programs that are loaded on the server or in an address space

The list of all NLM programs that are loaded on the server is the default view on this page.

You can sort the list by module name, code/data size, or memory usage. To do this, click the column heading you want to sort by.

The column totals of this list show how much memory is being used by all of the NLM programs collectively on the system. This information can help you better plan for future memory upgrades to the server.

To access detailed information about a module (flags, resources, memory use details, module dependency list, etc.), as well as an option to unload the NLM program if there are no module dependencies, click the module's name link.

To view the allocated memory summary for an individual NLM program, click the value link in the Alloc Memory column.

This summary indicates how much memory a NetWare Loadable Module has requested from the system and how much it is currently using. This information is valuable in determining whether the module is using too much system memory.

- ♦ Load an NLM program on the server

To do this, enter the name of the module you want to load in the Load Module field and then click the Load Module button. If you want to display the System Console while the NLM program is loading, check the Display System Console for Module Load check box.

- ♦ View the search path for loading modules or .NCF file

To do this, click the Module Load Search Path link. If the module cannot be found, you can change the search path as follows:

- ♦ To add another search path to the bottom of the search stack, enter the following command at the server console:

Search Add *complete_path*

For example: **Search Add SYS:\SYSTEM\EXTRAS**

- ♦ To insert a search path into the middle of the search stack, such as to make a search path the second place that NetWare looks for its files, enter the following command at the server console:

Search Add *number complete_path*

For example: **Search Add 2 SYS:\SYSTEM\EXTRAS**

- ♦ To find out more about using the Search command, click Console Commands and then click the Info icon next to Search.

Viewing and Managing Programs in Protected Memory and Protected Address Spaces

To view and manage programs in protected memory and protected address spaces, access the Address Space Information page by clicking the Protected Memory link in the navigation frame.

From the Address Space Information page, you can do the following:

- ♦ Execute an NCF to load several modules into the same protected address space

To do this, click the Load Modules Protected button. If you want to see the System Console screen while the NLM program is loading, check the Display System Console for NCF Execution check box.

- ♦ Load an individual module into the protected address space

To do this, click the Load Modules Protected button. If you want to see the System Console screen while the NLM program is loading, check the Display System Console for Module Load check box.

- ♦ View information about an address, such as its name, address space, time since last fault, restart count, and the status for Restartable, Unload, Remove, and Restart

If there is a button rather than n/a status in these columns, you can do the following:

- ♦ **Restartable** allows you to change the restart state of that address space.
 - ♦ **Unload** unloads all modules from the address space.
 - ♦ **Remove** removes the address space from the server without running the termination code of modules in that address space.
 - ♦ **Restart** allows you to reload that address space.
 - ♦ View information about modules running in protected address spaces on the server
- To view a listing of all NLM programs loaded in the protected address space, click the name link for that address space.
- ♦ View or change the current memory protection SET parameter settings
- To view the settings, click the Memory Protection Set Parameter link to display the Memory page.

To change a setting, access the Memory page, click the value link for the setting, enter a new value within the specified range, and then click OK.

Viewing System Resources

Resource tags are used to track things like allocated memory, screens, and packet receive buffers. When an NLM program wants to check out or allocate a resource from the system, it passes in a resource tag to the system and the resource tag is updated to show how much of the resource is in use. When the resource is returned to the system, the resource tag is again updated to reflect the change. When an NLM program is unloaded, the resource tags are also used to ensure that the NLM program returned all of the system resources that it was using.

To view the resource tags used by the system, access the System Resource page by clicking the System Resources link in the navigation frame.

From the System Resource page, you can do the following:

- ◆ View a list of all the Resource tags in use at any given time
- ◆ Access the details of a resource

To view the details of a resource, click the resource name.

A list is displayed that is sorted by NetWare Loadable Module (NLM) and then by number in use. The items displayed are a short name for the NLM, the NLM description, the resource tag description, and the amount of the resource that is checked out to that resource tag.

Viewing NetWare Registry Information

The NetWare registry is a database of setup and configuration information that determines how the NetWare server and applications on this server will run.

To view key information from the NetWare registry for this server, view operational information, run the consistency checker, and flush the registry, access the Registry page by clicking the NetWare Registry link in the navigation frame.

Key information shows keys and values for your server, performance, and other dynamic data.

Operational information shows the overall details about the NetWare registry for your server.

If any problems are noted when you run the consistency checker, contact a Novell support provider for actions to take.

Flushing the registry lets you make changes and save them to disk immediately rather than waiting 30 seconds for them to be copied to disk.

Viewing Winsock 2.0 Statistics

Viewing Winsock information can help you understand how the applications on your server are interacting with the Winsock APIs provided in NetWare. Error status conditions are distinguished with yellow and red for quick identification.

To view Winsock resource information, diagnostic and debug information for sockets, information for transport providers and active name space providers, and a small set of general statistics, access the NetWare Winsock 2 Communication Framework page by clicking the Winsock 2.0 link in the navigation frame.

The main content on this page shows the transport providers and active name space providers, and a small set of general statistics as well as the following links:

- ♦ Winsock 2 Resources link

Opens the Winsock 2 Resources page. From this page you can view all the Winsock resources that are currently in use, open sockets, Winsock 2 events, sockets that are used by a particular application, and protocol objects within an active session and the number that are active.

To view a list of Winsock 2 sockets in use, click the Winsock 2 Socket List link.

- ♦ If an error condition exists (indicated by the status being highlighted yellow or red), you might want to view the details of that socket. To view the details of a socket and socket status, click the link for the socket number you want to view on the Winsock 2 Socket list page.
- ♦ To view the details of the error, click the Last Error link in the Detailed Information for Socket Number *x* page.
- ♦ To close an individual socket, click the Close Socket button at the bottom of the socket detail page.

To view a list of all the events used by Winsock 2, click the Winsock 2 Event List link.

- ♦ This list shows the socket number used by the event, the event handle, the wait count, the wait status, the owning thread, and the application that the event is used by.
- ♦ If a socket number is listed, a link to the details page for that socket is provided.
- ♦ The Owning Thread link disassembles the code stack of the thread that created the event.

To view a list of sockets opened by a specific application, click the link for the application in the Winsock Applications list.

To view a list of all the session objects created within this protocol object, click the General WSP Protocol Object link to open the General WSP Protocol Object Session Map page. On this page, you can access links to the upper sessions and lower sessions as well as a link to the socket details page.

To view a list of all the session objects created within the IP protocol, click the IP Protocol Object link to open the IP Protocol Object Session Map page. On this page, you can link to the current session and upper session. Using these links to the sessions, you can map a sockets course throughout all the Winsock layers.

To view a list of all the session objects created within the SSL protocol, click the SSL Layered Protocol Object link to open the SSL Layered Protocol Object Session Map page. On this page, you can link to the current session, upper session, and lower session. Using these links to the sessions, you can map a sockets course throughout all the Winsock layers.

- ◆ **Diagnostics and Debug link**

Opens the Diagnostics and Debug page that shows five resource lists to identify, diagnose, and debug Winsock communication problems: 1) Socket Warning, 2) Session Warning, 3) Socket Waiting, 4) Event Waiting, 5) Session Linger.

From these lists you can follow active links to error or warning conditions on your server.

- ◆ **Toggle Counters ON/OFF button**

Lets you turn on or off the viewing of global counter information gathered in the system and view the number of successes and failures.

IMPORTANT: Toggling counters ON adds significant activity to the server operating system.

For optimal performance, toggle the Winsock diagnostic counts off after you have gathered the information you need.

Turning the counters on adds the following information to the general statistics and adds the Global API Counter link to the page:

- ◆ Bytes Received Successfully
- ◆ Bytes Transmitted Successfully
- ◆ Bytes Not Received Due to Error

- ◆ Bytes Not Transmitted Due to Error
- ◆ Packet Receive Buffers In Use 0
- ◆ Global API Counters link

Opens the Global API Counters page that lists all of the global counter information gathered in the operating system.

Viewing Information about Each Protocol Running on the Server

From the Protocol information page, you can view general and specific information about each protocol running on the server. To access specific information for a protocol, click the link for the protocol. From the specific NCP page, you can enable and disable tracking counters for NCP (NetWare Core Protocol).

Managing Server Hardware

When managing your server hardware using NetWare Remote manager, use the following links in the navigation frame to help you accomplish the following tasks:

Use this link	To do these tasks
Processors	◆ View the status and detailed information about all processors available on the server ◆ Bring a processor on or offline

Use this link	To do these tasks
Disk / LAN Adapters	♦ View information about the storage and network adapters that are installed on the server and the slots they are in ♦ View additional storage adapter information, such as statistical information for the media manager of the server, resources registered, and information for the devices that are controlled by the adapter ♦ View additional network adapter information, such as statistics generated and maintained by the LSL, resources registered and counter information, and frame types and protocols bound
PCI Devices	♦ View a list of Hardware Instance Numbers (HIN) ♦ View the Peripheral Component Interconnect (PCI) configuration space and hexadecimal offset for a HIN
Other Resources	View the resource information that drivers have registered for interrupts and handlers, non-ISA slots, ports, Direct Memory Access (DMA) channels, or shared memory addresses

Accessing Processor Information

Information about the processor speed as well as the local cache sizes is useful in determining how much work a processor can do. To access this information, click the Processors link in the navigation frame to access the Processor Information page.

From this page, you can view the status and detailed information about all processors available on the server.

Many of the profiling operations in NetWare Remote Manager (PORTAL.NLM) require at least a Pentium* Pro processor (family 6 or higher). If the processor is a Pentium III or higher model, the processor serial number is also displayed.

If more than one processor is present, you can stop and start processors individually (except for P0) by clicking the corresponding Stop/Start processor link.

Viewing Storage and Network Adapter Information

To view information about the storage and network adapters that are installed on the server and the slots they are in, access the Hardware Adapter page by clicking the Disk/LAN Adapter link in the navigation frame.

If the driver does not register a slot, it is reported as an ISA slot.

To view additional storage adapter information, use the following links:

- ♦ **Storage Statistics button** displays statistical information for the media manager of the server.
- ♦ **Info link** displays the resources registered for that adapter.
- ♦ **Name link** displays the information for the devices that are controlled by the adapter.

To view additional Network Adapters information, use the following links:

- ♦ **Storage Statistics button** displays the statistics generated and maintained by the Link Support Layer (LSL) of the server.
- ♦ **Info link** displays the resources registered and counter information for that adapter.
- ♦ **Name link** displays the frame types and protocols that are bound to that adapter.

Viewing PCI Device Information

To view a list of Hardware Instance Numbers (HIN), access the PCI Device Information page by clicking the PCI Devices link in the navigation frame.

Each HIN represents a hardware device.

To view the Peripheral Component Interconnect (PCI) configuration space and hexadecimal offset for a HIN, click the specific HIN link.

Viewing Hardware Resource Information

To view the resource information that drivers have registered with the following hardware resources listed, access the Hardware Resource page:

- ♦ Interrupts and handlers
- ♦ Non-ISA slots
- ♦ Ports
- ♦ Direct Memory Access (DMA) channels (if applicable)
- ♦ Shared memory addresses

To access the Hardware Resources page, click the Other Resources link in the navigation frame.

To display the information that the drivers have registered with the server operating system for a specific resource, click the specific resource link.

Managing Novell eDirectory

Walking the eDirectory Tree

From the NDS Tree Walker page, you can view the current eDirectory tree. This page also lets you view details on and delete individual objects in the tree.

WARNING: Be cautious when deleting objects. As an administrator, you can delete any object and you might accidentally delete the Admin object itself. This prevents any access to the system—including administrator access.

Viewing eDirectory Partitions and Replicas

From the NDS Partitions page, you can view information about eDirectory partitions on the server. The information available is the partition or replica name, the type of partition or replica, and the current state and name of the server that the partition or replica exists on.

Accessing Other eDirectory Management Tools

If NDSIMON.NLM is loaded on the server, you can also access the eDirectory iMonitor utility and DS Trace utilities to manage and troubleshoot eDirectory on your server. For more information about iMonitor, see [Novell iMonitor](#) in the *Novell eDirectory 8.6 Administration Guide*.

Using Server Groups

NetWare Remote Manager lets you build server groups and perform operations on those groups. Currently, the only operation you can do with a group is to monitor server health.

To build a group of servers that you want to monitor from one page, access the Server Group Selection page by clicking the Build Group link in the navigation frame.

You must wait a few minutes while NetWare discovers the servers that are available on your network to monitor and builds a selection page.

After the selection page is built, indicate which servers you want to monitor by checking the Select All button or clicking the check box next to each server that you want to include in the group, and then clicking the Build Server Group link. The Server Group Operation Page is displayed.

To build the Multiple Server Health Monitor page, complete the Health Monitor and Group Operations information and then click the Multiple Server Health Monitor button. For more information on monitoring the health of several servers, see [“Monitoring the General Health of a Group of Servers” on page 27](#).

You can save the configuration of the group so you can access this page again without having to complete the configuration options. To save the configuration of the group you have selected and completed the configuration options for, click the Save Group File button.

To access the page at a later time for a server group that you have saved, do the following:

- 1** Click the Load Group File link in the navigation frame.
- 2** On the Server Group file page, enter the path or browse to the configuration file for the server group that you previously saved.
- 3** Click the Build Server Group button.

Accessing and Managing Other Servers

To access other servers in your eDirectory tree that have NetWare Remote Manager loaded, click the Managed Server List link. A list of servers is provided via SLP (Service Location Protocol).

You can also access the file system of servers that don't have NetWare Remote Manager loaded that are in your current tree by clicking the Basic File Access link. Clicking this link loads an additional module called NWRSA (NetWare Remote Server Access) and then lists other servers not running the PORTAL.NLM as reported by SLP in the current server's tree (NetWare 5 and 4 servers only). No health monitoring or other administrative options are available on these servers.

When the list of NetWare servers is first displayed, it might include servers outside the current tree, as reported by SLP. The question mark (?) icon next to the server name indicates that the PORTAL.NLM is checking its availability. The question mark icon changes to a server icon if it is in the current tree. The question mark icon is removed if the server is not in the current tree.

The filtering of the server list might take several minutes if the list is long. To refresh the list, you can reload the page.

4

Troubleshooting Server Problems

You can use NetWare® Remote Manager to troubleshoot some server problems. This chapter includes methods for doing the following:

- ♦ [Finding CPU Hogs \(page 63\)](#)
- ♦ [Finding High Memory Users \(page 64\)](#)
- ♦ [Tracing Abend Sources \(page 65\)](#)
- ♦ [Locating Server Process Hogs \(page 66\)](#)
- ♦ [Locating Disk Space Hogs \(page 66\)](#)
- ♦ [Seeing Who Is Using a File \(page 67\)](#)

Finding CPU Hogs

A CPU hog could be an NLM™ program that is poorly designed or has become corrupted and, as a result, is using up so much of the server's CPU cycles that other NLM programs are not able to run properly.

CPU hog problems are indicated on the Server Health Monitoring page by a suspect or bad status for the CPU Utilization-x indicator.

To track down a CPU hog using NetWare Remote Manager, do the following:

- 1** Under the Diagnose Server heading, click the Profile/Debug link.
- 2** Identify the offending thread and Parent NLM.
 - 2a** In the Execution Profile Data by Thread table, note the thread and the Parent NLM that is taking the longest execution time.
 - 2b** To see which tasks the thread is trying to perform, do one of the following:
 - ♦ Click the execution time link.

- ♦ Click the Execution Profile Data by NLM link and note the execution time and module name for the Parent NLM of the first entry. The first entry will have the highest execution time. Click the Execution time value.
- 3** Identify which part of the NLM program is causing the problem by looking at the Nearest Symbol information.

From here you can trace each procedure including the one that is being called most often (indicated by the highest Call Count).
 - 4** If possible, unload the offending NLM program to see if the problem disappears.

Finding High Memory Users

High memory use problems are indicated on the Server Health Monitoring page by a suspect or bad status for the Available Memory indicator.

To find high memory users using NetWare Remote Manager, do the following:

- 1** Under the Manage Applications heading in the Navigation frame, click the List Modules link.

This displays the NetWare Loadable Modules Information page that shows a list of NLM programs running on the server.

- 2** On the NetWare Loadable Modules Information page, sort the list displayed by allocated memory usage by clicking the Alloc Memory heading.

The NLM program using the most memory will be at the top of the list.

To further track how that module is using memory, you can click the value link in the allocated memory column to display the Allocation Summary page for that NLM program.

This page contains the Allocation Summary L!=P information, links to sort the memory allocation by Resource Tag or size, and a link to display the object cache information.

Tracing Abend Sources

Server abends (abnormal end of a piece of server code) are indicated on the Server Health Monitoring page by a suspect or bad status for the Abended Thread Count indicator.

To trace sources of server abends, do the following:

- 1** Under the Diagnose Server heading, click the Profile/Debug link.

This displays the Profiling and Debug Information page that shows information about active and suspended threads, their states, the owning NLM program, and execution times.

- 2** On the Profiling and Debug Information page, check to see which thread or program has a Suspended by Abend Recovery state and click the thread name link for that thread.

This displays the Thread Information page.

- 3** From the Thread Information page, view the Suspend Description field.

This information should tell you what the thread experienced and when. You will also be able to see a listing of Registers, Code Executed, and Stack information that the server was executing at the time the thread suspended.

If the thread was suspended by the Abend Recovery process, the state of the thread at the time of the abend is displayed, along with the reason for the abend and the code that was being executed at the time.

- 4** Click the stack address and perform some basic stack tracing (if you are familiar with interpreting assembly code).

You can use this information to look at the NLM information that is associated with the thread that had the problem. This can help you determine whether the NLM itself is having a problem or whether it is having a problem only when certain other NLM programs are running.

- 5** If possible, unload the NLM to see if the problem disappears.

Locating Server Process Hogs

Server process hogs (or NLM programs that use a lot of server processes) are indicated on the Server Health Monitoring page by a suspect or bad status for the Available Server Processes indicator.

To find server process hogs, do the following:

- 1** Under the Diagnose Server heading, click the Profile/Debug link.

This displays the Profiling and Debug Information page that shows information about active and suspended threads, their states, the owning NLM program, and execution times.

- 2** On the Profiling and Debug Information page, click one of the thread name links that has a Delayed status.

This displays the Thread Information page.

- 3** From the Thread Information page, view the Suspend Description field.

This information should indicate what method the thread last used to yield the processor. A short trace of stack information that the server was executing at the time the thread suspended is also displayed.

- 4** Click the stack address and perform some basic stack tracing (if you are familiar with interpreting assembly code).

You can trace the service process that is in use by the NLM to see how it is actually using the process and you can look at the stack and see what the thread is using the service process for.

Locating Disk Space Hogs

To locate disk space hogs (traditional volumes only), do the following:

- 1** Under the Manage Server heading, click the Volumes link.

This displays the Volume Management page that shows the volumes and local server partition information.

- 2** On the Volume Management page, click one of the volumes listed.

This displays a list of all the subdirectories and files that are on that volume.

- 3** Sort the listing by disk space usage by clicking the Size heading. The highest user will be at the top of the sorted list.

Seeing Who Is Using a File

When you receive a message that a file has been locked, you can find out who is using that file by doing the following:

- 1** Under the Manage Server heading, click the Volumes link.

This displays the Volume Management page that shows the volumes and local server partition information.

- 2** On the Volume Management page, click the volume name link and browse to the file.

This displays a list of all the subdirectories and files that are on that volume.

- 3** When you have located the file, click the ? icon to the left of the filename.

This displays the information page for this file, which shows the file lock information by connection. You can then send a message to the user or clear the connection for the user.

- 4** Do one of the following:

- ♦ To clear the connection, click the Connections link, locate the connection that has the file open, and then click the Clear Connection link for that user.
- ♦ To send a message to the user, click the username link in the File Lock Information by Connection table on the information page for the file, enter a message in the Send Message field, and then click Send.

