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NETWARE REMOTE MANAGER
ADMINISTRATION GUIDE

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About This Guide

This guide describes how to access and use NetWare® Remote Manager. The majority of this guide is intended for network administrators. A few options for end users are also explained. This guide includes information to assist you with the following:

- Overview for NetWare Remote Manager (page 5)
- Accessing NetWare Remote Manager (page 11)
- Managing Servers Remotely (page 19)
- Troubleshooting Server Problems (page 61)

Documentation Conventions

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

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

1 Overview for NetWare Remote Manager

NetWare® Remote Manager (portal.nlm™) is a browser-based utility that you can use to manage your NetWare servers from any network workstation running Netscape* 4.5 or later, or Internet Explorer 5 or later.

NetWare Remote Manager provides most of the functionality of Monitor, along with some functionality of other utilities available at the server console; however, NetWare Remote Manager makes this functionality 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.

New Paragraph - Describe other remote management utilities available in NetWare 6.1 (such as RConsoleJ) and when I would want to use NRM rather than these utilities and describe when I might need to use something else.

This section explains the following:

- Benefits of Using NetWare Remote Manager (page 5)
- What's New (page 7)
- What's Next (page 10)

Benefits of Using NetWare Remote Manager

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

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

Long Description: NetWare Remote Manager layout indicating the location of the Navigation, Header, and Main Content frames and the location of the Overall Health indicator and Online Help icon

Overall Health Indicator | Header Frame | Online Help | Navigation Frame | Main Content Frame
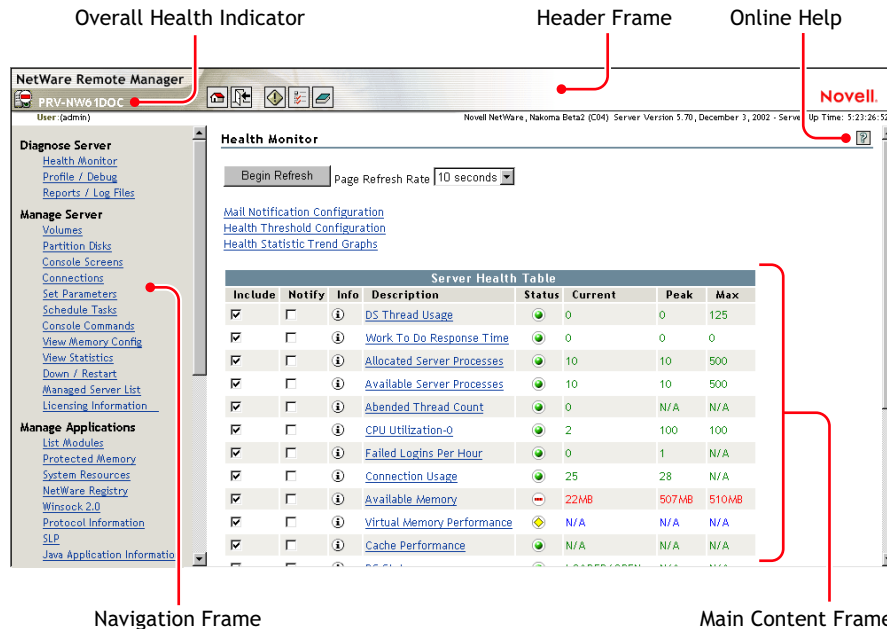
The management power and flexibility now available simplifies network administration and allows fewer staff to effectively manage more resources. NetWare Remote Manager provides the following advantages:

* Securely access and manage a NetWare server from any location. With proper login credentials and Internet access, administrators can control servers from any location.

* Group servers for collective management. Manage multiple servers through the same interface and application.

* Quickly locate and assess problems. An intuitive graphical user interface provides a control dashboard with indicators for server health and status.

* Manage servers comprehensively. NetWare Remote Manager provides complete control for managing NetWare servers, volumes, applications-access to everything needed for comprehensive server management.

While using NetWare Remote Major, you can perform the following major tasks.

Monitor and manage your server's health by

* Monitoring the health status of one or more servers.

* Building a group of servers that you can perform group operations on.

* Accessing Novell® eDirectory™ health and troubleshooting tools.

* Accessing server and configuration logs.

Configure your server by

* Managing disk partitions.

* Accessing any server console screen.

* 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.
- Running and viewing inventory reports for one or more servers.
- Finding high memory users.
- Tracing abend sources.
- Locating server process hogs.
- Finding disk space hogs.
- Seeing who is using an open file.

When you have other utilities loaded on the server, you can perform additional functions such as:

- Manage and monitor Novell Cluster services™
- Monitor IPP print service health
- Manage IP addresses and filtering
- Monitor Novell licenses

What's New

In this release, we have updated the interface for NetWare Remote Manager to make it look and work like other utilities in NetWare 6.5.

New features added to this release include the ability to

- Access and run the server GUI screens from the Console Screens link.

  All server screens can now be accessed from the Console Screens link including the Server GUI screen (X Server -- Graphical Console).

  For more information on accessing the console screens, see "Accessing and Running the Server Console Screens" on page 39.

- Allow limited access to your server for debugging by enabling a special debug user.

  For more information, see "Changing the Configuration of NetWare Remote Manager Views and Settings" on page 14.

- Configure NetWare server groups and perform similar operations on them from one location or run reports to collect data from multiple servers. (Beta 2,3)

  In this release, you can perform the following tasks on servers in the same tree that are running NetWare Remote Manager:

  - Configure server groups or collections and add monitoring items
  - Synchronize the Sadmin and Sdebug user password

- Synchronize e-mail settings for the mail notification page.

- Synchronize NetWare Remote Manager Health Item thresholds or configuration

- Compare server Set parameters

- Compare the modules running on each server

- Compare storage space, size, usage, and etc.

- Add additional monitor items such as the ability to ping a remote server or download a Web page.

In previous versions of NetWare Remote Manager, part of this functionality was in the Use Server Groups category.

For more information, see "Using Groups Operations" on page 55.

- Add a custom disclaimer or a text screen to be displayed and approved by the user before logging in to NetWare Remote Manager. (Beta 1)

For instructions, see "Setting Up a Customized Disclaimer or Text Screen" on page 11.

IMPORTANT: In this Beta version, this page does not display correctly in the server browser.(Check for limitations after beta 2)

- Do the following to volume, directories, or files:

  - Inventory volumes, directories, or subdirectories. (Beta 1 and Beta 2)

    With this feature, you can inventory servers, volumes, directories, or subdirectories as well as view graphs, profiles, reports and keys statistics about each of these items including space usage trends. With a few clicks, you get available space trend graphs; profiles for file types, last accessed, last modified, creation time, and file size; and links to specific reports for each of these.

    You can also customize the scan to look for specific file information.

    For more information, see "Inventorying Servers, Volumes, or Directories" on page 34.

  - Rename or delete files on the server's DOS partition (Beta 1 and 2)

  - Modify dates and times on files or directories (Beta 2)

  - Edit simple text files (Beta 2)

    For instructions, see "Viewing Details of Directories or Files and Creating, Editing, Renaming, or Deleting Them" on page 33.

  - Perform file searches at volume or subdirectory levels and perform additional file management functions.

    For more information, see "Searching for Files" on page 36.(Beta 2)

  - Perform text searches in subdirectories as well as current directories. (Beta 1)

    In addition to text searches in a current directory, you can now search in subdirectories as well. For more information, see "Searching for Text in Files" on page 37.

- Locate and select an eDirectory object by browsing to add the object as a Trustee rather than having to know and enter the object's full distinguished name in the User Name field. (Beta 1)

For instructions, see "Viewing and Changing Trustee Assignments and Inherited Rights Filters" on page 32.

- Do the following regarding server health:

- Restore the default threshold values for the all operations listed or access a specific operation and restore the default values for the specific operation.

  You can also configure a trigger to delay the time before the health status changes the traffic light for the overall health monitor.(Beta 2)

  For instructions, see "Configuring Health Thresholds" on page 21.

  ◆ Track failed logins in Server Health. (Beta 2)

  For instructions, see "Monitoring Specific Health Indicators on the Health Monitoring Page" on page 20.

  ◆ Change the rollover size of server health logs and HTTP logs and alarms or errors that are logged. (Beta 2)

  For instructions, see "Changing the Configuration of NetWare Remote Manager Views and Settings" on page 14.

  ◆ Run a trustee report for a volume. (Beta 2)

  For instructions, see "Generating, Viewing and Sending a Server Security Report" on page 26.

- Track system memory usage information easier:

  The following NSS cache statistics: Cache Balance Percent, Cache Hits, Cache Misses, Cache Hit Percentage, Cache Buffers, and Cache Pages Allocated have been added to the File System Cache Statistics page.(Beta 1, Beta 3)

  The View Memory Config page now shows the physical and virtual memory usage actual and peak usage statistics and the pie chart matches the statistics shown.

  For details, see "Viewing Memory Configurations" on page 45.

- View Service Location Protocol (SLP) settings and reports. (Beta 1)

  Rather than using the Display SLP commands at the server to view and manage your SLP configuration, you can view and manage it using the links on the Service Location Protocol page.

  For instructions, see "Managing Applications" on page 48.

- View additional hardware information:

  ◆ View USB statistics information (Beta 2)

  For instructions, see "Viewing USB Device Information" on page 53.

  ◆ View SMBIOS Information (Beta 2)

  For instructions, see "Viewing SMBIOS Information" on page 53.

  ◆ Configure multiple network boards for the same SCSI disk channel. This allows the hardware to failover to an additional network board in cases where a board fails. (Beta 2)

  (I need to research and provide instructions.)

- Access other network and server management tools.(Beta 3)

  If iManager is installed, configured, and running on the server, you can access it quickly by clicking the iManager icon in the Header frame.

  The Welcome to NetWare 6.5 page has links to other management tools accessible from a browser. You can access this page, by click the NetWare Web Manager icon in the header frame.

What's Next

Now that you have learned some of the benefits of using NetWare Remote Manager, use the following information to help you access and use it.

For Information About	See
Accessing, understanding the layout, and configuring NetWare Remote Manager	Chapter 2, "Accessing NetWare Remote Manager," on page 11
Using NetWare Remote Manager to monitor and manger your NetWare servers	Chapter 3, "Managing Servers Remotely," on page 19
Using NetWare Remote Manager to troubleshoot server problems	Chapter 4, "Troubleshooting Server Problems," on page 61

2 Accessing NetWare Remote Manager

This section includes the following information:

System Requirements

- NetWare® 5.1 or later

- Netscape* 4.5 or later (font set at 100% or lower), or Microsoft* Internet Explorer 5 or later (font text set at medium or smaller)

- The portal and httpstk NLM™ programs loaded on the server. These files are loaded by default in the autoexec.ncf file.

Setting Up a Customized Disclaimer or Text Screen

If you want to require users to view information specific to your company or server before they log in to NetWare Remote Manager, you can set up a custom disclaimer page or text screen that they will be required to view before logging in to NetWare Remote Manager.

To add a customized disclaimer or text screen:

1 Access the sys:\login\prtltxt.htm file.

2 Change the template text to a message of your choosing.

3 Rename the file to prtldisc.htm.

If you implement the custom disclaimer or text screen (sys:login\prtltxt.htm) for the NetWare Remote Manager login, it does not display correctly in the server browser.

Accessing NetWare Remote Manager

To access NetWare Remote Manager:

1 Open the Web browser at your workstation.

2 Point the browser to the URL of the server you want to manage by typing the following in the address (URL) field:

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

For example:

`http://137.65.123.11:8008`

The default alternate port number is 8008. If you have changed this value on the Configuration page, make sure you specify the same value for the port number here.

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 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 with the exception of being able to set a Simple Password for NFAP on the NFAP Simple Password Management page (if this is set up on the server). You can access this page by clicking the User Tools icon in the header frame and then clicking the NFAP Security link in the navigation frame.

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

Accessing and Running the Server GUI Screen from NetWare Remote Manager

Accessing and running the Server GUI screens from the Console Screens link in NetWare Remote Manager from more than one workstation requires you to configure the server GUI environment. The default configuration allows access from at least one workstation at a time.

To configure the Server GUI console for access through the NetWare Remote Manager for more than one workstation:

1 At the GUI screen on the server console, click Novell > Settings > GUI Environment.

2 At the XSetup screen, click Advanced.

3 Check the Enable Remote GUI Session Access check box.

4 (Optional) Move the Maximum Simultaneous Viewers slider to a number greater than one.

> **NOTE:** You only need to do this if you want more than one workstation to access this screen at the same time.

5 Click Apply, then click OK.

6 Click OK to restart the GUI.

Logging Out of NetWare Remote Manager

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).

Long Description: NetWare Remote Manager layout indicating the location of the Navigation, Header, and Main Content frames and the location of the Overall Health indicator and Online Help icon
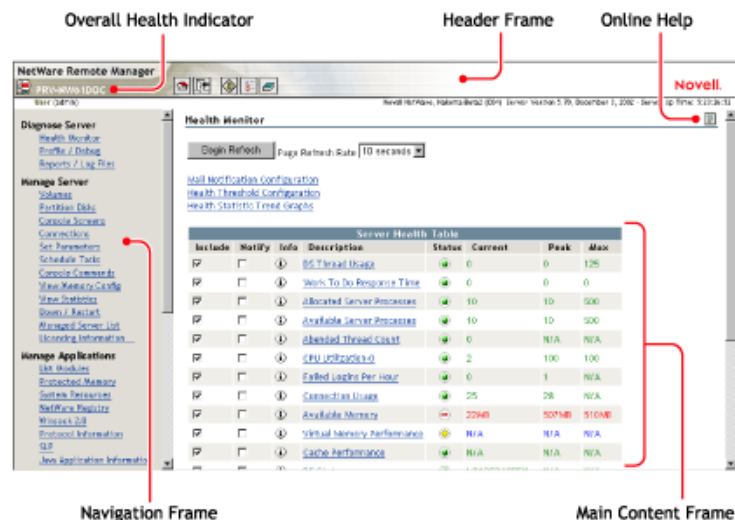
Header Frame

Contains general information about the server as well as links to the Volumes, Health Monitor, Configuration, and Report/Log pages and an Exit link to close the browser window. The Volumes page is considered the Home page.

Navigation Frame

Lists general tasks that you can do using NetWare Remote Manager as well as 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.

Main Content Frame

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

Overall Health Indicator

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

Online Help

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

Changing the Configuration of NetWare Remote Manager Views and Settings

Access the NetWare Remote Manager Configuration Options page by logging in to the server as a user with the Supervisor right to the Server object, and then clicking the Configure icon in the header frame.

Description: Icon to access the NetWare Remote Manager Configuration Option page

On 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.

- Enable or disable the Debug (SDebug ser) account and set, change, or clear the password for this account.

If you need assistance in debugging your server, you can enable and set the password for the SDebug User object to let the person log in to your system as this user rather than as user Admin or as a user with equivalent rights. The SDebug user will have all the rights necessary to look at your system but will not be able to make unwanted changes to your system or view confidential or sensitive information.

IMPORTANT: This user is not enabled by default.

This user *cannot* perform the following tasks:

- Partition disks operations.

- Access the server console (but does have access to the console logs).

- Schedule tasks.

- Load new modules.

- Access eDirectory™ through the tree walker to create users, groups, or assign trustees.

- Change the password for the Debug account.

When the person has completed the debugging tasks needed, you can then disable the account and clear the password.

To use the debug account after it has been disabled, you must enable the user again.

- View Server Health Log and Control Logging Functions and Log Sizes

The Server Health log lets you view all the changes to the health status of the server. The file is located in the sys:system directory on the server.

Using this reports combined with several of the health statistics and trend reports can be useful in diagnosing server problems.

To	Do This
View the current Server Health log	Click the View button next to View Current Server Health Log.
Clear the log	Click the Reset button for the Reset Current Server Health Log File option.
Change whether alerts are sent to the log or not	Toggle the Log Health Alerts to Log File options setting by clicking Yes or No.
Change the size of the log from the default size of 8 MB	Type the new value in the Server Health Log File Rollover Size field and click Apply.

- View HTTP Log and Control HTTP logging.

    When instructed by Novell Technical Services℠, 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.

◆ Access the IP Address Access Control page.

From this page you can limit access to NetWare Remote Manger. 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.

◆ Access the Mail Notification Configuration 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.

◆ 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.

IMPORTANT: Unloading portal.nlm or httpstk.nlm on the Configuration Options page is the preferred method for unloading and reload these NLM programs rather than unloading and reloading from the System Console screen. The functionality provided with this feature keeps track of the plug-in modules that have dependencies with these NLM programs and will unload and reload all the required modules.

If you just unload portal.nlm or httpstk.nlm at the server console, you might run into issues with module dependencies (such as timesync, libc, tcpstats, nwusage, etc.) that have be that have been established, and the NLM might not unload. If you successfully unload the modules, the dependent, plug-in modules have to be loaded manually after portal.nlm.

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 ? help 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) 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) 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) links directly to the product documentation for any shipping Novell product.

- Novell Developer Support Web page (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 section includes instructions for accomplishing the following tasks:

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 overall health status: green (good), yellow (suspect), red (bad) or white with black X (no connection)
- Server's name
- The name of the user you are logged in to NetWare Remote Manager as
- Version of NetWare running on the server and the amount of time the server has been running.

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

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. The follow table lists and explains each health status that might be displayed.

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

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

Therefore, if you have a server that has specific parameters that you know will cause a suspect or bad status to be shown and you want to be notified if other parameters have changed, you might want to remove the suspect or bad parameters from the Include and Notify lists.

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.

You can also view the changes of status in the Server Health Log.

Monitoring Specific Health Indicators on the Health Monitoring Page

The 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:

- 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)

- Failed logins per hour

- Available memory

- Packet receive buffers

- Available ECBs

- Available disk space

You can change the thresholds for the Suspect and Critical values of these indicators individually or restore the defaults for all these parameters at one time. See Configuring Health Thresholds (page 21).

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

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

- Overall server health status indicator

- Health Monitor icon link in the header frame

- Health Monitor link in the navigation frame

Configuring Health Thresholds

If you have a server that runs differently than normal, you might want to configure the suspect and critical threshold values for Health Thresholds to something other than the default or change the amount of time before the trigger occurs. After changing setting, you can also restore all setting to the default values.

Restoring Settings

To restore all the settings to the default values after changing them, click Health Monitor > Threshold Configuration > Restore All Defaults.

Changing Criteria for Suspect or Critical Health Indicators

To change the criteria for the suspect (yellow/suspect) and critical (red/bad), status indicators for a specific operation:

1 On the Health Monitoring page, click Threshold Configuration and then the Description name link for the item you want to change.

2 Enter the new Suspect or Critical value and click OK.

3 (Optional) If you want to change both the values back to the default setting, click Restore Default Values > OK.

Changing Suspect or Critical Status Indicator Triggers

To change the amount of time before the value changes the status for the suspect (yellow/suspect) and critical (red/bad), status indicators for a specific operation:

1 On the Health Monitoring page, click Threshold Configuration and then the Description name link for the item you want to change.

2 Enter the new Suspect or Critical trigger delay value and click OK.

3 (Optional) If you want to change both the values back to the default setting, click Restore Default Values > OK.

Viewing Statistics Trend Graphs

The Statistics Trend Graphs let you select and create specific server statistics trend graphs for the statistics and duration listed. The graphs can cover from the last minute up to the total time the system has been up, depending on the duration you select.

After changing the server configuration or hardware, you might want to reset the data you gather.

All the graph data is saved to files in sys:system with a .tdf extension. These files use minimal disk space compared to the value they provide.

For information about the trends you notice and actions to take, see the online help.

To	Do This
View the health statistics trends for your server	Access the Statistic Trend Graph page by clicking the Health Monitor or View Statics link in the navigation frame and then clicking the Statistics Trend Graphs link on either of these pages.
Determine which graphs you want to view and the duration for the trend	Use the Statistic Trend Graph page.
View one or more graphs:	Check the check box for each statistic and duration you want to view, and then click Draw Selected Graphs.
	A graph will be drawn for each check box you select.
	If you select durations of an hour or more, an average as well as a maximum value for each statistic is shown. The maximum value is always the top line of the graphs.
	If you select durations of a week or a month, each graph also has links to display statistics for specific days or weeks depending on the duration you first selected.
	The All Data column shows data for each statistic since portal.nlm was started on your server or the Reset button was clicked for a specific item. If the server is shut down, the statistics are still tracked and recorded as 0.
Clear all the check boxes and start determining what you want to view again	Click the Reset button at the bottom of the selection table.
Reset the data for a specific statistic	Click the Reset button at the end of the row for that statistic.
Reset the data for all statistics	Click the Reset button for each of the statistics.
Draw your own customized graph	View the raw data for the graph by clicking the View Hourly Raw Data link, and then copy and paste the numbers into a spreadsheet/graphing application.

Configuring E-mail Notification for Server Health Status

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

Setting Notications for Health Item Status

1 Check the Notify check box for that item on the Health Monitoring page.

If you want to receive an abend log by e-mail when the server has abended, click the Notify check box for the Abended Thread Count item on the Health Monitoring page.

2 Click the Mail Notification Configuration link on the Health Monitoring page.

3 Enter the required information on the Mail Notification Configuration page and then click Save.

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

4 Reload the httpstk NLM program on the NetWare Remote Manager Configuration page.

4a Click the Configure link in the header frame.

4b Click the Restart link for restarting httpstk.

Check with Del and add information about the multiple server configuration if when it is complete (beta 3)

Troubleshooting a Suspect or Bad Health Status

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

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

1 Access the 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.

You can also track the status of each health item that changes in the Server Health Log.

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.

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.

Accessing the Profiling and Debug Information Page

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

From this page, you can do the following tasks:

- 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.

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	Do This
Get more information about a specific thread	Click the thread-name link for that thread
Get information about the NLM program that owns the thread	Click the NLM program name
Profile where a thread is spending its time running	Click the Execution Time link for that thread. This will list the nearest symbols and might help identify the component that is using an unusually high volume of CPU cycles.

Viewing CPU Execution Profile Data by NLM

In CPU Execution Profile Data by NLM 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.

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.

To	Do This
View CPU Execution Profile Data by NLM	Click the Profile CPU Execution by NLM link on the Profiling and Debug Information page.
See where the processor is spending time within a specific NLM program	Click the link in the Execution Time column for that NLM. For more information about the NLM program, click the name for the program.

Viewing Detailed Thread Information

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

To	Do This
View a list of all the threads in the system	Click the Thread Information link on the Profiling and Debug Information page
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

Generating, Viewing, and Sending a Server Configuration Report

Generating 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 Services℠ 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	Do This
Generate and view a Server Configuration report	Click Reports / Log Files in the navigation frame and then click View Config Report on the Reports / Log Files page.
Send this report to someone from the Reports / Log Files page	Enter the person's e-mail address in the e-mail address field and then click Send Config Report.
	Prerequisites for Sending a report via e-mail are:
	1. Set up an e-mail server
	2. Complete the required information on the Mail Notification Configuration page
	3. Restart the httpstk.nlm on the Configuration Options page
Access the Mail Notification Configuration Page	Click the [icon] Configure icon in the navigation frame and the Access Mail Notification Configuration Page link on the NetWare Remote Manager Configuration Options page.
Print or save this report	View the report on the Report / Log Files page and then print or save the results using your browser's features.

Generating, Viewing and Sending a Server Security Report

Generating the server security report is helpful when you want to track potential security risk on a server. This report shows only the information that the logged-in user is allowed to view; so to receive a report with the most helpful information, run it when you are logged in to the server as user Admin or a user with rights equivalent to Admin.

From this report, a user with the same rights as user Admin can track the following:

- Trustee assignments for each volume

  Granting a user privileges at the root directory of a volume gives that user privileges to the entire volume unless those rights are specifically revoked at a lower level. You should be especially cautious about granting the Access Control right in a root directory. Users with the Access Control right can grant themselves all other rights in any subdirectory on the volume.

You can improve network security by granting each user privileges only to the specific directories he or she uses.

- Trustee assignments for each common folder on volume sys:

  Users or objects should have only limited access, such as Read and File Scan rights, to common directories on volume sys: such as public and login.

- Security information for each protocol loaded on the server

  For example, for the IP protocol, you will see the IP addresses for the server, the DNS name, and a list of open ports on the server and NLM programs that use those ports.

  NetWare Core Protocol (NCP) information shows the protocols bound to the server and the addresses they use as well as connection information for each connection to the server.

  Common Internet File System (CIFS) information shows the server name, where authentication is, the name of the workgroups, and whether Oplocks or ASync has been disabled.The security report also shows Share Points on the server and session information for each connected workstation.

- A list of users that have security equivalence to user Admin

  As the number of users with rights equivalent to user Admin increases, your security risks multiply. Any time a user with rights equivalent to user Admin is unattended, anyone can gain access to the server.

- A list of users and a list of several parameters related to security that you might want to track (such as password required, uniqueness, minimum length and expiration information, and grace login limit and remaining settings)

  A secure network is hard to maintain if an object has a password that is easy to guess.

  To enforce good security on your network, you should require your users to have a password that is unique, that exceeds five characters, and that expires at least every 60 days or less.

  You can achieve additional security by setting a grace login limit.

Have Deb edit changes in the prereq in the 2nd row.

To	Do This
Generate and view a NetWare Server Security report	Click Reports / Log Files in the navigation frame, and then click View Security Report on the Reports / Log Files page
Send the NetWare Server Security report to someone from the Reports / Log Files page	Enter the person's e-mail address in the e-mail address field, and then click Send Security Report. Prerequisites for Sending a report via e-mail are: 1. Set up an e-mail server. 2. Complete the required information on the Mail Notification Configuration page. To access the Mail Notification Configuration Page, click the ⊞ Configure icon in the header frame and the Mail Notification Configuration link on the NetWare Remote Manager Configuration Options page. 3. Restart the httpstk.nlm on the Configuration Options page.
Print or save the NetWare Server Security report	View the report on the Reports / Log Files page, and then print or save the results using your browser's features.

Generating, Viewing, and Sending a Server Inventory Report

Generating a server inventory report lets you view important information about the server's volumes, directories, or subdirectories and lets you view graphs, profiles, reports and keys statistics about each of these items including space usage trends. With a few clicks, you get Available space trend graphs, profiles for file types, last accessed, last modified, creation time, file size, and links to specific reports for each of these.

You can also customize the scan to look for specific file information.

Generating this report can take a while, so the file is automatically saved on the server so you can generate the report and view it later.

To	Do This
Generate and view a NetWare Server Inventory report	Click Reports / Log Files in the navigation frame, and then click View Inventory Report on the Reports / Log Files page
Send the NetWare Server Inventory report to someone from the Reports / Log Files page	Enter the person's e-mail address in the e-mail address field, and then click Send Inventory Report. Prerequisites for Sending a report via e-mail are: 1. Set up an e-mail server. 2. Complete the required information on the Mail Notification Configuration page. To access the Mail Notification Configuration Page, click the ⬚ Configure icon in the header frame and the Mail Notification Configuration link on the NetWare Remote Manager Configuration Options page. 3. Restart the httpstk.nlm on the Configuration Options page.
Print or save the NetWare Server Inventory report	View the report on the Reports / Log Files page, and then print or save the results using your browser's features.

Viewing and Managing Other Server Logs

Several other logs are available for viewing and managing on the Reports /Logs Files page.

- Server Personal Log Book at sys:system/nrmusers.log

  Use to enter and track changes made to the server or to log any other information you desire in order to track server performance or history.

- System Error Log File at sys:system/sys$log.err

  Use to view alert messages and other system operation information that is sent to the System Console and Logger screens.

- Abend Log File at sys:system/abend.log

  Use view information about all abends that have occurred on the server.

- Server Health Log File at sys:system/health.log

  Use to view all changes in the health status of the server. Using this reports combined with several of the health statistics and trend reports can be useful in diagnosing server problems.

Each of these logs is started automatically when you start your server.

To	Do This
Clear a log and start recording new information in any of these logs	Click the Clear link next to the log that you want to restart.
Print or save any of these reports	View the report on the Reports / Log Files 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
	◆ Mount or dismount volumes
	◆ Monitor disk space usage
	◆ Download a file from the server to a local workstation
	◆ Searching for files
	◆ Searching for text in files
	◆ Set or remove disk space restrictions
	◆ View an individual file
	◆ View details of directories or files and create, edit, rename, or delete them
	◆ View or change file access rights attributes
	◆ View or change trustee assignments and Inherited Rights Filters
	◆ Upload a file to the server
Partition Disks	Manage disk partitions
Console Screens	Access, view, and run the server console screens
Connections	◆ Broadcast messages to all users or to a specific user
	◆ Clear all not logged in connections
	◆ Clear specific connections
	◆ View current connections
	◆ View a list of files in use by any specific connection

Use this link	To do these tasks
Set Parameters	◆ Access each SET parameter by category to view the SET parameter current value and associated help and change the SET value
	◆ Control whether hidden SET parameters are viewable
	◆ Save the SET parameter settings to a text file on volume Sys:
	◆ View the SET parameter categories
	◆ 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	◆ Access the Console Screens link to execute any of the commands
	◆ Sort the list of console commands by command name or the module that registered the command
	◆ View a list of commands that can be executed at the server console and the associated help
View Memory Config	◆ Access the List Modules page (NLM Memory link) where you can view which NLM program is using the most allocated memory
	◆ Access the File System Cache Statistics page (File System Cache link) where you can view cache statistics for the NSS or traditional file system
	◆ Access the Virtual Memory Health Information page (Used By Virtual Memory System link) where you can view specific information about the server's virtual memory including swap file information, virtual memory cache pool information, and virtual memory statistics.
	◆ Access the Server Memory Pools Summary page (Total System Memory link) where you can view information about each memory pool in the server
	◆ View general information about how your server is using the physical server memory
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
Managed Server List	Access other servers in your eDirectory tree that have NetWare Remote Manager loaded.

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 [Home icon] Home icon (Volumes) link in the header frame or Volumes link 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
- Download a file from the server to a local workstation
- Inventory servers, volumes, and directories
- Mount or dismount volumes
- Monitor disk space usage
- Search for specific files
- Search for text in files
- Set or remove disk space restrictions
- View or change file access rights attributes
- View or changing trustee assignments and Inherited Rights Filters
- View details of directories or files and create, edit, rename, or delete them
- View an individual file
- Upload a file to the server

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.

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.

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.

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

The following table describes the actions you need to take to accomplish these tasks on the Volume Management page.

To	Do This
Browse a volume or partition	Click the link for the volume or DOS partition under the Name column.
Move down the directory tree	Click the directory name.
Move up the directory tree	Click the double dots link.
View or download a file	Browse to the filename and click it.

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:

1 Click Volumes.

2 Click the volume name link.

3 Browse to the directory or file you want to view or change the attributes of. View the attributes in the Attribute column.

4 To change the attributes, click the directory or file link under the Attributes column.

5 Check or uncheck the check box for the attribute you want to set, then click OK.

Viewing and Changing Trustee Assignments and Inherited Rights Filters

Your eDirectory™ rights govern your access to directories and files on NetWare partitions. For more information on trustee assignments and Inherited Right Filters, see "Trustee Assignments and Targets" in the *Novell eDirectory 8.7 Administration Guide*.

To view or change the trustee assignment of a directory or file:

1 Click Volumes.

2 Click the applicable volume name link.

3 Browse to the directory or file you want to view or change the assignment of.

4 Click the 📁 folder icon to the left of the directory or file you want to view or change. Then do one of the following:

- **To change the Inherited Rights Filter**, click the Inherited Rights Filter link in the directory or file information table. Check or uncheck the check box for the rights you want to set or change, then click OK.

  Changing the Inherited Rights Filter does not grant rights; it only removes rights previously assigned at a higher level in the tree.

- ◆ **To add a trustee,** type the full distinguished name or bindery name of the User object you want to add in the User Name field of the Trustee Information or browse to it and select it, then click Add Trustee.

- ◆ **To change a trustee's rights**, locate the User object name in the list of User objects under the Trustee Information, then click the Trustee Rights link next to the username. Check or uncheck the check box for the trustee right you want to change, then click OK.

- ◆ **To delete a trustee**, locate the User object name in the list of User objects under the Trustee Information, then click the Delete link next to the username.

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

Viewing the details of directories or files not only give you information about them but you can also perform the following tasks associated with them.

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

1 Click Volumes.

2 On 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.

3 On 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 edit, delete, or rename a file:

1 Click Volumes.

2 On 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.

3 On the information page that is displayed, view the information or enter the information required for the applicable task and then click the applicable button (Edit File, Delete File, Rename File) for the task you want to perform.

The Edit File button is available only on simple text files.

To rename a file on the server's DOS partition:

1 Click Volumes.

2 Click the applicable drive letter under the Local Server Partition heading.

3 Browse to the applicable file.

4 Click the Rename link for the file.

5 Type the new filename in the New File Name field, and then click Rename File.

To delete a file on the server's DOS partition:

1 Click Volumes.

2 Click the applicable drive letter under the Local Server Partition heading.

3 Browse to the applicable file.

4 Click the Delete link for the file, and then click OK on the returned deletion message.

When you upload a file using NetWare Remote Manager, the file date and time are recorded as the date and time that the file was uploaded. You can modify this date and time back to the file's original date and time.

To modify a directory's or files's date and time:

1 Click Volumes.

2 Click the applicable server volume or local partition drive.

3 Click the directory or file information icon to the left of the directory or filename. If the file is on a DOS partition, click the Date and Time link in the file listing.

4 Click the Date and Time link.

5 Modify the items that you want to change and click OK.

If the file is an Novell executable file, click the check box for restoring the original date and if desired and then you can further modify the date and time and save the new settings.

Monitoring Disk Space Usage

If your server is constantly running out of disk space or getting close to it, you might want to view the disk space usage to find out which users are using the most space and the files that they have rights to.

To view the disk space usage by each user for a volume:

1 On the Volume Management page, click the ⓘ Inforomation icon to left of the volume name that you want to check.

2 On the Volume Information page, click the Disk Space Usage button.

A list of users and the space that they have in use is shown. The disk space restriction is also shown. The restriction size is Unlimited for all users unless a disk space restriction for a user has been set.

To view the files that a user has rights to on this volume, click the link for the specific username link on the same page.

To view the space in use in a directory:

1 On the Volume Management page, click the volume name link that the directory resides on.

2 From the directory listing, click the 📁 folder information icon to the left of the directory or subdirectory you want to view.

3 Under the Directory Entry Information, view the information in the File Space in Use field.

Inventorying Servers, Volumes, or Directories

With this feature, you can inventory servers, volumes, directories, or subdirectories as well as view graphs, profiles, reports and keys statistics about each of these items including space usage trends. With a few clicks, you get available space trend graphs; profiles for file types; last accessed, last modified, creation time, and file size; and links to specific reports for each of these. You can also customize the scan to look for specific file information.

Generating this report can take a while, so the file is saved on the server so you can generate the report and view it later.

To generate an inventory report for a server and view it online or send it to someone via e-mail:

1 Click the Report / Log Files link in the navigation frame.

2 Click View Inventory Report to view the report online.

or

Click Send Inventory Report to generate the report and send it via e-mail.

Before you can send an inventory report via e-mail, you must configure the e-mail options on the Mail Notification Configuration page.

You can also generate this report for multiple servers in your tree using the Use Group Operations features and running the Compare Server Storage report. For more information, see .

To generate an inventory report for a volume or directory:

1 Click Volumes.

2 Browse to the volume name or directory you want inventory.

3 Click the Inventory link at the top of the page.

After generating an inventory report for a volume or directory, you can create a customized scan to look for more specific information.

To generate a customized inventory scan on a volume or directory:

1 Click Volumes.

2 Browse to the volume name or directory you want inventory.

3 Click the Inventory link at the top of the page.

4 In the generated report, click the Custom Volume Scan or Custom Directory Tree Scan link.

5 Type the specific search criteria in each of the fields provided.

6 Click Start Scan.

Viewing, Setting, Changing, or Removing Directory Space Restrictions

In environments such as a university, where you have set up a common work area and you want to limit the space that users or files in a directory or subdirectory can use, setting a Directory Space Quota can be useful.

In order to set or change this restriction, you must check the User Space Restrictions and Directory Quotas attributes when you create it. If this is not done when you create it, you cannot set or change these attributes later.

To set or change a Directory Space Quota for a directory or subdirectory:

1 On the Volume Management page, click the volume name link that the directory resides on.

2 From the directory listing, click the 🗔 Folder Information icon to the left of the directory or subdirectory you want to change.

3 Under the Directory Entry Information, click the link for the File Space Limit setting.

4 In the field next to the Set Space Restriction button, enter the value for the size (in kilobytes) that you want to set the restriction to, and then click the Set Space Restriction button.

The maximum space available will be shown.

To remove the restriction:

1 On the Volume Management page, click the volume name link that the directory resides on.

2 From the directory listing, click the Folder Information icon to the left of the directory or subdirectory you want to change.

3 Under the Directory Entry Information, click the link for the File Space Limit setting.

4 Click the No Quota button.

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. The file's date and time are changed when performing this task.

For instructions on changing the file date and time after a upload, see the procedure for Modifying Directories or Files Date and Time under "Viewing Details of Directories or Files and Creating, Editing, Renaming, or Deleting Them" on page 33.

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 the file to your local workstation. (This also applies to the files on the server's DOS partition.)

To download a file:

1 Click the Volumes link in the navigation frame.

2 On the Volume Management page, browse to or search for the file that you want to download.

3 Right-click the filename link.

4 Save the target file to your local workstation.

Searching for Files

You can search for files at the volume or subdirectory level.This feature is especially helpful when searching for files that are mentioned in documents where no search path was given or an incorrect path was specified. It is also helpful when searching for file types that you want to remove or change the location of.

To search for files at the volume or subdirectory level:

1 Click the Volumes link in the navigation frame.

2 On the Volume Management page, browse to the volume or directory you would like to search by clicking the volume or directory name link.

3 Click the File Search link.

4 Specify the filename or extension you would like to search for.

5 Click Start Search.

In the display results, you can

- ◆ Click the filename link to view or download the file.

- ◆ Click the File Information icon to view information about the file, change trustees, or rename or delete the file.

  If the file is a simple text file or a file with an extension listed in the sys:login.nrmedit.txt file, you can also edit the file by clicking the Edit File button.

- ◆ Delete, copy, or move selected files.

Searching for Text in Files

In the past, searching for files that contains specific text has has been difficult if not impossible. Now, you can do a GREP-type search (accepts GREP wildcard characters) through the files in the current directory as well as subdirectories.

To do a text search:

1 Click the Volumes link in the navigation frame.

2 On the Volume Management page, browse to the volume or directory you would like to search in by clicking the volume or directory name link.

3 Click the Text Search link.

4 Specify the content, filename, or extension you would like to search for and check whether you would like to match the case.

5 (Optional) If you want to search all subdirectories as well, check the Search Subdirectories check box.

6 Click Search.

If the search instructions are valid, the results are displayed 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.

Managing Disk Partitions

The Partition Disks 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, change, rename, or delete a logical (NSS) or traditional NetWare Partition Pool or volume, click the Partition Disks link under Manage Server in the navigation frame and then do one or more of the following tasks.

To create a partition or pool:

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 and confirming your decision by clicking OK in the resulting dialog box.

To expand a partition or pool:

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 mirror a partition:

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.

To name or rename a partition:

1 Locate and click the Set Partition Label link or the *name_of_the_partition* link next to the partition you to want to name or rename.

2 In the Enter the New Partition Label field, enter the name for the partition and click Apply > OK.

To remove the name of a partition:

1 Locate and click the *name_of_the_partition* link next to the partition you to want to remove.

2 Click the Delete Partition Label link > OK.

To create a volume and mount a volume:

1 Locate and click the Create link next to the free space on the device that you want to create the volume on or the Add a Volume link next to the pool or partition you want to create the volume in.

2 Select the type of volume to create. This step is assumed if you have click the Add a Volume link.

3 Complete the required fields for the type of pool and volume, or partition and volume you want to create and checking the check boxes for the volume attributes that you want to set.

IMPORTANT: Deciding which attributes you want to assign to your volume now is important because some attributes cannot be changed after the volume is created.

4 Click Create and confirm your decision by clicking OK in the resulting dialog box.

5 After creating a volume, you need to mount it in order to use it. You can do this by clicking the Mount Volume link next to the volume name you just created or clicking the No link next to the volume name on the Volume Management page.

On the Server Disk Partition Operations page, you access the links to rename an NSS pool or volume.

To rename an NSS pool:

1 Locate and click the Pool name link next to the pool you to want to rename.

2 Enter the new name in the Enter the new pool name field and click Rename.

To rename an NSS volume:

1 Locate and click the Volume name link next to the volume you to want to rename.

2 Click the Rename Volume link on the Volume Information page.

3 Enter the new name in the Enter the new volume name field and click Rename.

On the Partition Disks page, you can access links to delete an NSS pool or volume. Before deleting a pool, you must delete any volumes contained in the pool.

To delete an NSS volume:

1 Dismount the volume by clicking the Dismount Volume link next to the volume you to want to delete.

2 Click the Delete Volume link next to the volume you to want to delete and confirm your decision by clicking OK in the resulting dialog box.

To delete an NSS pool:

1 Delete any volumes contained in the pool.

2 Click the Delete Pool link next to the pool name you to want to delete and confirm your decision by clicking OK in the resulting dialog box.

A Delete link is displayed next to the NSS partition that was automatically created when you created the volume or pool. This partition must be deleted to make the space completely free or you can create a new pool and volume as desired in this partition.

3 To make the space completely free for reuse, delete the partition by clicking the Delete link next to the NSS partition you want to delete and clicking OK in the resulting dialog box.

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

To change a space quota for a volume:

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

You can access any of the server console screens from the Console Screens page.

For example, if you wanted to install a support pack update from a remote location, you could access the NWCONFIG utility using the Console Screen link and then run it as though you were at the server console.

To access the Console 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 Console Screens page. Clicking this link runs a Java applet that opens a secondary browser window.

From this secondary browser window:

You can	To do this
Cycle through the screens already loaded at the server console. 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.	Click the >> or << button. This functions the same as pressing Alt+Esc on the server console keyboard.
Display a list of current utilities that are running at the server console and the screens that are active	Click the Screens List button. This functions the same as pressing Ctrl+Esc on the server console keyboard.
Access any of the screens listed. From the System Console screen, you can load any of the other text based utilities by loading the applicable NLM program.	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.	Click the Title Bar button. This will toggle the screen title on or off and functions the same as pressing Alt on the server console keyboard.
Access the Emergency Console.	Click the Emergency Console button on this page. This functions the same as pressing Ctrl+Alt+Esc on the server console keyboard. The Emergency console can be useful when the server console seems to hang. 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.	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

On the Connections page, you can do the following tasks:

◆ 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 Connections page, click the Connections link in the navigation frame.

Viewing Connection Information

The table in the Connection Manager on the Connections 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 Connections 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 Connections 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:

1 Click the Connections link in the navigation frame to open the Connections page.

2 On the Connections 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:

1 Click the Connections link in the navigation frame to open the Connections page.

2 On the Connections 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	Do This
Send a message to all of the users who are currently logged in to the server through Novell ClientTM software	Type the message in the Broadcast Message to Everyone field on the Connections page, and then 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.
Send a message to a specific user who is currently logged in to the server through Novell Client software	Type the message in the Send Message field on the Connections page for that user, and then click Send.

Viewing or Changing SET Parameters

Changing Set parameters helps you to control special circustances that a server might have. We recommend that you keep the settings at the default unless you are aware of the ramification of the changed value.

On the Set Parameters page, you can do the following:

To	Do This
View the SET parameter categories	Access the Set Parameters page by clicking 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	Click the name of the category link on the Set Parameters page. To change the value for that parameter, click the parameter value link, change the value, and click OK. To view the help for each parameter, click the ⓘ information 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	Type 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	Click the View Hidden Set Parameter On or Off button on the Set Parameters page.

To	Do This
View SET parameters with settings that are different from the server default (modified) 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.	Click the View Modified Set Parameters button on the Set Parameters page. This list does not include nonpersistent SET parameters.
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). Nonpersistent SET parameters are those which are not stored in the NetWare Registry.	Click the View Non-persistent Set Parameters button on the Set Parameters page. 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 Tasks page to schedule console commands to run.

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

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.

The following table shows the actions you need to take to accomplish the desired task on the Scheduled Tasks page.

To	Do This
Access the Scheduled Tasks page	Click the Schedule Task link in the navigation frame.
Schedule a console command.	Complete the information in the form and click Submit.
See a list of console commands and the associated help	Click the Console Commands link.
Change an already scheduled console command	Select the command from the list of Currently Scheduled Console Commands; change the schedule; and then click Submit.
Delete a task	Select the task from the list of Currently Scheduled Console Commands, and then click Delete.

Viewing Server Console Commands

Viewing a list of server console commands is easier through NetWare Remote Manager than typing the **help** command at the System Console prompt and you can also do several things from this view that are not physically possible at the server console. You can sort the list by the command name or by the module that registered it. Using the normal print or copy and paste features of your browser, you can also print a copy of this page to use a reference at the server console or save copy of this list to a text file and annotate the list with information that you want.

The following table shows the actions you need to take to accomplish the desired task from the navigation frame or Console Commands page.

To	Do This
View a list of commands that can be executed at the server console	Click the Console Commands link in the navigation frame.
Access the server console in order to execute any of these commands from NetWare Remote Manger	Click the Console Screens link on the Console Commands page.
View specific syntax or help for each command	Click the ⓘ Information icon next to the command. Several of the hidden console commands do not have any help associated with the command.
Sort the list by the registered owner of the command.	Click the ▼ sort down icon in the Owner column. The default sort order for this list is by the command name. The ▼ sorted icon next to the column title indicates the sort order of the list.

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 View Memory Config page by clicking the View Memory Config link in the navigation frame.

The following table describes each statistic or action of a link shown on the View Memory Config page.

Statistics or Link	Description or Action
NLM Memory	Shows the total amount of memory allocated by the operating system to the NLM programs that are loaded on the server Links to the List Modules page that shows the details of how each NLM program is using memory.

Statistics or Link	Description or Action
File System Cache	Shows the amount of server memory in use by the directory cache buffers in the NSS or traditional NetWare file system.
	Links to the File System Cache Statistics page that shows the details of these cache statistics. Monitoring these statistics over time will help you determine when you might need to install more RAM for cache. See the online help for details of each of the statistics on this page.
Used by Virtual Memory System	Shows how much physical memory the virtual memory system is using. The virtual memory system can quickly be determined by the amount of physical memory backing the total virtual memory system.
	Links to the Virtual Memory Health Information page that shows:
	◆ Physical memory: The amount of physical memory backing the virtual memory system.
	◆ Memory swapped to disk: The amount of virtual memory swapped to disk and not backed by the virtual memory system.
	◆ Total bytes in virtual memory: The amount of virtual memory that has been used.
	and links to the:
	◆ **Swap File Information page** that shows 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.
	◆ **Virtual Memory Cache Pool page** that shows statistics for the physical memory cache pool, virtual memory cache pool, and individual cache pools. See the online help on this page for details about each of these statistics.
	◆ **Virtual Memory Statistics page** shows specific statistics related to virtual memory and provides links to the Virtual Memory Cache Pool page and Virtual Memory Health page.
Available Cache Memory	Show the amount of cache memory the server has available.
DOS, Video, Other Memory	Show the amount of memory used before the NetWare operating system loads.
Total System Memory	Show the total amount of memory the server has.
	Links to the Server Memory Pools Summary page that shows information for all the memory pools on the server.
Memory Usage chart	Shows how NetWare server memory usage relating to the statistic shown.

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	Do This
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 executing 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 white with a 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.

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).

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, reload the page by clicking the Managed Server List link again and then refreshing the list using normal browser functionality.

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 or unload 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
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
Protocol Information	View general and specific information about each protocol running on the server
SLP	View Service Location Protocol (SLP) settings and reports

Managing NLM Programs

Managing NLM programs on yours server controls what programs can run, what functionality your server has, and the capacity your server can provide. NetWare Remote Manager lets you access a list of them to view information about them and perform different operations with them.

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.

On 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.

If an Unload button is on the detailed information page, you can click it to unload the NLM.

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 ⓘ Information 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.

On the Address Space Information page, you can perform many tasks associated with managing protected memory.

To	Do This
Execute an .ncf to load several modules into the same protected address space	Type the .ncf filename in the field provided and click the Load NCF File Protected button.
Load an individual module into the protected address space	Type the module name in the field provided and click the Load Modules Protected button.
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 ◆ *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	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.

On 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 Information about Each Protocol Running on the Server

On the Protocol General Information page, you can view general and specific information about each protocol running on the server.

To access the Protocol General Information page, click the Protocol Information link in the navigation frame.

To access specific information for a protocol, click the link for the protocol.

On the specific NCP page, you can enable and disable tracking counters for NCP (NetWare Core Protocol).

Viewing SLP Information

Rather than using the Display SLP commands at the server to view and manage your SLP configuration, you can view and manage it using the following links on the Service Location Protocol page.

- **Scope List** shows each SLP scope that has been configured on the server.
- **SLP Configuration File** shows the contents of the sys:etc/slp.cfg file. You can edit this file using the Edit File features of NetWare Remote Manger. See "Viewing Details of Directories or Files and Creating, Editing, Renaming, or Deleting Them" on page 33.
- **Discovered Directory Agents** shows a list of all Directory Agents that have been discovered using multicast or DHCP or through static configurations in the slp.cfg file.

- **Server Agents Services** shows the internal services that have been registered.

- **Directory Agent Visible List** shows the all servers and directory agents in a reference table and lets you view the differences between each.

- **Directory Agent Services** shows the internal services on a directory agent. This option is available only when there is a directory agent loaded on the server.

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
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 hexidecimal offset for a HIN
USB Devices	View a list of USB devices by device name
SMBIOS Information	View System Management BIOS information for SMBIOS-compliant servers.
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 Disk/LAN 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

Viewing the PCI Device Information page lets you view a list of Hardware Instance Numbers (HIN). Each HIN represents a hardware device.

To access the PCI Device Information page, click the PCI Devices link in the navigation frame.

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

Viewing USB Device Information

Viewing the USB Device Management page lets view details about USB devices in your server by device type. These details include the device product, manufacturer, Address, Tier, Port, and Speed information.

To access the USB Device Management page, click the USB Devices link in the navigation frame.

Viewing SMBIOS Information

SMBIOS information lets you access details about the BIOS hardware in each NetWare server without having to physically remove the hardware cover. You also have access to information that is only available through the management system.

To view a list of SMBIOS types, access the SMBIOS Information page by clicking the SMBIOS Information link in the navigation frame.

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

To view the details of each information type, click the applicable link.

Viewing Hardware Resource Information

Accessing the Hardware Resource page lets you view the resource information that drivers have registered with the following hardware resources:

- 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

On the Traversing NDS Tree 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 accidently delete the Admin object itself. This prevents any access to the system-including administrator access.

To access the page to Traverse the current NDS tree, click the Access Tree Walker link in the navigation frame.

Viewing eDirectory Partitions and Replicas

On the Partitions in Tree *tree_name* 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.

To access the page to view Partitions in the current Tree, click the View eDirectory Partitions link in the navigation frame.

Accessing Other eDirectory Management Tools

If ndsimon.nlm is loaded on the server, you can also access the Novell iMonitor utility and DS Trace utilities to manage and troubleshoot eDirectory on your server. For more information about iMonitor, see "Using Novell iMonitor 2.0" in the *Novell eDirectory 8.7 Administration Guide*.

Using Groups Operations

NetWare Remote Manager lets you build and use server groups and perform similar operations on them or run reports to collect data from multiple servers. The functionality of this feature is not complete in Beta 2. (Beta 2)

In this version, you can perform the following tasks on servers that are in the same tree and that are running NetWare Remote Manager:

- ◆ Configure server groups and add monitoring items
- ◆ Synchronize the Sadmin user password
- ◆ Compare Set parameters
- ◆ Compare the modules running on each server
- ◆ Compare storage space, size, usage, and so on.
- ◆ Add additional monitor items such as the ability to ping a remote server or download a web page.

NOTE: In previous version of NetWare Remote Manager, part of this functionality was in the Use Server Groups category.

Using this feature involves one or more of the following tasks:

1. Build and configure group of servers.

2. (Optional) Save the group.

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

3. Perform a specific operation or task.

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

Building and Configuring a Server Group

NetWare Remote Manager lets you build and configure server group for monitoring health, ping, or other web pages, for performing specific operations, or for gathering statistics.

To build and configure a new monitor group:

1 Click the Configure New Group link in the navigation frame.

2 On the Group Monitoring Operations page, do the following: right-click and select Add Item or select the NRM Servers icon and select the servers you want to add to the group.

If	Then
You want to build a group that will monitor all the same items or perform the same type of task	Select the servers from the NRM server list

If	Then
You want to build a group that will monitor different items	Right-click the Group Monitoring Operations page, select Add Item, complete the Monitoring Item Configuration form for each server you want to add to the group. or Select the servers from the NRM server list. Then for each server you want to change from the default, select the server on the page, right click and select edit item, complete the Monitoring Item Configuration form. You can also delete a server from a group using the right-click > Delete item option.

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

Option	Details
Name	Enter a descriptive name for the item.
Monitoring Type	Enter one of the following types: **NRM Server Health Monitor:** Shows the health status of each server in the group. Lets you access the specific health page for each server in the group. **ICMP Echo (Ping):** Shows the response when sending ping requests to the specified DNS name or IP address. **Download Web Page:** Shows the response when trying to download a web page from the specified URL.
Item Address/URL	Enter the IP address for the server that you want to monitor or ping, or enter the URL for the web page that you want to download. The address can be an IP address or DNS name.
Hide Normal Status	When you want to display items that are only in an abnormal state, check the check box. If you want to monitor all statuses, leave the check box unchecked.

Option	Details
Text Color	Black is the default. You can select any other color on the drop down list.
Background Color	White is the default. You can select any other color on the drop down list.

3 Configure the group clicking the Configuration icon and completing the following options.

Option	Description
Display	The display options let you control the following:
	◆ **Full Screen:** When checked, lets you build a monitor page that shows only the items status for multiple servers without the left frame menus and the group configuration options.
	To return the monitor page to one with all the configuration options and the left menu, click the Configuration button and uncheck the Full Screen check box.
	◆ **Monitor Page Title:** Lets you specify a title that is shown at the top of the monitor page in the header area when the page is built.
	To have the entire name displayed, type ALL in this text box
	◆ **Name Length:** Lets you specify how many characters in an item's name will be displayed on the monitoring page.
	◆ **Refresh Rate:** Lets you specify the number of seconds between status queries to the server.
	◆ **Columns:** When the Monitor page is displayed, the items are displayed in a table. This option lets you specify the number of horizontal columns you want in that table.
	◆ **Background Graphic:** Lets you select a graphic from the sys:login directory for the monitor items to be displayed on. This option can be helpful if you want to show specific locations of the item being monitored.
	If you want to add a customized graphic, add it to the sys:login directory.
E-mail	The e-mail notification options control how and when e-mail notifications are sent when the server health changes. E-mail notifications are sent to the addresses in the mail notification list using the mail servers set on the Mail Notification Configuration page.

4 (Optional) If you want to use this server group later, save the group file by clicking the Save button and entering a filename for the group and clicking Save Group.

We recommend using a name that represents the group you built.(Add eDirectory stuff after beta 2)

Saving a Group

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 group to the local server:

1 While view the group on the Group Monitoring Operations page, click Save

2 Enter a filename for the group.

   We recommend using a name that represents the group you built.

3 Click Save.

To save the group to an eDirectory location:

1 This feature is not functional in Beta 2. (Add eDirectory stuff after beta 2)

Performing Operations

To synchronize the Sadmin user password:

1 Create the monitor group.

2 Click the Operations icon.

3 Click the Synchronize NetWare Remote Manager SADMIN Password icon link.

4 Enter the new password in the SAdmin Password and Confirm Password fields.

5 Click the Synchronize SAdmin Password button.

To synchronize the e-mail notification settings for NetWare Remote Manager (not functional in Nakoma Beta 2)

1 Create the monitor group.

2 Click the Operations icon.

3 Click the Synchronize E-mail Settings link.

4 Enter the information in the required fields.

5 Click the Synchronize E-mail Settings button.

Running Reports

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

To compare Set parameters:

1 Build the monitor group.

2 Click the Reports icon.

3 Click the Compare Server Set Parameter icon link.

To compare the modules running on each server:

1 Build the monitor group.

2 Click the Reports icon.

3 Click the Compare Server Modules icon link.

To compare storage space, size, usage, and so on:

1 Build the monitor group.

2 Click the Reports icon.

3 Click the Compare Server Storage icon link.

Add Collection (add stuff about this in Beta 3)

Accessing an Existing Group

To view the page for a server group after it has been saved:

1 Click the Select Group link in the navigation frame.

2 On the Server Group page, enter the path or browse to the configuration file for the server group that you previously saved.

3 Click the Build Group button.

4 Troubleshooting Server Problems

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

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 Health Monitoring page by a suspect or bad status for the CPU Utilization-*x* indicator.

To track down a CPU hog:

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 and 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 Health Monitoring page by a suspect or bad status for the Available Memory indicator.

To find high memory users:

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 Health Monitoring page by a suspect or bad status for the Abended Thread Count indicator.

To trace sources of server abends:

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 On 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 Health Monitoring page by a suspect or bad status for the Available Server Processes indicator.

To find server process hogs:

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 On 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 per server:

1 Run a server inventory report. See .

2 Look at the Available Space Trend Graphs and the File Owner Profiles data.

To locate disk space hogs per volume:

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 File information 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.