Novell
Open Enterprise Server

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HEALTH MONITORING SERVICES
ADMINISTRATION GUIDE

Novell

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About This Guide

This guide gives an overview of Health Monitoring Services provided in Open Enterprise Server and describes how to access and use the Health Monitoring Services plug-in provided in iManager and how to set up other servers for monitoring.

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Audience

This guide is intended for network administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation, or go to www.novell.com/documentation/feedback.html and enter your comments there.

Documentation Updates

The most recent version of the *Health Monitoring Services Administration Guide for OES* is available at the Open Enterprise Server online documentation (http://www.novell.com/documentation/oes/server_health/data/front.html#bktitle).

Additional Documentation

For more information on installing and using Novell iManager, see the *Novell iManager 2.5 Administration Guide*.

For more information about authentication on Linux*, see the *Novell Linux User Management Technology Guide*.

Documentation Conventions

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

A trademark symbol ($^{®}$, ™, etc.) denotes a Novell trademark. An asterisk (*) denotes a third-party trademark.

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

Overview

Health Monitoring Services (HMS) is a component provided in Open Enterprise Server (OES) that lets you monitor the health of Linux or NetWare® operating systems using Web-Based Enterprise Management (WBEM) (http://www.dmtf.org/standards/wbem). WBEM is a set of management and Internet standard technologies developed to unify the management of enterprise computing environments. The ultimate objective of WBEM is to provide customers with the ability to manage all systems, regardless of their instrumentation type, using a common standard.

OpenWBEM (http://www.openwbem.org) is an implementation of the specifications provided by the Distributed Management Task Force (DMTF). For more information, see the *OpenWBEM Services Administration Guide for OES*.

Health Monitoring Services includes a plug-in for iManager that provides an interface for monitoring the health of Linux or NetWare operating systems through OpenWBEM.

The level of monitoring increases for hosts that are running OpenWBEM and the HMS providers. For more information, see "Types of Health Monitoring" on page 10.

This is the first release of these services by Novell®. When these services are complete, you can gather data, analyze it, set up system alerts, and perform any actions needed. In this release, these services only let you collect data and do some analysis. You can obtain definitions of the analysis and action recommendations in the online help.

In future releases, you will be able to configure thresholds and system alerts. Analysis and action recommendations will be made by the system.

This section contains the following information:

1.1 Monitoring Service Components

Health Monitoring Services in OES is made of several components. The most significant are described in the following table:

Table 1-1   *Health Monitoring Services Components and Descriptions*

Component	Description
CIM	Common Information Model (CIM) is a conceptual information model that enables management of heterogeneous networks using standard methods. There are two parts to CIM: The CIM specification and the CIM schema.
CIMOM	Common Information Model Object Manager (CIMOM) is a CIM object manager or more specifically an application that manages objects according to the WBEM standard. OES contains the CIMOM from the OpenWBEM project.

Component	Description
Providers	Providers plug into the OpenWBEM to extend its functionality. Each provider instruments one or more aspects of the CIM Schema. Novell LIFE providers include some HMS providers and a base set of accompanying Novell schemas. For a complete listing, see "Health Monitoring Services Modules" on page 43.
Monitor Servers link in iManager	Health Monitoring plug-in for iManager that provides an interface for monitoring server health.

A detailed listing of additional components is in "Health Monitoring Services Modules" on page 43.

1.2 Types of Health Monitoring

The health monitoring services offers two monitoring types, Robust Health Monitoring and Simple Server Status.

- Section 1.2.1, "Robust Health Monitoring," on page 10
- Section 1.2.2, "Simple Server Status," on page 10

1.2.1 Robust Health Monitoring

Robust health monitoring provides statistics for a system in the following categories.

- Memory
- Operating System
- Processes/Threads
- Network
- CPU

To use this type, the owcimomd module must be running on the servers being monitored so the status can be obtained. You must also be authenticated to the server being monitored in order to view health status, edit, or change the type of monitoring that you want to view. For more information, see "Accessing Health Monitoring" on page 17.

1.2.2 Simple Server Status

This monitoring type monitors only whether the server is up and running, or down based on a connection attempt to at least one of the following standard ports:

- 7 (Echo)
- 13 (Time)
- 20 (FTP)
- 22 (SSH)
- 23 (Telnet)
- 80 (HTTP)
- 135 (DCE endpoint resolution)
- 443 (Secure HTTP)

- 445 (Microsoft* Directory Services)
- 524 (NCP™, eDirectory™)

In this release, the ports searched for are not configurable.

If a firewall blocks all of these ports or routing disables them, then obtaining a Simple Server status is not possible.

Coexistence and Migration

<div style="text-align: right">2</div>

This section contains the following information:

2.1 Coexistence

This section provides information regarding the compatibility and coexistence of Health Monitoring Services with existing NetWare® or Linux networks.

2.1.1 Compatibility

The following table summarizes the compatibility of Health Monitoring Services with various network operating systems:

Table 2-1 *Health Monitoring Services Compatibilty Matrix with Various Operating Systems*

Monitoring Type	Operating System	Compatible Versions	Notes
Simple	Any	NA	At least one of the specified ports must be open and not blocked by routing. For more information, see "Simple Server Status" on page 10.
Robust	NetWare	OES on NetWare NetWare 6.5 SP3 or later	If you are upgrading from NetWare 6.5 SP2 to NetWare SP3 or later, you must have iManager 2.5 somewhere in your network and you must install OpenWBEM manually. For procedures, see "Installing OpenWBEM on a Server Running NetWare 6.5 SP3 or Later" in the *OpenWBEM Services Administration Guide for OES*.
Robust	Linux	SUSE® Linux Enterprise Server 9 SP1 or later	NA

2.1.2 Coexistence Issues

Monitoring on servers that are not running the owcimomd module can only report a Simple Server Status (up/down).

Health Monitoring Services is not cluster-enabled; therefore if the server you are monitoring from fails, you must log into iManager again.

2.2 Migration

Health Monitoring Services is a new service in Novell® Open Enterprise Server.

Accessing Health Monitoring Services

3

This section provides prerequisites, security considerations, and instructions on how to access health monitoring services.

3.1 Prerequisites

When you install or upgrade to Open Enterprise Server, you have two components available for monitoring an OES server.

- Novell® Health Monitoring Schema Extension:

  This component extends the eDirectory™ schema for iManager to provide a plug-in for monitoring servers. You only need to extend the schema for eDirectory once per each tree.

  - **For Linux:** you can obtain this by selecting the *Open Enterprise Server* server type and accepting the default selection of *Novell Health Monitoring*. You can also select the *Novell Health Monitoring* package software selection with any of the software selection choices.

  - **For NetWare:** this component is implemented by default when any of the preconfigured server patterns are selected during the server installation.

- The monitoring agent.

  The monitoring agent is OpenWBEM and the providers for SUSE® Linux or NetWare®.

  In the SUSE Linux installation, these packages are required for servers that you want monitor with the Robust Health monitoring type:

  - openwbem
  - provider packages, see "Health Monitoring Services Modules" on page 43

These packages are installed with the following software selections during the installation. You can also install these packages after the installation is complete.

Table 3-1 *OES Linux Software Selections that Install the Health Monitoring Services Monitoring Agent*

Software Selection	Installed
Minimum System	No
Minimum Graphical System (without KDE)	No
Full	Yes

Software Selection	Installed
Default	No
Novell QuickFinder	Yes
Novell iFolder 2 Server	Yes
Novell Virtual Office Server	Yes
Novell Print Server	Yes
Novell Open Enterprise Server	Yes

In the NetWare installation, OpenWBEM and the providers are combined into one module called owcimomd.nlm, which is installed with the base OES installation or is added during an upgrade to OES. It is installed by default during all preconfigured server pattern options.

If you want to monitor NetWare SP3 servers, you must obtain the files for installing OpenWBEM and install them manually. For procedures, see "Installing OpenWBEM on a Server Running NetWare 6.5 SP3 or Later" in the *OpenWBEM Services Administration Guide for OES*.

Server You Are Monitoring From

For the server you are monitoring from, you need the following components installed.

- iManager 2.5 or later installed on the server.
- Novell Health Monitoring plug-in for iManager (This component is selected by default when you choose to install iManager.)

Monitored Server

For any server that you are going to monitor, you need the following components installed and running based on the platform and the monitoring type you want to perform:

Table 3-2   Requirements for the Health Monitoring Services Monitoring Types by Platform

Monitoring Type	Platform	Requirements
Robust	OES Linux	• Novell-life and OpenWBEM packages installed. • The owcimomd module is running. This module is started by default when the *OES* software selection is selected during the installation. If it is not, enter the following command at a console shell as a user with root privileges: /etc/init.d/owcimomd start • TCP port 5989 is open in the firewall
Robust	NetWare	• The owcimomd module is running. This module is started by default when OES is installed. If owcimomd is not running, enter the following command at the System Console prompt: openwbem.ncf • TCP port 5989 is open in the firewall.

Monitoring Type	Platform	Requirements
Simple Server Status	Both	A valid IP address or DNS name entered in the Monitor Server list.
		One of the following ports open:
		• 7 (Echo)
		• 13 (Time)
		• 20 (FTP)
		• 22 (SSH)
		• 23 (Telnet)
		• 80 (HTTP)
		• 135 (DCE endpoint resolution)
		• 443 (Secure HTTP)
		• 445 (Microsoft Directory Services)
		• 524 (NCP™, eDirectory)

3.2 Accessing Health Monitoring

1 Open iManager and log in.

2 If it is not already selected, select the *Roles and Tasks* view.

3 In the left navigation frame, click *Servers > Monitor Servers*.

If you log into iManager as user Admin or a user with rights equivalent to Admin, you can perform all the necessary tasks.

If you log in to iManager as a non-Admin user, you must have sufficient rights to monitor servers. The HMS object must be created and you must have the following rights to the HMS object:

[All Attributes Rights] Compare / Read / Write

[Entry Rights] Browse / Create / Rename / Delete

For more information, see "Delegating Monitoring Tasks" on page 29.

3.3 Understanding the Layout of Health Monitoring Services

When you have Novell Health Monitoring set up, a view similar to the following is displayed. The default view is the last view that you accessed.

Figure 3-1   *A Health Monitoring List with All of Access Points Described*
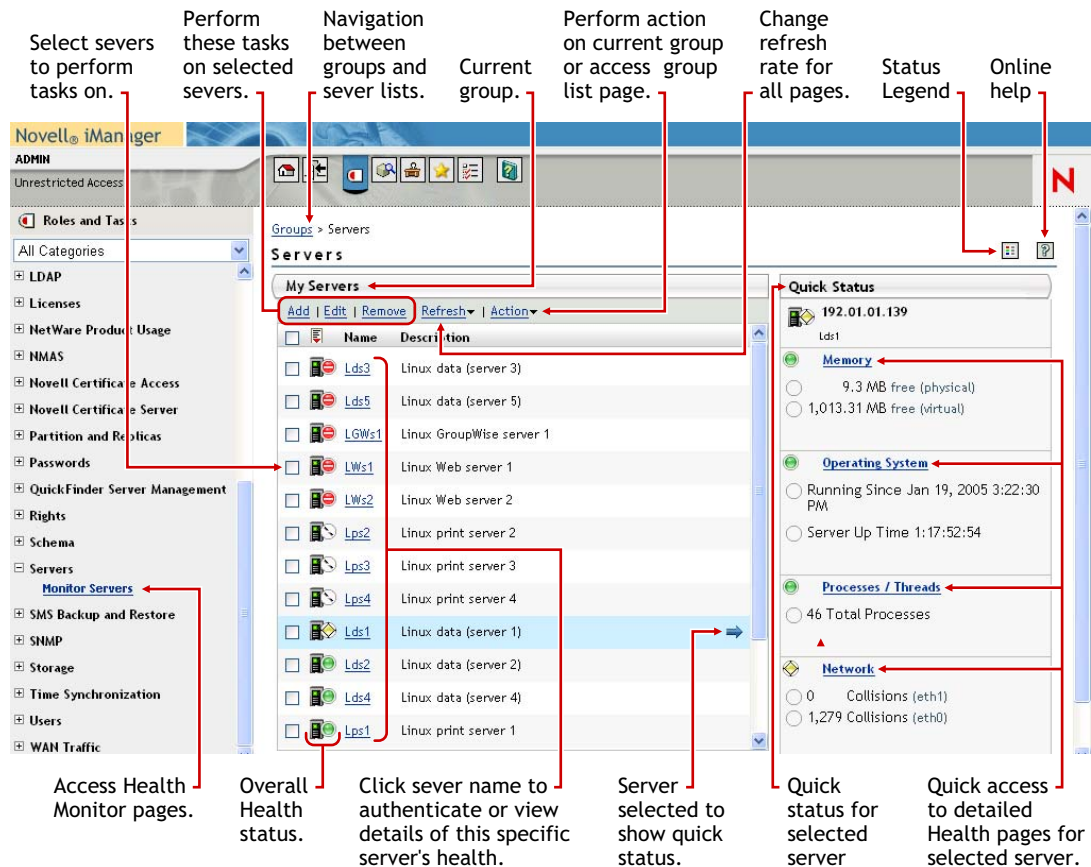
3.4 What's Next

After accessing Health Monitoring services, see the following information at the recommended times:

- The first time you log in to iManager and access Health Monitoring Services or when you want to change the setup of health monitoring, see "Setting Up Servers for Health Monitoring" on page 19

- Each time you want to monitor or diagnose a server's health, see "Monitoring Server Health" on page 31

Setting Up Servers for Health Monitoring

4

This section discusses the following actions to set up the objects in eDirectory™ and setting up lists of servers for monitoring:

4.1 Configuring Health Monitoring

When you first use Health Monitoring Services, no eDirectory objects for this service exist in the eDirectory tree and you are requested to specify a location for your monitoring list to be stored.

Figure 4-1 *Health Monitoring Services Configuration Page*
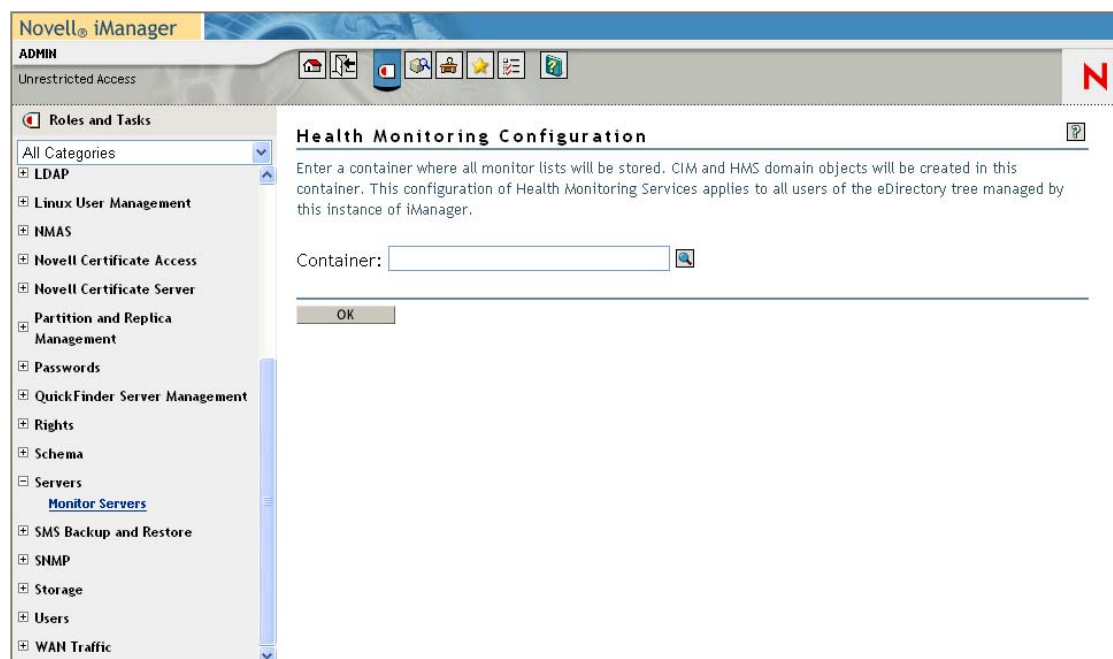
When you specify this location, the CIM, HMS, and ServerList objects are created in your tree as shown in the following figure. Objects that are in the same container as the CIM object vary depending on the parent container selected.

Figure 4-2 *The Position of the CIM, HMS, and ServerList Objects under a Generic Parent Container*

Parent Container
├── 🧑 admin
├── 📇 cimlab3
├── 🔑 cimlab3
└── 🌳 CIM
        └── 🌳 HMS
                ├── 👥 ServerList1
                ├── 👥 ServerList2
                └── 👥 ServerList3
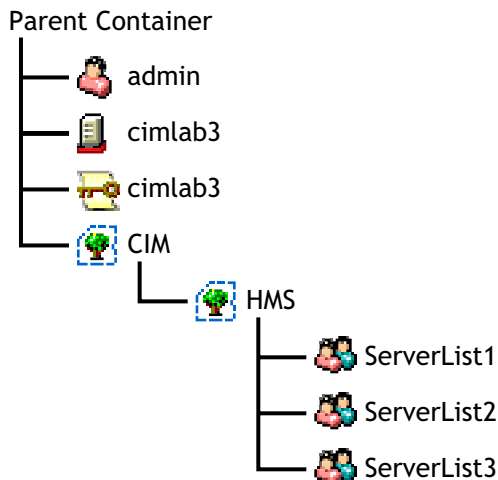
Each time you or another administrator uses a different server to monitor server health (another instance of iManager), you are asked to specify this location. You can point to the same location (recommended) if you want to use the same server monitoring lists and you have sufficient rights.

If you specify a different location, new objects are created in the alternate location and you must create new monitoring lists or import an existing server list. For more information, see "Importing or Exporting a Group of Servers to the Server Monitoring List" on page 25.

If you specify the same location where the CIM object already exists, the existing groups and server lists are displayed.

You can also change the location of the monitoring list objects in the eDirectory tree.

For these procedures and next steps, see:

- Section 4.1.1, "Specifying a Location for Server Monitoring Lists Objects in eDirectory," on page 20
- Section 4.1.2, "Changing the Location of the Monitoring List Objects in eDirectory," on page 21
- Section 4.1.3, "What's Next," on page 22

4.1.1 Specifying a Location for Server Monitoring Lists Objects in eDirectory

To specify a location for the Server Monitoring objects in eDirectory:

TIP: Only users logged in as Root, Admin, or with rights equivalent to Admin can perform this task.

---

1 In the *Container* field, type the full distinguished name of the container object where you want to maintain the list of servers or the name of the container where the CIM object already exists or locate the container using the *Object Selector* and select it.

Ensure that you select a container in the eDirectory tree that all users with responsibilities for managing health services have rights to access and make changes to.

2 Click *OK*.

4.1.2 Changing the Location of the Monitoring List Objects in eDirectory

If you decide to move the placement of the ServerList Objects Health Monitoring Service objects (CIM, HMS, and ServerLists) in your eDirectory tree, you need to change the specified location in the respective xml file as well.

1 As a precaution, export and save all current server lists. For more information, see .

2 Move the CIM, HMS, and ServerList objects to the new location.

3 After moving the objects, access the `lasMonitorServers.xml` file.

- **On Linux:** `/var/opt/novell/tomcat4/webapps/nps/WEB-INF/config/lasMonitorServers.xml`

- **On NetWare:** `/SYS/tomcat/4/webapps/nps/WEB-INF/config/lasMonitorServers.xml`

4 Remove the applicable entry from the respective `xml` file

For example:

```
<setting>
<name><![CDATA[location.cimserver1]]>></name>
<value><![CDATA[dc=cim,o=novell]]>></value>
</setting>
```

5 Open iManager and click *Servers > Monitor Servers*.

6 Specify the location for the server lists again, but this time point to the new parent container where the CIM, HMS, and ServerList objects already reside.

As an alternative to moving the objects, you can export all current server lists, then delete the objects and specify a new location when you log into iManager and monitor servers. Then you must create your groups again and import the applicable server lists into each applicable group.

4.1.3 What's Next

After specifying a location for the Health Monitoring Services eDirectory objects, a default group (My Servers) for creating a list of servers to monitor is displayed.

Depending on the task you want to do, see the following sections:

Table 4-1   *Tasks and Procedures Reference for Health Monitoring Services*

Task	Procedure
Add servers to a list one at a time.	"Adding a Single Server to the Server Monitoring List" on page 24
Add more than one server to a list at the same time.	"Importing or Exporting a Group of Servers to the Server Monitoring List" on page 25
Change the attributes of a server in the server monitoring list.	"Editing the Attributes of a Server in the Server Monitoring List" on page 27
Create groups in addition to the default group.	"Creating a Group" on page 23
Change the attributes of a group.	"Editing the Attributes of a Group" on page 24
Remove one or more groups from the group list.	"Removing Groups from the Group List" on page 24
Remove one or more servers from a server monitoring list.	"Removing a Server from the Server Monitor List" on page 28

4.2 Managing Groups of Server Lists

After specifying a location for the Health Monitoring System eDirectory objects, a default group (My Servers) for creating a list of server to monitor is displayed.

Figure 4-3   *Default Group Page*
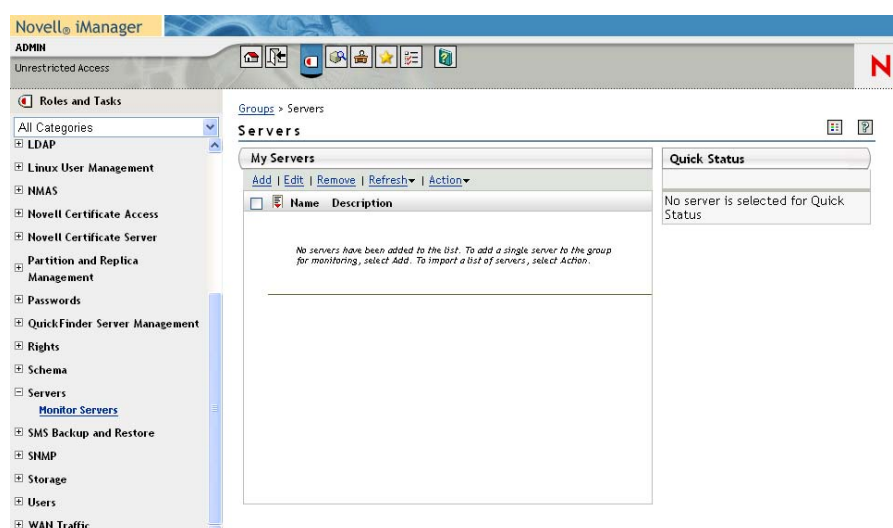
This section contains the following procedures:

- Section 4.2.1, "Creating a Group," on page 23
- Section 4.2.2, "Editing the Attributes of a Group," on page 24
- Section 4.2.3, "Removing Groups from the Group List," on page 24

4.2.1 Creating a Group

Creating different groups of servers can help you to delegate the management of your servers or better understand the health statistics of servers of the same type.

Figure 4-4 *Group Page Showing Several Groups*
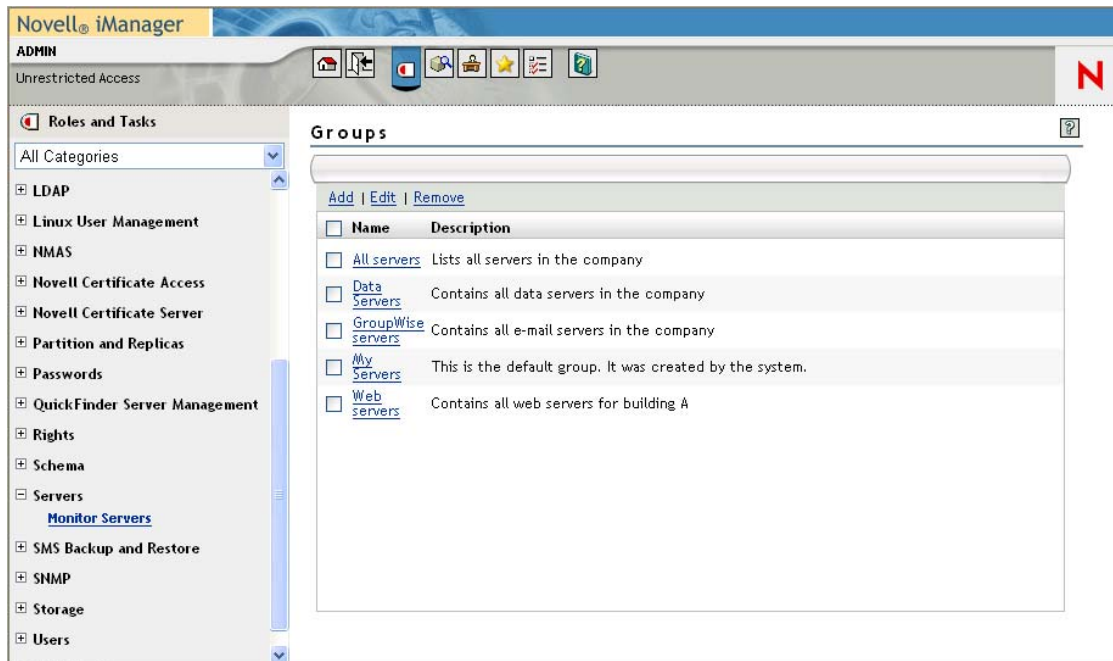
To create other groups in addition to the default group that is created:

1 Access the Groups page by clicking the navigation *Groups* link or by clicking *Action > Manage Groups*.

2 From the Group page, click *Add*.

3 In the *Group Name* field, type a name for the group you want to add.

4 (Optional) In the *Group Description* field, type a description for the group you want to add.

You might want to enter data about the type of servers in the group so you can quickly identify the differences in each group listed. For example, one group could be named Web Servers, another group, Database servers, and a third group could be named Data Servers.

5 Click *OK*.

6 Add servers to the list.

For procedures, see "Adding a Single Server to the Server Monitoring List" on page 24 or "Importing or Exporting a Group of Servers to the Server Monitoring List" on page 25.

4.2.2 Editing the Attributes of a Group

If you want to edit the attributes (name or description) of any group (including the default group):

1 Access the Groups page by clicking the navigation *Groups* link or by clicking *Action > Manage Groups*.

2 On the Group page, select the check box next to the group that you want to change.

   If you select more than one group, only the first group selected in the list is changed.

3 From the Group page, click *Edit*.

4 Change the attributes that you want to change.

5 Click *OK*.

4.2.3 Removing Groups from the Group List

To remove a group of servers from your monitor list:

1 Access the Groups page by clicking the navigation *Groups* link or by clicking *Action > Manage Groups*.

2 In the group list, select the check box next to each group that you want to remove.

3 Click *Remove*, then click *OK*.

4.3 Managing a Server Monitoring List

Before you can monitor servers, you must create a list of servers to monitor. You can add servers to the default group or create a new group and add servers to it.

- Section 4.3.1, "Adding a Single Server to the Server Monitoring List," on page 24
- Section 4.3.2, "Importing or Exporting a Group of Servers to the Server Monitoring List," on page 25
- Section 4.3.3, "Editing the Attributes of a Server in the Server Monitoring List," on page 27
- Section 4.3.4, "Removing a Server from the Server Monitor List," on page 28

4.3.1 Adding a Single Server to the Server Monitoring List

1 On the Server page, click *Add*.

2 Fill in the following fields:

   - *Server Name***:** Type a name for the server you want to add. You might want to match the actual host name of the server.

   - *IP Address / DNS Name:* Type the IP address or DNS name for the server you want to add. This information must match the actual IP address or DNS name for the server. If the address or name is not correct, the monitoring software cannot locate the server and return the health status.

   - *Description***:** Type a description for the server you want to add. You might want to enter data about the version of the operating system or the type of software being run so you can quickly identify the different servers listed.

3 Select the type of monitoring you want performed on this server.

- *Robust Health Monitoring*.

  This type monitors statistics in the following categories:

  - Memory
  - Operating System
  - Processes/Threads
  - Network
  - CPU

  The owcimomd module must be running on the servers being monitored so the Robust status can be obtained.

  In this release,

  - Filtering which statistics are monitored is not configurable.
  - Configuring thresholds for monitored item on Linux is not configurable. For items monitored on NetWare, the defaults are set and can be changed through Novell Remote Manager. See "Configuring Health Thresholds" in the *Novell Remote Manager for NetWare Administration Guide for OES*.

- *Simple Server Status*.

  This monitors only whether the server is up and running or down based on a connection attempt to a specified port.

4.3.2 Importing or Exporting a Group of Servers to the Server Monitoring List

Importing or exporting a server list can help you to share list with other users, save time when adding a lot of servers to a list, or let you make a number of changes to the existing lists all at once.

Figure 4-5 *Import Server List Page*
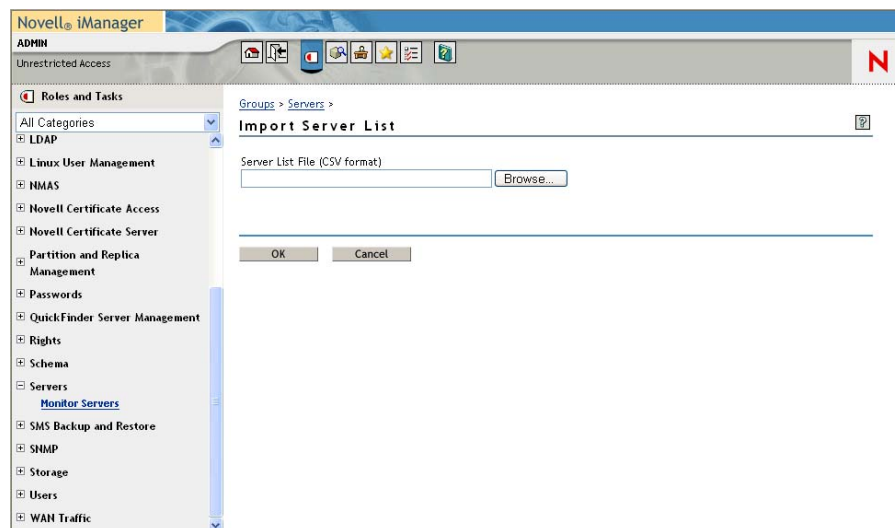
To import a list of servers:

1 In a plain text editor or a spreadsheet application, create a file with four columns and specify the following information:

Column	Contents
1	Name. Type a name for each server you want to add. You might want to match the actual hostname of the server.
2	IP Address or DNS Name. Type the IP address or DNS name for the server you want to add. This information must match the actual IP address or DNS name for the server. If the address or name is not correct, the monitoring software cannot locate the server and return the correct health status. A down status is returned.
3	Description. (Optional) Type a description for the server you want to add. You might want to specify data about the version of the operating system or the type of software being run so you can quickly identify the different servers listed.
4	Port. Type the applicable value. 5989=Use this value for the port if you want the server to have Robust Health monitoring performed on the server. 0=Use this value for the port if you want to simply ping the port and determine only whether the server is up or down.

Also note the following when typing text:

- Do not use double quotes (") as part of the text for any of the fields. You can use single quotes (').

  For example:

  Incorrect

  ```
  NWGWs1,192.65.59.135,"Doug's" GroupWise email server 1,5989
  ```

  Correct

  ```
  NWGWs1,192.65.59.135,Doug's GroupWise email server 1,5989
  ```

- If you need to use a comma to separate text, use double quotes to keep the information in the field together.

  For example:

  ```
  NWGWs1,192.65.59.135,"NetWare, GroupWise email server 1",0
  ```

- Make sure all field entries fit on one line and do not wrap when they are exported from a spreadsheet.

  For example:

  ```
  Lps1,191.155.188.22,Linux print server 1,5989
  Lps2,191.155.188.24,Linux print server 2,5989
  Lps3,191.155.188.25,Linux print server 3,5989
  Lps4,191.155.188.26,Linux print server 4,5989
  LGWs1,197.65.59.124,Linux GroupWise server 1,5989
  NWWs1,example.provo.novell.com,NetWare Web server 1,5989
  Lds5,192.65.71.14,Linux data server 5,5989
  Lds1,192.65.59.139,Linux-data server 1,5989
  Lds2,192.65.59.136,Linux-data server 2,5989
  Lds3,192.65.59.137,Linux-data server 3,5989
  LWs1,191.155.188.23,Linux (Web server) 1,5989
  LWs2,192.65.59.122,Linux (Web server) 2,5989
  W2003s1,191.155.188.21,Window 2003 server 1,5989
  NWGWs1,192.65.59.135,"NetWare, GroupWise email server 1",0
  NWMs1,192.65.59.140,NetWare Management server 1,0
  ```

2 Export the contents to a comma-separated value (CSV) formatted file.

3 Select the group that you want to add the imported list of servers to.

My Servers is the default group.

4 In the server list dialog box, click *Action > Import Server List*.

5 Specify or browse to the path or the location of the CSV formatted file that you created, then click *OK*.

To export a list of servers:

1 Browse to the server list that you want to export.

2 Click *Action > Export Server List*.

3 Save the file to directory on a local workstation or on a network that you have access to.

4.3.3 Editing the Attributes of a Server in the Server Monitoring List

To change the listed name of server, its description, or the type of monitoring for a single server in the list.

1 In the server list, select the check box next to the server that you want to change.

2 Click *Edit*.

If you select more than one server, only the first server selected in the list is changed.

3 Make the desired changes to any of the fields or selections, then click *OK*.

For more information on each of the fields, see "Adding a Single Server to the Server Monitoring List" on page 24.

TIP: If you want to change the details for more than one server at a time, you should use the *Export* and *Import* actions. For more information, see "Importing or Exporting a Group of Servers to the Server Monitoring List" on page 25.

4.3.4 Removing a Server from the Server Monitor List

When a server has been removed from your tree or is no longer needed in the list, use the following procedure to remove the server from this monitoring list.

TIP: If you want to simply move servers from one list to another list, you should use the *Export* and *Import* actions. For more information, see "Importing or Exporting a Group of Servers to the Server Monitoring List" on page 25.

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1 In the server list, select the check box next to each server that you want to remove.

2 Click *Remove*.

4.4 Changing the Refresh Rate of the Health Monitoring Services Pages

When Health Monitoring Services is started, a default refresh rate is set at 15 seconds for all pages viewed. You can change the refresh rate to a longer time or turn it off so you can view a longer list or edit items in the list. You can also refresh the current view immediately without resetting the rate so you can verify a monitored status.

To change the refresh rate for all pages:

1 From any page in the list, click *Refresh*.

2 Select the new status that you want.

The following refresh rates are available:

- *Off*
- *Immediately* (Refreshes the selected view immediately but does not change the current setting.)
- *Every 5 seconds*
- *Every 15 seconds*
- *Every 60 seconds*
- *Every 5 minutes*
- *Every 15 minutes*

To set the refresh rate differently for individual pages:

1 Right-click a link, and then select *Open Link in new window or tab*.

2 In the new window, click *Refresh*.

3 Click the new status that you want.

The following refresh rates are available:

- *Off*
- *Immediately* (Refreshes the selected view immediately but does not change the current setting.)
- *Every 5 seconds*
- *Every 15 seconds*
- *Every 60 seconds*
- *Every 5 minutes*
- *Every 15 minutes*

4.5 Delegating Monitoring Tasks

If you want to delegate the task of monitoring server health to users with fewer rights than user Admin or Root, you must make these users a trustee of the HMS object after it has been created and assign the users the following rights to these properties:

[All Attributes Rights] Compare / Read / Write
[Entry Rights] Browse / Create / Rename / Delete

The HMS object is created when you configure Health Monitoring. For detailed instructions, see "Configuring Health Monitoring" on page 19 and "Making Users A Trustee of The HMS Object Using iManager" on page 29.

These users can then create a server list or import a list that has already been created.

To allow users to authenticate using their eDirectory credentials to servers running Linux, you can install Linux User Management on the server and make sure these users are enabled for Linux User Management. For more information, see *Novell Linux User Management Technology Guide*.

4.5.1 Making Users A Trustee of The HMS Object Using iManager

1 In iManager, on the Roles and Task page, click *Rights*, then click *Modify Trustees*.

2 In the *Object name* field, type the full distinguished name of the HMS object or locate the HMS object using the *Object Selector* and select it.

For example:

.HMS.CIM.*container_name*

Replace *container_name* with the name of the container that the CIM.HMS object exists in.

If your are searching for the HMS object, enter HMS as the search string.

More than one object can exist. Make sure you select the object in the container that you want to change.

3 On the Modify Trustee page, click *Add Trustee*.

4 Using the object selector, add the names of the users or groups who you want to assign as trustees, and then click *OK*.

5 For each trustee, click *Assigned Rights*.

6 Make sure the following rights are selected for these properties:

[All Attributes Rights] Compare / Read / Write
[Entry Rights] Browse / Create / Rename / Delete

7 Click *Done*.

8 Click *OK* twice.

4.6 Sharing Server Lists

If you want to share server lists with other users, the easiest method is to export your list and let the other users import it to their own groups. For more information, see "Importing or Exporting a Group of Servers to the Server Monitoring List" on page 25.

Monitoring Server Health

<div style="text-align: right; font-size: 3em;">5</div>

When you have the Health Monitor System set up, you can perform the following tasks:

- At a glance, see the overall status of all servers in the monitor list.
- Select a server to get quick details about the overall status.
- Drill down and see the health status of the: physical and virtual memory, operating system, processes and threads, network, and CPU of a selected server.

This section includes the following procedures:

5.1 Viewing the Overall Health Status for Servers in Your Network

The meaning of the overall status is different for servers with the *Robust* monitoring type selected than for servers with a *Simple Status* monitoring type selected. For servers with the *Robust* monitoring type selected, the overall status icon reflects the overall health of the server. For servers with *Simple Status* monitoring type selected, the status reflects only whether the server is up or down.

For more information, see "Types of Health Monitoring" on page 10.

The default sort order for the server status list has the worst health showing at the top of the list. You can change the sort of the list by clicking the server's health status, name, or description column headings.

The overall server health status can be any one of the following:

Table 5-1 *Overall Server Health Statuses and Meanimg*

| Icon	Type	Status	Meaning
	Robust	Down or Stopped	An attempt to connect to the server through various ports was unsuccessful. Or, the OpenWBEM is unreachable for one of the following reasons: • The owcimomd module is not running. To start this module on a Linux* server, enter `etc/init.d/owcimomd` in a shell console. To start this and other required modules on a NetWare server, enter `LOAD OWCIMOMD.NCF` at the System Console prompt. • A network error occurred causing the server to be unreachable. • The server information is incorrect. • OpenWBEM is not installed on this node. • All versions of the components of Health Monitoring Services do not match or they are not installed. • Firewall software or hardware might be preventing access to TCP port 5989.
	Robust	No authentication	You have not logged in to this server yet. To access the login dialog box, click the server name link. If you have Linux User Management enabled in the same tree that this server is in, you can use eDirectory credentials to log in to the server rather than logging in as Root on a Linux server. For more information, see the *Novell Linux User Management Technology Guide*.
	Robust	Error	One or more measured parameters is operating outside the critical ranges or has a critical problem.
	Robust	Warning	One or more measured parameters is operating in the suspect range or has a minor problem.
	Robust	Normal	All measured parameters are within the specified operating limits.
	NA	Pending	The server's health is pending because a connection to this server has not been completed. This status refreshes as soon as a connection is complete.
	Simple	Up or Down	The lighter server status icons indicate the status of a server that does not have Health Monitoring installed or has Simple Status selected for the monitoring type. For this type, only a Up or Down status is monitored and shown. A down status indicates an attempt to connect to the server through various ports was unsuccessful.

If the status of any parameter that is monitored changes to ◇ (Warning) or ⊗ (Critical), the health status indicator on the server changes to indicate there is a problem. If more than one item changes, the worst status indicates the server's overall status.

When the status for all items returns to ● (Normal), the overall server health indicator changes back to ■● (Normal).

For all known states, you can view the details of a parameters by clicking the server name link and drilling down to the applicable status or by clicking the applicable link in the *Quick Status* view.

If you see an ⊘ (unknown) status, this indicates that you are not authenticated to the server or there might be a problem with the software.

5.2 Viewing a Quick Summary of a Server's Health Status

To get quick details about the overall status, select a server in the list of monitored servers by clicking the row for the server that you want to view. The selected server row is shaded light blue and has an arrow pointing to the quick status.

The amount of detail shown depends on monitoring type selected for the server and whether you are authenticated to the server.

If a ■◌ (no authentication) icon is displayed for the server's health status, you are prompted to log in to the server before a quick status is displayed.

Figure 5-1 *The Quick Status of the Selected Server*
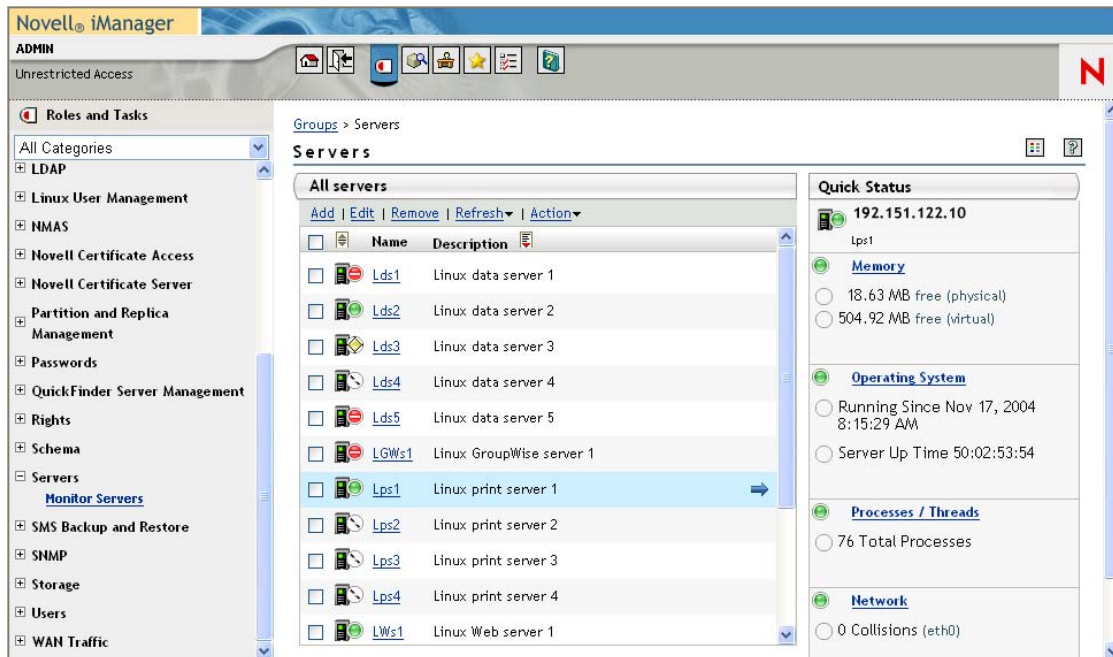
5.3 Accessing the Server Health Details

When you want to view the details of a server's health, you must be authenticated to the server.

1 Click the name link for the server you want to view.

2 (Conditional) If prompted, log into the server.

If a ![icon] (no authentication) icon is displayed for the server's health status, you are prompted to log in to the server.

If the server is an OES Linux server in a network that has Linux User Management installed and this service is enabled to use Linux User Management, you can log in as user Admin or a user with rights equivalent to user Admin.

If the server is not enabled for Linux User Management, you must log in as user Root.

If the server is an OES NetWare server, you must log in as user Admin.

If you are a non-admin eDirectory user, you must have rights to view the HMS object. For more information, see "Delegating Monitoring Tasks" on page 29.

3 Click one of the applicable links to view the details that you want to view.

TIP: If the server you want to view the details of is selected in the quick status view, you can also click the applicable link in the quick status view.

Figure 5-2   Detailed Server Health Page
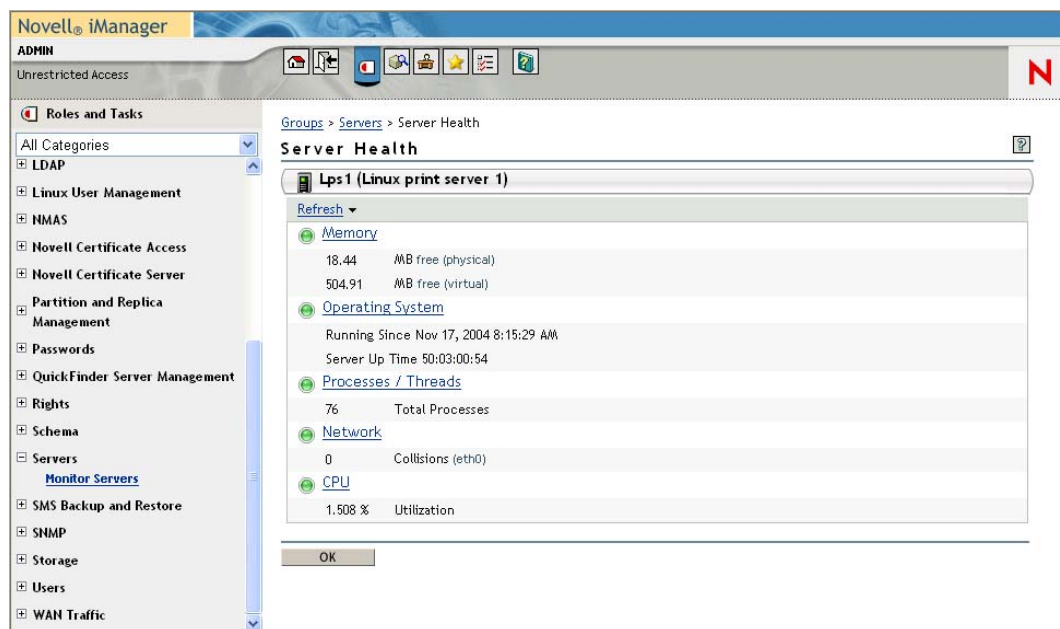
Table 5-2   Detailed Server Health Page Links and Descriptions

Link	Description of Details Available
Memory	Statistics about physical and virtual memory in the server being monitored
Operating System	Details about the server operating system, including OS type, kernel version, total number processes running, server up time, load average, etc.

Link	Description of Details Available
Processes and Threads	An overview of the total number of processes in the system, the types of processes, and the number of processes in each state at each update interval.
Network	Network Card Overall Status and Device Active statistics and detailed statistics about LAN traffic, transmit and receive errors, or collisions for each network board.
CPU	The overall CPU status and the data for each CPU in the device being monitored. Some additional statistics do not show health but give information about each of the processors on the system.

4 To get a description of the status you see and the actions recommended for each status, access the online help on each page.

The following figure shows an example of the details you might see for server memory on a Linux server.

Figure 5-3 *Server Memory Statistics on a Server Running OES Linux*
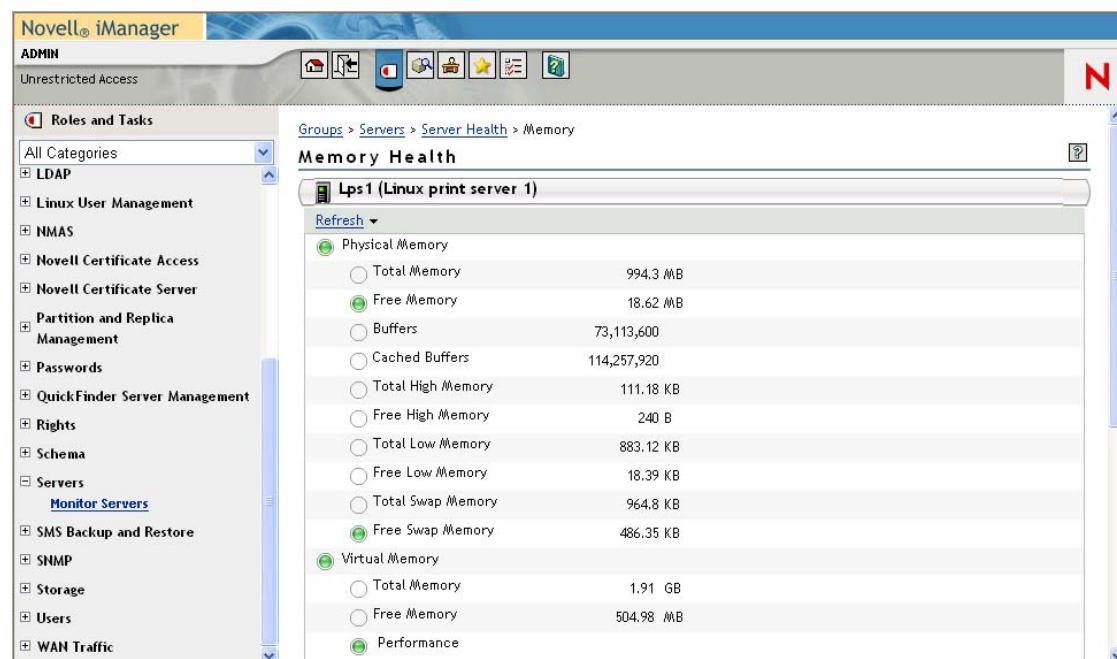
The following figure shows an example of the details you might see for processes and threads running on an OES Linux server.

Figure 5-4 Processes and Thread Statistics on a Server Running OES Linux
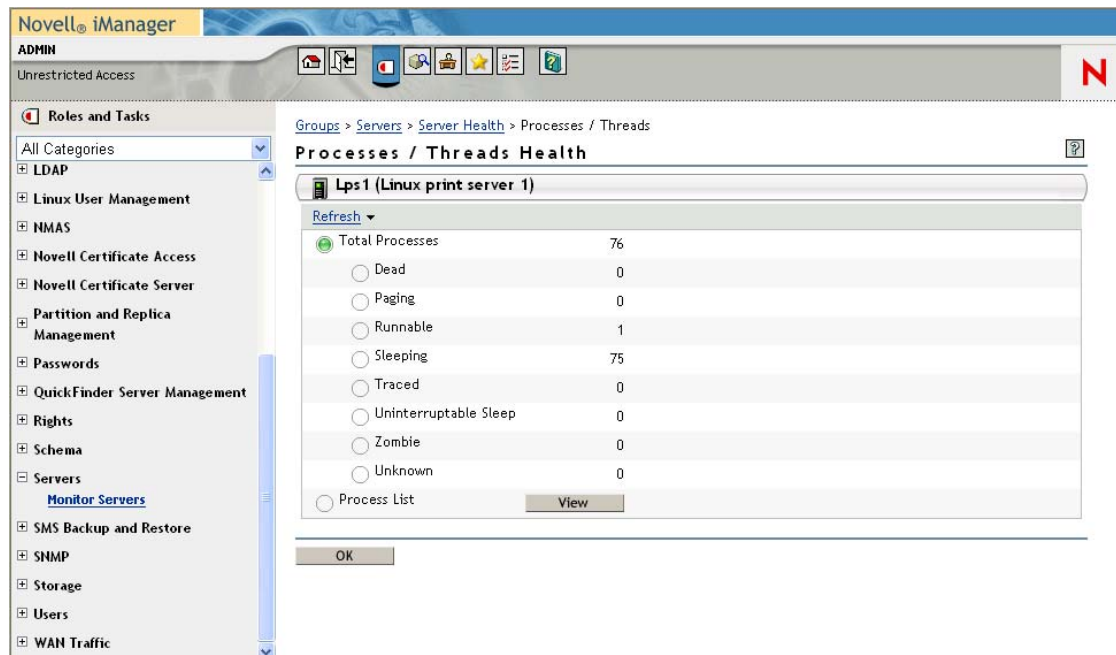
The following figure shows an example of the process list that you might see on an OES Linux server when you click the *View* button on the Processes and Threads page.

Figure 5-5 Process List on a Server Running OES Linux
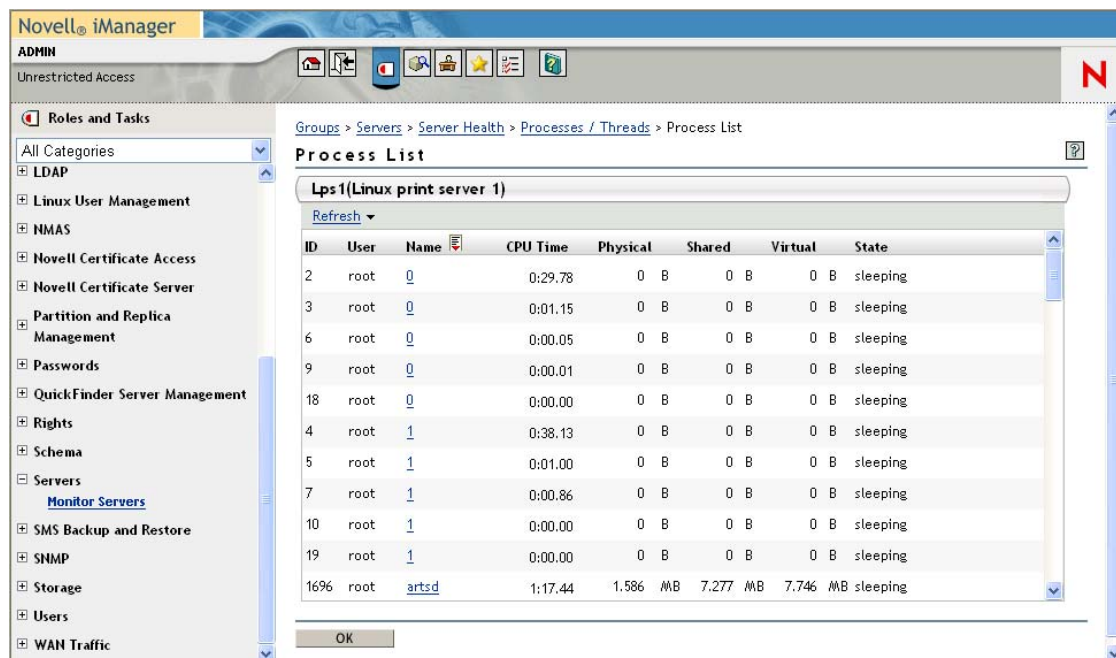
5.3.1 Comparing Servers

To compare the views of more than one server or look at several pages at the same time on one server:

1 Drill down to the link of the view that you want to monitor.

2 Right-click the link.

3 Select *Open Link in new window or tab*.

4 Resize and position the view to the desired size and location.

Repeat these steps for each view.

Figure 5-6   *Detailed Memory Health Views on Different NetWare and Linux Servers*
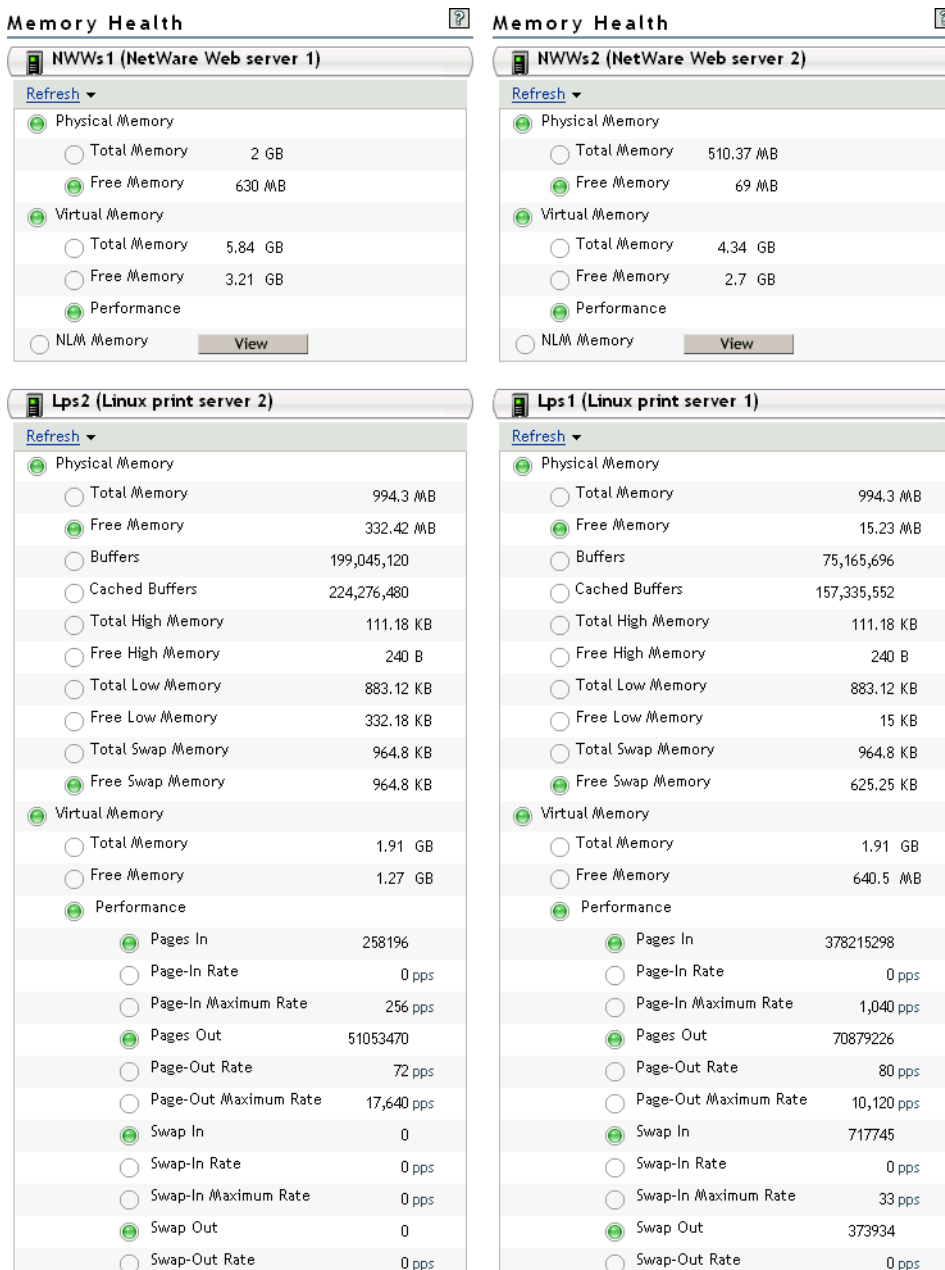
5.3.2 Integration with Novell Remote Manager

When you are viewing server memory or processes and threads details on a NetWare server, these pages have links to open views in Novell® Remote Manager.

To view these pages, you must log into the server you are viewing as user Admin or as a user with rights equivalent to Admin.

If you are unable to log into Novell Remote Manager or view these pages, you can try setting the browser security setting to Medium or Lower while viewing these page. You can change the settings back after you have finished viewing the pages integrated with Novell Remote Manager.

The following graphic shows the processes and threads page on a NetWare server with the views that are displayed after you click *View* and authenticate to Novell Remote Manager for the server you are accessing.

Figure 5-7 *NetWare Server Processes and Threads Page with the Views Displayed after Authentication to Novell Remote Manager*
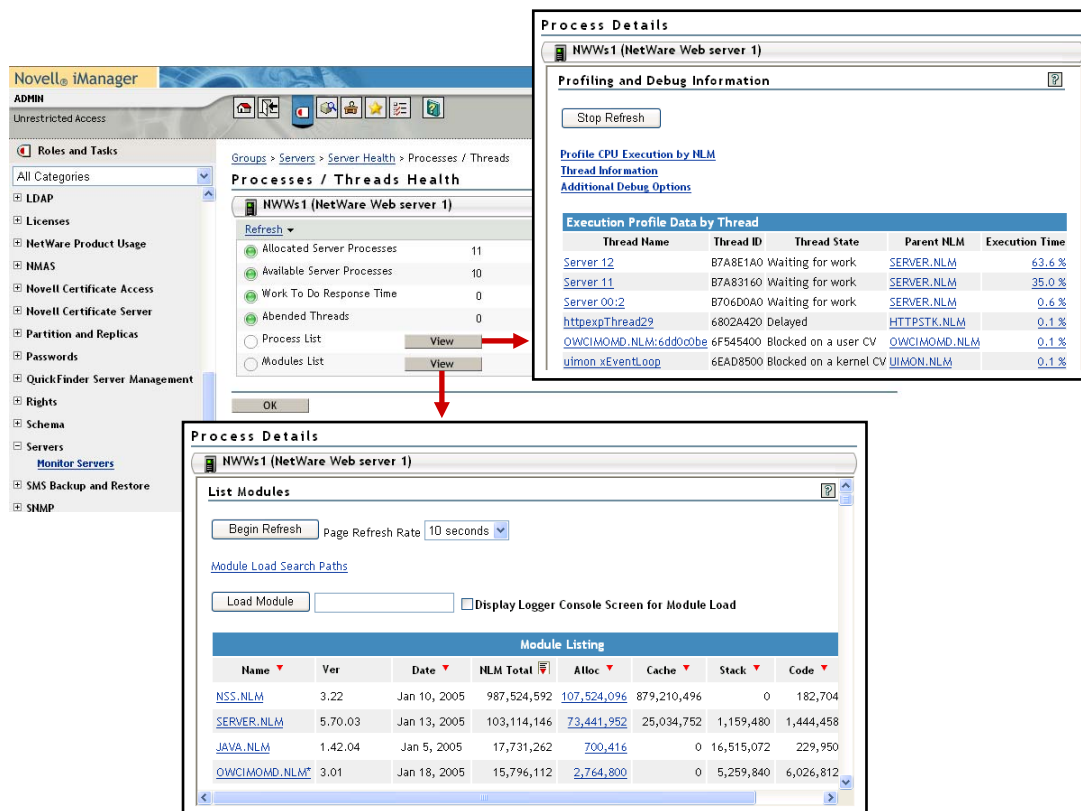
Disabling Integration with Novell Remote Manager

If you are an administrator and if you want to disable this link for integration with Novell Remote Manager, you can do the following:

1 Relative to the directory of the Tomcat instance where iManager is running, find the following file:

- **On Linux:** `/var/opt/novell/tomcat4/webapps/nps/WEB-INF/config/lasMonitorServers.xml`

- **On NetWare:** `SYS/tomcat/4/webapps/nps/WEB-INF/config/lasMonitorServers.xml`

This file is generated the first time you configure Health Monitoring Services (HMS). Therefore, it is not available if you have not yet configured HMS. See "Configuring Health Monitoring" on page 19.

2 In a standard text editor, edit the file to add the following xml lines to the file before the closing `</config>` tag.

```
<setting>
 <name><![CDATA[nrmIntegration.disabled]]></name>
 <value><![CDATA[true]]></value>
</setting>
```

Security Considerations

6

When implementing Health Monitoring Services in your network, please consider the following issue Anonymous SSL.

6.1 Anonymous SSL

Health Monitoring Services (HMS) uses anonymous SSL for the communication between iManager and the various OpenWBEM CIMOM agents which are being monitored. Because of this, HMS should be used only within trusted networks (behind a firewall), where there is a low risk for "man-in-the-middle" attacks.

Health Monitoring Services Modules

<div style="text-align: right">A</div>

The following information describes the modules provided by Health Monitoring Services for Linux and NetWare®.

A.1 Linux

On the Installation Settings page during the installation of OES Linux, if you click *Software > Detailed Selections > Novell Health Monitoring*, no description is displayed. This software selection is selected by default with all the Open Enterprise Server (OES) software selection. It is simply a file that extends the schema to provide the health monitoring interface for iManager when it is installed.

The following table lists the packages that are included with the Health Monitoring Services software selection for an OES Linux server.

Table A-1 *Packages Included in Health Monitoring Services Software Selections for OES Linux Server*

Package (RPM)	Description	Notes
novell-life	Linux Instrumentation for Enterprise OpenWBEM providers	Contains the providers necessary for Robust health monitoring on a Linux server.
openwbem	Web Based Enterprise Management (WBEM) Implementation	Contains the providers necessary for Robust health monitoring on a Linux server.
novell-plugin-life-health-imanager	iManager plug-in for Health Monitoring Services on Open Enterprise Server on Linux.	Provides the schema extension for Novell® eDirectory™, provides the interface for iManager, and populates the CIM, HMS, and Server List objects in the eDirectory tree when a container for monitoring is first selected.
novell-welcome-health-monitor	Health Monitoring Services Welcome Page Content for Novell Open Enterprise Server	Provides Welcome page (port 80) content for Health Monitoring Services
novell-health-monitor-acls	Access control List for LIFE Health Monitoring Service	Required when Linux User Management is installed and enabled.
novell-openwbem-authenticator	Authenticator module for OpenWBEM	Required when Linux User Management is installed and enabled.
novell-openwbem-authorizer	Novell's authorization module for OpenWBEM	A required provider when Linux User Management is installed and enabled.

Package (RPM)	Description	Notes
yast2-lifeconsole	Configuration of lifeconsole	Required for post-server installation of Health Monitoring Services and configuring the LDAP settings for Health Monitoring Services.

These packages are installed with the following software selections during the OES SUSE® Linux installation. You can also install them as a packages after initial installation.

Table A-2 *List of Packages installed with the following selections*

Package (RPM)	Minimum System	Minimum Graphical System	Full	Default	Novell QuickFinder	Novell iFolder	Novell Virtual Office	Novell iPrint	Novell Open Enterprise Server
novell-life	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
openwbem	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
novell-plugin-life-health-imanager	No	No	No	No	No	No	Yes	Yes	Yes
novell-welcome-health-monitor	No	No	No	No	Yes	Yes	Yes	Yes	Yes
novell-health-monitor-acls	No	No	No	No	Yes	Yes	Yes	Yes	Yes
novell-openwbem-authenticator	No	No	No	No	Yes	Yes	Yes	Yes	Yes
novell-openwbem-authorizer	No	No	No	No	Yes	Yes	Yes	Yes	Yes
yast2-lifeconsole	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

A.2 NetWare

The following table lists the NetWare Loadable Module™ software needed for Health Monitoring Services on an OES NetWare server. These modules are installed by default with all preconfigured server patterns.

Filename	Module Title	Notes
Health Monitor Services Plugins	Health Monitor iManager plug-in	Provides the schema extension for Novell eDirectory, provides the interface for iManager, and populates the CIM, HMS, and Server List objects in the eDirectory tree. It is installed with preconfigured server patterns that install iManager.
libNHMSNetworkDevice.nlm	NA	Provides system information for the owcimomd.nlm when monitoring server health on NetWare.
owcimomd.nlm	OpenWBEM CIMOM Daemon with Novell providers	Contains the providers necessary for Robust health monitoring on a NetWare server.

Documentation Updates

<div style="text-align: right">

B

</div>

To help you keep current on updates to the documentation, this section contains information on content changes that have been made in this*Health Monitoring Services Administration Guide for OES* since the initial release of Open Enterprise Server.

This document is provided on the Web in HTML and PDF; and is kept up to date with the documentation changes listed in this section. If you need to know whether a copy of the PDF documentation you are using is the most recent, check its publication date on the title page.

This documentation update information is grouped according to the date the changes were published. Within a dated section, the changes are alphabetically listed by the names of the main table of contents sections in the *Health Monitoring Services Administration Guide for OES*.

The documentation was updated on the following dates:

B.1 November 1, 2005 (Open Enterprise Server SP2)

Updates were made to the following section:

B.1.1 Entire Guide

Location	Change
Entire guide.	Page design reformatted to comply with revised Novell documentation standards.

B.2 August 19, 2005 (Open Enterprise Server SP1)

Updates were made to the following sections:

B.2.1 Health Monitoring Services Modules

Location	Change
"Health Monitoring Services Modules" on page 43	Restructured the appendix and added the following paragraph to the Linux topic.
	On the Installation Settings page, if you click *Software > Detailed Selections > Novell Health Monitoring*, no description is displayed. This software selection is selected by default with all the Open Enterprise Server (OES) software selections. It is simply a file that extends the schema to provide the health monitoring interface for iManager when it is installed.

B.2.2 Security Considerations

Location	Change
"Security Considerations" on page 41	Moved this information from Chapter 3, Accessing Health Monitoring Services to its own section.

B.2.3 Preface

Location	Change
"Feedback" on page 7	Added this section.