Novell NetWare® 6.5

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IP ADDRESS MANAGEMENT
ADMINISTRATION GUIDE

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About This Guide

This guide discusses how to administer the IP Address Management Framework on NetWare® 6.5. The discussion includes how to deploy and manage the framework.

This guide is divided into the following sections:

- Chapter 1, “Understanding,” on page 9
- Chapter 2, “Setting Up IP Address Management,” on page 13
- Chapter 3, “Using the IP Address Management Framework,” on page 15
- Appendix A, “Applications Integrated with the Framework,” on page 23
- Appendix B, “Troubleshooting IP Address Management,” on page 25

Documentation Updates

For the most recent version of the *Netware 6.5 IP Address Management Adminstration Guide,* see the NetWare 6.5 Documentation Web site (http://www.novell.com/documentation/lg/nw65/index.html).

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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 Understanding

IP Address Management is a centralized framework that stores and displays the IP address : port configuration of applications present on a server. The framework helps you in managing the IP address-application association when changing the server's IP address. It also helps in resolving IP address and port conflicts.

This guide helps you understand the framework and solve the problems that arise out of IP address and port conflicts.

This section covers the following:

- "Analyzing IP Address : Port Configuration Scenarios" on page 9
- "Benefits of the IP Address Management Framework" on page 11

Analyzing IP Address : Port Configuration Scenarios

Whenever a server's IP address changes, the following problems occur:

- Many critical applications might stop working and might not work even after a reboot of the server
- Restarting broken applications requires extensive modification of configuration files with the new IP address
- There are too many configuration files, making it difficult to figure out which application is using which IP address

Until now, the workaround was to manually modify the configuration files of each application with the new IP address. Some of you might have opted to reinstall the server.

Port conflicts occur when there are multiple applications contending for the same port, IP address and protocol combination. Even here, the workaround was to manually modify the configuration files of each application with the new IP address. Again, some of you might have opted to reinstall the server.

This section further discusses the following:

- "Scenarios for IP Address Configuration Changes" on page 10
- "Scenarios for Port Conflicts" on page 10

Scenarios for IP Address Configuration Changes

This section discusses the scenarios that you might encounter when you need to change the IP address of a server.

- "When Applications Bind to a Wildcard Address (0.0.0.0)" on page 10
- "When Applications Bind to a Specific Address" on page 10
- "When Applications Bind to a Nonspecific Address (Default IP)" on page 10

When Applications Bind to a Wildcard Address (0.0.0.0)

Applications that bind to a wildcard address (INADDR_ANY) will be bound to 0.0.0.0. These applications use any available IP address for connections, such applications continue to work without any problem when the IP address on the system is changed.

When Applications Bind to a Specific Address

These applications bind only to a specific IP address. When this address is changed, these applications stop working. These applications will not work even after they are reloaded or the server is restarted.

When Applications Bind to a Nonspecific Address (Default IP)

These applications do not care which IP address they are listening to as long as they get one of the IP addresses on the server.

NOTE: If a default IP address is not configured, the TCP/IP stack assigns the first bound IP address on the server as the default IP address.

To configure the default IP address, refer to the *TCP/IP Administration Guide* (http://www.novell.com/documentation/lg/nw65/tcpipenu/data/hc7znq4j.html).

Scenarios for Port Conflicts

This section discusses the scenarios related to port conflicts during IP Address : Port configuration changes.

- "When Applications Compete for Ports" on page 10
- "When Applications Do Not Compete for Ports" on page 10

When Applications Compete for Ports

When multiple applications contend for the same port : IP address : protocol combination, this results in port conflicts. Port conflicts can be resolved by using either a different port or a different IP address.

When Applications Do Not Compete for Ports

Applications that do not compete for ports toggle between the valid and invalid status. These applications have their ports marked as N/A.

Benefits of the IP Address Management Framework

The IP Address Management framework is a centralized repository that provides you a bird's eye view of all the applications IP Address : Port : Protocol configurations on a server. The prominent features of this framework are listed below:

- Provides a Web-based user interface to access the framework.
- Notifies any change in the server's IP address : Port configuration to the applications present on that server and to you (the administrator).
- Classifies application configurations as valid, invalid, or conflict and provides a centralized interface to edit and resolve application's configuration.
- When you use the framework to change the applications' IP Address : Port configuration, it also automatically updates the application's configuration file. When the server restarts, the application receives the correct configuration information
- Also accommodates and displays any change in an application's configuration done outside the framework UI.
- When any change occurs in the server's IP address, it automatically updates the etc\hosts and etc\hostname files with the right IP address.
- Displays a list of configured IP addresses on the server.
- Schedules changes to an application's IP address configuration at a specified date and time.

2 Setting Up IP Address Management

The IP Address Management framework is automatically installed during NetWare® 6.5 installation.

This section lists the modules that enable the IP Address Management framework:

- "IP Address Management Modules" on page 13

IP Address Management Modules

The following NetWare Loadable Module™ (NLM™) programs enable the IP Address Management framework:

- **Ipmgmt.nlm** can be loaded using ipminit.ncf and provides the basic framework to handle applications' IP address and port configuration.
- **Ipmcfg.nlm** can be loaded using inetstrt.ncf and provides the Netware Remote Manager (NRM) user interface for IP address management. This NLM auto-loads the ipmgmt.nlm.

3 Using the IP Address Management Framework

This section discusses how the following features of IP Address Management framework available in NetWare® Remote Manager (NRM) can be used:

- "Understanding the NRM-Based IP Address Management Framework" on page 15
- "Changing the IP Address and Port" on page 17
- "Viewing the Configured IP Address" on page 18
- "Scheduling Configuration Changes" on page 19
- "Resolving IP Address and Port Conflicts" on page 18

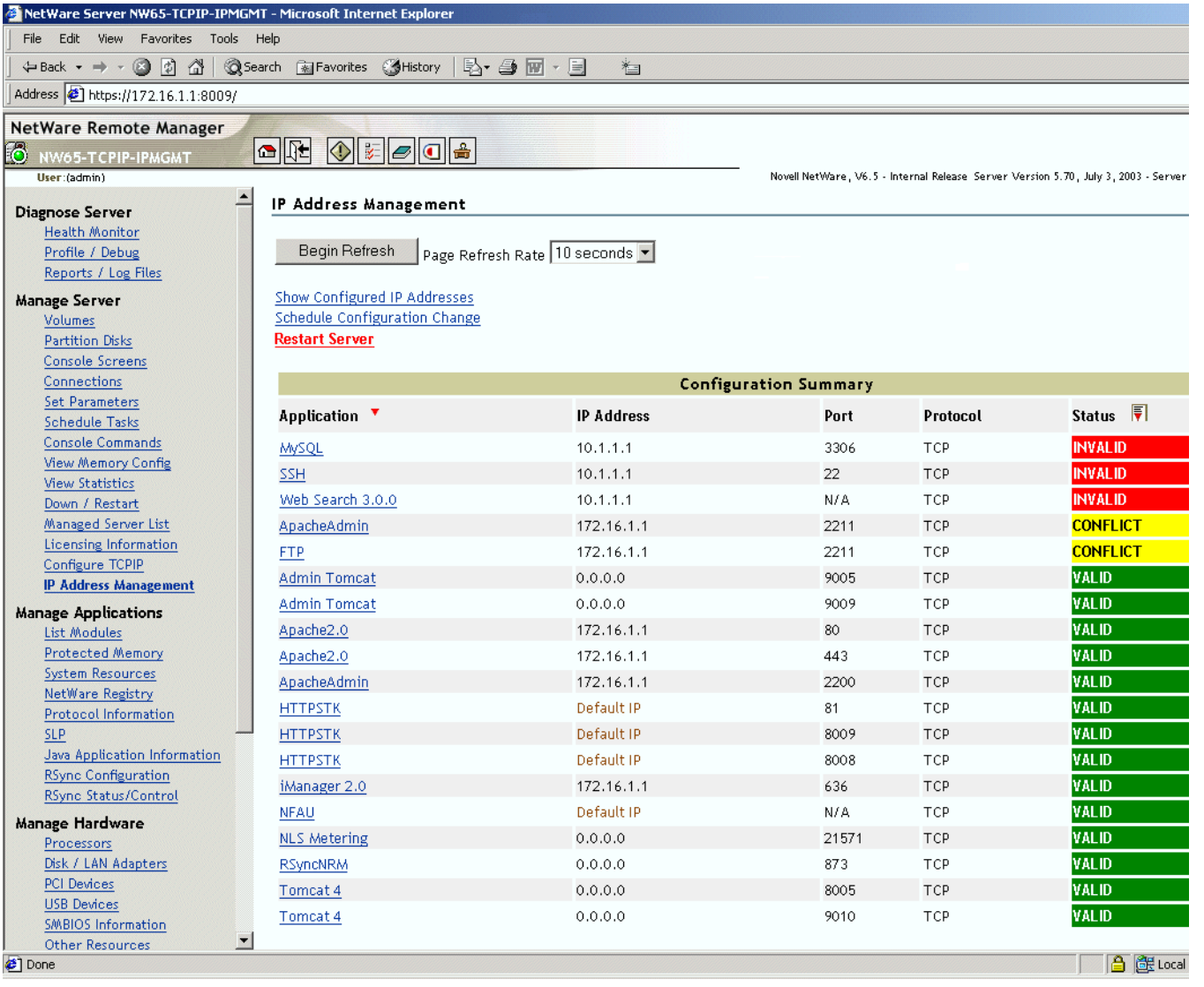
Understanding the NRM-Based IP Address Management Framework

Log in to NRM, then click the IP Address Management link in the left pane. The IP Address Management page displays as shown in Figure 1, "IP Address Management Page," on page 16.

The following information is available on this page:

- **Application** is the list of applications being served by the framework.
- **IP Address** is the IP address associated with the application. The supported address types are IPv4 and DNS.
- **Port** is the port number that the application is currently listening on. Consider the following:
  - You can select a port within the range of 1 to 65535.
  - If N/A is displayed in this field, it indicates that this application is not competing for ports. This value is not editable.
- **Protocol** is the Transport Layer Protocol being used by the application.
- **Status** is the current configuration status of the application. The status could be valid, conflict, or invalid:
  - **Valid** indicates the application is configured with an IP address configured on the server.
  - **Invalid** indicates the application is configured with an IP address that is not available on the server.
  - **Conflict** indicates that at least two applications are using the same IP address : port : protocol combination.

Figure 1 IP Address Management Page



The applications can be grouped based on either the application name or the configured status. The sample page in the above figure is grouped on the basis of Status. Click the Group By icon next to Application/Status to group the list by either Application or Status.

When the Grouped By icon is visible next to a field, it indicates that the list is grouped by that field.

NOTE: The same application might have more than one configuration record. Currently, the configuration for an application needs to be managed on a per-record basis.

The options available on the IP Address Management page are discussed below:

Show Configured IP Addresses

Use this link to view the configured IP addresses on the server. Refer to "Viewing the Configured IP Address" on page 18 for more information.

Schedule Configuration Change

Use this link to schedule configuration changes for applications by selecting the date and time when the changes need to take place. Refer to "Scheduling Configuration Changes" on page 19 for more information.

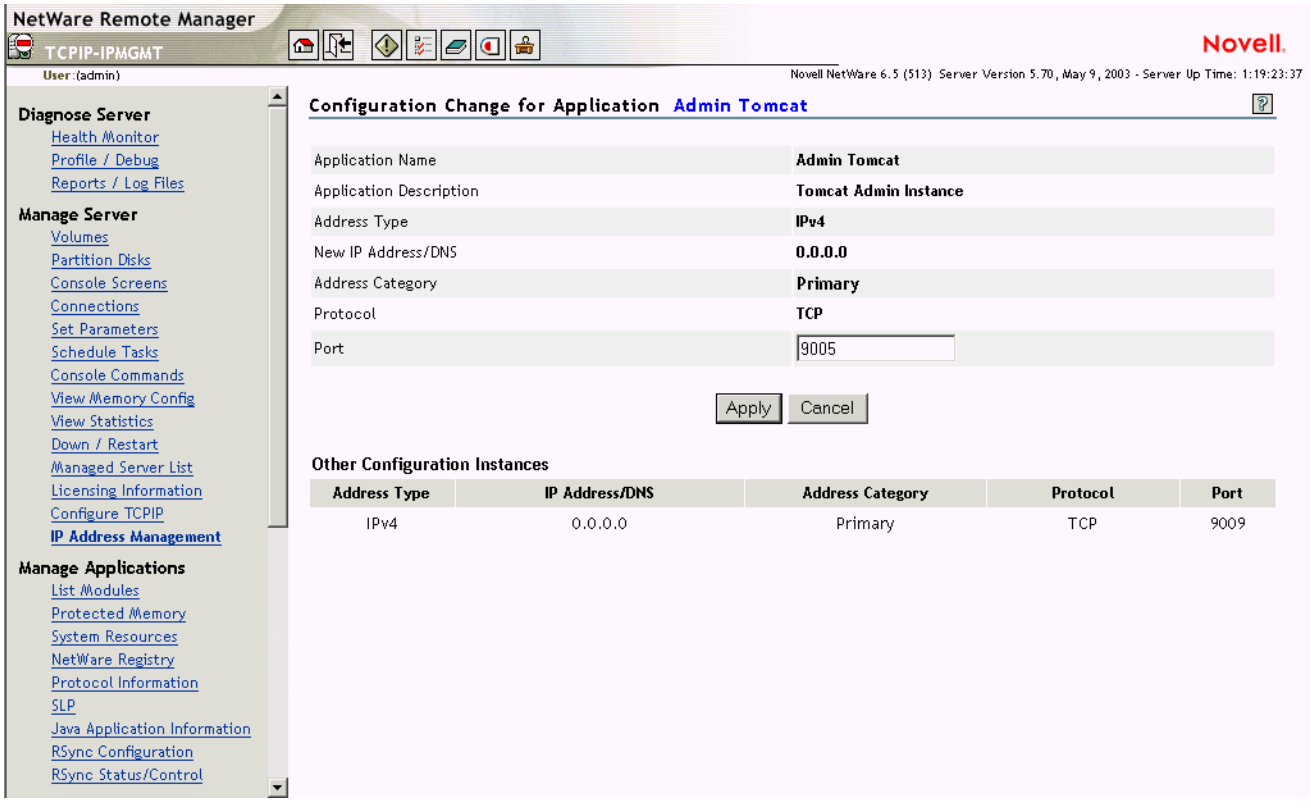
Restart Server

For the Restart Server link to appear on the IP Address Management page, you need to change any one application's configuration.

Changing the IP Address and Port

To change an application's configuration, click the *Application_name* on the IP Address Management page. The Configuration Change for Application *Application_name* page displays.

Figure 2 Configuration Change for Application *Application_name* Page



This page provides the following information:

- **Application Name** is the name of the application.
- **Application Description** gives a description of the application.
- **Address Type** is the type of address. (If the address type of the application is Default IP Address, that IP address cannot be changed.)
- **New IP Address/DNS** is a configurable value. You can choose one of the addresses from the drop-down list. (If the application has opted for the IP address to be noneditable, then it will not be configurable.)

- **Address Category** indicates whether the address is primary, secondary, or default.
  - **Primary IP Address** is the first address bound on an interface card.
  - **Secondary IP Address** is any other address bound to the interface card, apart from the Primary address.
  - **Default IP Address** is one of the Primary IP addresses configured as the default on the server. The default IP address is not configurable from the IP Address Management page.
- **Protocol** is the protocol (TCP or UDP) of the application.
- **Port** is the port that the application is listening on. This is a configurable value, so you can enter a new value here. (If the application has opted for the port to be noneditable, then it will not be configurable.)

Other Configuration Instances

All other configurations associated with that application are shown in the lower pane of the Configuration Change for Application *Application_name* page.

Resolving IP Address and Port Conflicts

This section discusses how to resolve IP address and port conflicts:

- "Resolving Invalid Addresses" on page 18
- "Resolving Port Conflicts" on page 18

Resolving Invalid Addresses

You can resolve an invalid IP address to a valid (configured) IP address from the new IP Address/DNS drop-down list on the Configuration Change for Application *Application_name* page.

The status of the application will move from Invalid (red) to Valid (green). If the Status changes to Conflict, refer to "Resolving Port Conflicts" on page 18.

Resolving Port Conflicts

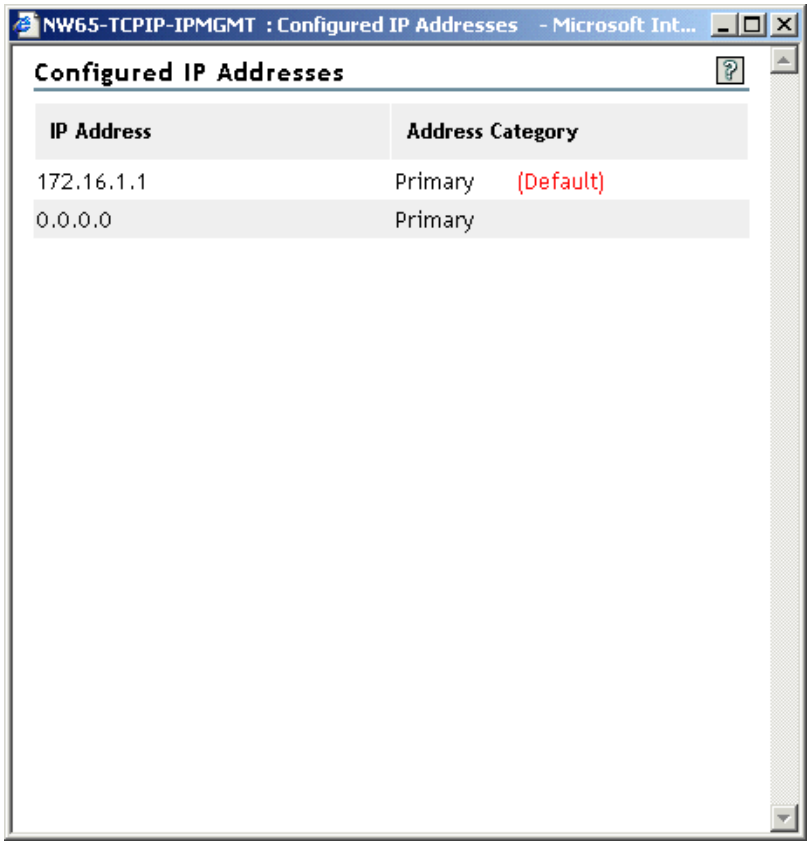
You can resolve port conflicts either by selecting a new IP address or by changing the port value on the Configuration Change for Application *Application_name* page.

The status of the application will move from Conflict (yellow) to Valid (green). For the applications to start working with the new configuration, you need to restart the server.

Viewing the Configured IP Address

Click the Show Configured IP Addresses link on the IP Address Management page to display the Configured IP Addresses window. This window displays all the IP addresses currently configured on the server.

Figure 3 Configured IP Address Window



This view-only window lists the following information:

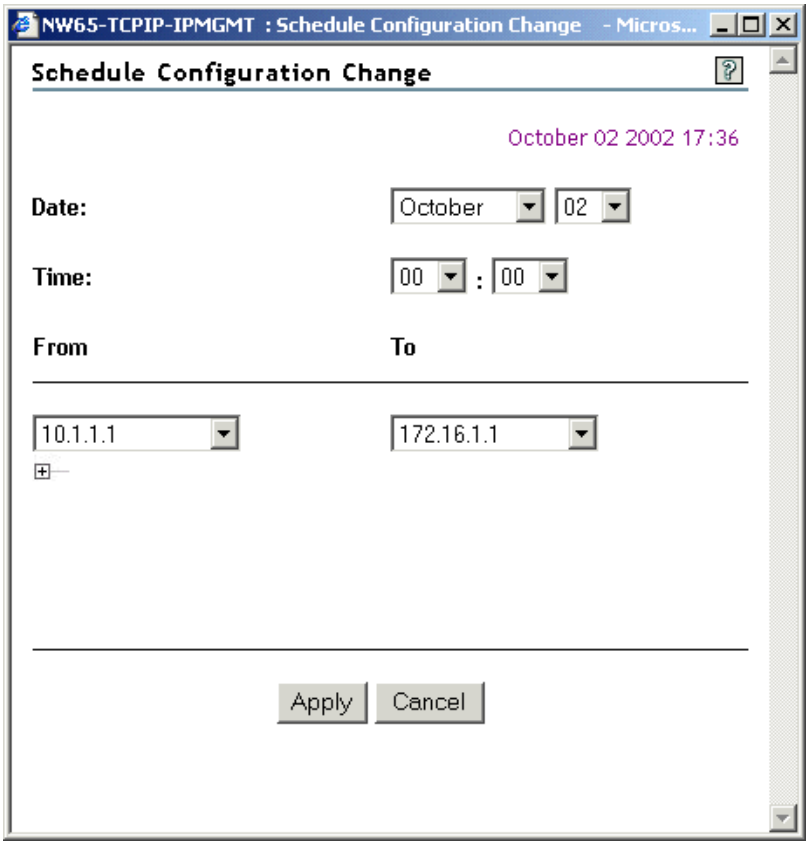
- All configured IP addresses
- The category that each address belongs to.
- The default IP address for the server.

Scheduling Configuration Changes

Click the Schedule Configuration Change link on the IP Address Management page to display the Schedule Configuration Change window. In this window, you can schedule configuration changes for applications by selecting the date and time when the changes need to take place.

IMPORTANT: You can use this window only for scheduling changes for IP address configuration.

Figure 4 Schedule Configuration Change Window



The server's current date and time are displayed in the upper right corner.

- **Date** specifies the date on which the changes need to take place. Select the month and day from the drop-down lists.
- **Time** specifies the time by when (on a particular date) the changes need to take place. Select the hour and minutes from the drop-down lists.
- **From** specifies the current IP address of an application that needs to be configured to use a new IP address. All the currently configured IP addresses are available in this drop-down list.
- **To** specifies the new IP address that the application can listen on after the scheduled date and time.

  NOTE: The IP addresses available in the To drop-down list need to be configured using INETCFG or the Configure TCP/IP link in NRM. However, do not reinitialize the server after configuring the new IP addresses because this might result in loss of the current connection.

Click the plus ⊞ icon below the From drop-down list to display another set of drop-down lists.You can select up to three IP addresses for scheduling configuration changes.

Make any desired changes, then click Apply for the changes to take place as well as to return to the previous page.

Click Cancel to close the window without saving any changes.

Click Delete to cancel a scheduled change. For the Delete button to appear in the Schedule Configuration Change window, a scheduled change should exist.

NOTE: After you save a schedule for configuration changes, the next time you open the Schedule Configuration Changes window, the previous schedule details are displayed.

When configuration changes occur on the scheduled date and time, the server will be restarted automatically.

Updating the Etc\hosts and Etc\hostname Files

Whenever you change a server's IP address and you need to update the etc\hosts and etc\hostname files, do the following:

1. Ensure that all applications have a Valid status.

   If any of the applications have a Conflict or Invalid status, resolve all the IP address and port conflicts.

2. After the status of all applications is changed to Valid, click Restart Server to activate the changes.

A Applications Integrated with the Framework

Applications that are integrated with the IP Address Management framework are listed below.

Application Name	Description
Admin Tomcat	Tomcat Admin Instance
Apache 2.0	Apache 2.0 Web Server
ApacheAdmin	Apache Administration Web Server
exteNdAppServer	exteNd™ Application Server
DNS Server	eDirectory integrated DNS Server
FTP	NetWare® FTP Server
HTTPSTK	Novell® Small HTTP Interface
iManager 2.0	iManager 2.0 Framework
MySQL	MySQL Database Server
NDPS Broker	Host for brokered services: SRS, ENS, and RMS
NFAU	Native File Access for UNIX*
NLS Metering	NLS - Usage Metering
RSyncNRM	RSync NRM Management Utility
SMDR	SMS - Storage Data Requestor
SSH	SSH Server
Tomcat 4	Tomcat User Instance
Web Search 3.0.0	NetWare Web Search Server 3.0.0

B Troubleshooting IP Address Management

This section contains the following troubleshooting information for IP Address Management under the following sections:

- "Sys:\system\ipconf\..\appconf.xml File Open Failed" on page 25
- "An Application Is Not Visible in the Framework" on page 25
- "ipmcfg.nlm Does Not Unload Automatically" on page 26
- "IP Address Change Does Not Reflect in the etc/hosts and etc/hostname Files" on page 26

Troubleshooting Strategies

Sys:\system\ipconf\..\appconf.xml File Open Failed

Problem: In the Logger Screen, I encountered the following error message:

```
sys:\system\ipconf\..\appconf.xml file open failed
```

Action: Do the following:

1. At the server console, increase the Set parameter IPMGMT Fetch Expiry Time to a higher value.

   Range: 1 to 60

   Default: 5

2. On the IP Address Management page, click Begin Refresh with 10 seconds as the refresh interval.

An Application Is Not Visible in the Framework

Problem: One of the configured applications is not visible in the framework.

Action: Do the following:

- Verify whether the application is integrated with the framework. Refer Appendix A, "Applications Integrated with the Framework," on page 23.
- Verify whether the application that you are looking for is loaded.
- Verify that in the Logger Screen, you have not encountered a sys:\system\ipconf\..\appconf.xml open failed message.
- On the IP Address Management page, click Begin Refresh with 10 seconds as the refresh interval.
- If you still encounter the problem, follow the procedure under "Sys:\system\ipconf\..\appconf.xml File Open Failed" on page 25.

ipmcfg.nlm Does Not Unload Automatically

Problem: Whenever httpstk.nlm is unloaded, the dependent ipmcfg.nlm is not uninitialising.

Action: Manually unload ipmcfg.nlm before unloading httpstk.nlm.

IP Address Change Does Not Reflect in the etc/hosts and etc/hostname Files

Problem: When I change the IP Address, the change does not reflect in the etc/hosts and etc/hostname files.

Action: This is because the etc/hostname file does not contain DNS name. Manually update the etc/hosts and etc/hostname files in such cases.