

Novell NetWare 6.5

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IP ADDRESS MANAGEMENT
ADMINISTRATION GUIDE



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IP Address Management Administration Guide

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Contents

- About This Guide** **3**

- 1 Understanding IP Address Management** **5**
 - Nature of IP Address and Port Conflicts 5
 - IP Address Management Framework. 5
 - Updating the etc\hosts File 6
 - Defining Application Categories 6
 - Applications That Bind to a Wildcard Address (0.0.0.0). 7
 - Applications That Bind to a Nonspecific Address (Default IP) 7
 - Applications That Bind to a Specific Address. 7
 - Applications That Compete for Ports 8
 - Applications That Do Not Compete for Ports 8
 - Applications That Need Real-Time Support. 9

- 2 Setting Up IP Address Management** **11**
 - IP Address Management Modules 11

- 3 Using the NRM-Based Administration Framework** **13**
 - Understanding the NRM-based IP Address Management Framework. 13
 - Changing the IP Address and Port 15
 - Viewing the Configured IP Address 16
 - Resolving IP Address and Port Conflicts 17
 - Resolving Invalid Addresses 17
 - Resolving Port Conflicts. 17

- 4 Troubleshooting** **19**
 - sys\...\appconf.xml File Open Failed 19
 - An Application Not Visible in the Framework 19

About This Guide

This guide discusses the IP Address Management Framework to be used by NetWare® applications to resolve the problems they face when changing the server IP address. The discussion includes how the framework works and how to deploy and manage the framework.

This guide is divided into the following sections:

- ◆ Chapter 1, “Understanding IP Address Management,” on page 5
- ◆ Chapter 2, “Setting Up IP Address Management,” on page 11
- ◆ Chapter 3, “Using the NRM-Based Administration Framework,” on page 13
- ◆ Chapter 4, “Troubleshooting,” on page 19

Documentation Updates

For the most recent version of the *IP Address Management Administration Guide*, see the [Novell online documentation \(http://www.novell.com/documentation/beta/nw65/index.html\)](http://www.novell.com/documentation/beta/nw65/index.html)

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1

Understanding IP Address Management

IP Address Management is a centralized framework that stores and displays the IP addresses of the applications running on the server. 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:

- ♦ “Nature of IP Address and Port Conflicts” on page 5
- ♦ “IP Address Management Framework” on page 5
- ♦ “Updating the etc\hosts File” on page 6
- ♦ “Defining Application Categories” on page 6

Nature of IP Address and Port Conflicts

Applications on NetWare[®] use different mechanisms for storing IP addresses that they are configured to use. When the IP address of a server is changed, applications that are using that IP address stop working. Until now, the workaround was to manually modify the configuration files of each application with the new IP address. Some users might have opted to reinstall the server.

Servers with multiple IP addresses do not provide a common or central mechanism for pairing up IP addresses with the services. Some services, including those which compete for ports, need to be programmatically told that an IP address is about to be unbound before it actually happens.

The port resolver is a stopgap measure that works only at install time. Servers with multiple IP addresses which have not been given a specific address or whose given address becomes unavailable do not have a clear IP address by default.

The problem can be summarized as follows:

- ♦ Many critical applications break and remain broken even after the server reboots
- ♦ Restart of broken applications requires extensive modification of configuration files with the new IP address
- ♦ There are too many configuration files and the administrator has no idea which application is using which IP address

IP Address Management Framework

The IP Address Management framework helps you resolve application level-IP address and port conflicts on the server. It provides the following advantages:

- ◆ The framework automatically pushes the change in IP address information to the local file of the application so that when the application restarts, it gets the right information. This prevents applications from crashing.
- ◆ The framework notifies applications of any change in IP address:Port configuration so that these issues do not arise.
- ◆ The framework has all the relevant information that the administrator might need.

The IP Address Management framework comes with a browser-based NetWare Remote Manager (NRM) framework. This framework can be used to

- ◆ Support legacy applications which use their own configuration files to get IP address:Port configuration information.
- ◆ Support applications which will use the framework to get IP address:Port configuration information.

For more information on the NRM-based IP Address Management framework see [Chapter 3, “Using the NRM-Based Administration Framework,” on page 13.](#)

Updating the etc\hosts File

To update the etc\hosts file whenever you change a server's IP address using INETCFG, NRM, or server console:

- 1 Log in to NRM, then click IP Address Management in the left pane.

The IP Address Management page is displayed.

- 2 Ensure that all applications are in a Valid status.

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

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

HINT: For the Restart Server button to appear on the IP Address Management page, you need to make a change in the existing configuration of at least one application.

If the etc\hosts file is found to contain an invalid or nonconfigured IP address, clicking Restart Server also automatically updates the etc\hosts file with the default IP address.

Defining Application Categories

This section identifies the various classes of applications that use IP Address Management framework for IP Address and Port Conflict issues. The applications covered here are as follows:

- ◆ [“Applications That Bind to a Wildcard Address \(0.0.0.0\)” on page 7](#)
- ◆ [“Applications That Bind to a Nonspecific Address \(Default IP\)” on page 7](#)
- ◆ [“Applications That Bind to a Specific Address” on page 7](#)
- ◆ [“Applications That Compete for Ports” on page 8](#)
- ◆ [“Applications That Need Real-Time Support” on page 9](#)

Applications That Bind to a Wildcard Address (0.0.0.0)

Applications that bind to a wildcard address (INADDR_ANY) can listen on all the IP addresses available on the system, including the broadcast address. These applications have the IP address 0.0.0.0. These applications can use any of the IP addresses available. Because storing addresses is not a requirement here, these applications do not store the IP address information anywhere. Because 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.

Table 1 NetWare Applications That Bind to a Wildcard Address

Application Name	Description
Admin Tomcat	Tomcat Admin Instance
Apache2.0	Apache 2.0 Web Server
MySQL	MySQL Database Server
NLS Metering	NLS - Usage Metering
SSH	SSH Server
Tomcat 4	Tomcat User Instance

Applications That Bind to a Nonspecific Address (Default IP)

Some applications bind to one of the server IP addresses and continue to listen on that particular IP address. These applications use a default IP address. Ideally, 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.

Table 2 NetWare Applications That Bind a Nonspecific Address (Default IP)

Application Name	Description
exteNdAppServer	exteNd™ Application Server
NFAU	Native File Access for UNIX*
SMDR	SMS™ Storage Data Requestor

IMPORTANT: 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*.

Applications That Bind to a Specific Address

Some 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.

Table 3 NetWare Applications That Bind to a Specific Address

Application Name	Description
ApacheAdmin	Apache Administration Web Server
DNS Server	eDirectory™ integrated DNS Server
HTTPSTK	Novell® Small HTTP Interface
Web Search 3.0.0	NetWare Web Search Server 3.0.0

Applications That Compete for Ports

Port conflicts occur when there are multiple applications contending for the same port and IP address combination. Port conflicts can be resolved by using either a different port or a different IP address.

Table 4 NetWare Applications That Compete for Ports

Application Name	Description
Admin Tomcat	Tomcat Admin Instance
Apache2.0	Apache 2.0 Web Server
ApacheAdmin	Apache Administration Web Server
DNS Server	eDirectory integrated DNS Server
exteNdAppServer	exteNd Application Server
HTTPSTK	Novell Small HTTP Interface
mySQL	MySQL* Database Server
NLS Metering	NLS - Usage Metering
SMDR	SMS Storage Data Requestor
SSH	SSH Server
Tomcat 4	Tomcat User Instance

Applications That Do Not Compete for Ports

Applications that do not compete for ports toggle between the valid and invalid status. These applications do not want their port conflicts to be resolved. These applications should specify a port 0 as their port.

Table 5 NetWare Applications That Do Not Compete for Ports

Application Name	Description
NFAU	Native File Access for UNIX
Web Search 3.0.0	NetWare Web Search Server 3.0.0

Applications That Need Real-Time Support

There are some addresses that the administrator does not have any control over. These addresses move from invalid or conflict to valid based on event notification from the applications.

Table 6 NetWare Applications That Need Real Time Support

Application Name	Description
DNS Server	eDirectory integrated DNS Server
NFAU	Native File Access for UNIX

2

Setting Up IP Address Management

The IP Address Management framework is installed automatically when you install NetWare® 6.5. It is the first framework, after TCP/IP, to get installed on the server. This is to enable all the applications that are subsequently launched to register with this framework.

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

- ♦ [“IP Address Management Modules” on page 11](#)

IP Address Management Modules

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

- ♦ **Ipncfg.nlm** provides the NRM-based user interface for IP address management. This NLM loads the **ipmgmt.nlm**.
- ♦ **Ipmgmt.nlm** provides the basic framework to handle all IP address and port configuration.

3

Using the NRM-Based Administration Framework

This chapter discusses how the following features of NRM-based IP Address Management framework can be used:

- ◆ “Understanding the NRM-based IP Address Management Framework” on page 13
- ◆ “Changing the IP Address and Port” on page 15
- ◆ “Viewing the Configured IP Address” on page 16
- ◆ “Resolving IP Address and Port Conflicts” on page 17

Understanding the NRM-based IP Address Management Framework

The IP Address Management framework can be accessed from the NetWare[®] Remote Manager (NRM) framework.

The IP Address Management page lists the current configured applications on the framework and helps you to resolve IP address and port conflicts of the applications running on NetWare 6.5.

Log in to NRM, then click IP Address Management in the left pane. The IP Address Management page displays as shown in [Figure 1, “IP Address Management Page,” on page 14](#).

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.
 - ◆ Port 0 is not editable.
 - ◆ 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 the IP address shown in the IP list.
 - ◆ **Invalid** indicates the application is configured with an IP address that is not available on the server.

- ◆ **Conflict** indicates two applications are using the same IP address, ports, or protocol.

Figure 1 IP Address Management Page

The screenshot displays the NetWare Remote Manager interface for IP Address Management. The main content area features a 'Configuration Summary' table. The table has the following columns: Application, IP Address, Port, Protocol, and Status. The status values are color-coded: green for 'VALID', red for 'INVALID', and yellow for 'CONFLICT'. The table lists various services such as Admin Tomcat, Apache 2.0, ApacheAdmin, DNS Server, and several instances of exteNdAppServer and HTTPSTK. Some entries show 'Default IP' or specific IP addresses like 164.99.151.101 or 164.99.151.102. The interface also includes a 'Begin Refresh' button, a 'Page Refresh Rate' dropdown set to 10 seconds, and a 'Restart Server' button. A sidebar on the left provides navigation options for server diagnosis, management, and hardware configuration.

Application	IP Address	Port	Protocol	Status
Admin Tomcat	0.0.0.0	9005	TCP	VALID
Admin Tomcat	0.0.0.0	9009	TCP	VALID
Apache2.0	0.0.0.0	80	TCP	VALID
Apache2.0	0.0.0.0	443	TCP	VALID
ApacheAdmin	164.99.151.102	2211	TCP	INVALID
ApacheAdmin	164.99.151.102	2200	TCP	INVALID
DNS Server	164.99.151.101	53	UDP	VALID
DNS Server	164.99.151.101	53	TCP	VALID
exteNdAppServer	Default IP	446	TCP	VALID
exteNdAppServer	Default IP	446	TCP	VALID
exteNdAppServer	Default IP	446	TCP	VALID
exteNdAppServer	Default IP	83	TCP	VALID
exteNdAppServer	Default IP	1111	TCP	CONFLICT
exteNdAppServer	Default IP	1111	TCP	CONFLICT
HTTPSTK	164.99.151.101	1111	TCP	CONFLICT
HTTPSTK	164.99.151.101	8008	TCP	VALID
HTTPSTK	164.99.151.101	81	TCP	VALID
MySQL	0.0.0.0	8008	TCP	VALID
NFAU	Default IP	N/A	TCP	VALID
NLS Metering	0.0.0.0	21571	TCP	VALID
SMDR	Default IP	40193	TCP	VALID
SSH	0.0.0.0	22	TCP	VALID
Tomcat 4	0.0.0.0	9010	TCP	VALID
Tomcat 4	0.0.0.0	8005	TCP	VALID
Web Search 3.0.0	164.99.151.101	N/A	TCP	VALID

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 applications. 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 each application needs to be managed on a per record basis.

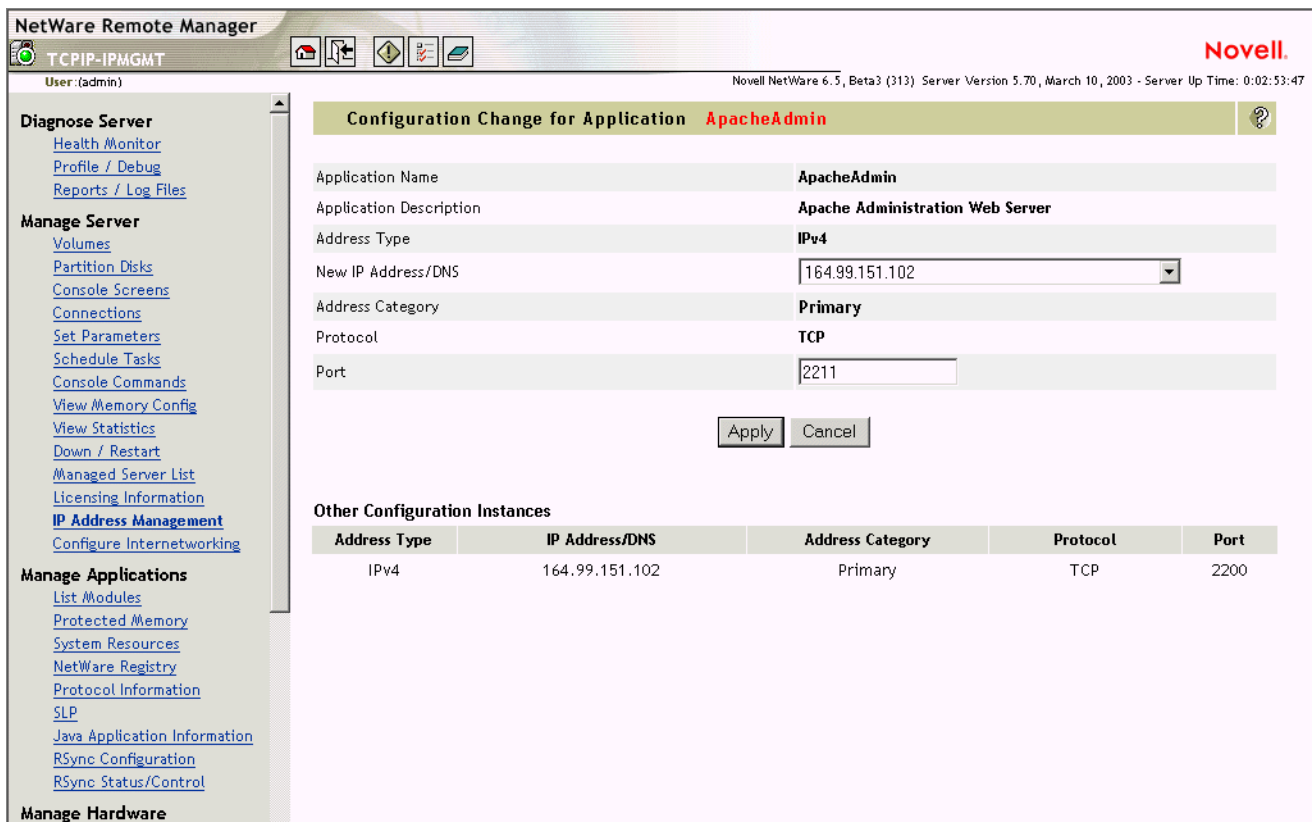
Two buttons are available on this page:

- ◆ **Begin Refresh** refreshes the page to display the current status of the configured applications on the framework. You can set the refresh rate to a value of your choice from the drop-down list. Click this button if you want to refresh the page immediately without waiting for the time interval specified in the drop-down list.
- ◆ **Restart Server** activates the changes. For the Restart Server button to appear on the IP Address Management page, you need to make at least one change in the current configurations.

Changing the IP Address and Port

To change an application's configuration, click any entry under Application 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.
 - HINT:** 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 Address is configured as default on the server.

IMPORTANT: Default IP Address is not configurable from the IP Address Management page.
- ◆ **Protocol** is the protocol of the application. (If the application has opted for the IP address to be noneditable, then it will not be configurable.)
- ◆ **Port** is the port that the application is listening to. This is a configurable value, so you can enter a new value here.

Make any changes, then click Apply. After the changes are made and applied, you are automatically returned to the IP Address Management page.

Other Configuration Instances

All the configured IP addresses associated with the applications are shown in the lower pane of the [Configuration Change for Application <Application name>](#) page.

Viewing the Configured IP Address

Click the Configured IP Addresses tab on the [IP Address Management](#) page to display the Configured IP Addresses window. This window displays all the IP addresses currently bound with 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.

Resolving IP Address and Port Conflicts

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

- ◆ [“Resolving Invalid Addresses” on page 17](#)
- ◆ [“Resolving Port Conflicts” on page 17](#)

Resolving Invalid Addresses

To resolve invalid IP address and port conflicts, click the particular application on the IP Address Management page. The [Configuration Change for Application <Application name>](#) page displays. Then complete the following:

- 1 Select a configured IP address from the drop-down list.

The drop-down list displays all the IP addresses configured on the server.

- 2 Return to the [IP Address Management](#) page to see the changes taking effect.

The status of the application will move from Invalid (red) to Valid (green).

HINT: You can change the refresh rate through the drop-down list adjacent to the Begin Refresh button.

Resolving Port Conflicts

To resolve conflicts between applications, select the application that you want to change on the IP Address Management page. The [Configuration Change for Application <Application name>](#) page displays. Then complete the following:

- 1 Either select a configured IP address from the drop-down list or specify a different port number, then click Apply.

- 2 Return to the [IP Address Management](#) page to see the changes taking effect.

The status of the application will move from Conflict (yellow) to Valid (green).

4 Troubleshooting

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

- ♦ “[sys\...\appconf.xml File Open Failed](#)” on page 19
- ♦ “[An Application Not Visible in the Framework](#)” on page 19

sys\...\appconf.xml File Open Failed

If you encounter sys\...\appconf.xml file open failed message when you log in to NRM and access the Console Screen > Logger Screen (View History Buffer), do the following:

- 1** At the server console, increase the Set parameter IPMGMT Fetch Expiry Time to a higher value.
- 2** On the [IP Address Management](#) page, click Begin Refresh.

An Application Not Visible in the Framework

If you cannot find a configured application on the IP Address Management page:

- ♦ Verify whether the application that you are looking for is loaded.
- ♦ Verify that in the Console Screen > Logger Screen (View History Buffer), you have not encountered a sys\...\appconf.xml file open failed message.
- ♦ On the IP Address Management page, click Begin Refresh with 10 seconds as the default interval.
- ♦ If you still encounter the problem, follow the procedure under “[sys\...\appconf.xml File Open Failed](#)” on page 19.

