



Network Registrar Installation Guide

Software Release 5.5

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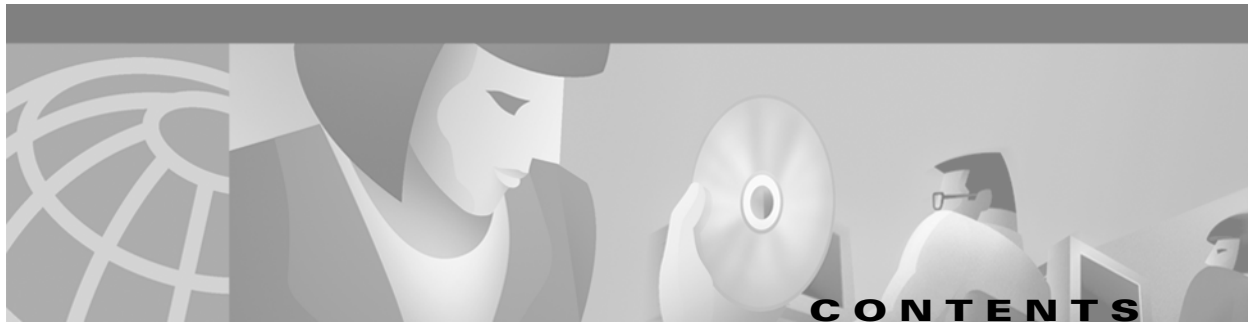
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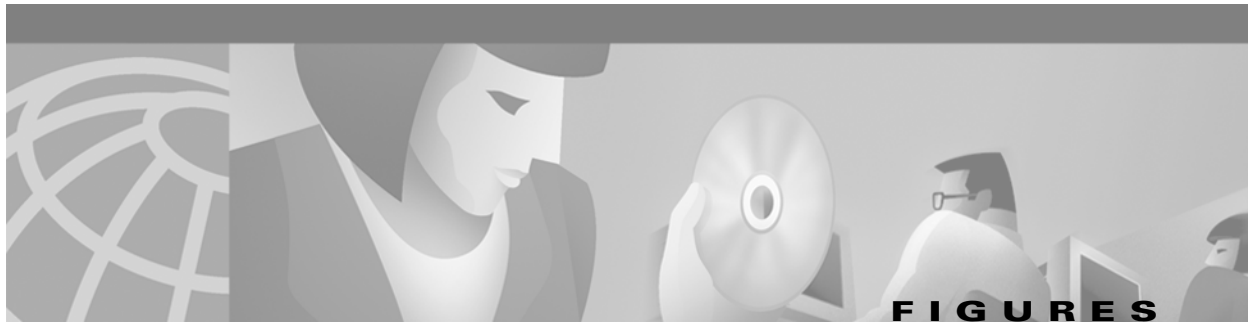


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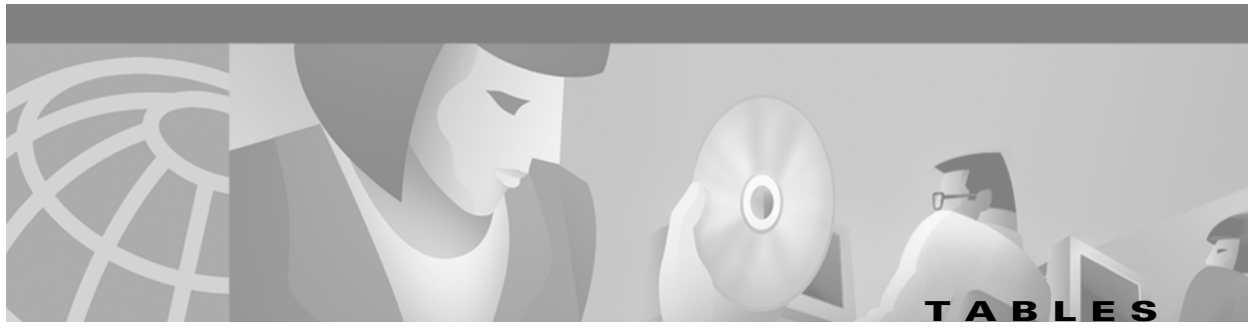
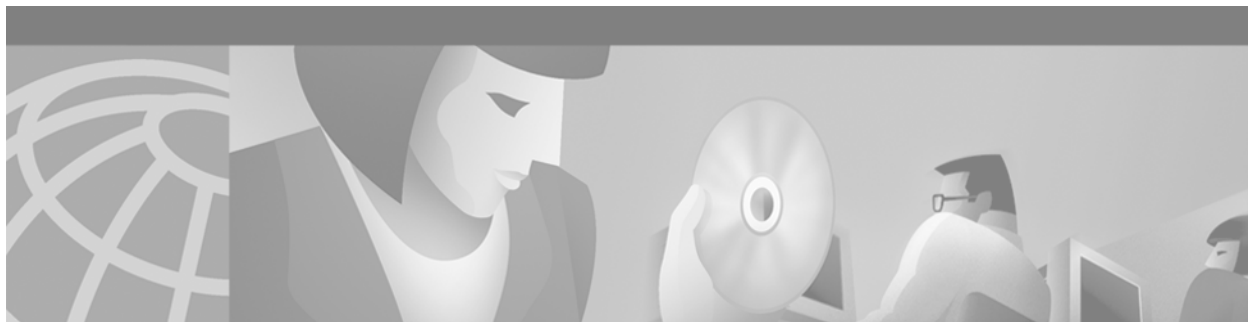


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Preface

This preface describes who should read this guide, how it is organized, and the document conventions.

Cisco documentation and additional literature are available in a CD-ROM package, which is shipped with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more up to date than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** on the toolbar, and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

Who Should Read This Guide

The *Network Registrar Installation Guide* is written for installers. It assumes you understand how your site is configured and are familiar with installing software on your platform.

How This Guide Is Organized

This guide describes how to install Network Registrar on several different platforms. A chapter is devoted to each platform, as follows:

- | | | |
|-----------|---|---|
| Chapter 1 | Overview | Introduces the DNS, DHCP and TFTP server components and describes conceptually how the network configuration impacts the installation procedure. Identifies the steps involved in installation. |
| Chapter 2 | Installing Network Registrar on Windows | Lists system requirements and explains how to install, upgrade, start, and exit the application on Windows 2000 and NT. |
| Chapter 3 | Installing Network Registrar on Sun Solaris | Lists system requirements and explains how to install, upgrade, start, and exit the application on Solaris. |
| Chapter 4 | Installing Network Registrar on Linux | Lists system requirements and explains how to install, upgrade, start, and exit the application on Red Hat Linux. |

Document Conventions

Network management interfaces use the following conventions:

Command paths in a graphical user interface (GUI) are indicated as in **Start > Programs > Network Registrar**.

**Caution**

Reader be careful. In this situation, you could do something that would result in equipment damage or loss of data.

**Note**

Reader take note. Notes contain helpful suggestions or references to material not covered in the publication.

**Timesaver**

The described action saves time and may improve performance.

**Tip**

The described action or information can help you solve a problem.

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

<http://www.cisco.com>

Translated documentation is available at the following URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

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- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:
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To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

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We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

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Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you to

- Streamline business processes and improve productivity
- Resolve technical issues with online support

- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

<http://www.cisco.com/register/>

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

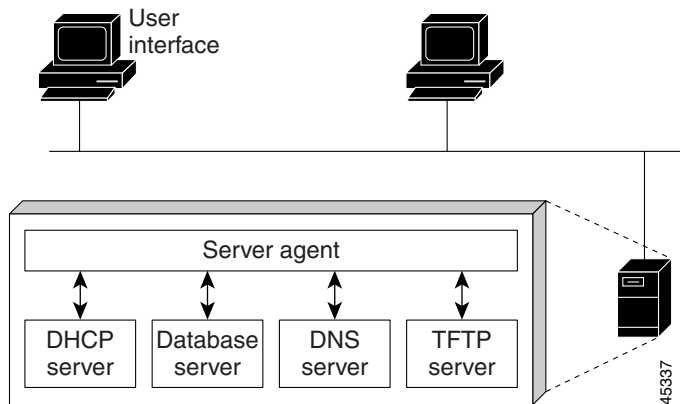
Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.



Overview

Network Registrar automates enterprise IP address management. It provides a stable infrastructure that increases the reliability and efficiency of the address assignment process. It also substantially diminishes the administrative burden associated with address management. It includes Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), and Trivial File Transfer Protocol (TFTP) servers (Figure 1-1). You can control these servers using the Network Registrar graphical user interface (GUI) or command line interface (CLI). These user interfaces can control server clusters that run on different platforms.

Figure 1-1 Network Registrar User Interfaces and the Server Cluster



DNS Features

Network Registrar supports the following DNS features:

- Dynamic DNS update (RFC 2136), including zone record scavenging
- Incremental zone transfer (IXFR; RFC 1995)
- NOTIFY (RFC 1996)
- Multithreading for scalable performance
- DNS subnet sorting
- Second generation design with two-level persistent cache and efficient memory management
- Stale record scavenging

DHCP Features

Network Registrar offers the following DHCP features:

- E-mail lease notification at a user-configurable level which, when reached, sends e-mail to the administrator
- DHCP option validation
- DHCP custom options
- DHCP vendor-specific options
- Name synchronization through dynamic DNS update
- Pinging addresses before allocation
- Address pools on multiple subnets
- BOOTP relay
- Audit log of address assignments
- DHCP failover, proving server redundancy

TFTP Features

Network Registrar offers the following TFTP features:

- High performance, multithreaded architecture
- Integrated with DNS and DHCP servers
- Configurable and controllable from the CLI
- Flexible path and file access controls
- Audit logging of TFTP connections and file transfers

Administration Features

Network Registrar offers the following administration features:

- Motif® and Windows® GUIs that manage servers locally or remotely
- Address utilization reports
- Ability to start, stop, and reload servers, and monitor server statistics
- Embedded configuration database
- Easy import of existing DNS BIND zone files
- Database exchange format for ASCII imports and exports
- DNS zone transfer and dynamic update restrictions, by IP address or host name
- Administrator login required to access the GUI; each administrator has a separate password
- Log files to record server operations
- Logging DHCP address assignments for later analysis
- SNMP notification to warn of error conditions and possible problems with servers

Types of Installations

There are three basic types of installations:

- New installations
- Upgrading with data migration
- Upgrading without data migration



Note

You can upgrade Network Registrar 5.0 and 3.5 databases to 5.5, but you cannot downgrade from 5.5.

For Microsoft Windows ([Chapter 2](#)), one installation procedure handles all three types of installations. Solaris ([Chapter 3](#)) and Linux ([Chapter 4](#)) installations involve separate procedures for new installations and upgrades. During the upgrade procedure, you are prompted to indicate whether to delete the earlier version of the database or convert it to the new one.

Before You Begin

If you already have an earlier version of Network Registrar installed, finish any critical updates and back up your 5.0 or 3.5 database. Your site must also meet the following server and client requirements.

Server Requirements

[Table 1-1](#) shows the minimum requirements for the Network Registrar servers.

Table 1-1 Network Registrar Server Requirements

Component	Windows	Solaris	Linux
CPU Architecture	Equivalent of Intel® Pentium 200 MHz or better (Pentium Pro or greater recommended)	Sun SPARCStation 20 or better	Equivalent of IBM Power PC or better with an Intel-based processor, Pentium II or greater
OS Version	Windows 2000 SP1 (SP2 or later recommended) or Windows NT 4.0 SP6a ¹ workstation or server	Solaris 7 or Solaris 8	Red Hat Linux 6.2 (kernel version 2.2)
Minimum RAM	64 MB	96 MB	64 MB
Minimum Disk Space ²	80 MB plus 1 MB for each 100 clients managed by DNS or DHCP		
Recommended Disk	The fastest available disk (such as Ultra-SCSI) and mirrored or RAID disks		
Swap Space	100 MB free swap space		

1. Network Registrar 5.5 will crash if you run NT 4.0 with no Service Pack installed. This crash occurs when you add recipients to the enabled SNMP traps. SP6a is the minimum supported.
2. A system managed by DHCP with dynamic DNS update counts as one client for this calculation.

Solaris 2.6, Windows NT 3.5.1, Windows 95, Windows 98, HP-UX, and IBM AIX are no longer supported.

**Caution**

Network Registrar is not compatible with Cisco Access Registrar (CAR). The two products cannot be run on the same host machine. Verify that CAR was not installed on your server. The integrity of Network Registrar and CAR will be compromised if you try to run both products simultaneously.

GUI Requirements

The Network Registrar GUI runs on Sun Solaris, Windows 2000, and Windows NT 4.0 systems only. The GUI does not run on Linux systems; however, you can access a Linux server using the GUI on another system. If you run the GUI on the same machine as the servers, you can use the requirements listed in [Table 1-1](#). If you run the GUI on a separate system, use the requirements listed in [Table 1-2](#).

Table 1-2 Network Registrar GUI System Requirements

Component	Windows	Solaris
CPU Architecture	Equivalent of Intel® 80486, or Pentium or Pentium Pro	SPARCStation 20 or better
OS Version	Windows 2000 SP1 (SP2 or later recommended) or Windows NT 4.0 SP6a workstation or server	Solaris 7 or Solaris 8 and CDE 1.02 (Desktop 1.1)
Minimum RAM	32 MB, 48 MB for over 10,000 hosts	64 MB
Recommended Disk	20 MB	50 MB

Virus Scanning While Running Network Registrar

If you have virus scanning enabled on your system, it is best to configure it to exclude certain Network Registrar directories from being scanned. Otherwise, it could be damaging to Network Registrar operation. Exclude the following directories and their subdirectories:

- On Windows—\Program Files\Network Registrar\data
- On UNIX and Linux—/var/nwreg2/data

What to Do After Installation

After Network Registrar is installed, you must configure it for your network. For procedures on configuring Network Registrar, see the *Network Registrar User's Guide*. For details about commands available through the CLI, see the *Network Registrar CLI Reference Guide*. Additional on-line help is available from the CLI.



Installing Network Registrar on Windows

Network Registrar runs on Microsoft Windows 2000 and NT 4.0. Network Registrar does not run on Microsoft Windows NT 3.5.1.

This chapter covers the following installation topics:

- [Installation Checklist](#)
- [System Requirements](#)
- [New Installation](#)
- [License Key](#)
- [Upgrading From an Earlier Version](#)
- [Uninstalling Network Registrar](#)
- [Re-installing Network Registrar](#)
- [Reverting to an Earlier Version](#)
- [Starting and Stopping the Servers](#)
- [What to Do Next](#)

Installation Checklist

Before running the installation program, answer the following questions:

- Does the target machine meet the system requirements?—See the [“System Requirements”](#) section.
- Do you have the appropriate username and password for the target machine?—This is typically an administrative account. You must have administrative privileges to install Network Registrar.
- What type of installation you want?
 - Both—Installs the servers and user interfaces—the recommended option
 - GUI—Installs only the user interfaces
 - Servers—Installs only the servers
- In what directory do you want to install Network Registrar?—The default installation directory on Windows is C:\Program Files\Network Registrar.
- Do you want to retain the ability to revert to a previous version of Network Registrar?—If so, you need to copy your database to another location. See the [“Reverting to an Earlier Version”](#) section on page 2-6.

- Is this a new installation or an upgrade from Network Registrar 5.0 or 3.5?
 - If a new installation, see the [“New Installation” section on page 2-2](#).
 - If an upgrade, see the [“Upgrading From an Earlier Version” section on page 2-4](#).
 - If you need to upgrade from a version prior to 3.5, contact the Cisco Technical Assistance Center as listed in the Preface of this guide.

System Requirements

You can install the Network Registrar servers on one machine and the Network Registrar GUI on another. A GUI-only installation does not require as many system resources as a complete installation.

Server or Complete Installation

To run Network Registrar on Windows requires:

- Equivalent of Intel® Pentium 200 MHz or better (Pentium Pro or greater recommended)
- 64 MB of RAM
- Windows NT 4.0 workstation or server Service Pack SP4 or later (SP6a recommended), or Windows 2000 SP1 or later (SP2 or later recommended)

Network Registrar will crash if you run NT4.0 with no Service Pack installed. This crash occurs when you add recipients to the enabled SNMP traps. Network Registrar will also not operate optimally if you do not have at least SP6 installed.

- 50 MB plus 1 MB for each 100 clients managed by DNS or DHCP (a system managed by DHCP with dynamic DNS update counts as one client for this calculation)
- Fastest available disk (for example, Ultra-SCSI) and mirrored or RAID disks with 100 MB free swap space

GUI-Only Installation

To run the Network Registrar GUI on a remote Windows machine, requires:

- Equivalent of Intel® 80486, or Intel® Pentium or Pentium Pro
- Windows 2000 or NT 4.0 workstation or server, with at least SP4 (SP6a recommended)
- 32 MB of RAM (48 MB for configurations of over 10,000 hosts)
- 50 MB of disk space

New Installation

To install the Network Registrar servers or the GUI on Windows, do the following:

-
- Step 1** Close all open applications, including antivirus software.
- Step 2** Log on to the target machine using an account that has administrative privileges.

- Step 3** Load the installation CD-ROM or browse to the network resource where the Network Registrar software is located. If you downloaded a distribution file from the Cisco web site, run it in a directory from which you want to install Network Registrar. The distribution file is a self-extracting executable, and places the `setup.exe` and other files in the directory where you run it.
- If your CD-ROM system is not configured for Autostart, run the Network Registrar `setup.exe` file located in the root directory of the installation CD-ROM or the installation directory.
- Step 4** In the first and second Welcome windows, click **Next**.
- Step 5** At the Question dialog box, click **Yes** to let the installation program test for Network Registrar components running on your machine and halt them if it finds them. If this is a new installation, none will be found. Click **No** to cancel the installation and halt these servers manually. When you click **Yes**, the User Information screen appears.
- Step 6** At the User Information screen, enter your name and the company for which you work, then click **Next**. The Setup Type screen appears.
- Step 7** At the Setup Type screen, choose the type of installation you want.
- **Both**—Installs the Network Registrar servers and user interfaces—the recommended option
 - **GUI**—Installs the user interfaces only
 - **Servers**—Installs the Network Registrar servers only
- At this point, you can also select a different location for the installation by clicking **Browse**. A standard Windows Choose Folder dialog box appears, where you can select a different folder. Click **Next** after selecting the folder, then click **Next** again to move on from the Setup Type screen.
- Step 8** In the Start Copying Files window, click **Next** to begin installing the system files.
- Step 9** After the installation is completed, restart Windows.
- Step 10** After the system restarts, enter the license key so that you can administer the servers you have just installed. See the “[License Key](#)” section.
-

License Key

To administer the cluster of Network Registrar servers that you just installed, you must enter the license key, which enables the user interfaces. The license key is located on the back of the installation CD-ROM case.

You can run the user interfaces and the servers on different machines. You must tell the user interface which cluster you want to access and whether the cluster is on the local host or on a remote machine. (A cluster is a group of Network Registrar servers that share a database.)

- If you have a permanent license, you must enter it once for each cluster that you want to access through the user interface. Once you enter the license key to access a Network Registrar server cluster, you are not prompted to enter a license key for that cluster again unless you move the cluster to another machine.
- If you have an evaluation copy of Network Registrar, you have a license that expires.
- If you have an invalid, missing, or expired license key, you cannot configure or manage the Network Registrar servers until you obtain a valid license key. However, the servers will continue to function normally.

On a new installation, enter the license key as follows:

-
- Step 1** Start Network Registrar CLI or GUI from the Windows command line prompt.
- To start the CLI, go to the C:\Program Files\Network Registrar\bin directory and enter:


```
# nrcmd -C clustername -U admin -P changeme
```

Include the name of the Network Registrar server cluster, and username *admin* and password *changeme*. (You should change this password later on.)
 - To start the GUI, Select **Start>Programs>Network Registrar 5.5** from the Windows Start menu.
- Step 2** If you are using the CLI, enter the following command at the nrcmd> prompt:
- ```
nrcmd> license set key=keystring
```
- The *keystring* is the 16-digit license identifier found on the back of your installation CD-ROM case. If you are using the GUI, when the Server Manager window appears, do the following:
- a. From the **Admin** pull-down menu, select **Clusters**.
  - b. In the Cluster dialog box, click **Add Cluster**.
  - c. In the Add Cluster dialog box, enter the cluster name. This name is the host (DNS) name of the machine on which the Network Registrar servers are installed.
  - d. Select the “Connect to this cluster” check box, then click **OK**.
  - e. In the Login for Cluster dialog box, enter the username *admin* and password *changeme*, then click **OK**. (You should change this password later on.)
  - f. From the License dialog box, click **New Key**.
  - g. From the Cluster Properties dialog box, select **Edit License Key**.
  - h. Enter the 16-digit license identifier found on the back of your installation CD-ROM case, then click **OK**.
- Step 3** Exit Network Registrar by entering the **exit** command from the CLI, or selecting **Exit** from the **Admin** menu in the GUI.
- 

## Upgrading From an Earlier Version

If Network Registrar 5.0 or 3.5 is already installed, you can upgrade to 5.5 while preserving your earlier databases, as follows:

- 
- Step 1** Back up the Network Registrar 5.0 or 3.5 databases. You cannot downgrade from 5.5, so you may need these.
- Step 2** Close all open applications, including any antivirus software that is running.
- Step 3** Log on to the target machine using an account that has administrative privileges.
- Step 4** Load the installation CD-ROM or browse to the network resource where the Network Registrar software is located. If you downloaded a distribution file from the Cisco web site, run it in a directory from which you want to install Network Registrar. The distribution file is a self-extracting executable, and it places the setup.exe and other files in the directory where you run it.

If your system is not configured for Autostart, run the Network Registrar **setup.exe** file in the root directory of the installation CD-ROM.

- Step 5** In the first and second Welcome windows, click **Next**.
- Step 6** In the Question dialog box, click **Yes** to let the installation program test for Network Registrar components running on your machine, and halt them if it finds them. Click **No** to cancel the installation and halt these servers manually. When you click **Yes**, the Setup Type screen appears.
- Step 7** At the Setup Type screen, choose the type of installation you want.
- **Both**—Installs the Network Registrar servers and GUI (this is the recommended option)
  - **GUI**—Installs the GUI only
  - **Servers**—Installs the Network Registrar servers only
- At this point, you can select a different location for the installation by clicking **Browse**. A standard Windows Choose Folder dialog box appears, where you can select a different folder. Click **Next** after selecting the folder, then click **Next** again to move on from the Setup Type screen.
- Step 8** Click **Yes** at the question about upgrading your existing installation. This converts your existing databases into a 5.5 databases. Click **No** if you do not want to go ahead with the conversion.
- Step 9** In the Select Program Folder window, click **Next** to confirm the installation folder.
- Step 10** In the Start Copying Files window, click **Next** to begin installing the system files.
- Step 11** During the course of copying the files and upgrading the databases, the installation program prompts you twice to enter your username and password. Enter your Network Registrar administrator username and password when prompted.
- Step 12** When the installation has completed, restart Windows.

**Note**

Upgrading to Network Registrar 5.5 from 5.0 or 3.5 automatically converts the DHCP failover and lease objects in the state database, but only those within a certain upgrade time frame (opportunity). The upgraded failover server gets from its partner all lease binding changes that occurred since the two servers last communicated. The upgrade time frame (without any server down time) depends on the number of leases issued or renewed each minute and the configured lease time. For example, if a configuration database upgrade takes 30 minutes and if there are 1000 leases with an expiration of six hours issued or renewed every hour, Network Registrar generates a maximum of 500 lease binding updates as part of the failover upgrade.

## Uninstalling Network Registrar

To uninstall Network Registrar without preserving its database, use either the Add/Remove Program from the Windows Control Panel or the Network Registrar uninstall program from the Windows taskbar. Access the uninstall program using the following path from the Start menu:

**Start > Programs > Network Registrar 5.5 > Uninstall Network Registrar**

The Network Registrar uninstallation program removes the server and user interface components, but does not delete data that belongs to the user, such as the log and user data files. To delete the data associated with Network Registrar, first uninstall the application and then delete the Program Files\Network Registrar folder.

## Re-installing Network Registrar

Infrequently, you may need to re-install the product because of a failure that could cause corrupted database files or if a file is accidentally deleted. On Windows, this is the same as a new installation. See the “[New Installation](#)” section on page 2-2 for details.

## Reverting to an Earlier Version

To revert to Network Registrar version 5.0 or 3.5, do the following:

- 
- Step 1** Back up the Network Registrar 5.5 database if you anticipate using it at a future date.
  - Step 2** Uninstall Network Registrar 5.5, as described in the “[Uninstalling Network Registrar](#)” section.
  - Step 3** Delete the Network Registrar 5.5 folder to remove the log and user data files that are not removed by the uninstall program.
  - Step 4** Re-install Network Registrar 5.0 or 3.5 as directed in the *Network Registrar Installation Guide* for that version.
  - Step 5** Stop the Network Registrar servers (as described in the “[Starting and Stopping the Servers](#)” section). Otherwise, you may get errors.
  - Step 6** If you are reverting to Network Registrar 3.5, copy the mcddb.d01, mcddb.d02, and mcddb.d03 files from their backup location, as in [Step 1](#) of the “[Upgrading From an Earlier Version](#)” section, into the database folder of the Network Registrar installation directory. Copy and *do not move* the files.  
If you are reverting to Network Registrar 5.0, you must also recover the data in CNRDB. You must run the **cnrdb\_recovery** utility. For details on recovering the data, see the *Network Registrar User’s Guide*.
  - Step 7** Change directories to the database directory.
  - Step 8** Run the **keybuild** tool to rebuild the key files. This can take several minutes.  
`installation-directory\bin\keybuild mcddb`
  - Step 9** Verify the integrity of the database by running the **dbcheck** tool.  
`installation-directory\bin\dbcheck mcddb`
- 

## Starting and Stopping the Servers

You can stop and start the Network Registrar servers (DNS, DHCP, and TFTP) from the Services feature of the Windows Control Panel. If the installation completed successfully and you did not stop the servers, they will run automatically and start each time the machine is rebooted.

All three servers in the cluster are controlled by a server agent. You can stop or start the servers by stopping or starting the server agent, as follows:

- 
- Step 1** From the Windows taskbar, select **Start > Settings > Control Panel**.
  - Step 2** In the Control Panel, click **Services**.
  - Step 3** From the Service list, select **AIC Server Agent 2.0**.



**Step 4** Click **Start** or **Stop**, as required.

**Step 5** Click **Close**.

---

## What to Do Next

After you complete the installation, Network Registrar is ready for configuration. The details are specific to your network. However, the sequence of configuration tasks is generally as follows:

1. Add clusters
2. Add user accounts
3. Configure DNS server properties
4. Configure DNS zones
5. Configure DHCP server properties
6. Configure DHCP scopes (including policies, options, clients, and client-classes)
7. Customize server operations

Procedures for these tasks are included in the *Network Registrar User's Guide*.





## Installing Network Registrar on Sun Solaris

---

Network Registrar runs on Solaris 2.6, Solaris 7 and Solaris 8. This chapter covers the following installation topics:

- [Installation Checklist](#)
- [System Requirements](#)
- [New Installation](#)
- [License Key](#)
- [Upgrading From an Earlier Version](#)
- [Uninstalling Network Registrar](#)
- [Re-installing Network Registrar](#)
- [Reverting to an Earlier Version](#)
- [Starting and Stopping the Servers](#)
- [What to Do Next](#)

### Installation Checklist

Before running the installation program, answer the following questions:

- Does the target machine meet the system requirements?—See the “[System Requirements](#)” section.
- Do you have the appropriate username and password for the target machine?—This is typically an administrative account. You must have root or superuser privileges to install Network Registrar.
- What type of installation you want?
  - Complete—Installs the servers and user interfaces—the recommended option
  - Server only—Installs only the servers
  - GUI only—Installs only the user interfaces
- In what directories do you want to install Network Registrar read-only, data, log, and temporary files?—There are default locations for these files.
- Do you want to retain the ability to revert to a previous version of Network Registrar?—If so, you need to copy your database to another location. See the “[Reverting to an Earlier Version](#)” section on [page 3-7](#).

- Is this a new installation or an upgrade from Network Registrar 5.0 or 3.5?
  - If a new installation, see the [“New Installation”](#) section.
  - If an upgrade, see the [“Upgrading From an Earlier Version”](#) section on page 3-5.
  - If you need to upgrade from a version earlier than 3.5, contact the Cisco Technical Assistance Center as listed in the Preface in this guide.

## System Requirements

On Solaris, you can monitor disk space using one of many third party packages and an automated script. A simple test is to run the `df -k` tool and check the available space on the `/var` volume that contains the database and log files. See the [“New Installation”](#) section.

## Server or Complete Installation

To run Network Registrar 5.5 on Solaris requires:

- Sun SPARCStation 20 or better
- 96 MB of RAM
- Solaris 2.6, Solaris 7, or Solaris 8
- 80 MB plus 1 MB of disk space for each 100 clients managed by DNS or DHCP. A system managed by DHCP with dynamic DNS update counts as one client for this calculation.
- Fastest disk (for example, Ultra-SCSI) and mirrored or RAID disks with 100 MB free swap space

## GUI-Only Installation

To run the Network Registrar GUI on a Solaris machine requires:

- Sun SPARCStation 20 or better
- 64 MB of RAM
- Solaris 2.6, Solaris 7, or Solaris 8
- 50 MB of disk space

## New Installation

The procedure for a new installation assumes that no previous version of Network Registrar is installed. If the installation program detects a Network Registrar file, it prompts you to overwrite it or abort the installation. To install Network Registrar 5.5 over a previous version, see the [“Upgrading From an Earlier Version”](#) section on page 3-5.

For a new installation of the Network Registrar servers or user interfaces on Solaris, do the following:

- 
- Step 1** If you are installing from a CD-ROM, insert it into the CD-ROM drive or mount it from a remote server. If you are installing from a network resource, locate the resource containing the image of the Network Registrar CD-ROM files.

If you downloaded the distribution file from a Cisco web site, uncompress and unpack it as follows:

- a. You must have the GNU **gzip** and **gtar** utilities installed and in your search path. See the GNU organization web site for additional information ([www.gnu.org](http://www.gnu.org)).
- b. Use the **cd** command to change into the directory in which you wish to unpack the Network Registrar distribution file.
- c. Run the **gunzip** and **tar** utilities to extract the files.

```
gtar -zxpf distribution_file_name
```

**Step 2** Become the root user by entering **su** and the root password.



**Caution** Do not set a permission that is too restrictive, such as 700 (drwx-----), for the parent directory of the installation directory, or Network Registrar will not install. Use a permission of 755 (drwxr-xr-x) instead. Always include only the absolute path to the program; it will not work specified as a symbolic link.

**Step 3** Enter the **pkgadd** command with the **-d** option that specifies the directory from which you are installing.

```
pkgadd -d cdrom-dir/solaris/see_readme_before_using
```

The *cdrom-dir* variable is the directory on which the CD-ROM is mounted or in which you unpack the distribution file, or the network resource from which you are installing. For the exact directory location, see the README.solaris file in the top-level directory.

**Step 4** The installation program prompts you for the package you want to install from that directory. Enter **all** or accept the default. This starts the Network Registrar installation program. If the program detects that your operating system is earlier than Solaris 2.6, it terminates.

**Step 5** Enter **Complete**, **Server only**, or **GUI only**.

- **Complete**—Installs the Network Registrar servers and user interfaces—the recommended option
- **Server only**—Installs the Network Registrar servers only
- **GUI only**—Installs the user interfaces only

**Step 6** Choose the location of the following files or accept the defaults:

- Read-only files (shared libraries, user executables, and configuration files)—The default directory is /opt/nwreg2. Its size is basically static and requires minimal monitoring.
- Data files—The default directory is /var/nwreg2/data. Its size can grow significantly, especially with backup files.
- Log files—The default directory is /var/nwreg2/logs. You can set the maximum size and number of these log files. See the *Network Registrar User's Guide*, the *Administering Network Registrar* chapter.
- Temporary files—Include lock management files that are recreated during a reboot in the /.A subdirectory. *Be sure to exclude these files from any cleanup process.* The default directory is /var/nwreg2/temp.

If the directories do not exist, the installation asks if you want them created. Choose **y** to have the installation program create them for you.

**Step 7** The installation program informs you that it will install scripts that run as the superuser. Enter **y**. If you enter **n**, the installation program terminates.

- Step 8** If the installation program detects a previous version of Network Registrar, it prompts you to either overwrite it by entering **y**, or abort the installation by entering **n**. Enter **y**, unless you want to stop the installation and investigate the earlier files.
- Step 9** The installation program copies all the files and starts the AIC Server Agent, which in turn starts the Network Registrar servers.
- Step 10** The program displays a message that the installation was successful, then returns to the opening prompt. Click **q** to quit the **pkgadd** program.
- 

To check the status of the Network Registrar servers, use the `/opt/nwreg2/usrbin/aicstatus` command. See the “Starting and Stopping the Servers” section.

## License Key

To administer the cluster of Network Registrar servers that you just installed, you must enter the license key, which enables the user interfaces. The license key is located on the CD-ROM case.

You can run the user interfaces and the servers on different machines. You must tell the user interface which cluster you want to access and whether the cluster is on the local host or on a remote machine. (A cluster is a group of Network Registrar servers that share a database.)

- If you have a permanent license, you must enter it once for each cluster that you want to access through the user interface. You are not prompted to enter a license key for that cluster again unless you move the cluster to another machine.
- If you have an evaluation copy of Network Registrar, you have a license that expires.
- If you have an invalid, missing, or expired license key, you cannot configure or manage the Network Registrar servers until you obtain a valid license key. The servers continue to function normally.

Enter the license key as follows:

---

- Step 1** Start the Network Registrar CLI or GUI from the Solaris command line prompt.

- To start the CLI, enter:

```
/opt/nwreg2/usrbin/nrcmd -C clustername -U admin -P changeme
```

Include the name of the Network Registrar server cluster, and username **admin** and password **changeme**. (You should change this password later on.)

- To start the GUI, enter:

```
/opt/nwreg2/usrbin/ntwkreg
```

- Step 2** If you are using the CLI, enter the following command at the `nrcmd>` prompt:

```
nrcmd> license set key=keystring
```

The *keystring* is the 16-digit license identifier found on the back of your installation CD-ROM case.

If you are using the GUI, when the Server Manager window appears, do the following:

- From the **Admin** pull-down menu and select **Clusters**.
- In the Cluster dialog box, click **Add Cluster**.
- In the Add Cluster dialog box, enter the cluster name. This name is the host (DNS) name of the machine on which the Network Registrar servers are installed.

- d. Select the **Connect to this cluster** check box, then click **OK**.
  - e. In the Login for Cluster dialog box, enter the username **admin** and password **changeme**, then click **OK**. (You should change this password later on.)
  - f. From the License dialog box, click **New Key**.
  - g. From the Cluster Properties dialog box, select **Edit License Key**.
  - h. Enter the 16-digit license identifier found on the back of your installation CD-ROM case, then click **OK**.
- Step 3** Exit Network Registrar by entering the **exit** command from the CLI, or selecting **Exit** from the **Admin** menu in the GUI.

## Upgrading From an Earlier Version

If Network Registrar 5.0 or 3.5 is already installed, you can upgrade your existing databases to 5.5, or delete them and use the newer 5.5 databases.

To upgrade from 5.0 or 3.5, you must run the **upgrade\_cnr** program, which is in the **solaris** subdirectory of the CD-ROM, and not the **pkgadd** command. If you use the standard configuration of the Solaris automounter, this program is in the **/cdrom/cnr\_5\_5/solaris** directory.



### Caution

Do not run the **pkgrm** command. It will delete your data.

To upgrade from an earlier version of Network Registrar, do the following:

- Step 1** Prepare yourself for the upgrade program:
- a. Back up the Network Registrar 5.0 or 3.5 databases. You cannot downgrade to them again.
  - b. If you are installing from a CD-ROM, insert it into the drive or mount it from your remote server. If you are installing from a network resource, locate the resource containing the image of the Network Registrar CD-ROM files.
 

If you download the distribution file from a Cisco web site, you must have the GNU **gzip** and **gtar** utilities installed and in your search path (see the GNU organization web site at [www.gnu.org](http://www.gnu.org)) for assistance). Change to the directory where you want to unpack the Network Registrar distribution file. Then, run the **gunzip** and **tar** utilities to extract the files, and include the distribution filename.

```
gtar -zxpf distribution-filename
```
  - c. Become the root user by entering **su** and the root password. Ensure that the current directory is the directory in which the CD-ROM is mounted.
- Step 2** Run the **upgrade\_cnr** program.
- ```
# /cdrom-path/solaris/upgrade_cnr
```
- Include the absolute path to run the program, or it will not work. If you mount the CD-ROM manually, or have a nonstandard automounter configuration, replace *cdrom-path* with the directory on which the CD-ROM is mounted (for example, */cdrom/cnr_5_5*). If you are installing from a network resource or a directory in which you unpacked the distribution file, replace *cdrom-path* with that directory.
- Step 3** When prompted, enter **y** to continue with the upgrade.

- Step 4** The program tries to validate your administrative username and password from the values of the AIC_NAME and AIC_PASSWORD environment variables. If these do not exist, enter the administrative username and password when prompted. This verifies your authentication.
- Step 5** When prompted, enter **y** to stop the Network Registrar servers. Your host stops providing DNS and DHCP services throughout the rest of the upgrade process.
- Step 6** The upgrade must save a backup copy of the databases as a precaution if the upgrade is interrupted. Decide on a backup directory path and enter it at the prompt, or press Enter to accept the default (/usr/tmp). Network Registrar creates a cnr_db.bak subdirectory at this location and places the backup files in that subdirectory.



Note Ensure that the specified directory has at least one megabyte of free space, or the backup may fail. Also, ensure that the directory is on a real filesystem, and not a memory-based one (such as /tmp frequently is), so as to preserve the database through a reboot.

If the program senses that a previous backup already exists, it prompts whether you want to overwrite the existing backup. Enter **y** to overwrite the existing backup, or **n** to receive a prompt at which to enter a different location for the new backup.

- Step 7** You can either preserve your data as part of the upgrade or erase it and start over with a fresh one. To preserve the old data, enter **y**; to overwrite it, enter **n**.
- Step 8** The program warns you that this is the last chance to abort the upgrade. Enter **y** to continue with the upgrade. This should successfully remove the /nwreg2 directory and its contents.
- An important notice appears, indicating that the upgrade does not remove files that were added after Network Registrar was initially installed. It also notifies you that it copies the aic.conf file as /export/home/aic/conf/aic.conf.SAVE, and preserves the data files in the /export/home/aic/temp, /export/home/aic/logs, and /export/home/aic/data directories. To completely remove Network Registrar, you must also remove these files and directories.
- The program then installs Network Registrar 5.5 and re-installs the /nwreg2 directory and its contents.
- Step 9** You should next get a message that the software was successfully upgraded, and that your database and extension scripts were preserved. The program then asks if you want to preserve a backup of the database. As a precaution, enter **y** to preserve the database backup. The program preserves the backup files in the location you specified in [Step 6](#).
- Step 10** Check whether your servers are now operating properly.



Note Upgrading to Network Registrar 5.5 from 5.0 or 3.5 automatically converts the DHCP failover and lease objects in the state database, but only those within a certain upgrade time frame (opportunity). The upgraded failover server gets from its partner all lease binding changes that occurred since the two servers last communicated. The upgrade time frame (without any server down time) depends on the number of leases issued or renewed each minute and the configured lease time. For example, if a configuration database upgrade takes 30 minutes and if there are 1000 leases with an expiration of six hours issued or renewed every hour, Network Registrar generates a maximum of 500 lease binding updates as part of the failover upgrade.

Uninstalling Network Registrar

The Solaris package removal program (**pkgrm**) uninstalls Network Registrar 5.5. You can save the 5.5 databases by using the **mcshadow** backup program. See the *Network Registrar User's Guide* for details on backing up your database. Note that you cannot convert the 5.5 databases back to the 5.0 or 3.5 databases.

To uninstall Network Registrar, use the **pkgrm** program to remove the `nwreg2` files, from a root account.

```
# pkgrm nwreg2
```

The uninstall procedure removes the server and user interface components, but does not delete user data, such as the log and data files. To delete the data associated with Network Registrar, follow the instructions in the uninstall dialog about which directories to remove.

Re-installing Network Registrar

Infrequently, you may need to re-install the product because of a failure that could cause corrupted database files or if a file is accidentally deleted. On Solaris, this is the same as an upgrade. See the “[Upgrading From an Earlier Version](#)” section on page 3-5 for details

Reverting to an Earlier Version

To revert to Network Registrar 5.0 or 3.5 from 5.5, do the following:

-
- Step 1** Uninstall Network Registrar 5.5, as described in the “[Uninstalling Network Registrar](#)” section.
The uninstall program does not remove the Network Registrar log and data files. However, it displays a list of the directories and files not being removed. Delete these files manually before installing the earlier version of Network Registrar.
 - Step 2** Re-install Network Registrar 5.0 or 3.5 as directed in the *Network Registrar Installation Guide* for that version.
 - Step 3** Stop the Network Registrar servers. Otherwise, you may get errors. See the “[Starting and Stopping the Servers](#)” section on page 3-8.
 - Step 4** If you are reverting to Network Registrar 3.5, copy the `mcddb.d01`, `mcddb.d02`, and `mcddb.d03` files from their backup location into the database subdirectory of the Network Registrar installation directory (for example, `/var/nwreg2/data/db`). Copy and do not move the files.

If you are reverting to Network Registrar 5.0, you must also recover the data in CNRDB. You must run the **cnrdb_recovery** utility. For details on recovering this data, see the *Network Registrar User's Guide*.
 - Step 5** Change directories to the database directory.
 - Step 6** Run the **keybuild** tool to rebuild the key files. This can take several minutes.

```
# opt/nwreg2/bin/keybuild mcddb
```
 - Step 7** Verify the integrity of the database by running the **dbcheck** tool.

```
# opt/nwreg2/bin/dbcheck mcddb
```
-

Starting and Stopping the Servers

You can start and stop the Network Registrar servers (DNS, DHCP, and TFTP) and databases from the Solaris command line. If the installation completed successfully and you did not stop the servers, they will run automatically and start each time you reboot the machine. However, you can stop and restart them by stopping and restarting the AIC Server Agent program.

The AIC Server Agent is the first Network Registrar program to run each time the host boots, and is the last Network Registrar program to exit when you shut down the service. It controls the loading and unloading of each executable server program and initiates service by starting each server.

To start the AIC Server Agent, do the following:

Step 1 Log in as superuser.

Step 2 Enter the **aicservagt** command with the **start** argument.

```
# /etc/init.d/aicservagt start
```

Step 3 Check that the servers are running by entering the **aicstatus** command.

```
# /opt/nwreg2/usrbin/aicstatus
DNS server running      (pid: 649)
MCD server running      (pid: 648)
DHCP server running     (pid: 650)
Server Agent running    (pid: 647)
MCD Lock Manager running (pid: 651)
```

To stop the AIC Server Agent, perform the previous steps, except enter the **aicservagt** command with the **stop** argument at [Step 2](#).

```
# /etc/init.d/aicservagt stop
```

What to Do Next

After you complete the installation, Network Registrar is ready for configuration. The details are specific to your network. However, the sequence of configuration tasks is generally as follows:

1. Add clusters
2. Add user accounts
3. Configure DNS server properties
4. Configure DNS zones
5. Configure DHCP server properties
6. Configure DHCP scopes (including policies, options, clients, and client-classes)
7. Customize server operations

Procedures for these tasks are included in the *Network Registrar User's Guide*.



Installing Network Registrar on Linux

Cisco Network Registrar runs on Red Hat Linux 6.2. This document covers the required installation topics and has the following contents:

- [Installation Checklist](#)
- [System Requirements](#)
- [New Installation](#)
- [License Key](#)
- [Uninstalling Network Registrar](#)
- [Re-installing Network Registrar](#)
- [Starting and Stopping the Servers](#)
- [What to Do Next](#)

Installation Checklist

Before you run the Network Registrar for Linux installation program, answer the following questions:

- Do you meet the system requirements?—See the “[System Requirements](#)” section.
- Do you have the right username and password for the target machine?—This is typically an administrator account. You must have root or superuser privileges to install Network Registrar.

System Requirements

To run Network Registrar on Red Hat Linux 6.2, you require the following for the target machine:

- IBM Power PC or better with an Intel-based processor, Pentium II or greater.
- A minimum 64 MB of RAM.
- Red Hat Linux 6.2 (kernel version 2.2)
- 80 MB plus 1 MB of disk space for each 100 clients DNS or DHCP manages. A system DHCP manages with dynamic DNS update counts as one client for this calculation.
- Fastest available disk (such as Ultra-SCSI) and mirrored or RAID disks with 100 MB free swap space.

New Installation

The procedure for a new installation assumes that no previous version of Network Registrar is installed. To install the Network Registrar servers and command line interface on Linux, do the following:

-
- Step 1** Ensure that Red Hat Linux 6.2 (kernel 2.2) is properly installed.
- Step 2** If you install from a CD-ROM, insert it in your CD-ROM drive or mount it from your remote server. If you install from a network resource, locate the resource containing the image of the Network Registrar CD-ROM files.
- Step 3** Enter username **su** and the root password to become the root user.
- Step 4** Run the **install_cnr** program from the installation directory. Always include only the absolute path to the program; it will not work specified as a symbolic link.
- ```
install-directory # install_cnr
Welcome to the Network Registrar installation program for Linux.

Please enter the directory where you would like Network Registrar binaries to be
installed.
```
- Step 5** Enter at the prompt the location where you want the Network Registrar binaries installed, or accept the default `/opt/nwreg2` directory.
- ```
[Default to /opt/nwreg2]:

Please enter the directory where you would like the databases and log files to be created.
```
- Step 6** Enter at the prompt the location where you want to store the database and log files, or accept the default `/var/nwreg2` directory.
- ```
[Default to /var/nwreg2] :
```
- You will see a few processing and server startup messages, and the installation is complete.
- 

## License Key

In Network Registrar terminology, a cluster is a group of Network Registrar server processes that share a database. To administer the cluster of servers you just installed, you must enter the license key. This license key appears on the back of the installation CD-ROM case.

The license is for the command line interface (CLI). The servers and CLI can run on different machines.

- If you have a permanent license, you must enter a license key for each cluster you want to access through the CLI. You are not prompted to enter a license key for a cluster again unless you move the cluster to another machine.
- If you have an evaluation copy of Network Registrar, your license will expire.
- If you have an invalid license or missing license key, you cannot configure or manage the Network Registrar servers, although the servers will continue to function normally.

Enter the license key as follows:

- 
- Step 1** Start the Network Registrar CLI (the **nrcmd** program) from the Linux command prompt. The standard location of the program is:
- ```
# /opt/nwreg2/usrbin/nrcmd
```
- Step 2** When prompted, enter username **admin** and password **changeme**.
- Step 3** Enter the 16-digit license key at the nrcmd> prompt.
- ```
nrcmd> license set key=license-key
```
- Step 4** Change the password of the **admin** account.
- ```
nrcmd> admin admin enterPassword
password:
verify password:
```
- Step 5** Exit the CLI by entering **exit** at the nrcmd> prompt.
- ```
nrcmd> exit
```
- 

## Uninstalling Network Registrar

The **uninstall\_cnr** program uninstalls Network Registrar 5.5. You can save the 5.5 databases by using the **mcdshadow** backup program. See the *Network Registrar User's Guide* for details on backing up your database.

Run the **uninstall\_cnr** program as follows:

```
install-directory# uninstall_cnr
Stopping Server Agent...
Deleting startup files...
Removing Network Registrar...
cannot remove /opt/nwreg2/usrbin - directory not empty
cannot remove /opt/nwreg2/conf - directory not empty
package optnwreg2 not found in file index
Note that any files that have been changed (including your database) have _not_ been
uninstalled. You should delete these files by hand when you are done with them, before you
reinstall the package.
```

The “cannot remove” warnings means that, although the uninstall program removes the server and user interface components, it cannot delete the database and log files. You must delete these separately before you re-install Network Registrar. You might want to delete what is left in the binary, data, and log directories.

You can ignore the “package optnwreg2 not found in file index” warning; the package does not actually exist. This is a known issue with the RPM utility on Linux 6.2.



### Note

The uninstall process usually stops the Network Registrar AIC Server Agent first. If you find that the server processes are not shutting down, see the “Starting and Stopping the Servers” section on page 4-5.

# Re-installing Network Registrar

Infrequently, you may need to re-install the product because of a failure that could cause corrupted database files or if a file is accidentally deleted. On Linux, this involves backing up the product databases, uninstalling, re-installing, and recover the databases. If you do not want to retain your data, simply uninstall, delete any leftover files, and re-install. The full process is as follows.

- Step 1** Ensure that you have a copy of the most recent shadow backup of the databases. If not, ensure that you have enough disk space for the backup and run the **mcdshadow** backup program. For the MCD data, check its integrity using the **dbcheck** program from the `.../data/db` directory; for the CNRDB data, use the **cnrdb\_check** program from the `.../data/server-type/ndb` directory.

```
.../bin# mcdshadow
.../data/db# dbcheck -a mcddb
.../data/dns/ndb# cnrdb_check
.../data/dhcp/ndb# cnrdb_check
```

- Step 2** Shut down the servers.

```
...# /etc/rc.d/init.d/aicservagt stop
```

- Step 3** Copy the operational database and log files in the `.../data` directory to the `/recover` and `/dbcopy` directories, which should not be in the installation path. The `/recover` directory contains the actual recovery files, while the `/dbcopy` directory stores a safety copy.

```
.../data# cp -rf *.bak .../recover/.
.../data# cp -rf *.bak .../dbcopy/.
```

- Step 4** Uninstall Network Registrar using the **uninstall\_cnr** program. Be sure to remove any leftover files not deleted by the uninstall program.

```
install-directory# uninstall_cnr
```

- Step 5** Re-install Network Registrar using the **install\_cnr** program.

```
install-directory# install_cnr
```

- Step 6** Stop the servers again, check for disk space, and recover the databases.

- a.** Recover the MCD data by copying the three `mcddb.*` files in `.../data/db.bak` to `.../data/db`. Rebuild the key files and check the data integrity.

```
...# /etc/rc.d/init.d/aicservagt stop
.../recover/db.bak# cp mcddb.* ./db
.../data/db# keybuild mcddb
.../data/db# dbcheck mcddb
```

- a.** Recover the CNRDB data by running the **cnrdb\_recover -c -v** recovery program on the server subdirectories of the `.../recover` directory. Then, verify and (optionally) archive the recovery. Finally, if no errors occur, copy all the files in `.../recover` to the `.../data` directories.

```
.../recover/dns.bak# cnrdb_recover -c -v
.../recover/dns.bak# cnrdb_verify dns.ndb
.../recover/dns.bak# cnrdb_archive -l
.../recover/dns.bak# cnrdb_archive -s
.../recover/dhcp.bak# cnrdb_recover -c -v
.../recover/dhcp.bak# cnrdb_verify dhcp.ndb
.../recover/dhcp.bak# cnrdb_archive -l
.../recover/dhcp.bak# cnrdb_archive -s
.../recover# cp -rf dns.bak/* ../data/dns/.
.../recover# cp -rf dhcp.bak/* ../data/dhcp/.
```

**Step 7** Restart the servers and start using the recovered data on the re-installed product.

---

## Starting and Stopping the Servers

You can start and stop the Network Registrar servers (DNS, DHCP, TFTP) from the Linux command line. If the installation is successful and you did not stop the servers, they run automatically and start each time you reboot. However, you can explicitly stop and restart the servers through the AIC Server Agent program. This is the first Network Registrar program to run each time the host boots up and the last one to exit when you shut down. It controls loading and unloading each server's executable programs.

To stop the AIC Server Agent and all Network Registrar server processes, log in to Linux as superuser and enter the **aicservagt stop** command.

```
/etc/rc.d/init.d/aicservagt stop
```

To start the AIC Server Agent and all Network Registrar server processes, enter the **aicstatus** command in the /opt location to check that the servers are running.

```
install-path/usrbin/aicstatus
```

Then enter the **aicservagt start** command.

```
/etc/rc.d/init.d/aicservagt start
```

## What to Do Next

After you complete the installation, Network Registrar is ready for configuration. The details are specific to your network. However, the sequence of configuration tasks is generally as follows:

1. Add clusters
2. Add user accounts
3. Configure DNS server properties
4. Configure DNS zones
5. Configure DHCP server properties
6. Configure DHCP scopes (including policies, options, clients, and client-classes)
7. Customize server operations

Procedures for these tasks are included in the *Network Registrar User's Guide*.

