



CHAPTER 1

Overview

This guide describes how to install Cisco Prime Network Registrar Release 8.1 on Windows, Solaris, and Linux operating systems, and how to install the Cisco Prime Network Registrar Virtual Appliance. You can also see the following documents for important information about configuring and managing Cisco Prime Network Registrar:

- For configuration and management procedures for Cisco Prime Network Registrar and Cisco Prime Network Registrar Virtual Appliance, see the *Cisco Prime Network Registrar 8.1 User Guide*.
- For details about commands available through the command line reference (CLI), see the *Cisco Prime Network Registrar 8.1 CLI Reference Guide*.

About Cisco Prime Network Registrar

Cisco Prime Network Registrar is a network server suite that automates managing enterprise IP addresses. It provides a stable infrastructure that increases address assignment reliability and efficiency. It includes (see [Figure 1-1 on page 1-2](#)):

- Dynamic Host Configuration Protocol (DHCP) server
- Domain Name System (DNS) server
- Caching Domain Name System (CDNS) server
- Router Interface Configuration (RIC) server
- Simple Network Management Protocol (SNMP) server
- Trivial File Transfer Protocol (TFTP) server

You can control these servers by using the Cisco Prime Network Registrar web-based user interface (web UI) or the command line interface (CLI). These user interfaces can also control server clusters that run on different platforms.

You can install Cisco Prime Network Registrar in either local or regional mode:

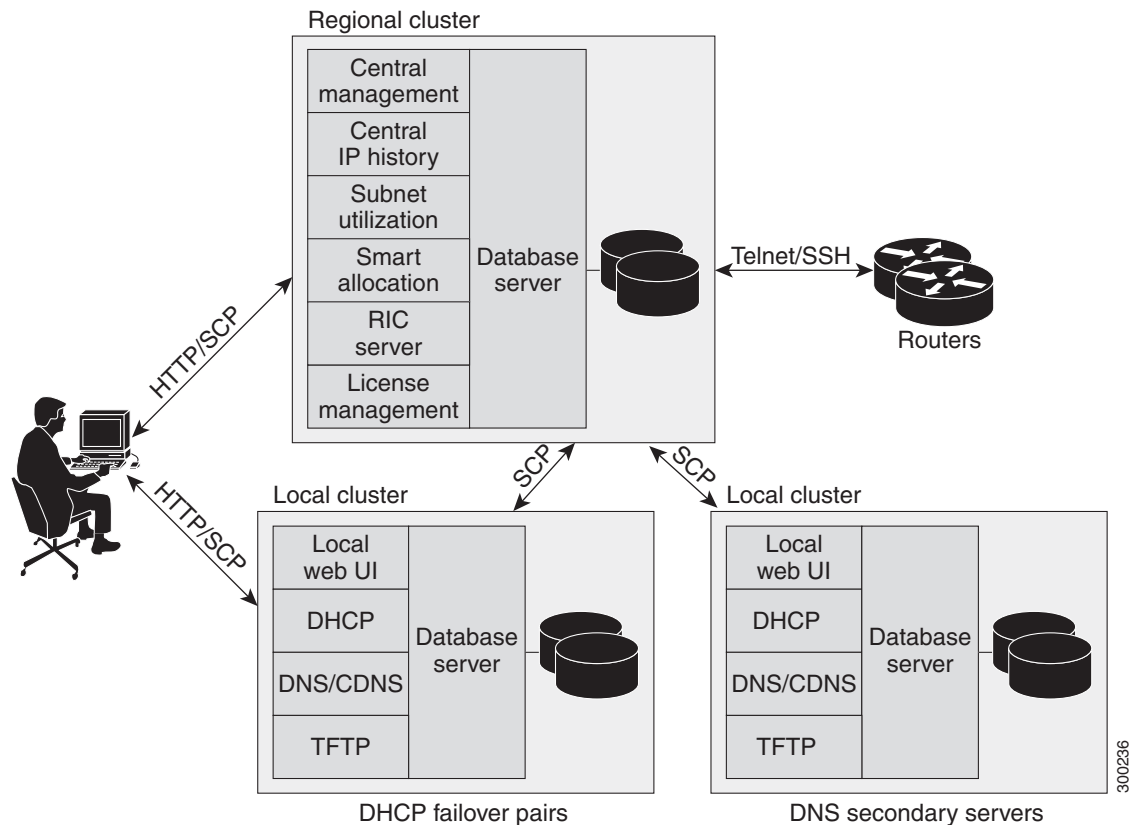
- Local mode is used for managing local cluster protocol servers.
- Regional mode is used for managing multiple local clusters through a central management model.

A regional cluster centrally manages local cluster servers and their address spaces. The regional administrator can perform the following operations:

- Manage licenses for Cisco Prime Network Registrar. An installation must have at least one regional cluster for license management purposes.
- Push and pull configuration data to and from the local DNS and DHCP servers.

- Obtain subnet utilization and IP lease history data from the local clusters.
- Manage the router interface configuration (RIC) server that integrates with cable modem termination systems (CMTSSs) directly from the regional cluster.

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



System Requirements

Review the system requirements before installing the Cisco Prime Network Registrar 8.1 software:

- **Java**—You must have the Java Runtime Environment (JRE) 5.0 (1.5.0_06) or later, or the equivalent Java Development Kit (JDK) installed on your system. (The JRE is available from Oracle on its website.)
- **Operating system**—We recommend that your Cisco Prime Network Registrar machine run on the Windows, Solaris, or Linux operating systems as described in [Table 1-1 on page 1-3](#). Cisco Prime Network Registrar is supported on 32-bit or 64-bit operating systems.

Cisco Prime Network Registrar supports running in VMWARE ESXi 4.1 environment.



Note

Cisco Prime Network Registrar applications are 32-bit executable programs and the system should support 32-bit applications (Java JRE/JDK, OpenLDAP library (for RedHat)).

- User Interface—Cisco Prime Network Registrar currently includes two user interfaces: a web UI and a CLI:
 - The web UI has been tested on Microsoft Internet Explorer 8 and Mozilla Firefox 5 and 6.
 - The CLI runs in a Windows, Solaris, or Linux command window.



Note For the CLI, the number of concurrent active user sessions and processes on a cluster can be no more than 14.



Tip

Include a network time service in your configuration to avoid time differences between the local and regional clusters. This method ensures that the aggregated data at the regional server appears consistently. The maximum allowable time drift between the regional and local clusters is five minutes. If the time skew exceeds five minutes, then the installation process will not be able to correctly register the server with the regional. In this case, unset and set the password on the regional cluster, and sync again.

Table 1-1 Cisco Prime Network Registrar Server Minimum Requirements

Component	Operating System		
	Solaris ¹	Linux	Windows
OS version ²	Solaris 10 ¹	Red Hat Enterprise Linux ES 5.0, Red Hat Enterprise Linux ES 6.0 ³	Windows Server 2008 ³
Disk space ⁴	2 x 73/146 SAS drives ⁵	With basic DHCP and optimal hardware configuration: <ul style="list-style-type: none"> • For expected peak load between 500 and 1000 DHCP leases per second, 7500 RPM SATA⁶ drives are recommended. • For expected peak load above 1000 DHCP leases per second, 15000 RPM SAS drives are recommended. Recommended hard drive—146 GB	
Memory ⁷	16 GB	Small networks—4 GB, Average networks—8 GB, or Large networks—16 GB	

1. Cisco Prime Network Registrar 8.1 supports Solaris Sparc only, 128-KB block sizes in the Solaris 10 ZFS and running in Solaris LDOM environments.
2. Cisco Prime Network Registrar is supported on 32-bit and 64-bit operating systems. Only 32-bit Red Hat Enterprise Linux ES 6.0 is supported.
3. Cisco Prime Network Registrar 8.1 supports Red Hat Enterprise Linux ES 5.0, Red Hat Enterprise Linux ES 6.0, and Windows Server 2008, running standalone or on VMWare (ESX Server 4.1) on Cisco Unified Computing System (CUCS) and other hardware supported by VMWare.
4. Higher I/O bandwidth usually results in higher average leases per second.
5. Serial Attached SCSI.
6. Serial Advanced Technology Attachment (Serial ATA).
7. Faster CPU and more memory typically result in higher peak leases per second.

**Note**

If you are upgrading from an earlier version of Cisco Prime Network Registrar to Cisco Prime Network Registrar 8.1, on the Solaris platform, make sure you upgrade the Solaris version as mentioned in [“Installation and Upgrade Procedure” section on page 2-3](#).

Installation Modes

The modes of installation that exist for the local and regional clusters are new installations and upgrades from a previous version. These installations or upgrades are performed by using operating system-specific software installation mechanisms:

- Windows—InstallShield setup program
- Solaris—**pkgadd** command
- Linux—**install_cnr** script that uses RPM Package Manager (RPM)

License Files

Cisco Prime Network Registrar uses the FLEXlm licensing tool. Your license file defines the features of Cisco Prime Network Registrar to which you have access.

Previously, Cisco Network Registrar was licensed as a single system with a single license type called ip-node. For Cisco Prime Network Registrar 8.1, the licensing is done according to the services that you require. The following are the types of licenses available:

- base-system—Licenses the CCM services. This license is mandatory if you want to run Cisco Prime Network Registrar.
- base-dhcp—Licenses DHCP/TFTP services and, optionally, an initial count of leases
- base-dns—Licenses authoritative DNS services and, optionally, an initial count of RRs
- base-cdns—Licenses caching DNS services and, optionally, an initial count of servers
- count-dhcp—Licenses an incremental number of active leases
- count-dns—Licenses an incremental number of RRs
- count-cdns—Licenses an incremental number of caching server instances

The different services provided by Cisco Prime Network Registrar are associated with the different license types as follows:

- CCM services—base-system
- DHCP services—base-dhcp and count-dhcp
- Authoritative DNS services—base-dns and count-dns
- Caching DNS services—base-system and base-cdns

**Note**

You should have at least one base license for a server to enable that service.

License management is done from the regional cluster when Cisco Prime Network Registrar is installed. You must install the regional server first, and load all licenses in the regional server. When you install the local cluster, it registers with regional to obtain its license.

When you install the regional, you are prompted to provide the license file. You can store the license file in any location provided the location and file are accessible during the installation.

The utilization of licenses are calculated by obtaining statistics from all the local clusters in the Cisco Prime Network Registrar system for all counted services (DHCP, DNS, and CDNS). The regional CCM server maintains the license utilization history for a predetermined time period.

Utilization is calculated for different services as:

- DHCP services—total number of active DHCP leases (including v4 and v6)
- Auth DNS services—the total number of DNS resource records (all RR types)
- Caching DNS services—total number of Caching DNS servers being run in the Cisco Prime Network Registrar system

The services on each local cluster will be restricted based on the services for which licenses are present.

When you configure DHCP failover, we strongly recommend you to use simple failover (see Failover scenarios section in the Configuring DHCP Failover chapter of the *Cisco Prime Network Registrar 8.1 User Guide*). While the back office failover and symmetrical failover functionalities are still present, these will not be supported. Also, using these have licensing implications and will most likely require more licenses (or higher node count licenses) than would otherwise be indicated.

To learn about obtaining the license files for Cisco Prime Network Registrar, see [“Obtaining Cisco Prime Network Registrar License Files” section on page 2-2.](#)

Backup Software and Virus Scanning Guidelines

If you have automatic backup or virus scanning software enabled on your system, exclude the Cisco Prime Network Registrar directories and their subdirectories from being scanned. If they are not excluded, file locking issues can corrupt the databases or make them unavailable to the Cisco Prime Network Registrar processes. If you are installing on the default locations, exclude the following directories and their subdirectories:



Note

In this documentation set, when *install-path* is used, it refers to all or part of the installation paths that were specified when installing Cisco Prime Network Registrar.

As an example using the Solaris and Linux default local cluster paths of */opt/nwreg2/local* and */var/nwreg2/local*, the *install-path* may represent these paths or just the */opt/nwreg2* or */var/nwreg2* portion.

- Windows—
install-path\data (for example, C:\NetworkRegistrar\Local\data and C:\NetworkRegistrar\Regional\data)
install-path\logs (for example, C:\NetworkRegistrar\Local\logs and C:\NetworkRegistrar\Regional\logs)
- Solaris and Linux—
install-path/data (for example, /var/nwreg2/local/data and /var/nwreg2/regional/data)
install-path/logs (for example, /var/nwreg2/local/logs and /var/nwreg2/regional/logs)

Modifying ACLs in Windows Installations

The Cisco Prime Network Registrar installation program for Windows does not try to modify ACLs to restrict access to installed files and directories. If you want to restrict access to these files and directories, use the native Microsoft utilities—**cacls** and **icacls**—to manually change file and directory permissions.

If you decide to manually change ACLs, we recommend that you control the settings so that the contents of the entire installation area are read-only to everyone except those in the Administrators system group.

The following files and sub directories contain data that you may want only the Administrators system group to access:

- *installdir\conf\cnr.conf*
- *installdir\tomcat\conf\server.xml*
- *installdir\conf\priv*
- *installdir\data*

Modifying the ACLs is strictly optional, and Cisco Prime Network Registrar will function normally without making any changes to them. See documentation supplied by Microsoft for information about how to use the **cacls** and **icacls** utilities.

Server Event Logging

System activity begins logging when you start Cisco Prime Network Registrar. The server maintains all the logs by default in the following directories:

- Windows—Local cluster: C:\NetworkRegistrar\Local\logs;
Regional cluster: C:\NetworkRegistrar\Regional\logs
- Solaris and Linux—Local cluster: /var/nwreg2/local/logs;
Regional cluster: /var/nwreg2/regional/logs

To monitor the logs, use the **tail -f** command.



Caution

In Windows, to avoid losing the most recent system Application Event Log entries if the Event Log fills up, use the Event Viewer system application and check the **Overwrite Events as Needed** check box in Event Log Settings for the Application Log. If the installation process detects that this option is not set properly, it displays a warning message advising corrective action.

Running Performance Monitoring Software on Windows

On Windows systems if you uninstall Cisco Prime Network Registrar and try to remove the associated data directories while having software installed that integrates with the Windows Performance Monitor, the software might take possession of certain shared libraries. This action prevents you from removing these files from the Cisco Prime Network Registrar folder and the directory itself. To keep this from happening:

1. Stop the service that is associated with the performance monitoring software.
2. Delete the Network Registrar folder.
3. Restart the service.

Running Other Protocol Servers

You cannot run the Cisco Prime Network Registrar DNS, CDNS, DHCP, or TFTP servers concurrently with any other DNS, DHCP, or TFTP servers. If the Cisco Prime Network Registrar installation process detects that a conflict exists, it displays a warning message.

On Windows systems, use one of the following methods to change the configuration from the Service Control Manager:

- Stop the Cisco Prime Network Registrar protocol server that conflicts with the Microsoft protocol server by using the Stop function in one of the user interfaces.
- Change the Microsoft servers from a Startup Type of Automatic to Manual or Disabled.

If you want to disable a protocol server and prevent the Cisco Prime Network Registrar server from starting automatically after a system reboot, use the **server {dns | cdns | dhcp | tftp} disable start-on-reboot** command in the CLI.

