# Installation Requirements

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## System Requirements

Review the system requirements before installing the Cisco Prime Network Registrar 11.1 software:

- Java—Ensure that you have Java Development Kit (JDK) 11 installed on your system.

**Note** Any 64-bit Java 11 is supported for Cisco Prime Network Registrar 11.1 and it has been tested with the Java 11 OpenJDK package.

- Operating System—Ensure that your Cisco Prime Network Registrar machine runs on the Linux Operating Systems as described in the Server Requirements table below. Cisco Prime Network Registrar requires a 64-bit operating system.
- 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 Edge 100, Mozilla Firefox 99, and Google Chrome 100. Internet Explorer is not supported.
  - The CLI runs in a Linux command window.

**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: Cisco Prime Network Registrar Server Requirements*

| Component | Requirement |
|---|---|
| OS version[1] | Red Hat Enterprise Linux ES/CentOS 7.3+ or RHEL 8.x/AlmaLinux 8.6 64-bit<br>**Note:** The newest level tested with this release is RHEL 8.6. |
| Minimum disk space | 200 GB<br>For best performance, Cisco recommends use of SSD drives. |
| Minimum memory | 16 GB |
| Minimum CPUs[2] | 4 CPUs |

[1] Cisco Prime Network Registrar 11.1 is only supported on 64-bit operating systems.
[2] Faster CPU and more memory typically result in higher peak performance.

**Note** The operating system version used for Cisco Prime Network Registrar 11.1 virtual appliance is AlmaLinux 8.6.

**Note** Cisco Prime Network Registrar 10.1 is the last release to support Windows. Also, there will be no 9.x or 10.x releases (including patch or maintenance) for Windows, except for Severity 1 issues.

**Note** Based on the type of clusters you are planning to deploy, see the Capacity and Performance Guidelines appendices for more details.

**Important** Treat these system requirements as minimal guidelines. We advise you to monitor your deployment and adjust based on the actual usage level you are seeing.

Cisco Network Registrar has been validated for use with Red Hat Enterprise Linux ES 8.6, AlmaLinux 8.6, and CentOS 7.3+. However, versions of CPNR released before 11.1.2 are not compatible with Red Hat 8.8 or its derivatives. Any issues encountered on Linux 8.8 and later have been resolved starting with CPNR 11.1.2 and newer versions.

While Cisco encourages users to apply patches and maintenance updates to keep their operating systems up to date with bug fixes and security patches, these updates within the same major OS version are not expected to cause compatibility issues. Nevertheless, it is strongly recommended that all updates be thoroughly lab-tested before deploying them to production environments.

### System Requirements for Linux OS

The following x86_64 (64-bit) packages (over and above the JDK) are required to install Cisco Prime Network Registrar on Red Hat Enterprise Linux, AlmaLinux or CentOS. If you use the **yum** or **dnf** commands to install Cisco Prime Network Registrar, then these packages are installed as part of the installation process if required. If you use the **rpm** command to install Cisco Prime Network Registrar, then you must install these packages separately.

***Table 2: Packages to Install***

| Package Name | Package Version | |
|---|---|---|
| | **For RHEL/CentOS 7.3 and later** | **For RHEL 8.x/AlmaLinux 8.6** |
| glibc | 2.17 or later | 2.28 or later |
| krb5-libs | 1.15.1 or later | 1.17 or later |
| ldns | (Included with Cisco Prime Network Registrar) | 1.7.0 or later |
| libcurl (built with OpenSSL) | 7.29.0 or later | 7.61.1 or later |
| libevent | (Included with Cisco Prime Network Registrar) | 2.1.8 or later |
| libgcc | 4.8.5 or later | 8.3.1 or later |
| libicu | (Included with Cisco Prime Network Registrar) | 60.3 or later |
| libstdc++ | 4.8.5 or later | 8.3.1 or later |
| libxml2 | 2.9.1 or later | 2.9.7 or later |
| net-snmp-libs | 5.7.2 or later | 5.8 or later |
| openldap | 2.4.44 or later | 2.4.46 or later |
| openssl-libs | 1.0.2k or later | 1.1.1c or later |
| tcl | 8.5.13 or later | 8.6.8 or later |
| zlib | 1.2.7 or later | 1.2.11 or later |
| libnghttp2 | 1.33.0 or later | 1.33.0 or later |

To find out the packages required, you can also issue the following command on your Linux system if you have downloaded the RPM:

```
rpm -qpR rpm_package_file
```

The installer will report any packages that may be missing before beginning the installation process.

**Note** To know the kind of Linux system you are on, use the following command:

```
more /etc/redhat-release
```

## Recommendations

When Cisco Prime Network Registrar is deployed on virtual machines, review the following recommendations:

- Do NOT deploy HA DNS or DHCP failover partners on the same physical server (in separate VMs). This will not provide high availability when the server goes down. Ideally, the high available/failover partners should be sufficiently "separate" that when one fails (because of a hardware, power, or networking failure), the other does not.
- When deploying multiple Cisco Prime Network Registrar VMs on the same physical server (or servers served by a common set of disk resources), you should stagger the automatic nightly shadow backups (by default, they occur at 23:45 in the server's local time). To know how to alter this time, see the *"Setting Automatic Backup Time" section in the Cisco Prime Network Registrar 11.1 Administration Guide*.

**Note** It may be acceptable to not follow the above recommendations for lab environments; but they must be followed for production.

# 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 the **yum install**, **rpm -i**, or **dnf install** command.

**Note** If you use the **rpm -i** command to install Cisco Prime Network Registrar, you may have to install the dependencies manually.

# License Files

Cisco Prime Network Registrar 11.1 supports both Smart Licensing and traditional licensing.

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it’s secure – you control what users can access. With Smart Licensing you get:

- **Easy Activation**: Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (Product Activation Keys).

- **Unified Management**: Cisco License Central provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License Flexibility**: Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

To use Smart Licensing, you must first set up a Smart Account on Cisco License Central. For a more detailed overview on Cisco Licensing, visit the Licensing Hub.

In case of traditional licenses (FLEXlm), you purchase a perpetual license for a version and use it until Cisco Prime Network Registrar servers are upgraded to a newer major version. In case of Smart Licensing, the licenses are not installed on the individual Cisco products, instead, they are kept in a centralized system called Cisco Smart Software Manager (CSSM) or CSSM On-Prem (Satellite), in customer specific Smart accounts.

For more details on the Licensing, see the *"Licensing" section in the Cisco Prime Network Registrar 11.1 Administration Guide*.

The The Cisco Prime Network Registrar 11.1 license file contains two sets of licenses that cover the permanent and subscription parts of the license. The permanent licenses are similar to the licenses issued for 8.x, 9.x, and 10.x versions. For Cisco Prime Network Registrar IP Express 11.1, the licensing is done according to the services that you require. The perpetual portion of the license will continue to use the mappings established for Cisco Prime Network Registrar 9.0 and later.

Following are the types of licenses available:

**Smart Licensing:**

- PNR-System—Licenses the CCM services. This license is mandatory if you want to run Cisco Prime Network Registrar.
- PNR-DHCP—Licenses DHCP/TFTP services and, optionally, an initial count of leases.
- PNR-DNS—Licenses the authoritative DNS services and, optionally, an initial count of RRs.
- PNR-Caching DNS—Licenses Caching DNS services and, optionally, an initial count of servers.
- PNR-DHCP Container—Licenses DHCP services on containers.
- PNR-DNS Container—Licenses authoritative DNS services on containers.
- PNR-Caching DNS Container—Licenses Caching DNS services on containers.

**Traditional Licensing:**

- 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 the 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.

A corresponding subscription license is issued for each permanent Cisco Prime Network Registrar 11.x license. The expiration date for each subscription license is set to the subscription period.

Following are the types of licenses available:

**Smart Licensing:**

- PNR-System SIA—Licenses the CCM services. This license is mandatory if you want to run Cisco Prime Network Registrar.
- PNR-DHCP SIA—Licenses DHCP/TFTP services and, optionally, an initial count of leases.
- PNR-DNS SIA—Licenses the authoritative DNS services and, optionally, an initial count of RRs.
- PNR-Caching DNS SIA—Licenses Caching DNS services and, optionally, an initial count of servers.
- PNR-DHCP Container SIA—Licenses DHCP services on containers.
- PNR-DNS Container SIA—Licenses authoritative DNS services on containers.
- PNR-Caching DNS Container SIA—Licenses Caching DNS services on containers.

**Traditional Licensing:**

- sub-system —Licenses the CCM services.
- sub-dhcp—Licenses the DHCP services.
- sub-count-dhcp—Licenses an incremental number of active leases.
- sub-dns—Licenses the authoritative DNS services.
- sub-count-dns—Licenses an incremental number of RRs.
- sub-cdns—Licenses Caching DNS services.

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

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

**Note** Licenses for Cisco Prime Network Registrar 10.x or earlier are not valid for Cisco Prime Network Registrar 11.x. You should have a new license for Cisco Prime Network Registrar 11.x. For the 11.x regional, if one has 10.x CDNS clusters, the 10.x CDNS licenses must be added on the regional server (10.x CDNS clusters will use 10.x licenses, and 11.x CDNS clusters will use 11.x licenses).

**Note** You should not delete any of the individual licenses loaded from the file. If required, you may delete older versions of DNS and DHCP licenses after the upgrade. Older versions of CDNS licenses must be retained if the servers are not upgraded.

**Note** Subscription licenses, if provided, should be installed to assure upgrades to future releases.

**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)

  Active leases include the number of leases in use by a client (and thus not available to another client) which also includes reservations and leases in transition.

- **Auth DNS services**—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, only simple failover is operational and supported (see the *"Failover Scenarios" section in the "Configuring DHCP Failover" chapter in the Cisco Prime Network Registrar 11.1 DHCP User Guide*).

To learn about obtaining the license files for Cisco Prime Network Registrar, see Obtaining Cisco Prime Network Registrar License Files.