



# CHAPTER 3

## Preparing for the Installation

This chapter provides preinstallation tasks that must be performed and verified before proceeding with the Prime Network installation.

- [Gateway Preinstallation Tasks—Embedded Database, page 3-1](#)
- [Gateway Preinstallation Tasks—External Database, page 3-3](#)
- [Unit Preinstallation Tasks, page 3-4](#)
- [IPv4 and IPv6 Compliance Considerations, page 3-8](#)
- [UNIX Services and Components Used by Prime Network, page 3-10](#)



**Note**

All procedures in this chapter are performed as the root user.

## Gateway Preinstallation Tasks—Embedded Database

[Table 3-1](#) shows the tasks that you must perform before installing Prime Network on a gateway that uses an embedded database. All procedures should be performed as the root user.

**Table 3-1** Gateway Preinstallation tasks Using an Embedded Database


	Task	Refer to (or perform):
Step 1	Verify that the <b>Disk 1: New Install</b> DVD is available.   <b>Note</b> If the Installation DVD is not available, mount the build server on the gateway and access the required build for PN installation.	<a href="#">Installation DVDs, page 1-2</a>
Step 2	Verify that the server machines meet the system requirements.	<a href="#">Installation Requirements, page 2-1</a>

Table 3-1 Gateway Preinstallation tasks Using an Embedded Database (continued)

	Task	Refer to (or perform):
Step 3	Ensure you have the following SSH connectivity as root: <ul style="list-style-type: none"> <li>Gateway to unit</li> <li>Unit to gateway</li> <li>Unit to localhost</li> <li>Gateway to localhost</li> </ul>	—
Step 4	Verify that the server machines meet the Oracle database requirements.	<a href="#">Prime Network Gateway and Database Requirements, page 2-2</a>
Step 5	Verify the installed operating system.	<a href="#">Verifying the Installed Operating System, page 3-5</a>
Step 6	Disable SELinux.	In <code>/etc/selinux/config</code> , configure <code>SELINUX=disabled</code> , then reboot the machine.
Step 7	Verify the RPM files required for Prime Network on Red Hat are installed.	<a href="#">Verifying the RPMs Required on Red Hat for Prime Network, page 3-5</a>
Step 8	Verify that all the ports designated for Prime Network are free.	<a href="#">Required Ports for Prime Network, page 2-32</a>
Step 9	Allocate the storage for the Oracle database files. By default, Prime Network supports an archive size of 14 days.  Contact your Cisco account representative for assistance.	Also see the database requirements in <a href="#">Breakdown of Oracle Database IOPS</a> .
Step 10	Verify that the time of the servers is synchronized.	<a href="#">Configuring the Network Timing Protocol, page 3-6</a> .
Step 11	Enable the <code>jar</code> command in the root user path on all machines where you will install Prime Network.	Run <code>which jar</code> to verify that the <code>jar</code> command is available.
Step 12	Verify that the user has root privileges on the gateway.	—
Step 13	Verify that DNS is enabled on the Prime Network gateway, unit, and client machines.	—
Step 14	Verify that the hosts file ( <code>/etc/hosts</code> ) is configured to include the machine's local hostname and its IP address.	Do not put the hostname and local host address on the same line, as shown in the bad <code>/etc/hosts</code> example.  Valid <code>/etc/hosts</code> file: <pre>127.0.0.1 localhost.localdomain localhost ::1          localhost6.localdomain localhost6 10.56.117.131 pnqa-ha-p2 pnqa-ha-p2.cisco.com</pre> Invalid <code>/etc/hosts</code> file: <pre>127.0.0.1    localhost.localdomain localhost hostname1 ::1          localhost6.localdomain localhost6</pre>
Step 15	Verify the minimum Swap file memory size is 8GB	If the installation fails because of missing swap file check the swap file minimum allowed size. The minimum allowed swap file size is 8192000.

# Gateway Preinstallation Tasks—External Database

Table 3-2 lists the tasks that you must perform before installing Prime Network on a gateway that uses an external database. All procedures should be performed as the root user.

Table 3-2 Gateway Preinstallation Tasks Checklists For External Database

	Task	Refer to (or perform):
Step 1	Verify that the <b>Disk 1: New Install</b> DVD is available.	<a href="#">Installation DVDs, page 1-2</a>
Step 2	Verify that the server machines meet the system requirements.	<a href="#">Installation Requirements, page 2-1</a>
Step 3	Ensure you have the following SSH connectivity as root: <ul style="list-style-type: none"> <li>• Gateway to unit</li> <li>• Unit to gateway</li> <li>• Unit to localhost</li> <li>• Gateway to localhost</li> </ul>	—
Step 4	Verify that the server meets the Oracle database requirements.	<a href="#">Prime Network Gateway and Database Requirements, page 2-2</a> Before you begin to Install Prime Network 5.2, ensure to: <ol style="list-style-type: none"> <li>1. Edit the file in the following path: /etc/systemd/logind.conf</li> <li>2. Change the value to <i>Set RemoveIPC=no</i></li> <li>3. Remove the following comment: Reboot Server</li> <li>4. Stop the Firewall: service firewalld stop</li> </ol>
Step 5	Verify the installed operating system.	<a href="#">Verifying the Installed Operating System, page 3-5</a>
Step 6	Disable SELinux.	In /etc/selinux/config, configure SELINUX=disabled, then reboot the machine.
Step 7	Verify the RPM files required for Prime Network on Red Hat are installed.	<a href="#">Verifying the RPMs Required on Red Hat for Prime Network, page 3-5</a>
Step 8	Verify that all the ports designated for Prime Network are free.	<a href="#">Required Ports for Prime Network, page 2-32.</a>
Step 9	Verify that the Oracle database is configured before proceeding with the installation.	<a href="#">Preparing the Oracle External Database, page 4-1.</a>
Step 10	Start the Oracle listener after installing the database.	<a href="#">Starting the Oracle Listener (External Database), page 3-6</a>

Table 3-2 Gateway Preinstallation Tasks Checklists For External Database (continued)

	Task	Refer to (or perform):
Step 11	(Optional) Collect the following details: <ul style="list-style-type: none"> <li>• Port number</li> <li>• SID</li> <li>• Data file location</li> </ul>	Required if you do <i>not</i> want Prime Network to auto-configure your database during the installation.  <b>Note</b> Confirm the absolute path and location of the Oracle data files with your database administrator. The location can be under the <i>ORACLEHOME</i> directory or under any other pre-allocated, mounted directory that has <b>oracle:oinstall</b> or <b>oracle:dba</b> permissions.
Step 12	Pre-allocate the storage for the Oracle database files.	See <a href="#">Prime Network Gateway and Database Requirements, page 2-2</a> .  <b>Note</b> Contact your Cisco account representative if you need assistance.
Step 13	Verify that the time of the servers is synchronized.	<a href="#">Configuring the Network Timing Protocol, page 3-6</a>
Step 14	Verify that the time zone setting on all Prime Network servers is GMT (with 0 offset). Prime Network stores events in the database in GMT format. The Prime Network clients convert events to the time zone that is configured on the client workstation.	—
Step 15	Enable the <b>jar</b> command in the root user path on all machines where you will install Prime Network.	Run <b>which jar</b> .
Step 16	Verify that the user has root privileges on the gateway.	—
Step 17	Verify that DNS is enabled on the Prime Network gateway, unit, and client machines.	—
Step 18	Verify that the hosts file (/etc/hosts) is configured to include the machine's local hostname and its IP address.	Do not put the hostname and local host address on the same line, as shown in the bad /etc/hosts example.  Valid /etc/hosts file:  <pre>ip_address1  hostname1.domain      hostname1 127.0.0.1    localhost.localdomain  localhost ::1         localhost6.localdomain localhost6</pre> Invalid /etc/hosts file:  <pre>ip_address1  hostname1.domain      hostname1 localhost 127.0.0.1    localhost.localdomain localhost hostname1 ::1         localhost6.localdomain localhost6</pre>

## Unit Preinstallation Tasks

Table 3-3 shows the tasks that you must verify or perform before proceeding with Prime Network unit installation. All procedures should be performed as the root user.

Table 3-3 Unit Preinstallation Tasks Checklists

	Task	Refer to:
Step 1	Verify that the <b>Disk 1: New Install</b> DVD is available.	<a href="#">Installation DVDs, page 1-2</a>
Step 2	Verify that the unit machines meet the system hardware and software requirements.	<a href="#">Prime Network Unit Requirements, page 2-10</a>
Step 3	Verify that the time on all units in the setup is synchronized.  <b>Note</b> The maximum difference allowed between different clocks is 4 minutes.	—
Step 4	Verify that all the ports designated for Prime Network are free.	<a href="#">Required Ports for Prime Network, page 2-32</a>

## Verifying the Installed Operating System

Prime Network 5.2 is supported on Red Hat 6.7, Red Hat 6.8, Red Hat 6.9, Red Hat 6.10, Red Hat 7.4, and Red Hat 7.5 64-bit Server Edition (English language).

To verify that you have installed a supported Linux version, as the root user, enter:

```
# cat /etc/redhat-release
```

The command output should list a supported version, as in this example:

```
Red Hat Enterprise Linux Server release 6.7
```

## Verifying the RPMs Required on Red Hat for Prime Network

As root user, verify all required RPMs are installed. For a list of required RPMs, see [Required Red Hat Services and RPMs, page 2-16](#).

To verify which required RPMs are installed, use the `rpm -q` command followed by the required RPMs, as in the following example (which is for Red Hat 6.7):

```
rpm -q binutils-2.20.51.0.2-5.36.el6.x86_64 compat-libcap1-1.10-1.x86_64
compat-libstdc++-33-3.2.3-69.el6.x86_64 gcc-4.4.7-4.el6.x86_64 gcc-c++-4.4.7-4.el6.x86_64
glibc-2.12-1.132.el6.x86_64 glibc-2.12-1.132.el6.x86_64 ksh-20120801-10.el6.x86_64
libgcc-4.4.7-4.el6.x86_64 libstdc++-4.4.7-4.el6.x86_64 libstdc++-devel-4.4.7-4.el6.x86_64
libaio-0.3.107-10.el6.x86_64 libaio-devel-0.3.107-10.el6.x86_64 make-3.81-20.el6.x86_64
sysstat-9.0.4-22.el6.x86_64 expect-5.44.1.15-5.el6_4.x86_64
openssh-clients-5.3p1-94.el6.x86_64 openssh-server-5.3p1-94.el6.x86_64
openssh-5.3p1-94.el6.x86_64 telnet-0.17-47.el6_3.1.x86_64 openssl-1.0.1e-16.el6.x86_64
compat-libstdc++-33.x86_64 dos2unix-3.1-37.el6.x86_64 --qf '%{name}.%{arch}\n' | sort
```

The output of this command will list the RPMs and will indicate which RPMs are not installed.

Example output:

```
binutils-2.20.51.0.2-5.36.el6.x86_64
package compat-libcap1-1.10-1.x86_64 is not installed
compat-libstdc++-33-3.2.3-69.el6.x86_64
```

```

package gcc-4.4.7-4.el6.x86_64 is not installed
gcc-c++-4.4.7-4.el6.x86_64
glibc-2.12-1.132.el6.x86_64
ksh-20120801-10.el6.x86_64
libgcc-4.4.7-4.el6.x86_64
libstdc++-4.4.7-4.el6.x86_64
libstdc++-devel-4.4.7-4.el6.x86_64
libaio-0.3.107-10.el6.x86_64
libaio-devel-0.3.107-10.el6.x86_64
make-3.81-20.el6.x86_64
sysstat-9.0.4-22.el6.x86_64
expect-5.44.1.15-5.el6_4.x86_64
openssh-clients-5.3p1-94.el6.x86_64
openssh-server-5.3p1-94.el6.x86_64
openssh-5.3p1-94.el6.x86_64
telnet-0.17-47.el6_3.1.x86_64
openssl-1.0.1e-16.el6.x86_64
compat-libstdc++-33.x86_64
dos2unix-3.1-37.el6.x86_64

```

## Starting the Oracle Listener (External Database)

After the external database has been created, start the Oracle listener so that the **network-conf.pl** configuration script can connect to the database.

---

**Step 1** Determine if the Oracle listener is up by executing the following command as the root user:

```
ps -ef | grep ora
```

The following output should be displayed (in this example, *ORACLEHOME* is set to */export/home/oracle*):

```
oracle 17327    1    0   Aug 02 ?        0:00 /export/home/oracle/product/11.2.3/bin/tnslsnr
LISTENER -inherit
```

**Step 2** If the Oracle listener is down, complete the following steps:

- a. Log in as user oracle.
  - b. Enter **lsnrctl start**.
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## Configuring the Network Timing Protocol

It is recommended to use your organization's NTP server for timing synchronization, however, if necessary, you could use the Prime Network gateway.



### Note

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If gateway high availability is configured, you must use your organization's NTP server for timing.

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To use your organization's NTP server for timing synchronization:

- 
- Step 1** Locate the **ntp.conf** file, which is usually located under **/etc**. (Check the file location with the NTP system administrator.)
- Step 2** Enter the following in **ntp.conf**, where **NTP\_SERVER\_IP** is the IP address of your organization's NTP server.
- For IPv4, enter:  

```
###  
server NTP_SERVER_IP prefer  
###
```
  - For IPv6, enter:  

```
###  
server -6 NTP_SERVER_IP prefer  
###
```
- Step 3** Restart the NTP service:  

```
service ntpd restart
```
- 

To use the Prime Network gateway for timing synchronization:

- 
- Step 1** On the Prime Network gateway, create a file with the following contents and save it as **/etc/ntp.conf**:
- ```
###  
server 127.127.1.0 prefer  
fudge 127.127.1.0 stratum 10  
restrict default noquery  
driftfile /var/lib/ntp/ntp.drift  
statsdir /var/lib/ntp/ntpstats/  
filegen peerstats file peerstats type day enable  
filegen loopstats file loopstats type day enable  
filegen clockstats file clockstats type day enable  
###
```
- Step 2** Create a drift file:  

```
touch /var/lib/ntp/ntp.drift
```
- Step 3** Restart the NTP service:  

```
service ntpd restart
```
- Step 4** Configure the units and database to be NTP clients by creating a file with the following contents, and save it as **/etc/ntp.conf**:
- a. Create an **/etc/ntp.conf** with the following contents:  
For IPv4, enter:  

```
###  
server GW_SERVER_IP prefer  
###
```

  
For IPv6, enter:  

```
###  
server -6 GW_SERVER_IP prefer  
###
```

- b. Restart the NTP service:
 

```
service ntpd restart
```
- c. Verify connectivity to the NTP server, enter:
 

```
ntpq -p
```

**Note**


---

If you find two NTP processes running on the server, kill one of them.

---

## Finding NTP Process in Server

To find an NTP process running in the server, follow the command provided below:

```
[root@ast-nms-cpn ~]# ps -ef | grep -v grep | grep "ntp"
ntp 2040 1 0 Jan23 ?    00:00:01 ntpd -u ntp:ntp -p /var/run/ntpd.pid -g
root 2051 2040 0 Jan23 ?    00:00:01 ntpd -u ntp:ntp -p /var/run/ntpd.pid -g
```

## Killing NTP Process in Server

To kill an NTP process running in the server, follow the command provided below:

```
[root@ast-nms-cpn ~]# kill -9 2051
[root@ast-nms-cpn ~]# ps -ef | grep -v grep | grep "ntp"
ntp  2040  1 0 Jan23 ?    00:00:01 ntpd -u ntp:ntp -p /var/run/ntpd.pid -g [
root@ast-nms-cpn ~]#
[root@ast-nms-cpn ~]# ps -ef | grep -v grep | grep "ntp" | wc -l
1
```

# IPv4 and IPv6 Compliance Considerations

Prime Network 5.2 supports monitoring and communication over IPv4 and IPv6 interfaces. Units can hold and manage VNEs from different interface types. Prime Network IPv4 and IPv6 installation options are shown in [Table 3-4](#). Variations in the options are possible, for example, a gateway with a dual-stack interface can connect to one unit with an IPv4 interface and another with an IPv6 interface.

**Note**


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If Gateway is installed with IPv6 interface then OR is not supported.

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*Table 3-4 Supported IPv4 and IPv6 Installations*

| Interface | IPv4 | IPv6 | IPv4 + IPv6 |
|-----------|------|------|-------------|
| Gateway   | Yes  | Yes  | Yes         |
| Client    | Yes  | Yes  | Yes         |
| Unit      | Yes  | Yes  | Yes         |



Table 3-4 Supported IPv4 and IPv6 Installations

| Interface             | IPv4 | IPv6 | IPv4 + IPv6                                                                                                                                                                                             |
|-----------------------|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco Embedded Oracle | Yes  | No   | Yes<br><b>Note</b> For Dual Stack environments IPv6 is supported. However, it is recommended to select IPv4 as the DB interface during network-conf execution and select IPv6 as the backend interface. |
| User-purchased Oracle | Yes  | No   | Yes                                                                                                                                                                                                     |
| Operations Reports    | Yes  | No   | Yes                                                                                                                                                                                                     |

While Prime Network 5.2 allows for flexible IPv4 and IPv6 installations, do not install Prime Network in an IPv4 and IPv6 network until you review the following points:

- Units configured in a redundant relationship must have the same interface type, that is, either IPv4 or IPv6.
- Installation sets the interface type between a unit and a gateway. Upgrading to Prime Network 5.2 does *not* automatically add a new interface type between an existing unit and its gateway, even if the IPv6 connectivity already exists. Contact Cisco Technical Support for assistance.
- The client must have the same connectivity type to the database machine as the Prime Network gateway. For example, if the gateway is configured to access the database using IPv4, the client must also be able to access the database using IPv4.
- Only Oracle version 12cR2 and later are IPv6-compliant. If you plan to install a gateway or unit with only IPv6 interface types, verify that the Oracle database is version 12cR2 or later. (The Prime Network embedded Oracle database is version 12c[12.2.0.1].)
- You can install the Prime Network 5.2 embedded database on an IPv4-only server or on a dual stack server (IPv4 and IPv6). You cannot install the embedded database on an IPv6-only server.
- You can install Prime Network 5.2 Operations Reports on an IPv4-only server or on a dual stack server (IPv4 and IPv6). You cannot install the tool on an IPv6-only server.
- When using Change and Configuration management, make sure your device can communicate both over IPv4 and IPv6. If your device cannot communicate over IPv4, then the Unit from which the VNE of that device is configured can only manage devices over IPv6. This is valid only in case the device does not have dual stack.
- If the units are installed with interface type that differs from the interface on which the database is installed, then database must be configured for dual listener. To configure dual listener, complete the procedure in [Configuring Dual Listeners, page 7-3](#) after the installation.

# UNIX Services and Components Used by Prime Network

Table 3-5 lists the Linux services and components that are used by the Prime Network system. Do not remove them.

**Table 3-5** Required Linux Services and Components

| Name              | Function           | Configuration Information | TCP or UDP Port No. | Traffic Classification |
|-------------------|--------------------|---------------------------|---------------------|------------------------|
| xntpd             | Time server        | /etc/inet/ntp.conf        | 123 (UDP)           | ntp                    |
| ntp4              | Time server        | /etc/inet/ntp.conf        | 123 (UDP)           | ntp                    |
| ntpd <sup>1</sup> | Time server        | /etc/inet/ntp.conf        | 123 (UDP)           | ntp                    |
| /bin/tcsh         | UNIX shell         | None                      | None                | None                   |
| /usr/bin/tcsh     | UNIX shell         | None                      | None                | None                   |
| Perl              | Scripting language | None                      | None                | None                   |
| /bin/sh           | UNIX shell         | None                      | None                | None                   |
| /bin/ksh          | UNIX shell         | None                      | None                | None                   |
| /usr/bin/ksh      | UNIX shell         | None                      | None                | None                   |
| ntpd              | Time server        | /etc/inet/ntp.conf        | 123 (UDP)           | ntp                    |

1. IPv6 support, installed package