



# Installing the Prime Network Integration Layer

Prime Network can be used with Multi-Technology Operations Systems Interface (MTOSI) and 3rd Generation Partnership Project (3GPP) northbound interfaces. To enable this, you must install the Prime Network Integration Layer (PN-IL) along with the MTOSI and 3GPP bundles.



**Note**

The PN-IL must be installed if you intend to use Prime Network in suite mode.

The PN-IL server allows Prime Network to expose MTOSI and 3GPP APIs over Simple Object Access Protocol (SOAP). The integration layer exposes MTOSI and 3GPP interfaces to enable clients to register and receive notifications. For information on interfaces exposed by the integration layer for MTOSI and 3GPP, refer to the [Cisco Prime Network OSS Guide](#). An OSS client can use these standard and vendor extension APIs to integrate with Prime Network.

There are two methods for installing the PN-IL—using the GUI wizard (preferred method) or using CLI commands.

The following topics guide you through these PN-IL tasks:

- [Installing the PN-IL Using the Installation Wizard, page 9-2](#)
- [Installing the PN-IL \(CLI Method\), page 9-4](#)
- [Enabling and Disabling the PN-IL Health Monitor, page 9-5](#)
- [Managing FTP for Prime Network Integration Layer Server, page 9-5](#)
- [Changing the Ports Used by the PN-IL, page 9-7](#)



**Note**

If the integration layer is installed and you want to upgrade to the current version, refer to the section [Upgrading the Prime Network Integration Layer \(PN-IL\), page 10-17](#).

## Prerequisites for Installing the PN-IL

Before you start installing the PN-IL:

- Make sure Prime Network is completely installed.
- Verify that the ports required by PN-IL are available. See the [Prime Network Integration Layer Ports, page 2-27](#). To change the default ports used by PN-IL, see the section [Changing the Ports Used by the PN-IL, page 9-7](#).
- Verify that the system has at least 4 GB of RAM available using the `top` command.

- Verify that the system has minimum of 1 GB free space in the temp directory.
- To use the GUI method (installation wizard), make sure that:
  - An X client application, such as Xming, is installed on the local machine where you plan to launch the wizard.
  - A Telnet/SSH client, such as PuTTY, is installed on the local machine where you plan to launch the wizard, and X11 forwarding is enabled.
  - Max user processes value on the machine is higher than 2048. Check this by executing:
 

```
command ulimit -a
```

## Installing the PN-IL Using the Installation Wizard

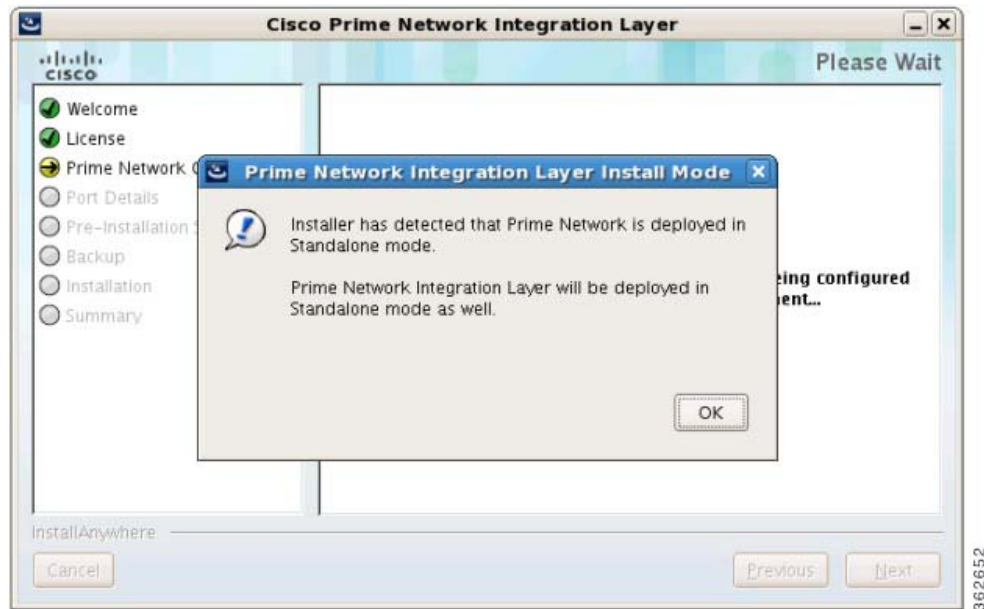
The PN-IL can be quickly and easily installed using the GUI installation wizard.

### Before you Begin

Make sure that all the prerequisites for installing the PN-IL are met. See [Prerequisites for Installing the PN-IL, page 9-1](#).

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- Step 1** Launch the X client application (for example, Xming).
- Step 2** As the root user, launch a terminal to the Prime Network gateway server.
- Step 3** Insert **Disk 2: Software and Documentation** in the DVD drive. (See [Installation DVDs, page 1-2](#)).
- Step 4** Mount the inserted DVD using the **mount** command, and move to the mount directory.
- Step 5** In the mount directory, locate the PNIntegrationLayer\_v1.9.0.bin file and run it. This will launch the installation wizard.
- ```
./PNIntegrationLayer_v1.9.0.bin
```
- Step 6** Read the introduction in the Welcome page and click **Next**.
- Step 7** In the License page, accept the terms of the License Agreement and click **Next**.
- Step 8** In the Prime Network Credentials page, provide the following information, then click **Next**.
- Operating System user—The username for the Prime Network operating system that was defined during installation of the Prime Network gateway.
  - Prime Network Root User—The username for the root user that was defined during installation of the Prime Network gateway.
  - Prime Network Root User Password—Password for the root user.
- Step 9** After you have entered the Prime Network credentials, the installation checks the disk space and RAM and identifies whether Prime Network is installed in standalone or suite mode. Click **OK** to proceed with the installation.

Figure 9-1 PN-IL Installation Wizard - Prime Network Credentials



**Step 10** The Port Details page lists the ports used by the PN-IL. Verify that they are available. Click **Next**.

**Step 11** Review the pre-installation summary. If you need to change any of the user inputs, click **Previous**, otherwise click **Install** to continue.

**Step 12** To run 3GPP services in Prime Network, use the following command to enable the NBI script:

```
cd $PRIMEHOME
install/scripts/accessconfig.sh nbi enable
```

**Step 13** Restart the PN-IL:

```
$PRIMEHOME/bin/itgctl restart
```

**Step 14** When the installation is complete, click **Done** to close the wizard.

**Step 15** Verify the PN-IL installation by logging into the Prime Network bin directory on the gateway as the Prime Network user (e.g., pn432) and executing this command:

```
cd $PRIMEHOME/bin
itgctl status
```

The integration layer status should be “Restarted”.



**Note**

After the PN-IL installation is complete, a new environmental variable \$PRIMEHOME is created and points to the PN-IL installation directory.

# Installing the PN-IL (CLI Method)

## Before you Begin

Make sure that all the prerequisites for installing the PN-IL are met. See [Prerequisites for Installing the PN-IL, page 9-1](#).

To install PN-IL:

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**Step 1** As the root user, open a terminal on the Prime Network gateway server where you want to install PN-IL.

**Step 2** Insert **Disk 2: Software and Documentation** in the DVD drive.

**Step 3** Mount the inserted DVD using the **mount** command and change to the mount location.

**Step 4** Change to the *pnuser*:

```
su - pnuser
```

**Step 5** Create an installation directory for PN-IL (pnil in this example).

```
mkdir -p $PRIME_NETWORK_HOME/pnil
```

**Step 6** Copy the PN-IL installation tar file from the mount location to this directory.

```
cp /mnt/**/Integration/sil-esb-x.x.x.tar.gz $PRIME_NETWORK_HOME/pnil-directory
```

**Step 7** Move to the directory in which the tar file was copied and extract the PN-IL installation tar:

```
cd $PRIME_NETWORK_HOME/pnil-directory
tar -zxvf sil-esb-x.x.x.tar.gz
```

**Step 8** Move to the directory in which the installation tar files were extracted and run the installation script:

```
cd sil-esb-x.x.x./install/packages/
./installAndConfigureEsb.sh
```

**Step 9** Reload user profile using the following command:

```
source $PRIME_NETWORK_HOME/.cshrc
```

The installation does the following:

- Sets the \$PRIMEHOME variable to the PN-IL home directory.
- Sets up a PN-IL health monitor that checks the PN-IL status every 3 minutes.

**Step 10** Configure PN-IL in standalone mode by running the following command as *pnuser*.




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**Note** If you installed Prime Network in suite mode, you must configure PN-IL to run in suite mode after Prime Network has been integrated with Prime Central. Refer to the [Cisco Prime Central Quick Start Guide](#).

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**Step 11** Go to the path `cd $PRIMEHOME/bin`.

```
itgctl config 1 --anaPtpServer ana_host_ip --anaPtpUser user --anaPtpPw password --authURL
pnetwork-authentication-URL
```

where:

- *user* is the Prime Network root user (usually **root**)
- *password* is the Prime Network root user password

- *pnetwork-authentication-URL* is the URL used to authenticate Prime Network calls; usually `https://localhost:6081/ana/services/username`

**Step 12** To run 3GPP services in Prime Network, use the following command to enable the NBI script:

```
cd $PRIMEHOME
install/scripts/accessconfig.sh nbi enable
```

**Step 13** Restart the PN-IL:

```
$PRIMEHOME/bin/itgctl restart
```

## Enabling and Disabling the PN-IL Health Monitor

The PN-IL health monitor checks the PN-IL status every 3 minutes. If the services are down for any reason, the health monitor brings the PN-IL back up.

If you do not want PN-IL to be automatically restarted (such as for a maintenance window), manually disable the health monitor. As *pnuser*, enter the following:

```
$PRIMEHOME/local/scripts/il-watch-dog.sh disable
```

To re-enable the health monitor:

```
$PRIMEHOME/local/scripts/il-watch-dog.sh enable
```



**Note**

By default, the PN-IL health monitor is disabled.

## Managing FTP for Prime Network Integration Layer Server

Each PN-IL FTP server has a primary and a secondary FTP server setup with a failover option or a replication option

- **Failover**—If the primary server is not reachable, files are transferred to the secondary FTP server. If the secondary server is also not reachable, files are copied to the configured directory on the local machine.
- **Replication**—Files are transferred to both the primary and the secondary FTP servers.

The PN-IL directory contains a script (`ftpConfig.sh`) that is available in the PN-IL installation directory. The default location is `$PRIMEHOME/esb/bin`.

Use the `ftpConfig.sh` script with the following options to modify the file transfer component:

```
ftpConfig.sh [-help] [-ftp enable | disable] [-localDir new-location] [-replication enable | disable] [-clearConfig] [-display]
```

| Options                      | Description                                            |
|------------------------------|--------------------------------------------------------|
| <b>-help</b>                 | View the FTP options for standalone integration layer. |
| <b>-ftp enable   disable</b> | Enables and disables the FTP service.                  |

| Options                                     | Description                                                                                                                                                                                                    |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-localDir</b><br><i>new-location</i>     | Changes the storage directory that is used on the local machine when file transfer is disabled (the default is /tmp).                                                                                          |
| <b>-replication enable   disable</b>        | Enables and disables replication of XML and status files on both primary and secondary FTP servers. To see where files are stored, see <a href="#">Storage Location for PN-IL Replicated Files, page 9-6</a> . |
| <b>-clearConfig</b>                         | Clears the FTP configuration. See <a href="#">Clearing the FTP Configuration for the Standalone Integration Layer Server, page 9-6</a>                                                                         |
| <b>-display options</b>                     | Displays the FTP configurations, with the following <i>options</i> :                                                                                                                                           |
| <b>im [-hostOption primary   secondary]</b> | Displays all servers configured for Inventory Management interface type for 3GPP. Use <b>-hostOption</b> to specify the primary or secondary server.                                                           |
| <b>global</b>                               | Displays FTP configurations for primary and secondary servers across all management interface type for 3GPP.                                                                                                   |
| <b>all</b>                                  | Displays global FTP configurations                                                                                                                                                                             |

## Storage Location for PN-IL Replicated Files

Table 9-1 shows where the files are stored when the replication is enabled/disabled. Tick mark indicates ftp details are configured for the particular FTP server.

**Table 9-1 FTP Configuration with Replication Enabled/ Disabled**

| Primary FTP | Secondary FTP | Replication | Files Stored Under: |
|-------------|---------------|-------------|---------------------|
| ✓           | X             | X           | Primary             |
| ✓           | ✓             | X           | Primary             |
| X           | ✓             | X           | Secondary           |
| ✓           | X             | ✓           | Primary             |
| ✓           | ✓             | ✓           | Primary, Secondary  |

## Clearing the FTP Configuration for the Standalone Integration Layer Server

Use one of these command to clear the configuration depending on the server type:

- Global primary server:  

```
./ftpConfig.sh -clearConfig true -hostOption primary -mgmtDataType global
```
- Global secondary server:

```
./ftpConfig.sh -clearConfig true -hostOption secondary -mgmtDataType global
```

- IM primary server:

```
./ftpConfig.sh -clearConfig true -hostOption primary -mgmtDataType im
```

- IM secondary server:

```
./ftpConfig.sh -clearConfig true -hostOption secondary -mgmtDataType im
```

## Changing the Ports Used by the PN-IL

This section explains how to change the default ports listed in [Prime Network Integration Layer Ports, page 2-27](#).



### Note

These procedures stop the PN-IL. If you do not want the health monitor to automatically restart the PN-IL after 3 minutes, disable it as described in [Enabling and Disabling the PN-IL Health Monitor, page 9-5](#).

## Changing the NIO and SSL Ports

By default, the NIO and SSL transport ports are 61616 and 61615. To change the port numbers:

- 
- Step 1** Edit the `$PRIMEHOME/esb/etc/activemq.broker.cfg` as follows:
    - Change the `nioTransportPort` value to a port number that is not in use, such as 61614.
    - Change the `sslTransportPort` value to a port number that is not in use, such as 61613.
  - Step 2** Edit the `$PRIMEHOME/esb/etc/com.cisco.prime.esb.jms.cfg` file and change the `prime.connection.port` value to the value of `nioTransportPort` from [Step 1](#).
  - Step 3** Save and close the `activemq.broker.cfg` and `com.cisco.prime.esb.jms.cfg` files.
  - Step 4** From the `$PRIMEHOME/bin` directory, stop the integration layer server by invoking `itgctl stop`.
- 

## Changing the MTOSI Web Services Port

By default, the MTOSI web services implementation port is 9110. To change the port number:

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- Step 1** Open the `$PRIMEHOME/esb/etc/com.cisco.prime.esb.mtosi.cfg` file and change the `mtosiPort` value to a port number that is not in use.
  - Step 2** Save and close the `com.cisco.prime.esb.mtosi.cfg` file.
  - Step 3** From the `$PRIMEHOME/bin` directory, stop the integration layer server by invoking `itgctl stop`.
-

## Changing the 3GPP Web Services Port

By default, the 3GPP web services implementation port is 9220. To change the port number:

- 
- Step 1** Open the `$PRIMEHOME/esb/etc/com.cisco.prime.esb.tgpp.cfg` file and change the **tgppPort** value to a port number that is not in use.
  - Step 2** Save and close the `com.cisco.prime.esb.tgpp.cfg` file.
  - Step 3** From the `$PRIMEHOME/bin` directory, stop the integration layer server by invoking **itgctl stop**.
- 

## Changing the Alarm Web Services Port

By default, the Alarm web services implementation port is 9020. To change the port number:

- 
- Step 1** Open the `$PRIMEHOME/esb/etc/com.cisco.prime.esb.alarm.cfg` file and change the **alarmMgmtPort** value to a port number that is not in use.
  - Step 2** Save and close the `com.cisco.prime.esb.alarm.cfg` file.
  - Step 3** From the `$PRIMEHOME/bin` directory, stop the integration layer server by invoking **itgctl stop**.
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## Migrating the PN-IL from Standalone Mode to Suite Mode

If Prime Network was originally installed in standalone mode and was subsequently migrated to work as part of a suite, you need to migrate the PN-IL to suite mode as well. You can do this using the installation wizard.

During the installation, the system automatically detects that the migration to suite mode is required and, after receiving your confirmation, proceeds with the relevant installation and configuration.

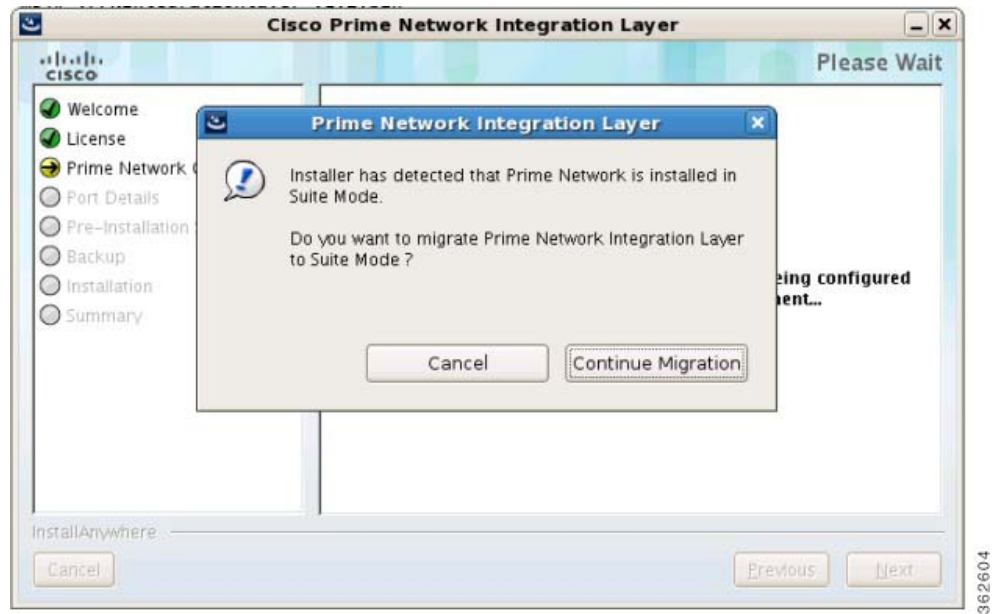
To migrate the PN-IL to suite mode:

- 
- Step 1** Log in to the Prime Network gateway as the Prime Network user.
  - Step 2** Stop the PN-IL instance and then disable PN-IL Health checker, as follows:
 

```
$PRIMEHOME/bin/itgctl stop
$PRIMEHOME/local/scripts/il-watch-dog.sh disable
```
  - Step 3** Launch the installation wizard and follow Steps 1 through 8 in [Installing the PN-IL Using the Installation Wizard, page 9-2](#).
  - Step 4** After you have provided the Prime Network credentials, the system identifies that Prime Network is installed in suite mode. Click **Continue Migration** in the displayed message:



Figure 9-2 Migration to Suite Mode



**Step 5** Click **Next** in the Port Details page.

**Step 6** In the Pre-Installation Summary page, check that the installation mode is Suite Mode Deployment, then click **Install**.

**Step 7** When the installation is complete, click **Done** to close the wizard.

