



## **Cisco Optical Network Planner Installation Guide, Releases 4.1, 4.2, and 5.0**

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## CHAPTER 1

# Install Cisco Optical Network Planner

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## Cisco Optical Network Planner Overview

Cisco Optical Network Planner (Cisco ONP) provides a way to model and test Optical Transport Network (OTN) and Dense Wavelength Division Multiplexing (DWDM) optical networks in a graphical environment. The primary use of Cisco ONP is to design and validate networks of NCS 1004, NCS 1010, NCS 2000 and NCS 4000 series. Use the Cisco ONP tool, to create multiple instances of a network, modify different parameters in each instance and compare the instances.

## Hardware and Software Requirements

The hardware and software requirements for installing Cisco ONP are:

### Hardware Requirements

You need to have Ubuntu server with version either 18.04.3 or 20.04.3.

Recommended Server Configuration for Cisco ONP and LNI:

- 8 CPU, 48 GB RAM, and 500GB server free space after installation, for 3 concurrent Parallel ONP analysis
- 8 CPU, 64 GB RAM, and 500GB server free space after installation, for 6 concurrent Parallel ONP analysis

- 8 CPU, 96 GB RAM, and 500GB server free space after installation, for 10 concurrent Parallel ONP analysis

### Software Requirements

- Supported browser: Google Chrome
- Recommended version of the Google Chrome browser:
  - For Windows: Version 103.0.5060.134
  - For Mac: Version 103.0.5060.114




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**Note** Minimum 100Mbps internet speed is recommended for better Cisco ONP user experience.

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## Install Cisco ONP

The Cisco ONP application is delivered as a bundled tar, signature file, and pubkey files package. The tar file (CONP-xx.xx.xx.xx.tar.gz) contains the following files:

- ONP component
- LNI component
- A shell script (ONPLniInstaller.sh) to install both ONP and LNI components.

Use this procedure to install Cisco ONP by using the tar archive and the installation script:

---

**Step 1** Log in to the Ubuntu server as root or a user with sudo privileges, where Cisco ONP is to be installed.

**Step 2** Create the directory to keep all the required files for the installation.

**Example:**

```
user@host:~/Desktop$ mkdir ONP_Builds
```

**Note** The example path here /home/user/Desktop/ONP\_Builds is referenced as \$ONP\_HOME in this document.

The \$ONP\_HOME directory can be any other directory in your server. You can create a directory of your choice and copy the ONP build tar file, signature file, and pubkey file to that directory.

**Step 3** Copy or download the Cisco ONP build tar, signature file, and public key file to the created ONP\_Builds directory.

**Step 4** Go to the \$ONP\_HOME directory.

**Step 5** Assign full permission to the build tar.

**Example:**

```
cd /home/user/Desktop/ONP_Builds
sudo chmod 777 CONP-xx-xx.xx.xx.tar.gz
```

**Step 6** Untar the Cisco ONP build.

```
tar -xvf CONP-xx-xx-xx.xx.tar.gz
```

**Step 7** Set read, write, and execute permissions for the Install script, LNI, and ONP folders using the following commands.

```
sudo chmod -R 777 ONP
sudo chmod -R 777 LNI
sudo chmod 777 ONPLniInstaller.sh
```

**Step 8** Check whether curl is installed in the server by entering the following command:

```
root:~/$ONP_HOME# curl
```

If you see the following output, curl is installed. Otherwise, install curl.

```
curl: try 'curl --help' or 'curl --manual' for more information
```

To install curl, run the following command:

```
root:~/$ONP_HOME# sudo apt install curl
```

**Step 9** Start Cisco ONP installation. Type command “`sudo ./<install file> <tar file> <public key>`,” and press Enter.

Example:

```
sudo ./ONPLniInstaller.sh CONP-xx.xx.xx.xx.tar.gz CONP-xx.xx.xx.xx_pem.pubkey
```

**Step 10** Enter **y** or **n** to change the default IP address.

```
Would you like to change the IP (y/n)
```

If you enter **n**, the installation proceeds with the same IP address as mentioned above and if you enter **y**, you must provide the IP address and the installation proceeds with the IP address that is provided by you.

```
ONP Host IP: 10.76.82.14
```

```
LNI Host IP: 10.76.82.14
```

**Step 11** Enter **y** or **n** to install the ONP or ONP and LNI packages.

```
Would you like to install complete ONP+LNI package ? (y/n) [default: n] If no, then only ONP will be installed:
```

By default, the value that is considered for installation is *n*.

Install complete ONP and LNI packages for Live Network Import (LNI) feature. Otherwise proceed with only ONP installation. Enter **n** for ONP package installation. Enter **y** for ONP and LNI packages installation.

**Step 12** Enter your ONP database credentials:

**Note** Make sure to use **ONLY alphabets or numbers**.

If you are installing Cisco ONP for the first time, you must set the username and password for the database.

```
Enter your ONP database username, only alphanumeric characters are valid [user]:
```

```
Enter your ONP database password, only alpha numeric characters are valid (len >= 8 and <= 64 characters) [password]:
```

```
Repeat your ONP database password.
```

**Step 13** If you chose to install ONP package alone, go to [Step 19, on page 4](#). Else continue with below steps which are required for ONP and LNI packages installation.

**Step 14** Enter your LNI database credentials:

```
Please enter your Username LNI database: (Maximum 12 chars)
```

Please enter Password for LNI database (Min chars, Maximum 64 chars):

Please repeat Password for LNI database (Min chars, Maximum 64 chars):

**Step 15** Enter **y** or **n** to reserve disk space for log storage.

Application will reserve 10 GB for logs. Do you want to change this value? (y/n):

If you enter **n**, Cisco ONP allocates the default disk space. If you enter **y**, you must allocate the disk space.

**Step 16** Enter the disk space for the log storage:

Please enter maximum available disk space in GB for log storage (from 5 to 50):

**Step 17** Enter **y** or **n** to provide encryption key for device credentials.

Do you want to provide encryption key for device credentials (y/n):

If you enter **n**, Cisco ONP uses the default encryption key. If you want to provide encryption key for the LNI device, enter **y** and enter the encryption key.

**Step 18** If you entered **n**, skip this step. Otherwise, enter the encryption key for device credentials:

Please enter encryption key for device credentials (Min 8 chars, Max 64 chars):

**Step 19** Wait for the installation to complete.

**Note** The Cisco ONP services start automatically, after you successfully install the build.

The install logs are located in the following path:

```
/var/log/cnp/install.log
```

Run the following command to see the list of services running:

```
root:~/$ONP_HOME# sudo docker ps
```

You can confirm the successful installation based on whether the following services are up and running for more than five minutes:

For only ONP installation:

- cnp\_cnp
- cnp\_ode.1
- cnp\_ode.2
- cnp\_ode.3
- cnp\_pce.1
- cnp\_pce.2
- cnp\_cnp\_frontend
- cnp\_gene
- cnp\_mongo

For ONP and LNI installation, you can see the following services along with the services that are mentioned earlier for ONP only:

- lni\_modelaggregatorservice



- lni\_circuitservice
- lni\_inventorieservice
- lni\_topologyservice
- lni\_collectorservice
- lni\_lniBroker
- lni\_devicemanager
- lni\_apigw
- lni\_ncs1kinventoryadapterservice
- lni\_ncs4kinventoryadapterservice
- lni\_ncs2kinventoryadapterservice
- lni\_netconfadapterservice
- lni\_tlladapterservice
- lni\_kibana
- lni\_kafka
- lni\_netconfPluginService
- cnp\_mongo
- lni\_elasticsearch
- lni\_servicediscovery
- lni\_tllPluginService
- lni\_zookeeper
- lni\_logstash

**Step 20** After you confirm that all the mentioned services in the previous step are up, you can access the Cisco ONP using the Google Chrome browser pointing to Ubuntu server hostname or IP address.

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## Log into Cisco ONP

After installing Cisco ONP, use this procedure to log into the Cisco ONP user interface.

---

**Step 1** Open the Google Chrome browser.

**Note** Clear the browser cache if you have used earlier versions of Cisco ONP.

**Step 2** In the browser's address bar, enter *https://hostname* or *https://ipaddress*, where *hostname* or *IP address* belongs to the Ubuntu server used for Cisco ONP installation, for example: *https://cisco-onp-server.cisco.com* or *https://10.76.82.14*.

The Cisco ONP user interface displays the Login window.

**Step 3** Enter **admin** and **cisco123** as the default username and password.

**Step 4** Click **Login** to log into Cisco ONP.

**Note** Cisco ONP prompts you to change the administrator password, when you log in for the first time after installation. Cisco recommends that you create a new user with valid email ID and administrative privileges. Do not use the default administrator username because the administrator password cannot be recovered, if forgotten.

**Step 5** To change the administrator password, perform the following actions in the prompt:

a) Enter **Old Password**.

b) Enter **New Password**.

As you enter the password, the Cisco ONP prompt displays the strength of the password in different colors.

c) Enter **Repeat New Password** to confirm the new password.

d) Click **Update**.

Wait till Password updated successfully message appear.

## Update the Default Self-Signed Certificates

Use this procedure to update the default self-signed certificates for Cisco ONP, after the installation:

**Step 1** Log into the server where Cisco ONP is hosted.

**Step 2** Go to the path `/opt/cnp/nginx/conf/ssl` using “cd” command.

Example:

```
cd /opt/cnp/nginx/conf/ssl
```

**Step 3** Delete existing self-signed certificates.

**Step 4** Copy Certificate Authority (CA) signed certificates and paste the certificates and key.

**Note** You need to have this required CA signed certificates.

**Step 5** Restart Cisco ONP. See [Restart Cisco ONP, on page 6](#).

## Restart Cisco ONP

Use this procedure to restart the Cisco ONP server:

**Step 1** Go to `$ONP_HOME`.

**Step 2** Execute the following command:

```
sudo docker stack rm cnp
```

**Step 3** Go to \$ONP\_HOME/ONP:

```
cd /home/user/Desktop/ONP_Builds/ONP
```

```
sudo docker stack deploy -c images/conf/docker-compose.yml --resolve-image=never cnp
```

## Restart LNI

Use this procedure to restart the LNI services, if you have installed Cisco ONP and LNI.

Go to \$ONP\_HOME/LNI to restart LNI services.

```
cd /home/user/Desktop/ONP_Builds/LNI
```

```
sudo bash ciscoLniInstaller.sh -o stop -t update -m offlinemode
```

```
sudo bash ciscoLniInstaller.sh -o start -t update -m offlinemode
```

## Uninstall Cisco ONP

Feature Name	Release Information	Description
--------------	---------------------	-------------

**Warning:** When you uninstall Cisco ONP, you will lose all created networks and users. You must again set the admin password.



**Note** We suggest that you perform a database backup before uninstallation. For more information, see [Backup Cisco ONP Database](#).

Use these commands to uninstall Cisco ONP:



**Note** You must run the following commands **one-by-one**:

```
sudo docker stack rm cnp
sudo docker swarm leave --force

sudo apt -y purge docker-ce
sudo apt -y purge docker-ce-cli
sudo rm -rf /var/lib/mongodb_cnp
sudo rm -rf /opt/cnp
sudo rm -rf /var/log/cnp
sudo rm -rf /var/log/nginx
sudo docker image prune -a -f
```

```

sudo rm -rf /var/lib/mongodb_lni

sudo rm -rf /var/lib/elasticsearch_data/*
sudo rm -rf ONP
sudo rm -rf LNI
sudo rm -rf ONPLniInstaller.sh

```

## Install Cisco ONP on Laptop

Use this procedure to install Cisco ONP on a Windows laptop or Apple MacBook.

### Before you begin

Ensure that your Windows laptop or Apple MacBook has at least 16 GB of RAM.

- 
- Step 1** Download and install the latest version of Oracle VirtualBox on your Windows or Mac laptop. See <https://www.virtualbox.org/wiki/Downloads> and <https://www.youtube.com/watch?v=x5MhydijWmc>. We recommend downloading "macOS /Intel hosts" for the Apple MacBook.
- Step 2** Download the Ubuntu 20.04 Desktop AMD64 image from the link: <https://releases.ubuntu.com/focal/> and install it on the VirtualBox.
- Note** Ensure that you allocate at least 30 GB of storage space on the VirtualBox, 8 GB of RAM and four virtual CPUs, and mount a directory with full access for file sharing. See [How to setup shared folders in VirtualBox 6](#).
- Step 3** Install VirtualBox Guest Additions to share the clipboard operations and to share the folder access between the Host and Guest operating systems. See [Installing and Maintaining Guest Additions](#).
- Step 4** Download the Cisco ONP tar build, public key, and signature files from <https://www.cisco.com/c/en/us/support/optical-networking/optical-network-planner/series.html#%7Etab-downloads> to the Host Windows laptop or MacBook, and copy it into the shared folder mounted as in Step 3.
- Step 5** Log in to the VirtualBox and access the Cisco ONP tar build, public key, and signature files through the shared folder.
- Step 6** Open the terminal in the VirtualBox, navigate to the shared folder and, install Cisco ONP. See Step 5 of the procedure, [Step 5, on page 2](#).
- Step 7** To log into Cisco ONP see [Log into Cisco ONP](#).
- Note** Try launching Cisco ONP through <https://localhost> if you are not able to launch it through [ipaddress/hostname](https://ipaddress/hostname).
- 

## Docker Commands

The following table lists the docker commands, that you can use for performing a specific task:

Task	Docker Command
Check installed docker version.	<code>docker -v docker --version</code>
List available docker images.	<code>docker images</code>

Task	Docker Command
List all running containers.	<code>docker ps</code>
List all running and exited containers.	<code>docker ps -a</code>
Remove a particular container.	<code>docker rm &lt;container ID/ container name&gt;</code>
Remove a particular docker image.	<code>docker rmi &lt;Image name / Image ID&gt;</code>
Fetch the logs of a container.	<code>docker logs -f &lt;container ID&gt;</code>
Fetch the resource utilization by a container.	<code>docker stats &lt;container ID&gt;</code>

## Monitor Cisco ONP Health

To check the status or health of Cisco ONP, use the following command, which lists all running containers:

```
$sudo docker ps
```

## Cisco ONP Logs

Cisco ONP provides the following logs:

**Table 1: Logs**

Logs	Description	
Container Logs	<p>The command <code>sudo docker ps</code> provides the list of running containers and their IDs. Copy the container ID of that container whose log you require.</p> <p>You can obtain the log or activities of the container by using the following command:</p> <pre>sudo docker logs (container name/ID) &gt; filename.log/txt</pre>	<p>Example:</p> <pre>sudo docker logs cnp &gt; file.log sudo docker logs 274a5fc1152b &gt; file.log</pre>
Application Logs	<p>You can find Cisco ONP application logs in the following locations:</p> <ul style="list-style-type: none"> <li><code>/var/log/cnp</code></li> <li><code>/var/log/nginx</code></li> </ul>	—
Install Logs	<p>You can find Cisco ONP install logs in the following location:</p> <pre>/var/log/cnp</pre>	—





# APPENDIX **A**

## Troubleshoot

- [Troubleshooting Tasks, on page 11](#)

## Troubleshooting Tasks

The following table describes the common error messages that are related to Cisco ONP installation and the workarounds:

**Table 2: Troubleshooting Tasks for Cisco ONP Installation**

Warning Message or Error	Probable Reason for the Error	Workaround
Non-Responsive user interface	The Server is not reachable. Or The internet connectivity is not stable.	Check whether <code>cnp</code> and <code>onp_frontend</code> containers are running using this command: <pre>\$sudo docker ps</pre> If the containers are not up, <a href="#">Restart Cisco ONP, on page 6</a> . Or Check whether the internet connectivity is fine and log in to Cisco ONP again.
Installation not successful. Creating network "lni_network-lni" with driver "bridge" Pool overlaps with other one on this address space No container found for <code>mongo_1</code> .	Tar extraction may be partially completed due to exhausted server disk space. You may see an error message similar to "Error processing tar file(exit status 1): write /usr/lib/gcc/x86_64-linux-gnu/8/cc1plus: no space left on device" in the Installation logs.	<ul style="list-style-type: none"> <li>• Uninstall Cisco ONP.</li> <li>• Remove unwanted files from the server and retain at least 20 GB of free space.</li> <li>• Untar the Cisco ONP tar file and install again.</li> </ul>

Warning Message or Error	Probable Reason for the Error	Workaround
<p>LNI services are not coming UP at the end of the installation. Getting timed out and all services are DOWN.</p>	<p>Network proxy may not be set, and the Host server does not have shared network access.</p> <p>Or</p> <p>No proper permission is set on the docker volumes.</p>	<p>Check whether the network proxy is set in the file path, <code>/etc/environment</code>. If either of <code>http_proxy</code>, <code>https_proxy</code>, and <code>no_proxy</code> details are not present on this file, configure the required proxy on the server and then reinstall Cisco ONP.</p> <p>After you untar the Cisco ONP tar file, set read, write, and execute permissions for the Install script, LNI, and ONP folders using the following commands, and start the installation:</p> <pre>sudo chmod -R 777 ONP sudo chmod -R 777 LNI sudo chmod 777 ONPLniInstaller.sh</pre>
<p>MongoDb container is not starting within stipulated time Exiting.</p>	<p>Server disk space has exhausted.</p>	<ul style="list-style-type: none"> <li>• Check the available disk space by using the command <b>df -h</b>.</li> <li>• If the memory utilization is 100%, remove the unwanted files from the server.</li> <li>• Retain at least 20GB of free space and reinstall Cisco ONP again.</li> </ul>
<p>After successful installation, not able to log in to Cisco ONP with default username and password (admin/cisco123)</p>	<p>Check whether any special characters are used in the Cisco ONP database username or password during installation.</p>	<p>Uninstall and reinstall Cisco ONP. Make sure that only alphanumeric characters are used in the database username or password.</p>
<p>Cisco ONP keeps on reverting to the login page after logging in.</p>	<p>Old browser cache may not be cleaned up.</p>	<p>Clear browser cache, relaunch browser and log in again.</p>