

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

First Published: 2021-08-09

Last Modified: 2022-08-10

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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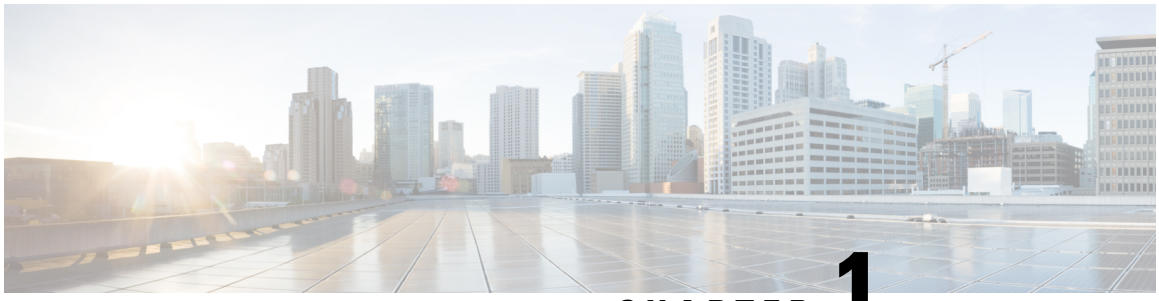
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CHAPTER 1

Install Cisco Optical Network Planner

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Cisco Optical Network Planner

Cisco Optical Network Planner (Cisco ONP) is a software tool that

- models and tests Optical Transport Network (OTN) and Dense Wavelength Division Multiplexing (DWDM) optical networks,
- operates within a graphical environment, and
- supports the design and validation of networks of NCS 1004, NCS 1010, NCS 2000, and NCS 4000 series.

Cisco ONP capabilities

Cisco ONP capabilities include:

- creation of multiple network instances,
- modification of parameters for each instance, and
- comparison between different network instances.

Hardware and software requirements

The hardware and software requirements for installing Cisco ONP are:

Hardware Requirements

You need to have an 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 500 GB server free space after installation, for 3 concurrent Parallel ONP analysis
- 8 CPU, 64 GB RAM, and 500 GB server free space after installation, for 6 concurrent Parallel ONP analysis
- 8 CPU, 96 GB RAM, and 500 GB 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



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

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

Install Cisco ONP

Use this task to install Cisco ONP by using the tar archive and the installation script.

Table 1: Feature History

Feature Name	Release Information	Feature Description
Installation Packages	Cisco ONP Release 5.0	Cisco ONP provides the option to install the ONP package or ONP and LNI packages. This installation approach allows you to install the full or lightweight setup of 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 these files:

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

Procedure

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.

a) Assign full permission to the build tar.

Example:

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

b) Untar the Cisco ONP build.

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

c) Set read, write, and execute permissions for the Install script, and ONP folders using these commands.

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

d) Check whether curl is installed in the server by entering this command:

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

If you see this output, curl is installed. Otherwise, install curl.

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

To install curl, run this command:

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

Step 5 Start Cisco ONP installation. Type the command sudo *./<install file> <tar file> <public key>*," and press Enter.

Example:

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

a) 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
```

b) 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.

c) 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.
```

d) If you chose to install ONP package alone, go to #unique_6 unique_6_Connect_42_step_tpd_r4v_k5b. Else continue with these steps which are required for ONP and LNI packages installation.

e) 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):
```

f) 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.

g) Enter the disk space for the log storage:

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

h) 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.

i) 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 6 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 this path:

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

Run this command to see the list of services running.

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

You can confirm the successful installation based on whether these 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 these services along with the services that are mentioned earlier for ONP only:

- lni_modelaggregatorservice
- lni_circuitservice

- lni_inventoryservice
- lni_topologyservice
- lni_collectorservice
- lni_lniBroker
- lni_devicemanager
- lni_apigw
- lni_ncs1kinventoryadapterservice
- lni_ncs4kinventoryadapterservice
- lni_ncs2kinventoryadapterservice
- lni_netconfadapterservice
- lni_tl1adapterservice
- lni_kibana
- lni_kafka
- lni_netconfPluginService
- cnp_mongo
-
- lni_elasticsearch
- lni_servicediscovery
- lni_tl1PluginService
- lni_zookeeper
- lni_logstash

Step 7 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.

Install Cisco ONP

Set up Cisco ONP software by extracting the provided package and running the installer.

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 these files:

- ONP component
- A shell script (Installer.sh) to install ONP component
- SSF component

- README file for installation Procedure of SSF Component

Follow these steps to install Cisco ONP by using the tar archive and the installation script.

Note This task is also applicable for upgrading Cisco ONP 24.3.1 to Cisco ONP 25.1.1. If you are upgrading from software version prior to R24.3.1 to R25.1.1, you must upgrade to R24.3.1 and then to R25.1.1 to retain data from software version prior to R24.3.1.

If the host server is upgraded from Ubuntu 22.04 to 24.04, restart the Ubuntu host server before proceeding with the Cisco ONP installation.

Procedure

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

Step 2 Create the *25.1.1_Build* folder under *ONP_Builds* to keep all the required files for the installation.

Example:

```
user@host:~/Desktop$ mkdir ONP_Builds/25.1.1_Build
```

Note
The example path here `/home/ user/Desktop/ONP_Builds/25.1.1_Build` 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 and perform these steps:

a) Assign full permission to the build tar.

Example:

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

b) Untar the Cisco ONP build.

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

c) Set read, write, and execute permissions for the Install script, and ONP folders using these commands.

```
sudo chmod -R 777 ONP
sudo chmod 777 Installer.sh
```

d) Check whether curl is installed in the server by entering this command.

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

If you see this output, curl is installed. Otherwise, install curl.

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

To install curl, run this command.

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

e) 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
```

Step 5 Start Cisco ONP installation. Type the command sudo ./<*install file*> <*tar file*> <*public key*>," and press **Enter**.

Example:

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

a) 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
```

b) Enter your ONP database credentials.

Note
Make sure to use **ONLY alphabets or numbers**. We recommend not to use any special characters.

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 6 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 this path:

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

Run this command to see the list of services running:

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

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

- cnp_cnp
- cnp_ode.1
- cnp_ode.2
- cnp_ode.3
- cnp_pce.1
- cnp_pce.2

- cnp_cnp_frontend
- cnp_gene
- cnp_postgres

Step 7 After you confirm that all the mentioned services in the previous step are up, you can access the Cisco ONP using the Google Chrome, Mozilla Firefox, or Microsoft Edge browser pointing to Ubuntu server hostname or IP address.

Step 8 To install the SSF component, refer the README file for SSF installation.

After you install the SSF component, you can add SSF server details in the Cisco ONP application at **Preferences** > **General Settings** > **SSF Server Details**.

Install Cisco ONP on laptop

Use this task 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.

Follow these steps to install Cisco Optical Network Planner on your laptop using Oracle VirtualBox:

Procedure

Step 1 Download and install the latest version of Oracle VirtualBox on your Windows or Mac laptop. See Downloads and Youtube.

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 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 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.

Log into Cisco ONP

Access the Cisco ONP user interface using the default administrator credentials after installation.

Follow these steps to log into the Cisco ONP user interface, after installing Cisco ONP.

Procedure

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 these 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 until the Password updated successfully message appear.

Update the default self-signed certificates

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

Follow these steps to update the default self-signed certificates for Cisco ONP:

Procedure

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

Step 2 Use the `cd` command, to go to the path `/opt/cnp/nginx/conf/ssl`.

Example:

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

Step 3 Delete the existing self-signed certificates.

Step 4 Copy the Certificate Authority (CA)-signed certificates, then paste the certificates and key.

Note
You must have CA-signed certificates.

Step 5 Edit the ssl_certificate and ssl_certificate_key filenames in the default.conf file (located at /opt/cnp/nginx/conf) so that they match the new certificate and key filenames.

Example:

```
server {
listen 443 ssl default_server;
server_name localhost;
ssl_certificate /etc/nginx/ssl/cnp_dev_selfsigned.crt;
ssl_certificate_key /etc/nginx/ssl/cnp_dev_selfsigned.key;
ssl_protocols TLSv1.2 TLSv1.3;
client_max_body_size 200M;
```

Step 6 Restart Cisco ONP. See Restart Cisco ONP, on page 11.

Restart Cisco ONP

Restart the Cisco ONP server to ensure continued proper operation after maintenance or troubleshooting.

Follow these steps to restart the Cisco ONP server:

Procedure

Step 1 Go to $ONP_HOME.

Step 2 Execute this 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

Restart the LNI services, if you have installed Cisco ONP and LNI.

Follow these steps to restart the LNI services:

Procedure

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

Remove Cisco ONP and its associated files from your system by running a series of commands.

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.

Follow these steps to uninstall Cisco ONP and remove all related files:

Procedure

Run these 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
```

```
sudo docker stack rm cnp
sudo docker swarm leave --force
sudo docker network rm lni_network-lni
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/postgresdb_lni/
sudo rm -rf /var/lib/postgres_lni_db/
sudo rm -rf /var/lib/elasticsearch_data/*
sudo rm -rf ONP
sudo rm -rf LNI
sudo rm -rf ONPLniInstaller.sh
```

Docker commands

This table lists docker commands that you can use to perform a specific task.

Task	Docker command
Check installed docker version	docker -v docker --version
List available docker images	docker images
List all running containers	docker ps
List all running and exited containers	docker ps -a
Remove a particular container	docker rm <container ID/ container name>
Remove a particular docker image	docker rmi <Image name / Image ID>
Fetch the logs of a container	docker logs -f <container ID>
Fetch the resource utilization by a container	docker stats <container ID>

Cisco ONP logs

Cisco ONP provide these logs.

This table lists the different log types available for Cisco ONP, their descriptions, and the methods or locations for accessing each log.

Table 2: Logs

Logs	Description	Example

Container logs	The command *sudo docker ps* provides the list of running containers and their IDs. Copy the container ID of that container whose log you require.
	You can obtain the log or activities of the container by using this command.
	`sudo docker logs (container name/ID) > filename.log/txt`
		Example:
		`sudo docker logs cnp > file.log`
		`sudo docker logs 274a5fc1152b > file.log`

Logs	Description	Example
Application logs	You can find Cisco ONP application logs in these locations: • `/var/log/cnp` • `/var/log/nginx`	—
Install logs	You can find Cisco ONP install logs in this location. `/var/log/cnp`	—

Monitor the Cisco ONP health

Ensure Cisco ONP system operates reliably by confirming all containers are healthy.

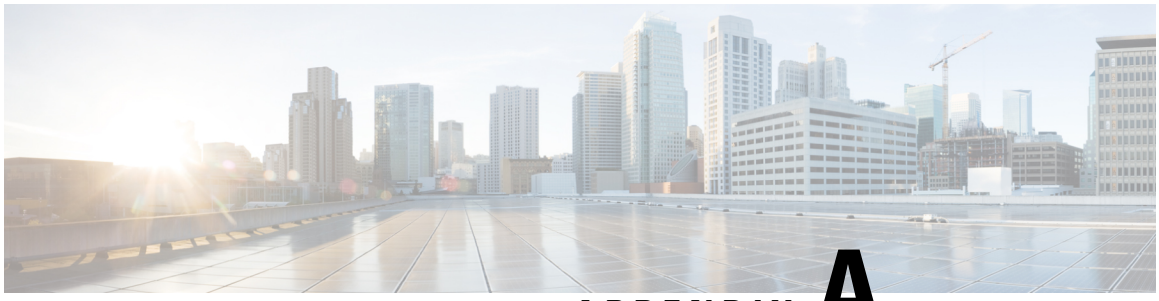
Follow this step to check the status or health of Cisco ONP.

Procedure

Run this command to list all running containers.

Example:

```
$sudo docker ps
```



APPENDIX A

Troubleshoot

- Troubleshooting tasks, on page 15

Troubleshooting tasks

This table describes the common error messages that are related to Cisco ONP installation and the workarounds.

Table 3: Troubleshooting tasks forCisco 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 cnp and onp_frontend containers are running using this command: `$sudo docker ps` If the containers are not up, Restart Cisco ONP, on page 11. 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 mongo_1.	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.	• Uninstall Cisco ONP. • Remove unwanted files from the server and retain at least 20 GB of free space. • Untar the Cisco ONP tar file and install again.

Warning message or error	Probable reason for the error	Workaround

LNI services are not coming UP at the end of the installation. Getting timed out and all services are DOWN.	Network proxy may not be set, and the Host server does not have shared network access.
	Or
	No proper permission is set on the docker volumes.
		Check whether the network proxy is set in the file path, `/etc/environment`. If either of http_proxy, https_proxy, and no_proxy details are not present on this file, configure the required proxy on the server and then reinstall Cisco ONP.
		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:
		`sudo chmod -R 777 ONP`
		`sudo chmod -R 777 LNI`
		`sudo chmod 777 ONPLniInstaller.sh`

MongoDb container is not starting within stipulated time Exiting.	Server disk space has exhausted.	• Check the available disk space by using the command **df -h**. • If the memory utilization is 100%, remove the unwanted files from the server. • Retain at least 20GB of free space and reinstall Cisco ONP again.
After successful installation, not able to log in to Cisco ONP with default username and password (admin/cisco123)	Check whether any special characters are used in the Cisco ONP database username or password during installation.	Uninstall and reinstall Cisco ONP. Make sure that only alphanumeric characters are used in the database username or password.
Cisco ONP keeps on reverting to the login page after logging in.	Old browser cache may not be cleaned up.	Clear browser cache, relaunch browser and log in again.
Error response from daemon : This node is not swarm manger. Use "docker swarm init"or "docker swarm join" to connect this node to swarm and try again.	Server is not in Swarm mode.	**1.** Use this command. `$docker swarm init --advirtise-addr` *`IP address of Ubuntu Server`* **2.** Use this command. `$docker swarm join` *`token`* Use the token that is generated after running the command in the previous step. **3.** Re-install Cisco ONP.