Design and Analyze Networks

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Design a network using Cisco ONP

You can design a network in one of these ways:

- Manual Design—Create a network design using a design palette.
- Import Design—Import a network design from an Excel sheet, Live Network Import or from an existing network from CTP, or another instance of Cisco ONP.

Manually design a network using Cisco ONP

Table 1: Feature History

Feature Name	Release Information	Feature Description
Database Operations Optimization	Cisco ONP Release 5.2	Cisco ONP now provides an option to run some operations in the background involving database interaction, such as **Save As**, **Import CPZ**, and **Export CPZ**. You can continue to use the Cisco ONP interface for other operations when these operations are running in the background.

Table 2: Feature History

Feature Name	Release Information	Feature Description
4K-2K SSON Network Creation Support	Cisco ONP Release 5.2	Now you can include the 4K-2K nodes in both SSON and non-SSON networks while designing the network. This helps you to validate 4K-2K nodes in the SSON design which has higher line rates.

Table 3: Feature History

Feature Name	Release Information	Feature Description
NCS 1010 C+L Network Design	Cisco ONP Release 5.1	Cisco ONP now supports the C+L-band networks that help you plan NCS 1010 networks using the OLT-L and ILA-L line cards to increase your network's bandwidth capacity. Enhanced with L-band related properties, the UI enables you to design a C+L-band network for your ever-increasing channel demands. The following L-band types are introduced to suit your design needs: • **C+L**—This band type adds more channels to your network, increasing its traffic carrying capacity. • **C+L Futuristic**—This band type creates a network with C-band edges and future provisions for L-band edges that you can cost-effectively upgrade after exhausting the C-band capacity.

Table 4: Feature History

Feature Name	Release Information	Feature Description
Greenfield NCS 1010 Network Design	Cisco ONP Release 5.0	You can design and validate NCS1010 optical line system. This feature helps to create OLT-C, OLT-R-C, ILA-C, ILA-R-C, and ILA-2R-C based NCS 1010 networks using fixed grid add/drop MD-32-ODD, MD-32-EVEN and flex grid add/drop BRK-24, BRK-16, and BRK-8 passive modules.

Table 5: Feature History

Feature Name	Release Information	Feature Description
Multi-Layer Platform (MLP) Greenfield Design with NCS 4k-1k-2k	Cisco ONP Release 4.1	This feature allows you to perform the following: • Support NCS 4K-1K-2K multi-platforms • Visualize new layout for Txp and SVO for NCS 2000 node • Support different OTN service types with protection • Edit layout for NCS 4000 and NCS 1004 nodes

You can create any of the following network designs:

- Spectrum Switched Optical Network (SSON) that uses flexible spectrum allocation, where the required minimum spectral resources are allocated adaptively based on traffic demand and network conditions
- Non-SSON network that allocates single spectrum (fixed spectrum) irrespective of the traffic demand and network conditions
- NCS 1010 network

Perform the following steps to create a network in the Cisco ONP:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **New**.

Step 2 In the **Create New Network** dialog box, choose the required options to create a network.

a) From the **L0 Network Platform** drop-down list, choose one of the following:

- NCS 2000—To create a non-SSON network that contains NCS 2000 and NCS 4000 nodes, or an SSON network including NCS 2000, NCS 1004, and NCS 4000 nodes
- NCS1010—To create a network that contains only NCS 1010 nodes
- NCS1001—To create a network that contains only NCS 1001 nodes
- NCS1014—To create a network that contains only NCS 1014 nodes

b) If you want to create an SSON network, check the **SSON Network** check box, else leave it unchecked.

This option is not for the NCS 1010 network.

c) Choose **NCS (4K_1K_2K)** or **NCS (4K_2K)** from the **Traffic Type** drop-down list.

If you had chosen to create an SSON Network in the previous step, you can view the **Traffic Type** drop-down list.

Note
Once the network is created you cannot change the **Traffic type** from 4K_1K_2K to 4K_2K or vice versa. Hence, we recommend you export the network into an Excel sheet, do the required modification and then import it as a new network.

d) Choose the **System Release** for NCS 2K or NCS 1010 from the drop-down list.

You cannot change the system releases that are available for NCS 4K and NCS 1K.

The **Band Type** drop-down list appears for NCS 1010 networks from Release 7.9.1.

e) From the **Band Type** drop-down list for NCS 1010, choose one of the following:

- C-Band—Only C-band edges are created and ANS is generated based on C-band. For L-band upgrade, ANS unlock is required.
- C+L Futuristic—Only C-band edges are created and ANS is generated based on C-band and L-band. For L-band upgrade, ANS unlock is not required.
- C+L—Both C-band and L-band edges are created and ANS is generated based on C-band and L-band.

Note
After the creation of a NCS 1010 R7.9.1 network, if required, you can change the network band type under the **Network Application Configuration** section in the Network Properties.

f) Click **Create**.

You can view a map and the design palette. For more information, see Design Palette.

Step 3 Click the **Drawing Tool** icon (pencil and ruler crossed), and add sites and other network elements.

a) Add sites to the map using the drawing tool.

Zoom into the map to the desired level. Click any of the site icons (**ROADM**, **OLA** or **Traffic**(4K-1K-2K)), and drag it to the sites on the map. Drag or click the map where a site has to be placed, when the cursor changes to the site icon.

Note
- SRLG is not supported in the SSON networks.

  Traffic node is not supported on the NCS 1010 network.

b) Click the **Fiber** icon and drag it to connect from one site to another site. Continue this for all sites.

Note
By default, the fiber length is updated as 1 km for all the fibers. If you want the length to be auto updated based on the x, y coordinates, then enable the **Use Coordinates Distance** property under the network properties.

c) Create services between the sites (only for SSON and non-SSON networks).

Cisco ONP provides only OTN service.

d) Click **OTN Service** (Green in color) and add the service between the existing Traffic sites on the map.

e) Click **Circuit** (purple in color), **Media channel** (purple in color), or **Waves** (red in color), and add media channel, or waves between the existing sites on the map.

In the left pane, you can view a network tree panel with a default network name. The network elements added are displayed in the tree panel.

Step 4 Choose **File** > **Save As**.

a) In the **Give a Network Name** dialog box, enter a network name and click **Save**.

b) If you want this operation to run in the background, click the **Run in Background** check box.

A notification pops-up after the background operation is completed. Go to **Job Monitor** to view the progression of the operation running in the background.

Create Shared Risk Link Group

You can use the Shared Risk Link Group (SRLG) feature for routing protected services. You can create SRLGs through the Excel import file SRLG tab or through the Cisco ONP GUI using the following procedure:

Note SRLG is supported only for the non-SSON network including the traffic nodes.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Click the network tree panel in the left.

Step 2 Expand **Fibers**, and check the check box next to each fiber in the same SRLG.

Step 3 After all fibers are checked, right-click, and select **Create SRLG**.

SRLG is created with a unique name. You can rename the SRLG.

Import network using Excel sheet

Use this task to import a network into Cisco ONP, using an Excel sheet.

Table 6: Feature History

Feature Name	Release Information	Feature Description
CX Unified Planning Tool Network Import	Cisco ONP Release 5.0	The integration between CX Unified Planning Tool (UPT) and Cisco ONP enables you to import the networks created and analyzed in Cisco CX UPT into Cisco ONP. This helps you avoid recreating the networks that are already created in UPT. This feature allows you to import networks having NCS 1010 and NCS 2000 nodes into Cisco ONP.

Table 7: Feature History

Feature Name	Release Information	Feature Description
Export and Import of Network Topology in Excel Format	Cisco ONP Release 5.1	It is now possible to export the topology data of an existing network into an Excel file. You can easily modify the exported data in Excel and import it back into Cisco ONP to create a new network or modify an existing network. The following are the supported Excel formats: • **xlsx**—Standard Excel with multiple sheets, each corresponding to a network element such as Network, Sites, Circuits, Spans, OTNdemands, and so on. • **xlsm**—Macros-enabled Excel file that can filter out and display only the applicable network element sheets based on the platform selected in the Network sheet. Cisco ONP has the built-in intelligence to automatically calculate the shortest path between a source and a destination, even if only a partial fiber path is mentioned in the imported Excel file.

Note By default, the system release of the Excel imported network is 11.0.

Note From Release 5.0, Cisco ONP supports import of networks created using CX UPT via Cisco ONP Import Excel option. CX UPT does not populate the *DWDMChannel Type* and *Add/Drop Type* values in the Excel sheet. If the values are not found in the Excel sheet, then Cisco ONP picks the default options. By default, **DWDMChannel Type** is *NCS1004_QPSK_SP_16QAM_200G_27%SDFEC_60GBd* and **Add/Drop Type** is *Colored*. We recommend you to check the *DWDMChannel Type* and *Add/Drop Type* values before importing the Excel sheet into Cisco ONP to avoid any discrepancies.

From Release 5.1, in addition to exporting the template, you can also export the entire network design data of an existing network in the form of the Excel sheet, modify the network properties available in the Excel sheet and reimport. The network can be exported in all modes and reimported on Design mode, Upgrade mode, and Release Upgrade mode.

Note Transponders are not supported as part of Export/Import Excel. When you export an existing network with transponder card forced, the exported Excel sheet will have the Traffic type set to Pluggable Card in DWDMChannels/MediaChannels tab. Make necessary changes in the exported Excel sheet before you import it into Cisco ONP.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **Export** > **Excel**.

a) Choose the **Network Type** as Template or Current Network.

b) Choose the **File Type** as xlsx or xlsm (Macro Enabled)

The Macros Enabled Excel sheet automatically customizes the tabs on the Excel sheet based on the platform that you choose. It also provides additional functionalities such as selection of fibers in the path selection, wavelength count validation in case of regen selection.

c) Click **Download**.

The template has the following mandatory tabs, and the respective fields to be filled in the Excel sheet.

Tabs	Description
Network	Label (name of the network), Platform (NCS2000(NON SSON), NCS2000 (SSON), NCS1010, NCS 1001, NCS 1014), Traffic Type, NCS1010 Line Card, NCS1010 Band Type, Chassis Type, and System Release
Network Property	This is applicable for NCS 1010 network alone. State (New, Locked, and Unlocked), NCS 1010 Line Card, NCS 1010 Band Type, and Chassis Type
Sites	Site Label, Type, X coordinates, Y coordinates,X_Rearranged, Y_Rearranged, Pre Equip Degree, Grooming Site, CLLI code, and Site Address, Degree (Scalable upto degree), NCS1010 Line Card, NCS1010 Band Type, Chassis Type, and State.
Spans	Span label, A (Source site name), Z (Destination site name), Kms (Distance), Loss, Type, A_Edge, Z_Edge, AZ_Loss, ZA_Loss, AZ_Kms, ZA_Kms, NCS1010 Band Type, and State.
OTNDemands-4K-2K	Demand Label, A (Source), Z (Destination), Y (Tertiary Source), B (Tertiary Destination), Type, Quantity, Protection, Primary Path, Secondary Path, and State. Note: Y and B can be used with Unprotected Disjoint Service.
OTNDemands-4K-1K-2K	Demand Name, Source, Destination, Service Group, Type, A/D Type, Protection, Primary Wavelength, Secondary Wavelength, Primary Path, Secondary Path, First Restoration path, Second Restoration Path, Primary ODU Timeslot, Secondary ODU Timeslot, Primary Regen, Secondary Regen, Trunk Mode, Baud Rate, and State.
MediaChannels	Channel Label, Source, Destination, Primary Wavelength, Secondary Wavelength, Protection, Traffic Type, Card Type, A/D Type, Primary Path, Secondary Path, Primary Regen, Secondary Regen, and State.
ServiceGroup	ServiceGroup Name, Demand Types, 4K Exclusive LC Usage, 4K Symmetric Aggregation, 1K Exclusive LC Usage, 1K Symmetric AggregationChannel Label, and State.
DWDMChannels	Primary Wavelength and Secondary Wavelength (Work and Protect Wavelength for NCS2000 non-SSON waves), Primary Path and Secondary Path (Work and Protect Path for NCS2000 Wave/Media Channel and NCS1010 circuit), A/D Type (Colored/Colorless/Contentionless), Traffic Type, Primary Regen Secondary Regen State, Channel label, A, Z, Wavelength, Protection, and Type.

Tabs	Description
Services-1K	Service Name, Source, Destination, Type, Protection, Primary Wavelength, Primary Path, Primary Regen, Card Type, Trunk Mode, A/D Type, Band Type, and State.
Circuits	Circuit Label, Source, Destination, Primary Wavelength, Protection, Traffic Type, Card Type, A/D Type, Primary Path, Primary Regen, Band Type, and State.
Flex Optical Source	Flex Optical Source Name.
SRLG	SRLG Label, Spans, and State.

Step 2 Fill the network details in the template file or edit the current network file, and save the file.

Step 3 Choose **Import** > **Excel**, and select the **Import Type**.

- New—Choose this option if you want to create a new network using the design data available in the Excel sheet.
- Existing—Choose this option if you want to update an existing network with the data available in the Excel sheet. Open the network before you import the Excel sheet. The network must be on Design mode, Upgrade mode, or Release Upgrade mode.

You can view the data available in the Excel sheet before importing the network data. The **View Data** check box remains checked by default. Uncheck it of you do not want to view the imported data.

Step 4 Browse, select the saved file, and click **Import**.

During the import for the Existing network, if the state is Locked, Cisco ONP does not consider the data, if the state is Unlocked, Cisco ONP changes the existing parameter, provided the network is in upgrade mode, and if the state is New, the parameters in the Excel is added as a new entry into the network.

During new network import, new network design is created irrespective of the State.

Note
If there are errors in the imported data, a pop-up error message is shown in case of new import, and the errors are available under the **Elements** > **Messages** tabs in case of updating the existing network.

Cisco Transport Planner network import support

You can import the networks that are created and analyzed from Cisco Transport Planner (CTP) to Cisco ONP, to avoid recreating the networks that are already created in CTP. The CTP network files are in .mpz format. You can, release upgrade, the imported networks.

Note

- Network must be in design-analyzed or upgrade-analyzed mode.
- You cannot import networks which are earlier than Release11.0.

Supported Hardware

- Optical source files and transponders

See Supported Optical Sources, and Supported Cards and Pluggables.

- Contentionless, colorless, and colored point-to-point demands
- Flex network
- Gain Equalizer

Note The Gain Equalizer node changes as a ROADM node when you unlock the site after the release upgrade.

- ROADM-SMR-9 and SMR-20
- All flex supported amplifiers, controller cards, and chassis types

Import MPZ Design File

Use this task to import .mpz file from CTP to Cisco ONP.

Note Importing of mpz networks with P-Ring and A2A demands is not supported. Hence, we recommend you to delete these demands in CTP, reanalyze the networks in CTP and import the mpz into Cisco ONP.

Before you begin

Log in to Cisco ONP web interface as a user with network creation permission.

Import the required optical source files and layout template using **Manage** > **Optical Source** and **Manage** > **Optical Source** options. For more information, refer **Manage Alien** and **Manage Layout** .

Delete the parameters that are not supported by Cisco ONP from the .mpz file and then import the .mpz file to Cisco ONP.

Procedure

Step 1 Choose **Import** > **MPZ**.

The **Import File (.mpz)** dialog box appears.

Step 2 Browse to the .mpz file stored in your local system.

Step 3 Choose **4K_1K_2K** or **4K_2K** from the **Traffic Type** drop-down list.

If you had chosen an SSON MPZ file, you can view the **Traffic Type** drop-down list.

Step 4 Click **Import**.

The .mpz file gets imported to Cisco ONP.

Note
If you view a blank screen when you click waves in the network tree, refresh the browser.

Step 5 Choose **Network** > **Upgrade** or **Network** > **Release Upgrade** to make any changes on the imported network.

Note
- You cannot go back to design mode on the imported mpz network.
- The wave label of imported mpz network in Cisco ONP is the service name present in the CTP properties window.

Export the CPZ File

Cisco ONP stores the network design file as .cpz file in its database. You can export the design file into your local system.

- In design mode, the .cpz file includes the design file, layout template, and optical source details.
- In analyze mode, the .cpz file contains a design file, analyze file, ANS file, per-side ANS file, BOM, error messages, trace files, layout template, mpz, and report.
- For networks in upgraded mode, you can only export the last child in the parent-child hierarchy.

Note You can export only one network at a time.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Choose **File** > **Open**.

Step 2 In the **Select Network To Open** dialog box , click the network that you want to export, from the list of networks.

The network opens.

Note
If you view a blank screen when you open a network, refresh the browser, or log in to Cisco ONP again.

Step 3 Choose **Export** > **CPZ**.

Step 4 In the **Export .cpz file** dialog box:

a) If required, rename the file.

b) If you want this operation to run in background, click the **Run in Background** check box.

A notification pops-up after the background operation is completed. Go to **Job Monitor** to view the progression of the operation running in the background.

c) Click **Export** and save the file in your local system.

Import CPZ File

You can import the cpz network design files that are exported from another Cisco ONP instance.

Note You can import only the networks that are exported from the current release.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **Import** > **CPZ**.

Step 2 In the **Import .cpz file** dialog box:

a) Click **Choose file**, and select a cpz network design file that you want to import into Cisco ONP, from your local system.

b) If you want this operation to run in background, click the **Run in Background** check box.

A notification pops-up after the background operation is completed. Go to **Job Monitor** to view the progression of the operation running in the background.

c) Click **Import**.

If the names of the optical source and layout template files available in the Cisco ONP database and the imported network file are the same, you are prompted to confirm whether you want to overwrite the existing file.

Note
The error message **"Network already exists in the system with another user. New network will be created"** is just an information. You do not need to perform any action. Cisco ONP automatically imports as a new network specific to the user. There is no impact on the already existing network.

d) If you want to overwrite the existing file, check the **Overwrite Network** check box.

If you leave the check box unchecked, Cisco ONP saves the imported network as a new network.

e) Choose the optical source files and layout template that you want to replace.

If you do not choose the optical source or the layout template file, the files will not be imported.

f) Click **Confirm**.

The imported network is saved in the Cisco ONP database.

Live Network Import

Table 8: Feature History

Feature Name	Release Information	Feature Description
Live network import from Cisco ONC	Cisco ONP Release 25.1.1	Cisco ONP now directly communicates with Cisco ONC to perform a live network import, eliminating the need for Cisco ONP to be directly connected to a device or network. In addition to the previously supported NCS 2000, networks that include NCS 1010 nodes contained within NCS 1010 and NCS 1014 shelves can also be imported.

Table 9: Feature History

Feature Name	Release Information	Feature Description
Live Network Import	Cisco ONP Release 4.1	This feature allows you to import a live deployed network having NCS 1004, NCS 2000, and NCS 4000 nodes into Cisco ONP, using the LNI (Live Network Import) import template. This feature also allows you to view network topology, BOM, and layout report.

The Live Network Import (LNI) feature allows you to import deployed networks into Cisco ONP in real-time. This includes networks containing NCS 2000 nodes and NCS 1010 nodes contained within NCS 1010 and NCS 1014 shelves. To perform the LNI operation, you must have a Network Management role. Once the import is complete, you can view the entire deployed network details within Cisco ONP. The Map displays the network topology, and you can check the node, fiber, service, and circuit properties through the **Network Tree** and the **Entity Editor**.

From Release 25.1.1, you can import a live network through Cisco ONC.

Perform Live Network Import

Use this task to perform live import of a network from Cisco ONC:

Before you begin

- Perform LNI only when the Cisco ONC is in a stable or running state. Do not perform LNI during the maintenance period for software upgrade.
- Ensure that the release version of Cisco ONC you are using for the network import is 25.1.1.
- Configure all the mandatory parameters on the circuit.
- Check the card label set for the following NCS 2000 cards and update it if they are not aligned.

PID	Card Label
NCS2K-16-AD-CCOFS	AD-16-FS

PID	Card Label
NCS2K-20-SMRFS	SMR20-FS-CV
NCS2K-20-SMRFS-L	SMR20-FS
NCS2K-9-SMR17FS	SMR9-17-FS
NCS2K-9-SMR24FS	SMR9-24-FS
NCS2K-9-SMR34FS	SMR9-34-FS
NCS2K-9-SMR34FS-L	SMR9-34-FS
15454-M-RAMAN-COP=	OPT-RAMP-COP
15454-M-RAMAN-CTP=	OPT-RAMP-CTP
NCS2K-OPT-EDFA-35	OPT-EDFA-35

- Log in to Cisco ONP web interface

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Procedure

Step 1 Choose **Import** > **Live Import**.

Step 2 In the **Import Live Network** dialog box:

a) Enter **CONC Server IP**, **Username**, and **Password**.

b) Click **Import**.

The **Import** button will be enabled only when all the values entered are valid.

Step 3 View the status of the LNI operation:

a) Click **Job Monitor**, to view the status of the IMPORT_LIVE_NETWORK task. Click **Refresh** to see the updated status.

After LNI is completed, the job is removed from the **Job Monitor** page.

b) Click **Logs** to view the list of events that are related to the LNI operation, as logs.

Step 4 After the completion of the LNI operation, choose **File** > **Open**.

The format of the LNI imported network filename is LNI_<Date>_<Time>.

Step 5 Click the imported network name to view the network under the **Map** tab and its corresponding network tree in the left panel.

You can view the tag **Imported from Network** in the top-right corner.

Note

- The configurations that are supported by Cisco ONC can only be imported into Cisco ONP. See Configurations and hardware supported by LNI, on page 15.

- Even If some errors occur during the LNI operation, the LNI operation is not canceled. In such case, when you open the imported network, a warning message is displayed.
- You can view the errors under the **Elements > Messages** tab. See both critical and noncritical messages.
- If both NCS and Non-NCS PIDS are present in the inventory, Cisco ONP enables the **Enable NCS** option. You can edit this option during upgrade after unlocking the site, if necessary.

What to do next

Click the **BOM** tab to view the BOM details of the network.

Note The PIDs of prototype cards are shown as "NA" in the BOM details of the LNI network.

You can export the CPZ, import the CPZ, and share the imported network. You can check the properties of the network using the **Entity Editor**.

Configurations and hardware supported by LNI

The live network import from Cisco ONC supports the configurations and hardware listed in this table.

Table 10: Configurations and hardware supported by LNI

Platform	Chassis	Card type	Card	Configurations
NCS 2000[1]	NCS 2015 NCS 2006 NCS 2002	ROADM	NCS2K-20-SMRFS-L NCS2K-20-SMRFS= NCS2K-20-SMRFS-CV= NCS2K-9-SMR17FS= NCS2K-9-SMR34FS= NCS2K-9-SMR24FS-L= NCS2K-9-SMR34FS-L=	Contentionless Unprotected circuits
		Add/Drop	NCS2K-16-AD-CCOFS	
		Amplifiers	NCS2K-OPT-EDFA-17= NCS2K-OPT-EDFA-24= NCS2K-OPT-EDFA-35= 15454-M-RAMAN-CTP= 15454-M-RAMAN-COP=	
		Transponders	NCS2K-400GXP-L-K9 NCS2K-200G-CK-LIC NCS2K-200G-CK-LIC+ 15454-M-10X10G-LC	
NCS 1010	NCS 1010 NCS 1014	ROADM	All OLT variants with Standard and Enhanced faceplate	Colored Colorless Unprotected Circuits
		Add/Drop	CCMD16-C MD-32-ODD MD-32-EVEN BRK-24 BRK-8 Direct LC	
		Amplifiers	All ILA variants	
		Transponders	NCS1K14-2.4T-K9, NCS1K14-2.4T-X-K9 and NCS1K4-QXP-K9	

[1] Optical source interface import is not supported in NCS2000. By default, it is set to NCS1004_SP_16QAM_300G_27%SDFEC_69GBd. You can manually edit the optical source interface to the correct one during an upgrade, without unlocking the circuit.

Limitations of LNI

The LNI feature has these limitations:

- You cannot perform multiple LNI at the same time.
- Scheduled LNI is not supported.
- LNI does not support:
  - Non-SSON Network import
  - Non-Contentionless configuration import
  - Import of NCS1001, NCS1004 and NCS4000 devices
- Importing a network with a mix of NCS 2000 and NCS 1010 nodes from Cisco ONC is not supported.

  Workaround: Add either NCS 2000 nodes or NCS 1010 nodes into Cisco ONC and perform the Live Network Import for the selected node type.
- When importing an NCS2000 network, only the 400G-XP-LC, 200G-CK-C, and 200G-CK-C+ 10x01G-LC transponder cards are successfully imported.
- If X, Y coordinates are not configured in the devices, nodes are overlapped in the Cisco ONP map.

  Workaround: Configure X, Y coordinates before importing the network for a better view of the topology in Cisco ONP map; otherwise, you can drag and drop the nodes in the Cisco ONP map and adjust the node position after importing.
- Cisco ONP imports the proto-PID, if any, present in inventory, and show as N/A PID in the Cisco ONP BOM.
- Duplicate media channel label is not supported. If there are multiple media channels with same label present in the network, only one media channel is imported and the rest of them are discarded.
- Fiber name, source, and destination names may not match between the first and the second import. Source and destination site names may interchange for bidirectional fibers.
- Fibers may not be associated with correct optical subnet if the fibers are not configured with the same channel number at both source and destination ends. Due to this amplifier output power may not be within valid range. Hence, you either correct channel number at both source and destination nodes and re-import the network, or associate the fiber with correct optical subnet after network upgrade in Cisco ONP.

Create optical subnet for Non-SSON networks

An optical subnet is a collection of spans with certain associated properties. When you create a new network, Cisco ONP automatically creates an optical subnet that is associated to the network. At least one optical subnet must exist for each network.

Note Check the **Current Subnet** check box in the properties window below the network tree, to make the subnet you created as the current subnet. You cannot uncheck the **Current Subnet** check box.

Use this procedure to create an optical subnet for Non-SSON networks:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the non-SSON network in which you want to create a subnet.

The network opens.

Step 2 Expand **Subnet** in the network tree panel.

Step 3 Click the **Ellipsis** icon available in the right side of **Optical Subnet**.

a) In the **Create Optical Subnet** dialog box, choose the C-band design rules for the new optical subnet that you want to create, from the **Cband Rules** drop-down list, then click **Save**.

A new optical subnet with the design properties you selected is created and placed in the network tree panel under **OpticalSubnet**.

Step 4 After the new optical subnet is created:

If you want to...	Then...
select a new spectral density	select a new spectral density from the **Spectral Density** drop-down list in the properties window displayed under the network tree.
add a fiber to a subnet	add a fiber to a subnet from the **Fiber links** drop-down list in the properties window. The fiber now appears in the **Fiber links** field. When you select the optical subnet, its corresponding fiber is highlighted in the map.
add a fiber to a subnet from the network tree panel	• Click the **Ellipsis** icon available in the right side of the required optical subnet and select **Edit Fibers**. In the **Info** dialog box, click **OK**. The UI freezes, and you can select a fiber only from the map. • Select the required fiber and click the **Done** button appearing near the zoom icon. **Note** When a fiber is added to one of the subnets, it is automatically removed from the other subnets. Only one subnet rule is associated with one fiber.

Create optical Subnet for SSON networks

The following procedure creates an optical subnet for SSON networks:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the SSON network in which you want to create a subnet.

The network opens.

Step 2 Expnad **Subnet** in the network tree panel.

Step 3 Click the **Ellipsis** icon available in the right side of **Optical Subnet**, and select **Create Optical Subnet**.

a) In the **Create Optical Subnet**, choose the spectral density for the new optical subnet that you want to create from the **Spectral Density** drop-down list.

The **Name**, **CBand Rules**, and **Maximum Number of Channels** the you see in the **Create Optical Subnet** dialog box, are set based on the spectral density that you have selected.

b) Click **Save**.

A new optical subnet with the design properties you selected is created and placed in the network tree panel under **OpticalSubnet**.

Step 4 After the new optical subnet is created:

If you want to...	Then...
select a new spectral density	select a new spectral density from the **Spectral Density** drop-down list in the properties window displayed under the network tree.
add a fiber to a subnet	add a fiber to a subnet from the **Fiber links** drop-down list in the properties window. The fiber now appears in the **Fiber links** field. When you select the optical subnet, its corresponding fiber is highlighted in the map.

If you want to...	Then...
add a fiber to a subnet from the network tree panel	• Click the **Ellipsis** icon available in the right side of the required optical subnet and select **Edit Fibers**. In the **Info** dialog box, click **OK**. The UI freezes, and you can select a fiber only from the map. • Select the required fiber and click the **Done** button appearing near the zoom icon. **Note** When a fiber is added to one of the subnets, it is automatically removed from the other subnets. Only one subnet rule is associated with one fiber.

Create optical subnet for NCS 1010 networks

Note From Release 7.9.1, both C-Band and L-Band optical subnets appear by default for the NCS 1010 networks.

For C-Band and C+L Futuristic networks, the L-Band optical subnet contains no fiber links. To add fiber links for the L-Band optical subnet, you must upgrade the existing network to a C+L-Band network or add an L-Band edge for each C-Band edge.

The following procedure creates an optical subnet for SSON networks:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:
a) Choose **File** > **Open**.
b) In the **Select Network To Open** dialog box, select the NCS 1010 network in which you want to create a subnet.
The network opens.

Step 2 Expand **Subnet** in the network tree panel.

Step 3 Click the **Ellipsis** icon available in the right side of **Optical Subnet**, and select **Create Optical Subnet**.

Step 4 In the **Create Optical Subnet** dialog box:
a) Choose either **C-Band** or **L-Band** from the **Band Type** drop-down list.

Note
From R7.9.1, **Band Type** drop-down list is available when creating an optical subnet for NCS 1010.

b) From the **Spectral Density** drop-down list, choose the spectral density for the new optical subnet that you want to create.

From Release 5.2, the range of spectral density has increased (ranges 30–100).

The **Name**, **CBand Rules** or **LBand Rules**, and **Maximum Number of Channels** values that appear in the **Create Optical Subnet** dialog box are set based on the spectral density that you have selected.

c) Click **Save**.

A new optical subnet with the design properties you selected is created and placed in the network tree panel under **OpticalSubnet**.

Step 5 After the new optical subnet is created:

If you want to...	Then...
select a new spectral density	select a new spectral density from the **Spectral Density** drop-down list in the properties window displayed under the network tree.
add a fiber to a subnet	add a fiber to a subnet from the **Fiber links** drop-down list in the properties window. The fiber now appears in the **Fiber links** field. When you select the optical subnet, its corresponding fiber is highlighted in the map.
add a fiber to a subnet from the network tree panel	• Click the **Ellipsis** icon available in the right side of the required optical subnet and select **Edit Fibers**. • In the **Info** dialog box, click **OK**. The UI will freeze to allow fiber selection from the map. • Select the required fiber and click the **Done** button appearing near the zoom icon. **Note** When a fiber is added to one of the subnets, it is automatically removed from the other subnets. Only one subnet rule is associated with one fiber.

Convert a non-SSON network to SSON network

The following procedure converts non-SSON networks to SSON networks:

Note You cannot convert a non-SSON network with Traffic Sites to SSON.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the non-SSON network you wish to convert.

Ensure that the network is in Design Mode. If the network is in **Analyze** mode, upgrade or release upgrade the analyzed network, then unlock all the channels, and force CFP-2 optical source.

Step 2 Convert to SSON:

a) Choose **Network** > **SSON Convert** and click **Ok**.

b) If you see the error message "Network cannot be converted to SSON due to following errors : [Network contains waves with invalid traffic types: [100G-SD-FEC, 200G-SD-FEC]]", follow these steps to resolve it:

- Choose **Network** > **Entity Editor** > **Services**.
- Expand **Waves** and navigate to trail, and click a trail.
- From the **Src Card Type** drop-down list, choose any CFP-2optical source
- Click **Update**, then choose **File** > **Save**.
- Choose **Network** > **SSON Convert** again.

Step 3 In the **Warning** pop-up window, choose **4K-2K** or **4K-1K-2K** from the **Traffic Type** drop-down list, and click **Ok**. Note that **4K-1K-2K** is the default option. After the network is converted, you cannot switch the site types between 4K-2K and 4K-1K-2K.
The non-SSON gets converted as SSON network.

Step 4 After the network is converted to SSON, select SSON optical source from the **Traffic Type** drop-down list in the properties window displayed under the network tree and click **Update**.

Convert NCS 2000 network to NCS 1010 network

Use the following task to convert an NCS 2000 network (both SSON and non-SSON) into to NCS 1010 network:

Table 11: Feature History

Feature Name	Release Information	Feature Description
Convert NCS 2000 network to NCS 1010 network	Cisco ONP Release 5.1	The newly introduced **NCS 1010 Convert** option under the **Network** menu enables you to directly convert an existing NCS 2000 network into an NCS 1010 network. This conversion eliminates the need to build an NCS 1010 network from scratch.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the non-SSON network that you wish to convert.

The network opens. Ensure that the network is in **Design Mode**, **Upgrade Mode** or **Release Upgrade Mode**.

Step 2 Choose **Network** > **NCS 1010 Convert**, then click **Ok**.

The network does not get converted and shows an error message, if

- the network contains traffic sites.
- the fiber type is LS or TWClassic.
- the network contains OTN services.
- the traffic Type property is set to anything other than **Optical Source** or **Pluggable Card**.
- the Traffic Type is 100G-SD-FEC or 200G-SD-FEC in non-SSON networks.

Step 3 Choose **File** > **Save**.

The following parameters are automatically updated after the conversion:

- Contentionless sides are deleted and contentionless demands are automatically changed as colorless.
- Protected channels are converted to two unprotected channels. The path, wavelength, regen sites and cards that are configured are retained.

Share a network

Use these steps to share a network with one or more users or user groups:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the network that you want to share.
The network opens.

Step 2 Choose **File** > **Share**.

Step 3 In the **Share Network** dialog box, select one or more users or user groups, then click **Share**.

You can share the network with selected users or user groups in read-only mode.

Access a shared network

Use these steps to access a network shared by another user:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open a shared network:

a) Choose **File** > **Open Shared**.

b) In the **Select Network To Open** dialog box that lists the networks that are shared by other users, select a network. The shared network opens in read-only mode.

Step 2 Choose **File > Save As**.

Step 3 Enter the name in the **Give a network name** dialog box, and click **Save**.

A copy of the shared network is saved.

Note
You can work on this copy of the network, depending on the privileges of your user role. For example, if your user role is Designer, you can change the design of the saved copy of the shared network, but you cannot analyze the shared network.

Step 4 If you want, share the updated network with other users.

Unshare a network

Use these steps to unshare a network with one or more users or user groups:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the network you want to share. The network opens.

Step 2 Choose **File > Share**.

Step 3 In the **Share Network** dialog box, remove the name of one or more users or user groups from the list, then click **Share**. The shared network is no longer available to the users or user groups that are removed.

Split-Step Fourier (SSF) Simulation

Table 12: Feature History

Feature Name	Release Information	Feature Description
Split-Step Fourier (SSF) Simulation Method	Cisco ONP Release 25.1.1	The Split-Step Fourier (SSF) method is introducted to calculate optical parameters in addition to the existing e-GN algorithm for analysing NCS 1010 networks. This enhancement: • Improves the accuracy of the simulations for OSNR and BER, particularly in complex network scenarios. • Provides an SSF engine that leverages GPUs to work on intense calculations. • Requests simulation generation from GENE (Generic Engine for NCS 1000 platforms) • Monitors analysis progress on the GPU server, and updates the user through analysis notifications. • Sends simulation results to GENE for report generation after analysis completion. • Provides a Lookup Table that contains the default optical specification values for each supported amplifier. The new properties that enable the SSF method for network analysis are. • At network level, **Advanced Optical Settings** > **SSF Simulation**—Enables the SSF simulation. Enable the *Enable Special Settings* check box to view the *SSF Simulation* check box • At network level, **Advanced Optical Settings** > **LUT version**—Shows the default LUT version to be used for network analysis. Enable the *Enable Special Settings* check box to view the *LUT version* check box • **Preferences** > **General Settings** > **SSF Server Details**—Allows to configure the GPU server used for SSF simulation. • **Manage** > **Lookup Table**—Allows you to refer the default optical specification of the supported amplifiers.

The Cisco Optical Network Planner supports simulation using Split-Step Fourier (SSF) method in addition to the existing e-GN Algorithm for optical parameters calculations such as OSNR, BER. The SSF method uses an SSF engine that runs on GPUs to do intense optical calculations.

Limitations of SSF simulation

- Supports only point-to-point networks
- Works only with CIM8 interfaces
- Supports only colorless add/drop
- Computation intensive than e-GN algorithm for better OSNR margins

Set SSF Server Details

The procedure to set the SSF server to run the SSF analysis is as follows:

Before you begin

Install the SSF component.

Procedure

Step 1 Open the network:
a) Choose **File** > **Open**.
b) In the **Select Network To Open** dialog box, select the network that you want to upgrade.

The network opens.

Step 2 Navigate to **SSF Server Details**.
a) Choose **Preferences** > **General Settings**
b) In the dialog box, select **SSF Server Details**.

Step 3 Enter the SSF server details.

In **SSF Server Details**, enter the required details

Fields	Description
SSF Server IP	Enter the server IP address
API Key	This field is disabled.
Proxy IP	Enter the customised proxy IP address.
Proxy Port	Enter proxy port of the server.

Step 4 Click **OK**.

To reset the server details or close the dialog box, click **Reset** or **Cancel**.

Lookup Table (LUT)

CONP uses LUTs while performing analysis using SSF simulation. LUT can also be used even when SSF simulation is not in use. The LUT values are used for the NCS 1010 networks only.

You can enable LUT only when you enable the **Advanced Special Settings** checkbox at the Network level. By default, Lut is set to the version – '1.1.3'

Manage Amplifier Gains using Look Up Table

The procedure to refer or manage the amplifier gains in the look up table is as follows:

Procedure

Step 1 Open look up table.

a) Choose **Manage** > **Lookup Table**
The **Manage Lookup Table** dialog box opens displaying the list of supported amplifiers.

Options	Actions
Search	Allows to type in the amplifier to filter the desired lookup table.
Check boxes	Selects all or required amplifier tables.
Page numbers	Turns to the desired page.
Import	Imports the customized tables.
Export	Exports the selected tables.
Delete	Deletes the selected tables.
Cancel	Closes the dialog box.

When expanded, the table displays the optical specifications.

Table 13: Amplifier optical specifications

Parameter	Description
Fiber Type	Displays the list of supported fibers for the amplifier.
Total Loss (dB)	Displays total signal loss in dB.
SD Range	Displays the SD gain range.

Parameter	Description
Raman Amplified	Displays the status of Raman amplification in the amplifier.
BST PSD (dBm)	Displays the PSD value for the booster amplifier in dBm.
More Parameters	Contains an information button to check for additional values.

Step 2 (Optional) Customize the optical specifications in the Lookup table.

a) Select the required amplifier.
b) Click **Export**.
The amplifier value downloads in spreadsheet.
c) Edit the values in the downloaded spreadsheet and click **Import**.
The new values are added to the Lookup table.

Step 3 (Optional) Delete the customized specifications in the Lookup table.

a) Select the required amplifier.
b) Click **Delete**.

Restriction
You cannot delete the default tables.

Analyze the network

Table 14: Feature History

Feature Name	Release Information	Description
Detailed Tooltip for Sites on the Map View	Cisco ONP Release 5.1	The **See More Details** option has been introduced in the tooltip displayed on hovering over Sites on the **Map** view of an analyzed network. This option shows the Amplifier data and PSD (Power Spectral Density) profile graph. The **See More Details** option avoids navigating to the **Entity Editor** to view these details.

Use this procedure to analyze the network after design completion.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the network that you want to analyze.

The network opens.

Step 2 Analyze the network:

a) Choose **Network** > **Analyze**.

The Cisco ONP analysis progress indicator indicates the analysis status. After successful analysis, the network goes to **Analyze Mode**.

b) If you see the "Analysis Failed." message, navigate to the **Elements** > **Messages** tab to see the list of error details in the analyzed network.

By default, it shows only the key messages when the **Critical Only** toggle button is enabled. If you want to view the entire network message, disable the **Critical Only** toggle button.

c) Resolve the error and analyze the network again. Repeat this step until all errors are resolved.

Note
The error message "Unexpected Situation 999" may occur when the optical simulation becomes inconsistent due to incorrect values of properties entered or modified while designing the network. Call Cisco TAC to know the exact cause of the error and modify the suggested property value for the successful analysis of the network.

Step 3 If you want to view the details such as **Amplifier Data** and **PSD Profile** graph for a site in an analyzed network, hover the mouse over a site and click **See More Details**.

The amplifier data includes output power, EOL gain, attenuator in, attenuator out, and Raman gain. The attenuator details are not displayed for the NCS 1010 site. The PSD profile graph is displayed only for the NCS 1010 site.

Bottom-Up Flow

Bottom-up support enables step-by-step creation of a network. Adding all the services and waves on day 0 itself is not mandatory to analyze the network and view reports. Bottom-up flow enables you to build a network over a period.

Day 0: Create a network with only the topology added. Add all sites and add fibers between them. Analyze the network and view the reports without adding any services or waves.

Day 1: Add waves between the sites that are added on Day 0 and newly added sites and fibers. Analyze the network and view the reports.

Day 2: Add services and tag waves that are created on Day 1 and newly added sites and fibers. Analyze the network and view the reports.

Note After you have created the topology with sites and fibers added, you can add either a service or a wave. You need not follow any specific order.

Bottom-up flow is applicable only for Non-SSON networks. In order to achieve this, you must set A2A mode as A2A_fast in network properties. You can also set the A2A channel type as contentionless, colorless, and colored.

Idle Timeout in the Analyze Mode

If you keep the browser idle for more than 15 minutes, you are logged out of Cisco ONP. The default timeout is set to 15 minutes. The System Admin can disable this feature by changing the enabled option in the configuration file on the server to false. You can change the default time of 15 minutes by editing the duration option in the configuration file.

During a long network analyze cycle, you get logged out due to idle timeout, and the network analysis runs in the background. When you log back, the same network opens in one of the following states:

- If the analysis is still on, the analysis progress bar is shown, and you cannot perform any other action.
- If the analysis is complete, the network opens in the Analyze mode.
- If the analysis has failed, the network opens in the design mode, and you can view the reason for failure on the **Elements > Messages** page.

The session time out does not redirect you to the login page always; so, reload or enter the URL again.

Upgrade the analyzed network

Table 15: Feature History

Feature Name	Release Information	Description
NCS 1010 Network Upgrade Flexibility	Cisco ONP Release 5.0	After a network is analyzed, all the network elements get locked. With this feature, you can selectively unlock certain network elements to upgrade the network further. This helps in preventing accidental updates to the part of the network that does not need any modification.

Cisco ONP allows you to upgrade an existing network that is in analyzed mode. You can modify certain properties of a network element in the network while retaining the existing network layout and design in the locked state. Upgrade is supported for NCS2K, NCS4K-2K, NCS4K-1K-2K and NCS1010 networks.

Use these steps to upgrade your network:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the network that you want to upgrade.

The network opens.

Step 2 Upgrade the network:

a) Choose **Network** > **Upgrade**.

b) Click **Yes** .

The message “Network Upgraded Successfully” appears. The network goes into upgrade mode and network elements such as sites, fiber, waves (for non-SSON), media channel (for SSON), and circuits (for NCS 1010) are locked.

Step 3 To modify a network element in the network tree panel, click the **Ellipsis** icon next to element, and choose **Unlock**.

You can unlock elements one at a time down to the lower levels of the network tree hierarchy. For example, you can hierarchically unlock at the node level, side level, side add/drop card level, and side amplifiers level.

If you want to change only the add/drop between MD-32-ODD/Even or BRK_24/16/8 in the NCS 1010 network, you can unlock the add/drop without unlocking the network elements that are higher in the hierarchy.

You can make these modifications:

- Editing the properties of network elements.
- Deleting the network elements from the network.
- Adding a new site, wave, services, demands, optical subnet, or fiber into the network map.

Step 4 Choose **File** > **Save**.

The newly added elements are automatically displayed in the network tree panel, and by default, remain unlocked.

Note
You can insert a node in the upgrade mode only for the unlocked fiber. Therefore unlock the fibers that are connected to the node and add nodes to the network.

Step 5 Choose **Network** > **Analyze**.

After the analysis is completed, the newly added elements are locked, and the optical reports and installation parameters of the upgraded network are updated.

When you add services or fibers while upgrading a network that has where layout template is applied, the template gets updated with the newly added service or fiber. You can export this template, make changes and reapply it to another network.

Step 6 Choose **Network** > **Design** to further upgrade the newly upgraded network design.

When you upgrade a network every time, Cisco ONP saves the new version of the network as a child network, and maintains the parent and child relationship.

Upgrade LNI network

Table 16: Feature History

Feature Name	Release Information	Feature Description
Upgrade LNI Network	Cisco ONP Release 4.1	This feature allows you to upgrade and modify the imported LNI (Live Network Import) network as required. You can also correct LNI errors, reanalyze the network, and view the updated parameters such as BOM, layout, connections, and optical results.

The Upgrade feature can be used to correct LNI errors, modify the network, reanalyze the network and view updated BOM, Layout, Connections, and Optical Results.

Use these steps to upgrade the LNI network:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, select the network imported through LNI that you want to upgrade.

The network opens.

Step 2 Upgrade the network:

a) Choose **Network** > **Upgrade**.

b) Click **Yes** .

The message “Network Upgraded Successfully” appears. After upgrading the network, the network enters the upgrade mode, locking elements like Sites, Fiber, OTN Services, and Media Channels.

Step 3 To modify a network element in the network tree panel, click the **Ellipsis** icon next to element, and choose **Unlock**.

You can unlock elements one at a time down to the lower levels of the network tree hierarchy. For example, you can hierarchically unlock at the node level, side level, side add/drop card level, and side amplifiers level.

You can make these modifications:

- Editing the properties of network elements.
- Deleting the network elements from the network.
- Adding a new site, wave, services, demands, optical subnet, or fiber into the network map.

Step 4 Choose **File** > **Save**.

When you upgrade a network every time, Cisco ONP saves the new version of the network as a child network, and maintains the parent and child relationship.

Step 5 Choose **Network** > **Analyze**.

Analysis is successful only if a consistent and valid network is imported. For instance, in an NCS 2000 network imported from Cisco ONC, if the device connections do not match with Cisco ONP rules, the upgrade analysis may fail with a connection error. If the analysis fails, perform these steps:

a) Check the reports under **Elements Messages** for failure reasons.
b) Unlock the specific site to allow Cisco ONP to rebuild the connections according to its rules. Alternatively, correct the connections on the device and re-import the network.
c) Re-Analyze the network.

Step 6 After analyzing the network:

a) Click the **Layout** tab and edit the layout manually to adjust chassis or card position for NCS 4000 and NCS 1004 platforms. See
b) Click the **BOM** tab, and the **Results** tab to view the BOM and optical results.

After upgrading and analyzing the LNI network:

1. If the LNI inventory has any unconnected cards, that will be removed from the Cisco ONP reports after upgrading and analyzing the LNI network.
2. These PIDs are added in the Cisco ONP BOM after upgrading and analyzing the LNI network. These PIDs are not part of the LNI network BOM.
   - Pre-provisioned PIDs
   - Release software PIDs and Licenses
   - Optical cables: Cables used for Internal Patch-cord Connection (IPC) is not imported in LNI as this data cannot be retrieved from device
   - Attenuators
   - SMR port license PIDs: Only SMR card PID is imported as part of LNI. If a licensed PID is retrieved, corresponding port licenses are added after upgrading and analyzing the LNI network, based on the number of ports used.
   - USB cables: Added if Pre-provisioned passive cards are present.
   - Blank cards: Blank cards are not imported. They are added in Cisco ONP after upgrading and analyzing the LNI network.

Possible error scenarios and the workarounds

This table describes the workarounds for the errors that are shown under the **Elements** > **Messages** tab.

Table 17: Error scenarios and the workarounds

Error message	Workarounds
Device Authentication failure	Check the username and password of the device, which is given in LNI input Excel and retry LNI import with valid device credentials.
Device collection failed or Device not reachable.	Check for any connectivity issue in the setup, fix it and retry LNI import.
In Site4.A, output power setting is not supported by the amplifier.	Unlock C-Band amplifiers for side A inside Site4 in the Network tree and force the valid output power. If not sure, set it to Auto and analyze. Cisco ONP chooses the best value based on the configuration.
Cannot Route demand! Did not find any valid Omnidirectional Side.	For protected OTN service or SSON service, a minimum of two contentionless sides must be present on the source and destination sites. Check and add contentionless sides on the target service source and destination site and analyze.
• Demand OTU3 has unrecognized type [OTU3] • ServiceGroup does not support the demandType OTU3 for OTU3	Only 100GE, 10GE, and STM-64 service rates are supported. If any other service rate is present in the network, unlock the specific service, change it to one of the supported service types and update the ODU time slot accordingly and analyze.
Primary OTN Demand [100GE_Flex] has invalid Timeslot ranges. Allowed ranges are [1-80]	100GE service type must have ODU time slot in the range of 1–80. If any other value is set, update the correct value or leave it blank so that Cisco ONP can set it to the correct value.
Cannot complete mesh connections at Site3.	Unlock the site and reanalyze.
No OTN demand found for NCS4K trunk port - NCS4016-B - OTU40/8/0/1.	No action required. This is an information message to the user.
Fiber between Node1.A and Node2.B has an invalid value in connector loss value	Unlock the corresponding fiber couple and update the correct connector loss value to be greater than zero. The typical value is 0.2.
Fiber between Nod1.C and Node2.C has an invalid value in Tot SOL Loss w/o Connectors.	Unlock the corresponding fiber couple and update the correct Tot SOL Loss w/o Connectors. The value should be greater than zero.
Span Fiber-2 is forced as Raman but no traffic is present.	Remove Raman forcing on the fiber, or check and force the path for any service so that it goes through Raman enabled span.

Error message	Workarounds
Couple Fiber-2 has Raman enabled on the duct but corresponding Raman Forcing is missing.	Force RAMAN-CTP or COP on the Fiber-2 connecting node interface or remove RAMAN forcing on the Fiber-2

Note No specific action is required for noncritical messages. These are just information messages to the user.

Upgrade the software release of a network

Table 18: Feature History

Feature Name	Release Information	Feature Description
Release Upgrade	Cisco ONP Release 4.1	This feature allows you to choose the NCS 2000 system release to the desired release (11.1.0, 12.0.1, or 12.1.0), while performing the release upgrade of CTP network, Cisco ONP network, network imported through Excel, and LNI network.

You can upgrade the software version of networks that are imported from CTP, created in Cisco ONP, LNI Network, or imported from Excel to any desired release version. The release upgrade is supported for both SSON and non-SSON networks that have NCS 2000 nodes with ROADM, OLA, Traffic, or Passthrough functionality, and NCS 1010 networks.

Release upgrade is supported starting with NCS 2000 Release 11.1.0.

Note NCS 2000 supports SVO from the Release 12.1.0, and Cisco Optical Site Manager from 25.1.1.

The table shows the available upgrade releases for each network type.

Table 19: Supported upgrade paths for network system releases

Network	Upgrade Release
CTP network (.mpz)	• From 11.0.0 to 11.1.0, 12.1.0, 12.2.0, 12.3.1, and 25.1.1 • From 11.1.0 to 12.1.0, 12.2.0, 12.3.1 and 25.1.1
Cisco ONP network	• From 11.0.0 to 11.1.0, 12.1.0, 12.2.0, 12.3.1, and 25.1.1 • From 11.1.0 to 12.1.0, 12.2.0, 12.3.1, and 25.1.1 • From 12.1.0 to 12.2.0, 12.3.1, and 25.1.1
Excel imported network	• From 11.0.0 to 11.1.0, 12.1.0, 12.2.0, 12.3.1, and 25.1.1

Network	Upgrade Release
LNI network	**Note** Release upgrade is not supported for the LNI networks in Release 25.1.1.
NCS 1010 Network	• 7.7.1 to 7.9.1, 7.10.1, 7.11.1, 24.31,25.1.1 • 7.9.1 to 7.10.1, 7.11.1, 24.31, 25.1.1 • 7.10.1 to 7.11.1, 24.31, 25.1.1 • 7.11.1 to 24.31, 25.1.1

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open the network in which you want to perform the system release upgrade.

Step 2 Upgrade the software release of the network:

a) Choose **Network** > **Release Upgrade**.

b) From the **New System Release** drop-down list, choose the system release of NCS 2000 or NCS 1010, to which you want to upgrade.

c) Click **Submit**.

The upgraded network is saved as a child network.

The network elements are locked in the network tree after the release upgrade. You can unlock and modify the elements.

Note
If the PMD coefficient does not get updated with the expected value, update the fiber type first, followed by the PMD value when you edit the fiber properties.

Plan mode

Table 20: Feature History

Feature Name	Release Information	Feature Description
What-if Analysis for OTN Services	Cisco ONP Release 4.1	This feature extends the current implementation of What-if analysis for the OTN Services that are connecting the aggregated nodes. The failure report includes the number of failed services, restored services, and unrestored services. This feature is supported for SSON (4K-1K-2K and 1K-2K) and non-SSON (4K-2K) networks.

Plan mode overview

Plan mode is a feature that allows you to perform what-if analysis on existing network designs. This analysis can simulate network behavior during failures and determine if services can be rerouted. However, it does not provide guidance on setting up new wavelengths or adding new nodes, cards, or ports.

Advantage

The Plan mode effectively simulates and analyzes potential network issues and solutions, focusing on rerouting capabilities without physical changes to the network infrastructure.

Supported network elements

- NCS 2000 aggregated node that includes ROADM, OLA, and passthrough nodes
- Traffic nodes such as 1K-2K, 4K-2K, and 4K-1K-2K
- Nodes created in Cisco ONP
- CTP imported networks (mpz format)
- LNI imported networks

Limitations

- Only users with PLANNER and ADMIN roles can access the Plan mode.
- It does not guide on turning up new wavelengths or adding new network components.

Perform a what-if analysis on an analyzed network in the Plan mode

Use this task to perform a what-if analysis of a network and export the failure report in the Plan mode.

Before you begin

Log in to Cisco ONP web interface as a user with admin or planner role.

Procedure

Step 1 Open a network that is in Analyze mode.

Step 2 Choose **Network** > **Enter Plan Mode**.

The network switches to the Plan mode. After entering the Plan mode, you can do what-if analysis of the network by failing fibers and sites in the network.

Step 3 Fail the sites:

a) Expand the **Sites** option in the network tree panel.
b) Click the **Ellipsis** icon available in the right side of the site, and click **Fail**. Alternatively, you can right-click a site in the map and select **Fail**.
c) To fail multiple sites, check the check box next to each fiber before selecting **Fail**.

Step 4 Fail the fibers.

a) Expand **Fibers** in the network tree panel.
b) Click the **Ellipsis** icon available in the right side of the fiber, and click **Fail**. Alternatively, you can right click a fiber in map and select **Fail**.
c) To fail multiple fibers, check the check box next to each fiber before selecting **Fail**.

You can observe that all media channels or waves, OTN services, and demands that pass through the failed fiber will fail. These are indicated by symbols in the map:

- Failed channels: Red cross
- Fibers impacted due to site failure: Yellow cross
- Restored channels: Green tick

d) To undo the fiber failure, click the **Ellipsis** icon available in the right side of the fiber, and click **Undo Fail**.

Step 5 If you want, you can Create a failure set.

Step 6 Restore the failed fibers by clicking **Restore**.

The restored channels are indicated with a green color tick mark in the network tree and map.

All media channels or waves, and demands that pass through the restored fiber also get restored. The Path Computation Element (PCE) supports the restoration of the OTN services based on the optical feasibility and OTN constraints.

Step 7 After restoring the fibers, export the failure report:

a) Choose **Export** > **Failure Report** to export the failure report as an Excel sheet. See Failure report , on page 39for the parameters included in the failure report.
b) Alternatively, you can click **Export** in the **Failure Report** area below the map.

You can view the unrestored channel details in the failure report and the reason for restoration failure under **Elements** > **Messages** tab.

Step 8 Exit the Plan mode.

a) Choose **Network** > **Exit Plan Mode**.

Create a failure set

Create a failure set to fail a set of fibers and sites in a single click. You can save multiple failure sets under a given failure group.

The following procedure shows how to create a failure set:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Open a network and enter the Plan mode.

Step 2 Click the **Ellipsis** icon available in the right side of the **Failure Groups** option in the network tree panel.

Step 3 Click **Add Failure Group**.

A Failure group gets created.

Step 4 Add fibers and sites to the group.

a) Choose the **Fibers** and **Sites** to fail by checking the check boxes next to the them.
b) Click the **Ellipsis** icon available in the right side of the chosen **Fibers** and **Sites**, and click **Fail**.

Step 5 Click the **Ellipsis** icon available in the right side of the network name and click **Add Failure Set**.

Step 6 Select the Failure Group to which the failed fibers or sites must be added.

The Failure Set gets created under the Failure Group. The failed fibers or sites are added to the created **Failure Set**.

Note
If networks have dark fibers (which do not carry any traffic), that path is not considered for restoration.

Failure report

The failure report shows these parameters:

Report	Description
Failed Fibers	Shows the failed fibers in the network.
Failed Sites	Shows the failed sites in the network.
Impacted Fibers	Shows the fibers that are impacted due to the site failure.
Total Channels	Shows the total number of media channels in the network.

Report	Description
Failed Channels	Shows the total number of media channels that are passing through the failed ducts or sites in the network.
Restored Channels	Shows the total number of media channels that are restored from the failure state.
Unrestored Channels	Shows the total number of media channels that are not restored from the failure state due to the unavailability of alternate paths.
Fiber HotZones	Shows the fibers that have utilized greater than or equal to 80% of the bandwidth. You can modify the threshold by updating the value in the Feature.Properties file. • **Fiber**: Shows the fibers that are listed under fiber hot zones. • **Utilization Before (%)**: Shows the percentage of bandwidth that is utilized before the channel restoration. • **Utilization After (%)**: Shows the percentage of bandwidth that is utilized after the channel restoration.
Total Services	Shows the total number of services going through the fiber that was failed.
Failed Services	Shows the number of failed services going through the fiber that was failed.
Restored Services	Shows the number of restored services going through the fiber that was restored.
Unrestored Services	Shows the number of unrestored services going through the fiber that was restored.

Automatic suggestion for regeneration sites in Plan mode

Table 21: Feature History

Feature Name	Release Information	Feature Description
Automatic Suggestion for Regeneration Sites	Cisco ONP Release 5.0	Cisco ONP displays feasibility report in the Plan mode. This report automatically suggests regeneration sites for the channels with high and marginal risk of failure. You can incorporate these regeneration sites in the optical network to make the channel optically feasible. This feature avoids multiple iterations required to manually create the regeneration sites and test the optical feasibility of large networks.

Optical network feasibility assessment

Cisco ONP identifies networks that are not optically feasible, focusing on channels with a high or marginal risk of failure. These risks are highlighted in red and orange on the Optical Results page, indicating End of Life (EOL) and Start of Life (SOL) issues.

Regeneration site suggestions

To address optical feasibility issues, the Path Computation Element (PCE) runs a regeneration suggestion algorithm. This algorithm proposes potential regeneration sites. When entering plan mode, Cisco ONP presents these suggested regeneration sites within the **Feasibility Report**, located at the bottom of the map. You can apply these suggestions to enhance network feasibility.

For channels with pre-existing regeneration, the system provides suggestions at the section level.

The Feasibility Report table encompasses several fields, which are crucial for assessing the optical feasibility of the network.

Table 22: Feasibility Report

Field	Description
Channel Name	Displays the list of channels (trail and sections) that are not optically feasible.
Alarm	Displays the color of alarm (red, orange, or yellow)
Paths	Displays the actual path of the channel as hyperlink. If you click the link, the path is highlighted in the map.
Suggested Regens	Displays the intermediate sites that can be used as regen sites so that the channel becomes optically feasible.

Exporting the Feasibility Report

You have the option to export the Feasibility Report. Click **Export**.

The **Suggested Regen** field in the report may display as "NA" for the following reasons:

- Negligible Loss: Channels with yellow alarms indicate negligible loss, thus not requiring regeneration suggestions.
- Insufficient Intermediate Sites: When high loss occurs and there are not enough intermediate sites available to mitigate the overall loss.
- Lack of Contentionless Sides: Intermediate sites without added contentionless sides are not considered viable for regeneration sites.

Support for various network configurations

Auto regeneration site suggestion functionality is available for both SSON and non-SSON networks that includes contentionless channels or waves between NCS2K (ROADM) or 4K-1K-2K (TRAFFIC) sites.

Apply the suggested regen sites

Use this task to apply the suggested regeneration sites to make the network optically feasible.

Before you begin

Log in to Cisco ONP web interface as a user with admin or planner role.

Procedure

Step 1 Open an analyzed network.

Step 2 Enter the plan mode.

Step 3 Apply the suggested regen sites to the network.

a) Choose **Network** > **Open Feasibility Report**.

The **Feasibility Report** is displayed at the bottom of the map.

b) Select the channels for which regeneration has to be applied and click **Apply**.

c) In the **Suggested Regen Applied** dialog box,click **Ok** .

Step 4 Exit the Plan mode.

a) Choose **Network** > **Exit Plan Mode**.

b) Click **Yes** in the **Warning** dialog box.

The network gets auto upgraded and saved as a new network. The channels with regens applied are unlocked with the Regen Sites property auto updated and noneditable.

Step 5 Analyze the network.

In the **Optical Results** page, the SOL, and EOL fields become green, and the channels are not displayed in the feasibility report again when you switch to the plan mode.

Line Rate Tuner Mode

Table 23: Feature History

Feature Name	Release Information	Feature Description
Automated Selection of Optimal Wavelength Bitrate: Flexible Modelling	Cisco ONP Release 5.2	You can now automate the calculation of optical sources for your networks using the new Line Rate Tuner Mode. This mode reduces human errors while finding the correct optical source for your network from a set of network resources.

Line Rate Tuner Mode significantly reduces turnaround time, avoiding manual calculation of different possibilities of network resources.

Note Line Rate Tuner Mode is available for NCS 2000 and NCS 1010 networks.

Enter the Line Rate Tuner Mode

Use these steps to enter the Line Rate Tuner mode.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Open the network in Analyze mode.

Step 2 Choose **Network** > **Enter Line Rate Tuner Mode**.

Switching to line rate tuner mode.. progress bar appears.

The network opens in the Line Rate Tuner Mode.

Create a Custom Optical Source

Use this procedure to create a custom optical source.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Open the network in Line Rate Tuner mode.

Step 2 Click **Open Tuner Input**.

Input Tuner pane appears below the map area.

Step 3 In the network tree, select the section of the media channel that you want to add the tuner input.

In **Select Input Parameters**, the selected section appears with default parameter values.

Step 4 Modify the following Input Parameters as required.

Property	Platform	Description
Optical Family	NCS 2000 SSON NCS 1010	Choose the optical family. Based on the analyzed network, Cisco ONP provides the options. Based on the optical family chosen, the remaining parameters provide related options.

Property	Platform	Description
Optical Source	NCS 2000 SSON NCS 1010	Choose the optical source. Based on the optical sources that are already imported, Cisco ONP provides the list of optical sources.
Data Rate	NCS 2000 SSON NCS 1010	Choose the data rate. Based on the optical family chosen, Cisco ONP provides options to choose the channel capacity for the new section.
Bit Rate Range	NCS 2000 SSON NCS 1010	Choose the bit data rate. Based on the optical family chosen, Cisco ONP provides options to choose the speed of data transfer in the new section.
Baud Rate Range	NCS 2000 SSON NCS 1010	Choose the baud rate range. Based on the optical family chosen, Cisco ONP provides options to choose the minimum signal width for new each channel.
FEC Type	NCS 2000 SSON NCS 1010	Choose the FEC type. Based on the optical family chosen, Cisco ONP provides the list of supported FEC types
Result Type	NCS 2000 SSON NCS 1010	Choose the Result Type. The available options are: • Best OSNR—Provides results based on maximum OSNR margin. • Maximum Capacity—Provides results based on the maximum capacity of the channels.
Optical Feasibility	NCS 2000 SSON NCS 1010	Choose optical feasibility for the new section. The available options are: • Green • Yellow • Orange • Red Each color represents the severity of alarms that may arise in the new section.
Sigma Number	NCS 2000 SSON NCS 1010	Choose the sigma number from 0 to 3. The sigma number calculates the OSNR margin.
Number of results	NCS 2000 SSON NCS 1010	Choose the number of optical source results that you want for the new section. The default value is set as 5. However, you can choose up to 15 results.

Step 5 (Optional) Click **Reset** to reset the modified parameters to default values.

Step 6 Click **Add**.

In **Select Section**, *Tuner Input is added successfully. Please refer the below table for the added inputs* message appears.

The **Select Section** pane provides the details of the modified section.

Table 24: Select Section Parameters

Section Parameters	Description
Section Label	Name of the modified section.
Src Site	Site name for the optical channel source.
Dst Site	Site name for the optical channel destination.
Path	Fiber paths in the section.
Actions	Icons to edit or delete the modified section.

Step 7 (Optional) To modify or delete the section, choose the following icons as required:

Icon	Actions
Pencil	Edit Input—Modifies the section
Trash Bin	Delete Input—Deletes the section

To edit the modified section:

a. Click the pencil icon.

b. Modify the input parameters as required.

c. Click **Update** to update the edited section parameters.

To delete the modified section:

a. Click the trash bin icon.

A confirmation message appears.

b. Click **Yes**.

Step 8 Click **Run Tuner** to trigger the simulation.

The *Running Tuner Analysis* progress bar appears. The message, *Tuner analysis completed successfully* appears.

Step 9 In **Tuner Result**, click **Export** to export the results as an Excel sheet.

Start the New Tuner Analysis

Use these steps to start a fresh tuner analysis for the new section.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Open the network in Line Rate Tuner mode.

Step 2 Click **Start New**.

The **Start New Tuner** dialog box appears asking for a confirmation.

Step 3 (Optional) Check the **Retain the tuner inputs** check box to retain the previous input values.

Step 4 Click **Yes**.

The message *Started new tuner successfully* appears.

Step 5 Modify the input parameters of the new section.

Step 6 Click **Update**.

Step 7 Click **Run Tuner** to trigger the simulation.

The *Running Tuner Analysis* progress bar appears. The message, *Tuner analysis completed successfully* appears.

Open the Custom Optical Source Tuner Result

Use these steps to open the tuner results for the customized optical sources.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Open the network in Line Rate Tuner mode.

Step 2 Click **Open Tuner Result**.

The **Tuner Result** pane appears.

Add the Custom Optical Source to the Network

Use these steps to add the custom optical sources to the network.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Open the network in Line Rate Tuner mode.

Step 2 Click **Open Tuner Result**.

The **Tuner Result** pane appears displaying the new sections and their demand channels.

The result provides the following action icons to add the optical sources to the network.

- **Add Demand to Network**—Click this icon to add the demand to the network.
- **Download Optical Source**—Click this icon to download the optical sources as an Excel sheet to review offline.

Step 3 To add the optical source to the network, perform one of the following actions:

To add manually:

Note
For some custom optical source results, the download icon becomes disabled. In that case, go to **Manage** > **Optical Source** to download the optical result as explained in Download Optical Sources.

a. Click the download icon.

The *Downloading Optical Source* message appears. The Excel sheet contains data in Cisco ONP format.

b. Open the Excel sheet to review the data.

c. Import optical sources as explained in Import Optical Sources.

To add automatically:

a. Click the add icon.

The **No. of demands** pop-up appears asking for the number of demands to add to the network.

b. Enter the demands number and click **Add**.

The *Demand is added successfully* message appears.

The new demand appears in the network tree. Along with the demand, the Cisco ONP adds the required optical source also automatically to the server.

Exit the Line Rate Tuner Mode

Use these steps to exit the Line Rate Tuner mode.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Open the network in Line Rate Tuner mode.

Step 2 Choose **Network** > **Exit Line Rate Tuner Mode**.

The **Exiting Tuner** dialog box appears.

Step 3 Choose the following action as required.

Button	Actions
Previous State	Moves the network to previous state with applied changes.
Upgrade	Moves the network to Upgrade mode with applied changes.
Cancel	Cancels the operation.

The network exits the Line Rate Tuner mode.

Create an Optical Source

Use this task to creat an optical source.

Before you begin

Procedure

Step 1 Choose **Export** > **Optical Source Template**.

The downloaded template has two sheets with information related to interfaces and their respective Optical Classes.

Sheets	Description
Interface	contain the details specific to the interface only.
Class	contains the information that can be overlapped with multiple interfaces. In those cases, multiple interfaces can be mapped to the same class.

For the list of the required Optical Parameters, refer to Optical Parameters Available in the Excel Sheet for Optical Sources Creation.

The dowloaded sheet has the data for one of the existing interfaces for reference. You can edit or delete the data from the sheet.

Step 2 Fill all the required parameters from the specicification sheet.

There are some hidden columns that are not mandatory for Optical Source Creation. But, you can expand those columns and fill the details.

Step 3 After you have filled all the information, save the excel file with an optical source name.

What to do next

Go to Import Optical Sources to import the optical source from an Excel sheet.

Import Optical Sources

Table 25: Feature History

Feature Name	Release Information	Feature Description
Create Optical Source using Excel Sheet	Cisco ONP Release 5.0	You can create an optical source by defining the details of interfaces and the corresponding optical classes in an Excel template. This feature provides you with the flexibility to create any required optical source based on existing or new traffic resources.

Optical Source Wavelength is a way to connect a DWDM interface from any external element to a third-party optical network.

Use this procedure to import an optical source:

Before you begin

Log in to Cisco ONP web interface.

If you want to import the optical sources from an Excel sheet, download the template by choosing **Export** > **Optical Source Template**. Fill the necessary details in the **Interfaces** and **Optical Classes** sheets of the downloaded template and save the file. See Optical Parameters Available in the Excel Sheet for Optical Sources Creation, on page 50.

The fields in the columns D, E, and F that are not mandatory are hidden by default in the Interfaces sheet of the template. You can expand the columns and fill the details.

Procedure

Step 1 Choose **Manage** > **Optical Source**.

The **Manage Optical Source** dialog box appears. The default optical sources available in the server are:

- OpticalSources_NCS2K_400GXP-LC_NCS4K-4H-OPW-QC2
- NCS1004_OpticalSources_V3

- ONS-CFP2D-400G-C-OpticalSources-V2.mxd
- QDD-400G-ZRP-S-OpticalSources-V2.mxd

Note
By default, all existing optical source files are loaded in the server.

Step 2 To import optical source as .mxd file:

a) Click **Add**.
b) Choose **Optical Source (.mxd)**

The **Import Optical Source (.mxd)** dialog box appears.

c) Click **Choose File** and browse to the .mxd file stored in your local system, and click **Import**.

After the optical source is imported, a list of related interfaces appears.

Step 3 To import the optical source from an Excel sheet:

a) Click **Add**.
b) Choose **Optical Source (.xlsx)**

The **Import Optical Source (.xlsx)** dialog box appears.

c) Click **Choose File** and browse to the .xls file (optical source template) saved in your local system, and click **Import**.
d) Choose the **Release Version** of the NSC2K network.

Note
Selected release version is applicable only for NCS2K network. For NCS 1010, NCS 1001, and NCS 1014 networks, the imported optical source is available for all supported release versions irrespective of the selected NCS 2000 release version.

e) Select the interface.

If you want all the interfances, then click **Select All**.

f) Click **Create**.

After the optical source is imported, a list of related interfaces appears.

Step 4 Choose the interfaces to import by checking the check box next to them. The selected interfaces get added to the **Type** drop-down list in the properties window of the network tree.

When you create waves, you can use the interfaces in the **Type** drop-down list.

What to do next

Go to Download Optical Sources, on page 53 to download optical source for Cisco ONC.

Optical Parameters Available in the Excel Sheet for Optical Sources Creation

The following parameters are available in the Excel sheet template for creating optical sources.

Table 26: Optical Parameters for Creating Optical Sources

Parameters	Description
Interface Name	The name of the interface. It should be unique for all the interfaces that are added in the file.
Vendor Name	The name of the vendor.
Vendor IDs	The vendor IDs.
Platform	The name of the platform.
Pluggable PID	The PID of the pluggable.
Name	It is the combination of the Data Rate and Open Config Code. For example: R400G#5000.
FEC	The forward error correction type for the given interface.
Data Rate	The line rate for the given interface.
Mod Format	The modulation format to be used for the interface.
Baud rate	The baud rate for the given interface.
BPS	The speed of data transfer (bits per symbol) for the given interface.
Open Config Code	The unique code assigned to the interface as specified by the Open Industry Standard for optical networks. For example: 5000.
Sub Mode	Enter the sub-mode if there are any associated with the interface. If not, leave it blank.
Trunk Rate	The trunk rate of the transponder.
Nominal Bit Rate	The bit Rate for the interface
BER Target	The post FEC BER Target for the interface
Power Min and Power Max	The minimum and maximum Tx Power for the interface.
Ovl	The overload power limit for the interface
OL Power	The Rx power sensitivity for the interface.
OL OSNR	The Rx OSNR sensitivity for the interface.
PL Power	The extended Rx power sensitivity.
PL OSNR	The Rx OSNR sensitivity at the extended Rx power sensitivity.

Parameters	Description
Variance	The variance in power in the Txp.
Opt Class	The optical class to which the interface will be mapped.
InBand OSNR	The Tx OSNR contribution due to laser instability inside the Txp.
Out of Band OSNR	The Tx OSNR contribution due to Add/Drop at 80% and 100% channel spectral density.
ONC Release	The Software release of Cisco ONC from which this interface will be supported.
Interface Type	It is the same as the name of the interface.
Min and Max Frequency	The operating frequency range of the interface.

Table 27: Optical Class Parameters

Class Parameters	Description
Interface Type	The name of the interface. Enter the same name of the interface, if you are doing one to one mapping with the interface.
Opt Class	You can create the optical classes for different optical sources. Certain optical parameters are added in the optical class. Based on interface properties, multiple interfaces can be mapped to the same class. Enter a unique alphanumeric name for the Optical class. While creating new optical classes, we recommend using the name starting with "X" to avoid overlapping in the existing classes.
Bit Rate	The bit rate for the given interface.
Baud Rate	The baud rate for the given interface.
ModGB Coeff	The modulation guard band coefficient.
Modulation OSNR Penalty	The modulation OSNR penalty.
GBf	The filtering GuardBand at different OSNR penalties.
Mux/Demux Filtering Penalty	Enter the mux/demux filtering penalty value, if there are any.
Chromatic Dispersion	The chromatic dispersion limit at different OSNR penalties.

Find Optical Sources Faster

Use these steps to find the optical sources faster.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Choose **Manage** > **Optical Source**.

The **Manage Optical Source** dialog box appears.

Note
By default, all existing optical source files are loaded in the server.

Step 2 To find the customized optical sources:

a. Check **Show only line rate tuner generated sources**.

The dialog box displays only the customized optical sources.

Step 3 To filter the required optical source:

a. Enter the optical source name in the Search box.

The dialog box displays the optical sources matching the typed keyword.

Download Optical Sources

Use this procedure to download an optical source:

Procedure

Step 1 Choose **Manage** > **Optical Source**.

The **Manage Optical Source** dialog box appears.

Step 2 Choose an optical source to download.

Step 3 Click **Download** and select one of the following options to download the optical sources.

- .mxd—Downloads the selected optical sources as .mxd file.
- .xlsx—Downloads only the optical sources which were created and added using the Excel template, as .xls file. Others such as the optical sources which were directly added as .mxd file, are not included in the .xsl file.

- .xml—Downloads the optical source data as a .xml file. This file contains the application codes for circuit provisioning in Cisco ONC, optical parameters of the interfaces, PIDs, and Vendor ID information. You can load the .xml file into Cisco ONC to create circuits with these optical source interfaces. See Alien Import.

  After the import is successful, the optical source will be present under the **Application Code** tab in the **Service Manager** screen of the Cisco ONC application. See Service Manager.

Delete Optical Sources

Use this procedure to delete an optical source:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **Manage** > **Optical Source**.

The **Manage Optical Source** dialog box appears.

Step 2 Choose an optical source to delete.

Step 3 Click **Delete** to delete the selected optical sources.

Layout Template for NCS 2000 Network

Layout templates are reusable templates that are used to design layout configurations for the NCS 2000 network. When you have an NCS 2000 network with fixed layout rules applicable for multiple nodes, you can use these templates to accurately set up the layout for those nodes. These templates save you time, effort, and they minimize errors.

Note Layout template is not supported for a mix of TXP and Real card label of transponders.

Export Layout Template

Table 28: Feature History

Feature Name	Release Information	Feature Description
Layout Template Enhancement	Cisco ONP Release 4.1	This feature allows you to export the layout template for an individual site or for all the sites. The layout template export is possible only if the network is analyzed in Cisco ONP Release 4.1. The export of layout template is supported on 4K, 4K-1K-2K, and 2K nodes.

Use the following procedure to export the layout template of a specific site or all sites:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the network whose network layout template you want to export.

The network opens.

Step 3 Choose **Network** > **Analyze**.

Note
Network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** tab.

Step 5 Click the name of a site in the left side panel, for which you want to download the layout template.

Step 6 Hover the mouse pointer over the **Export** icon and click **Layout Template** for **Current site** or **All Sites**.

The **Export Layout Template** dialog box appears.

Step 7 Click **Export**.

Note

- We recommend that you export the layout template only in the analyze mode. Exporting layout templates in the upgrade and release upgrade modes may be inaccurate.
- You can export the layout template for node of the type 4000 and 1000, but the exported layout template will contain only the layout of NCS 2000 nodes. To export the layout template for the node type NCS4K-1K-2K and NCS1K-2K, perform the following:
  - Right click the site name in the **Layout** panel, and click **Export**.

- Click **OK** to export the layout template in text format.

- The NCS 2000 layout template is in XML format.

Import Layout Template for NCS 2000 Network in to Cisco ONP Database

Use the following procedure to import a template for NCS 2000 Network into the Cisco ONP database:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **Manage** > **Layout Templates**.

Step 2 Click **Add** in the **Manage Layout Template** dialog box.

Step 3 Click **Choose Files** and select a template from your local system.

Step 4 Click **Import**.

The template is imported to the Cisco ONP database.

Download Layout Template for NCS 2000 Network

Use the following procedure to download a template from the Cisco ONP database:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **Manage** > **Layout Templates**.

Step 2 In the **Manage Layout Template** dialog box, choose the template that you want to download.

You can also choose multiple templates.

Step 3 Click **Download**.

Save the template into your local system.

Delete Layout Template for NCS 2000 Network

Use the following procedure to delete a NCS 2000 Network template from the Cisco ONP database:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **Manage** > **Layout Templates**.

Step 2 In the **Manage Layout Template** dialog box, choose the template that you want to download.

You can also choose multiple templates.

Step 3 Click **Delete** to delete the template from the Cisco ONP database.

Apply NCS 2000 Layout Template into a Site

Use this task to apply the NCS 2000 Layout template into a site. The site can be NCS4K-2K, NCS1K-2K-4K, or NCS1K-2K, but the template will be applied only to the NCS 2000 section of that site.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the network where you want to apply the layout template into an NCS 2000 site.

The network opens.

Step 3 Choose **Network** > **Entity Editor**.

Step 4 In the **Entity Editor** window, expand **Sites** and choose the site.

Step 5 In the right pane, choose the required template from the **Layout Template** drop-down list.

Note
Make sure that the other properties under **Layout** section such as **Chassis Type**, **Power Supply**, **Controller Card**, **Node Protection**, **Redundant Controller Card**, and **MF-Unit** are

set to *Auto*. Otherwise the **Layout Template** drop-down list remains disabled.

Import NCS 1000 and NCS 4000 Layout Template into NCS1K-2K and NCS4K-1K-2K Sites

Use this task to import NCS 1000 and NCS 4000 layout templates that were exported, into 4K-2K and NCS4K-1K-2K Sites.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the network that has the site to which you want to apply the layout template.

The network opens.

Step 3 Click the **Layout** tab.

Step 4 Add the required NCS 4000 and/or NCS 1000 chassis, cards, and pluggables to the required slot of the added chassis. See Edit the Layout Manually, on page 59

Step 5 Click **Edit** to enter the edit mode.

Step 6 Right click the name of a site on which you want to import the layout template, and click **Import**.

Step 7 Choose the layout template that you want to import into the site and click **OK**

The layout template gets applied to the site.

Note
When you modify an exported template, ensure to rename the modified template before reapplying it to a site in the upgrade mode so that the changes in the template reflect in the layout view.

Layout Visualization

Table 29: Feature History

Feature Name	Release Information	Feature Description
Layout Visualization and Edit	Cisco ONP Release 4.1	This feature allows you to view and adjust the position of NCS 4016 and NCS 1004 chassis and cards in the layout. This feature is supported only on 4K-1K-2K and 1K-2K aggregated nodes and not supported on stand-alone NCS 2000 node.

This feature allows you to visualize the layout of a network, designed using Cisco ONP. You can view the arrangement of racks, chassis inside the racks and cards inserted in the chassis. When you click a particular Rack or Chassis or Card in the**Layout** panel, the corresponding Rack or Chassis or Card gets highlighted in the Layout image. You can zoom in and zoom out the Layout image.

View Network Layout

The procedure to view the network layout is as follows:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 From the **File** menu, click **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the network to open from the list of available networks.

Step 3 Choose **Network** > **Analyze**.

Note
Network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** tab.

Step 5 In the **Layout** panel on the left side, click the site.

Note
The OLA sites are highlighted in green color, ROADM sites in blue color and Aggregated nodes in purple color.

Passthrough sites are not listed under layout.

For NCS 1010 network, Aggregated nodes are not available.

Step 6 Click any rack under a site to visualize the rack view of the network under **Layout** tab.

Step 7 Click any chassis under a rack to visualize the chassis view of the network.

Note
When you click the Aggregated node under **Layout** panel, NCS 1004, NCS 2000 and NCS 4000 series chassis are placed in separate racks.

You can click the screenshot icon to take screenshot of all racks layout of the selected site.

Edit the Layout Manually

The Manual layout edit feature is used to adjust the position of NCS 4016 and NCS 1004 chassis and cards in the layout.

The procedure to edit the layout manually is as follows:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the network to open from the list of available networks.

Choose the network where 4K-1K-2K and 1K-2K aggregated nodes are added. This feature is not supported on NCS 2000 node.

Step 3 Choose **Network** > **Analyze**.

Note
Network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** tab.

Step 5 Click **Edit** to enter the Edit mode.

Step 6 Select the Chassis (4K-1K-2K and 1K-2K) or Card from a particular rack.

Step 7 Drag and drop the selected Chassis or Card from a particular rack to the empty slot in the same or different Chassis or Rack.

Step 8 To add pluggables to a particular card, perform the following steps:

Note
Make sure to add the required cards.

a) Select the Rack.

The cards available in the Rack are displayed.

b) Select the card to which you want to add pluggables.

The ports available in the card are displayed.

c) Select the pluggable for each port.

The following pluggables are displayed:

Card	Supported Pluggables
NCS4K-4H-OPW-QC2	• ONS-QSFP8-LR4= • QSFP-110G-SR4-S= • ONS-QSFP-4*10-MLR=
NCS4K-4H-OPW-LO	• ONS-QSFP8-LR4= • QSFP-100G-SR4-S= • ONS-QSFP-4*10-MLR=

Card	Supported Pluggables
NCS1K4-1.2T-K9=	• ONS-QSFP8-LR4= • QSFP-100G-SR4= • ONS-QSFP28-LR4-S= • QSFP-100G-CWDM4-S= • QSFP-100G-SM-SR=

d) Click the Tick icon.

Step 9 Click **Done** to save the changes in the Layout.

View the Layout Details Using Tooltip

You can hover over the Racks or Chassis or cards in the Rack and view the details using Tooltip. Click **See More Details** to view the details of port no. type, pluggables and rates.

Copy the Configurations of a Particular Node to Another Node

The configuration can be copied from one node to another node only for the manual 4K-1K layout movement. It is not supported for NCS1010 layout movement.

The procedure to copy the configurations of a particular node to another node of a different site is as follows:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the network to open from the list of available networks.

Step 3 Choose **Network** > **Analyze**.

Note
Network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** tab.

Step 5 Select the Rack, Chassis, or Card of a particular site.

Step 6 Select the site to where you want to copy the configurations to, from the **Copy To** drop-down list.

Step 7 Click **New Rack** to add a new rack. The configuration gets copied to the new rack.

Step 8 Click **Done** to save the changes in the Layout.

Note
You can also cut, copy, and delete Racks, Chassis, and Cards in the Chassis from the Layout.

Export Port Usage of LNI Network

Table 30: Feature History

Feature Name	Release Information	Feature Description
Multi-Layer Connections Phase 1	Cisco ONP Release 4.1	This feature provides the connection trace of a service across various interfaces in a network. This feature allows you to export the following: • Consolidated port usage report based on network in addition to the internal port details which you can view by hovering the mouse pointer over the tooltip • Port usage report based on sites • Port usage report only for LNI imported networks

Use the following procedure to export the port usage details of an LNI network:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the LNI network whose port usage you want to export.

The network opens.

Step 3 Choose **Network** > **Analyze**.

Note
Network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** tab.

Step 5 Click the name of a site in the left side panel,for which you want to download the port usage.

Step 6 Mouse hover the **Export** icon and click **Port Usage** for **Current site** or **All Sites**.

The **Export Port** dialog box appears.

Step 7 Click **Continue**.

The port usage details are exported in the Excel sheet format.

Note

- If you modify any services in the NCS 4000 node after upgrading the LNI network , the changes will not get updated in the port usage details.
- The demand labels seen against the trunk ports of NCS4K-DWDM line card in the port mapping report are not logically related to the NCS 4000 trunk ports, but are related to NCS 1004 client ports.

Define multilayer connections for SSON network

Table 31: Feature History

Feature Name	Release Information	Feature Description
NCS4K-1K-2K Multilayer Connection Trace	Cisco ONP Release 4.2	You can define Multilayer Connections (MLC) such as cards and pluggables for NCS 4K-1K-2K and NCS 1K-2K aggregated nodes in an SSON network. This new tab in the **Layout** page helps to view end-to-end MLC trace for OTN service starting from **NCS4K IN** until **NCS2K** Add/Drop for LNI network. Also, it helps to define new traces for the newly added service and maintain the network design and deployment.

Use this procedure to define the Multilayer Connections (MLC) such as cards and pluggables for 4K-1K-2K and 1K-2K aggregated nodes in an SSON network.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Open a network:

a) Choose **File** > **Open**.

b) In the **Select Network To Open** dialog box, click a network in which you want to define the multilayer connections.

Make sure that the network is in analyzed mode and 4K, 1K, and cards are defined in the network.

Step 2 Define the MLC:

a) Click the **Layout** tab.

b) In the left pane, click the **MLC** tab.

Alternatively, you can navigate to the **MLC** page by clicking the **Ellipsis** icon available in the right side of the service name in the network tree and clicking **View in MLC**

You can view a table describing the properties of the service, in the right pane. See MLC details, on page 65.

c) Click the service name to switch to the layout view.

You will view the layout and the service details in the right pane.

d) Select the rack, shelf, card, and ports from the drop-down lists for NCS4K In, NCS4K Out, NCS 1K In, and NCS 1K out, for both **Source** and **Destination** sites.

The details of the NCS 2000 chassis are auto-populated.

Note
For LNI imported network all the details are auto-populated. If you add any new service, you can change the details of the new service as per your requirement.

e) Click the Tick icon to save the changes you have done.

You can click the refresh icon to delete the changes you made after saving.

The updated details are included in the BOM.

Step 3 If you want to export the MLC details perform these steps:

a) Click the Table icon to switch to the table view.

b) Choose **Export** > **MLC Traces**to export all the details available in the MLC table.

c) Choose **Export** > **LMP/TTI Connections** to export the details of Link Management Protocol (LMP) connections which are the connections between NCS 1004 and NCS 2000 cards, and Trail Trace Identifier (TTI) connections which are the connections between NCS 4000 and NCS 1004 cards.

All these connections get added to the BOM.

Step 4 If you want to filter the services displayed in the left pane, click the Filter icon and choose one of these options:

- Source Site
- Destination Site
- Type of the traffic
- Trace Origin
  - LNI: Imported through Import Live Network option
  - User Created: Created through Cisco ONP UI
- Trace Status
  - Completed: User has defined all MLC details.

- Partial: User has defined only partial MLC details.
- Empty: User has not defined any MLC details.

Step 5 Click the three vertical dots and select the required options:

- **Enable Multi Select**: You can select up to the card level for different OTN.
- **Expand All**: Expands the services tree.
- **Collapse All**: Collapses the expanded services tree.
- **Show Trace Status**: Shows the trace status icon next to the service name.

Step 6 Click the three horizontal dots across the service trace and select the required options:

- **Delete Trace**: Deletes the respective trace.
- **Locate in Map**: Shows the service in the map view.

Note
You can enable the same port number on the primary and secondary **NCS4K IN** nodes for Client 1+1 and other protection scheme.

MLC details

This table describes various fields available in the MLC tab.

Table 32: MLC details

Properties	Description
Name	Name of the service
Group Name	Name of the group to which the service belongs to
Type	Traffic type
Src Site	Source site
Src NCS4K In	Details of Rack/Slot/Card/Port in the input side of the NCS 4000 chassis in the source site
Src NCS4K Out	Details of Rack/Slot/Card/Port in the output side of the NCS 4000 chassis in the source site
Src NCS1K In	Details of Rack/Slot/Card/Port in the output side of the NCS 1004 chassis in the source site
Src NCS1K Out	Details of Rack/Slot/Card/Port in the output side of the NCS 1004 chassis in the source site

Properties	Description
Src NCS2K AddDrop	Add/Drop multiplexer and demultiplexer connected to the NCS 2000 chassis in the source site
Src NCS2K MPO	Media channel between the source and destination sites
Dst NCS4K In	Details of Rack/Slot/Card/Port in the input side of the NCS 4000 chassis in the destination site
Dst NCS4K Out	Details of Rack/Slot/Card/Port in the output side of the NCS 4000 chassis in the destination site
Dst NCS1K In	Details of Rack/Slot/Card/Port in the input side of the NCS 1004 chassis in the destination site
Dst NCS1K Out	Details of Rack/Slot/Card/Port in the output side of the NCS 1004 chassis in the destination site
Dst NCS2K AddDrop	Add/drop multiplexer and demultiplexer that is connected to the NCS 2000 chassis in the destination site
Dst NCS2K MPO	MPO cable connecting the NCS 2000 chassis in the destination site
Media Channel	Media channel between the source and destination sited
Notes	More notes, if any
Trace Origin	Indicates whether the service connections are user-created or imported through LNI.

Spectrum Utilization and Path Finder

Table 33: Feature History

Feature Name	Release Information	Feature Description
Spectrum Utilization and Path Finder	Cisco ONP Release 24.3.1	The Spectrum Utilization and Path Finder introduces the **Minimal Map**, a streamlined network visualization tool focusing on essential data points like Sites and Fibers, enhancing usability and performance. **General Settings** now allow individual customization, including default map views and spectrum utilization colors. The **Path Finder/Selector** enables interactive path selection with options for manual and custom path finding for multiple routing options. The **Spectrum Utilization** provides a comprehensive visualization of used spectrum, while the **Spectrum Finder** helps locate and apply available spectrum across fibers, offering dual-view capabilities and multiple selection methods. These enhancements collectively improve network management, planning, and resource optimization.

Spectrum Utilization and Path Finder introduces

- Minimal Map: streamlines network visualization tool focusing Sites and Fibers.
- Path Finder/Selector: enables interactive path selection with options for manual and custom path finding.
- Spectrum Utilization: provides a comprehensive visualization of used spectrum.
- Spectrum Finder: helps to locate available spectrum across fibers and apply them on a Circuit or Media Channel.

Find a Custom Path

The Custom Path Finder is accessible exclusively through the Minimal Map. When you choose the custom path finder, the detailed map automatically switches to the Minimal Map.

Limitations

- Applies to only Circuits (NCS1010/ NCS1001), Waves (NCS2000 NON-SSON), media channel (NCS2000 SSON).

The procedure to customize a fiber path on the map is as follows:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 In the network tree, select the section of the media channel/circuit that you want to add a new path.

Step 2 Click the **Ellipses** icon and select **Custom Path Finder**.

The Custom Path Finder for the selected section opens.

Step 3 In the **Visualization** area, choose the required map view.

Map View	Result
Complete Map	Shows a complete network map of the selected path with other sites.
Sub Map	Shows only maps with chosen sites and fiber.

Step 4 In the **Options** area, choose the required parameters to calculate the Path Finder.

Option	Description
Minimum Hop	Performs all the routing based on minimum number of hop counts, irrespective of length of fibers
Minimum Length	Performs all the routing based on fiber minimum length, irrespective of hop count
Distinct Fiber Set	Provides Distinct set of fibers. This makes sure the same fiber is not repeated in other paths
Number of Path Count	Calculates the number of paths based on the provided number

Step 5 Click **Calculate**.

The list of paths calculated based on the chosen parameters displays.

The calculated paths table contains the path parameters.

Table 34: Path Parameters

Parameter	Description
S.No	Displays the serial number
Path	Displays fiber path direction based on chosen **Options** parameters

Parameter	Description
Funnel icon	Filters the path based on fiber labels
Hops	Provides the hop count
Total Length	Provides the total length of the fiber path

Step 6 Click **Export** to export the chosen fiber path.

Step 7 In the **Selected Service and Path** area, check the service and path information and click **Apply Path** to apply the selected path.

Select Path Manually

The Manual Path Selector is accessible exclusively through the Minimal Map. When you choose the manual path selection, the detailed map automatically switches to the Minimal Map.

Limitations

- Available in Design and Upgrade modes where circuits path can be updated.
- Applies to only Circuits (NCS1010/ NCS1001), Waves (NCS2000 NON-SSON), media channel (NCS2000 SSON).
- Applies to regen circuits/waves/media channel.
- Additional options are applicable for Section under Network Tree.

The procedure to select a path manually on the map is as follows:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 In the network tree, select the section of the media channel that you want to add a new path.

Step 2 Click the **Ellipses** icon and select **Manual Path Selection**.

Step 3 In the Search field, enter the site or fiber to focus on it.

Step 4 Select the required the fibers to create a path.

The selected fibers appear on the **Operation Modes** pop-up pane under **Fibers** area.

Step 5 Click **Apply**.

View Spectrum Utilization and Spectrum Finder

The Spectrum Finder is accessible exclusively through the Minimal Map. When you choose the spectrum finder, the detailed map automatically switches to the Minimal Map.

We recommend that you use the Spectrum Finder for the network in Design/Upgrade/Release Upgrade Mode and view the Spectrum Utilization in Analyze Mode.

The procedure to view the spectrum utilization and find a spectrum to apply for a service is as follows:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 In the network tree, select the section of the media channel that you want to learn the spectrum utilization per fiber.

Step 2 Click the **Ellipses** icon and select **Spectrum Finder**.

The Spectrum Finder for the selected section opens.

Step 3 In the **Selected Fibers** area, click **+Add Fiber** and choose the required fibers from the drop-down list.

Step 4 In the **Visualization** area, choose the required map view.

Map View	Result
Complete Map	Shows a complete network map of the selected path with other sites.
Sub Map	Shows only maps with chosen sites and fiber.

Step 5 In the **Spectrum Finder** area, modify the parameters as required..

Option	Description
Tabular View	Similar to Spectrum Utilization View
Detailed View	Displays multiple fibers in a vertical orientation (Y-Axis) and the spectrum on the horizontal axis (X-Axis).
Spectrum Selection	Enable Spectrum Selection to modify the subsequent parameters.
Spacing	Enter the bandwidth (GHz) that is required for the network circuit.
Distinct Fiber Set	Provides Distinct set of fibers. This makes sure the same fiber is not repeated in other paths
Number of Path Count	Calculates the number of paths based on the number provided
Allow Overlap	Allows you to select overlapping wavelengths with selected fibers, when enabled.

Option	Description
Zoom	Zooms in and out of detailed view to granular view. Click **Default** reset zoom.
View Labels	Displays the labels. Enable to view the labels. You can also view the labels of existing occupied circuits.
Hovered Spectrum	Shows the start, end, and central wavelengths (THz) of the hovered spectrum when moving across the view
Selected Spectrum	Shows the start, end, and central wavelengths (THz) of the selected spectrum when selecting across the view.
C-Band	Toggle to view the C-band spectrum usage.
L-Band	Toggle to view the L-band spectrum usage.
Fiber Utilization Graph	Displays the frequency utilzed in a fiber for each span in continuation in a vertical axis. Each square block is 3.125GHz. The frequency range starts from the left and continues towards the right, increasing 3.125GHz per block for both C- and L-band. For C-band, the first row has the starting frequency as 191.325 THz. A single row contains 53 blocks, totalling 0.165625 THz (53*3.125 GHz). The starting frequency of subsequent rows increment at 0.165625 GHz.

Color tone of the blocks varies in the Fiber Utilization Graph

Dark red	Indicates overlap of same spectrum across multiple waves.
Light red	Indicates less spectrum usage.

Step 6 In the **Apply Properties to Existing Service** area, check the service parameters and click **Apply Wavelength** and **Apply Path**.

Click **Apply Wavelength** and **Apply Path** to revert the changes.

Step 7 Select **Apply to Service**.

Regenerate BoM Automatically

You can view the new Chassis or Card added to the existing layout under the **BOM** tab. You can also view the regenerated BoM after manual editing of the layout.

Add new Pluggables, Alarm Cables and 100G Client Bandwidth Licenses to BoM

You can add new pluggables, alarm cables and 100G bandwidth licenses of NCS 1004 and NCS 4000 platforms to the existing BoM.

The procedure to add new pluggables, alarm cables and 100G client bandwidth licenses to the existing BoM is as follows.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.
The **Select Network To Open** dialog box appears.

Step 2 Click the network to open from the list of available networks.

Step 3 Choose **Network** > **Analyze**.

Note
Network must be successfully analyzed to proceed further.

Step 4 Click the **BOM** tab.

Step 5 Click **Add**.
The **New** window opens.

Step 6 Enter the Cisco part number of the pluggable or alarm cable or 100G bandwidth license in the **Cisco Part Number** field.

Step 7 Choose the **Quantity** of pluggables or alarm cables or 100G bandwidth licenses to be added.

Step 8 Click **Add**.

The new pluggables or alarm cables or 100G bandwidth licenses are added to the BoM list.

Export IPC Report

You can export the connections of a current site or all sites to an Excel sheet using the following procedure:

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 From the **File** menu, click **Open**.

The **Select Network To Open** dialog box appears.

Step 2 Click the network to open from the list of available networks.

Step 3 Choose **Network** > **Analyze**.

Note
The network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** > **IPC** tabs.

You can view the patches that are listed in the left pane. Click each patch to view the details such as position, card, and port of the source and destination sites.

The patches that you click are highlighted in the rack.

Step 5 Hover over the **Export** icon, and click **Current site** or **All Sites** option.

The **Export IPC** dialog box appears.

Step 6 Click **Continue** to export the connections of the current site or all sites.

The cable-type and Cable ID are included in the report only for the NCS 1010 network.

Edit the Layout Manually for NCS 1010 Networks

Table 35: Feature History

Feature Name	Release Information	Feature Description
Layout Edit Support for NCS 1010 Networks	Cisco ONP Release 5.0	Cisco has introduced NCS 1010 as a new optical line system to meet the growing optical network needs. Using Cisco ONP you can visualize and edit layouts for NCS 1010 chassis and patch panels.

The Manual layout edit feature is used to adjust the position of the NCS 1010 chassis and patch panels in the layout.

The procedure to edit the layout manually is as follows:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose **File** > **Open**.

The **Select Network To Open** dialog box appears.

Note
You can also create a new NCS 1010 network. For more information, see Manually design a network using Cisco ONP, on page 2.

Step 2 Click the network to open from the list of available networks.

Choose the NCS 1010 network.

Step 3 Choose **Network** > **Analyze**.

Note
The network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** tab.

Step 5 Click **Edit** to enter the Edit mode.

Step 6 In the left panel, click a site.

Step 7 Select a unit (NCS 1010 chassis or patch panel) using one of the following methods:

- In the left panel, expand the rack under a site and choose a unit.
- Or, in the Rack view, click a chassis or patch panel.

Step 8 To adjust the position of the selected units, use one of the following methods:

Note
If necessary, click the **+New Rack** button to create more racks.

- In the Rack view, drag and drop the selected chassis or panel from a particular rack to the empty slot in the same or different rack.
- Swap units in the Rack view:
  - Click a transponder or NCS1K14-CCMD-16 card.

    The **Swap with** button appears.
  - Click **Swap with** and select a slot to swap from the drop-down list.

  Note
  The **Swap with** button appears only for NCS 1014 and NCS 1020 chassis.

- Cut and Paste unit in the left panel:
  - Click **Cut** above the Rack view.
  - Right-click on an empty slot in the same or different rack and click **Paste**.

    Cisco ONP disables the Paste option if you try to paste the unit in the prohibited slots.

Cisco ONP disables the Cut option if an existing cut unit is not pasted.

- Cut and Paste unit in the Rack view:
  - Right-click the selected chassis or panel and click **Cut**.
  - Right-click on an empty slot in the same or different rack and click **Paste**.

    Cisco ONP disables the Paste option if you try to paste the unit in the prohibited slots.

    Cisco ONP disables the Cut option if an existing cut unit is not pasted.

- Move the unit in the left panel:
  - Go to **Move to** > **Site-X** > **Rack-X** above the Rack view to move the chassis to the same or different rack. Or go to **Move to** > **Site-X** > **+ New rack** above the Rack view to move the chassis to a new rack.

- Move the unit in the Rack view:
  - Right-click the selected chassis or panel and go to **Move to** > **Site-X** > **Rack-X** to move the chassis to the same or different rack. Or go to **Move to** > **Site-X** > **+ New rack** to move the chassis to a new rack.

Note
The **Move to** option moves the unit automatically to the immediate empty slot. The **Cut** and **Paste** option moves the unit to the selected empty slot.

Step 9 Click **Done** to save the changes in the Layout.

A warning message appears when empty racks are present in the layout.

Step 10 Click **OK** to remove the empty racks.

View Internal Node Connections of NCS 1010 Network

Table 36: Feature History

Feature Name	Release Information	Feature Description
View Internal Node Connections of NCS 1010 Network	Cisco ONP Release 5.0	The Node diagram tab displays a functional view that includes precise connections and port labeling of each component such as OLT or ILA, NCS1K-BRK-8/16/24, AAWG-32-O, and AAWG-32-E, for each site in an analyzed NCS 1010 network.

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 Choose**FileOpen**.

The **Select Network To Open** dialog box appears.

Step 2 Click the analyzed NCS 1010 network.

The network opens.

Step 3 Choose **Network** > **Analyze**.

Note
Network must be successfully analyzed to proceed further.

Step 4 Click the **Layout** > **Node Diagram** tabs.

Step 5 Click each site in the left panel and select a side to view the functional view of the site.

The functional view includes both the combination of physical and logical connections such as:

- Degree interconnections between NCS1010 (OLT or ILA) and NCS1K-BRK-8
- Add/drop connections between NCS1010 and colorless add/drop units (NCS1K-BRK-8, NCS1K-BRK-16, or NCS1K-BRK-24) and colored add/drop units (AAWG-32-O or AAWG-32-E)

Step 6 Hover over the cable to view the details such as name of the ports that are connected and the cable ID.

Designing networks with COSM card

The COSM card, along with application software, provides functionality-based licenses for features such as alarm correlation, performance monitoring, connection verification, and Optical Time Domain Reflectometry (OTDR). You can design networks with ROADM and TRAFFIC nodes equipped with COSM cards.

From Release 25.1.1, SVO card is referred as COSM card.

Features of the COSM card:

- The COSM card occupies two slots.
- It serves as the primary card for all networks starting from Release 12.1.0.
- For high availability, a node can be equipped with two COSM cards, but they cannot be in the same chassis.
- Two 10G SFP+ pluggables can be used to connect two COSM cards within a node.
- You can connect a Cisco ASR 920 Switch to the COSM cards during network design.
- The COSM can function as either a card or a UCS-based solution.

COSM Licenses:

From 25.1.1, one COSM license PID OAS-COSM-MLCL is added for each active card present in the chassis like M15, M6, M2, 1010, 1020, 1014, and 1004.

SVO Licenses

SVO licenses are applicable for NCS 2000 networks until Release 12.3.1.

- SVO cards require either a Base License or an SVO Full License (which covers High Availability, Connection Verification, and Flex Spectrum). If the SVO Full License is not selected, the SVO Base License and High Availability are enabled by default.
- Types of SVO licenses include:
  - Cisco NMS: Features High Availability, Connection Verification, Flex Spectrum, and OTDR.
  - Third-Party NMS: Includes NBI (North Bound Interface), Alarm Correlation, Performance Monitoring, and Circuit Provisioning.

Chassis Licensing:

- Every chassis added to the network must be licensed from Release 12.1.0 onwards. For networks upgraded to Cisco ONP Release 4.0 or higher, a new chassis license is required after analysis.
- Chassis licenses come in variants such as 1-chassis, 5-chassis, 10-chassis, 20-chassis, 50-chassis, and so on, chosen based on cost optimization.
- A license is required for each chassis added to the network beyond the first.
- Chassis License Flush Out: Existing chassis licenses can be flushed out and replaced with new ones. The current license remains active if the site is unlocked, but flush-out is only supported in network upgrade mode.
- You can continue using existing licenses with changes to the chassis unless you opt for the Chassis License Flush Out option.

Note Chassis Licensing and SVO Licenses are applicable until Release 12.3.1.

Cisco Optical Site Manager associations

Table 37: Feature History

Feature Name	Release Information	Feature Description
Cisco Optical Site Manager enhancements	Cisco ONP Release 25.1.1	Cisco ONP has been enhanced to support COSM line card connectivity from ROADM nodes to various site types. A ROADM node equipped with a COSM card can now manage upto 14 additional OLA and ROADM nodes. Previously, this was limited to OLA-to-ROADM associations. The node with the COSM card acts as the primary node. The new **COSM High Availability** options available under the Site properties, such as **Auto**, **Local HA**, **None**, **Only Active**, and **Geo HA** enable more dynamic and rule-based association in the NCS 2000 network.

From Release 25.1.1, Cisco ONP has been enhanced to support COSM line card connectivity from ROADM or Traffic nodes to various site types. A ROADM or Traffic node equipped with a COSM card can now manage upto 14 additional OLA, Traffic, and ROADM nodes. Previously, this was limited to OLA-to-ROADM and Traffic-to-OLA associations. The node with the COSM card acts as the primary node.

This connectivity enhancement can be implemented in three ways:

1. **Automatic COSM associations**: Cisco ONP automatically selects a primary node if the fiber property **DCN Extension** is enabled or if the node has the highest number of degrees. Up to 15 nodes can be associated with a single primary node. If there are more than 15 nodes in the network, Cisco ONP will identify another primary node.
2. **Manual association in Network Tree and Map**: You can manually associate nodes within the network tree and map. See Associate sites with COSM cards, on page 79
3. **Association through COSM High Availability property**: The association options are available under the High Availability drop-down list, applicable to both SSON and non-SSON NCS 2000 networks. The options include:
   - **Auto**: Based on analysis and default behavior.
   - **Local HA**: Both active and standby COSM cards are placed on the same node.
   - **None**: No COSM card present.
   - **Only Active**: No High Availability. Only Primary COSM card is added.
   - **Geo HA**: COSM cards are placed in two different sites located at different geographical locations, but adjacent to each other.

The Geo HA feature offers two selectable values: Primary and Secondary. These rules and behaviors apply:

Rules and Behavior:

1. **Primary HA check box**:
   - Selecting this check box designates a site as the Primary.
   - Adjacent sites will automatically be considered as Secondary.
2. **Auto re-assignment**:
   - If a Primary node selects a different node as its new Secondary, the previous association is automatically removed.

Associate sites with COSM cards

Use this task to associate OLA and ROADM sites with the COSM cards:

Before you begin

Log in to Cisco ONP web interface.

Procedure

Step 1 In the network tree panel, click the **Ellipsis** icon available in the right side of any ROADM or Traffic site with COSM card.

Step 2 Click **Edit** COSM **Associations**.

Step 3 Select thesites on the map to toggle the COSM connections. Click **Done** at the top-right corner to confirm the selection.

You can associate up to 14 nodes with a single ROADM or Traffic node equipped with an COSM card. To associate more than 14 nodes, you will need an additional primary node to manage the extra nodes. You can open widgets in the map and select top section to view the association.

Note
You can also right-click any ROADM or Traffic site from the Map and click **Edit COSM Associations**. For the sites that are of DGE type, the **Edit** COSM **Associations** option is not displayed.

The tool associates the sites that are not associated by you, with the COSM card during the network analysis.

Export Device NETCONF XML File

You can export the NETCONF (Network Configuration Protocol) XML files for all the individual sites in a network or the complete network. The following procedure shows how to export NETCONF XML files for the complete network from the Cisco ONP GUI.

Before you begin

Log in to Cisco ONP web interface.

Table 38: Feature History

Feature Name	Release Information	Feature Description
ALC2 Enhancements	Cisco ONP Release 25.1.1	The NETCONF XML file exported for the analysed NCS 1010 network design with Microsoft configuration now includes a new parameter. • OTDR-ScanMode-Expert If you enable the **Enable Special Settings** check box under Network level properties, the generated XML file contains the OTDR-ScanMode-Expert is set to *multi-region* when the when Microsoft Configuration is enabled. If you do not enable the **Enable Special Settings**check box, then scan mode config is not added to device Netconf XML.

Table 39: Feature History

Feature Name	Release Information	Feature Description
New Parameters Included in NCS 1010 NETCONF XML file	Cisco ONP Release 24.3.1	The NETCONF XML file exported from the NCS 1010 network design now includes these new parameters to support seamless Day-0 provisioning and the setup of a new node added to the network. • Optical cross-connects • Gain range margin • Tone Rates • Raman tuning configurations • Slot reserve • Dmux WSS attenuation • Unused CCMD-16 ports shutdown • Span baseline-deviation • OTDR Thresholds • APC Span-loss correction threshold

Table 40: Feature History

Feature Name	Release Information	Feature Description
Export NETCONF File from NCS 1010 network	Cisco ONP Release 5.0	You can export the NETCONF XML files for all the NCS 1010 nodes, and upload them to the NCS 1010 nodes through the Yang suite. This enables automatic bring up of the NCS 1010 nodes using the NETCONF data.

The network must be in Analyze mode.

Procedure

Step 1 In the network tree panel, click the three dots.

A pop-up list appears.

Step 2 In the list, click **Generate Device NetConf XML**.

Export window appears with network name.

Step 3 Click **Export**.

The message, "Success. Device NetConf exported successfully" appears.

You can download the zip file that contains NETCONF XML files of individual sites.

Note
You can choose the destination folder to save the downloaded NETCONF XML files of individual sites.

This feature has limited scope in this release.

Note
For C+L Network, the partner band configurations are not part of the Cisco ONP-generated XML file. You must manually configure the partner bands on the devices while bringing up the NCS 1010 C+L network.

From Release 24.3.1, the following new parameters are available in the NETCONF file exported from the NCS 1010 network design:

- OSC TX Power
- Optical Cross Connect
- OTS tone rate
- OMS tone rate
- OTS tone pattern expected
- OTS tone detect OOB
- OTS tone pattern
- OTS tone frequency

- Raman pump configurations
- Line port attenuation
- Raman dual safety

The following parameters are available only when you have enabled the **Enable Special Settings** check box under Network level properties.

- Raman turnup
- OTS ports shutdown
- OTDR autoscan
- Gain range margin
- OTDR excess attenuation threshold
- OTDR end of fiber threshold
- Slot reserve
- Dmux WSS attenuation
- Unused CCMD-16 ports shutdown
- Span baseline-deviation
- OTDR Thresholds
- APC Span-loss correction threshold
- OTDR-ScanMode-Expert

Upload NETCONF XML Files on COSM Web Interface

The following procedure shows how to upload the NETCONF XML files on the COSM web interface:

Procedure

Step 1 In the browser URL field, enter the IP address of the COSM line card.

The login page appears.

Step 2 Enter the username and password.

Step 3 Click **Login**.

Step 4 Click the hamburger icon at the top-left of the page, and select **Node Configuration**.

Step 5 Click the **Node Setup** tab.

Step 6 Click **Select files** .

Step 7 Browse to the NETCONF XML files exported from the Cisco ONP GUI and upload them.

If the passive unit ID in the NETCONF file exceeds the range 1–126, COSM displays an error message. Validate the XML file and reimport.

Note
If the value of FEC mode already provisioned in the 200G-CK-C line card does not match with the value available in the NETCONF XML file, COSM displays an error message. We recommend that you remove the provisioned FEC settings for this card and reimport the XML file.

Export Device NETCONF XML Files for Individual Sites

The following procedure shows how to export Device NETCONF XML files for individual sites from the Cisco ONP GUI.

Before you begin

Log in to Cisco ONP web interface.

The network must be in Analyze mode.

Procedure

Step 1 Click the **Ellipsis** icon available in the right side of the site.

Step 2 In the list, click **Generate Device NetConf XML**.

Export window appears with network name.

Step 3 Click **Export**.

The message, "Success. Device NetConf exported successfully" appears.

You can download the zip file that contains Device NETCONF XML files of individual sites.

Upload NETCONF Files to NCS 1010 Device

Use this task to upload the NETCONF files that downloaded from Cisco ONP into the NCS 1010 device using a NETCONF client.

Procedure

Step 1 Log in to the NETCONF Yang Suite which has access to the NCS 1010 device.

Step 2 Connect to the NCS 1010 device.

Step 3 Copy the NETCONF XML file content that is downloaded from Cisco ONP, and paste it into the Protocol NETCONF Run RPC block.

Step 4 Append the following commit code at the end of the NETCONF XML file content.

```
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="102">
<commit/>
</rpc>
```

Export Cisco Optical Site Manager NETCONF XML File

You can export the Cisco Optical Site Manager NETCONF XML files for all the individual sites in a network or the complete network. The following procedure shows how to export Cisco Optical Site Manager NETCONF XML files for the complete network from the Cisco ONP GUI.

Before you begin

Log in to Cisco ONP web interface.

Table 41: Feature History

Feature Name	Release Information	Feature Description
Export Cisco Optical Site Manager (COSM) NETCONF File from NCS 1010 network	Cisco ONP Release 5.2	The new **Generate COSM NetConf XML** option allows you to export from the Cisco Optical Network Planner, the Cisco Optical Site Manager NETCONF XML files for all the NCS 1010 nodes. You can then upload these files to the NCS 1010 nodes through the Cisco Optical Site Manager, enabling automatic bring-up of the NCS 1010 nodes.

The network must be in Analyze mode.

Procedure

Step 1 In the network tree panel, click the three dots.

A pop-up list appears.

Step 2 In the list, click **Generate COSM NetConf XML**.

Export window appears with network name.

Step 3 Click **Export**.

The message, "Success. COSM NetConf exported successfully" appears.

You can download the zip file that contains COSM NETCONF XML files of individual sites.

Note

You can choose the destination folder to save the downloaded Cisco Optical Site Manager NETCONF XML files of individual sites.

This feature has limited scope in this release.

Note

- For the ROADM OLT node, the device name is generated in the **Site Name-Side Name** format.
- For the OLA node, the device name is same as the **Site Name**.

Align the device name in COSM accordingly.

If the **Site Name** contains any special character, the XML file replaces the special charcter with its ASCII value in the COSM XML device name to allow seamless experience with COSM data backup workflow.

Note
L-Band Configuration is not certified in Cisco Optical Site Manager for R7.11.1. A future release will be considered for the L-Band configuration.

Upload Cisco Optical Site Manager NETCONF XML to NCS 1010 Device via Cisco Optical Site Manager Web Interface

Use this task to upload the Cisco Optical Site Manager NETCONF files that you downloaded from Cisco ONP into the NCS 1010 device using the Cisco Optical Site Manager web interface.

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Log in to the Cisco Optical Site Manager UI that has access to the NCS 1010 device.

Step 2 Cross-check the device name, UID, and card layout position (Rack ID, RU Position) with CONP XML.

The Cisco Optical Site Manager device name and UID should match with the CONP XML. If any mismatch exists, delete the device from Cisco Optical Site Manager and add back with name and UID as in the CONP XML.

Step 3 Go to **Optical Setup** and browse the CONP-generated XML without OXC for that device and load it.

Step 4 Click the **Select files...** button.

The file explorer window appears.

Step 5 Select the CONP-generated Cisco Optical Site Manager XML from your local device.

Step 6 Click **Open**.

A confirmation message appears.

Step 7 Click **Yes**.

Step 8 Click **Upload**.

The *COSM XML successfully uploaded* message appears.

Step 9 Go to **Optical Configuration** > **ANS parameter** and verify whether the respective configurations are complete.

Step 10 After loading the Cisco Optical Site Manager XML file without optical cross connect, load the Cisco Optical Site Manager XML with optical cross connect.

Step 11 After adding the Cisco Optical Site Manager XML file with optical cross connect, go to the **Optical Cross Connections** tab and verify whether the respective configurations are complete.

Export NCS 1010 network planning data for Cisco Optical Network Controller

Table 42: Feature History

Feature Name	Release Information	Feature Description
Export NCS 1010 Network Planning Data for Cisco Optical Network Controller (Cisco ONC)	Cisco ONP Release 5.0	You can export the planning data of NCS 1010 network, in the form of a JSON file. This JSON file can be uploaded into Cisco ONC to configure the managed devices in bulk.

Use this task to export the planning data of NCS 1010 network, which is in the form of JSON file from Cisco ONP. This JSON file is uploaded into Cisco ONC to configure the managed devices.

You can export the planning data of NCS 1010 network only for the releases 7.7.1 and 7.9.1.

Before you begin

Log in to Cisco ONP web interface.

The network must be in Analyze mode.

Procedure

Step 1 In the network tree panel, click the **Ellipsis** icon available in the right side of the network name, and select **Generate CONC JSON** .

Step 2 In the **Export File** dialog box, enter the name of the JSON file, and click **Export** to download the JSON file into your local system.

Upload Planning Data into Cisco ONC

Use this task to upload the network planning data (JSON file) downloaded from the Cisco ONP.

Procedure

Step 1 Log into Cisco ONC.

Step 2 Hover over the **Import** icon in the left panel and click **Planning Data Import**.

Step 3 Click **Import**.

Step 4 Browse and select the JSON file that is downloaded from Cisco ONP.

You can use the planning data to configure the devices managed by Cisco ONC.