Cisco Optical Network Planner Configuration Guide, Releases 25.x.x

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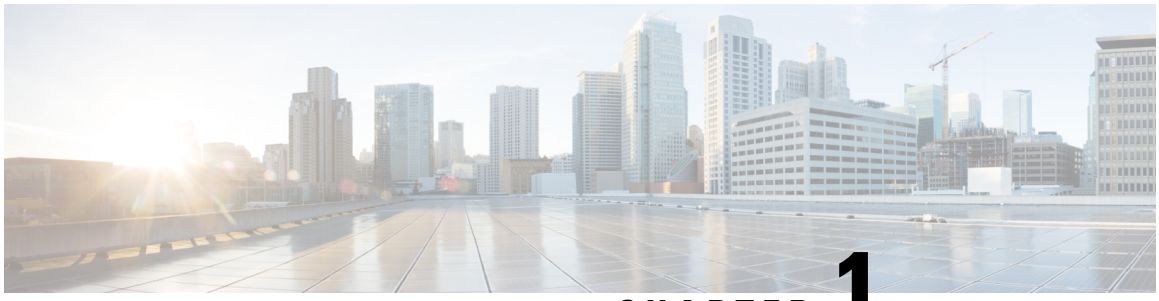

CHAPTER 1

Get Started with Cisco Optical Network Planner

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Cisco Optical Network Planner

Introduction to Cisco Optical Network Planner

Cisco Optical Network Planner (Cisco ONP) is a web application designed to model and test Optical Transport Networks (OTN) and Dense Wavelength Division Multiplexing (DWDM) optical networks using a graphical environment.

Purpose of Cisco ONP

The primary purpose of Cisco ONP is to design and validate networks for the NCS 1001, NCS 1004, NCS 1010, NCS 2000, and NCS 4000 series.

Network design and comparison

With Cisco ONP, users can create multiple instances of a network, modify various parameters for each instance, and perform comparisons. The tool generates a rack view of all the sites deployed in the network, highlights the differences between instances, and provides a complete Bill of Materials (BoM).

Detailed network information

Cisco ONP not only models the network and generates the BoM but also offers detailed information about the network. This includes reports such as the Cabling report, Optical report, Device Configuration file, and Traffic matrix.

Features and compliance

This chapter outlines the features of Cisco ONP, including protection scenarios, topology and service support, and compliance with the Cisco Secure Development Lifecycle (CSDL). It also covers setting up the graphical display.

Additional resources

For more detailed information about Cisco ONP, please refer to the data sheet.

Supported platforms

Table 1: Feature History

Feature Name	Release Information	Feature Description
Support for NCS 1001 Network Creation	Cisco ONP Release 24.3.1	This release supports the design of C-band NCS 1001 networks. The NCS 1001 is a 1RU, DWDM line system optimized for data center environments. It includes support for amplifiers, PSM modules, and various colored add/drop modules such as MD-32-EVEN, FLD-4, MD-48-ODD, MD-48-EVEN, and MD-64. Cisco ONP supports unprotected, terminal section, and terminal path protection over the NCS 1001 network. Also, the NCS 1001 network is compatible with optical sources such as NCS 1004, CIM8, Bright ZR, QDD, and CFP2.

Feature Name	Release Information	Feature Description
Addition of new NCS 1020 Chassis for NCS 1010 Networks	Cisco ONP Release 24.3.1	NCS 1020 is a 10RU optical line system that supports the OLTs and NCS1K14-CCMD-16-C card in the NCS 1010 networks. The NCS 1020 chassis optimizes the NCS 1010 networks design, extending the reach of NCS 1010 networks. With OLTs and NCS1K14-CCMD-16-C, the NCS 1020 chassis provides a wide range of configuration options to NCS 1010 networks.

Cisco ONP supports these platforms:

Table 2: Supported platforms and releases

Platforms	Recommended and Supported Releases
NCS 1001	7.10.1
NCS 1014	25.1.1
NCS 1010	7.7.1, 7.9.1, 7.10.1, 7.11.1, 24.3.1, 25.1.1
NCS 2000	11.0.0, 11.1.0, 12.1.0, 12.2.0, 12.3.1, 25.1.1
NCS 4000	6.5.33

Supported topologies

Cisco ONP supports several network topologies, each offering different configurations and benefits:

Linear topology

In a linear topology, the nodes are arranged in a line and are connected to two adjacent nodes. However, the first and last nodes are not connected to each other.

Mesh topology

In a mesh topology, each node is connected to one or more nodes. This configuration provides maximum redundancy to the network.

Ring topology

In a ring topology, each node is connected to exactly two other nodes, forming a circular configuration. It requires at least three nodes to form a ring.

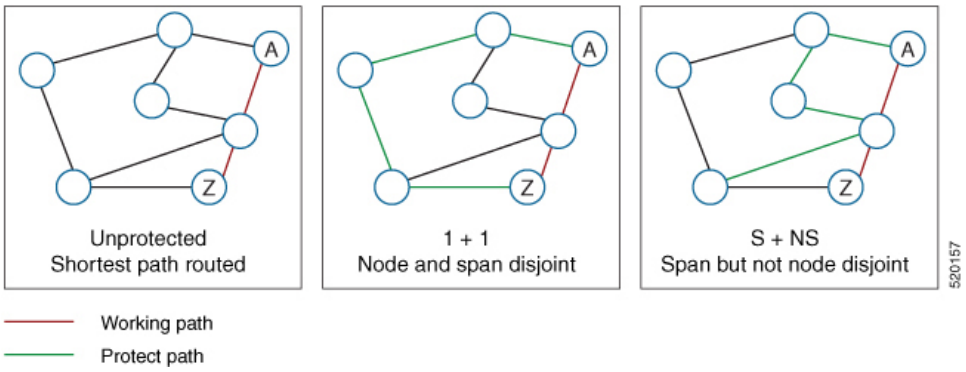
Supported protection schemes

Table 3: Feature History

Feature Name	Release Information	Feature Description
Protection Types Supported	Cisco ONP Release 4.1	The following protection schemes are supported: • 1+R: For each service, Cisco ONP automatically finds one working path. You can define the restoration path. • 1+1+R: For each service, Cisco ONP finds one working path, and one protected path. You can define the restoration path. • 1+1+R+R: For each service, Cisco ONP finds one working path and one protected path. You can define the restoration paths.

Cisco ONP offers a variety of protection schemes to enhance network reliability and resilience:

Figure 1: Protection schemes



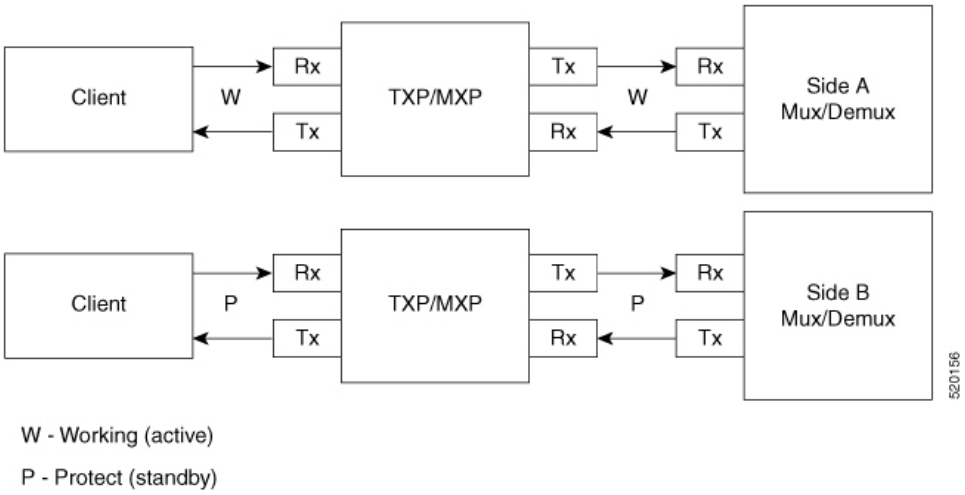
Unprotected

In unprotected mode, the tool routes the service on the shortest path without any backup.

1+1

In this scheme, two client signals are transmitted to separate line cards or transponder cards, rather than using a Y-cable to split one client signal into two. Client 1+1 protection allows the client system to control failure and switchover.

Figure 2: 1+1 protection



1+R

Supported on SSON networks, this scheme allows Cisco ONP to automatically find one working path for each service. Users can define the restoration path.

1+1+R

Also supported on SSON networks, this scheme involves Cisco ONP finding one working path and one protected path for each service. Users can define the restoration path.

1+1+R+R

Supported on SSON networks, this scheme involves Cisco ONP finding one working path and one protected path, with the option for users to define additional restoration paths.

S+NS

Supported on both SSON and non-SSON NCS 4000-NCS 2000 network, Cisco ONP uses the shortest path for the working service and the next shortest path for protection. The paths are span-disjointed but not node disjointed.

Unprotected disjoint

Supported on both SSON and non-SSON NCS 4000-NCS 2000 network, this scheme provides two cards following two completely disjoint paths in the network to reach their destination.

PSM-Channel protection

This protection scheme is supported on NCS 2000 non-SSON networks.

Supported services

Cisco ONP supports these OTN demands:

- ODU-1,ODU-2,ODU-3,ODU-4
- GE – Gigabit Ethernet
- 10GE – 10-Gigabit Ethernet
- 100GE –100-Gigabit Ethernet
- 400GE –400-Gigabit Ethernet

  The 400GE service is supported on the NCS 1010 networks.
- STS-3
- STS-12
- STS-48
- STS-192
- VC-4-4
- VC-4-16
- VC-4-64
- STM-64

Supported DWDM channel interfaces

For detailed information on the DWDM channel interfaces supported by Cisco ONP, refer toSupported Cards and Pluggables, on page 293 and Supported Optical Sources, on page 307.

Supported fiber types

Cisco ONP supports these fiber types:

- G652-SMF
- G652-SMF-28E
- True Wave Reach
- True Wave RS
- True-Wave Plus
- True-Wave Minus
- True-Wave Classic
- Free-Light
- Tera-Light
- Metro-Core

- ELEAF
- NDSF (only NCS 1010)
- ALLWave (only NCS 1010)
- SMF-28 ULL (only NCS 1010)
- SMF28-Ultra (only NCS 1010)

Register a new user

Use this task to register yourself as a user.

Procedure

Step 1 In the browser URL field, enter the IP address or hostname of the Cisco ONP instance.

Step 2 Click **Sign Up** in the Login page.

Step 3 Enter the **Username**, **Email**, **Password**, and **Confirm Password**, and click **Submit**.

Step 4 If you want a system-generated password, click **Generate**, and click **Submit**. The generated password is autopopulated in the **Password**, and **Confirm Password** fields.

Step 5 Click **Ok** in the **Success** dialog box.

Log in to Cisco ONP web interface

Use this task to log into the Cisco ONP web interface.

Procedure

Step 1 In the browser URL field, enter the IP address or hostname of the Cisco ONP instance.

If you are a new user, sign up. See Register a new user, on page 7, for more information.

Note
If the Google Chrome browser blocks your access to Cisco ONP due to self-signed certificate security, type **thisisunsafe** to proceed to the Login page.

Step 2 Enter the username and password in the **Username** and **Password** text boxes, and click **Login**.

Cisco ONP home page

After logging in, the Cisco ONP home page displays several key elements that help users navigate and utilize the tool effectively:

Menu bar

The menu bar includes various menus such as File, Network, Export, Import, Manage, Logs, Job Monitor, Control Panel, and Help. [Additional information or reference needed here]

Last login details

- **Last login**: Displays the last date and time of user login to Cisco ONP.
- **Last login IP**: Shows the IP address from which the user previously logged into Cisco ONP.

User information

- **User name**: Displays the name of the currently logged-in user, for example, ADMIN.

Reports tabs

The home page includes various report tabs that provide access to different reports. The availability of reports depends on whether a network has been analyzed. Reports can also be accessed in site properties after network analysis.

Network tree

The network tree displays the network name and its elements, such as Sites, Fibers, Waves or Media Channels, SRLGs, and Subnet. [Additional information or reference needed here]

Expanding the workable area

To expand the Cisco ONP workable area, click the horizontal and vertical arrows on the home page. If an empty grey window appears, ensure you are using the latest version of your browser. For detailed hardware and software requirements, refer to theCisco ONP Installation Guide.

Change Password

use this task to change your existing password.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Click the Login icon in the top-right corner of the home page, and choose **Change Password**.

Step 2 In the **Change Password** dialog box, enter the **Old Password**, **New Password**, **Repeat New Password**, and click **Update**.

Reset your password

The following procedure shows how to reset the password.

Procedure

Step 1 In the browser URL field, enter the IP address or hostname of the Cisco ONP instance.

Step 2 Click **Forgot Password ?** in the Cisco ONP Login page. The **Forgot Password** page appears.

Step 3 Enter the registered email ID in the **Forgot Password** page, and click **Continue**.

A verification code is generated and sent to the registered email ID.

Step 4 Enter the verification code, new password and confirm password, and click **Continue**.

Sign out from Cisco ONP

Use this task to sign out of Cisco ONP.

Procedure

Click the Login icon in the top-right corner of the home page, and choose **Sign Out** to log out of the Cisco ONP tool.

Cisco Secure Development Lifecycle compliance

Table 4: Feature History

Feature Name	Release Information	Feature Description
CSDL Compliance Enhancements	Cisco ONP Release 4.1	The following CSDL compliance enhancements are supported: • Displays the last login IP address of the client. • Allows you to set a passphrase for encryption of credentials during the installation of LNI application and database.

Cisco ONP incorporates several CSDL compliances to enhance security and user management:

Passphrase security

- **Dictionary check**: Ensures new passphrases do not exist in a dictionary of common passwords.
- **Expiration warning**: You receive pop-up messages alerting them about impending passphrase expiration.
- **Configurable lifetime and grace period**: Admin users or those with CONFIGURATION_MANAGEMENT permission can set the lifetime of a passphrase and a grace period for changing it via the system configuration tab.
- **Passphrase requirements**: Passphrases must be between 8 and 127 characters, including at least one lowercase letter, one uppercase letter, one number, and one special character.

Passphrase management

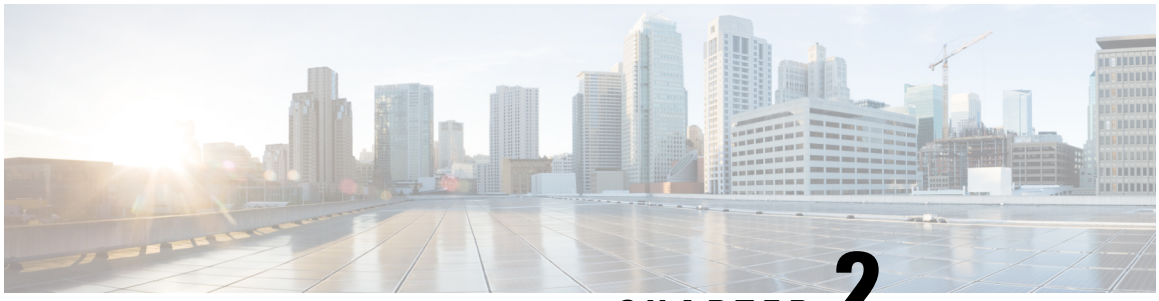
- **Initial admin login**: Prompts the admin to change the passphrase upon first login.
- **Installation encryption**: Allows setting a passphrase or key for encrypting credentials during the installation of the Live Network Import (LNI) application. If unspecified, a default key is used.
- **Installation passphrase length**: During Cisco ONP and LNI database installation, users can set a passphrase between 8 and 64 characters.

User login information

- **Last login details**: Displays the last login date, time, and IP address in the Cisco ONP user interface.

Additional security features

- **Password generation**: Users have the option to generate a password using the Generate Password feature.
- **Password strength display**: The strength of the password set by the user is displayed.



CHAPTER 2

Manage Users and Roles

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User roles in Cisco ONP

Cisco ONP provides a structured approach to access control management through various user roles. Here's an overview of the default roles and their capabilities:

Administrator

The roles and responsibilities of the administrator are:

- **User activation**: Admin or users with admin access grant access by activating new users, who are then notified by email.
- **Group management**: Admins can create new user groups, assign users to them, and allocate roles. Certain predefined user groups cannot be edited or deleted.
- **Role assignment**: Admins assign roles to groups, defining the actions a group can perform.

Designer

The roles and responsibilities of the designer are:

- **Network design**: Designers can create network topologies using either manual design or import design methods.
- **Capabilities**: They can design networks with various topologies (linear, ring, mesh) and assign fibers between sites, including Traffic, OLA, ROADM, and Passthrough sites.
- **Limitations**: Designers cannot analyze networks but can view reports shared by others after analysis.

Planner

The roles and responsibilities of the planner are:

- **Design and analysis**: Planners can both design and analyze networks. They evaluate network performance after creating sites, fiber spans, and service demands.

Reader

The roles and responsibilities of the reader are:

- **View-only access**: Readers can view users, user groups, roles, permissions, network topology, layout, connections, and the Bill of Materials (BOM).

  By default, users are assigned to the READ_ONLY_GROUP with a READER_ROLE.

You can also create new roles. See Create a new role, on page 17.

Under **Control Panel** > **Roles** and **Control Panel** > **Permissions**, you can view the permissions applicable for each role and the actions that can be performed for each permission.

Grant access to a new user

All users with Admin role receive an email notification about new user registration.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 You can change the state of a user from INACTIVE to ACTIVE by using either of two ways:

a. From the **State** field, click **INACTIVE** in the respective user row.

b. Select a user row or multiple user rows and click **Update**.

- In the **Update User** dialog box, select the **Group** and **State** from the respective drop-down lists.
- Click **Save**.

Step 3 Click **OK** in the **Success** dialog box.

Note

- After the Admin grants access, the new user gets notified by email (sent to the email address registered while signing up). It is only then that the new user will be able to log in.
- The admin assigns a newly created user with a Role and Group that determines what actions the user can perform.

Remove access to a user

Use this task to remove Cisco ONP access to a user.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control panel**.

The **Access Control Management** page appears.

Step 2 You can change the state of a user from ACTIVE to INACTIVE by using either of two ways:

a. From the **State** field, click **ACTIVE** in the respective user row.

b. Select a user row or multiple user rows and click **Update**.

- In the **Update User** dialog box, select the **Group** and **State** from the respective drop-down lists.
- Click **Save**.

Step 3 Click **OK** in the **Success** dialog box.

Delete a user

Use this task to delete a user or multiple users.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control panel**.

The **Access Control Management** page appears.

Step 2 Delete a user:

a) Select the user or multiple users to be deleted under the **USERS** tab and click **Delete**.

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

The message *User deleted successfully* appears.

Create a new user group

Use this task to create a new user group.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Click the **USER GROUPS** tab.

Step 3 Click **Create**.

a) In the **Create Group** dialog box, enter the **Group Name**.

b) Choose the appropriate role from the **Role** drop-down list. The available default roles are:

- ADMIN
- PLANNER
- DESIGNER
- READER

The **Role** drop-down list may also have user-defined roles listed under it.

c) Click **Save** to save the created user group.

Step 4 Click **OK** in the **Success** dialog box.

Assign a user to a user group

Use this task to assign a user to a user group.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control panel**.

The **Access Control Management** page appears.

Step 2 Under the **USERS** tab, select the user or users who are to be assigned to the new group, and click **Update**.

In the **Update User** dialog box:

a) From the **Group** drop-down list, select the appropriate group.
b) From the **State** drop-down list, select **Active** or **Inactive** to activate or inactivate the user in the group, respectively.
c) Click **Save**.

Step 3 Click **OK** in the **Success** dialog box.

Note

a. A user can belong to only one group.

b. Only one role can be assigned to any group.

c. All the users of a group have the same role as that of the group.

d. By default, a new user is assigned to the Read_Only_Group.

Set password expiration for individual user

Use this task to set the expiration of the password set by the user.

Before you begin

Log in to Cisco ONP web interface, on page 7 with Admin or Configuration_Management permission.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Select the user under the **USERS** tab., and click **Update**.

In the **Update User** dialog box:

a) Click the **PASSWORD EXPIRY** tab.
b) Enter values for the **Lifetime**, **Warning** and **Grace** fields.
c) Click **Save**.

Note
The password expiry settings like lifetime, warning and grace time, take effect after the existing password is changed by the user.

Step 3 Click **OK** in the **Success** dialog box.

Set password expiration for all users

Use this task to set the expiration of the password for all users.

Before you begin

Log in to Cisco ONP web interface, on page 7 with Admin or Configuration_Management permission.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Click the **System Configuration** tab.

a) Enter values for the **Lifetime**, **Warning** and **Grace** fields.
b) Click **Update**.

Note
The password expiry settings like lifetime, warning and grace time, take effect after the existing password is changed by the user.

Lock and unlock an individual user account

Use this task to lock or unlock an individual user account.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Click the **USERS** tab.

a) Select the user whose account you want to lock or unlock.
b) Click **Lock** to lock the user account, or click **Unlock** to unlock the locked user account.

Note
The user of a locked account must contact the admin to unlock the user account.

Expire the password set by an individual user

Use this task to expire the password set by an individual user.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Click the **USERS** tab.

a) Select the user whose password you want to expire.
b) Click **Expire**.

Create a new role

Use the following task to create a new role.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Click the **ROLES** tab, and click **Create**.

a) In the **Create Role** dialog box, enter the **Role Name** and select the **Permissions** for the role, and click **Save**.

Note
You can select more than one permission.

b) In the **Success** dialog box, click **OK**.

Assign a role to a user group

Use this task to assign a new role to a user group.

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin role.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Click the **USER GROUPS** tab.

a) Select the user group whose role is to be updated, and click **Update**.
b) In the **Update Group** dialog box, select the desired role from the **Role** drop-down list, and click **Save**.
c) In the **Success** dialog box, click **OK**.

Manage password through Dictionary

If a password exists in the predefined list of passwords under the **Content** column in the **DICTIONARY** tab, the dictionary rejects the new password set by the user.

This password verification check against the dictionary happens during any one of these events:

- New user sign-up
- Password change

- Password reset using forgot password option

Use this task to verify whether the new password set by the user exists in the list of predefined passwords:

Before you begin

Log in to Cisco ONP web interface, on page 7 as a user with Admin or Configuration_Management permission.

Procedure

Step 1 Click **Control Panel**.

The **Access Control Management** page appears.

Step 2 Click the **DICTIONARY** tab.

a) Enable the **Rejection Mode** toggle button to verify the password against dictionary.

By default, the **Rejection Mode** toggle button remains disabled.

b) Enter the password in the **Enter Passphrase** text box.

c) If you want to enter the limit (maximum number of matching passphrases), enter the same in the **Enter Limit** text box.

d) Click **Search**.

The matching passphrases get displayed.

Note
If you have entered the limit, a number of search results matching the limit gets displayed. Otherwise, all matching passphrases get displayed.

Retrieve system logs

The **System Logs** page shows at logs the events that are initiated during a specific time interval. See Logs , on page 276.

Before you begin

Log in to Cisco ONP web interface, on page 7 as an admin or a user with User Management and Network Management permission.

Procedure

Click **Logs**.

a) Click **Select Start Date**, and choose the start date. Similarly, click **Select End Date**, and choose the end date.

b) Choose the **Logs Category**.

c) Click **FILTER** to retrieve the logs.

If you want to.....	then...
export the system logs to an Excel sheet	click the **Export as CSV** icon.
export the system logs as a zip file	click the **Export Archive** icon.
import the zip file	click the **Import Archive** icon.
refresh the system logs page	click the **Refresh** icon.
delete the existing logs	click the **Clear Logs** icon.

Retrieve component logs

Use this task to retrieve the critical logs for each event from the **Component Logs** page. See Logs , on page 276.

Before you begin

Log in to Cisco ONP web interface, on page 7 as an admin or a user with User Management and Network Management permission.

Procedure

Step 1 Go to **Logs**>**Component Logs**.

Step 2 From the **Component** drop-down list, choose a component.

The logs for the chosen component appear. The available components are:

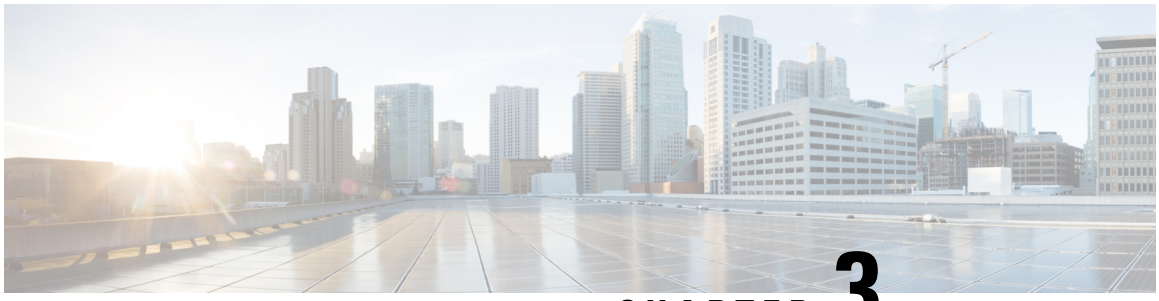
- BE
- GENE
- ODE
- PCE

Step 3 In the **Search** field, enter the event to locate the event logs.

The action icons available in the **Component Logs** page are:

If you want to.....	then.....
export the component logs as a text file	click the **Export** icon.

If you want to…..	then…..
see the file path of the chosen component	hover the **Information** icon.



CHAPTER 3

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 5: 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 6: 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 7: 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 8: 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 9: 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, on page 7.

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, on page 282.

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, on page 7.

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 10: 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 11: 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, on page 7.

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, on page 307, and Supported Cards and Pluggables, on page 293.

- 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, on page 7 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, on page 7

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, on page 7.

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 12: 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 13: 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, on page 7

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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 37.

- 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 14: 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, on page 7.

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, on page 7.

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, on page 7.

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, on page 7.

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 15: 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, on page 7.

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, on page 7.

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, on page 7.

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, on page 7.

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 16: 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 17: 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 18: 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, on page 7.

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 19: 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, on page 7.

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 20: 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, on page 7.

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 21: 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 22: 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 23: 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, on page 7.

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 24: 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, on page 7 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 61 for 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, on page 7.

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 25: 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 26: 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, on page 7 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 27: 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, on page 7

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, on page 7

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 28: 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, on page 7

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, on page 7

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, on page 7

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, on page 7

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 29: 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, on page 7.

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 72.

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 75 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 30: 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 31: 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, on page 7

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, on page 7.

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 32: 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, on page 7.

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, on page 7.

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, on page 7.

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, on page 7.

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, on page 7.

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, on page 7.

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 81

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 33: 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, on page 7.

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, on page 7.

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, on page 7.

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 34: 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, on page 7.

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 35: 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, on page 7

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 87.

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 36: 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 37: 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, on page 7.

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 38: 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, on page 7.

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, on page 7.

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, on page 7.

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, on page 7

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 39: 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, on page 7.

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 24.

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 40: 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, on page 7.

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 41: 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 101
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, on page 7.

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, on page 7.

Table 42: 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 43: 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 44: 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, on page 7.

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, on page 7.

Table 45: 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, on page 7

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 46: 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, on page 7.

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

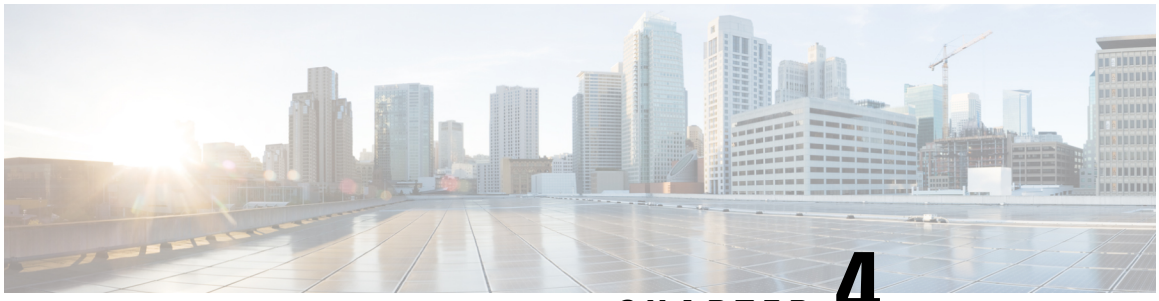
Step 1 Log into Cisco ONC.

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.



CHAPTER 4

Modify Network Properties

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Modify Network Properties

Table 49: Feature History

Feature Name	Release Information	Description
Improved Optical Results	Cisco ONP Release 24.3.1	The new network-level properties introduced improve the accuracy of the optical results. • **Ignore APC Penalty**: When enabled, the APC penalty is not considered while calculating the OSNR and power margin. • **SOL Optimized PSD**: When enabled, an optimum PSD value is calculated by considering the SOL Span losses. Also, Cisco ONP sets PSD and drop attenuation to specific values for the CCMD-16 LC card connected to the ports of the OLT-E-C, to achieve optimal RX power for the circuits.

Feature Name	Release Information	Description
Skip Routing Failures in NCS 2000 Network Analysis	Cisco ONP Release 24.3.1	A new **Continue Analysis On Routing Failure** check box is introduced to improve network analysis reliability for larger NCS 2000 networks. When a routing failure occurs, this enhancement moves the network to **Partially Analysed** mode, and move the network to **Design** or **Upgrade** mode to edit properties and correct routing. After the analysis, • successful routing paths appear in the **BOM** and **Optical Reports** tabs. • failed routing paths are not listed in these tabs. • error messages for the individual routing failures appear in the **Messages** tab. • red cross marks appear next to the failed routing paths. This approach prevents a single failure from failing the entire analysis, isolating specific issues to enhance troubleshooting.

Table 50: Feature History

Feature Name	Release Information	Description
New Network Level Properties	Cisco ONP Release 5.2	New Network Level properties are introduced under **Advanced Optical Settings** for NCS 1010 network. You have the flexibility to define custom values for the following properties for the Raman span and validate the optical circuit feasibility. • **Amplifier Gain Range** • **Connector Loss** • **Minimum OSNR Margin** • **Minimum Span Loss for Raman Amplifiers** • **Percentage of Fibers with Higher Aging Loss** • **Generate Cross-Connect** • **Maximum OSC Reach for NCS 1010Raman Amplifiers** • **Retain Auto Placed Raman Spans for Failure** • **Freq Allocation Order** • **Link Power Control** • **Gain Estimator** • **OTDR**

Table 51: Feature History

Feature Name	Release Information	Description
New Bandwidth Properties	Cisco ONP Release 5.1	Cisco ONP introduces the **Statistical Simulation Sigma**, **Statistical Simulation Margin Sigma**, and **OSNR Resolution Bandwidth** properties in this release. When the ideal OSNR values calculated by Cisco ONP are not feasible to be used at the time of deployment, you can modify the values for these properties to customize OSNR margin, power margin, and G-OSNR values to fix the fiber span issues.

Feature Name	Release Information	Description
New Network Level Properties	Cisco ONP Release 5.1	Three new Network Level properties are introduced to enable you to customize the core operations of an NCS 2000 Network. These operations ran in the background in the earlier releases. The new properties available under **Core Operations** as check boxes are: • **Enable LOGO Algorithm**—It runs the Local Optimization Global Optimization (LOGO) algorithm to find the efficient output power setpoint for booster amplifiers. By default, this **Enable LOGO Algorithm** check box is enabled. • **Log Enabled**—It generates, and stores logs only for selected network topologies. This saves a lot of storage space compared to previous implementations in which logs were automatically generated and saved for all topologies. • **Ignore Raman Span Checks**—It ignores the analysis of Raman spans between ROADM sites. This is useful when designing nonstandard network topologies with more than two Raman amplifiers between ROADM sites. Selecting the check box prevents Cisco ONP from raising an error message when analyzing such topologies.

Feature Name	Release Information	Description
BOM Customization for the UCS-based SVO Server Application	Cisco ONP Release 5.1	From this release onwards, the **BOM** does not include any UCS-based SVO server information. It is expected that you add the server PID and quantities manually. Cisco ONP prompts you to add the server by displaying the message "*UCS server is not billed in BoM, please add it as needed.*" in the **Messages** tab of the **Elements** tab.

Use this task to modify the properties of the network.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, click the network name.

You can view the basic properties of the network at the bottom of the network tree.

Step 2 Modify the following network properties as required.

Property	Platform	Description
Name	NCS 2000 NCS 1010 NCS 1001	Modify the network name as required.
Quick Analysis	NCS 2000	Check the **Quick Analysis** check box to quickly analyze the network by using a less accurate algorithm. The quick analysis option does not optimize the DCU and amplifier placement algorithm, hence resulting in an approximate BoM. To receive an accurate BoM, uncheck the **Quick Analysis** check box.

Property	Platform	Description
DWDM Interfaces	NCS 2000	Cisco ONP supports 100G and 200G transceivers as DWDM interfaces. This option is applicable only for automatically created waves, when OTN services are present. • 100G—The entire network chooses the 100G wavelength for transmission. • 200G—The entire network chooses the 200G wavelength for transmission. If you enable both 100G and 200G options, by default, the entire network chooses the 200G wavelength for transmission. If the 200G wavelength is not optically feasible, then it selects 100G automatically for transmission.
Customer Name	NCS 2000 NCS 1010 NCS 1001	Enter the customer name.
Project	NCS 2000	Choose ANSI (North American standard) or ETSI (European Telecommunications Standards Institute) from the drop-down list. ANSI networks do not allow you to define SDH (ETSI) service demands. ETSI networks do not allow you to define SONET (ANSI) service demands.
	NCS 1010 NCS 1001	Displays the type of the project, ANSI, or ETSI. You cannot edit it.
Measurement Unit	NCS 2000 NCS 1010 NCS 1001	Select the unit of measurement of span length. The available options are Miles and Km.
Chassis Type	NCS 1010	Choose the type of chassis. The available options are: • NCS 1010 • NCS 1020 **Note** When you check the **Enable Special Settings** check box, *NCS 1020* is selected as *Chassis Type* by default.
NCS1014 Grouping	NCS 1010	Enable this property to group all NCS1K14-CCMD-16 cards of a site in NCS1014 shelf.
	NCS 1014	Enable this property to group all the NCS 1000 transponder cards of a site in NCS1014 shelf.

Property	Platform	Description
A2A Mode	NCS 2000	Choose the A2A (Any to Any) mode. The available options are: • A2A_None • A2A_FAST
A2A Power Output	NCS 2000	The power output value is based on the chosen A2A mode.
A2A Demand Type	NCS 2000	The demand type is based on the chosen A2A mode.
A2A Channel Type	NCS 2000	Choose the type of channel. You can choose multiple types. The available options are: • Contentionless—This property enables an N-degree ROADM node to accommodate N wavelengths of the same frequency from a single add or drop device. • Colorless—The colorless property enables tuning of channel wavelengths without changing the optical interface of the port. • Colored—The Colored property dedicates a separate port for each wavelength.
SSON	NCS 2000	Indicates whether the network is an SSON network.
Use client Payg	NCS 2000	Check this check box to enable the Pay As You Grow feature on the client cards. The PAYG feature enables you to implement a cost-effective solution when the wavelength requirements are comparatively less than the maximum capacity of the network. A standard card is configured to work on maximum supported wavelengths, whereas a PAYG license comprises license restricted cards and a base license. So, instead of purchasing a standard card, you can purchase a PAYG license.
Naming Convention Enabled	NCS 2000	(Display only.) By default, the Naming Convention Enabled option is enabled by default for the networks that are created in Cisco ONP, and you cannot edit it. By default, the sides are named from T, S, R, Q, P, O, N, M, L, K, J, I, H, G, F, E, and index, depending upon the used Scalable Upto parameter. • You can import a mpz network without naming convention enabled, but the Cascaded SMR option remains disabled. • You cannot edit the label name of the side.
System Release		

Property	Platform	Description
NCS 1001	NCS 1001	Displays the system release of the NCS 1001 node in the network.
NCS 1010	NCS 1010	Displays the system release of the NCS 1010 node in the network.
NCS 4K	NCS 4000	Displays the system release of the NCS 4000 node in the network.
NCS 2K	NCS 2000	Displays the system release of the NCS 2000 node in the network.
NCS 1K (Available only on the SSON network)	NCS 1004	Displays the system release of the NCS 1004 node in the network.
Previous NCS 2K (Available only on the Release upgraded network)	NCS 2000	Displays the system release of the NCS 2000 node in the network, before the Release upgrade.
Previous NCS 1010 (Available only on the Release upgraded network)	NCS 1010	Displays the system release of the NCS 1010 node in the network, before the Release upgrade.
COSM	NCS 2000	Line Card is the only option. You can edit this property. **Note** In Release 25.1.1, only Line card option is available. For Release 12.x, both server and line options are available.
Network Application Configuration		
Install with COSM	NCS 1010	Enable **Install with COSM** to see software license for COSM file for R7.11.1 networks.
Use Coordinates Distance	NCS 2000 NCS 1010 NCS 1001	Check this check-box to use the x and y coordinates to calculate the fiber length.
Raman-Tuner	NCS 1010	Check this check-box to enable the Raman tuner.
Spectrum Utilization	NCS 1010	By default, the spectrum utilization is Short Path First. This field is noneditable.

Property	Platform	Description
Band Type	NCS 1010 NCS 1001	Choose the band type. The available options are: • C-Band • C+L Futuristic • C+L **Note** After creation of a network, you can change the network band type, if required.
NCS 1010 Line Card	NCS 1010	Choose the Line Card faceplate. The available options are: • Standard Faceplate • Enhanced Faceplate The default option is *Enhanced Faceplate*. For R7.10.1 networks, Cisco ONP supports Enhanced NCS 1010 Line Cards. For 7.11.1 networks, Cisco ONP supports Enhanced NCS 1010 Line Cards and NCS1K14-CCMD-16-C/L cards.
Routing Strategy	NCS 1010	Choose default routing priority for circuits based on minimum distance (Length) or minimum number of hops (Hop).
NCS1010 Line Card	NCS 1010	Choose the line card variant that will be applied to all edge sides in the network. The options available are: • Standard Faceplate • Enhanced Faceplate
Max Auto Omni Allowed	NCS 1010	Based on the number that you enter, Cisco ONP will automatically generate up to that many Omni Edges and run the analysis. There is no need for manual creation by the user. The default value is 0.
Probe Channel	NCS 1014	Choose the coherent probe pluggable to enable the probe functionality. The available options are: • DP01QSDD-ZT5-A1 • None **Note** You can force the selected probe channel option at the network level only. The selected option applies to all the edges of all sites in the network and remains disabled at the edge and site levels.

Property	Platform	Description
OTDR Pluggable	NCS 1014	Choose the pluggable to enable OTDR functionality. The available options are: • ONS-QSFP-OTDR • None **Note** You can force the selected OTDR pluggable option at the network level only. The selected option applies to all the edges of all sites in the network and remains disabled at the edge and site levels.
Optical Algorithm Options		
Stat Sim Sigma	NCS 2000 NCS 1010 NCS 1001	Choose the Statistical Simulation Sigma (Stat Sim Sigma) value. The available options are 0, 1, 2, and 3. The default value is 3. The Stat Sim Sigma value is used in calculating the SOL G-OSNR, EOL G-OSNR, SOL Power, EOL Power, SOL OSNR margin, EOL OSNR margin, SOL Power margin, and EOL Power margin displayed in the **Optical Results** page. The lower the value you choose, the better is the OSNR and power margins. You can edit this value in Design mode, and Upgrade mode (after unlocking the network). Analyze the network and check the **Optical Results** page to view the updated OSNR and Power values.
Stat Sim Margin Sigma	NCS 2000 NCS 1010 NCS 1001	Choose the Stat Sim Margin Sigma value. The available options are 0, 1, 2, and 3. The default value is 3. You can edit this value in all modes (Design, Analyze (locked state), Upgrade, and Release Upgrade). To view the OSNR margin and power values that get updated based on the value you selected, reopen the **Optical Results** page.
Core Operations		
Enable LOGO Algorithm	NCS 2000	By default, this property is enabled. In non-SSON networks, it is editable. In the SSON network, it is noneditable. This algorithm enables the Cisco ONP to automatically find the optimal output power setpoint for booster amplifiers within a fiber span.
Log Enabled	NCS 2000 NCS 1010 NCS 1001	Check this check-box to enable generation and storage of network logs.

Property	Platform	Description
Ignore Raman Span Checks	NCS 2000	Check this check-box to enable network analysis to ignore Raman span checks.
Traffic Algorithm Options		
Continue Analysis On Routing failure	NCS 2000	Check this check-box to skip routing demand failures when analyzing the networks. Passed demands appear in the *Optical Reports* tab, while failed demands are not listed in the *Optical Reports* tab. Red cross marks appear next to the failed demands in the network tree, and error messages for these failures appear in the *Messages* tab. If any demand fails during the analysis, the network enters the *Partial Analysis* mode. To edit the network, enter *Design* mode or *Upgrade* mode. It is recommended to use the *Upgrade* mode for retaining the already analysed results and data. **Note** If any non-routing issue is present in the network, then the design network will not move to the *Partial Analysis* mode
Advanced Optical Settings		

Property	Platform	Description
Enable Special Settings	NCS 1010	Check this check-box to enable the following properties and set default values for them. • Amplifier Gain Range Margin • Connector Loss • Minimum OSNR Margin • Minimum Span loss for Raman Amplifiers • Percentage of Fibers with Higher Ageing Loss • Freq Allocation Order • MC Routing Order • Ignore APC Penalty • SOL optimized PSD If you check the **Enable Special Settings** check box, the following parameters are added to the Device Netconf XML file. • Slot reserve • Unused CCMD-16 ports shutdown • Span baseline-deviation • OTDR Thresholds • Dmux WSS slice attenuation • APC span-loss correction threshold
Amplifier Gain Range Margin	NCS 1010	Enter the amplifier gain range margin. The default value is 3 dB.
Connector Loss	NCS 1010	For all fibers the default connector loss would be set to 0.5 from 0.25. The default value is 0.5 dB.
Minimum OSNR Margin	NCS 1010	Enter the minimum OSNR margin required for the amplifier. The default value is 1 dB.
Minimum Span Loss for Raman Amplifiers	NCS 1010	This is the minimum required span loss for fiber to be considered for Auto Raman placement. The default value is 27 dB.

Property	Platform	Description
Percentage of Fibers with Higher Aging Loss	NCS 1010	Click the field and enter the values for the following fields in the Fiber Sorting Settings window: • Percentage of Fibers with Higher Aging Loss (default value is 40%) • Ageing Loss for Top Fibers (default value is 3 dB) • Ageing Loss for Bottom Fibers (0.75 dB)
Generate Cross-Connect	NCS 1010	Check this check-box to add Cross connect details in the COSM XML
Raman Amplification	NCS 1010	Choose whether Raman amplification is Auto or User Forced. The default option is User Forced.
Maximum Auto Ramans	NCS 1010	Choose the maximum number of Raman enabled links on an end-to-end circuit path. The available options are 0-5, and ALL.
Maximum OSC Reach for Raman Amplifiers	NCS 1010	Enter the maximum span loss for which fiber can be considered for Auto Raman placement. The default value is 33 dB.
Link Tuner	NCS 1010	Choose how to enable the Link Tuner. The available options are Automatic-Enabled, Force-Disabled, and On-Request-Enabled. The default option is **On-Request-Enabled**, when the **Enable Special Settings** check-box is checked, and the **Automatic-Enabled** check-box is unchecked.
Ignore APC Penality	NCS 1010	By default this check-box remains checked, when the **Enable Special Settings** check-box is checked. Automatic Power Control (APC) penality occurs due to the inherent error in regulating the set-point for power. This penalty is considered while calculating the OSNR and power margin. When this property is enabled, this penalty is ignored during the calculation and thus providing accurate optical results.
Retain Auto Placed Raman Spans for Failure	NCS 1010	In general, automatically placed Raman will be retained only if the circuit becomes feasible with those Raman placements. Otherwise, it will be removed automatically. If you want to retain it, check this check-box. It is disabled by default.

Property	Platform	Description
Raman Gain Auto Tuner	NCS 1010	Choose how to calibrate the Raman gain. The available options are Automatic, Automatic-On-request, and No-calibration. The default option is No-Calibration.
SOL Optimized PSD	NCS 1010	By default this check-box remains checked, when the **Enable Special Settings** check-box is checked. When enabled, an optimum PSD value is calculated by considering the SOL Span losses.
Freq Allocation Order	NCS 1010	Choose the Freq Allocation Order. The available options are: • FROM-LOWER-FREQ • FROM-HIGHER-FREQ The default option is FROM-HIGHER-FREQ.
Link Power Control	NCS 1010	Choose how to enable the Link Power Control. The available options are Automatic-Enabled, Force-Disabled, and On-Request-Enabled. The default option is **On-Request-Enabled** , when the **Enable Special Settings** check-box is checked, and **Automatic-Enabled** when the check-box is unchecked.
Gain Estimator	NCS 1010	Choose how to enable the Gain Estimator. The available options are Automatic-Enabled, Force-Disabled, and On-Request-Enabled. The default option is **On-Request-Enabled** , when the **Enable Special Settings** check-box is checked, and **Automatic-Enabled** when the check-box is unchecked.
OTDR	NCS 1010	Choose whether to enable or disable the OTDR. The default option is Enabled.
MC Routing Order	NCS 1010	Choose routing order for the multicarriers: • CREATION: Based on the *Freq Allocation Order* chosen, the tool allocates frequency based on order carrier creation. • NO-OF-CARRIERS: Based on the *Freq Allocation Order* chosen, the tool allocates frequency to circuits based on the number of carriers. The default option is CREATION.
SSF Simulation	NCS 1010	Enable optical simulation using Split-Step Fourier(SSF) algorithms for better OSNR margins.

Property	Platform	Description
LUT Version	NCS 1010 NCS 1014	The default value is 1.1.3. • For NCS 1010, the network analysis can be done with or without LUT. If you check *Enable Special Settings* check box, then LUT is enabled. You can set LUT to None. Otherwise, it will be non-LUT-based analysis. • For NCS 1014, the network analysis is always LUT-based analysis. Look-Up Table is noneditable. You cannot unselect LUT.

Step 3 Click **Update**.

Step 4 To modify the advanced properties of the service, click **Show Advanced Properties** or choose **Network** > **Entity Editor**.

Step 5 In the **Entity Editor** window, click the **Site** tab.

Step 6 Click the network, and modify the properties in the right pane.

Step 7 Click **Update**.

Modify site properties

Table 52: Feature History

Feature Name	Release Information	Feature Description
M2 chassis support	Cisco ONP Release 25.1.1	You can now select M2 Chassis as Chassis Type under the site properties for the NCS 2000 ROADM and OLA nodes in SSON and non-SSON networks. This is in addition to the M6 and M15 chassis that were supported previously. M2 chassis is suitable for small sites where only two slots are sufficient to meet the networking requirements. It provides a compact and efficient solution for locations with limited space or lower capacity needs.

Table 53: Feature History

Feature Name	Release Information	Feature Description
Layer-2 SMR Enhancement to Support Second and Third Port Extension	Cisco ONP Release 5.2	This enhancement allows you to extend the contentionless sides in a ROADM site, increasing the number of provisioned contentionless sides in the NCS 2000 networks. New contentionless sides increase the number of traffic channels in the NCS 2000 networks. The new **Reserve Cascaded SMR Port** property reserves more SMR ports to extend the Layer-2 contentionless sides in a ROADM site.

Table 54: Feature History

Feature Name	Release Information	Feature Description
Shared SMR Port	Cisco ONP Release 4.2	You can enable the **Colored Add/Drop** property. This feature supports the use of contentionless and colored demands that are connected to the same port of an SMR card. With the **Shared SMR Port** enabled, you can create and validate the contentionless and colored configuration on a 16-degree SMR-20 node.

Use this task to modify the properties of the site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Sites**, and click a site.

You can view the basic properties of the site at the bottom of the network tree.

Step 2 Modify the following site properties as required.

Property	Platform	Description
General		

Property	Platform	Description
Name	NCS 2000 NCS 1010 NCS 1001	Enter the site name, either alphanumeric or numeric.
Type	NCS 2000	Choose the type of site. For example, ROADM, OLA, PASSTHROUGH, or a Traffic site. • You can add a passthrough site as a place holder. You cannot add services or waves to this site and therefore cannot generate the report. Later, you can convert the passthrough site to a ROADM, OLA, or the Traffic site in the design mode. • OLA is an optical line amplifier site that is used only for amplification. You cannot add service or waves on this site. • You cannot add a Traffic site of the type 4K-2K into an SSON network.
	NCS 1010	Choose the type of site. For example, ROADM, OLA, or PASSTHROUGH.
	NCS 1001	Displays the type of site.
MPO Cable	NCS 1010	Choose the type of MPO cable. The options available are: • Auto • 16MPO-MPO • 24MPO-MPO
Node Type	NCS 2000	The default value is FLEX NG-DWDM for all nodes. This field is noneditable.
Equipment Configuration	NCS 2000	Choose the configuration from the drop-down list. This option is available only for the Traffic site. The available options are: • Large CO - NCS 4016 • Small Site - NCS 4016 • Small Site - NCS 4009
Traffic Type (only for Traffic site)	NCS 2000	Choose the traffic type. The available options are: • 4K_1K_2K (for SSON) • 1K_2K (for SSON) • 4K_2K (non- SSON)

Property	Platform	Description
SSON	NCS 2000	Indicates whether the network is an SSON network.
COSM	NCS 2000	This property is noneditable at site level. This property enables you to select an COSM card as Server or Line card at the network level.
Layout		
Chassis Type	NCS 2000	Choose the type of chassis. The chassis type is supported for all the sites except the passthrough. The available options are: • M2 Chassis M2 chassis does not support multichassis and multidegree system. • M6 Chassis • M15 Chassis • Auto M15 is the default option when you choose Auto.
	NCS 1010	Choose the type of chassis. The available options are: • NCS 1010 • NCS 1020
NCS1014 Grouping	NCS 1010	Enable this property to group all NCS1K14-CCMD-16 cards of a site in NCS1014 shelf.
	NCS 1014	Enable this property to group all the NCS 1000 transponder cards of a site in NCS1014 shelf.
Power Supply	NCS 2000 NCS 1010 NCS 1001 NCS 1014	Choose the type of Power Supply. The available options are Auto, AC Power, and DC Power. The default option is Auto.
UTS AC Power Cables	NCS 2000 NCS 1010 NCS 1001 NCS 1014	Choose the type of cables to be used for the AC power supply. Cables are listed based on the country type and the Chassis type selected.
C Band		

Property	Platform	Description
Structure	NCS 2000	Choose the type of the site. The available options for ROADM and Traffic sites are: • Multi-degree • Line • Terminal For OLA and PASSTHROUGH, it is Line, and you cannot edit it.
	NCS 1010	Choose the type of the site. The available options for ROADM sites are: • Multi-degree • Line • Terminal For OLA and PASSTHROUGH, it is Line, and you cannot edit it.
	NCS 1001	Choose the type of the site. The available options are: • Terminal • Terminal-Section • Terminal-Path
	NCS 1014	Choose the type of the site. The default option is: • Terminal
Functionality	NCS 2000	Displays the site functionality. Following is the functionality available for each type of sites: • Optical Cross Connect (OXC) for ROADM and traffic site • Auto or Line Amplifier for OLA site, Cisco ONP downgrades OLA site to passthrough if OLA is not required. • Passthrough for passthrough site
	NCS 1010	Displays the site functionality. ROADM is the default functionality for all site types.
	NCS 1001	Displays site functionality.

Property	Platform	Description
Scalable up to Degree	NCS 2000	This parameter determines the maximum number of degrees, ducts, or line sides that can be supported by the site. For an NCS 2000 site, the available options are 2, 4, 8, 12, and 16. The default option is 4. The network is scalable up to 16 degrees for ROADM and Traffic sites. Choose 2 to have a LINE ROADM site. For OLA, the value is 2 and is noneditable.
	NCS 1010	For an NCS 1010 site, the available options are 7, 9, 15, 17, 23, 25, and 31. If you choose **Line Card Faceplate** as *Enhanced Faceplate*, for NCS 1010 site, the available options are 3…15, 23, and 31.
Site Type	NCS 2000	Choose the type of site. The available options are: • Auto Note When you choose Auto, the default option is SMR-20. • SMR-20 • SMR-9 The Site type is Line for the OLA site.
	NCS 1010	For NCS 1010 site, the only option is OLT, and it is not editable.
	NCS 1001	Displays the type of site, and it is noneditable.
L0 Platform	NCS 2000 NCS 1010 NCS 1001	Displays the platform. For example, NCS 1010 , NCS 1001, or NCS 2000.

Step 3 Click **Update**.

Step 4 To modify advanced properties of the site, click **Show Advanced Properties**, or choose **Network** > **Entity Editor**.

Step 5 In the **Entity Editor** window, expand **Sites** under the network tree, choose the site, and modify the following properties that are displayed in the right pane. For more information on entity editor, see Entity Editor, on page 284.

Properties	Platform	Description
General		
CLLI Code	NCS 1004 NCS 2000 NCS 4000	Enter a string holding the CLLI code.

Properties	Platform	Description
Site Address	NCS 2000 NCS 1010 NCS 1001	Enter the site address.
Evolved Mesh	NCS 2000	By default, this option is unchecked. When you enable this feature on the network, it is automatically enabled on the associated sites of the network.
Status	NCS 2000	Displays the status of the network. It shows whether the network is **Up** or **Down**.
Node Protection	NCS 2000	Choose the Node Protection. The available options are: • Same shelf • Separated shelves
Mpo16Lc	NCS 2000	Displays the fan-out module. The default option is MF-MPO-16LC. The MPO-16 to 16-LC fan-out module is a double slot module with one MPO-16 connector (COM) and eight LC duplex connectors. The MPO-16 connector is compatible with the SMR20 FS EXP and 16-AD-CCO FS units.
Mpo16ToMpo8	NCS 2000	Choose the required Mpo16 to Mpo8 converter. The available options are: • MPO16ToMPO8Cable • MF-2MPO_ADP
MPO Cable	NCS 1010	Choose the required Mpo cable. The available options are: • Auto • 16MPO-MPO • 24MPO-MPO
Cascaded SMR	NCS 2000	Enable this option to add Layer-2 contentionless sides.

Properties	Platform	Description
Reserve Cascaded SMR Port	NCS 2000	**Note** This property becomes available when you enable *Cascaded SMR* for NCS 2000 networks from Release 11.1.x. Choose the number of ports to reserve for the cascaded SMR. The available options are: • 1, 2, and 3 if Scalable Upto Degree is 12 and 16. • 1 and 2 if Scalable Upto Degree is 8. • 1 if Scalable Upto Degree is 12 and 4.
Flex Spectrum	NCS 2000	By default, this check-box remains checked for a newly created network. You cannot edit it.
Grooming Site	NCS 2000 NCS 4000	When you enable this option, it indicates that OTN traffic can be groomed at this site.
MR-MXP BreakOut Cable	NCS 2000	Check this check box to use the ONS-MPO-MPOLC-10 breakout cable to interconnect the client ports of the MR-MXP card with the NCS2K-MF-MPO-20LC passive module.
8X10G-FO	NCS 2000	Check this check box to use the NCS2K-MF-8X10G-FO passive module only for 10G on the client-side of the NCS2K-400G-XP card. By default, this passive module is enabled.
Band Type	NCS 1010 NCS 1001	Choose the required band type for NCS 1010 R7.9.1.
NCS 1010 Line Card	NCS 1010	Choose whether the Line Card faceplate is Standard Faceplate or Enhanced Faceplate. **Note** If you assigned a **Scalable Upto Degree** value that is supported for both standard and enhance at the site level, then you can select *Standard Faceplate* in one side and *Enhanced Faceplate* in another side.
Bill of Material		
License Suite	NCS 1010	Choose whether the License Suite is Essential (RTU + SIA3) or Advanced (RTU + SIA3).
	NCS 1014	The default option is RTU + SIA3. It is noneditable.

Properties	Platform	Description
NCS1k Line card license	NCS 1010	Choose whether the License Suite is: • Essential (RTU + SIA3) • Advanced (RTU + SIA3) • Essential (RTU + SIA5) • Advanced (RTU + SIA5)
Enable NCS	NCS 2000	This feature enables NCS features on all sites in the network.
Use PAYG	NCS 2000	The Pay As You Grow (PAYG) functionality significantly reduces the initial setup cost and enables the purchase of another wavelength capacity on a need basis. PAYG enables port-based cost or licensing for SMR-9 and SMR-20 cards.
Connection Verification	NCS 2000	Enable this check box to: • Validate the correct optical interconnection between the optical cards inside a Flex ROADM. • Measure the insertion loss of the external passive path. • Validate the quality of the connections to the patch panel. • Check if the insertion loss is within the expected value. The following cards support connection verification: • SMR20 FS CV • MF-DEG-5-CV • MF-MPO-16LC-CV • MF-UPG-4-CV
New FS-SMR PID	NCS 2000	By default, this check-box remains checked for newly created network. You cannot edit it. This option enables displaying of the new SMR-20 PID in the BOM page. You can enable this option when you unlock an mpz network where SMR-20 is selected, during an upgrade or release upgrade.
Layout		

Properties	Platform	Description
Chassis Type	NCS 2000	Choose the type of chassis. The available options are: • M2, M6, and M15 Chassis for OLA and ROADM • M6 and M15 Traffic • Auto for all nodes **Note** Chassis type is not supported for the passthrough site.
	NCS 1010	Choose the type of chassis. The available options are: • NCS1010 • NCS1020
NCS1014 Grouping	NCS 1010	Enable this property to group all NCS1K14-CCMD-16 cards of a site in NCS1014 shelf.
	NCS 1014	Enable this property to group all the NCS 1000 transponder cards of a site in NCS1014 shelf.
Power Supply	NCS 2000	Choose the type of Power Supply. For an NCS 2000 site, the available options are based on the chassis type: • Auto for all types of chassis • AC Power, DC power for M15 and M2 chassis • AC Power, DC Power, AC2 Power, DC40 Power, and DC20 Power for M6 chassis
	NCS 1010 NCS 1001 NCS 1014	The options available for the NCS 1010 site are Auto, AC Power, and DC power.

Properties	Platform	Description
Controller Card	NCS 2000	Choose the type of the controller card. For an NCS 2000 site, the default controller card is TNCS-2. The available options are based on the chassis type chosen. By default, controller cards that are supported by M15 chassis are listed. The available options are: • Auto • TNC/TSC, TNC-E/TSC-E, TNCS, TNCS-0, TNCS-2, and TNCS-20 for M2 chassis • TNC/TSC, TNC-E/TSC-E, TNCS, TNCS-0, TNCS-2, and TNCS-20 for M6 chassis • TNCS, TNCS-0 TNCS-2, TNCS-20 for M15 chassis
	NCS 1010	The following options are available for the NCS 1010 site: • Auto • NCS1010-CNTRL-K9 • NCS1010-CNTRL-B-K9 *NCS1010-CNTRL-B-K9* appears for networks from R7.11.1. **Note** If you enable **Advanced Optical Settings**, Cisco ONP takes the default controller card as *NCS1010-CNTRL-B-K9*, else *NCS1010-CNTRL-K9*. However, you can still change the controller later.
	NCS 1001	CONP takes NCS1K-CNTLR2 as default.
	NCS 1014	The following options are available for the NCS 1014 site: • NCS1K14-CNTLR-K9 • NCS1K14-CNTLR-B-K9
Redundant Controller Card	NCS 2000 NCS 1010 NCS 1001	Choose whether to use a redundant controller card. **Note** When you select **Chassis Type** as *NCS1020*, you can force **Redundant Controller Card** to Yes.

Properties	Platform	Description
Layout Template	NCS 2000	Choose the required layout template. **Note** After the chosen layout template is applied, all layout properties will be reset and disabled. **Note** After design analysis, if the applied layout template is not considered for card placement in the layout, check for the error message (non-critical) under the **Elements** > **Messages** tab. If you see a template-related error which indicates that there is a mismatch between the cards that are defined in the template and the cards that are created on the site, perform the following: • Export the template from the **Layout** page, and modify it as required. • Import the modified template using the **Manage** > **Layout Template** option. • Switch to Design mode and apply the template to the site using the **Entity Editor**. • Reanalyze the network to get the correct layout populated.
UTS AC Power Cables	NCS 2000 NCS 1010 NCS 1001 NCS 1014	Choose the type of cables to be used for the AC power supply. Cables are listed based on the country type and the Chassis type selected.
Redundant Power Scheme	NCS 2000	Choose the redundant power scheme from the drop-down list to configure the number of working and protected power units for the chassis. For an NCS 2000 site, the options available are based on the chassis type. For M15 chassis, the options available are 1+0, 1+1, 2+0, 2+1, 3+0, 3+1, 2+2, 3+1 is the default redundancy power scheme for M15 DC chassis and 2+2 is the default redundancy power scheme for M15 AC chassis. For example, if you choose 3+1 redundant power scheme, there are 3 working power units and 1 protected power unit. For an M6 chassis, the options available are Auto, Yes, and No.
	NCS 1010 NCS 1001 NCS 1014	The options available are Auto, 1+0, and 1+1.

Properties	Platform	Description
Raman Adapter Share	NCS 2000	This option is available only for the OLA site. By default, this check box remains checked. This option indicates that MF-2LC-ADP can be shared with EDRA amplifiers and not with RAMAN amplifiers irrespective of the default selection.
ECU Type	NCS 2000	Choose the External Connection Unit (ECU) type from the drop-down list. The options available are based on the chassis type. By default, the ECU applicable for M15 is listed. • ECU—Has 12 USB 2.0 ports and supports IEEE1588v2 PTP, time-of-day (ToD), and pulse-per-second (PPS) inputs. • ECU-S—Similar to ECU except that it has eight USB 2.0 ports and two USB 3.0 ports. • ECU60-S—Variant of ECU-S introduced for the NCS 2006 when the shelf is powered at –60VDC nominal input voltage. ECU-S and ECU60-S are supported only for M6 chassis.
MF Unit	NCS 2000	Choose the mechanical frame for the passive optical modules from the drop-down list. The options available are Auto, MF-6RU/MF-10RU, and MF-1RU. • The NCS2K-MF-1RU has four slots for the passive optical modules. • The NCS2K-MF-6RU supports up to 14 single-slot passive optical modules such as any combination of NCS2K-MF-DEG-5, CS2K-MF-UPG-4, or Connection Verification (CV) units. • The NCS2K-MF10-6RU supports up to 10 double-slot passive optical modules such as NCS2K-MF-MPO-16LC=.
	NCS 1010	For NCS 1010 site, the available options are Auto, MF-4RU, and MF-1RU.
	NCS 1001 NCS 1014	MF-1RU is the default option. This property is noneditable.
Chassis Disaggregation	NCS 2000	If you check this check-box, ROADM, and transponder cards are placed in different chassis.
Map		

Properties	Platform	Description
X Coordinate	NCS 2000 NCS 1010 NCS 1001	It represents the longitudinal location of the site. Longitude can be positive or negative (-180 to 180). Negative is west of Greenwich, and positive is eastward.
Y Coordinate	NCS 2000 NCS 1010 NCS 1001	It represents the latitudinal location of the site. Latitude can be positive or negative (- 90–90), north and south of the Equator.
Position Lock	NCS 2000 NCS 1010 NCS 1001	Check this check box to lock the site position on the map.
C Band		
Shared SMR Port	NCS 2000	Check this check box to connect Contentionless unit 16-AD-CCOFS and Colored unit MD-48-ODD/Even to the same MPO port of SMR-20. When Shared SMR port is enabled, MD-48-ODD/EVEN unit connects to the specific side of SMR-20 through MPO-8LC and UPG-4 instead of directly connecting to SMR-20 through MPO-16LC. **Note** Shared SMR port becomes disabled, if • **Degree Mesh Type** property is *PPMESH8-5AD* • Or, **Site Type** property is *SMR-9* and **Scalable Upto Degree** property is *8*
Degree Mesh Type	NCS 2000	Choose the mesh type for the Flex NG-DWDM site. The available options are: • DEG-5/UPG-4 • PPMESH8-5AD DEG-5/UPG-4 is the default value.
Degree Type	NCS 1010	Displays the type of degree. For example, BRK-8.
Pre Equip Degree	NCS 2000	This parameter determines the number of degrees to be considered for the site hardware placement on day 0. For NCS 2000, the values can be None, Auto, 4, 8, 12 or 16. The default option is None. If you choose None, only the sides that are present in the Cisco ONP GUI are shown. The values in the drop-down list are populated based on the value of **Scalable Upto Degree** parameter.
	NCS 1010	For NCS 1010 site, the options available are Yes and No.

Properties	Platform	Description
COSM		
Chassis License Flush Out	NCS 2000	Allows you to flush out the existing chassis license and purchase a new chassis license.
COSM Pluggables	NCS 2000	You can choose one of the following options from the drop-down list. When you choose Auto, ONS_SC+-10G_SR is the default option. • Auto • ONS-SC +- 10G-SR • ONS-SC +-10G-LR **Note** The COSM pluggables are not applicable for UCS-based COSM network design.
Cisco NMS		
COSM Full License	NCS 2000	Enable this check box to add High Availability (Feature and License), Connection Verification license, Flex Spectrum license, and OTDR license packaged in it.
COSM High Availability	NCS 2000	Choose the high availability options: • 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. See Rules and Behaviour that are applicable for the selection.
Primary HA	NCS 2000	Enable this check box to add the High Availability feature to the license package.
Connection Verification License	NCS 2000	Enable this check box to add the Connection Verification feature to the license package. (This is applicable for the NCS 2000 networks until Release 12.3.1)
SVO Flex Spectrum License	NCS 2000	Enable this check box to add the Flex Spectrum feature to the COSM license package. For SSON networks, the Flex Spectrum license is enabled by default. (This is applicable for the NCS 2000 networks until Release 12.3.1)

Properties	Platform	Description
OTDR License	NCS 2000	Enable this check box to add the OTDR feature to the license package. (This is applicable for the NCS 2000 networks until Release 12.3.1)
3rd party NMS (These are applicable for the NCS 2000 networks until Release 12.3.1)		
3rd party Full License	NCS 2000	Enable this check box to add NBI (North Bound Interface), Alarm Correlation, Performance Monitoring, and Circuit Provisioning features to the license package.
NBI	NCS 2000	Enable this check box to add the NBI feature to the license package.
Alarm Correlation	NCS 2000	Enable this check box to add the Alarm Correlation feature to the license package.
Performance Monitoring	NCS 2000	Enable this check box to add the Performance Monitoring feature to the license package.
Circuit Provisioning	NCS 2000	Enable this check box to add the Circuit Provisioning feature to the license package.
Enhanced Face Plate Options		
Degree Priority	NCS 1010	Choose the port type for interconnect degree priority. The available options are: • LC Ports • MPO Group The default option is *LC Ports*. **Note** This field appears only when you select **NCS 1010 Line Card** as *Enhanced Faceplate*.
Add/Drop Shelf Type	NCS 1010	This property is noneditable and appears for networks from R7.11.1.

Step 6 Click **Update**.

Add Contentionless Side to a Site

Contentionless functionality on a site refers to the contentionless add or drop ability of an N-degree ROADM node to accommodate N wavelengths of the same frequency from a single add or drop device. For a ROADM to be contentionless, the number of drop units must be equal to ROADM degrees.

Use the following procedure to add contentionless sides to a ROADM or traffic site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

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

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

Step 2 Click the network in which you want to add contentionless sides to a site.

The network opens.

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

Step 4 Click the site to which you want to add contentionless sides.

Step 5 Click the **Add Contentionless Side** icon.

Step 6 Enter the appropriate value in the **Enter number of contentionless sides** field.

The number of contentionless sides that can be added to a site depends on the type of site, the **Scalable Upto Degree** property. The following table explains the same.

Table 55: Contentionless Sides for Layer-1 SMR

Site Type	Scalable Upto Degree	Number of Contentionless Sides
SMR-20	4	16
SMR-20	8	12
SMR-20	12	8
SMR-20	16	4
SMR-20	Line	8
SMR-20	Terminal	8
SMR-9	4	5
SMR-9	8	1

Step 7 To add layer-2 SMR-20 contentionless sides, perform the following steps:

a) Check the **Evolved Mesh** check box.
b) Choose **Site Type** as *SMR-20* or *Auto*.
c) Check the **Cascaded SMR** check box.
d) Choose **Degree Mesh Type** as *DEG-5/UPG-4*.
e) Click **Update**.

You can add 20 more contentionless sides on each site for layer-2 SMR.

Step 8 To add an extended layer-2 SMR-20 contentionless side, choose the **Reserve Cascaded SMR Port** value.

Note

The **Reserve Cascaded SMR Port** drop-down property is available for NCS 2000 networks from R11.1.x.

Based on the N-degree and Layer-2 SMR, you can add more contentionless sides on each site for the extended layer-2 SMR, sacrificing some Layer-1 contentionless sides. The following table explains the same.

Table 56: Contentionless Sides for Extended Layer-2 SMR

Reserve Cascaded SMR Port	Site Type	Scalable Upto Degree	No. of Contentionless Sides for Layer-1 Side	No. of Contentionless Sides with 1st Port Layer-2	No. of Contentionless Sides with 2nd Port Layer-2	No. of Contentionless Sides with 3rd Port Layer-2
1	SMR-20	4	16	20	Unsupported	Unsupported
	SMR-20	8	12	20	Unsupported	Unsupported
	SMR-20	12	8	20	Unsupported	Unsupported
	SMR-20	16	4	20	Unsupported	Unsupported
2	SMR-20	4	Unsupported	Unsupported	Unsupported	Unsupported
	SMR-20	8	11	20	20	Unsupported
	SMR-20	12	7	20	20	Unsupported
	SMR-20	16	3	20	20	Unsupported
3	SMR-20	4	Unsupported	Unsupported	Unsupported	Unsupported
	SMR-20	8	Unsupported	Unsupported	Unsupported	Unsupported
	SMR-20	12	6	20	20	20
	SMR-20	16	2	20	20	20

Step 9 Click **OK**.

Modify Number of Contentionless Side Ports for a Site

Use this task to modify the number of contentionless ports for a side in a ROADM site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

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

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

Step 2 Click the network in which you want to modify the number of contentionless ports for a side in a ROADM site.

The network opens.

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

Step 4 Expand a ROADM site and select a contentionless side.

You can view the properties of the side in the right panel.

Step 5 From the **Contentionless Ports** drop-down list, choose the required number of ports.

Click **Update**.

Modify Contentionless Side to a Site in Upgrade Mode

Use the following procedure to modify contentionless sides to a ROADM or traffic site in upgrade mode.

Limitation

- Supports networks from R11.1.x.
- NCS 2000 networks have the limitation of Passive units count up to 126. When you add the second and third L2 contentionless sides, the passive units count goes beyond the limit. In such cases, the tool allows the analysis and notifies the limitation via an error message, *The passive units in this design (count) has exceeded the maximum supported passive units on the NE SW (126). Please review the design with Cisco before proceeding for deployment*.

Before you begin

Set the following conditions.

1. Enable **Evolved Mesh**.
2. Set **Site Type** as *SMR-20* or *Auto*
3. Enable **Cascaded SMR**.
4. Set **Degree Mesh Type** as *DEG-5/UPG-4*.
5. Set **Scalable Upto Degree**.

If the above Prerequisites are not met, you must unlock the site to modify the contentionless sides.

Procedure

Step 1 Choose **Network** > **Entity Editor**.

Step 2 Click the site to which you want to modify the contentionless sides.

Step 3 Check the **Cascaded SMR** check box if not enabled already.

The **Reserve Cascaded SMR Port** drop-down appears.

Step 4 Choose the SMR port value in **Reserve Cascaded SMR Port**.

To reduce the Layer-2 SMR sides:

a. Choose a lower value.

b. Click **Update**.

If SMR ports are available, the update becomes successful. Else, an error message appears. Perform the following actions:

1. Unlock the site.
2. Start over from Step 1.

To increase the Layer-2 SMR sides:

a. Choose a higher value.

b. Click **Update**.

If SMR ports are available, the update becomes successful. Else, an error message appears. Perform the following actions:

1. Unlock the site.
2. Delete the lowest contentionless side in Layer-1 SMR site.
3. Start over from Step 1.

Step 5 Click the site to which you want to add contentionless sides.

Step 6 Click the **Add Contentionless Side** icon.

Step 7 Enter the appropriate value in the **Enter number of contentionless sides** field.

The number of contentionless sides that can be added to a site depends on the type of site, the **Scalable Upto Degree** property.

Step 8 Click **OK**.

Add L-Band Side to a Site

Use the following procedure to add L-Band sides to an NCS 1010 R7.9.1 site:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

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

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

Step 2 Click the network in which you want to add the L-Band sides to a site.

The network opens.

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

Step 4 To add the L-Band sides, choose one of the following options:

- Click the site to which you want to add the L-Band sides.

  Note
  If you add an L-Band side to a site, the corresponding attached sides from other sites also automatically add L-Band sides. A pop-up message appears to indicate the addition of L-Band sides.

- Or, expand the site and click on a side to add L-Band to the selected side only.

Step 5 Click the **Add L-Band** icon.

The L-Band side appears under the required site or side.

Note
If ILA or pass-through sites are present in APC domain, then the end-to-end path in the L-band becomes enabled automatically.

Add Omni-Directional Side to a Site

Table 57: Feature History

Feature Name	Release Information	Description
Omnidirectional Configuration Support for NCS 1010 Network	Cisco ONP Release 24.3.1	You can now include both colorless and colored omnidirectional configurations when designing an NCS 1010 network. New Properties Added: • **Add Omni-Directional** icon (under Entity Editor): Use this icon to add the required number of omnidirectional sides. • **Omni Variant** (under Side Properties): Select the desired Add/Drop stage, such as Dual OLT or 4x4 COFS. • **Max Auto Omni Allowed** (under Network Properties): Cisco ONP automatically generates the omni edges based on the number entered. This omnidirectional setup enhances the flexibility of the multidegree topology, allowing channels to be routed through any optical degree during a fiber cut without needing physical fiber reconnections.

The omnidirectional configuration allows you to add/drop traffic to/from any of the node directions in a multidegree topology. This configuration gives flexibility to the multidegree topology to route channels through any of the optical degrees during fiber cut without the need for changing the physical fiber connections.

Note Omni edges are not supported on a Terminal site.

Use the following procedure to add omnidirectional sides to an NCS 1010 site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

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

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

Step 2 Click the network in which you want to add contentionless sides to a site.

The network opens.

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

Step 4 Click the site to which you want to add contentionless sides.

Step 5 Click the **Add Omni-Directional** icon.

Step 6 Enter the appropriate value in the **Enter number of Omni Directional sides** field.

The number of omnidirectional sides that can be added to a site depends on the **Scalable Upto Degree** property.

Step 7 Click **OK**.

The omnidirectional sides are created under the site and are labeled as omni-1, and omni-2 and so on. Also, a tag called *Omni* is added to the Omni side to indicate it as an omnidirectional side.

You can add L-band functionality to the side by clicking the **Add L-Band** icon.

Note
Cisco ONP will automatically generate up to the number of Omni Edges specified in the **Max Auto Omni Allowed** field under Network properties. Manual creation by the user is not required.

Modify Fiber Properties

Use this task to modify the properties of fiber.

Before you begin

Log in to Cisco ONP web interface, on page 7

Procedure

Step 1 In the network tree, expand **Fiber**, and select a fiber or click a fiber on the map. The selected fiber will be highlighted in orange.

You can view the basic properties of the fiber at the bottom of the network tree.

Step 2 Modify the following fiber properties as required.

Property	Platform	Description
General		

Property	Platform	Description
Name	NCS 2000 NCS 1010 NCS 1001	By default, the name of the fiber is based on the number of fibers between the source and destination sites. You can edit the name.
Source	NCS 2000 NCS 1010 NCS 1001	Displays the source site name. This field is noneditable.
Destination	NCS 2000 NCS 1010 NCS 1001	Displays the destination site name. This field is noneditable.
Bidirectional	NCS 2000 NCS 1010 NCS 1001	Indicates whether a standard single fiber is used to transmit the data in both directions.

Property	Platform	Description
Fiber Type	NCS 2000	Select the fiber type. Cisco ONP supports the following fibers, and the default fiber type is G652-SMF. • G652-SMF • G652-SMF-28E • True Wave Reach • True Wave RS • True-Wave Plus • True-Wave Minus • True-Wave Classic • Free-Light • Tera-Light • Metro-Core • ELEAF • NDSF • ALLWave • SMF-28 ULL • SMF28-Ultra
	NCS 1010	

Property	Platform	Description
		Select the fiber type. Cisco ONP supports the following fibers, and the default fiber type is G652-SMF. • G652-SMF • G652-SMF-28E • True Wave Reach • True Wave RS • True-Wave Plus • True-Wave Minus • True-Wave Classic • Free-Light • Tera-Light • Metro-Core • ELEAF • NDSF • ALLWave • SMF-28 ULL • SMF28-Ultra
	NCS 1001	• G652-SMF • G652-SMF-28E • True Wave Reach • True Wave RS • Free-Light • Tera-Light • ELEAF

Property	Platform	Description
Length	NCS 2000 NCS 1010 NCS 1001	Displays the span length of the fiber connecting a source and destination site. If necessary, change the span length manually. • The Cisco ONP tool automatically updates the fiber length to 1 km or 1 mile. If you change the fiber length, then the tool updates the same in the network tree and the map accordingly. • In the network tree pane, expand **Fiber** and select the fiber couple, A-Z and Z-A. The properties pane displays the fiber couple name, source side, destination side, its span length, loss, and, Polarization Mode Dispersion (PMD) value. • You can enter the different span length and loss values for the individual fibers in a fiber couple.
Network status	NCS 2000 NCS 1010 NCS 1001	Displays the status of the network, whether the network is being deployed or not. If the network is not deployed, it shows the status as UNDISCOVERED.
Business status	NCS 2000 NCS 1010 NCS 1001	Displays the status of the fiber in a business perspective view. If fiber is not deployed, it shows the status as FUTURE. This field is noneditable.
Measurement Units	NCS 2000 NCS 1010 NCS 1001	Choose the measurement unit (Km or Miles) for the fiber span. You can set the measurement unit only for the duct, but not for the fiber pair (couple) or fiber.
Ageing Loss [dB]	NCS 2000 NCS 1010 NCS 1001	Enter the aging loss value for the fiber.
DCN Extension	NCS 2000 NCS 1010 NCS 1001	Check this check box to enable the default use of data connection network (DCN) extension on each span in the project. This setting implies that the optical service channel (OSC) channel is not used to connect the two nodes.

Property	Platform	Description
OSC FrameType	NCS 2000	Choose the OSC frame type. The options available are: • Auto • OC3 Frame • GE Frame • FE Frame The default option is Auto. When set in Auto, Cisco ONP uses FE Frame as the preferred frame type.
Ageing Factor	NCS 2000 NCS 1010 NCS 1001	Enter the number to fiber aging factor.
Physical		
Length-Based Loss	NCS 2000 NCS 1010 NCS 1001	The fiber loss value is automatically calculated based on length and loss coefficient, when you check this option.
Tot SOL Loss w/o connectors	NCS 2000 NCS 1010 NCS 1001	Enter the start of life fiber loss value for each span, excluding the connector concentrated loss.
Raman Amplification		
Raman Amplified	NCS 2000	Enable Raman Amplification on the ducts. **Note** When you enable Raman amplification for NCS 2000 system release 12.2, the side property *Enable C+L Band S/C* is automatically disabled and vice versa.

Step 3 Click **Update**.

Step 4 To modify the advanced properties of the fibers, click **Show Advanced Properties**, or choose **Network** > **Entity Editor**.

Step 5 Click the **FIBER** tab in the **Entity Editor** window.

Step 6 Choose the fiber and modify the following properties in the right pane.

Property	Platform	Description
General		
Ageing loss [dB]	NCS 2000 NCS 1010 NCS 1001	Enter the aging loss value.

Property	Platform	Description
DCN Extension	NCS 2000 NCS 1010 NCS 1001	Enable the default use of data connection network (DCN) extension on each span in the network.
OSC Frame Type	NCS 2000 NCS 1010	Choose the OSC frame type. The options available are Auto, OC3 Frame, Gigabit Ethernet Frame, and Fast Ethernet Frame. The default option is Auto. When set in Auto, Cisco ONP uses Fast Ethernet Frame as the preferred frame type.
Aging Factor	NCS 2000 NCS 1010 NCS 1001	Enter the number to factor fiber aging. This factor is multiplied by the SOL total span loss without connectors.
Physical		
Connector Loss A	NCS 2000 NCS 1010 NCS 1001	Connector Loss at Source Site [dB]
Connector Loss B	NCS 2000 NCS 1010 NCS 1001	Connector Loss at Destination Site [dB]
Factors		
Loss Coefficient [dB/km]	NCS 2000 NCS 1010 NCS 1001	Loss is calculated based on the loss coefficient.
PMD Coefficient	NCS 2000 NCS 1010 NCS 1001	Displays the PMD coefficient.
QD C-Band	NCS 2000 NCS 1010 NCS 1001	Displays the secondary order dispersion for C-band.
CD C-Band	NCS 2000 NCS 1010 NCS 1001	Displays the secondary order dispersion for L-band.

Property	Platform	Description
RD Factor	NCS 2000 NCS 1010 NCS 1001	Displays the random dispersion value.
Extended		
Effective Mode Area	NCS 2000 NCS 1010 NCS 1001	Displays the effective mode area [µm^2]
SRS tilt coefficient	NCS 2000 NCS 1010 NCS 1001	Displays the Stimulated Raman Scattering tilt coefficient on the band.
DRBS coefficient	NCS 2000 NCS 1010 NCS 1001	Displays the Rayleigh Scattering capture coefficient.
N2	NCS 2000 NCS 1010 NCS 1001	Nonlinear index of refraction [1e-16 cm^2/W]
LFBR	NCS 2000 NCS 1010 NCS 1001	Length of individual fibers for sigmaDSP [Km]
Totals (The properties under Totals are noneditable)		
Loss EOL	NCS 2000 NCS 1010 NCS 1001	Displays the total loss EOL calculation.
Loss SOL	NCS 2000 NCS 1010 NCS 1001	Displays the total loss SOL calculation.
CD C-Band	NCS 2000 NCS 1010 NCS 1001	Displays the total chromatic dispersion for the C-band.

Property	Platform	Description
QD C-Band	NCS 2000 NCS 1010 NCS 1001	Displays the secondary order dispersion for C-band.
RD	NCS 2000 NCS 1010 NCS 1001	Displays the random dispersion value.
PMD	NCS 2000 NCS 1010 NCS 1001	Displays the Polarization Mode Dispersion (PMD) value.

Step 7 Click **Update**.

Modify Fiber Couple Properties

Use this task to modify properties of the fiber couple.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Fiber**, and drill down up to a fiber couple and click the fiber couple.

You can view the basic properties of the fiber couple at the bottom of the network tree.

Step 2 Modify the following fiber couple properties as required.

Property	Platform	Description
General		
Name	• NCS 2000 • NCS 1010 • NCS 1001	By default, fiber couple is named based on the fiber name followed by COUPLE-AZ or COUPLE-ZA. The sides that are connected by the fiber couple are indicated inside brackets. The name is noneditable.
Source Side	• NCS 2000 • NCS 1010 • NCS 1001	Displays the source side name. This field is noneditable.

Property	Platform	Description
Destination Side	• NCS 2000 • NCS 1010 • NCS 1001	Displays the destination side name. This field is noneditable.
Length	• NCS 2000 • NCS 1010 • NCS 1001	Automatically displays the span length of the fiber connecting a source and destination side. Change the span length manually, if necessary. You can enter the different span length and loss values for the individual fibers in a fiber couple.
Factors		
Loss coefficient [dB]	• NCS 2000 • NCS 1010 • NCS 1001	Enter the value of the SOL fiber loss per kilometer used to calculate the loss of each span in the network.
Totals		
Loss SOL	• NCS 2000 • NCS 1010 • NCS 1001	Displays the total loss SOL calculation.
Loss EOL	• NCS 2000 • NCS 1010 • NCS 1001	Displays the total loss EOL calculation.
Physical		
Tot SOL Loss w/o connectors	• NCS 2000 • NCS 1010 • NCS 1001	Enter the start of life fiber loss value for each span, excluding the connector concentrated loss.

Step 3 Click **Update**.

Step 4 To modify advanced properties of the fiber couple, click **Show Advanced Properties**, or choose **Network** > **Entity Editor**.

Step 5 Click the **FIBER** tab in the **Entity Editor** window.

Step 6 Choose the fiber and drill down to the fiber couple, and modify the following properties in the right pane.

Property	Platform	Description
Physical		

Property	Platform	Description
Connector Loss A	• NCS 2000 • NCS 1010	Connector Loss at Source Site [dB]
Connector Loss B	• NCS 2000 • NCS 1010	Connector Loss at Destination Site [dB]
Factors		
PMD coefficient	• NCS 2000 • NCS 1010 • NCS 1001	Displays the PMD coefficient.
Totals (The properties under Totals are noneditable)		
PMD	• NCS 2000 • NCS 1010 • NCS 1001	Displays the PMD value.
Loss EOL	• NCS 2000 • NCS 1010 • NCS 1001	Displays the total loss EOL calculation.
Loss SOL	• NCS 2000 • NCS 1010 • NCS 1001	Displays the total loss SOL calculation.
CD C-Band	• NCS 2000 • NCS 1010 • NCS 1001	Displays the total chromatic dispersion for the C-band.
QD C-Band	• NCS 2000 • NCS 1010 • NCS 1001	Displays the secondary order dispersion for C-band.

Property	Platform	Description
RD	• NCS 2000 • NCS 1010 • NCS 1001	Displays the random dispersion value.

Step 7 Click **Update**.

Modify Service Properties

Use this task to modify the properties of the service.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Services** and click a service.

You can view the basic properties of the service at the bottom of the network tree.

Step 2 Modify the following service properties as required.

Property	Platform	Description
General		
Name	NCS 2000	By default, the service name is based on the source and destination sites and the number of services between them. You can edit the name. For example, if there are two services between site 1 and site 2, the names of the services are Site-1-Site-2-1 and Site-1-Site-2-2, respectively.
Type	NCS 2000	Choose the types of service.

Property	Platform	Description
Protection	NCS 2000	Choose the protection type from the drop-down list. Options available are: • Unprotected • 1+1 • Disjoint • S+NS • 1+R • 1+1+R • 1+1+R+R For more information on protection types, see Supported protection schemes , on page 4.
Source	NCS 2000	Displays the source site name.
Destination	NCS 2000	Displays the destination site name.

Step 3 Click **Update**.

Step 4 To modify advanced properties of the service, click **Show Advanced Properties** or choose **Network** > **Entity Editor**.

Step 5 In the **Entity Editor** window, click the **Service** tab.

Step 6 Choose the service under the network tree, and modify the following properties in the right pane.

Property	Platform	Description
General		
Tertiary Source	NCS 2000	From the drop-down list, select the possible site as a tertiary source.

Property	Platform	Description
Tertiary Destination	NCS 2000	From the drop-down list, select the possible site as a tertiary destination. Tertiary source and tertiary destination are enabled only when you select the protection scheme as Unprotected Disjoint. You can select either tertiary destination or both tertiary source and tertiary destination. • If you select only the tertiary destination, the demand is created between the source and destination and between the source and tertiary destination. These do not have common fibers in the path, which are disjoint. • If you select both tertiary source and tertiary destination, two unprotected demands are created between the source to destination, and tertiary source to tertiary destination. The demands are disjoint to each other.
Primary Path Forcing		
Path	NCS 2000	Cisco ONP automatically selects the shortest path as working path and also allows you to force the path manually.
Fiber	NCS 2000	Primary path fiber is forcing path for working trail.
Regeneration Platform	NCS 2000	Displays the platform of the regeneration site
Regen Sites	NCS 2000	Choose the regeneration site.
Wavelength	NCS 2000	Click **Edit** to choose the wavelength. The default option is Auto.
ODU Timeslot	NCS 2000	Enter the ODU timeslot value.
Section Wavelength(s)	NCS 2000	Displays the selected **Wavelength**.
Src Channel Type	NCS 2000	Choose the type of source channel. The available options are: • Auto—This is the default option. *Auto* option is the contentionless demand. • Contentionless • Colorless • Colored
Dst Channel Type	NCS 2000	Choose the type of destination channel.

Property	Platform	Description
Secondary Path Forcing (Available only for (1+1)		
Path	NCS 2000	Secondary path is the protected path when the primary path fails. This path is the second best path after the primary path.
Fiber	NCS 2000	Secondary path fiber is for protected service, forcing path for the protected trail.
Regeneration Platform	NCS 2000	Displays the platform of the regeneration site
Regen Sites	NCS 2000	Choose the regeneration site.
Wavelength	NCS 2000	Click **Edit** to choose the wavelength. The default option is Auto.
ODU Timeslot	NCS 2000	Enter the ODU timeslot value.
Section Wavelength(s)	NCS 2000	Displays the selected **Wavelength**.
Src Channel Type	NCS 2000	Choose the type of source channel.
Dst Channel Type	NCS 2000	Choose the type of destination channel.
Restoration 1 Path Forcing (Available for 1+R, 1+1+R, 1+1+R+R)		
Path	NCS 2000	Cisco ONP automatically selects the first restoration path.
Fiber	NCS 2000	Choose the first restoration path fibers.
Restoration 2 Path Forcing (Available for 1+1+R+R)		
Path	NCS 2000	Cisco ONP automatically selects the second restoration path.
Fiber	NCS 2000	Choose the second restoration path fibers.
NCS 1 K Domain		
Client Type	NCS 2000	Displays the client type. By default, client type is OTU4.
Interface Type	NCS 2000	Displays the interface type. By default, interface type is BH.
Trunk Mode	NCS 2000	Choose whether the trunk mode is 200G or 300G. By default, Trunk Mode is 200G. **Note** Based on the selected trunk mode, Baud rates are filtered.
Baud Rate	NCS 2000	Choose whether the Baud rates mode as 60 or 69GBd.

Note

- Ensure that you force both primary and secondary path fiber or channel for protected service. Also ensure that the wave type is same for both primary and secondary paths. While doing path forcing, make sure that you perform an end-to-end path forcing from the source to the destination. Analysis fails if the partial path is forced.
- Force the wave path for the wave, which is tagged to the service.
- In case of protection type: 1+1+R+R, 1+1+R, and 1+R, you can force a path in restoration path1 or restoration path2 Fiber that is forced in primary or secondary path Fiber.

Step 7 Click **Update.**

Modify service properties for NCS 1010

Table 58: Feature History

Feature Name	Release Information	Description
L-Band support for 2.4TX transponder card in NCS 1010 network	Cisco ONP Release 25.1.1	In addition to the previously supported C-band, the NCS1K14-2.4T-X-K9 transponder card now also supports the L-band under the **Service** and **Trail** properties for the NCS 1010 network. The 2.4TX card's support for the L-band increases capacity and spectral efficiency by utilizing both the L-band and C-band. C-band and L-band circuits can now use the same cards with different trunks for propagation.

Table 59: Feature History

Feature Name	Release Information	Feature Description
Transponder Support on NCS 1010 Network	Cisco ONP Release 24.3.1	You can now create optical services for the NCS 1010 network. You can include cards such as NCS1K14-2.4T-K9, NCS1K14-2.4T-X-K9, and NCS1K4-QXP-K9 as native transponder instead of optical sources and check the feasibility of the network. You can generate the traffic report and BoM with the exact count of cards and pluggables based on the requirements, along with licensing details for the OLT card and the transponders.

From Release 24.3.1, you can add services between two NCS 1010 or NCS 1020 sites. Use this task to modify the properties of the service.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Services** and click a service.

You can view the basic properties of the service at the bottom of the network tree.

Step 2 Modify the following service properties as required.

Property	Platform	Description
General		
Name	NCS 1010	The services are named as Service-1, Service-2, and so on. You can edit the name.
Type	NCS 1010	Choose the traffic type as 100GE or 400GE.
Protection	NCS 1010	Protection is not supported for the NCS 1010 network. The only option available is **Unprotected**.
Source	NCS 1010	Displays the source site name.
Destination	NCS 1010	Displays the destination site name.
Encryption	NCS 1010	Check this check box to enable encryption on the service. Encrypted and non-encrypted services will not be aggregated and they use separate trunks. **Note** Encryption is supported only for NCS1K14-2.4T-X-K9 and NCS1K4-QXP-K9

Step 3 Click **Update**.

Step 4 To modify the advanced properties of the service, click **Show Advanced Properties** or choose **Network** > **Entity Editor**.

Step 5 In the **Entity Editor** window, click the **Service** tab.

Step 6 Choose the service under the network tree, and modify the following properties in the right pane.

Property	Platform	Description
Primary Path		
Path	NCS 1010	Path of the service.
Fiber	NCS 1010	Choose the fiber.
Regen Sites	NCS 1010	Choose the regeneration site.

Property	Platform	Description
Channel	NCS 1010	Choose if a new circuit is to be created or an existing circuit to be used. The available options are: • **Auto**: The system will automatically choose whether to create a new circuit or use an existing one. • **Create New**: A new circuit will be created, and no existing circuits will be used. • Existing circuits (Displays the name of the circuits that are already created): Select an existing circuit to use. If you need to specify a particular circuit, choose a circuit from drop-down list. **Note** When you select an existing circuit with the following conditions: • **Traffic Type** is set to *Transponder Card* under the circuit properties. • **Trunk Mode** and **Baud Rate** are already defined under the Trail properties You will not be able to select **Trunk Mode** and **Baud Rate** under the Service properties. To edit these properties change the traffic type and change the **Channel** property to *Auto* or *Create New*.
Band Type	NCS 1010	Displays whether it is a C-type or L-type band. If you choose NCS1K14-2.4T-X-K9 as the *Card Type*, you can select the band as C-Band or L-Band.
Section Wavelengths	NCS 1010	Choose the wavelength for the regen site that is selected.
Trunk mode	NCS 1010	Choose the trunk mode of the line card. The trunk rate is from 400G to 1200G for NCS1K14-2.4T-K9 and NCS1K14-2.4T-X-K9, from 100G to 400G for NCS1K4-QXP-K9.
Baud Rate	NCS 1010	Select the baud rate. The baud rates that are suitable for the trunk rate chosen are displayed.
Wavelength	NCS 1010	Click **Edit** to choose the wavelength. The default option is Auto.
Primary Channel Source		

Property	Platform	Description
Card Type	NCS 1010	Choose the card for the service. The available options are: • NCS1K14-2.4T-K9 • NCS1K14-2.4T-X-K9 • NCS1K4-QXP-K9
TXP Chassis	NCS 1010	Choose the transponder chassis for the service. The available options are: • NCS 1014 • NCS 1004—Supports only NCS1K4-QXP-K9
Modulation	NCS 1010	Displays the type of modulation.
Bundle Mode	NCS 1010	This property is enabled when the NCS1K14-2.4T-X-K9 card is selected. When selected, the routing will be based on Muxponder mode and supports Trunk modes 600G or 1000G. **Note** Default value for trunk mode will be 600G when bundle mode is enabled.
Trunk Mode	NCS 1010	Choose a trunk mode from the drop-down list. The options for trunk mode changes based on the selected Card Type.
Sub Mode	NCS 1010	This field is applicable only for the NCS1K4-QXP-K9 card. Choose the required sub mode. The available options are: • 1_E • 0_S
FEC	NCS 1010	Displays the type of FEC supported on the chosen card.
Src Add/Drop Type	NCS 1010	Choose the Add/drop type. The available options are: • Colored • Colorless • Omni-colored • Omni-colorless
Client Interface	NCS 1010	Choose the client pluggable for the selected card.
Client Port	NCS 1010	This property is enabled only when a trunk mode is selected. Choose the client port.

Property	Platform	Description
Trunk Type	NCS 1010	The trunk pluggables that are applicable for the selected card is displayed. Choose the required trunk pluggable.
Primary Channel Destination		
Card Type	NCS 1010	Choose the card for the service. The available options are: • NCS1K14-2.4T-K9 • NCS1K14-2.4T-X-K9 • NCS1K4-QXP-K9
TXP Chassis	NCS 1010	Choose the transponder chassis for the service. The available options are: • NCS 1014 • NCS 1004—Supports only NCS1K4-QXP-K9
Modulation	NCS 1010	Displays the type of modulation.
Bundle Mode	NCS 1010 t	This property is enabled when the NCS1K14-2.4T-X-K9 card is selected. When selected, routing will be based on Muxponder mode and supports Trunk modes 600G or 1000G. **Note** Default value for trunk mode will be 600G when bundle mode is enabled.
Trunk Mode	NCS 1010	Choose a trunk mode from the drop-down list. The options for trunk mode changes based on the selected Card Type.
Sub Mode	NCS 1010	This field is applicable only for the NCS1K4-QXP-K9 card. Choose the required sub mode. The available options are: • 1_E • 0_S
FEC	NCS 1010	Displays the type of FEC supported on the chosen card.
Dst Add/Drop Type	NCS 1010	Choose the Add/drop type. The available options are: • Colored • Colorless • Omni-colored • Omni-colorless
Client Interface	NCS 1010	Choose the client pluggable for the selected card.

Property	Platform	Description
Client Port	NCS 1010	This property is enabled only when a trunk mode is selected. Choose the client port.
Trunk Type	NCS 1010	The trunk pluggables that are applicable for the selected card is displayed. Choose the required trunk pluggable.

Step 7 Click **Update.**

Services Aggregation

Table 60: Feature History

Feature Name	Release Information	Feature Description
Services Aggregation	Cisco ONP Release 4.1	Services aggregation feature allows two or more services to share the same trunk port or channel. By default, the services are added to the DefaultGroup. You can also export the aggregation reports.

Services aggregation indicates whether two or more services can share the same trunk port or channel. The aggregation is defined based on the properties of the Service Group. When you add services to the Traffic site (of the type 1K-2K-4K) in an SSON network, a **DefaultGroup** is created under the **Services** in the network tree. The services that you add, are associated to the **DefaultGroup**.

Create a New Service Group

Use this task to create a new service group:

Before you begin

Log in to Cisco ONP web interface, on page 7

Procedure

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

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

Step 2 Click a network, where you want to create a new service group.

The network opens.

Step 3 Click the **Ellipsis** icon available in the right side of **Services** under the network tree and choose **Create Service Group**.

A new service group gets created under the Services.

Modify Service Group Properties

Use this task to modify the properties of service group.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Services** and click a service group.

You can view the basic properties of the service at the bottom of the network tree.

Step 2 Modify the following service properties as required.

Property	Platform	Description
General		
Name	NCS 2000	By default, the service name is based on the source and destination sites and the number of services between them. You can edit the name. For example, if there are two services between site 1 and site 2, the name of the services are Site-1-Site-2-1 and Site-1-Site-2-2, respectively.
Demand Types	NCS 2000	Choose the demand type. For default group all demand types are available, and you cannot edit them.
Default Group	NCS 2000	Indicates whether the service group is a default group or a user created group.
NCS 4 K		
Exclusive LC Usage	NCS 4000	Indicates whether the services belonging to this group must have an exclusive Line Card (LC) or not. For example, when you check this check box, neither the Client LC nor the Trunk LC of the services belonging to this group can be shared by services belonging to any other groups.

Property	Platform	Description
Symmetric Aggregation	NCS 4000	Indicates whether this group allows aggregation of only symmetric services. Services are symmetric if they have same protection scheme. Following are the various protection schemes: • Unprotected • 1+R • 1+1 • 1+1+R • 1+1+R+R For Example, all “1+1” services are symmetrical. If you check this check box, this service group allows aggregation of only symmetrical services. For example, “Unprotected” can be aggregated only with “Unprotected”, “1+R” only with “1+R”, “1+1” only with “1+1”, and so on. If this check box is unchecked, this service group allows aggregation of symmetrical and unsymmetrical services together. For example, “Unprotected” can be aggregated with either “Unprotected”, “1+R”, “1+1” “1+1+R” or “1+1+R+R”. See Aggregation Rules, on page 171.
NCS 1 K		
Exclusive LC Usage	NCS 1004	Same as NCS 4 K.
Symmetric Aggregation	NCS 1004	Same as NCS 4 K.

Step 3 Click **Update**.

Aggregation Rules

Following are the rules for any two services (symmetrical or nonsymmetrical) to be aggregated:

- The services must have the same Source and Destination.
- The services must have same paths for the same path types.

  For example:

  - For symmetric aggregation between two “1+1” services, the working path of the first service must match with the working path of the second service and the protection path of the first service must match with the protection path of the second service.

- For non-symmetric aggregation between “1+1” and “1+1+R” services, the working path of the first service must match with the working path of the second service and the protection path of the first service must match with the protection path of the second service. The restoration path of second service can be anything.

- The services must be configured to use same wavelength for same path types.
- If the wavelength is set to “auto”, it is flexible to be aggregated with other “auto" wavelength or a fixed wavelength.
- The services must be configured to use same trunk mode for same path types.
- The services must be configured to use same regeneration sites for same path types.

Note Demand Type is not used as a constraint for aggregation (except for trunk capacity availability).

Associate a Service to the Newly Created Group

By default, the services are associated to the **DefaultGroup**. But you can change the group.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, click the service that you want to associate to a group.

You can view the basic properties of the network at the bottom of the network tree.

Step 2 Choose the group from the **Service Group** drop-down list.

Step 3 Click **Update**.

Note
For an LNI imported network, by default, all the services are present in the Default group. Only when you upgrade the LNI imported network for the first time, you can move the services to other newly created Service Groups without having to unlock them. On subsequent upgrades, you must unlock the services to facilitate the movement between Service Groups. Also, the Service Groups are in locked state in the upgrade mode, unless a complete Network-level unlock has been performed.

What to do next

Export Aggregation Reports

Use this task to export the service aggregation reports:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

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

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

Step 2 Click an analyzed network.

The network opens.

Step 3 Choose **Export** > **Service Aggregation**.

Step 4 Save the aggregation report in the form of an Excel sheet to your local system.

Modify Wave Properties

Table 61: Feature History

Feature Name	Release Information	Feature Description
PSM Support on Non-SSON Network	Cisco ONP Release 24.3.1	The **PSM-channel** option is now available as a **Protection Type** under the Wave properties for NCS 2000 non-SSON networks. This option allows you to use PSM channel trunk protection with the PSM card during network design, in addition to existing client protection. You can verify the optical feasibility for both working and protection paths, providing all necessary parameters and connections for deployment.

Use the following task to modify the properties of the wave.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Waves**, and click a wave.

You can view the basic properties of the wave at the bottom of the network tree.

Step 2 Modify the following wave properties as required.

Property	Platform	Description
General		
Label	NCS 2000	By default, the wave is named based on the source and destination sites and the number of waves between them. You can edit the name. For example, if there are two waves defined between site 1 and site 2, the waves are named as Site-1-Site-2-1 and Site-1-Site-2-2, respectively.
Source Site	NCS 2000	Displays the source site name.
Destination Site	NCS 2000	Displays the destination site name.
Traffic Type	NCS 2000	Choose the traffic type from the drop-down list. The available options are: • Optical Source • 100GE • 10GE LAN PHY • 40GE LAN PHY • Fiber Channel 10G • Fiber Channel 16G • Fiber Channel 8G • OC-192/STM-64 • OTU2 • OTU2e • OTU4 • Pluggable Card

Property	Platform	Description
Protection Type	NCS 2000	Choose the protection type. • Unprotected • Client 1+1 • PSM-Channel The *PSM-channel* option is available only for non-SSON networks. PSM-channel is not supported with the colorless Add/Drop MF-6AD-COFS. When you select the *PSM-Channel* option, the Protection Switch Module (PSM) for the Cisco ONS15454 Multiservice Transport Platform (MSTP) (15454-PSM card) is placed in the network to provide protection at the trunk level. The PSM card splits the traffic originated by transponder trunk across the working and protected TX ports. For more information on protection types, see Supported protection schemes , on page 4.
Forecast	NCS 2000	Check this check box to change a present wave to a forecast wave.
Encryption	NCS 2000	Check this check box to enable encryption.

Step 3 Click **Update**.

Modify Media Channel Properties

Use the following task to modify properties of the media channel.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Media Channels**, and click a media channel.

You can view the basic properties of the media channel at the bottom of the network tree.

Alternatively, you can choose **Network** > **Entity Editor** > **Services**, expand **Media Channels**, and click a media channel to view the properties.

Step 2 Modify the following properties as required.

Property	Platform	Description
General		
Label	NCS 2000	By default, the media channel is named based on the source and destination sites and the number of media channels between them. You can edit the name. For example, if there are two media channels between site 1 and site 2, they are named as Site-1-Site-2-1 and Site-1-Site-2-2, respectively.
Source Site	NCS 2000	Displays the source site name.
Destination Site	NCS 2000	Displays the destination site name.
Traffic Type	NCS 2000	Choose the traffic type from the drop-down list. The available options are: • Optical Source • 100GE • 10GE LAN PHY • 40GE LAN PHY • Fiber Channel 10G • Fiber Channel 16G • Fiber Channel 8G • OC-192/STM-64 • OTU2 • OTU2e • OTU4 • Pluggable Card
Protection Type	NCS 2000	Choose the protection type. • **Unprotected** • **Client 1+1** For more information on protection types, see Supported protection schemes , on page 4. For Client 1+1, ensure that the sites have contentionless sides for the analysis to be successful. By default, Cisco ONP finds both span and node disjoint path for Client1+1 protected waves, but allows you to force span and node disjoint path.

Property	Platform	Description
Forecast	NCS 2000	Check this check box to change a present wave to a forecast wave.
Encryption	NCS 2000	Check this check box to enable encryption.

Step 3 Click **Update**.

Modify circuit properties

Use the following task to modify the properties of the circuit in an NCS 1010 network.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Circuits**, and click a circuit.

You can view the basic properties of the circuit at the bottom of the network tree.

Step 2 Modify the following circuit properties as required.

Property	Platform	Description
General		
Label	NCS 1010 NCS 1001	By default, the circuit is named based on the source and destination sites and the number of circuits between them. You can edit the name. For example, if there are two circuits defined between site 1 and site 2, the circuits are named as Site-1-Site-2-1 and Site-1-Site-2-2, respectively.
Source Site	NCS 1010 NCS 1001	Displays the source site name.
Destination Site	NCS 1010 NCS 1001	Displays the destination site name.

Property	Platform	Description
Traffic Type	NCS 1010 NCS 1001	Choose the traffic type from the drop-down list. The available options are: • Optical Source • Pluggable Card • Transponder Card **Note** QDD interfaces (both as optical source and pluggable) are not supported with colorless BRK-8, BRK-16, and BRK-24 configurations.
Protection Type	NCS 1010 NCS 1001	Choose the protection type. Currently, we support only Unprotected.
Encryption	NCS 1010	The Encryption property gets enabled when you select *Line card* as the **Traffic Type**.
Forecast	NCS 1010 NCS 1001	Check this check box to change a present wave to a forecast wave.

Step 3 Click **Update**.

Modify trail properties

Use this task to modify the properties of the trail.

Table 62: Feature History

Feature Name	Release Information	Description
Bright ZR+ Pluggable Support	Cisco ONP Release 5.1	The Bright ZR+ pluggable can now be included in the network design by choosing them as **Card Type** or **Client Interface** under the **Trail** properties. This selection is available for all types of sites. The Bright ZR+ pluggable has high transmit optical power up to 0dBm, high transmit OSNR, and high-density QSFP-DD form factor.

Table 63: Feature History

Feature Name	Release Information	Description
Multilayer Nodes Enhancements	Cisco ONP Release 5.1	You can now choose from the full array of supported **Card Types** and **Client Interfaces** under the **Trail** properties option for the multilayer nodes. Previously, only a limited set of cards were available for selection. With this enhancement, you can design diverse networks leveraging the unique functionalities of all types of cards.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Waves**, **Media Channels** or **Circuits**, drill down up to a trail and click a trail.

The basic properties of the trail are displayed at the bottom of the network tree.

Step 2 Modify the following trail properties as required.

Property	Platform	Description
General		
Label	NCS 2000 NCS 1010 NCS 1001	Displays the name of the trail.
Path of Wave	NCS 2000 NCS 1010 NCS 1001	Select a fiber from the drop-down list.
Regen Sites	NCS 2000 NCS 1010	Select the regeneration site.
Source Site	NCS 2000 NCS 1010 NCS 1001	Displays the source site name.

Property	Platform	Description
Destination Site	NCS 2000 NCS 1010 NCS 1001	Displays the destination site name.
Wavelength	NCS 2000 (Non-SSON)	Click **Edit** to choose the wavelength. The default option is Auto.
Central Wavelength [nm]	NCS 2000 NCS 1010 NCS 1001	Click **Edit** to choose the central wavelength. The default option is Auto. **Note** If you select *L-Band* as **Band Type**, the L-band wavelength options appear along with C-band wavelengths for NCS 1010 R7.9.1.
Multicarrier	NCS 2000 NCS 1010	Indicates whether the transmission is a multicarrier transmission.
Trunk Mode	NCS 2000	The trunk mode can be edited only when you choose *400G-XP-LC* as **Card Type**.
	NCS 1010	The trunk mode can be edited only when the **Traffic Type** is set to *Line card* under the circuit properties.
	NCS 1001	Trunk mode is noneditable. *Auto* is default option.
Number Of Carrier(s)	NCS 1010	Enter values 2–16 to add the required number of carriers to the channel. The default value is 1. **Note** If you select *Colorless* or *Omni-Colorless* as **Add/Drop Type** and *Auto* or *OLT/LC/AddDrop* as **Add/Drop Connector**, this property becomes editable. **Note** When you enable bundle mode in line circuit, this value is 2 and non-editable.
Baud Rate	NCS 1010	Choose the baud rate that is suitable for the selected trunk rate.
Filtering Penality	NCS 2000 NCS 1010	Displays the value of the penalties that are caused by the different filter types (OADM, and ROADM).

Step 3 To modify the advanced properties of the trail, click **Show Advanced Properties** or choose **Network** > **Entity Editor**.

Step 4 In the **Entity Editor** window, click the **Service** tab.

Step 5 Expand **Waves**, **Media Channels** or **Circuits**, under the network tree, drill down to the trail, click the trail, and modify the following properties that are displayed in the right pane.

Property	Platform	Description
General		
OSNR Forward [dB]	NCS 2000 (non-SSON)	Displays the forward optical signal to noise ratio.
OSNR Reverse [dB]	NCS 2000 (non-SSON)	Displays the reverse optical signal to noise ratio.
Band Type	NCS 1010	Choose the required band type for the circuit. **Note** When you select *L-Band* as **Band Type**, then the **Add/Drop Type** field automatically selects *Colorless* and becomes disabled.
	NCS 1001	This property is noneditable. *C-Band* is the default option.
OTN (non-SSON)		
ODUTimeslot	NCS 2000 (non-SSON)	Displays the Optical Data Unit timeslot.
SRLGs	NCS 2000 (non-SSON)	Displays the SRLGs associated with the trail.
OTN Hops	NCS 2000 (non-SSON)	Displays the number of OTN hops.
Quantity	NCS 2000 (non-SSON)	Displays the number of OTN services on the trail.
Source		

Property	Platform	Description

Card Type	NCS 2000
	NCS 1010
		Choose the card used in the source site. See Supported Cards and Pluggables, on page 293 and Supported Optical Sources, on page 307 for more information on the list of supported cards.
		From Release 5.1, Bright ZR+ pluggables are supported for all the types of sites. Also, there are no limitations on the type of cards that can be chosen for the multilayer nodes.
		Note
		• Non-SSON
		  • Colored and colorless—Baud rates less than 42 are supported and listed.
		  • Contentionless—Mean power less than –4.4 is supported and listed.
		• SSON
		  • Colored—Baud rates less than 65 are supported and listed.
		  • Colorless—All interfaces supported and listed.
		  • Contentionless—Mean power less than –4.4 are supported and listed.
		Mean power = (ochData.txRange.max + ochData.txRange.min)/2
		If contentionless is selected for the *source channel type*, the QDD interfaces are not supported.

	NCS 1001	Choose a card type from the drop-down list.

Property	Platform	Description
Client Interface	NCS 2000 NCS 1010	Choose the pluggable from the drop-down list. The pluggables suitable for the chosen card type are displayed. See Supported Cards and Pluggables, on page 293 for more information on the list of supported pluggables. From Release 5.1, Bright ZR+ pluggables are supported for all the types of sites. Also, there are no limitations on the type of cards that can be chosen for the multilayer nodes. The pluggable FR-1(QSFP-100G-FR-S) is supported on the client ports of the 400G-XP LC starting from NCS 2000 Release 11.1.0. The pluggable ERL (QSFP-100G-ERL-S) is supported on the client ports of the 400G-XP LC with 100G traffic type starting from NCS 2000 Release 11.1.3. **Note** When you export the NCS 2000 R11.1.3 network, the Cisco ONP exports the NCS 2000 R11.1.0 report. You must edit the exported report for R11.1.3.
	NCS 1001	This property is noneditable. *Auto* is the default option.
Add/Drop Type	NCS 2000	Choose the type of Add/Drop. The available options are: • Auto • Contentionless • Colorless • Colored
	NCS 1010	Choose the type of Add/Drop. The available options are: • Auto • Colorless • Colored • Omni-Colorless • Omni-Colored
	NCS 1001	This property is noneditable. *Colored* is the default option.

Property	Platform	Description
Add/Drop Connector	NCS 1010	**Note** This property appears when you select **Add/Drop Type** as *Colorless*. Choose the type of Add/Drop Connector. The available options are: • Auto—Auto is OLT/LC/AddDrop. • OLT/LC/Add/Drop—Combination of OLT LC ports and CCMD-16 LC ports • OLT/LC—Direct OLT LC ports • OLT/MPO/Add/Drop—Combination of OLT LC ports and break out units such as BRK-8, BRK-16, BRK-24 MPO ports **Note** This property is applicable only for Enhanced NCS 1010 line cards from R7.11.1.
Modulation	NCS 1010	Displays the type of modulation.
Bundle Mode	NCS 1010	This property is enabled when the NCS1k14-2.4T-X-K9 card is selected. When selected, the routing is based on Muxponder mode and supports Trunk modes 600G or 1000G.
Sub Mode	NCS 1010	This field is applicable only for the NCS1K4-QXP-K9 card. Choose the required sub mode. The available options are: • 1_E • 0_S
FEC	NCS 1010	Displays the type of FEC supported on the chosen card.
Trunk Type	NCS 2000 NCS 1010	Choose the trunk type from the drop-down list.
	NCS 1001	This property is noneditable. *Auto* is the default option.
Contentionless Side	NCS 2000	Choose the contentionless side from the drop-down list.
Launch Power	NCS 1010 NCS 1001	Enter a launch power value. Default option is *Auto*.
Destination		

Property	Platform	Description
Card Type	NCS 2000 NCS 1010	The destination card type is auto populated based on the source card type chosen.
	NCS 1001	Choose the card type from the drop-down list.
Client Interface	NCS 2000 NCS 1010	Choose the pluggable from the drop-down list. The pluggables suitable for the chosen card type are displayed.
	NCS 1001	This property is noneditable. *Auto* is the default option.
Trunk Type	NCS 2000 NCS 1010	Choose the trunk type from the drop-down list.
	NCS 1001	This property is noneditable. *Auto* is the default option.
Add/Drop Type	NCS 2000	Choose the type of the Add/Drop. The available options are: • Auto • Contentionless • Colorless • Colored
	NCS 1010	Choose the type of the Add/Drop. The available options are: • Auto • Colorless • Colored • Omni-Colorless • Omni-Colored
	NCS 1001	*Colored* is the default option.

Property	Platform	Description
Add/Drop Connector	NCS 1010	**Note** This property appears when you select **Add/Drop Type** as *Colorless*. Choose the type of Add/Drop Connector. The available options are: • Auto—Auto is OLT/LC/AddDrop. • OLT/LC/Add/Drop—Combination of OLT LC ports and CCMD-16 LC ports • OLT/LC—Direct OLT LC ports • OLT/MPO/Add/Drop—Combination of OLT LC ports and break out units such as BRK-8, BRK-16, BRK-24 MPO ports **Note** This property is applicable only for Enhanced NCS 1010 line cards.
Modulation	NCS 1010	Displays the type of modulation.
Bundle Mode	NCS 1010	This property is enabled when the NCS1k14-2.4T-X-K9 card is selected. When selected, the routing is based on Muxponder mode and supports Trunk modes 600G or 1000G.
Sub Mode	NCS 1010	This field is applicable only for the NCS1K4-QXP-K9 card. Choose the required sub mode. The available options are: • 1_E • 0_S
FEC	NCS 1010	Displays the type of FEC supported on the chosen card.
Trunk Type	NCS 1010	Choose the trunk pluggable. From R25.1.1, new pluggables are supported on the NCS1K4-QXP-K9 card.
Contentionless Side	NCS 2000	Choose the contentionless side from the drop-down list.
Launch Power	NCS 1010 NCS 1001	Enter a launch power value. Default option is *Auto*.

Step 6 Click **Update**.

Modify Section Properties

Use this task to modify properties of the section.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, expand **Waves**, drill down up to section and click a section.

You can view the basic properties of the section at the bottom of the network tree.

Step 2 Modify the section properties as required.

Section and trail have the same properties. Refer Modify trail properties, on page 178 for the descriptions of the properties.

Step 3 Click **Update**.

Modify Side Properties

Table 64: Feature History

Feature Name	Release Information	Feature Description
Colorless Add/Drop Configuration with SMR-9 Card	Cisco ONP Release 24.3.1	In addition to the SMR-20 card, the colorless Add/Drop configuration can now be added to both SSON and non-SSON networks using the SMR-9 card, providing more flexibility to use the available SMR-9 ports for add/drop functionality.

Table 65: Feature History

Feature Name	Release Information	Feature Description
NCS2K-RMN-CTP-C+L support	Cisco ONP Release 5.0	Cisco ONP now supports the passive module, NCS2K-RMN-CTP-C+L (C- and L-band counterpropagating Raman amplifier), starting from the NCS 2000 system release 12.3.1 for SSON and non-SSON networks.

Table 66: Feature History

Feature Name	Release Information	Feature Description
Support for NCS2K-MF-CL-SC (C and L-band combiner and splitter)	Cisco ONP Release 4.2	Cisco ONP supports the passive module, NCS2K-MF-CL-SC (C and L-band combiner and splitter), starting from the NCS 2000 system release 12.2 for SSON and non-SSON networks. This feature enables combining C and L band wavelengths.

Use this task to modify the properties of a side in a site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, Choose **Sites** > **Site** > **Site domain** > **Side**.

Step 2 To modify the side properties, perform the following steps:

a) Click **Show Advanced Properties**.

b) In the right pane of the **Entity Editor** window, modify the following properties of the side.

Note
You cannot edit the properties of the Pass through site side.

Options	Platform	Description
General		
Label	NCS 2000 NCS 1010 NCS 1001	Displays the label of the side. Editable for NCS 1001. **Note** For L-band nodes, the suffix **L** is added to the side label.
Type	NCS 2000 NCS 1010 NCS 1001	Displays the type of the side. You cannot edit this property.

Options	Platform	Description
Omni Variant	NCS 1010	Select the type of omnidirectional add/drop stage. The available options are: • Dual OLT (the default option) • 4x4 COFS (supports only C-band Omni colorless) You can choose 4x4 COFS only if the **Structure** under the **Sites** properties is *Line*. **Note** In a site, all Omni edges must have the same Omni Variant. Changing the Omni Variant for one edge updates the variant for all edges.
Omni Directional Ports	NCS 1010	Enter the number of omnidirectional ports. It is applicable only for the 4x4COFS Omni variant. The available values range from 1 through 4, with a default value of 4.
Node Address	NCS 1010 NCS 1001	Enter the node address
MPO Cable	NCS 1010	Choose the MPO cable. The available options are: • Auto • 16MPO-MPO • 24MPO-MPO
Colorless Ports (Displayed for Line side)	NCS 2000	Enter the number of colorless ports. From Release 24.3.1, this property is enabled for the SMR-9 card.
Contentionless Ports (Displayed for Contentionless side)	NCS 2000	Choose the number of contentionless ports.

Options	Platform	Description
Enable C+L Band S/C (Displayed for Line side type)	NCS 2000	Cisco ONP supports the following passive modules: • NCS2K-MF-CL-SC (C and L-band combiner and splitter), starting from the NCS 2000 system release 12.2 for SSON and non-SSON networks. Check this check box to enable the NCS2K-MF-CL-SC card. This card is supported for ROADM, OLA, and traffic nodes, but not on the passthrough node. **Note** When you enable this option on a side: • It is automatically enabled on the side that is connected to the selected side through a fiber. • The fiber property *Raman Amplified is* automatically disabled, and the opposite way. • This card introduces a certain amount of attenuation and insertion loss that is reflected in the ANS parameters. The NCS2K-MF-CL-SC module does not appear in the layout. • NCS2K-RMN-CTP-C+L (C- and L-band counterpropagating Raman amplifier), starting from the NCS 2000 system release 12.3 for SSON and non-SSON networks. Check this check box to enable the NCS2K-RMN-CTP-C+L card. **Note** When you enable this option on a side: • If you enable the fiber property *Raman Amplified*, then the *NCS2K-RMN-CTP-C+L* card is automatically forced. • If you disable the fiber property *Raman Amplified*, then the *NCS2K-MF-CL- SC* card is automatically forced. • Fiber property *Raman Amplified is* automatically disabled for NCS 2000 system release 12.2. The NCS2K-RMN-CTP-C+L module appears in the layout.

Options	Platform	Description
Band Type	NCS 1010 NCS 1001	Choose the required band type. The available options are: • C-Band • C+L Futuristic
NCS 1010 Line Card	NCS 1010	Choose whether the Line Card faceplate is Standard Faceplate or Enhanced Faceplate. **Note** If you assigned a **Scalable Upto Degree** value that is supported for both standard and enhance at the site level, then you can select *Standard Faceplate* in one side and *Enhanced Faceplate* in another side.
Probe Channel	NCS 1014	The Probe channel pluggable option that you selected at the network level applies to all the edges of all sites in the network. This field is noneditable.
OTDR Pluggable	NCS 1014	The OTDR pluggable option that you selected at the network level applies to all the edges of all sites in the network. This field is noneditable.
OSC Pluggable	NCS 1001	Choose the type of OSC pluggable. The available options are: • CWDM-SFP-1510 • CWDM-SFP-1610 • ONS-SC-Z3-1510 • ONS-SC-Z3-1610 • ONS-SE-155-1510
	NCS 1014	Choose the type of OSC pluggable. The available option is: • ONS-SC-PTP-1510
Bill of Material		
License Suite	NCS 1010	Choose whether the License Suite is Essential (RTU +SIA3) or Advanced (RTU +SIA3).
	NCS 1014	The default option is RTU + SIA3. It is noneditable.
Layout		

Options	Platform	Description
Power Supply	NCS 1010 NCS 1001	Choose the type of Power Supply. The available options are Auto, AC Power, and DC Power. The default option is Auto. With the *Auto* option, the default power supply is selected as *DC Power*.
Chassis Type	NCS 1010	Choose the type of chassis. The available options are: • NCS 1010 • NCS 1020
NCS1014 Grouping	NCS 1014	This check box is enabled by default. If you enabled NCS 1014 grouping at the site level, then this check box becomes noneditable.
Controller Card	NCS 1010	Choose the type of the controller card. The available options are: • Auto • NCS1010-CNTRL-K9 • NCS1010-CNTRL-B-K9
	NCS 1001	NCS1K-CNTLR2 is default.
Redundant Controller Card	NCS 1010 NCS 1001	Displays the redundant controller card, if any. Else displays No.
UTS AC Power Cables	NCS 1010 NCS 1001	Choose the type of cables to be used for the AC power supply. You can choose the cables when the **Power Supply** is set as *AC Power* or *DC Power*.
Redundant Power Scheme	NCS 1010 NCS 1001	Choose the redundant power scheme from the drop-down list to configure the number of working and protected power units for the chassis. The available options are Auto, 1+0, and 1+1.
MF Unit	NCS 1010 NCS 1001	Choose the mechanical frame for the passive optical modules from the drop-down list. The options available are Auto, MF-1RU, and MF-4RU.
Enhanced Face Plate Options		

Options	Platform	Description
Degree Priority	NCS 1010	Choose the port type for interconnect degree priority. The available options are: • LC Ports • MPO Group The default option is *LC Ports*. **Note** This field appears only when you select **NCS 1010 Line Card** as *Enhanced Faceplate*.
Direct LC Add/Drop	NCS 1010	Choose the number of LC ports to reserve for Direct Add/Drop connection. The range of values is 0–14. This property appears for networks from R7.10.1. The chosen option will not be used for Degree Connection.

c) Click **Update**.

Modify C-Band Amplifier Properties

Table 67: Feature History

Feature Name	Release Information	Feature Description
Manual Editing of Raman COP values	Cisco ONP Release 4.1	This feature allows you to edit the crosstalk values of the Raman COP amplifier in the SSON network, starting from NCS 2000 Release 11.1.

Table 68: Feature History

Feature Name	Release Information	Feature Description
Inline Amplifier	Cisco ONP Release 4.2	The **Inline Amplifier** option allows you to enable an inline amplifier in the network. You can simulate the optical feasibility of the network with and without an inline amplifier. Based on the colorless or colored add/drop type selected and the QSFP-DD pluggable status, a default inline amplifier is enabled for the network.

Use this task to modify the properties of a c-band amplifier in a site.

Note Make sure that SMR card is forced on the site before you update the c-band amplifier properties.

Before you begin

Log in to Cisco ONP web interface, on page 7

Procedure

Step 1 In the network tree, choose **Sites** > **Site** > **Site domain** > **Side** > **C-Band**.

Step 2 To modify the amplifier properties, perform the following steps:

a) Click **C-Band Amplifier**.

You can view the properties of the C-Band Amplifier at the bottom of the network tree. For more information, see Supported Amplifiers, on page 313.

b) Modify the following properties of the amplifier:

You can also modify the properties by choosing the **C-Band Amplifier** under **Network** > **Entity Editor**.

Options	Platform	Description
General		
PSD Shape	NCS 1010	Enter a Power Spectral Density (PSD) value.
Dual Band PSD Shape	NCS 1010	Enter Central PSD and Tilt values.
Raman COP Tilt	NCS 2000	The default value is Auto. You can enter a value.
Pre Tilt	NCS 2000 NCS 1010	The default value is Auto. You can enter a value.
Raman Tilt	NCS 2000 NCS 1010	The default value is Auto. You can enter a value.
Booster Tilt	NCS 2000 NCS 1010	The default value is Auto. You can enter a value.

Options	Platform	Description

Inline Amplifier	NCS 2000	Choose whether inline amplifier can be forced. The available options are:
		• Yes—EDFA17 or EDFA35 amplifier is chosen as the default amplifier when you choose colored add/drop module MD-64-C or colorless add/drop MF-6AD-CFS, respectively. See Modify Add/Drop Multiplexer Properties, on page 202.
		• No—No amplifier can be forced.
		• Auto
		  • EDFA17 amplifier is chosen as the default amplifier when any one of the demands aggregated in MD-64-C has low launch power optical resource or QSFP-DD pluggable is forced.
		  • EDFA35 amplifier is chosen as the default amplifier when any one of the demands aggregated in MF-6AD-CFS has low launch power optical resource or QSFP-DD pluggable is forced.
		Note
		When you configure MF-6AD-CFS+EDFA35 in an SSON or non-SSON network, the optical results show system error for the demands of the same or different types. This error affects the what-if analysis. Hence we recommend choosing the appropriate channel and client attenuators so that the inline amplifier works at the proper gain range.
		You can view the amplifier added in the **IPC**, **BOM**, and **Layout** tabs, after the successful analysis.
		Note
		• When you add a QDD demand while upgrading a network where the Inline Amplifier property is set as *no*, the inline amplifier can be included in the network only if you unlock the side and set the Inline amplifier property as *Auto* or *Yes*.
		• Default colorless configuration does not require inline amplifier.
		• When there are no demands passing through the colored or colorless Add/Drop device, the forced Inline amplifier is not placed.

Options	Platform	Description
From Fiber		
Pre Amp	NCS 2000	Choose a preamplifier from the drop-down list. The default value is Auto. To enable this field for ROADM and Traffic nodes, you must choose SMR-9 or SMR-20 from the **Site Type** drop-down list under the Site properties. If you choose SMR-9, the available options are: • SMR9-FS-EDFA17-PRE • SMR9-FS-EDFA24-PRE • SMR9-FS-EDFA24-PRE If you choose SMR-20, the available options are: • SMR20-FS-EDFA17-PRE • SMR20-FS-EDFA24-PRE For the OLA site, the available options are: • EDFA35-35-PRE • EDFA35-24-PRE • OPT -EDFA-17 • OPT -EDFA-24
	NCS 1010	The options available for NCS 1010 are: • Auto • Normal • Extended
	NCS 1001	The options available for NCS 1001 are: • Auto • NCS1001-PRE-1 • NCS1001-PRE-2
	NCS 1014	The Pre Amplifier value is decided based on the launch power of the optical source. The default option is Auto. It is noneditable.
Pre PSD	NCS 1014	The Pre PSD value is picked from LUT. The default option is Auto. It is noneditable.

Options	Platform	Description
Output Power	NCS 2000 NCS 1001	The default value is Auto. You can enter a value.
Attenuator In	NCS 2000	This field is enabled only when you choose a preamplifier. Choose an attenuator from the drop-down list. The available options are: • ATT-LC-2 • ATT-LC-3 • ATT-LC-5 • ATT-LC-7 • ATT-LC-10 • ATT-LC-12 • ATT-LC-15 • ATT-LC-18
Attenuator Out	NCS 2000	This field is enabled only when you choose a preamplifier. Choose an attenuator from the drop-down list. The available options are: • ATT-LC-2 • ATT-LC-3 • ATT-LC-5 • ATT-LC-7 • ATT-LC-10 • ATT-LC-12 • ATT-LC-15 • ATT-LC-18
To Fiber		

Options	Platform	Description
Booster	NCS 2000	The default value is Auto. To enable this field for ROADM and Traffic nodes, you must choose SMR-9 or SMR-20 from the **Site Type** drop-down list under the Site properties. If you choose SMR-20, the default booster is 20SMR-FS-BST. If you choose SMR-9, default booster is SMR9-FS-EDFA-BST. For the OLA node, the available options are: • EDFA35-35-BST • EDFA35-24-BST • OPT -EDFA-17 • OPT -EDFA-24
	NCS 1010	For NCS 1010, it is OLT-C-EDFA-Bst
	NCS 1001	The option available for NCS 1001 is: • NCS1001-BST
First Booster	NCS 1014	The options available are: • Normal • Extended
Second Booster	NCS 1014	The default option is Auto. It is noneditable.
Second Booster PSD	NCS 1014	The Pre PSD value is picked from LUT. The default option is Auto. It is noneditable.
Output Power	NCS 2000 NCS 1001	The default value is Auto. You can enter a value.

Options	Platform	Description
Attenuator In	NCS 2000	This field is enabled only when you choose a booster. Choose an attenuator from the drop-down list. The available options are: • ATT-LC-2 • ATT-LC-3 • ATT-LC-5 • ATT-LC-7 • ATT-LC-10 • ATT-LC-12 • ATT-LC-15 • ATT-LC-18
Attenuator Out	NCS 2000	This field is enabled only when you choose a booster. Choose an attenuator from the drop-down list. The available options are: • ATT-LC-2 • ATT-LC-3 • ATT-LC-5 • ATT-LC-7 • ATT-LC-10 • ATT-LC-12 • ATT-LC-15 • ATT-LC-18
Raman Amplification		

Options	Platform	Description
Raman Amp	NCS 2000	Choose the Raman amplifier from the drop-down list. **Note** To force the RAMAN amplifier on NCS 2000 node, you must enable **RAMAN amplified** on the fiber, else the **Raman Amp** is disabled, and network analysis fails. **Note** When you enable the fiber property **Raman amplified** and the side property **Enable C+L Band S/C** for NCS 2000 node, **Raman Amp** is automatically forced as *RAMAN-C+L*. The available options for NCS 2000 ROADM and Traffic sites are: • RAMAN-CTP • RAMAN-COP-CTP Raman Amp can be forced only between two nodes. The available options for the OLA site are: • EDRA1-26 • EDRA1-35 • EDRA2-26 • EDRA2-35 • RAMAN-CTP
	NCS 1010	The available options for NCS 1010 ROADM site are: • Auto • None • Raman **Note** For NCS 1010 network, when Raman is forced on one side, Raman is automatically forced on all connected sides (APC Domain). If there are passthrough nodes connected, Raman will be automatically enabled on both sides of the passthrough nodes.
Raman CTP Gain	NCS 2000	Enter a value.
Raman COP Gain	NCS 2000	Enter a value. This field is enabled only when you choose RAMAN-COP-CTP.

Options	Platform	Description
Raman Gain	NCS 1010	Displays the Raman gain.
Static Data	NCS 2000	By default, this option is disabled. Enable it to edit the crosstalk values of the Raman COP amplifier. **Note** Static data is supported from Release 11.1 for SSON network.
Linear XT Avg	NCS 2000	Edit the value of average linear crosstalk.
Linear XT Six	NCS 2000	Edit the value average linear crosstalk sigma.
NonLinear XT Avg	NCS 2000	Edit the value of average nonlinear crosstalk.
NonLinear XT Sig	NCS 2000	Edit the value of average nonlinear crosstalk sigma.

Note
Raman crosstalk values are present in the ANS file under *logoparameters* section.

c) Click **Update**.

Modify L-Band Amplifier Properties

Use this task to modify the properties of an L-band amplifier in a site.

Before you begin

Log in to Cisco ONP web interface, on page 7

Procedure

Step 1 In the network tree, choose **Sites** > **Site** > **Site domain** > **Side** > **L-Band**.

Step 2 To modify the amplifier properties, perform the following steps:

a) Click **L-Band Amplifier**.

You can view the properties of the L-Band Amplifier at the bottom of the network tree. For more information, see Supported Amplifiers, on page 313.

b) Modify the following properties of the amplifier:

You can also modify the properties by choosing the **L-Band Amplifier** under **Network** > **Entity Editor**.

Options	Platform	Description
General		

Options	Platform	Description
PSD Shape	NCS 1010	Enter a Power Spectral Density (PSD) value.
Dual Band PSD Shape	NCS 1010	Enter Central PSD and Tilt values.
Pre Tilt	NCS 1010	The default value is Auto. You can enter a value.
Raman Tilt	NCS 1010	The default value is Auto. You can enter a value.
Booster Tilt	NCS 1010	The default value is Auto. You can enter a value.
From Fiber		
Pre Amp	NCS 1010	The options available for NCS 1010 are: • Normal • Extended
To Fiber		
Booster	NCS 1010	For NCS 1010, it is OLT-L-EDFA-Bst

c) Click **Update**.

Modify Add/Drop Multiplexer Properties

Table 69: Feature History

Feature Name	Release Information	Description
User-Defined Colorless Ports Distribution for CCMD Card in NCS 1010 Network	Cisco ONP Release 24.3.1	The new property, **Colorless Port Distribution** is introduced under the **Add/Drop Multiplexer** properties. This property allows you to select the number of CCMD cards to connect to the LC ports of the enhanced OLT and determine the number of channels for each chosen CCMD card. It provides the flexibility to choose the desired number of CCMD cards and distribute the colorless ports across them.

Table 70: Feature History

Feature Name	Release Information	Feature Description		
Modify Properties of Add/Drop Multiplexer and Demultiplexer	Cisco ONP Release 4.2	You can create and validate network designs by choosing colored and colorless add/drop multiplexers and demultiplexers, and interlever under **C-Band** > **Add/Drop**. The following options are supported in this release:		
		Type of Add/Drop	Options	Network Supported
		Colorless	• Direct SMR • MF-6AD-CFS	• SSON • Non-SSON
		Colored	• MD-64-C • MD-48-ODD • MD-48-EVEN • MD-48-ODD + MD-48-EVEN	• SSON • Non-SSON
		Interlever	• MpoCable • MD-48-CM	• Non-SSON

Use this task to modify the properties of the add/drop multiplexer in a site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, Choose **Sites** > **Site** > **Site domain** > **Side** > **C-Band**.

Step 2 To modify the Add/Drop multiplexer card properties, perform the following steps:

a) Click **Add/Drop**.

You can view the properties of the add/drop multiplexer at the bottom of the network tree.

b) Modify the following properties of the add/drop multiplexer:

You can also modify the properties by choosing the **Add/Drop** under **Network** > **Entity Editor**.

Options	Platform	Description
General		

Options	Platform	Description
Colored Add/Drop	NCS 2000	Choose the colored add/drop multiplexer and demultiplexer: The available options are: • MD-64-C—Passive optical multiplexer and demultiplexer module (for SSON network) • None • Auto To mix 16-AD-CCOFS and MD-48-ODD/EVEN on the same MPO port of SMR-20 and connect MD-48-ODD/EVEN to SMR-20 via MPO-8LC and UPG-4, enable Shared SMR port and force the required colored Add/Drop. The following options are added automatically based on the colored demands created and the wavelengths forced in the non-SSON network. • MD-48-ODD • MD-48-EVEN • MD-48-ODD + MD-48-EVEN
	NCS 1010	The options available for NCS 1010 are: • Auto • None • MD-32-EVEN • MD-32-ODD • MD-32- ODD+MD-32-EVEN
	NCS 1001	

Options	Platform	Description
		The options available for NCS 1001 are: • Auto • MD-64 • MD-32-EVEN **Note** In pre-R2511 networks, MD-32-EVEN refers to N1K-MD-32E-C patch panel. In R2511 networks, NCS1K-MD-32E-CE replaces N1K-MD-32E-C. For pre-R2511 networks with MD-32E-C add/drop option, you need to reset the add/drop option to Auto and then to MD-32-EVEN and reanalyse the network to add the new MD-32E-CE PID. • MD-48-EVEN • MD-48-ODD • MD-48-ODD+MD-48-EVEN • FLD-4 (10 variants) **Note** Choose a Add/Drop type with a Baud rate that matches the Optical Source Baud rates.
	NCS 1014	The options available for NCS 1014 are: • Auto • NCS1K-MD-32O-CE • NCS1K-MD-32E-CE • MD-32-ODD+MD-32-EVEN— Combination of both MD-32-CE add/drop panels.

Options	Platform	Description
Colorless Add/Drop	NCS 2000	Choose the colorless add/drop multiplexer and demultiplexer. The available options for NCS 2000 are: • Auto • Direct SMR—SMR-20 and SMR-9 cards that are directly connected to the colorless channels through MF-MPO-16-LC and MF-MPO-8-LC respectively. • MF-6AD-CFS—6 Port Add/Drop Module (supported only for ROADM starting from NCS 2000 system release 11.0, and traffic site). **Note** If you choose MF-6AD-CFS for a side, we recommend you to choose the same for other sides of the site.
	NCS 1010	The options available for NCS 1010 are: • Auto • None • BRK-8 • BRK-16 • BRK-24 **Note** QDD optical sources are not supported (both as optical source and pluggable) with colorless BRK-8, BRK-16, or BRK-24 configurations.
Interlever Type	NCS 2000	Choose the interlever type from the drop-down list. The available options are: • Auto • MpoCable • MD-48-CM **Note** **Interlever Type** property is visible and editable only for Line sides of Multi-Degree nodes having **Site Type** property as *SMR-9* and **Scalable Upto Degree** property as *8* under the C-Band tab at the Site level.
MPO Connector Add/Drop		

Options	Platform	Description
Colorless Add/Drop	NCS 1010	**Note** **MPO Connector Add/Drop** appears for networks from R7.10.1. The options available for NCS 1010 are: • Auto • None • BRK-8 • BRK-16 • BRK-24 **Note** QDD optical sources are not supported (both as optical source and pluggable) with colorless BRK-8, BRK-16, or BRK-24 configurations.
Colorless Ports	NCS 1010	Enter the number of colorless ports. The default value is 0. If you do not change the default value, Cisco ONP automatically calculates the number of colorless ports based on the number of circuits added and colorless add/drop units forced. **Note** For the R7.10.1 network, you can assign a maximum of 48 colorless ports. The assigned ports are applicable to the MPO ports. For the R7.11.1 network, you can assign a maximum of 128 colorless ports.
LC Connector Add/Drop		
Colorless Add/Drop	NCS 1010	**Note** **LC Connector Add/Drop** appears for networks from R7.11.1. The options available for NCS 1010 are: • Auto • None • NCS1K14-CCMD-16C

Options	Platform	Description
Colorless Ports	NCS 1010	Enter the number of colorless ports. The default value is 0. If you do not change the default value, Cisco ONP automatically calculates the number of colorless ports based on the number of circuits added and colorless add/drop units forced. **Note** For the R7.10.1 network, you can assign a maximum of 48 colorless ports. The assigned ports are applicable for the LC ports. For the R7.11.1 network, you can assign a maximum of 128 colorless ports.

Options	Platform	Description
Colorless Ports Distribution	NCS 1010	• Click the field to open the **Colorless Ports Distribution** pop-up window. • Choose the CCMD card (NCS1K14-CCMD-16C) for each of the LC ports (A/D 4 - A/D 17). • Select the number of ports for each CCMD card, ensuring the total does not exceed 128. • Click **Submit**. When allocating LC ports, the priority is as follows: **1.** Degree connection **2.** Direct LC ports Only the remaining LC ports can be allocated to CCMD cards. If the Degree Priority under Site Properties is set to LC Ports, the number of CCMD cards that can be forced on the line side edges depends on the number of degrees (including omni and line degrees, depending on the scalable degree) and the Direct LC ports. This is explained in the following formula: If Degree Priority is LC_Ports, Maximum number of CCMDs Allowed = 14 - (scalableUptoDegree - 1) - Direct LC add/drops - Number of Omni Edges The number of ports that you have selected is displayed in the field. When the **Enable Special Settings** under the Network properties is enabled and if the **Colorless Ports Distribution** has not been set previously, it will default to *16,16,0*. In this case three LC ports already used for CCMD card. **Note** For omnidirectional sides, you can select the CCMD card for all the LC ports. After successful analysis of the network, you can view the port distribution under the **Layout** > **Node Diagram** tab. Currently, this property is only supported for the enhanced plate.

c) Click **Update**.

Modify L-Band Add/Drop Multiplexer Properties

Use this task to modify the properties of the add/drop multiplexer in a site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 In the network tree, Choose **Sites** > **Site** > **Site domain** > **Side** > **L-Band**.

Step 2 To modify the Add/Drop multiplexer card properties, perform the following steps:

a) Click **Add/Drop**.

You can view the properties of the add/drop multiplexer at the bottom of the network tree.

b) Modify the following properties of the add/drop multiplexer:

You can also modify the properties by choosing the **Add/Drop** under **Network** > **Entity Editor**.

Options	Platform	Description
General		
Colorless Add/Drop	NCS 1010	The options available for NCS 1010 are: • Auto • None • BRK-8 • BRK-16 • BRK-24 **Note** Only L-band optical sources are supported. Pluggables are not supported in L-band networks.
MPO Connector Add/Drop		

Options	Platform	Description
Colorless Add/Drop	NCS 1010	**Note** **MPO Connector Add/Drop** appears for networks from R7.10.1. The options available for NCS 1010 are: • Auto • None • BRK-8 • BRK-16 • BRK-24 **Note** QDD optical sources are not supported (both as optical source and pluggable) with colorless BRK-8, BRK-16, or BRK-24 configurations.
Colorless Ports	NCS 1010	Enter the number of colorless ports. The default value is 0. If you do not change the default value, Cisco ONP automatically calculates the number of colorless ports based on the number of circuits added and colorless add/drop units forced. **Note** For the R7.10.1 network, you can assign a maximum of 48 colorless ports. The assigned ports are applicable for the MPO ports. For the R7.11.1 network, you can assign a maximum of 128 colorless ports.
LC Connector Add/Drop		
Colorless Add/Drop	NCS 1010	**Note** **LC Connector Add/Drop** appears for networks from R7.11.1. The options available for NCS 1010 are: • Auto • None • NCS1K14-CCMD-16L

Options	Platform	Description
Colorless Ports	NCS 1010	Enter the number of colorless ports. The default value is 0. If you do not change the default value, Cisco ONP automatically calculates the number of colorless ports based on the number of circuits added and colorless add/drop units forced. **Note** For the R7.10.1 network, you can assign a maximum of 48 colorless ports. The assigned ports are applicable for the LC ports. For the R7.11.1 network, you can assign a maximum of 128 colorless ports.

Options	Platform	Description
Colorless Ports Distribution	NCS 1010	• Click the field to open the **Colorless Ports Distribution** pop-up window. • Choose the CCMD card (NCS1K14-CCMD-16L) for each of the LC ports (A/D 4 - A/D 17). • Select the number of ports for each CCMD card, ensuring the total does not exceed 128. • Click **Submit**. When allocating LC ports, the priority is as follows: **1.** Degree connection **2.** Direct LC ports Only the remaining LC ports can be allocated to CCMD cards. If the Degree Priority under Site Properties is set to LC Ports, the number of CCMD cards that can be forced on the line side edges depends on the number of degrees (including omni and line degrees, depending on the scalable degree) and the Direct LC ports. This is explained in the following formula: If Degree Priority is LC_Ports, Maximum number of CCMDs Allowed = 14 - (scalableUptoDegree - 1) - Direct LC add/drops - Number of Omni Edges The number of ports that you have selected is displayed in the field. When the **Enable Special Settings** under the Network properties is enabled and if the **Colorless Ports Distribution** has not been set previously, it will default to *16,16,0*. In this case three LC ports already used for CCMD card. **Note** For omnidirectional sides, you can select the CCMD card for all the LC ports. After successful analysis of the network, you can view the port distribution under the **Layout** > **Node Diagram** tab. Currently, this property is only supported for the enhanced plate.

c) Click **Update**.

Modify Client Properties

Use this task to modify the properties of a client-side attenuator in a site.

Before you begin

Table 71: Feature History

Feature Name	Release Information	Feature Description
Channel Attenuators	Cisco ONP Release 4.2	You can set up channel attenuators for QSFP-DD demands. You can choose different channel attenuators based on the specific configuration and check for the optical feasibility of the channel.

Log in to Cisco ONP web interface, on page 7

Procedure

Step 1 In the network tree, choose **Sites** > **Site** > **Site domain** > **Side** > **Clients** > **Channel-Attenuators**.

Step 2 In the right pane of the **Entity Editor** window, modify the following properties of the client-side attenuator.

Properties	Platform	Description
General		
Wavelength	NCS 2000	This column displays the selected wavelength.
RX-Attenuator	NCS 2000	Choose an RX-Attenuator from the drop-down list. The default option is Auto. **Note** You must select a wavelength to edit this field.
TX-Attenuator	NCS 2000	Choose a TX-Attenuator from the drop-down list. The default option is Auto. **Note** You must select a wavelength to edit this field.

Properties	Platform	Description
New Wavelength - Auto	NCS 2000	Click **Edit** to select a Flex Grid or Fixed Grid wavelength. **Note** Select **Fixed Grid (64-Chs)** for SSON network with NCS1K-MD-64-C card. **Note** NCS1K-MD-64-C card has First Channel limitation for Colored sites. First Channel (196.1 THz) in Fixed Grid (64-Chs) wavelength supports only Terminal Add/Drop sites and not ROADM sites.
New Wavelength	NCS 1001	Click **Add** to select a wavelength.

Step 3 Click **Update**.

Sort the Network Elements

You can sort the sites, services, fibers, waves, and SRLG in ascending or descending order. This feature is helpful for huge networks, to find out the required site, fiber, waves, or SRLG names quickly. Click the **Ellipsis** icon available in the right side of the network element, for example **Sites** and choose **Ascending** or **Descending**. You can sort based on alphabets, numbers, or alphanumeric.

Regeneration Support

In optical networks, as the fiber length increases, a loss in the signal ratio and power could occur due to attenuation and dispersion. You require a regenerator to recreate the weak and distorted optical signals through reamplification, regeneration, and retiming processes. The regenerators remove noise and distortion, convert the optical signal to electrical signal, and then convert the signals back to optical signals (OEO conversion). Cisco ONP supports creation of regeneration sites in the network.

Note A regenerator site can only be a ROADM site.

Create a Regeneration Site

Table 72: Feature History

Feature Name	Release Information	Feature Description
Wavelength Forcing at the Section Level	Cisco ONP Release 4.1	This feature allows you to assign different wavelengths for different sections of the Regen sites.

Use the following procedure to create a regeneration site in the network.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

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

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

Step 2 Select a network from the list of networks. This opens the selected network's map.

You can also add a regeneration site when you are designing a new network or upgrading a network.

Step 3 In the network tree, expand **Waves**, select a wave and drill down to its trail.

Note
If the network is an SSON network or NCS 1010 network, you see **Media Channels** or **Circuits** respectively. instead of waves. Expand **Media Channels** or **Circuits** , and drill down to its trail.

Step 4 Click the trail.

You can view the properties of the trail at the bottom of the network tree.

Step 5 From the **Regen Sites** drop-down list, select a regeneration site.

Note
If you select a fiber from the **Path of Wave** drop-down list, you cannot select any regeneration site to force a path. Similarly, if you select a regeneration site, you cannot force a path for the wave. However, if you want to force a fiber, select the fiber from the **Path of Wave** drop-down list available under the section properties.

Step 6 (Optional) Select the wavelength of each section in the properties for non-SSON network.

Note
For the SSON network, you can select the wavelength only at the trial level.

Step 7 Click **Update**.

A new section is added along with the existing section under the trail, whenever a regeneration site is created. Regeneration can be performed using any two cards back-to-back or with a dedicated regenerator card.

Step 8 Click **Analyze** to analyze the network.

After analysis, if you click trail or section in the network tree, the map highlights the trail in orange color, and the section in green color.

Note
You can assign different wavelengths for different sections. The **Central Wavelength** is denoted as a *, when different wavelengths are assigned for different sections.

Multidegree ROADM

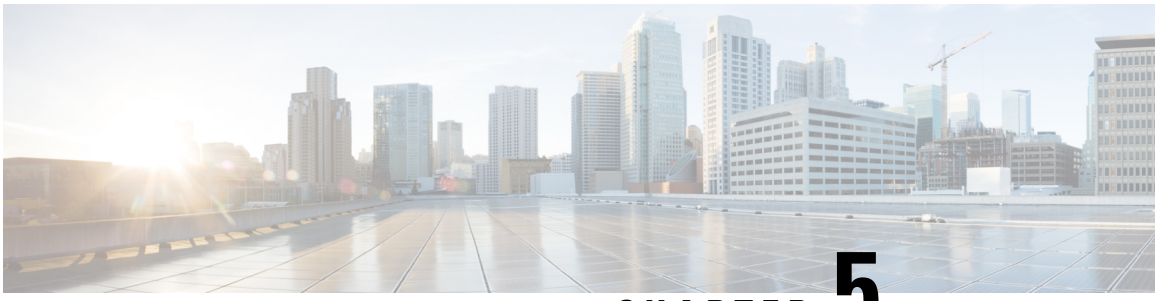
In multidegree ROADM, sites have two or more sides and face two or more fibers spans. You can select the degree of a node from the Cisco ONP GUI. The values are 2, 4, 8, 12, and 16 for Evolved Mesh (EV) ON and OFF scenarios. The default value is 4. Degrees 5, 9, and 13 are not supported. EV flag is editable.

Prerequisites for Cascaded SMR

- The **Structure** field under **C Band** in the **Entity Editor** must be Multidegree.
- The **Site Type** field under **C Band** in the **Entity Editor** must be SMR-20.
- The **Evolved Mesh** check box under **General** in the **Entity Editor** must be checked.
- The **Degree Mesh Type** field under **C Band** in the **Entity Editor** must be Auto or DEG-5/UPG-4.
- The **Mpo16TOMpo8** field under **General** in the **Entity Editor** must be MPO16To2MPO8 cable.
- By default, the **Cascaded SMR** check box is unchecked, but you can edit in the design mode as a site property. Check the **Cascaded SMR** check box for contentionless side creation. L2 SMR is supported for both SSON and Non-SSON networks.
- You can edit the **Cascaded SMR** check box when **Evolved Mesh** is ON and the SMR-20 card is selected. You can create Layer 2 SMR sides only after you check the **Cascaded SMR** check box.
- You can create contentionless sides manually and force the contentionless ports. The default value is 16 for the contentionless ports. The range of values is 0–16.

Limitations

- Supports only contentionless add/drop demands.
- Supports Layer-2 SMR for SMR-20 card only.



CHAPTER 5

Configure a Network

Table 73: Feature History

Feature Name	Release Information	Feature Description

MOLS 2.0 Support	Cisco ONP Release 25.1.1	CONP now supports the latest Metro DCI Open Line System, MOLS 2.0, which is hosted on the NCS 1014 chassis. This includes support for:
		• new EDFA amplifier that hosts
		  • a new OTDR pluggable (ONS-QSFP-OTDR),
		  • a new coherent probe pluggable (DP01QSDD-ZT5-A1), and
		  • an existing OSC pluggable (ONS-SC-PTP-1510), and
		• a pair of new 32-channel colored add/drop passive modules
		  • NCS1K-MD-32O-CE
		  • NCS1K-MD-32E-CE
		
		Select the NCS 1014 platform during network creation to create MOLS 2.0 networks. You can design the new MOLS 2.0 networks through the properties.
		• Probe Channel and OTDR Pluggable at the nework level,
		• OSC Pluggable property at the edge level,
		• the MOLS 2.0 colored add/drop modules (default option is odd + even cards) at add/drop level, and
		• noneditable Pre Amp, Pre PSD, Second Booster, Second Booster PSD at the C-band amplifier level.

Feature Name	Release Information	Feature Description
Transponder Aggregation Service	Cisco ONP Release 25.1.1	This release introduces the transponder aggregation service, which provides comprehensive support for transponder service aggregation across NCS 1000 line cards on all L0 platforms. Key features include: • Support for transponder service creation and network-wide analysis, considering transponder services in both greenfield and brownfield deployments. • Compatibility with NCS 2000, NCS 1001, NCS 1010, and NCS 1014 platforms, with specific add/drop support for each platform. • Force update the transponder properties, with support for service control, property override, and UI configurations. • Update Optical, Traffic, BOM, Installation Parameters, and Cabling Reports to include transponder parameters. • Placement of transponder cards in NCS1004 and NCS1014 chassis, with NFV view including Transponder connections. • Draw services between ROADM/Terminal/Traffic sites, force transponder properties, and view updated BOM and reports after network analysis.

This chapter describes the various ways of configuring the network designed through Cisco ONP.

- Configure a NCS 2000 Network for Contentionless Functionality, on page 220
- Configure an NCS 2000 Network for Colorless Functionality, on page 221
- Configure an NCS 2000 Network for Colored Functionality, on page 222
- Configure a Network with Mixed Add/Drop Multiplexers and Demultiplexers, on page 223
- Configure an NCS 1010 Network for Colorless Functionality, on page 227
- Configure an NCS 1010 Network for Colored Functionality, on page 228
- Configure an NCS 1010 Network with Mixed Add/Drop Multiplexers and Demultiplexers, on page 229
- Configure an NCS 1010 C+L-Band Network with Mixed Add/Drop Multiplexers and Demultiplexers, on page 229
- Configure an NCS 1010 Network for Omnidirectional Functionality, on page 230
- Configure an NCS 1001 Network for Colored Functionality, on page 231
- Configure an NCS 1014 Network for Colored Functionality, on page 231
- Configure a NCS 1001/1010/1014 Network with NCS 1000 Transponders, on page 232
- Configure a NCS 2000 Network with NCS 1000 Transponders, on page 233

Configure a NCS 2000 Network for Contentionless Functionality

Use the following procedure to configure the contentionless functionality in a network:

Before you begin

Log in to Cisco ONP web interface, on page 7

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Add contentionless sides to the required sites. See Add Contentionless Side to a Site, on page 142.

Step 3 Set the channel type for the demands:

a) In the **Entity Editor** window, click the **Services** tab.

b) Click the service connecting the site and set the **Src Channel Type** property as *Auto* or *Contentionless*. Similarly, click the trail under the wave (for non-SSON) or Media Channel (for SSON) and set the **Src Channel Type** property as *Auto* or *Contentionless*.

Note
Contentionless is the default option when you select *Auto*.

c) Click **Update**.

Step 4 Analyze the network by choosing **Network** > **Analyze.**

Configure an NCS 2000 Network for Colorless Functionality

Use the following procedure to configure the colorless functionality in a network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the channel type for the demands:

a) In the **Entity Editor** window, click the **Services** tab.

b) Click the service connecting the site and set the **Src Channel Type** property as *Colorless*. Similarly, click the trail under the wave (for non-SSON) or Media Channel (for SSON) and set the **Src Channel Type** property as *Colorless*.

c) Under the **Site > Side** properties, choose the Line type side from which you want to create the colorless demand, and enter the number of **Colorless Ports**.

From Release 24.3.1, you can select the colorless ports for the SMR-9 card.

The number of colorless ports for *MF-6AD-CFS* depends on the **Scalable Upto Degree** property. The following table explains the same.

Table 74: Colorless Ports for SSON and Non-SSON Networks

Site Type	Scalable Upto Degree	Maximum Number of Colorless Ports for SSON	Maximum Number of Colorless Ports for Non-SSON
SMR-20	4	72	72

Site Type	Scalable Upto Degree	Maximum Number of Colorless Ports for SSON	Maximum Number of Colorless Ports for Non-SSON
SMR-20	8	72	72
SMR-20	12	24	24
SMR-20	16	24	24
SMR-20	Line	96	96
SMR-20	Terminal	120	96

d) Click **Update**.

Step 3 Under the **C-Band** properties, choose *MF-6AD-CFS* or *Direct SMR* as the **Colorless Add/Drop**.

Step 4 Click **Update.**.

Step 5 Analyze the network by choosing **Network** > **Analyze.**

You can see the colorless Add/Drop unit getting added in the layout and BOM.

Configure an NCS 2000 Network for Colored Functionality

Use the following procedure to configure the colored functionality in a network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the channel type for the demands:

a) In the **Entity Editor** window, click the **Services** tab.

b) Click the service connecting the site and set the **Src Channel Type** property as *Colored*. Similarly, click the trail under the wave (for non-SSON) or media channel (for SSON) and set the **Src Channel Type** property as *Colored*.

c) Click **Update**.

Step 3 For SSON network, perform the following:

a) Under the **C-Band** properties, choose *MD-64-C* as the **Colored Add/Drop**.

Note
MD-64-C is supported from NCS 2000 Release 12.x.

b) Click **Update.**.

For non-SSON network, by default, *MD-48-ODD* or *MD-48-EVEN* is added as the **Colored Add/Drop** when **Share SMR Port** is not enabled.

Note
If you choose *MD-48-EVEN* or *MD-48-ODD*, make sure to select an even wavelength for the **Wavelength** property under **Trail**.

Step 4 When **Share SMR Port** port is enabled, you can select the **Colored Add/Drop** by using the following steps:

a) Under the **C-Band** properties, choose *MD-48-ODD*, *MD-48-EVEN*, or *MD-48-ODD+MD-48-EVEN* as the **Colored Add/Drop**.

Note
The above mentioned Add/Drop units are supported from NCS 2000 Release 11.x.

b) Click **Update**.

Step 5 Analyze the network by choosing **Network** > **Analyze**.

You can see the colored Add/Drop unit getting added in the layout and BOM.

Configure a Network with Mixed Add/Drop Multiplexers and Demultiplexers

Use the following procedure to configure mixed wavelengths in a network:

Table 75: Feature History

Feature Name	Release Information	Feature Description
Support for Mixed Add/Drop Configuration	Cisco ONP Release 4.2	You can configure different functionalities in the network created in Cisco ONP. Mixed wavelengths such as colorless and contentionless, colored and contentionless, can be added/dropped on the same side or direction. The following mixed configurations are supported: • Colored (MD-48-ODD/MD-48-EVEN) and Contentionless (16-AD-CCOFS) without shared SMR port • Colored and Contentionless (MD-64-C and 16-AD-CCOFS) • Colored (MD-64-C) and Colorless (Direct SMR) • Colored (MD-48) and Contentionless (16-AD-CCOFS) with Shared SMR Port • Colorless and MD-48-ODD/MD-48-EVEN • Colorless and 16-AD-CCOFS

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the properties of the network under the **Entity Editor** for different combinations of the functionalities, as described in the following table:

Table 76: Supported Mixed Configurations

Supported Network Type	Possible Mixed Configurations	Properties to be Set
Non-SSON	Colored (MD-48-ODD/MD-48-EVEN) and Contentionless (16-AD-CCOFS) without shared SMR port	• Add required number of contentionless sides. • **Channel Type—**Set the **Src Channel Type** and **Dst Channel Type** to be *Colored* for one wave. Set the **Src Channel Type** and **Dst Channel Type** to be *Contentionless* for the second wave created on the same site. Both wavelengths must add/drop in the same side or direction. • By default, MD-48-ODD or MD_48-EVEN is added as the Colored Add/Drop in the BOM and layout, when you set the **Channel Type** as *Colored* and when **Shared SMR Port** is disabled. By default, 16-AD-CCOFS is added in the BOM and layout, when you set the **Channel Type** as *Contentionless*.
SSON	Colored and Contentionless (MD-64-C and 16-AD-CCOFS)	• Add required number of contentionless sides. • **Channel Type—**Set the **Src Channel Type** and **Dst Channel Type** to be *Colored* for one media channel. Set the **Src Channel Type** and **Dst Channel Type** to be *Contentionless* for the second media channel created on the same site. Both channels must add/drop in the same side or direction. • **Colored Add/Drop—**MD-64-C under the side.
SSON	Colored (MD-64-C) and Colorless (Direct SMR)	• **Channel Type—**Set the **Src Channel Type** and **Dst Channel Type** to be *Colored* for one media channel. Set the **Src Channel Type** and **Dst Channel Type** to be *Colorless* for the second media channel created on the same site. Both channels must add/drop in the same side or direction. • Enter the number of **Colorless Ports** under the **Line Side** properties. • **Colored Add/Drop—**MD-64-C **Colorless Add/Drop—**Direct SMR

Supported Network Type	Possible Mixed Configurations	Properties to be Set
Non-SSON	Colored (MD-48) and Contentionless (16-AD-CCOFS) with Shared SMR Port	• Add required number of contentionless sides. • **Channel Type—**Set the **Src Channel Type** and **Dst Channel Type** to be *Colored* for one wave. Set the **Src Channel Type** and **Dst Channel Type** to be *Contentionless* for the second wave created on the same site. Both wavelengths must add/drop in the same side or direction. • Check the **Shared SMR Port** check box, under the **Site** properties. • **Colored Add/Drop—**MD-48-ODD, MD-48-EVEN, or MD-48-ODD and MD-48-EVEN If you choose *MD-48-EVEN*, make sure to select an even wavelength for the **Wavelength** property under **Trail**.
Non-SSON	Colorless and MD-48-ODD/MD-48-EVEN	• **Channel Type—**Set the **Src Channel Type** and **Dst Channel Type** to be *Colorless* for the wave. • Enter the number of **Colorless Ports** under the **Line Side** properties. • By default, MD-48-ODD/MD-48-EVEN is added as colored Add/Drop in the BOM and layout, when any colored demand is added in the non-SSON network.
SSON	Colorless and Contentionless (16-AD-CCOFS)	• Add required number of contentionless sides. • **Channel Type—**Set the **Src Channel Type** and **Dst Channel Type** to be *Colorless* for the wave or media channel. • **Channel Type—***Colorless* for one wave and *Contentionless* for another wave created on the same site. Both wavelengths must add/drop in the same side or direction.

Note
MF-6AD-CFS colorless configuration cannot be mixed with any other configurations.

The following is the list of mixed configurations that are not supported by Cisco ONP.

Table 77: Unsupported Mixed Configurations

Network Type	Mixed Configurations
SSON	Colored (MD-64-C) and Colorless (MF-6AD-CFS)
SSON	Contentionless and Colorless (MF-6AD-CFS)
SSON	Colored (MD-64-C), Contentionless, and Colorless (MF-6AD-CFS)
SSON	Colored (MD-64-C) and Layer-2 Contentionless
Non-SSON	Contentionless and Colorless (MF-6AD-CFS)
Non-SSON	Colored (MD-48) and Colorless (MF-6AD-CFS)
Non-SSON	Colorless (Direct SMR) and Colorless (MF-6AD-CFS)
Non-SSON	Colored, Contentionless, and Colorless (MF-6AD-CFS)

Configure an NCS 1010 Network for Colorless Functionality

Use the following procedure to configure the colorless functionality in an NCS 1010 network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the channel type for the demands:

a) In the **Entity Editor** window, click the **Services** tab.
b) Click the trail under the circuit set the **Src Channel Type** property as *Colorless*.
c) Click **Update**.

Step 3 Under the **C-Band** properties, choose *BRK-8*, *BRK-16* or *BRK-24* as the **Colorless Add/Drop**.

The Maximum number of colorless ports depends on the scalable up to degree. The following table explains the same.

Table 78: Colorless Ports for NCS 1010 Networks

Scalable Upto Degree	MPO Port Used for Degree Interconnect	Maximum Number of Colorless Ports Supported		
		BRK-24	BRK-16	BRK-8
7	4	72	48	24

Scalable Upto Degree	MPO Port Used for Degree Interconnect	Maximum Number of Colorless Ports Supported		
		BRK-24	BRK-16	BRK-8
9	1	66	44	22
15	3, 4	48	32	16
17	1, 2	42	28	14
23	2, 3, 4	24	16	8
25	1, 2, 3	18	12	6
31	1, 2, 3, 4	0	0	0
Terminal	NA	90	60	30
Line	4	72	48	24

Note
Colorless configuration is not supported for scalable upto degree 31.

Step 4 Click **Update**.

Step 5 Analyze the network by choosing **Network** > **Analyze**.

You can see the colorless Add/Drop unit getting added in the layout and BOM.

Configure an NCS 1010 Network for Colored Functionality

Use the following procedure to configure the colored functionality in an NCS 1010 network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the channel type for the demands:

a) In the **Entity Editor** window, click the **Services** tab.
b) Click the trail under the circuit and set the **Src Channel Type** property as *Colored*.
c) Click **Update**.

Step 3 Under the **C-Band** properties, choose *MD-32-EVEN*, *MD-32-ODD*, or *MD-32- ODD+MD-32-EVEN*as the **Colored Add/Drop**.

Step 4 Click **Update**.

Step 5 Analyze the network by choosing **Network** > **Analyze**.

You can see the colored Add/Drop unit getting added in the layout and BOM.

Configure an NCS 1010 Network with Mixed Add/Drop Multiplexers and Demultiplexers

Use the following procedure to configure mixed wavelengths in an NCS 1010 network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the properties under the **Entity Editor** for different combinations of the functionalities:

For example, set the source **Add/Drop Type** and destination **Add/Drop Type** to *Colored* for one circuit. Set the **Src Channel Type** and **Dst Channel Type** to *Colorless* for the second circuit created on the same site. Both channels must add/drop in the same side or direction.

You can choose any combination of the colored or colorless add/drop.

Note
When the **Scalable Upto Degree** is 31, the colorless configuration is not supported, and hence mixed configuration is also not supported for **Scalable Upto Degree** 31.

Configure an NCS 1010 C+L-Band Network with Mixed Add/Drop Multiplexers and Demultiplexers

Use the following procedure to configure mixed wavelengths in an NCS 1010 C+L-Band network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the properties under the **Entity Editor** for different combinations of the functionalities:

For example, set the source **Add/Drop Type** and destination **Add/Drop Type** to *Colored* or *Colorless* for the C-band circuit. Set **Band Type** as *L-band* for the second circuit created on the same site. Both channels must add/drop in the same side or direction.

You can choose any combination of the colored or colorless add/drop for C-band circuits. However, for L-band circuits, colorless add/drop is the default value.

Note
When **Scalable Upto Degree** is 31, only C-band colored configuration is supported. Colorless cannot be created as all colorless ports are exhausted and hence mixed configuration is also not supported for **Scalable Upto Degree** 31.

Configure an NCS 1010 Network for Omnidirectional Functionality

Use the following procedure to configure colored and colorless omnidirectional functionalities in an NCS 1010 network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Add Omnidirectional sides to the required sites. See Add Omni-Directional Side to a Site, on page 148. You can also use the **Max Auto Omni Allowed** property under the network properties. Based on the number that you enter, Cisco ONP will automatically generate up to that many Omni Edges and run the analysis.

Step 3 Select the Omni variant and type of omnidirectional add/drop stage.

a) In the **Entity Editor** window, click the **Sites** tab.
b) Choose the omnidirectional side under the required site, and set the following properties.

Omni Variant: Select the type of omni variant as *Dual OLT* or *4x4 COFS*. The available options are:

Omni Directional Ports: Enter the number of omnidirectional ports.

Step 4 Select the type of omnidirectional add/drop stage.

a) In the **Entity Editor** window, click the **Services** tab.
b) Choose the required service and set the **Src Add/Drop Type** and **Dst Add/Drop Type** as *omni-colored* or *omni-colorless*.
c) Choose the trail under the service, and set the **Add/Drop Type** as *omni-colred* or *omni-colorless*.

Step 5 Click **Update**.

Step 6 Analyze the network by choosing **Network** > **Analyze**.

You can see the Omni Add/Drop unit getting added in the layout and BOM.

Configure an NCS 1001 Network for Colored Functionality

Use the following procedure to configure the colored functionality in an NCS 1001 network.

Note Deployment of more than two OLA nodes between two Terminal Sites is not supported.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the channel type for the demands:

a) In the **Entity Editor** window, click the **Services** tab.
b) Click the trail under the circuit and set the **Src Add/Drop Type** property as *Colored*.
c) Click **Update**.

Step 3 Under the **C-Band** properties, choose *MD-32-EVEN*, *FLD-4*, *MD-48-ODD*, *MD-48-EVEN*, *MD-48-ODD+MD-48-EVEN*, or *MD-64* as the **Colored Add/Drop**.

Step 4 Click **Update**.

Step 5 Analyze the network by choosing **Network** > **Analyze**.

You can see the colored Add/Drop unit getting added in the layout and BOM.

Configure an NCS 1014 Network for Colored Functionality

Use the following procedure to configure the colored functionality in an NCS 1014 network:

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the channel type for the demands:

a) In the **Entity Editor** window, click the **Services** tab.
b) Click the trail under the circuit and set the **Src Add/Drop Type** property as *Colored*.
c) Click **Update**.

Step 3 Under the **C-Band** properties, choose *MD-32-EVEN*, *MD-32-ODD*, or *MD-32- ODD+MD-32-EVEN*as the **Colored Add/Drop**.

Step 4 Click **Update**.

Step 5 Analyze the network by choosing **Network** > **Analyze**.

You can see the colored Add/Drop unit getting added in the layout and BOM.

Configure a NCS 1001/1010/1014 Network with NCS 1000 Transponders

Use the following procedure to add transponders in a network.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24 .

Step 2 Set the TXP Chassis and Card type for the transponders.

a) In the **Entity Editor** window, click the **Services** tab.
b) At circuit/media channel level, set **Traffic Type** as *Transponder Card*.
At trail level, **Card Type** and **TXP Chassis** properties appear.
c) Click the trail under the sections, set the **TXP Chassis** and **Card Type** properties.
d) Click the services under the services and set the **TXP Chassis** and **Card Type** properties.

Choose the required chassis and card type.

Table 79: Supported Transponders

TXP Chassis	Card Type
NCS 1014	• Auto • NCS1K14-2.4T-K9 • NCS1K14-2.4T-X-K9 • NCS1K4-QXP-K9
NCS 1004	• Auto • NCS1K4-QXP-K9

e) Click **Update**.

Step 3 Under the **C-Band** properties, choose the required multiplexer and demultiplexer.

Step 4 Click **Update**.

Step 5 Analyze the network by choosing **Network** > **Analyze**.

Configure a NCS 2000 Network with NCS 1000 Transponders

Use the following procedure to add transponders in a network.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP, on page 24.

a) Enable **SSON Network** check box and choose **Traffic type** as *NCS (4K_1K_2K)*.

b) In the design palette, use the drawing tool to add traffic sites to the network.

Step 2 Set Traffic Site and Traffic Type.

a) In the **Entity Editor** window, click the **Site** tab and expand the sites.

b) Select a site.
On the right pane, the **General** tab opens.

c) Under the **General** tab, set **Type** as *Traffic* and **Traffic Type** as *1K-2K*.

Step 3 Set the TXP Chassis and Card type for the transponders.

a) In the **Entity Editor** window, click the **Service** tab.

b) At circuit/media channel level, set **Traffic Type** as *Transponder Card*.
At trail level, **Card Type** and **TXP Chassis** properties appear.

c) Click the trail under the sections, set the **TXP Chassis** and **Card Type** properties.

d) Click the services under the services and set the **TXP Chassis** and **Card Type** properties.

Choose the required chassis and card type.

Table 80: Supported Transponders

TXP Chassis	Card Type
NCS 1014	• Auto • NCS1K14-2.4T-K9 • NCS1K14-2.4T-X-K9 • NCS1K4-QXP-K9

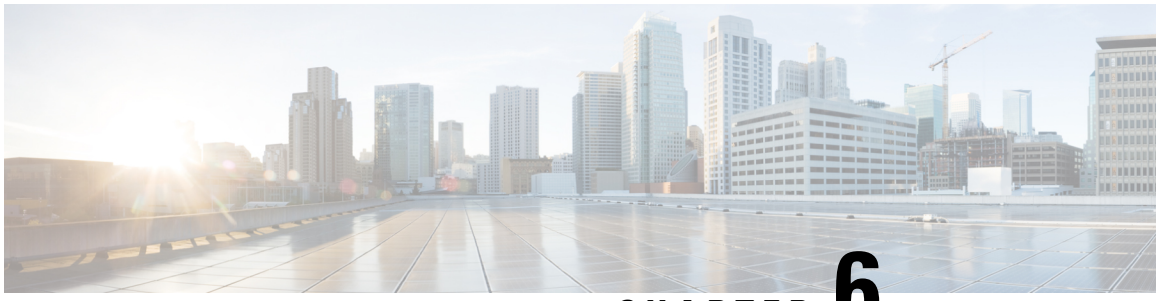
TXP Chassis	Card Type
NCS 1004	• Auto • NCS1K4-QXP-K9

e) Click **Update**.

Step 4 Under the **C-Band** properties, choose the required multiplexer and demultiplexer.

Step 5 Click **Update**.

Step 6 Analyze the network by choosing **Network** > **Analyze**.



CHAPTER 6

View Network Reports

Table 81: Feature History

Feature Name	Release Information	Feature Description
Deployability and Debuggability Enhancements	Cisco ONP Release 24.3.1	

Feature Name	Release Information	Feature Description

		Cisco ONP enhances the debuggability and deployability of the network with the following improvements in Optical sources, and various reports available in the **Results** page:
		• **Optical Sources**: Including new optical parameters such as vendor name, vendor ID, and submode in the downloaded optical souce Excel file to improve inperoperability with Cisco Optical Network Controller.
		• **BOM**: The exported Excel file includes these updates:
		  • Sales BOM Sheet: Providing information tailored for sales personnel.
		  • Net BOM Sheet: Providing the site-wise BOM count and categories of elements such as Chassis, Controllers, Mux-Demux units, Line Cards, Fillers, and more, offering a comprehensive overview of all network elements in the analyzed network.
		• **IPC**:
		  • Consolidating the IPC Cabling Report and the IPC Patch Report into a unified view with additional columns, streamlining connection details and eliminating the need to access multiple sources.
		  • Highlighting patches when clicked.
		• **Optical Reports**: Filtering

Feature Name	Release Information	Feature Description
		results by any column available in the report for more precise data analysis. • **Elements > Messages**: Providing links to navigate to the respective object in the network tree, allowing users to take the necessary action to correct errors.

Table 82: Feature History

Feature Name	Release Information	Description

Simplified Navigation to Results Tab	Cisco ONP Release 5.1	Cisco ONP now provides a simplified approach to navigate to the **Results** tab to view reports for analyzed multinode network topologies with the following enhancements:
		• Click the **Ellipsis** icon available in the right side of a particular site in the network tree to view:
		  • BOM details
		  • Optical Reports
		• Click the **Ellipsis** icon available in the right side of a particular circuit/media/wave in the network tree to view:
		  • Optical Report
		  • Traffic Report
		• New **IPC** tab —The **IPC** tab is introduced in **Cabling Reports** to intuitively view the internal patch connections for a site.
		• Search Box—The **Results** tab is enhanced with a Search Box at the top. You can use this search box to find a particular site in the topology by entering the site name.

• Network reports, on page 239

Network reports

The Cisco ONP home page has multiple tabs to access the reports of the analyzed network. You can also view the reports for specific site, fiber, or wave properties by clicking the respective report in the Network Tree pane. The tabs are:

• Dashboard

- Elements
- Map
- BOM
- Layout
- Results

View reports in the Dashboard tab

Table 83: Feature History

Feature Name	Release Information	Feature Description
View sustainability report	Cisco ONP Release 25.1.1	The **Sustainability Insights** tab in the Cisco ONP **Dashboard** presents these sustainability metrics for a network designed in Cisco ONP: • Energy Consumption Distribution (kWh) • CO2 Emission (Kg) • Energy Efficiency (kWh/GHz) • CO2 Emission Equivalent: This shows the number of miles traveled by a car, bus, and airplane that would produce the same amount of CO2 emissions. • Number of Trees Needed: Indicates the number of trees that would need to be planted to absorb the network's carbon emissions. This report helps you understand the environmental impact of the optical networks you design.

From Release 25.1.1, Cisco ONP uses the Energy Management Capability (EMC) API to display sustainability reports. The EMC API calculates sustainability metrics by considering the power consumption and the geographical location of the site. See Formulas for sustainability calculation , on page 242 to know how the EMC API does the calculation.

Follow these steps to view various reports of an analyzed network under the **Dashboard** tab.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Enable Sustainability report, on page 241 to view the sustainability report.

Procedure

Step 1 Open the analyzed network for which you want to view the network summary.

Step 2 Click the **Dashboard** tab.

By default, the **Network Summary** tab will appear and display this information about the network:

- Total count of sites
- Total count of fibers
- Total count of SRLGs (Shared Risk Link Groups)
- Total count of services
- Total count of waves/media channels/circuits
- Total count of messages

Step 3 Click the **Sustainability Insights** tab to view the sustainability metrics for a network designed in Cisco ONP.

- Energy Consumption Distribution (kWh)
- CO2 Emission (Kg)
- Energy Efficiency (kWh/GHz)
- CO2 Emission Equivalent: This shows the number of miles traveled by a car, bus, and airplane that would produce the same amount of CO2 emissions.
- Number of Trees Needed: Indicates the number of trees that would need to be planted to absorb the network's carbon emissions.

a) Click the **Bypass EMC API** radio button to display default values for the metrics regardless of the site's location or its power consumption.

Enable Sustainability report

Use this task to enable the **Sustainability Insights** tab under the **Cisco ONP** Dashboard.

Procedure

Step 1 Log in to the server where Cisco ONP is installed.

Step 2 Use the cd command to go to the cnp directory and then to the conf directory.

Example:

```
root#cd /opt /cnp / conf
```

Step 3 use the **vi feature.properties** command to open the feature.properties file in the vi editor.

Example:

```
root:/opt/cnp/conf# vi feature.properties
```

Step 4 Edit the file.

a) Change SustainabilityInsights.enabled=false to SustainabilityInsights.enabled=true.

b) Press the w and q keys to save and exit the vi editor.

Example:

```
:wq
```

What to do next

View reports in the Dashboard tab, on page 240

Formulas for sustainability calculation

The EMC API calculates sustainability metrics using these formulas:

1. Energy Consumed (kWh)

   Formula:

   EnergyConsumed = PowerUtilizedByNode * ObservationPeriodicity / 60

   PowerUtilizedByNode: The total power consumed by the optical node (in Watts).

   ObservationPeriodicity: The observation duration, fixed at 300 seconds (approximately 5 minutes).

2. Carbon Emission (kg)

   Formula:

   CarbonEmission = EnergyConsumed * CarbonIntensity

   CarbonIntensity: The value obtained from the EMC API. If the EMC API does not return a value, a default constant value of 442 is used.

3. Energy Efficiency (kWh/GHz)

   Formula:

   EnergyEfficiency = EnergyConsumed / TrafficServed

   EnergyConsumed: The result from the first formula.

   TrafficServed: The total traffic passing or reserved in the network

View reports in the Elements tab

The **Elements** tab provides comprehensive reports of network elements and any associated messages.

Follow these steps to view the network elements report and messages.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Open the analyzed network for which you want to view the network summary.

Step 2 Click the **Elements** tab.

You can view the reports described in this table.

Table 84: Reports under Elements

Report	Description
Sites	Shows the site information, which consists of the name of the sites, their types, and their X and Y coordinate values.
Fibers	Shows the information about the fiber length between the source and the destination for the corresponding sites. You can sort and filter the fiber details available in each column of the table.
Services	Shows the service type, source and destination sites for particular service, quantity, protection type, and status. For each service, the report shows the primary path, secondary path, and their status.
Waves	The Waves report shows the number of waves available in the network and the wave utilization. Click each wave to view the following details: • Wave: Consists of a wave UID and its source and destination sites. • Wave Details: Provides details of wave OSNR, channel path, OTN services associated to wave and excluded channels. • Channels: Port details of the source and destination cards, the wavelength that is used, and its utilization demands. • Optical Results: Provides details of optical parameters such as OSNR, SOL, EOL, power margin, CD, and PMD.
SRLGs	Lists the names of created SRLGs and their fiber details. Click **Export** at the bottom to export the report in .xlsx format.
Messages	Shows messages that relate to errors that occurred while analyzing the network. By default, only critical messages for the analyzed network are listed here. You can disable the **Critical Only** toggle button to view all messages. Click the link in the Target column to navigate to the respective object in the network tree and take the necessary action to correct the error.

Step 3 Click each tab to view the respective report.

Step 4 Click the Pop-up icon to view the reports in a larger, resizable window.

View details of the BOM report

Table 85: Feature History

Feature Name	Release Information	Feature Description
MLP Brownfield with Diff BOM	Cisco ONP Release 4.1	This feature allows you to perform the following: • Compare the BOMs of two or more LNI imported networks. • Upgrade brownfield network. • Upgrade the Cisco ONP network with traffic sites.

The Bill of Materials (BOM) report includes these components:

- Detailed price lists for each site.
- Categories of elements such as Chassis, Controller, Mux-Demux, Line Card, Filler, and more.
- The overall BOM for the entire network.

Follow these steps to view the BOM report for an analyzed network.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Open the analyzed network for which you want to view the BOM.

Step 2 Click the **BOM** tab.

The BOM details are displayed.

To view the BOM details for OTN and DWDM separately, click each site. See Licensed PIDs available in the BOM report, on page 245for the list of licensed PIDs added into the BOM report.

See for the list of licensed PIDs added into the BOM report.

Step 3 View the BOM details for any particular site.

a) In the network tree, expand **Site** and click the **Ellipsis** icon available in the right side of the required site.

b) Click **Open BOM**

Cisco ONP opens the **BoM** tab and provides the BoM details of the selected site.

c) Expand the Site to view the PID information.

Step 4 Click **Export** to export the BOM details in the form of a spreadsheet, and save it into your local system.

We recommend that you export the BOM report only in analyze mode. Exporting the reports in the upgrade and release upgrade modes may lead to inaccuracies..

From Release 24.3.1, the exported Excel file includes these updates:

- **Sales BOM Sheet**: Contains information tailored for sales representatives.
- **Net BOM Sheet**: Now includes the sitewide BOM count, providing a comprehensive overview of all network elements in the analyzed network.

Step 5 Compare the BOM of the existing network with other networks:

a) Click **Compare with: Other Networks**.
b) From the **Other Networks** dialog box, choose the network that you want to be compared with.

You can view both BOM reports displayed on the same page for comparison.

Step 6 Use the Search box on top of the BOM reports to search for any specific site or wave in the reports.

a) Enter the name of the specific site or wave in the Search box.
b) Choose **equals** or **contains** from the drop-down list.
c) Click the Search icon to search for the required site or wave.

Licensed PIDs available in the BOM report

Table 86: Feature History

Feature Name	Release Information	Feature Description
Support for New PIDs for SMR-20 Card	Cisco ONP Release 4.2	The following new licensed PIDs for the SMR-20 card are displayed on the BOM page so that you can view the price details and consider ordering. • NCS2K-FSSMR-2LIC= • E-NCS2K-1P-LIC= • E-NCS2K-5P-LIC= • E-NCS2K-10P-LIC=

Cisco ONP introduces new licensing PIDs with each platform release to incorporate the latest updates and features.

This table lists the licensed PIDs included in the BOM report for different Cisco ONP releases.

Table 87: Licensed PIDs added to BOM report

Cisco ONP release supported from	Platform	PIDs and description
4.2	NCS 2000	• **NCS2K-FSSMR-2-LIC=** : 20-port FS-SMR licensed to enable two ports • **E-NCS2K-1P-LIC=** : Software license to enable one port on licensed 20-port FS-SMR • **E-NCS2K-5P-LIC=** : Software license to enable five ports on licensed 20-port FS-SMR • **E-NCS2K-10P-LIC=** : Software license to enable ten ports on licensed 20-port FS-SMR
5.2	NCS 1010 from Release 7.11.1	• **NCS1K10-ATO=** : NCS 1010 ATO • **SF-NCS1K10-7111K9S=** : Software license to download the COSM NETCONF XML file for the COSM UI. • **NCS1K4-CCMD-C=** : 16-port, C-Band Colorless Coherent Multiplexer/Demultiplexer with an EDFA • **NCS1K4-CCMD-L=** : 16-port, L-Band Colorless Coherent Multiplexer/Demultiplexer with an EDFA

Cisco ONP release supported from	Platform	PIDs and description
	NCS 1020 from Release 24.3.1 NCS 1001 from Release 7.10.1	• **NCS1020-SA=** : NCS 1020 Shelf Assembly • **NCS1020-FAN=** : NCS 1020 Fan for NCS 1014 Slots • **NCS1020-FAN-BLANK=** : NCS 1020 Fan Blank • **CWDM-SFP-1510=**: CWDM 1510 NM SFP Gigabit Ethernet and 1G/2G FC • **CWDM-SFP-1610=**: CWDM 1610 NM SFP Gigabit Ethernet and 1G/2G FC • **ONS-SC-Z3-1510=**: SFP - OC48/STM16/GE, CWDM, 1510 nm, Commercial Temp • **ONS-SC-Z3-1610=**: SFP - OC48/STM16/GE, CWDM, 1610 nm, Commercial Temp • **ONS-SE-155-1510=** : SFP - OC3/STM1 CWDM, 1510 nm, EXT
	NCS 1014 transponder cards from Release 24.3.1.	

Cisco ONP release supported from	Platform	PIDs and description
		• **S-NCS1K14-L-100U=** : NCS 1014 100G Client Capacity Smart License - 400-600 • S-NCS1K14-L-100L= : NCS 1014 100G Client Capacity Smart License - 700-900 • S-NCS1K14-L-100M= : NCS 1014 100G Client Capacity Smart License - 1T-1.2T • NCS1K14-2.4T-K9= : Network Convergence System 1014 2.4T Line Card • **NCS1K14-2.4T-X-K9=** : Network Convergence System 1014 2.4T-X Line Card • **NCS1K4-QXP-K9=** : NCS1004 3.2T QSFP-DD DCO Transponder • **ESS-TXP-SIA3** : Essential Coherent DWDM interface SIA 36-59 months • **ESS-TXP-SIA5** : Essential Coherent DWDM interface SIA 60-120 months • **ESS-TXP-RTU** : Essential Coherent line card interface RTU • **ADV-TXP-SIA3** : Advance Coherent DWDM interface SIA 36-59 months • **ADV-TXP-SIA5** : Advance Coherent DWDM interface SIA 60-120 months • **ADV-TXP-RTU** : Advance Coherent line card interface RTU **Note** This is applicable only for the newly designed and upgraded networks.

Cisco ONP release supported from	Platform	PIDs and description
25.1.1	NCS 2000 with chassis models M6, M15, M2 NCS 1004 NCS 1014 NCS 1010 NCS 1020	**OAS-COSM-MLCL** One COSM PID is added for each active card present in the chassis. If a chassis slot is occupied with any active card such as SMR, 16-AD, EDFA, RAMAN, TXP, PSM cards, OLT, ILA, NCS1K14-2.4T-K9, NCS1K14-2.4T-X-K9, and NCS1K4-QXP-K9, one license is added for each occupied slot.

View details of layout and internal connections

Follow these steps to obtain the layout details and internal connections of an analyzed network.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Click the **Layout** tab on the Cisco ONP homepage.

Step 2 Type the site name in the search box, or select a site from the **Sites** drop-down list.

The site layout is displayed with its racks and cards.

a) Hover the mouse pointer over the transponder card to view the details of the slot, the PID of the card, and the ports.
b) Expand the Ports to view details, such as wavelength and trunk mode.
c) Hover the mouse pointer over the chassis to view the total power consumption.

COSM supports up to 50 UIDs; beyond which, the site layout displays incorrect UID for the chassis.

Step 3 Click the **IPC** tab to view the internal patch connections of the selected site.

Export Internal connections

Cisco ONP allows you to export internal fiber connections in two ways: either at site-level or network-level.

Follow these steps to export internal fiber connections.

Before you begin

Log in to Cisco ONP web interface, on page 7.

View details of layout and internal connections, on page 249

Procedure

Step 1 Click the **Ellipsis** icon available in the right side of the internal fiber connection or site.

Step 2 Click **Export**.

View end-to-end OCH connections

Table 88: Feature History

Feature Name	Release Information	Feature Description
View the End-to-End Optical Channel (OCH) Connectivity from Source to Destination	Cisco ONP Release 24.3.1	You can now view the end-to-end OCH connection details in the graphical form for the analyzed NCS 1010 networks. The new **OCH** tab in **Layout** displays all the OCH connectivity from source to destination in: • **Degree Connection View**: Displays the source and destination site's connectivity. • **Functional View**: Displays the end-to-end port and card connections from source to destination through the fiber.

You can now view the end-to-end OCH connection details in the graphical form in Degree Connection and Functional views for the analyzed NCS 1010 networks.

Follow these steps to view the end-to-end OCH connectivity from source to destination.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Open the analyzed NCS 1010 network for which you want to view the end-to-end OCH connectivity./

Step 2 Click the **Layout** tab on the Cisco ONP homepage.

Step 3 Click the **OCH** tab.

The **OCH Pipes** pane appears to display the sites and sections in the circuits tree.

Step 4 Click the ellipsis icon next to the **Circuits**.

A pop-up list displays the view options.

Table 89: Option Descriptions

Options	Descriptions
Expand All	Expands all the items in the circuits tree.
Collapse All	Collapses all the items in the circuits tree.

Step 5 Use the search bar or filter icon to select the required source and destination sites.

Icon/Field	Description
Search	Locates the site based on the typed-in site name.
Filter	Filters the circuit based on **Source Site** and **Destination Site**.
Reset	Resets the filter conditions.

Based on the unit that you select in the circuit tree, you can see the site connectivity or the detailed end-to-end OCH connectivity.

If you click the...	Then you can see the...
circuit in the OCH tree	source and destination site connectivity only.
sections in the OCH tree	end-to-end OCH connectivity, including intermediate nodes and cards connectivity.

Step 6 In the graphical area, use the action icons to view the source and destination sites connectivity.

Table 90: Action icons

Icons	Description
Zoom In	Zooms in for a closer view of a specific connection
Zoom Out	Zooms out for a larger view of the entire connection
Fit View	Resets the zoom-in/zoom-out view to the default view
Lock/Unlock	Locks the view at a specific area Unlocks the view
Download PNG	Downloads the end-to-end circuit connection as a PNG image
Switch to Degree Connection View / Switch to Functional View	• **Degree Connection View**: Displays the source and destination site's connectivity • **Functional View**: Displays the end-to-end port and card connections from source to destination through the fiber

Icons	Description
Reset All Nodes Position	Reverts the nodes to the default position

Export end-to-end OCH connections

Follow these steps to view the end-to-end OCH connectivity from source to destination.

Before you begin

Log in to Cisco ONP web interface, on page 7
View end-to-end OCH connections, on page 250

Procedure

Step 1 In the graphical area, click the download icon.

The **Export** pop-up list displays the circuit options.

Table 91: Option descriptions

Options	Descriptions
Current Circuit	Provides details of the end-to-end OCH connectivity for the circuit that you selected.
All Circuits	Provides details of the end-to-end OCH connectivity for all the circuits.

Step 2 Click the required option to export the end-to-end OCH connectivity details to an Excel sheet.

View power consumption and unit weight report

Table 92: Feature History

Feature Name	Release Information	Feature Description
Power Consumption and Unit Weight Report	Cisco ONP Release 5.2	Now, you can generate the power consumption and unit weight report for each product ID (PID). In the layout tab, you can see the power consumption and unit weight values and export them into Excel as a report for a single site or all sites. With prior knowledge of power consumption and weight details for each PID, you can plan and design an energy-efficient network. The new options that allow you to view and export the reports are: • **Show Typical Power Consumption** • **Show Max Power Consumption** • **Show Unit Weight** • **Power Consumption & Weight**

The Power Consumption and Unit Weight report includes power consumption and weight details of cards and shelves at each site.

Remember The power consumption of the Power Supply Unit (PSU) is not included in the total power consumption for NCS 1001, NCS 1010, NCS 1014, and NCS 1020 chassis. Determine the total power consumption for these chassis by adding 8 percent of the aggregated power consumption of all the cards inside the chassis to account for the PSU power consumption.

Note To view the power consumption and weight report, upgrade and analyze the LNI network.

Follow these steps to view the power consumption and unit weight report for each site.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Open the analyzed network for which you want to view the power consumption and weight report.

Step 2 Click the **Layout** tab on the Cisco ONP homepage.

Step 3 Click the ellipsis icon next to **Sites**.

A pop-up list displays these options.

Table 93: Option descriptions

Options	Description
Expand All	Expands all the items in the layout tree.
Collapse All	Collapses all the items in the layout tree.
Show Typical Power Consumption	Check the **Show Typical Power Consumption** check box to view typical power consumption values of each card and shelf in watts.
Show Max Power Consumption	Check the **Show Max Power Consumption** check box to view the power consumption values of each card and shelf in watts. Max Power Consumption for a shelf is the sum of cards and modules. **Note** The total power consumption of an NCS 2000, NCS 4000, or NCS 1000 shelf changes based on AC or DC power supply. • For DC power supply, total power consumption of the shelf includes all Cards, DC power module, and fan tray. • For AC power supply in NCS 2000 M6 only, total power consumption of the shelf includes all cards, fan tray, 10% of power consumed by all cards, and 5W of Cooling Unit power consumption.
Show Unit Weight	Check the **Show Unit Weight** check box to view the weight of each card and shelf in kilograms. The unit weight for a shelf is the sum of cards and modules.

Step 4 Select the options as you require.

Export power consumption and unit weight report

Follow these steps to export the power consumption and weight report of each shelf and card.

Before you begin

Log in to Cisco ONP web interface, on page 7

View power consumption and unit weight report , on page 253.

Procedure

Step 1 In the graphical area, click the download icon.

The **Export** pop-up list displays these options.

Table 94: Option Descriptions

Options	
Current site	Provides details of the site that you selected.
All Sites	Provides details of all the sites.

Step 2 Click the option as you require.

Step 3 Click **Power Consumption & Weight** to export the optical reports details in an Excel sheet.

We recommend that you export the power consumption and weight report only in the analyze mode. Exporting the reports in the upgrade and release upgrade modes may be inaccurate.

View the results of analyzed network

Note You can refer to the optical results data to check and correct the optically not feasible channels. You can modify the network properties in the Upgrade and Release Upgrade modes. After making the necessary corrections, analyze again to update the optical results based on the new modifications.

Follow these steps to view the details of optical reports, installation parameters, traffic reports, and cabling reports.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Open the analyzed network for which you want to view the optical results.

Step 2 Click the **Results** tab on the Cisco ONP home page.

By default, the **Optical Report** tab appears. Each row in the tab shows the performance of one optical path. See Optical Report, on page 258.

Note
From Release 24.1.1, you can view the multicarrier sites highlighted in the **Optical Report** tab, and organized in the I**nstallation Report** tab.

To view the optical report for any particular optical path:

a) In the network tree, expand **Circuits/Waves/Media Channels** and click the **Ellipsis** icon available in the right side of the required optical path.

b) Click **Open Results**.

The Cisco ONP opens the **Optical Report** tab and provides the details of the selected optical path.

c) Expand the optical path to view the wave and aggregated wave information for a selected circuit.

Step 3 From the **OSNR RBW** drop-down list, select the OSNR Resolution bandwidth between 0.5 nm and 0.1 nm.

The default value is 0.5 nm. You can change it in Design mode, Analyzed mode, Upgrade mode, and Release upgrade mode. When set to 0.1 nm, the SOL G-OSNR and EOL G-OSNR values increase to 7 dB.

Step 4 Click the **Installation Parameters** tab.

The Installation Parameters report specifies the values to be provisioned at installation for each site in the network.

To view the installation parameters for Automatic Node Setup (ANS) and Automatic Node Provisioning (ANP), click the respective tabs. See Installation parameters, on page 260

Step 5 Click the **Traffic Report** tab.

You can view the aggregated demand channel data in the form of the traffic reports. See Traffic reports, on page 261.

In Release 5.1, you can view the traffic report for all imported networks except the imported .mpz networks. To view the traffic report for individual optical path in imported .mpz networks, you must manually search in the Search box.

To view the traffic report for any particular optical path:

a) In the network tree, expand **Circuit** and click the **Ellipsis** icon available in the right side of the required optical path.
b) Click **Open Results**.

The Cisco ONP displays the traffic report for the selected optical path.

Note
By default, **Optical Result** appears under the **Results** tab. Click **Traffic Report** to view traffic reports.

c) Expand the optical path to view the wave information.

Step 6 Click the **Cabling Report** tab. See Cabling report , on page 262

You can view the patch cord connections related to internal patch connections and multishelf management. This report is available for the networks starting from NCS 2000 system Release 12.1.0.

To view the internal patch connections for any particular site:

a) In the network tree, expand **Site** and click the **Ellipsis** icon available in the right side of the required site.
b) Click **Open Cabling Report**.

The Cisco ONP opens the **Cabling Report** tab. By default, the **IPC** tab appears and provides the IPC details of the selected site.

c) To view the internal patch connections, expand the Site.

Step 7 Use the Search box on top of the reports to search for any specific site or wave in the reports

a) Enter the name of the specific site or wave in the Search box.
b) Choose **equals** or **contains** from the drop-down list.
c) Click the Search icon to search for the required site or wave.

Step 8 Click **Export Report** to export the optical reports details in an Excel sheet.

We recommend exporting the optical report only in analyze mode. Exporting reports in upgrade and release upgrade modes may be inaccurate.

Compare installation parameters of two networks

Table 95: Feature History

Feature Name	Release Information	Feature Description
UI Revamp of Optical Reports	Cisco ONP Release 4.1	This feature improves the user experience while comparing the installation parameters and optical reports of two networks.

Use this task to compare the installation parameters of two networks.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Click the **Results** tab on the Cisco ONP home page.
Step 2 Click **Installation Parameters**.
Step 3 Click **Other Networks**.
Step 4 From the list of networks, select the network with which to compare.

FInd a new parameter called **diffBy**.

Step 5 To stop comparing the two networks, click **Clear**.
Step 6 Click **Export Report** to export the comparison report.

Compare the optical reports of two networks

Follow these steps to compare the optical reports of two networks.

Before you begin

Log in to Cisco ONP web interface, on page 7.

Procedure

Step 1 Click the **Results** tab on the Cisco ONP home page.
Step 2 Click **Optical Report**.
Step 3 Click **Other Networks**.
Step 4 From the list of networks, select the network with which to compare.

The optical parameters display two values.

Step 5 To stop comparing the two networks, click **Clear**.

Step 6 Click **Export Report** to export the comparison report.

Optical Report

From Release 24.3.1, you can filter the results by any column available in the report for more precise data analysis. For reports represented as colored icons, you can use the first letter of the color (e.g., "g" for green) to filter the results.

Table 96: Optical Report

Optical Parameter	
Name	Displays the ID number of the wave and aggregated waves. ID is automatically generated based on the site name.
Protection	Displays the protection type of the wave.
Protection Type	Displays whether the path type is Protected or Working path for NCS 1001.
SOL	Displays an icon indicating the results summary of the analysis that is run with Start of Life (SOL) fiber loss values: • Green indicates success. • Yellow indicates success with a marginal failure risk. • Orange indicates that the channel has a higher risk of failure. • Red indicates failure.
EOL	Displays an icon indicating the results summary of the analysis that is run with End of Life (EOL) fiber loss values. The indicator shows the optical performance for the path at the end of the fiber life: • Green indicates success. • Yellow indicates success with a marginal failure risk. • Orange indicates that the channel has a higher risk of failure. • Red indicates failure.
SE	Indicates a system-related error that may impact the analysis of the design. If the indicator is red, review the messages that are reported at the end of the analysis or determine which units or sites have a problem.
P/F	Displays the present or forecast services indication.
Source	Displays the name of the source site and side; for example, Site 1-E.
Src Colorless	Displays whether the colorless functionality is enabled on source ports.
Src Contentionless	Displays whether the contentionless functionality is enabled on source ports.
Destination	Displays the name of the destination site and side; for example, Site 1-E.
Dst Colorless	Displays whether the colorless functionality is enabled on destination ports.

Optical Parameter	
Dst Contentionless	Displays whether the contentionless functionality is enabled on destination ports.
Wavelength	Displays the wavelength of the optical channel.
Band Type	Displays the band type of the optical path.
Src Tx Type	Displays the type of DWDM unit or pluggable port module that is used at the source of the specific Optical Channel (OCH) trail. The class of the DWDM unit is also displayed.
Dst Tx type	Displays the type of DWDM unit or pluggable port module that is used at the destination of the specific OCH Trail. The class of the DWDM unit is also displayed.
Span	Displays the total span length (source to destination) for this path in kilometers.
Suggested Regen Locations	Displays the regeneration locations.
BER Target	Displays the bit error rate (BER) target for this channel, based on the capability of the channel's optical interface. It is 1.0E-15 for the interfaces using forward error correction (FEC) and 1.0E-12 for interfaces without FEC.
SOL OSNR	Displays the start of life average Optical Signal to Noise Ratio (OSNR) value at the receiver.
EOL OSNR	Displays the end of life average OSNR value at the receiver.
SOL OSNR margin	Displays the SOL OSNR margin calculation. It is the difference between the OSNR value at certain power of the working point of the receiver client and the working area boundary.
EOL OSNR margin	Displays the EOL OSNR margin calculation, which is the difference between the OSNR value at a certain power of the working point of the receiver client and the working area boundary.
SOL RX	Displays the SOL average power that is received at the destination site in dBm.
EOL RX	Displays the EOL average power that is received at the destination site in dBm.
SOL Power Margin	Displays the SOL power budget margin at the receiver in decibels. It is defined as the offset between the receiver working point and the BER curve with margin. A positive value indicates that there are no power problems.
EOL Power Margin	Displays the EOL power budget margin at the receiver in decibels. It is defined as the offset between the receiver working point and the BER curve with margin. A positive value indicates that there are no power problems.
SOL Overload	Displays the SOL overload margin at the receiver in decibels. A positive value indicates that there are no overload problems.
EOL Overload	Displays the EOL overload margin at the receiver in decibels. A positive value indicates that there are no overload problems.
Residual CD	Displays the chromatic dispersion (CD) margin of the demand.
CD robustness	Displays the robustness to chromatic dispersion of the receiver.

Optical Parameter	
Single-Channel NLE Status	Displays the status of alarms if any nonlinear effect (NLE) is present in the demand.
Multi-Channel NLE Status	Provides the status of the nonlinear effect (NLE) on a particular channel or demand due to other channels or demands.
Min GB	Displays the minimum Guard Band (GB) requirement between channels on the 40G CP-DQPSK MXP and 40G CP-DQPSK ME MXP cards, and other transponders in a mixed any-to-any connectivity.
Filtering Penalty	Displays the value of the penalties that are caused by different filter types (OADM, ROADM, and arrayed waveguide grating (AWG)).
PMD	Displays the calculated total Polarization Mode dispersion (PMD) for each circuit. If the overall PMD for the link overcomes the maximum that is allowed, the PMD value is displayed in a red-colored font. The maximum allowed value depends on the client interface. For these special cases, the network must be manually resolved by contacting a Cisco TAC team.
RX Atten	Displays the attenuation at the input of the receiver.
TX Atten	Displays the attenuation at the output of the receiver.
Encryption	Displays the encryption type of the channel. Possible values are N/A, Yes, No.

Installation parameters

This table outlines the installation parameters for the ANS component.

Table 97: ANS Parameters

Parameter	Description
Name	Displays the name of the site
Side	Displays the line side
Position	Displays the rack number, shelf number, and slot position of the card where the patch cord originates.
Unit	Displays the name of the card.
Port	Displays the port number where the patch cord originates.
Port ID	Displays the port ID.
Port Label	Displays the name of the port.
Parameter	Displays the name of the parameter to be set, such as RX Power Low, PSDShape, PSD, Gain, AmpliGainRange, AddAttenuation, DropAttenuation, Control Mode, MinExpSpanLoss, MaxExpSpanLoss, and so on. For the CCMD-16 LC card connected to the ports of the OLT-E-C, the PSD is set using a specific formula and the VOA drop attenuation is set to 0dB to have optimal RX power for the circuits.

Parameter	Description
Value	Displays the name of the value to be set for the parameter.
Measurement Unit	Displays the measurement unit for the related installation parameter value, such as dBm.
Manual Set	Indicates with a Yes or No which parameters must be manually set using the Cisco Transport Controller (CTC) interface.

This table outlines the installation parameters for the ANP component.

Table 98: ANP Parameters

Parameter	Description
Name	Displays the name of the site.
Unit ID	Displays the unit (slot number) of the passive units in the shelf.
Shelf ID	Displays the shelf identifier.
Rack Number	Displays the rack number.
Rack Position	Displays the rack position in the shelf.
Slot Position	Displays the slot position in the shelf for the card.
Equipment Type	Displays the card type.
Description	Displays the details of the card type.

Traffic reports

This table displays the aggregated data of demand channel in the traffic report for the analyzed network.

Table 99: Traffic Reports

Traffic report	Description
Demand	Categorizes each demand type. Each demand is further categorized into service, trails, and sections.
Section	Displays the sections under every service.
Src Site	Displays the site name for the optical channel source.
Band Type	Displays the band type for the optical path.
Src Position	Displays the rack, shelf ID, and slot identifiers for the source of the optical channel.
Src Card	Displays the unit name for the optical channel source.

Traffic report	Description
Dst Site	Displays the site name for the optical channel destination.
Dst Position	Displays the rack, shelf ID, and slot identifiers for the destination of the optical channel.
Dst Card	Displays the unit name for the optical channel destination.
Client Service Type	Displays the client service type of the demand; for example, OC-48.
Protection Type	Displays the protection type of the demand
Encryption	Displays whether the demand is encrypted with values: NA, Yes, or No.
Wavelength	Displays the wavelength value of the optical channel, and the serial number of the wavelength in the wavelength band.
Max Latency (for NCS 2000 network)	Displays the latency time for the current circuit. This value includes all the latency components for the circuit, including fiber and DWDM units on the path.
Fiber Latency (for NCS 1010 and NCS 1001)	Displays the latency time for the fiber.

Cabling report

The IPC Cabling and Patch reports are consolidated into a single view with additional columns. This streamlines connection details and eliminates the need to access multiple sources.

This table shows patch cord connections related to internal patch connections and multishelf management.

Table 100: IPC

Parameter	Description
Name	Displays the name of the site.
Src Unit Type	Displays the source unit.
Src Position	Displays the rack, shelf, and slot position of the card from which the patch cord originates.
Src Port Label	Displays the name of the port.
SrcFicBay	Displays the assigned rack number.
SrcShelfName	Displays the type of shelf or the shelf name.
SrcShelfNumber	Displays the type of shelf or the shelf name.

Parameter	Description
SrcShelfUniqueId	Displays the unique ID assigned to the shelf. The unique ID will be used in COSM XML to push the configuration to the device.
SrcRUPosition	Displays the rack unit position in layout.
SrcCardNumber	Displays the card slot number within the shelf .
Cable	Displays the type of cable.
Dst Unit Type	Displays the source unit.
Dst Position	Displays the rack, shelf, and slot position of the card from which the patch cord terminated.
Dst Port Label	Displays the name of the port.
DstFicBay	Displays the assigned rack number.
DstShelfName	Displays the type of shelf or the shelf name.
DstShelfNumber	Displays the assigned shelf number.
DstShelfUniqueId	Displays the unique ID assigned to the shelf, which is used in COSM XML to push the configuration to the device.
DstRUPosition	Displays the rack unit position in layout.
DstCardNumber	Displays the card slot number within the shelf .
ManuallySet/AutomaticallySet	Indicates whether a cable connection will be automatically generated or requires manual configuration for NCS 2000 networks.

Table 101: MSM

Parameter	Description
Name	Displays the name of the site.
Src Unit Type	Displays the source unit.
Src Position	Displays the rack, shelf, and slot position of the card from which the patch cord originates.
Src ID	Displays the source unit ID.
Src Port Label	Displays the name of the port.
Cable Type	Displays the type of cable.
Dst Unit Type	Displays the source unit.

Parameter	Description
Dst Position	Displays the rack, shelf, and slot position of the card from which the patch cord terminated.
Dst ID	Displays the destination unit ID.
Dst Port Label	Displays the name of the port.
W/P	Indicates whether the connection relates to a present or forecast circuit.

Confidential banner in exported reports

Table 102: Feature History

Feature Name	Release Information	Feature Description
Confidential Banner	Cisco ONP Release 4.1	This feature indicates the confidentiality of the reports or results generated by Cisco ONP for a network. The CONFIDENTIAL banner is placed in all the exported reports. It is placed in the first row and first cell of the Excel sheet, followed by a blank row and the contents of the exported report.

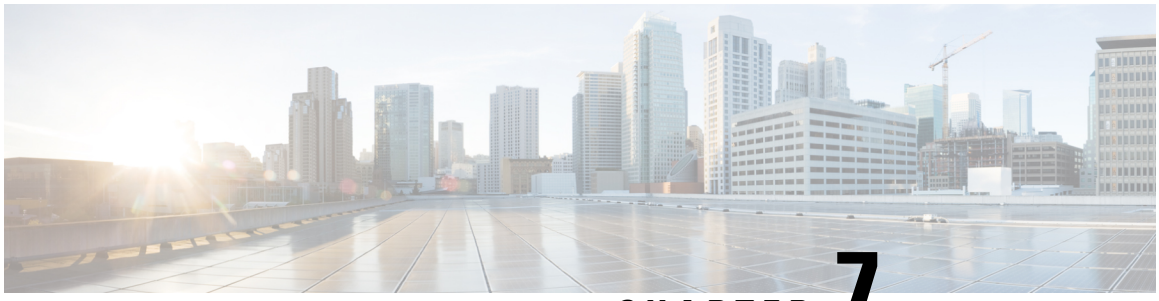
Table 103: Feature History

Feature Name	Release Information	Feature Description
Customizable Confidential Banner	Cisco ONP Release 4.2	The Confidential Banner string can be customized as required. An admin user can modify the banner string when the *confidentialBanner.enabled* field is set to true in the *feature.properties* file.

The "CONFIDENTIAL" banner appears in all exported reports. In Excel files (.xlsx), it is located in the first cell of the first row, followed by a blank row, and then the report contents. If the .xlsx file contains multiple sheets, the banner is included on each sheet.

The "CONFIDENTIAL" banner is updated only when reports are exported in .xlsx format.

Server administrators can customize the "CONFIDENTIAL" banner text by modifying the `confidentialBanner.content` field. To enable banner customization, the `confidentialBanner.enabled` field must be set to `true` in the `feature.properties` file. By default, this field is set to `false`.



CHAPTER 7

Backup and Restore Cisco ONP Database

- Backup Database, on page 265
- Restore database using script, on page 269

Backup Database

The database backup configuration on the server, set by the system administrators, allows backups of the entire database to be taken daily, weekly, or monthly. Only system administrators have access to the backup folders and can perform restorations. Backup archives are stored on a highly durable NFS share. The available backup archives include:

- Daily archives for the last 7 days
- Weekly archives for the last 4 weeks
- Monthly archives for the last 6 months

Note You can change the duration for monthly archives.

Setup Backup

Before you begin

- Ensure that a highly durable 2 TB NFS storage is available to store database archives.
- Ensure that the storage is accessible from the Cisco ONP environment.
- Set up rules as defined by the Cisco ONP network and configure the appropriate Access Control List (ACL) to permit or deny access to the storage as needed.

Procedure

Step 1 Log into the Cisco ONP server, where you have installed Cisco ONP by using the tar archive.

Step 2 Create a folder for backup. Ideally it should be mounted on a reliable object storage such as NFS.

Step 3 Copy backup, rotation, and setup backup scripts from `ONP/images` folder to the new folder created in step 2.

Example:

```
 $ cd
$ mkdir cnp_backups
$ tree ~/cnp_backups/
 /home/ciscocnp/cnp_backups/
├── backup_postgres.sh
└── rotation.sh
└── setup_backup.sh
```

Ensure that all scripts have necessary permissions:

```
 $ chmod +x backup_postgres.sh
 $ chmod +x rotation.sh
 $ chmod +x setup_backup.sh
$ ls -l | grep .sh
 -rwxrwxr-x 1 ciscocnp ciscocnp 518 Jan 16 05:23 backup_postgres.sh
-rwxrwxr-x 1 ciscocnp ciscocnp 1412 Feb 1 05:50 rotation.sh
```

Step 4 Copy `restore_postgres.sh` from `/ONP/images/`.

Perform manual backup

Follow these steps to back up the Cisco ONP database.

Procedure

Step 1 Browse to the location where the backup_postgres.sh script is stored.

Step 2 Use the `bash rotation.sh` command to execute the rotation.sh script.

Example:

```
user@server:~/cnp_backups$ bash rotation.sh
```

This command creates the necessary folder structure.

Step 3 Use the `bash backup_postgres.sh` command to execute the script.

Example:

```
 user@server:~/cnp_backups$ bash backup_postgres.sh
```

The backup file is stored in the daily backup folder (backup.daily) with the current time stamp.

Schedule a backup

You can schedule a backup in either of these two ways:

• Schedule a backup using script, on page 267
• Schedule a backup with Crontab, on page 267

Schedule a backup using script

Follow these steps to schedule the backup operation using a script.

Procedure

Step 1 Log in to the Cisco ONP server.

Step 2 Use the command `bash rotation.sh` to execute the rotation.sh script.

Example:

```
user@server:~/cnp_backups$ bash rotation.sh
```

This command creates the necessary folder structure.

Step 3 Use the command `bash setup_backup.sh` to execute the setup_backup.sh script.

Example:

```
user@server:~/cnp_backups$ bash setup_backup.sh
```

The backup file is stored in the daily backup folder (backup.daily) with the current time stamp.

Step 4 Enter the path at the user prompt to store the file.

Backup files are stored in your required file path as shown in this example.

Example:

```
/user-defined path/backups/backup.daily
```

Schedule a backup with Crontab

Follow these steps to schedule the backup operation using Crontab.

Procedure

Step 1 Log in to the Cisco ONP server.

Step 2 Use the command `sudo crontab -e` to configure the Crontab job.

```
user@server~/cnp_backups$ sudo crontab -e
```

Step 3 Update the `Crontab.sh`script with the required cron job entries using the Syntax to schedule the backup using Crontab, on page 270, to schedule backup operations.

Example:

This example shows the scheduling of the backup operation at 3:00 a.m daily.

```
0 3 * * * /home/ciscocnp/cnp_backups/backup_postgres.sh
```

Syntax to schedule the backup using Crontab

Use this syntax to schedule a backup in Crontab:

```
m h dom mon dow
```

Where:

- m: Minutes (0–59)
- h: Hours (1–23)
- dom: Day of the month (1–31)
- mon: Month of the year (1–12)
- dow: Day of the week (0–6, where 0 represents Sunday)

To specify the time, you can provide exact values for the minute (m), hour (h), day of the month (dom), month (mon), and day of the week (dow). Alternatively, you can use the wildcard character * in these fields to indicate "any value."

Note The backup jobs are initiated according to the system daemon's understanding of time and time zones as defined by the cron scheduler.

Restore the database manually

Follow these steps to restore the database manually.

Procedure

Step 1 Check the Cisco ONP Database.

Example:

```
$ postgres CnpDB

MongoDB shell version: 2.6.10
 connecting to: CnpDB
 Server has startup warnings:
 2019-01-31T12:17:39.354+0000 I STORAGE [initandlisten]
 2019-01-31T12:17:39.354+0000 I STORAGE [initandlisten] ** WARNING: Using the XFS filesystem is
strongly recommended with the WiredTiger storage engine.
 2019-01-31T12:17:39.354+0000 I STORAGE [initandlisten] ** See
http://dochub.mongodb.org/core/prodnotes-filesystem
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten]
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten] ** WARNING: Access control is not enabled
for the database.
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten] ** Read and write access to data and
configuration is unrestricted.
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten]
```

```
 > show collections
 NetworkEntity
 SystemLog
 BOM
 fs.files
 Users
 fs.chunks
 ErrorInfo
 NetworkObject
 UserGroups
 TaskInfo
 ActionGroups
 Roles
 >
 ```
```

**Step 2** Remove the Cisco ONP back-end and front-end Docker services,"docker service rm cnp_cnp cnp_cnp_frontend" and check again:

**Example:**

```
```

$ postgres CnpDB

```
 MongoDB shell version: 2.6.10
 connecting to: CnpDB
 Server has startup warnings:
 2019-01-31T12:17:39.354+0000 I STORAGE [initandlisten]
 2019-01-31T12:17:39.354+0000 I STORAGE [initandlisten] ** WARNING: Using the XFS file system is
strongly recommended with the WiredTiger storage engine.
 2019-01-31T12:17:39.354+0000 I STORAGE [initandlisten] ** See
http://dochub.mongodb.org/core/prodnotes-filesystem
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten]
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten] ** WARNING: Access control is not enabled
for the database.
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten] ** Read and write access to data and
configuration is unrestricted.
 2019-01-31T12:17:40.013+0000 I CONTROL [initandlisten]
 > show collections
 >
 ```
```

Step 3 Copy the database to the folder that is mapped to PostgresDB container's volume:

Example:

```
 $ sudo cp backups/2019-02-01-04-29.archive /var/lib/postgresdb_cnp/
```

Step 4 Restore the database and check.

Example:

```
 $ docker exec -t cnp_postgres.1.$(docker service ps -f 'name=cnp_postgres.1' -f 'desired-state=running'
 cnp_postgres -q) bash -c "postgresrestore -u \$(cat \$MONGO_INITDB_ROOT_USERNAME_FILE) -p \$(cat
\$MONGO_INITDB_ROOT_PASSWORD_FILE) --authenticationDatabase admin --port 27017 -h localhost --db
CnpDB --gzip --archive=/data/db/2019-02-01-04-29.archive"
```

Restore database using script

You can restore the database using a script, which is available at this location:

`/ONP/Images/restore_postgres.sh`

Follow these steps to restore the database using a script:

Procedure

Use the command `sudo bash restore_postgres.sh` to restore the database

Example:

```
 $ sudo bash restore_postgres.sh DB backup archive file path.
$ sudo bash restore_postgres.sh /backups/backup.daily/2019-05-05-23-58.archive
```

The database backup is created and a confirmation prompt appears asking to delete the database.

```
!!! WARNING! Complete Restore Operation will replace Existing Database with Backup Database
(Recommended) !!!
Do you want Complete Restore? (Yes/No) [default - Yes]
```

Enter `Yes` to delete the database and restore the database with backup file.

Enter `No` to not delete the database and apply only missing data(s) from backup file.

Syntax to schedule the backup using Crontab

Use this syntax to schedule a backup in Crontab:

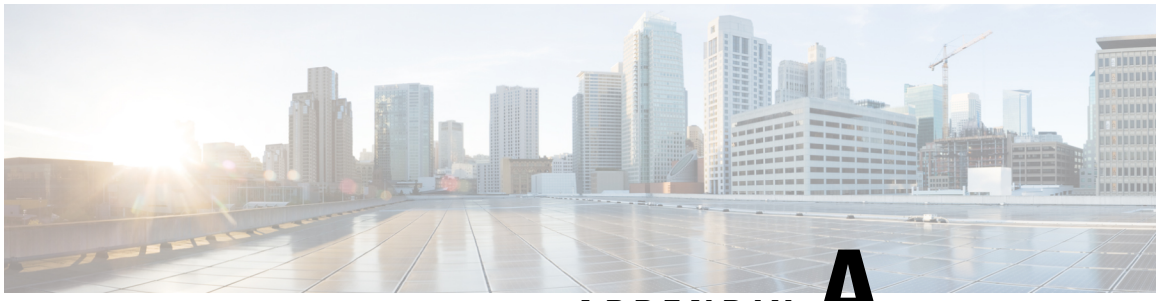
```
m h dom mon dow
```

Where:

- m: Minutes (0-59)
- h: Hours (1-23)
- dom: Day of the month (1-31)
- mon: Month of the year (1-12)
- dow: Day of the week (0-6, where 0 represents Sunday)

To specify the time, you can provide exact values for the minute (m), hour (h), day of the month (dom), month (mon), and day of the week (dow); alternatively, you can use the wildcard character `*` in these fields to indicate "any value."

Note The backup jobs are initiated according to the system daemon's understanding of time and time zones as defined by the cron scheduler.



APPENDIX A

Cisco ONP UI Reference

This appendix chapter describes the various options available in the Cisco ONP UI.

Table 104: Feature History

Feature Name	Release Information	Feature Description
Enhancements and Engineering Initiatives	Cisco ONP Release 25.1.1	This release includes several user experience and functionality enhancements to the application: • Added color indication at the circuit and network level in the network tree to represent optical feasibility and overall network performance. • Enhanced selection capabilities within the network tree for more efficient management. • Added version and timestamp information to exported reports to improve traceability and documentation. • Displayed edge labels directly on the map view for easier identification and understanding of network topology. • Provided users with the ability to unlock and modify entity properties within the entity editor. • Enabled users to edit the Effective Mode Area parameter for fibers to achieve more accurate OSNR and power calculations.

Table 105: Feature History

Feature Name	Release Information	Feature Description

User Interface Enhancements	Cisco ONP Release 24.3.1	Cisco ONP improves the user experience with these user interface enhancements:
		• **Maps**:
		  • Providing an option to increase the workable area.
		  • Switching to zoom mode that automatically centers the map on the selected node.
		  • Highlighting nodes and fibers selected in the network tree on the map.
		• **Entity Editor**: Adding tooltips for some of the properties.
		• **Results**:
		  • Including Raman information in the Fiber Details that are exported from **Export**>**Fibers**.
		  • Introducing **Export Report** button to export Optical Reports/BOM differences between two networks in CONP.
		  • Maintaining the recent view in the **Results** tab view when switching to the **Map** or **BoM** tabs.
		• Enabling editing of EOL Aging Loss with **Aging Loss [dB]** property in both the entity editor and Properties pane.
		• Updating optical sources with minimum system release information for user visibility in the **Manage Optical Source** dialog box.
		• Adding an *OMNI* marker to identify the Omni-Directional sides in the NCS 2000 networks.
		• **Component Logs**: Streamlining log management, this **Logs** menu option provides direct access to critical component logs such as cnp Backend (BE), ODE, GENE, and PCE through the user interface.

• Menu bar, on page 272
• Network Tree, on page 280
• Design Palette, on page 282
• Entity Editor, on page 284

Menu bar

This table lists all options available in your Cisco ONP GUI menu bar.

Table 106: Menu options and descriptions

Options	Description
File	Performs common file operations such as New, Open, Open Shared, Save, Save As, Share, and Delete
Network	Opens Entity Editor, analyzes the network, and converts non-SSON to SSON networks
Export	Exports reports of CPZ, sites, fibers, SRLGs, services, waves, media channels, optical results, service aggregation, BOM, and messages. Export allows you to download Excel and LNI templates
Import	Imports CPZ, Excel, LNI, and MPZ to design a network in Cisco ONP
Manage	Manages Layout Templates and Optical Sources
Logs	Displays log events initiated during a specific period, such as user login, user logout, password change, and LNI - start, failed, and completed
Job Monitor	Monitors background tasks
Control Panel	Manages users, user groups, user roles, permissions, system configuration, and dictionary
Preferences	Changes the default map view and personalizes the color code for spectrum utilization
Help	Displays the Cisco ONP version
Last Login	Shows the last date and time you logged in to Cisco ONP including the last login IP details
Username	Displays the name of the user who has currently logged in to Cisco ONP

File

The **File** menu includes common file options such as New, Open, and Delete.

Options	Description
New	Creates a new network. By default, NCS 1010 is created. To create NCS 2000 networks, change **L0 Network Platform** to *NCS2000*. You can check the **SSON Network** check box and select **System Release** for NCS 2K to create an SSON network.
Open	Opens a saved network. The network name in blue-colored font indicates that the network is in the Design mode, and the network name in green-colored font indicates that the network is in the Analyze mode. **Note** If you view a blank screen when you open a network, refresh the browser, or log in to Cisco ONP again.
Open Shared	Opens a shared network.
Save	Saves a network.
Save As	Saves the network with a new name.
Share	Shares a network or networks.

Options	Description
Delete	Deletes a network or networks.

Network

The **Network** menu includes options such as Entity Editor, Analyze, and SSON Convert in the design mode. It includes options such as Entity Editor, Design, Upgrade, and Enter Plan Mode in the Analyze mode.

Options	Description
Entity Editor	Use this option to edit various properties of an element in the network
Analyze	Analyzes the network after completing the design
SSON Convert	Converts a Non-SSON network to an SSON network
Design	Switches from Analyze mode to Design, Upgrade, or Release Upgrade mode
Upgrade	Upgrades an existing network that is in the Analyze mode
Release Upgrade	Upgrades the NCS 2K or NCS 1010 System Release of a network
Enter Plan Mode	Switches to the Plan mode
Exit Plan Mode	Exits the plan mode
Enter Link Rate Tuner Mode	Enters the link rate tuner mode
Open Tuner Input	Opens the tuner input table to add parameters for custom optical sources
Run Tuner	Runs the tuner input options to provide custom optical source results.
Start New	Starts fresh tuner analysis
Open Tuner Result	Opens the already analyzed tuner results
Exit Link Rate Tuner Mode	Exits the link rate tuner mode
Restore	Restores failed fibers and nodes
Open Failure Report	Expands the Failure Report from the bottom of the Map. Data is populated after Restore.
Open Feasibility Report	Expands the Feasibility Report from the bottom of the Map. The report displays the data regarding Auto Regen Suggestions for channel feasibility.

Export

The **Export** menu includes options to export reports of Sites, Fibers, Services, SRLG, Waves, Messages, and BOM.

Options	Description
CPZ	Export the .cpz design file of a network into your local system.
Sites	Exports site details such as x and y coordinates, grooming site flag, CLLI code, site address, site type, and site name.
Fibers	Exports fiber details such as length, loss to fiber, source and destination site, source and destination edge. From Release 24.3.1, the exported fiber details contains the Raman information.
Services	Exports service details such as name, type, path, quantity, and protection.
SRLGs	Exports details about created SRLGs.
Waves (Available for non-SSON network)	Exports wave details such as Label, Source and Destination sites, Card Type, Wavelength, Utilization, Source port, Destination port, Demands, OTN Hops, OSNR, OSNRMarginEOL, StatusEOL, Excluded Channels, and Path of Wave.
Media Channels (Available for SSON network)	Exports media channel details such as Media Channel Label, Media Carrier Label, Source and Destination sites, Card Type, Wavelength, Utilization, Source port, Destination port, Demands, OTN Hops, OSNR, OSNRMarginEOL, StatusEOL, Excluded Channels, and Path of Media channel.
Circuits (Available for NCS1010 network)	Exports circuits details such as Circuit Label, Carrier Label, Source and Destination sites, Card Type, Traffic Type, Wavelength, Utilization, Source port, Destination port, Demands, OTN Hops, OSNR, OSNRMarginEOL, StatusEOL, Excluded Circuits, and Path of Circuit.
Messages	Shows the complete log of the analysis, including critical errors.
Excel	Download sample Excel file that can be used as a reference for creating networks using the Import Excel feature.
LNI Template	Download sample LNI file that can be used as a reference for creating networks using the Import feature.
Optical Source Template	Download sample Optical Source Excel file that can be used as a reference for creating User Defined/custom Optical Source using the **Manage** > **Optical Sources** feature.
BOM	Exports details about pricing and quantity of the network equipment
Failure Groups	This option is available only in the plan mode. You can add failed fibers to a failure group.
Failure Report	This option is available only in the plan mode. It shows the failed fibers, total channels, failed channels, restored channels, and fiber hotzones.
Optical Results	Exports details such as protection type, SOL, EOL, source, and destination
Device Configuration	Exports the Device Netconf XML file and COSM Netconf file.

Import

The Import menu imports an Excel file, a CPZ file, or an MPZ file.

Options	Description
CPZ	Imports the .cpz network design files that are exported from another Cisco ONP instance
Excel	Imports an Excel file containing all the design parameters
Live	Imports a live deployed network by retrieving configurations of the nodes, provided in the LNI input Excel sheet
MPZ	Imports the .mpz network design files from CTP to Cisco ONP, to avoid recreating the networks that are already created in CTP

Manage

You can manage layout templates and optical sources.

Options	Description
Layout Templates	Imports reusable templates to design layout configurations for a network
Optical Sources	Imports an optical source from your local system
Look Up Table	Displays the optical feasability values for the gain ranges of each EDFA cards.

Logs

System Logs

The System Logs option allows an admin user, or user with USER MANAGEMENT, and NETWORK MANAGEMENT permissions to view at logs the events that are initiated during a specific time interval. Examples of events are user login, user logout, password change, Live Network Import (LNI)-start, failed, completed and analysis-start, and failed.

The **SYSTEM LOGS** page includes the following fields:

Field	Description
Time Stamp	Provides the date and time of the specific event
Event Type	Shows the type of event, which includes user login, user logout, password change, and so on
Description	Describes the event, which includes user login success, user logout success, and so on
Username	Shows the user who has initiated specific events
Event Source	Shows the IP address of the device from where the event is initiated

Events that are captured in the System Logs are:

Event	Description
SIGNUP	New user sign-up for Cisco ONP
LOGIN	User log in to Cisco ONP
USER STATE CHANGE	User state change from Active to Inactive and the converse
USER ROLE CHANGE	User role change, such as admin to planner, and so on
LOGOUT	User log out from Cisco ONP
USER DELETION	Deletion of a particular user
UNAUTHORIZED	User enters invalid login credentials
LNI_START	Successful initiation of Live Network Import
LNI_COMPLETE	Successful completion of live import of a network
LNI_CANCEL	Cancellation of Live Network Import
CONC_IMPORT_COMPLETE	Successful completion of live import of a network from Cisco ONC
ANALYZE_LNI_START	Analysis of LNI network started successfully
ANALYZE_LNI_END	Analysis of LNI network completed successfully
ANALYZE START	Starting of the network analysis
ANALYZE END	Completion of the network analysis
ANALYZE CANCEL	Cancellation of the network analysis
UPGRADE NETWORK	Entering the Upgrade mode
PLAN_INIT	Entering the Plan mode
PLAN_END	Exiting the Plan mode
PLAN_REROUTE	Checking for alternate paths to restore failed media channels or waves
PLAN_PROGRESS	Restoration of failed media channels or waves in progress
RELEASE_UPGRADE_NETWORK	Upgrading the system release of the network is in progress.

Component Logs

The Component Logs option allows you to access logs for multiple critical components such as cnp Backend (BE), ODE, GENE, and PCE, directly through the user interface. This streamlines the process, eliminating the need for server access and manual file navigation. This enhancement simplifies log management, aiding in performance monitoring, troubleshooting, and system insights.

The **Component Logs** page includes the fields:

Field	Description
Time Stamp	Provides the date and time of the specific event
Logs	Describes the events for the selected component
Component	Provides list of critical components to choose from. The available components are: • BE • ODE • GENE • PCE
Search	Locates specific log entries based in the entered value
Pages	Allows you to navigate through logs page by page

Job Monitor

The **Job Monitor** menu checks and manages tasks running in the background.

You can access this menu if you have ADMIN, NETWORK_MANAGEMENT, or NETWORK_PLANNING role.

The **JOB MONITOR** page has the following options:

Options	Description
Refresh	Refreshes the display information.
Filter	Applies one or more of the following filter options: Task Type: Filters the display information based on the task type. Select Start Date: Filters the display information based on the start date of the task. Select End Date: Filters the display information based on the end date of the task. Username: Filters the display information based on the username.
Created Date	The date on which the task is started by the user.
User Name	Name of the user who initiated the job.
Network Name	Name of the network on which the task is running.
Task Type	The type of background task: Valid values are ANALYZE and EPNM_IMPORT.
Messages	The current state of the task.

Options	Description
Cancel	Enables you to cancel or stop an ongoing background task: • The Admin can cancel any of the running background tasks. Other valid users can cancel only their own tasks. • If you want to cancel your ongoing network analysis, you can open Cisco ONP at the browser in incognito mode, or contact the Admin. • After a task is cancelled, it gets removed from the job monitor. You can check the status of a cancelled task from **System logs** page. Click **Logs** to open the **System logs** page.
Clear all Completed Tasks	Removes all the completed tasks from the **Job Monitor** page.

Control Panel

Apart from designing, analyzing, and creating BOM for a network, a user with admin rights can activate, manage, and delete users and their roles.

To navigate to the control panel page, click **Control Panel**.

The admin or any user with USER_MANAGEMENT role can lock, unlock an individual user account, and manually expire the individual user password. For more information, see Manage Users and Roles, on page 11.

Preferences

This menu contains the General Settings option to customize Cisco ONP settings such as the default map view and spectrum utilization percentage.

Field	Description
General Settings	Allows choosing the default map view and applying color codes for spectrum usage percentage • **Default Map**: Choose the **Detailed** or **Minimal** map from the drop-down list. • **Spectrum Utilization Percentage**: Click and drag to change the color code to indicate spectrum usage.

Help

This menu provides information about the Cisco ONP version.

Field	Description
About	Provides the Cisco ONP version.

Network Tree

Table 107: Feature History

Feature Name	Release Information	Feature Description
Network Tree Enhancements	Cisco ONP Release 5.2	Now, you can use the Ellipsis icon at the right side of each element in the Network tree to perform various actions such as Expand All, Collapse All, Enable Multi-Select, and so on. Also, you have multiple entity-level options to filter the elements under the Network tree. These enhancements make the Network tree more intuitive.

The left pane of the Cisco ONP home page comprises a network tree. The network tree includes various network elements. When you click each element, the respective property is displayed under the network tree. You can edit the properties. For more information on editing the network properties, see Modify Network Properties, on page 111.

From R25.1.1, the network tree provides the UI enhancements

- Default multi-select check boxes—network tree entities have the multi-select check boxes enabled by default. To disable the multi-select check boxes, click the ellipses icon and click the **Disable Multi-Select** option. To enable the multi-select option, follow the same navigation.
- Coloring indication on network tree—network tree entities display red, green, and yellow colors to indicate the optical feasibility of the circuits and overall network.

Table 108: Network Tree Elements

Network Tree Elements	Description
Network name	Displays the name of the network.
Sites	Customer premise equipment that is located in a rack within a building. When you click a site name in the network tree, the site will be highlighted in orange on the map. When multiselect is enabled, the network tree displays checkboxes for each site, fiber, and circuit. Selecting multiple sites from the network tree highlights the same sites on the map.
Fiber	Optical fiber connecting two sites.
Fiber Couple	A fiber couple consists of two different fibers (clockwise and counterclockwise), one for transmission and another for reception.

Network Tree Elements	Description
Services	Service is the circuit through which traffic flows between nodes. When you add services to the Traffic site (of the type 1K-2K-4K) in an SSON network, a DefaultGroup is created under the Services in the network tree. You can also create a new service group.
Waves or Medial Channel or Circuits	The wave or Media channel represents a DWDM channel. In a wave hierarchy, for each wave, there is a trail. When you expand a trail, there is a section under each trail. The trail is an optical path or a network section joining two traffic nodes. It can have more than one section depending on whether the trail has a regenerator site. For more information on regeneration, see Regeneration Support, on page 215.
SRLG	Shared Risk Link Group (SRLG) is useful for routing the protected services. If there are Fiber 1 and Fiber 2 in the network, they are assumed to be diverse and are used as alternates for protection purposes. If Fiber 1 and Fiber 2 are in an SRLG, they are not true alternates, and they share the same risk of failure. Therefore, if Fiber1 fails, Fiber 2 also fails, and Fiber 2 cannot be used as a protected path.
Optical subnet	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.

Use the Search box on top of the network tree to search for any specific site, fiber, or wave in the network tree panel. Click the Refresh icon to refresh your search.

Now, you can filter the elements available in the network tree using the Filter icon available next to the Search box. The following table explains the various filter options available.

Table 109: Network Tree Elements

Filters	Options Available Under Each Filter
Network Filter	Entity Type
Sites Filter	Site Type, and DWDM Site Type
Fibers Filter	Source Site, Destination Site, Source Edge, Destination Edge, and Raman
Services Filter	Protection Type, Source Site, Destination Site, Src Add-Drop Type, and Dst Add-Drop Type

Filters	Options Available Under Each Filter
Waves, Medial Channel, or Circuits Filter	Protection Type, Source Site, Destination Site, Src Add-Drop Type, and Dst Add-Drop Type

Design Palette

Table 110: Feature History

Feature Name	Release Information	Feature Description
Intuitive Map Display	Cisco ONP Release 5.2	The new intuitive map display allows you to virtually rearrange networks for a clutter-free view without impacting the original design. This display simplifies adding new nodes to complex networks. Save the last modified network in the new view to retain the latest rearrangement. The new icons in the Design Palette that enable the intuitive display are: • **Switch to Intuitive Arrangement**/**Switch to Coordinates Arrangement**—Toggles the map between the intuitive and original displays. • **Rearrange nodes**—Overrides node coordinates and rearranges the map in a presentable manner.

At the right of the Cisco ONP home page, there is the design palette. You can use this design palette to create a network design. It consists of the following six icons:

Icons	Description
Switch to Zoom Mode/ **Switch to Normal Mode**	Click this icon to toggle between Normal and Zoom modes. **Zoom Mode:** Highlights the selected node and automatically centers the map on the selected node. The size of labels, such as fiber and service names, adjusts according to the mode. **Normal Mode:** Highlights the selected node on the map. Autozoom is disabled. You need to manually move the map to view the selected node if it is not visible.
Zoom In	Click this icon to magnify the map.
Zoom Out	Click this icon to minimize the map.
Reset Zoom	Click this icon to reset the map to its original size.
Switch to Intuitive Arrangement/**Switch to Coordinates Arrangement**	Click this icon to toggle between the intuitive and coordinates display. Save the last modified network in the Intuitive view to retain the latest rearrangement. The saved networks retain the map designs when reopened or shared with others. When you export the network as CPZ or Excel files, the exported files include both original and modified or rearranged coordinate data.

Icons	Description
Rearrange nodes	Click this icon to rearrange the map in a presentable fashion.
Drawing Tool	The Drawing Tool consists of the following icons: • **Traffic Site**: Select this icon, and click the working area to create traffic sites in the network. • **ROADM Site**: Select this icon, and click the working area to create ROADM sites. • **OLA Site**: Select this icon, and click the working area to create OLA sites. • **Passthrough Site**: Select this icon, and click the working area to create passthrough sites. • **Link**: Click this icon, and drag and drop between sites to create a fiber link. • **OTN Service**: Click this icon to create OTN service between sites. • **DWDM channel**: Click this icon to add a wave or medial channel between sites. • **Select**: The **Select** icon looks similar to the cursor tool. Click this icon to select a node, link service, and so on.
Layers Window	Use this icon to view or hide layers such as fiber link, service, text, and channel. The following are the four toggle icons: • **Toggle Fiber**: Click this icon to view or hide fiber link details from the network. • **Toggle Service**: Click this icon to view or hide service details from the network. • **Toggle Wave**: Click this icon to view or hide the channel or wave details from the network. • **Toggle Text**: Click this icon to view or hide the text from the network. • **Toggle COSM associations**: Click this icon to remove or add COSM associations. • **Expand/Collapse All Demands**: Click this icon to expand the waves or media channels so that you can view them clearly. Click this icon again to collapse the waves and media channels to their original shape and position. The eye symbol in the icon indicates that you are currently viewing the respective details.

Icons	Description
Zoom Tool	The icon below the **Drawing Tool** is the **Zoom Tool**. You can change the display of the working area by using this function. Click the arrow to view two sliders. • **Map Fade**: Move the **Map Fade** slider from right to left to fade the map from the background. • **Zoom In/Out**: To magnify the map, move the Zoom in or out slider from left to right.
Zoom Elements	Click the **Zoom Elements** icon to view four sliders. • **Media Channel Width**: Move this slider from left to right to increase the channel width. • **Path Spread**: Move this slider from left to right to increase the space between the paths. • **Fiber Width**: Move this slider from left to right to increase the fiber width. • **Service Width**: Move this slider from left to right to increase the service width.
Show Failed (available only in plan mode)	This icon shows the failed media channels in the map. Failed ones are marked with a red cross mark.
Traffic Monitor (available only in plan mode)	This icon shows the total number of impacted media channels, demands, or services that are working or failed in the entire network.
Switch to Minimal Map/**Switch to Detailed Map**	Click this icon to toggle between Minimal Map and Detailed Map. **Switch to Minimal Map:** Focuses on Sites and Fibers, allowing you to view spectrum utilization, and supporting the spectrum and path finder. **Switch to Detailed Map:** Displays all network components for a comprehensive view.

Entity Editor

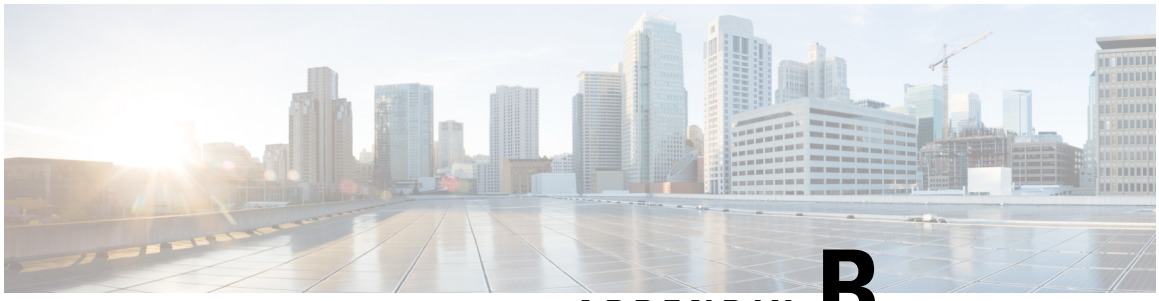
The **Entity Editor** allows you to edit various properties of an element in the network. Choose **Network** > **Entity Editor** to open the **Entity Editor** window.

The **Entity Editor** enhances some properties with descriptions in the form of tooltips.

The table lists the operations that you can perform in the **Entity Editor** window.

Options	Description
Left pane filter	Includes check boxes to filter the network elements displayed under each tab: • For the **SITE** tab, you can choose whether to display OTN (only traffic node), DWDM (ROADM, OLA, or pass-through) node, or both. • For the **FIBER** tab, you can choose the fiber connecting a particular source and destination sites. • For the **SERVICE** tab, you can choose to display either services, waves, or both.
Right pane properties	Displays all properties of the selected network element. You can modify the properties as required.
Search	Searches for a particular network element.
Refresh	Refreshes the list of network elements displayed under each tab.
Expand/Collapse	Expands or collapses the network elements available in the network tree under each tab.
Select Similar	Selects similar network elements available in the network tree. For example, select a ROADM site, and click the **Select Similar** icon. All ROADM sites are selected. You can change a property in all the selected sites at the same time. This option allows you to identify and compare the property difference. For example, if a property is different among the selected sites, that property is dimmed. You can select an option that is applied to all the selections.
Un-Select All	Deselects all selections that you make under the network tree.
Delete	Deletes the selected network elements.
Add Contentionless Sides (available only under the **Site** tab for the NCS 2000 network)	Adds contentionless sides to NCS 2000 networks. Contentionless functionality on a site refers to the contentionless add/drop ability of an N-degree ROADM node to accommodate N wavelengths of the same frequency from a single add/drop device. For a ROADM to be contentionless, the number of drop units have to be equal to ROADM degrees. • Click the ROADM site to add contentionless sides. • Click the **Add Contentionless Side** icon. • Enter an appropriate value in the **Enter number of contentionless sides** field. • Click **OK**. After adding the contentionless side, you can edit the contentionless port property of the side at the right pane. You can select any of the values ranging from 1 to16. The default value is 16.

Options	Description
Add L-Band (available only under the **Site** tab for NCS 1010 site)	Adds L-Band sides to an NCS 1010 R7.9.1 site. To add L-Band sides, • Click the site or side to which you want to add L-band sides. • Click the **Add L-Band** icon.
Add Omni-Directional (available only under the **Site** tab for the NCS 1010 network)	Adds omnidirectional functionality on a site. Omnidirectional functionality on a site refers to the ability to route channels through any of the optical degrees in a multidegree topology during fiber cut without the need for physical fiber reconnections. To add omnidirectional functionality, • Click the ROADM site to which you want to add omnidirectional sides. • Click the **Omni-Directional** icon. • Enter the appropriate value in the **Enter number of Omni Directional sides** field. • Click **OK**.
Copy (available only under the **Service** tab)	Clones a service or wave that is connected between two sites. To clone a service, • Select a wave and click **Copy**. • Enter the quantity in the **Clone Service/DWDM Channel** dialog box, and click **OK**. –1 is added at the end of the label of the cloned wave. An example label of a cloned wave is Site-2-Site3-1-1. The original wave is Site-2-Site3-1. You can rename the label. You can also clone a service in a similar way.
Unlock	Unlocks the required entities in an analysed network for editing.



APPENDIX B

Supported ROADMs, Add/Drop Cards, and Modules

• Supported ROADMs, Add/Drop Cards, and Modules, on page 287

Supported ROADMs, Add/Drop Cards, and Modules

Cisco ONP supports the following ROADM, Add/Drop cards and modules:

Table 111: NCS 2000 ROADM Cards

Product	Product Description
NCS2K-9-SMR34FS=	9-port Single Module ROADM - 20—34-dB Gain - Flex Spectrum
NCS2K-9-SMR24FS=	9-port Single Module ROADM - 12—24-dB Gain - Flex Spectrum
NCS2K-9-SMR17FS=	9-port Single Module ROADM - 0—17-dB Gain - Flex Spectrum
NCS2K-20-SMRFS=	20-port Single Module ROADM - Switchable Gain Flex Spectrum
NCS2K-20-SMRFS-CV=	20-port SMR - Switch. Gain Flex Spectrum with Connection Verification

Table 112: NCS 2000 ADD/DROP Line Cards and Optical Passive Modules

Product	Product Description
NCS2K-16-AD-CCOFS=	4- to 12-degree 16-port Contentionless Add/Drop Unit
NCS2K-MF-6AD-CFS=	6-port Colorless Flex Spectrum Add/Drop MF Unit
NCS2K-MF-MPO-16LC=	MPO-16 to 16xLC Fan-Out MF Unit with Integrated Monitoring
NCS2K-MF-M16LC-CV=	MPO-16 to 16xLC Fan-Out with Connection Verification
15216-MD-48-ODD=	ONS 15216 48-channel Mux/DeMux Exposed Faceplate Patch Panel Odd
15216-MD-48-EVEN=	ONS 15216 48-channel Mux/DeMux Exposed Faceplate Patch Panel Even

Supported ROADMs, Add/Drop Cards, and Modules

Product	Product Description
15216-MD-48-CM=	ONS 15216 Mux/Demux Plugin Coupler/De-Interleaver Module
NCS1K-MD-64-C=	NCS 1000 64-channel Odd Mux/Demux Patch Panel—C-band

Table 113: NCS 2000 Controller Cards and Common Equipment

Product	Product Description
NCS2006-DC=	NCS 2006 30A DC Power Filter
NCS2006-AC=	NCS 2006 1500W AC Power Supply
NCS2015-SA-DC=	NCS 2015 Shelf Assembly - DC Power
NCS2015-SA-AC=	NCS 2015 Shelf Assembly - AC Power
NCS2K-TNCS-2-K9=	NCS 2000 Transport Node Controller, version 2
NCS2K-TNCS-2O-K9=	NCS2000 Transport Node Controller with 2x OTDR/OSC, version 2
NCS2K-TNCS-K9=	Transport Node Controller for NCS2002, 2006, and 2015 chassis
NCS2K-TNCS-O-K9=	NCS 2000 Transport Node Controller with 2x OTDR/OSC
NCS2K-SVO-K9=	Shelf Virtualization Orchestrator - LC, Full
NCS2K-PSM=	Protection Switching Module (PSM) card for NCS 2000

Table 114: NCS 2000 Series Passive Optical Modules

Product	Product Description
NCS2K-MF-6RU=	6RU Mechanical Frame for Passive Units—14 slots with USB Hub
NCS2K-MF10-6RU=	6RU Mechanical Frame for Passive Units—10 slots with USB Hub
NCS2K-MF-1RU=	1RU Mechanical Frame—4 slots
NCS2K-MF-UPG-4=	4-degree Upgrade Mesh Interconnection MF Unit
NCS2K-MF-UPG-4-CV=	4-degree Upgrade Mesh Interconnect with Connection Verification
NCS2K-MF-DEG-5=	Up to 5-degree Mesh Interconnection MF Unit
NCS2K-MF-DEG-5-CV=	5-degree Mesh Interconnect with Connection Verification
NCS2K-PPMESH8-5AD=	2RU 8-degree Mesh Patch Panel—5-Add/Drop Port + Monitoring

Table 115: NCS 4000 Chassis and NCS 1004 Line Cards

Product	Product Description
NCS4016-SA-DC=	NCS 4016 shelf assembly - DC Power

Product	Product Description
NCS4016-SA-AC=	NCS 4016 shelf assembly - AC Power
NCS4009-SA-DC=	NCS 4009 shelf assembly - DC Power
NCS4K-4H-OPW-QC2=	NCS 4000 400G Packet/OTN/WDM—QSFP28/CFP2 line card
NCS4K-24LR-O-S=	NCS 4000 24-port low rate OTN—SFP line card
NCS1004=	Network Convergence System 1004 four line card slots

Table 116: NCS 1010 Line Cards, Chassis, and PSUs

Product	Product Description
NCS1K-OLT-C=	NCS 1010 Optical Line Terminal—C-band
NCS1K-OLT-L=	NCS 1010 Optical Line Terminal—L-band
NCS1K-OLT-R-C=	NCS 1010 Optical Line Terminal with Raman—C-band
NCS1K-ILA-C=	NCS 1010 In-Line Amplifier—C-band
NCS1K-ILA-L=	NCS 1010 In-Line Amplifier—L-band
NCS1K-ILA-2R-C=	NCS 1010 In-Line Amplifier with 2x Raman—C-band
NCS1K-ILA-R-C=	NCS 1010 In-Line Amplifier with 1x Raman—C-band
NCS1010-SA=	NCS 1010 Shelf Assembly
NCS1010-DC-PSU=	NCS 1010 DC Power Supply Unit
NCS1010-AC-PSU=	NCS 1010 AC Power Supply Unit
NCS1K-E-OLT-C=	NCS 1010 Optical Line Terminal—C-band, enhanced
NCS1K-E-OLT-R-C=	NCS 1010 Optical Line Terminal with Raman—C-band, enhanced
NCS1K-E-OLT-L=	NCS 1010 Optical Line Terminal—L-band, enhanced
NCS1K-E-ILA-R-C=	NCS 1010 In-Line Amplifier with 1x Raman—C-band, enhanced
NCS1K-E-ILA-2R-C=	NCS 1010 In-Line Amplifier with 2x Raman—C-band, enhanced
NCS1K-E-ILA-R-C-2=	NCS 1010 In-Line Amplifier with 1x Raman west facing—C-band, enhanced
NCS1K14-2.4T-K9=	NCS 1014 2.4T Line Card

Table 117: NCS 1014 Line Cards, Chassis, and PSUs

Product	Product Description
NCS1K14-SYS	NCS 1014 Assemble to Order

Product	Product Description
NCS1K14-EDFA2=	NCS 1014 EDFA terminal with equalization
NCS1K4-AC-PSU	NCS 1004 AC Power Supply Unit, 2.1 kW
NCS1K4-DC-PSU	NCS 1004 DC Power Supply Unit, 2.1 kW
NCS1K4-AC-PSU-2	NCS 1004 AC Power Supply Unit, 2.5 kW
NCS1K4-DC-PSU-2	NCS 1004 DC Power Supply Unit, 2.5 kW

Table 118: NCS 1014 Passive Modules

Product	Product Description
NCS1K-MD-32O-CE=	NCS 1000 32chs Odd Mux/Demux Patch Panel - 150GHz—C-band Enhanced
NCS1K-MD-32E-CE=	NCS 1000 32chs Even Mux/Demux Patch Panel - 150GHz—C-band Enhanced

Table 119: NCS 1010 Passive Modules

Product	Product Description
NCS1K-BRK-SA=	NCS 1000 shelf for four passive modules
NCS1K-BRK-8=	NCS 1000 MTP/MPO to 8-port passive breakout module
NCS1K-BRK-24=	NCS 1000 MTP/MPO to 24-port colorless channels passive breakout module
NCS1K-BRK-16=	NCS 1000 MTP/MPO to 16-port colorless channels passive breakout module
NCS1K-MD-32O-C=	NCS 1000 32-channel Odd Mux/Demux Patch Panel - 150GHz—C-band
NCS1K-MD-32E-C=	NCS 1000 32-channel Even Mux/Demux Patch Panel - 150GHz—C-band
NCS1K14-CCMD-16-C	NCS 1000 16-port Colorless Mux/Demux Optical Line Card—C-band
NCS1K14-CCMD-16-L	NCS 1000 16-port Colorless Mux/Demux Optical Line Card—L-band

Table 120: NCS 1020 Chassis and Modules

Product	Product Description
NCS1020-SA=	NCS 1020 Shelf Assembly
NCS1010-CTR2-K9=	NCS 1010, 1012, 1020 Controller, 112500-bps Default Console Baud Rate
NCS1010-CTR2-B-K9=	NCS 1010, 1012, 1020 Controller, 9600-bps Console Baud Rate

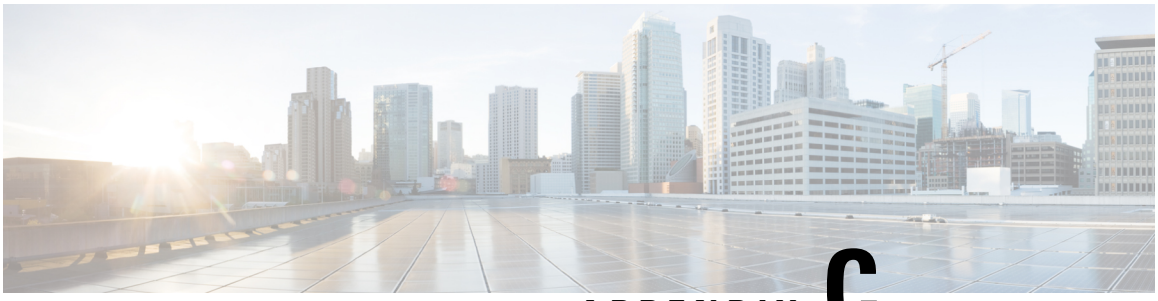
Product	Product Description
NCS1020-FAN=	NCS 1020 Fan for NCS 1014 Slots
NCS1020-FAN-BLANK=	NCS 1020 Fan Blank
NCS1010-FLR-P=	Filler / Blank for NCS 1010 Slot on NCS 1012, 1020, Passive
NCS1010-FLR-A=	Filler / Blank for NCS 1010 Slot on NCS 1012, 1020, Active, with Fan slots
NCS1010-CTR2-FLR=	Filler / Blank for Controller Slot on NCS 1012, 1020
NCS1K14-BLANK=	Network Convergence System 1014 Blank card

Table 121: NCS 1001 Chassis, Modules, and Pluggables

Product	Product Description
NCS1001-K9=	Network Convergence System 1001 line system 3 slots
NCS1K-CNTLR2=	Network Convergence System 1001 Control card
NCS1K-EDFA=	Network Convergence System 1001 amplifier module
NCS1K-PSM=	Network Convergence System 1001 protection module
NCS1K-2KW-AC2=	Network Convergence System 1001 AC power supply unit - 2KW normal operating temperature, 600W short term high temperature
NCS1K-2KW-DC=	Network Convergence System 1001 DC power supply unit - 2KW normal operating temperature, 600W short term high temperature
NCS1K1-FAN=	Network Convergence System 1001 line system Fan
ONS-SC-Z3-1510=	SFP OC-48/STM-16/GE, CWDM, 1510 nm
ONS-SE-155-1510	SFP OC-3/STM-1, CWDM, 1510 nm EXT; SFP Pluggable Optics Module
CWDM-SFP-1510	CWDM 1510-nm SFP; Gigabit Ethernet 1 and 2 Gb Fibre Channel
CWDM-SFP-1610	CWDM 1610-nm SFP; Gigabit Ethernet 1 and 2 Gb Fibre Channel
ONS-SC-Z3-1610=	SFP OC-48/STM-16/GE, CWDM, 1610 nm

Product	Product Description
15216-MD-48-ODDE	ONS Multiplexer/Demultiplexer Patch Panel Even Extended
15216-MD-48-EVENE	ONS Multiplexer/Demultiplexer Patch Panel Odd Extended
15216-MD-48-CME	ONS Coupler and Splitter
15216-FLD-OSC	OSC Combiner and Splitter
NCS1K-MD-64-C	NCS 1000 64 channels Odd Multiplexer/Demultiplexer Patch Panel-C-band
NCS1K-MD-32E-CE	NCS 1000 32chs Even Mux/Demux Patch Panel - 150GHz—C-band Enhanced

Supported ROADMs, Add/Drop Cards, and Modules



APPENDIX C

Supported Cards and Pluggables

- Supported Transponder Cards and Pluggables, on page 293

Supported Transponder Cards and Pluggables

Table 122: Feature History

Feature Name	Release Information	Feature Description
Pluggable Support	Cisco ONP Release 4.1	QSFP-100G-FR-S= pluggable is supported on the QSFP ports of the 400G-XP LC transponder card with 100GE data rate.
QSFP-100G-ERL-S Pluggable	Cisco ONP Release 5.1	The new QSFP-100G-ERL-S pluggable enables you to design and validate topologies for NCS 2000 R11.1.3 networks. This pluggable is supported on the QSFP ports of the 400G-XP-LC transponder card with 100GE data rate. You can select this pluggable from the **Client Interface** drop-down list at trail level properties for the 400G-XP-LC transponder card.

Cisco ONP supports the following transponders and pluggables for NCS 2000 networks:

Table 123: Supported Transponder Cards and Pluggables for NCS 2000 Network

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
200G-CK-LC + MR-MXP (200G MXP mode)	• 100GE • OTU4	SD-FEC_20	• SR-1(CPAK-100G-SR10) • SR-1(CPAK-100G-SR4) • LR-1(CPAK-100G-LR4) • SR-1(CPAK-100G-SR10) • LR-1(CPAK-100G-LR4)	Yes (only for 100GE)	No	Auto, TRK_200G
200G-CK-LC + MR-MXP (100G TXP mode)	100GE	SD-FEC_20	• SR-1(CPAK-100G-SR10) • SR-1(CPAK-100G-SR4 • LR-1(CPAK-100G-LR4)	Yes	Yes	Auto, TRK_100G
200G-CK-LC + MR-MXP (100G TXP mode)	100GE	SD-EFEC	• SR-1(CPAK-100G-SR10) • SR-1(CPAK-100G-SR4 • LR-1(CPAK-100G-LR4)	Yes	Yes	Auto, TRK_100G
200G-CK-LC + MR-MXP (100G TXP mode)	100GE	SD-FEC	• SR-1(CPAK-100G-SR10) • SR-1(CPAK-100G-SR4 • LR-1(CPAK-100G-LR4)	Yes	Yes	Auto, TRK_100G
200G-CK-LC + MR-MXP (100G MXP mode)	• 10GE • 10GE LAN PHY • OC192 • OTU2	SD-FEC_20	• LR-1(ONS-QSFP-4*10G-MLR) • LR-1(QSFP-4*10G-MLR) • SR-1(QSFP-40G-SR4) • SR-1(ONS-SC+10G-SR) • LR-1(ONS-SC+10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x)	Yes	Yes	Auto, TRK_100G

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
200G-CK-LC + MR-MXP (100G MXP mode)	• 10GE • 10GE LAN PHY • OC192 • OTU2	SD-EFEC	• LR-1(ONS-QSFP-4*10G-MLR) • LR-1(QSFP-4*10G-MLR) • SR-1(QSFP-40G-SR4) • SR-1(ONS-SC+10G-SR) • LR-1(ONS-SC+10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxxx)	Yes	Yes	Auto, TRK_100G
200G-CK-LC + MR-MXP (100G MXP mode)	• 10GE LAN PHY • 10GE • OC192 • OTU2	SD-FEC	• LR-1(ONS-QSFP-4*10G-MLR) • LR-1(QSFP-4*10G-MLR) • SR-1(QSFP-40G-SR4) • SR-1(ONS-SC+10G-SR) • LR-1(ONS-SC+10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxxx)	Yes	Yes	Auto, TRK_100G
200G-CK-LC + MR-MXP (100G MXP mode 2*10G 2*40G MODE)	• 10GE • 10GE LAN PHY • 40GE	SD-FEC_20	• SR-1(ONS-SC+10G-SR) • LR-1(ONS-SC+10G-LR) • DWDM(ONS-SC+-10G-C) • LR-1(QSFP-40G-LR4) • DWDM(ONS-SC+-10GEPxxx) • SR-1(QSFP-40G-SR4) • SR-1(QSFP-40G-SR-BD)	Yes	Yes	Auto, TRK_100G
200G - CK-LC + MR - MXP (100G MXP mode 2*10G 2*40G MODE)	• 10GE • 40GE	SD-EFEC	• SR-1(ONS-SC+10G-SR) • LR-1(ONS-SC+10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxxx) • SR-1(QSFP-40G-SR4) • LR-1(QSFP-40G-LR4) • SR-1(QSFP-40G-SR-BD)	Yes	Yes	Auto, TRK_100G

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
200G - CK-LC + MR -MXP (100G MXP mode 2*10G 2*40G MODE)	• 10GE • 40GE	SD-FEC	• SR-1(ONS-SC+10G-SR) • LR-1(ONS-SC+10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • SR-1(QSFP-40G-SR4) • LR-1(QSFP-40G-LR4) • SR-1(QSFP-40G-SR-BD)	Yes	Yes	Auto, TRK_100G
200G - CK-LC +10x10G -LC	• 10GE • OC192 • OTU2 • OTU2e	SD-FEC_20	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR (ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	Yes for OTU2e	No	Auto, TRK_100G
200G - CK-LC +10x10G -LC	• 10GE • OC192 • OTU2 • OTU2e	SD-EFEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER (ONS-SC+-10G-ER) • ZR (ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	Yes for OTU2e	No	Auto, TRK_100G
200G-CK-LC + 10x10G -LC	• 10GE • OC192 • OTU2 • OTU2e	SD-FEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	Yes for OTU2e	No	Auto, TRK_100G

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
200G - CK-LC + MR-MXP (200G Mxp 100G+10*10G Mode)	• 100GE • 10GE • OC192 • OTU2	SD-FEC_20	• SR-1(CPAK-100G-SR10) • SR-1(CPAK-100G-SR4) • LR-1(CPAK-100G-LR4) • SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	Yes for 100GE and OTU2	No	Auto, TRK_200G
200G-CK-LC + MR-MXP + MR-MXP (200G Mxp 4*40G + 4*10G Mode)	• 10GE • 10GE LAN PHY • 40GE	SD-FEC_20	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • SR-1(QSFP-40G-SR4) • LR-1(QSFP-40G-LR4) • SR-1(QSFP-40G-SR-BD)	Yes	Yes	Auto, TRK_200G
200G-CK-LC + 10x10G -LC + MR-MXP	• 10GE • OC192 • OTU2	SD-FEC_20	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x) • LR-1(ONS-QSFP-4*10G-MLR) • ZR(ONS-SC+-10G-ZR)	Yes	Yes	Auto, TRK_200G

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
200G-CK-LC + MR-MXP + MR-MXP	• 10GE • OC192 • OTU2	SD-FEC_20	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x) • LR-1(ONS-QSFP-4*10G-MLR) • ZR(ONS-SC+-10G-ZR)	Yes	Yes	Auto, TRK_200G
100GS - CK-LC + 10x10G-LC	• 10GE • OC192	EFEC, SD-FEC_20	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	No	No	Auto, TRK_100G
100G - LC-C + 10x10G-LC	• 10GE • OC192 • Fiber Channel 10G • Fiber Channel 8G • OTU2 • OTU2e	FEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	No	No	Auto

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
100G - LC-C + 10x10G-LC	• 10GE • OC192 • Fiber Channel 10G • Fiber Channel 8G • OTU2 • OTU2e	EFEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER (ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	No	No	Auto
100G - LC-C + 10x10G-LC	• 10GE • OC192 • Fiber Channel 10G • Fiber Channel 8G • OTU2 • OTU2e	HG-FEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER (ONS-SC+-10G-ER) • ZR (ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	No	No	Auto
100G - CK-LC-C + 10x10G-LC	• 10GE • 10GE LAN PHY • OC192 • Fiber Channel 10G • Fiber Channel 8G • OTU2 • OTU2e	FEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	No	No	Auto

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
100G -CK-LC-C + 10x10G-LC	• 10GE • 10GE LAN PHY • OC192 • Fiber Channel 10G • Fiber Channel 8G • OTU2 • OTU2e	EFEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	No	No	Auto
100G - CK-LC-C + 10x10G-LC	• 10GE • 10GE LAN PHY • OC192 • Fiber Channel 10G • Fiber Channel 8G • OTU2 • OTU2e	HG-FEC	• SR-1(ONS-SC+-10G-SR) • LR-1(ONS-SC+-10G-LR) • DWDM(ONS-SC+-10G-C) • DWDM(ONS-SC+-10GEPxx.x) • ER(ONS-SC+-10G-ER) • ZR(ONS-SC+-10G-ZR) • DWDM(ONS-SC+-10G-xx.x)	No	No	Auto

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
400G-XP-LC	• 100GE • 10GE LAN PHY • 10GE • 40GE • Fiber Channel 10G • Fiber Channel 16G • Fiber Channel 8G • OC192 /STM64 • OTU2 • OTU2e • OTU4	SD-FEC_25-NO_DE	• SR-1(QSFP-100G-SR4-S) • LR-1(QSFP-100G-LR4-S) • LR-1(QSFP-28-LR4) • SR-1(QSFP-100G-SM-SR) • SR-1(QSFP-40/100G-SRBD) • LR-1(ONS-QSFP-4*10G-MLR) • LR-1(QSFP-4*10G-LR) • SR-1(QSFP-40G-SR4) • ER(ONS-QSFP-4*10G-MER) • LR-1(QSFP-40G-LR4) SR-1(QSFP-40G-SR-BD • LR-1(ONS-QC16GFC-LW) • LR-1(ONS-QC16GFC-SW) • LR-1(ONS-QSFP28-LR4) • FR-1 (QSFP-100G-FR-S) (only for 100GE) • ER-1 (QSFP-100G-ERL-S) (only for 100GE)	Yes	Yes	TRK_100G, TRK_200G

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
400G-XP-LC	• 100GE • 10GE LAN PHY • 10GE • 40GE • Fiber Channel 10G • Fiber Channel 16G • Fiber Channel 8G • OC192 /STM64 • OTU2 • OTU2e • OTU4	SD-FEC_15 -NO_DE	• SR-1(QSFP-100G-SR4-S) • LR-1(QSFP-100G-LR4-S) • LR-1(QSFP-28-LR4) • SR-1(QSFP-100G-SM-SR) • SR-1 (QSFP-40/100G-SRBD) • LR-1(ONS-QSFP-4*10G-MLR) • LR-1(QSFP-4*10G-LR) • SR-1(QSFP-40G-SR4) • ER(ONS-QSFP-4*10G-MER) • LR-1(QSFP-40G-LR4) • SR-1(QSFP-40G-SR-BD • LR-1(ONS-QC16GFC-LW) • LR-1(ONS-QC16GFC-SW) • LR-1(ONS-QSFP28-LR4) • FR-1 (QSFP-100G-FR-S) (only for 100GE) • LR-1 (QSFP-100G-ERL-S) (only for 100GE)	Yes	Yes	TRK_100G, TRK_200G
100G-LC-C	• 100GE • OTU4	FEC	SR-1(CPAK-100G-SR10)	No	No	Auto
100G-LC-C	• 100GE • OTU4	EFEC	SR-1(CPAK-100G-SR10)	No	No	Auto
100G-LC-C	• 100GE • OTU4	HGFEC	SR-1(CPAK-100G-SR10)	No	No	Auto
100G - CK-LC-C	• 100GE • 40GE • OTU4	FEC	• SR-1(CPAK-100G-SR4) • SR-1(CPAK-100G-SR10) • LR-1(CPAK-100G-LR4)	No	No	Auto

Transponder/ Muxponder	Traffic Type	FEC mode	Pluggables Supported	Encryption SSON	Encryption Non-SSON	Trunk Mode
100G - CK-LC-C	• 100GE • 40GE • OTU4	EFEC	• SR-1(CPAK-100G-SR4) • SR-1(CPAK-100G-SR10) • LR-1(CPAK-100G-LR4)	No	No	Auto
100G - CK-LC-C	• 100GE • 40GE • OTU4	HGFEC	• SR-1(CPAK-100G-SR4) • SR-1(CPAK-100G-SR10) • LR-1(CPAK-100G-LR4)	No	No	Auto
100GS - CK-LC	100GE	FEC	SR-1(CPAK-100G-SR10)	Yes	No	Auto, TRK_100G
100GS - CK-LC	100GE	EFEC	LR-1(CPAK-100G-LR4)	YEs	No	Auto, TRK_100G
100GS - CK-LC	100GE	SD-FEC_20	SR-1(CPAK-100G-SR10)	Yes	No	Auto, TRK_100G
200G - CK-LC (100G Mode only)	• 100GE • OTU4	FEC	• SR-1(CPAK-100G-SR4) • SR-1(CPAK-100G-SR10) • LR-1(CPAK-100G-LR4)	Yes (for 100GE)	No	Auto, TRK_100G
200G - CK-LC (100G Mode only)	• 100GE • OTU4	EFEC	• SR-1(CPAK-100G-SR4) • SR-1(CPAK-100G-SR10) • LR-1(CPAK-100G-LR4)	Yes (for 100GE)	No	Auto, TRK_100G
200G-CK-LC (100G Mode only)	• 100GE • OTU4	SD-FEC_20	• SR-1(CPAK-100G-SR4) • SR-1(CPAK-100G-SR10) • LR-1(CPAK-100G-LR4)	Yes (for 100GE)	No	Auto, TRK_100G

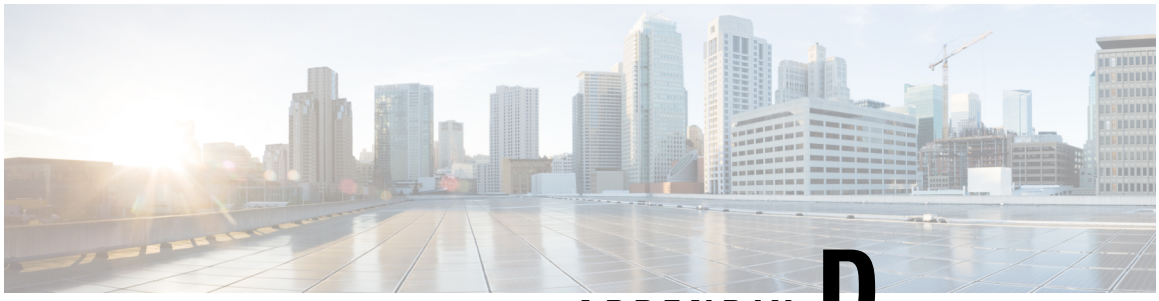
Cisco ONP supports the following transponders and pluggables for NCS 2000 networks:

Table 124: Supported Transponder Cards and Pluggables for NCS 1010 Network

Transponder / Muxponder	Traffic Type	FEC mode	Pluggables Supported		Encryption	Trunk Mode
			Client Pluggables	Trunk Pluggables		
NCS1K14-2.4T-K9	100GE 400GE	SD_FEC_15	• Auto • QDD-400G-FR4-S • QDD-400-AOC1M • QDD-400G-DR4-S • QDD-4x100G-LR-S	• Auto • CIM8-C-K9	No	• Auto • 400G • 500G • 600G • 700G • 800G • 900G • 1000G • 1100G • 1200G
NCS1K14-2.4T-X-K9	100GE 400GE	SD_FEC_15	• Auto • QDD-400G-FR4-S • QDD-400-AOC1M • QDD-400G-DR4-S • QDD-400G-LR4-S • QDD-4x100G-LR-S • QDD-4x100G-FR-S	• Auto • CIM8-LE-K9 • CIM8-C-K9	Yes	• Auto • 400G • 500G • 600G • 700G • 800G • 900G • 1000G • 1100G • 1200G

Transponder / Muxponder	Traffic Type	FEC mode	Pluggables Supported		Encryption	Trunk Mode
			Client Pluggables	Trunk Pluggables		
NCS1K4-QXP-K9	100GE	OFEC CFEC	• Auto	• Auto • QDD400G-ZRP-S • QDD400G-ZR-S • DP04QSDD-HK9 • DP04QSDD-LK9 • DP04QSDD-HE0	Yes	• Auto
			• QSFP-100G-DR-S • QSFP-100G-LR4-S • QSFP-100G-LR-S • ONS-QSFP-28-LR4 • QSFP-100G-CWDM4-S • QSFP-100G-FR-S • QSFP-100G-SR4-S			• 100G
			• QDD-4x100G-LR-S			• 100G • 200G • 300G • 400G
	400GE		• QDD-400G-FR4-S • QDD-400-AOC1M • QDD-400G-DR4-S			• 400G

Supported Cards and Pluggables



APPENDIX D

Supported Optical Sources

- Supported Optical Sources, on page 307

Supported Optical Sources

Table 125: Feature History

Feature Name	Release Information	Feature Description
New Optical Source and Pluggable Support	Cisco ONP Release 4.2	Optical Sources enable you to simulate the optical feasibility of the network with the 400G and other interfaces that are not natively modeled in Cisco ONP. The following Optical Sources are introduced in this release: • ONS-CFP2D-400G-C-OpticalSources-V 2.mxd • QDD-400G-ZRP-S-OpticalSources-V2.mxd

Cisco ONP supports the following optical sources:

Note From Release 24.3.1, the optical sources for NCS 2000 networks are tagged with System Release to indicate from when the optical sources support the network release.

- OpticalSources_NCS2K_400GXP-LC_NCS4K-4H-OPW-QC2 DWDM Line Card
  - 400GXP_100G_25%_DE
  - 400GXP_200G_15%_DE
  - 100G-SD-FEC
  - 400GXP_100G_15%_DE
  - 200G-SD-FEC
  - 400GXP_100G_15%

- 400GXP_200G_15%
- 400GXP_200G_25%DE

- NCS1004_OpticalSources_V3
  - NCS1004_QPSK_SP_16QAM_200G_27%SDFEC_60GBd
  - NCS1004_SP_16QAM_300G_27%SDFEC_69GBd
  - NCS1004_QPSK_200G_27%SDFEC_69GBd
  - NCS1004_16QAM_32QAM_400G_27%SDFEC_62GBd
  - NCS1004_16QAM_400G_27%SDFEC_69GBd
  - NCS1004_SP_16QAM_16QAM_300G_27%SDFEC_60GBd
  - NCS1004_32QAM_500G_27%SDFEC_69GBd

- NCS1004_L_Band_OpticalSources_V3
  - NCS1004_L_200G_QPSK_27%SDFEC_69GBd
  - NCS1004_L_200G_QPSK_SP_16QAM_27%SDFEC_60GBd
  - NCS1004_L_300G_SP_16QAM_16QAM_27%SDFEC_60GBd
  - NCS1004_L_300G_SP_16QAM_27%SDFEC_69GBd
  - NCS1004_L_400G_16QAM_32QAM_27%SDFEC_62GBd
  - NCS1004_L_400G_16QAM_27%SDFEC_69GBd

- QDD and CFP2-DCO variants
  - **ONS-CFP2D-400G-C-OpticalSources-V2.mxd**[2]
    - CFP2_200OR_TXP_FOIC2_OFEC_15_DE_ON_4Q_1S_BR63_1
    - CFP2_300OR_TXP_FOIC3_OFEC_15_DE_ON_8Q_1S_BR63_1
    - CFP2_400OR_TXP_FOIC4_OFEC_15_DE_ON_16Q_1S_BR63_1
  - **ONS-CFP2D-400G-C-OpticalSources-V2.mxd**[3]
    - CFP2_300ZR+_MXP_GAUI8_OFEC_15_DE_ON_8Q_0S_BR60_1
    - CFP2_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_8Q_1E_BR40_1
    - CFP2_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_16Q_1E_BR30_1
    - CFP2_400ZR_TXP_GAUI8_CFEC_15_DE_ON_16Q_0S_BR59_8
    - CFP2_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_4Q_0S_BR60_1
    - CFP2_100ZR+_TXP_GAUI2_OFEC_15_DE_ON_4Q_1S_BR30_1

[2] The optical source interfaces are supported for SSON networks.
[3] The optical source interfaces are supported for SSON and non-SSON networks.

- CFP2_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_4Q_1S_BR60_1
- CFP2_400ZR+_TXP_GAUI8_OFEC_15_DE_ON_16Q_1E_BR60_1
- CFP2_300ZR+_MXP_GAUI8_OFEC_15_DE_ON_8Q_1E_BR60_1
- CFP2_400ZR+_TXP_GAUI8_OFEC_15_DE_ON_16Q_0S_BR60_1
- CFP2_100OR_TXP_FOIC1_OFEC_15_DE_ON_4Q_1S_BR31_6
- CFP2_200OR_TXP_FOIC2_OFEC_15_DE_ON_8Q_1S_BR42_1
- CFP2_200OR_TXP_FOIC2_OFEC_15_DE_ON_16Q_1E_BR31_6

- **QDD-400G-ZRP-S-OpticalSources-V2.mxd**[3]
  - QDD_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_4Q_1S_BR60_1
  - QDD_400ZR_TXP_GAUI8_CFEC_15_DE_ON_16Q_0S_BR59_8
  - QDD_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_4Q_0S_BR60_1
  - QDD_400ZR+_TXP_GAUI8_OFEC_15_DE_ON_16Q_1E_BR60_1
  - QDD_400ZR+_TXP_GAUI8_OFEC_15_DE_ON_16Q_0S_BR60_1
  - QDD_300ZR+_MXP_GAUI8_OFEC_15_DE_ON_8Q_1E_BR60_1
  - QDD_400ZR+_TXP_GAUI8_OFEC_15_DE_ON_16Q_0E_BR60_1
  - QDD_300ZR+_MXP_GAUI8_OFEC_15_DE_ON_8Q_0E_BR60_1
  - QDD_100ZR+_TXP_GAUI2_OFEC_15_DE_ON_4Q_1S_BR30_1
  - QDD_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_16Q_1E_BR30_1
  - QDD_300ZR+_MXP_GAUI8_OFEC_15_DE_ON_8Q_0S_BR60_1
  - QDD_200ZR+_MXP_GAUI2_OFEC_15_DE_ON_8Q_1E_BR40_1

  - From Release 24.3.1, CONP supports **QDD-400G-ZR-S** Optical Sources.
    QDD_400ZR_TXP_GAUI8_CFEC_15_DE_ON_16Q_0S_BR59_8

- Bright ZR+ Optical Sources
  - Bright-400G-FOIC4-OFEC-16QAM-1-E_BR63_14
  - Bright-400G-FOIC4-OFEC-16QAM-1-S_BR63_14
  - Bright-300G-FOIC3-OFEC-8QAM-1-S_BR63_14
  - Bright-200G-FOIC2-OFEC-QPSK-1-S_BR63_14
  - Bright-200G-FOIC2-OFEC-8QAM-1-E_BR42_09
  - Bright-200G-FOIC2-OFEC-16QAM-1-E_BR31_57
  - Bright-200G-FOIC2-OFEC-16QAM-1-S_BR31_57
  - Bright-100G-FOIC1-OFEC-QPSK-1-S_BR31_57

- Bright-100G-FOIC1-OFEC-DQPSK-1-S_BR31_57
- Bright-400G-400ZR-CFEC-16QAM-1-S_BR59_84
- Bright-400G-400ZRP-OFEC-16QAM-1-E_BR60_14
- Bright-400G-400ZRP-OFEC-16QAM-1-S_BR60_14
- Bright-300G-300ZRP-OFEC-8QAM-1-E_BR60_14
- Bright-300G-300ZRP-OFEC-8QAM-1-S_BR60_14
- Bright-200G-200ZRP-OFEC-QPSK-1-S_BR60_14
- Bright-200G-200ZRP-OFEC-8QAM-1-E_BR40_09
- Bright-200G-200ZRP-OFEC-16QAM-1-E_BR30_07
- Bright-100G-100ZRP-OFEC-QPSK-1-S_BR30_07
- Bright-100G-OTU4-SCFEC-DQPSK-1-S_BR27_95
- From Release 24.3.1, CONP supports the **DP04QSDD-HE0** Optical Sources.

  Bright_100G_100ZRP_OFEC_QPSK_1S_BR30_07
- Bright_200G_200ZRP_OFEC_16QAM_1E_BR30_07
- Bright_400G_400ZRP_OFEC_16QAM_1S_BR60_14
- Bright_200G_200ZRP_OFEC_8QAM_1E_BR40_09
- Bright_400G_400ZRP_OFEC_16QAM_1E_BR60_14
- Bright_300G_300ZRP_OFEC_8QAM_1E_BR60_14
- Bright_300G_300ZRP_OFEC_8QAM_1S_BR60_14
- Bright_200G_200ZRP_OFEC_QPSK_1S_BR60_14
- Bright_400G_400ZR_CFEC_16QAM_1S_BR59_84

Note Delete any of the old versions of Bright ZR+ optical sources that may be present in the server. The latest list of optical resources will be automatically loaded after Cisco ONP, Release 5.1 software is installed.

- Bright_ZRP_OpticalSources_V2

  The Rx OSNR sensitivity is improved for the *Bright_400G_400ZRP_OFEC_16QAM_1E_BR60_14* interface in the new version.

  The latest list of optical resources will be automatically loaded after Cisco ONP, Release 5.2 software is installed.

- From Release 25.1.1, CONP supports the CIM8 Optical Sources:

  CIM8_OpticalSource_v12

- CIM8_400G_15FEC_Eth_ZR_BR108
- CIM8_400G_15FEC_Eth_ZR_BR130
- CIM8_400G_15FEC_Eth_ZR_BR88
- CIM8_500G_15FEC_Eth_ZR_BR128
- CIM8_500G_15FEC_Eth_ZR_BR88
- CIM8_600G_15FEC_Eth_ZR_BR128
- CIM8_600G_15FEC_Eth_ZR_BR98
- CIM8_700G_15FEC_Eth_ZR_BR98
- CIM8_700G_15FEC_Eth_ZR_BR128
- CIM8_800G_15FEC_Eth_ZR_BR108
- CIM8_800G_15FEC_Eth_ZR_BR118
- CIM8_800G_15FEC_Eth_ZR_BR128
- CIM8_800G_15FEC_Eth_ZR_BR138
- CIM8_900G_15FEC_Eth_ZR_BR118
- CIM8_900G_15FEC_Eth_ZR_BR138
- CIM8_1000G_15FEC_Eth_ZR_BR128
- CIM8_1000G_15FEC_Eth_ZR_BR138
- CIM8_1100G_15FEC_Eth_ZR_BR138
- CIM8_1200G_15FEC_Eth_ZR_BR138
- CIM8_500G_15FEC_Eth_ZR_BR138
- CIM8_600G_15FEC_Eth_ZR_BR138
- CIM8_700G_15FEC_Eth_ZR_BR138

1. Delphi_ULH_Optical_Source_v2 (new)
   - Delphi-400G-ULH_OpenZR_16Q_OS_E_60_1
   - Delphi-400G-ULH_OpenZR_16Q_OS_HB_60_1
   - Delphi-400G-ULH_FlexO-4e_OS_65_7
   - Delphi-400G-ULH_FlexO-4_MPCS_OS_69_1
   - Delphi-400G-ULH_FlexO-4e_MPCS_OS_75
   - Delphi-400G-ULH_FlexO-4e_MPCS_OS_78_9
   - Delphi-400G-ULH_FlexO-4_MPCS_OS_87_3
   - Delphi-400G-ULH_FlexO-4e_MPCS_OS_87_4

- Delphi-400G-ULH_FlexO-4e_MPCS_OS_97_9
- Delphi-400G-ULH_FlexO-4e_QPSK_NOS_OR_118_2
- Delphi-400G-ULH_OpenZR_16Q_OS_LA_60_1
- Delphi-400G-ULH_FlexO-4_MPCS_OS_100_8

Pluto_QSFP28_100G_Optical_Source_v1 (new)

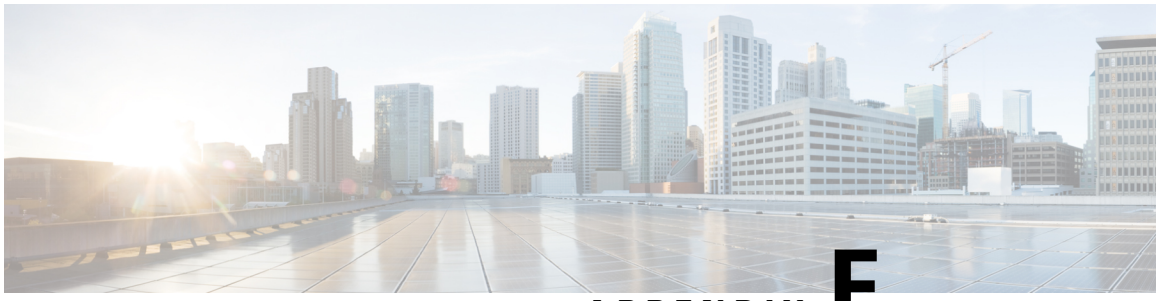
- QSFP28_100G_SC_FEC_7_QPSK_BR28

Note NCS 1004 is supported as an optical source.

Note The following optical source files are not supported in NCS 2000 Release 11.0:

- NCS1004_16QAM_32QAM_400G_27%SDFEC_62GBd
- NCS1004_QPSK_SP_16QAM_200G_27%SDFEC_60GB

Hence, we recommend you to upgrade the system release of the network to Release 11.1, or force the optical source files that are supported for the Release 11.0.



APPENDIX E

Supported Amplifiers

- Supported Amplifiers, on page 313

Supported Amplifiers

Cisco ONP supports the following amplifiers:

Table 126: Cisco ONP Supported NCS 2000 Amplifiers

Amplifier	Description
15454-M-RAMAN-CTP	Raman Amp C-Band
15454-M-RAMAN-COP	Raman Amp C-Band
EDFA 35 for OLA node	Erbium Doped Fiber Amplifier (EDFA) that can function in dual gain with maximum gain of 35 dB
NCS2K-EDRA2-26C	21dBm EDFA + Bst 26dB Span - C-Band
NCS2K-EDRA1-26C	21dBm EDFA 26dB Span - C-Band
NCS2K-EDRA2-35C	21dBm EDFA + Bst 35dB Span - C-Band
NCS2K-EDRA1-35C	21dBm EDFA35dB Span - C-Band

Note

- RAMAN-CTP is supported on all nodes.
- EDRAs are supported on the OLA node.
- For ROADM and Traffic nodes, the booster amplifier and preamplifier are in-built. The booster is 20SMR-FS-BST.

Table 127: Cisco ONP Supported NCS 1010 Amplifiers

Amplifier	Description		
	Lower Range Gain (dB)	Standard Range Gain (dB)	Tilt Uncontrolled Range Gain (dB)
C-Band			
OLT-C-Bst	16	24	31
OLT-C-Pre-Normal	12	22	25
OLT-C-Pre-Extended	17	32	35
ILA-C-Normal	8	17	20
ILA-C-Extended	13	30	33
ILA-R-C-Normal	8	17	23
ILA-R-C-Extended	13	30	36
ILA-2R-C-Normal	8	17	20
ILA-2R-C-Extended	13	30	33
E-ILA-R-C-Normal	8	17	20
E-ILA-R-C-Extended	13	30	33
E-ILA-2R-C-Normal	8	17	20
E-ILA-2R-C-Extended	13	30	33
E-ILA-C-R-2-Normal	8	17	20
E-ILA-C-R-2-Extended	13	30	33
L-Band			
OLT-L-Bst	17.5	25.5	32.5
OLT-L-Pre-Normal	13.3	23.3	26.3
OLT-L-Pre-Extended	18.3	36.3	39.3
ILA-L-Normal	10.8	19.8	22.8
ILA-L-Extended	15.8	32.8	35.8

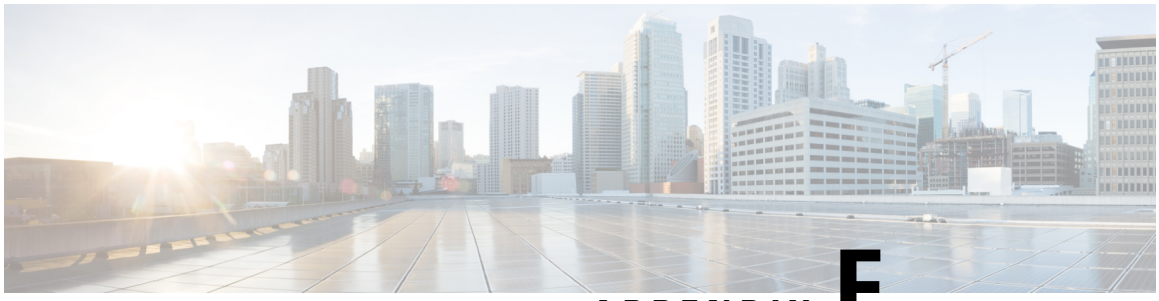
Table 128: Cisco ONP Supported NCS 1001 Amplifiers

Amplifier	Description		
	Pre Amplifier Gain (dB)	Standard Range Gain (dB)	Tilt Uncontrolled Extended Range Gain (dB)
NCS1K-EDFA-Bst		1-20	20-25
NCS1K-EDFA-Pre - Range 1		0-24	24-27
NCS1K-EDFA-Pre - Range 2		20-34	34-27

Table 129: Cisco ONP Supported NCS 1014 Amplifiers

Amplifier	Description		
	Fixed Gain (dB)	Standard Range Gain (dB)	Tilt Uncontrolled Extended Range Gain (dB)
NCS1K14-EDFA2-Bst-1 - Range 1	8	-	-
NCS1K14-EDFA2-Bst-1 - Range 2	20	-	-
NCS1K14-EDFA2-Bst-2	-	12-24	24-27
NCS1K14-EDFA2-Pre - Range 1	-	0-25	25-28
NCS1K14-EDFA2-Pre - Range 2	-	20-26	36-29

Supported Amplifiers



APPENDIX F

Troubleshoot

- Troubleshooting Tasks, on page 317

Troubleshooting Tasks

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

Table 130: Troubleshooting Tasks for Cisco ONP Configuration

Warning Message or Error	Probable Reason for the Error	Workaround
Cannot Route demand! Didn't find any valid Contentionless Side.	Required contentionless sides are not created on add/drop sites. For protected service or wave, minimum two contentionless sides are required on the add/drop sites.	Check and add the required number of contentionless sides on the target service or wave source and destination sites.
Error: No valid path from <*source*> to <*destination*>	Disjoint path is not available for protected demand. Or Forced wavelength may be already used for other demand in the same path. Or The number of colorless demands created is more than the colorless ports forced on the interfaces.	For linear topology, change the demand protection to unprotected. For ring topology, ensure that at least two nodes and fiber-disjoint paths are available and the forced wavelength is unconfined in the end-to-end path. Force the required number of colorless ports.
Error: Traffic subnet constraints prevent routing of section.	Disjoint path is not available for protected demand. Or Forced wavelength may be already used for other demands in the same path.	For linear topology, change the demand protection to unprotected. For ring topology, ensure that at least two nodes and fiber-disjoint paths are available and the forced wavelength is unconfined in the end-to-end path.

Warning Message or Error	Probable Reason for the Error	Workaround
Error: The sum of CoDem and Non-CoDem colorless ports and ports that are used for Omnidirectional and Contentional sides cannot exceed 20 when the TYPE is SMR-20.	The number of contentionless sides, colorless ports that are forced, and colored demand exceed SMR-20 port capacity. Or The Cascaded SMR flag is enabled, and colored or colorless demand is created.	If the Cascaded SMR flag is enabled, create only contentionless demands on those nodes. Else, reduce the number of contentionless sides, colorless ports, or colored demands that are created, to get successful network analysis.
Couple between <*source*>.<*side*> and <*destination*>.<*side*> is of invalid type.	The fiber connecting these sides is not supported by Cisco ONP.	Change the fiber type to the one that is supported by Cisco ONP.
Unconnected nodes or sites are present in the network.	Any of the sites are connected to the fiber in the Ring/Linear network.	Connect the fiber to the nodes in the ring network.
Unfeasible forcing	Wrong path has been forced on the wave or media channel.	Force the correct path on the Wave/Media Channel.
E11000 duplicate key error collection: CnpDB.dbchangelog index: _id_ dup key: { : ObjectId(') }	Restore database script attempts to write data in the postgres database, but the data with the same index is already present.	Clear the contents of postgresdb_cnp folder before running the restore command: **rm -rf /var/lib/postgresdb_cnp/***cannot
Cannot complete mesh connection.	There is an issue with setting up connection in the lock mode.	Unlock the mentioned entity or unlock the complete site.
Path constraints prevent routing.	Invalid path has been forced.	Check the path and choose the correct primary path and secondary path fibers. Or Remove all the fibers that are forced to set the **Path of Wave** property as *Auto*.
Traffic subnet constraints prevent routing.	Forced Wavelength is not part of the Optical subnet rule.	Force the wavelength as per optical subnet rule or change the optical subnet rule.
MF Unit value MF1-RU is not supported in RPT, so resetting the value to default for <*site name*>.	Template is applied when properties such as **ECU**, **MF Unit** are forced.	Set the property **MF Unit** to *Auto* and then force the template.

Warning Message or Error	Probable Reason for the Error	Workaround
Please force MD-48-CM as Interlever Type for {0}.	In non-SSON traffic, the ROADM site with the properties (DEG-8, SMR-9, number of contentionless sites is equal to 1) has 96 colored waves. The **Interlever Type** is property set to *Auto* or *MpoCable.*	Modify the Interlever forcing on the line side to MD-48-CM.
The sum of forced CoDem and Non-CoDem colorless ports and colored demands can't be greater than 9 for type SMR-9.	During upgrade or Release upgrade, colorless port is forced on SMR-9, and more than one contentionless side is added in the imported MPZ network.	Delete the extra contentionless sides.
No Route Found.	Plan mode restoration fails because the presence of dark fiber in the restoration path makes it difficult to find it.	Check the restoration path. It must not have any dark fiber.
Wavelength Forced {0} in this {1} is already in use / not as per current optical subnet channel rule.	Two fibers are occupied by a wave with the same wavelength. The fiber belongs to a subnet where the wavelength is not supported. For example, a wave with an even wavelength is forced through a fiber belonging to the C40 channel or C48 channel subnet rules.	Correct the wave such that the wavelength is supported by the optical subnet C-band rule.
tm.unsupported_client_pluggable.msg =Incompatible Client Interface forcing.	ROADM sites having waves with optical source other than 100, 200SDFEC are converted to traffic sites.	Before you convert the site type to traffic, modify the optical source wave to be feasible.
Error Message	Slow internet connectivity, or idle session.	Refresh the browser and try again.
Please provide a valid .mpz network file.	The MPZ file that you are trying to upload does not have a valid file extension.	Upload proper .MPZ file.
Failed to import mpz file, please make sure the MPZ file is not in use and retry.	MPZ file remains open in the CTP tool.	Close MPZ file in the CTP tool before uploading it to Cisco ONP .
Cannot connect to Server;(Password).	Failed to connect to Postgres DB on opening **Control Panel** tab.	Restart the Postgres database container or reinstall the Build.

Warning Message or Error	Probable Reason for the Error	Workaround
Null pointer exception	The applied layout template file has syntax error such as extra SPACE, TAB, missing symbols such as <, >.	Fix the syntax and reapply the template.
Object not found in cache.	Intermediate network disconnection.	Refresh the browser or log in again to Cisco ONP.
Session does not exist.	Idle time-out	Log in again to Cisco ONP.
Forced/Locked wavelength is not feasible for spectrum to be allocated for the demand/MCH <*Site-1-Site-3-1*>. Insufficient spectrum around the forced central wavelength.	Forced wavelength is not a feasible central wavelength based on the configuration.	Force another wavelength that is next to the currently forced one.
Route could not be found/Alternate path not found/<Optically not feasible>.	Insufficient spectral width due to the following reasons: • The alternate path has no waves (dark fiber). • Optical parameters are not feasible. • Wavelength dos not have sufficient bandwidth.	Make sure that the alternate path has waves associated with the fiber and has sufficient bandwidth available.
Error: Could not find any valid flex configuration for the traffic matrix defined at <*Site-1.A*> This could be because of configuration limitations, invalid forcings, or equipment restrictions.	Check if it is 8 degrees, SMR-9 node with Evolved Mesh ON and contentionless and colorless/colored mixed add/drop configuration.	Change Evolved Mesh to Off, reduce Scalable upto degree to 8, change Site Type to SMR-20, or Remove contentionless or colorless forcing.
Single hop path Site-1~Site-3 needs regeneration but has no regenerator hosting sites.	Check if **Quick analysis** under Network property is disabled.	• Enable **Quick analysis**. • After successful analysis, check the optical report and look for the waves that require regeneration. • Split the long haul demand between the intermediate short distance nodes that are equivalent to regen site. • Disable **Quick analysis** and analyze.

Warning Message or Error	Probable Reason for the Error	Workaround
Missing SOURCE TermPoint for PceServiceRequest	Required Add/Drop card cannot be placed on the source node.	Check the source node configuration (such as scalable upto degree, number of colored and colorless circuits or port forcing,and colored add/drop card forcing).
Missing DESTINATION TermPoint for PceServiceRequest	Required Add/Drop card cannot be placed on the destination node.	Check the destination node configuration (such as scalable upto degree, number of colored and colorless circuits or port forcing,and colored add/drop card forcing).
Service allocation failed: No resource available	Spectrum allocation failed for the mentioned service	• Check the colored add/drop forcing and the number of colored demands routing on the path. • Check the number of colorless demands, ports, and add/drop cards forced on the path. • Check the optical subnet defined on the path and the type of service used.
Service allocation failed: [PCE-WAL00028] - No free spectrum available to allocate circuit: [PCE-WAL00028]	Spectrum allocation failed for the mentioned service	Check the card type forced for the colored circuit. Circuits with a maximum spectrum of 75GHz can be used with colored add/drop MD-32-ODD/EVEN. For example, a circuit that has an interface with rate greater than 60-bit rate or 60GBd cannot work with 75GHz fixed grid add/drop with 82% spectral density. Change to colorless add/drop BRK-24 or change to interface type having less spectral occupancy.
Colorless configuration is not supported for *Scalable Upto Degree* [25]	Check if MF Unit is forced as MF-1RU. Only 3 USB ports available with NCS 1010 OLT-C-R. Maximum of only 3 Passives can be connected to OLT line cards. So, for Scalable upto degree >25, since USB ports are not available to connect to passive colorless Add/Drop, error appears.	Force MF Unit as MF-4RU

Warning Message or Error	Probable Reason for the Error	Workaround
Error: No free spectrum available to allocate circuit	1. If it is an L-band Circuit, L-band forcing may be missing in the intermediate nodes. 2. Complete spectrum is utilized in the path if forced, or on all the available path between source and destination.	1. 1. Force L-band on all intermediate nodes on the L-band circuit route path. 2. 2. Try to force other available path or add new path if spectrum is exhausted on all available paths.
Untested System Configuration: Number of OLA sites between Terminal sites is more than 2. Please contact support before deployment.	The NCS 1001 network has more than two OLA sites between Terminal sites.	Keep only two OLA sites between Terminal sites.