Configure a Network

Table 1: 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

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

Before you begin

Log in to Cisco ONP web interface

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

Step 2 Add contentionless sides to the required sites. See Add Contentionless Side to a Site.

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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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 2: 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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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 3: 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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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 4: 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 5: 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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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 6: 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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

Step 2 Add Omnidirectional sides to the required sites. See Add Omni-Directional Side to a Site. 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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP .

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 7: 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.

Procedure

Step 1 Create a network design. See Design a network using Cisco ONP.

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 8: 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**.