



## Creating and Analyzing Networks

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A project consists of a single network or multiple networks that you analyze and compare. In a project, you can have multiple copies of a single network with the same customer input data, but use different options in each to investigate multiple solutions.

### 2.1 Creating a Project

Use the following procedure to create a single network in a project. A new network is in the Design state. For more information about the different network states, see the [“2.10 Managing the Network Design” section on page 2-55](#).



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**Note**

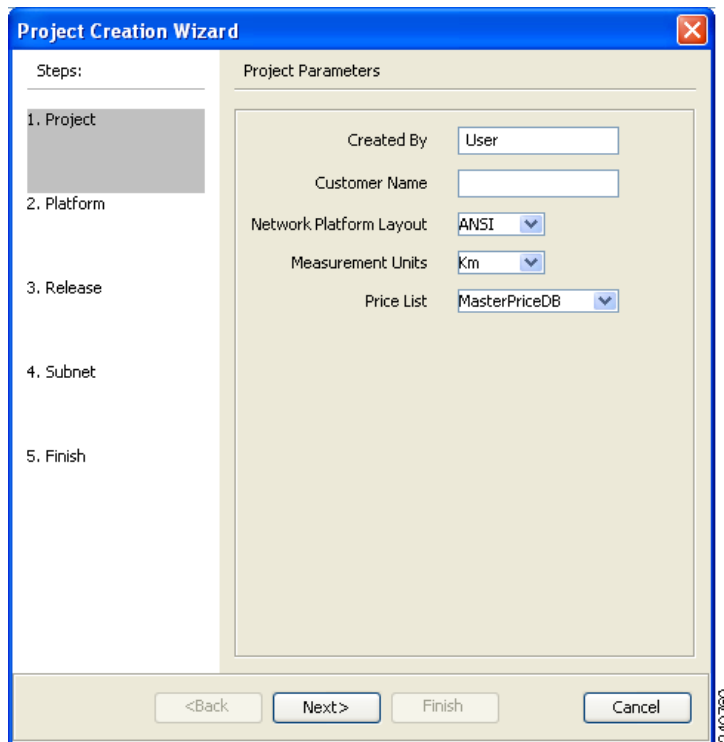
All options that the Project Creation wizard sets can be changed as needed, except Measurement Units and ANSI/ETSI.

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**Step 1**

From the File menu, choose **New** or click **New** in the Start Page. The Project Creation wizard appears ([Figure 2-1](#)).

Figure 2-1 Project Creation Wizard



**Step 2** In the Project Parameters area complete the following:

- **Created By**—Enter a user name. You can enter a maximum of 128 character.
- **Customer Name**—Enter the name of the customer requiring this network design. You can enter a maximum of 128 character.
- **Network Platform Layout**—Choose **ANSI** (the North American standard) or **ETSI** (the international standard) from the drop-down list to indicate the platform type. ANSI networks will not allow you to define SDH (ETSI) service demands. ETSI networks will not allow you to define SONET (ANSI) service demands.
- **Span Measurement Units**—Choose **Km** (kilometers) or **Miles** from the drop-down list to set the unit of measure used for span length.
- **Price List**—Choose a price list from the drop-down list.

**Step 3** Click **Next**.

The Choose Platform area appears.

**Step 4** In the Choose Platform area, check the desired platform and click **Next**.

The Choose Release area appears.

**Step 5** In the Choose Release area, check the desired software release for the network design and click **Next**. The Subnet Options area appears.

To set a default software release see “[1.6.2 Setting the Default Software Release](#)” section on page 1-27.

**Step 6** In the Subnet Options area, complete the following:

- Traffic Mapping Algorithm Release 10.6—Check to select the ONS 15454 Software Release 10.6 version of the interface and the wavelength routing optimization algorithm to be used in the network design. Software R10.1 is backward compatible: it allows you to manage Software Releases 9.0, 9.1, 9.2, 9.2.1, 9.3, 9.4, 9.6.0.3, 9.8, 10.0, and 10.1 and load 7.0 and 8.0.
- Design Rules Release 10.6—Check to select DWDM Design Rules Release 10.6.
- Layout Release 10.6—Check to define the ONS 15454 Software Release 10.6 version of the algorithm used to generate the layout of each site within the subnetwork. Software Release 10.6 is backward compatible: it allows you to manage Software Releases 9.0, 9.1, 9.2, 9.2.1, 9.3, 9.4, 9.6.0.3, 9.8, 10.0, 10.1, 10.3, and and load 7.0 and 8.0.
- Bundle Licensing Release 10.6—Check this check box to select the PAYG bundle licensing for Release 10.6. For more information about the Pay As You Grow (PAYG) feature, see the [“1.8 Understanding the Pay As You Grow Feature” section on page 1-46](#).

**Step 7** Click **Next**.

**Step 8** Complete one of the following:

- To run the Network Creation wizard, check the **Run the Network Wizard Now** check box and click **Finish**. Continue with [Step 9](#).
- To create an empty project to add sites and fibers manually, un-check the **Run the Network Wizard Now** check box and click **Finish**. Project Creation wizard creates the project and an empty network and subnetwork where you can manually add sites and fibers. Skip the remaining steps in this procedure. To add sites manually, see the [“2.2 Adding Sites” section on page 2-14](#).

**Step 9** In the Topology area of the Network Creation wizard, choose one of the following options from the Network-Topology drop-down list:

- Ring—Supports MSTP 15454 ONS, HYBRID 15454 ONS, and NG-DWDM configurations.



**Note** In HYBRID 15454 ONS configuration, at least one node must be hub for the ring topology.

- Linear—Supports MSTP 15454 ONS, HYBRID 15454 ONS, and NG-DWDM configurations.
- PSM Line—Supports only MSTP 15454 ONS configuration.
- PSM Section—Supports only MSTP 15454 ONS configuration.

**Step 10** To instruct Cisco Transport Planner to automatically create a traffic subnet associated with the created network, check the Create Traffic Subnet check box. Cisco Transport Planner creates (in addition to the Traffic\_ALL) an additional traffic subnet (Traffic\_Ring or Traffic\_Linear) depending on the topology value you specify in the Network Creation wizard.

**Step 11** Click **Next**.  
The Configuration page appears.

**Step 12** Choose one of the following options from the node type drop-down list:

- Legacy MSTP 15454 ONS—To create an MSTP 15454 configuration.
- HYBRID 15454 ONS—To create a 15216 FlexLayer Hybrid configuration.
- Flex NG-DWDM—To create an NG-DWDM configuration.

15216 FlexLayer Hybrid configuration cannot be mixed with the 15454 MSTP configuration. However, a network can have two clusters one being MSTP and the other 15216 hybrid, without any connection between the two. In the same way, an NG-DWDM configuration cannot be mixed with any other configuration.

**Note**

For PSM Line and PSM Section topologies, the only possible configuration is MSTP 15454 ONS and the node type drop-down list is disabled.

- Step 13** Enter the number of sites in the fields displayed depending on the network topology selected in [Step 9](#). The following options are available:

Network topology	Fields to be entered...	Maximum, Minimum, and Default Number of Sites
Ring or Linear	Number of Sites	Maximum: 150 Minimum: 2 Default: 3
PSM Line	<ul style="list-style-type: none"> <li>Intermediate Sites on Working path</li> <li>Intermediate Sites on Protected path</li> </ul>	Both for working and protected paths: Maximum: 74 Minimum: 0 Default: 0
PSM Section	<ul style="list-style-type: none"> <li>Intermediate Sites on Working path</li> <li>Intermediate Sites on Protected path</li> </ul>	Both for working and protected paths: Maximum: 74 Minimum: 0 Default: 0

The maximum number of locations where the optical service channel (OSC) can be terminated in a network is 150. The maximum number of add/drop locations (equipped with WSS, WXC, multiplexer/demultiplexer, or OADM cards) traversed by an optical circuit is by default limited to 40. However, this maximum limit can be customized to 150.

- Step 14** On the Site Name and Topology area, choose the topology for each site from the drop-down list. For multi-degree sites, choose the number of sides from the drop-down list or see [2.2 Adding Sites, page 2-14](#). For corresponding options for NG-DWDM nodes, see [Table 2-2](#). Available Site Topology options are:

Structure	Supported Configurations	Description
Line	<ul style="list-style-type: none"> <li>MSTP 15454 ONS</li> <li>HYBRID 15454 ONS</li> <li>NG-DWDM</li> </ul>	Site with two sides facing two fiber spans. The default site value for ring topology is Line.
Terminal	<ul style="list-style-type: none"> <li>MSTP 15454 ONS</li> <li>HYBRID 15454 ONS</li> <li>NG-DWDM</li> </ul>	Site with one side facing one fiber span.
Line+	MSTP 15454 ONS	Site with two sides facing two fiber spans that can provide multidegree expansion capability through an MMU unit.

Structure	Supported Configurations	Description
Terminal+	MSTP 15454 ONS	Site with one side facing one fiber span that can provide multidegree expansion capability through an MMU unit. Terminal+ is not allowed for ring network or linear network topology intermediate sites.
Multi-degree	<ul style="list-style-type: none"> <li>MSTP 15454 ONS</li> <li>NG-DWDM</li> </ul>	Sites have two or more sides and face two or more fiber spans. The default is two and you can choose up to eight sides for a site.
PSM Terminal - Optical Path Protection	MSTP 15454 ONS	Provides protection for terminal sites at line level through an optical protection switching module (PSM). In this configuration, the PSM is directly connected to the fibers after the amplification stage.
PSM Terminal - Multiplex Section Protection	MSTP 15454 ONS	Provides protection for terminal sites at multiplex level through an optical protection switching module (PSM). In this configuration the PSM is equipped between the mux/demux stage and the amplification stage.

The site topology options displayed depend upon the restrictions listed in the following table. See [Table 2-1](#).

**Table 2-1 Site Topology Restrictions**

If the Network Topology is...	then...
Ring	You cannot choose the following options: <ul style="list-style-type: none"> <li>Terminal</li> <li>Terminal+</li> <li>PSM Terminal - Optical Path Protection</li> <li>PSM Terminal - Multiplex Section Protection</li> </ul>
Linear	You cannot choose the following options: <ul style="list-style-type: none"> <li>Terminal for the intermediate sites</li> <li>Terminal+ for the intermediate sites</li> <li>PSM Terminal - Optical Path Protection</li> <li>PSM Terminal - Multiplex Section Protection</li> </ul>

**Table 2-1 Site Topology Restrictions**

If the Network Topology is...	then...
PSM Line	You cannot set any topology for the sites. CTP automatically sets the site topology as follows: <ul style="list-style-type: none"> <li>PSM Terminal - Optical Path Protection for the two PSM sites</li> <li>Line for the intermediate sites</li> </ul>
PSM Section	You cannot set any topology for the sites. CTP automatically sets the site topology as follows: <ul style="list-style-type: none"> <li>PSM Terminal - Optical Path Protection for the two PSM sites</li> <li>Line for the intermediate sites</li> </ul>

The Topology and Scalable upto Degree options for NG-DWDM node are given in the following table. See [Table 2-2](#).

**Table 2-2 Topology and Scalable Upto Degree for NG-DWDM**

If the Network Topology is...	then the network is scalable upto...
Line	2 degrees
Terminal	1 degree
Multi-degree	4, 8, and 12 degrees

**Step 15** To enable the Split Node feature in any site, check the corresponding check box. The Split Node feature is available only for MSTP 15454 node type.

**Step 16** Click **Next**  
The Options area appears.

**Step 17** The Options area allows you to define C-band and L-band rules for the network design. In the Options area complete the following:

- C-band rules—The C-band options appear in the following format: 80Ch. 50 GHz +1dBm. The channels available are 96, 80, 72, 64, 48, 40, 32, 20, 16, or 8; the reference per channel power options available are -1 dBm, +1 dBm, 2 dBm, -2 dBm, +4 dBm, 5 dBm, 7 dBm and 8 dBm; and the spacing options available are 100 GHz or 50 GHz. You can use even wavelengths for the following channel designs:
  - 80 (40 even wavelengths + 40 odd wavelengths)
  - 72 (40 even wavelengths + 32 odd wavelengths)
  - 64 (32 even wavelengths + 32 odd wavelengths)



**Note** L-band Expand is also supported in the 50 GHz even wavelengths design.



**Note** For the HYBRID 15454 ONS configuration, 32 channels is the default value. The channels available are 8, 16, 20, 32, and 40.

- L-band Rules— The L-band options appear in the following format: 32 Ch. 100 Ghz +5dBm. The options available are: None, Expand, and channels available are 32; the reference per channel power available are 2 dBm and 5 dBm; and, the spacing options available is 100 GHz.




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**Note** L-band is not applicable for the HYBRID 15454 ONS and NG-DWDM configurations.

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**Note** If you use a Line+ or Multidegree site, you must select design rules based on 100 GHz channel spacing, and in the case of Line+, you must also select 32-channel rules. If these conditions are not met, Cisco Transport Planner will provide an error message when you attempt to analyze the network. See [Table 4-2](#) and [Table 4-3](#) for additional details on site design rules.

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**Step 18** Click **Next**  
The Site Management area appears.

**Step 19** In the Site Management area, complete the following.

- Shelf Management—Choose one of the shelf management configurations:
  - Auto—External switch is placed if node controller is M12. If M6 is the node controller, the external switch is placed only if it is required.
  - Multi Shelf Integrated Switch—All the Multi Service Transport Platform (MSTP) optical cards (optical add/drop multiplexers [OADMs] and amplifiers) reside in different shelves connected by a LAN. The LAN is implemented with switches connected to the MSTP shelves. For this option, the Multi Shelf Integrated Switch Cards (MS-ISC) are used to support the multishelf configuration.
  - Multi Shelf External Switch—All the MSTP optical cards (OADMs and amplifiers) reside in different shelves connected by a LAN. The LAN is implemented with switches external to the MSTP shelves (Cisco Catalyst 2950). For this option, two external Ethernet switch units (Cisco Catalyst 2950 and Cisco Catalyst 3650) are used to support the multishelf configuration. The Cisco Catalyst 2950 supports 12 subtending shelves and Cisco Catalyst 3650 supports 24 subtending shelves. CTP supports a maximum of 50 shelves, including the node controller shelf, in a multishelf configuration when the TNC, TNCE, TSC, TSCE, or TCC3 card is used as the node controller. CTP supports a maximum of 5 shelves, including the node controller shelf, in a multishelf configuration when TCC2P card is used as the node controller.




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**Note** When the Multi Shelf External Switch is forced, the Multi Shelf External switch is placed in the layout irrespective of the node controller.

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**Note** The M6 chassis, when used as node controller with Integrated Switch, can support three subtended shelves. The subtended M6 chassis can subtend two more shelves.

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- Individual Shelf—All the MSTP optical cards (OADMs and amplifiers) reside in the same shelf. For this option, the multishelf management is not supported; every shelf is managed as an independent shelf.




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**Note** Shelf Management is disabled for HYBRID 15454 ONS configuration.

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**Note** If you select the Shelf Management type as Multi Shelf Integrated Switch or Multi Shelf External Switch, you can modify the MSM Shelf ID for Multi Shelf Management Configuration. To modify the MSM Shelf ID, refer [“3.2.6 Viewing the Layout of Single Site” section on page 3-15](#).

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- **Node Protection**—Choose **Same Shelf** (single shelf configurations) or **Separated Shelves** (multishelf configurations). Same Shelf configuration places all the OADM/ROADM units in a single shelf, and does not provide any protection at the shelf level in the node. Separated Shelves places OADM/ROADM units (west-facing and east-facing) in separate shelves in the node and it is selectable only if Multishelf management is selected. You can also set node protection for a multidegree node.




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**Note** Node protection is disabled for HYBRID 15454 ONS configuration with an auto-selected value of Same Shelf.

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- **Hybrid Site Config**—Check to create all the nodes configured as hybrid MSTP/Multi Service Provisioning Platform (MSPP) nodes. Hybrid Node is only available if you chose Individual Shelf as the Shelf Management type.
- **OSMINE Compliant**—Check this option to place the DWDM units in the shelves according to Operations Systems Modifications for Integration of Network Elements (OSMINE) placement rules.
- **DCC Chain**—Check to put a TXP(P)\_MR\_2.5G card in slot 12 on each shelf of each site to use DCC.
- **Max Shelves per Rack**—Choose the maximum number (from 1 to 4) of ANSI or ETSI shelves (equipping optical cards or TXP/MXP cards) that can be placed in each rack in the site when generating the layout of the site.
- **Installation w/o CTP**—Check this box to design a network that does not require the setup of configuration files (thresholds and setpoints). Installation without Cisco Transport Planner is also known as automatic node turn up. When this feature is enabled, the software in the node will configure itself with parameters; XML configuration files are not required to configure the node. When this option is selected at the end of EDFA and DCU placement, Cisco Transport Planner will analyze the resulting network and verify that in each node, where the option installation w/o Cisco Transport Planner is enabled, has:
  - A preamplifier in each direction.
  - All amplifiers working in gain control mode.
  - A flat node output spectrum, that is, the resulting channel tilt at the exit of the node is 0.
  - A feasible set point forced during simulation.
- **Use Payg**—Check this check box to enable the Pay As You Grow feature on all the sites created in the current network. For more information about the Pay As You Grow feature, see the [“1.8 Understanding the Pay As You Grow Feature” section on page 1-46](#).



- Enable NCS—Check this check box to enable NCS feature on all the sites created in the current network. The existing MSTP PIDs are replaced with new NCS PIDs. The NCS PIDs corresponding to the existing MSTP PIDs are given in the following table.

**Table 2-3 NCS PIDs**

<b>NCS PID</b>	<b>DESCRIPTION</b>	<b>MSTP PID</b>
NCS2006-SA=	NCS 2006 Shelf Assembly	15454-M6-SA=
NCS2006-DC=	NCS 2006 30A DC Power Filter	15454-M6-DC=
NCS2006-DC20=	NCS 2006 20A DC Power Filter	15454-M6-DC20=
NCS2006-DC40=	NCS 2006 40A DC Power Filter	15454-M6-DC40=
NCS2006-AC=	NCS 2006 1500W AC Power Supply	15454-M6-AC2=
NCS2006-PWRFLR=	NCS 2006 Power Filter/Supply Filter	15454-M6-PWRFLR=
NCS2006-ECU=	NCS 2006 External Connections Unit	None
NCS2006-LCD=	NCS 2006 LCD Display with Backup Memory	15454-M6-LCD=
NCS2006-FTA=	NCS 2006 Fan Tray	15454-M6-FTA2=
NCS2006-DR=	NCS 2006 Standard Door	15454-M6-DR=
NCS2006-DDR=	NCS 2006 Deep Door	15454-M6-DDR=
NCS2002-SA=	NCS 2002 Shelf Assembly	15454-M2-SA=
NCS2002-DC-E=	NCS 2002 ETSI DC Power Filter	15454-M2-SA=
NCS2002-DC=	NCS 2002 ANSI DC Power Filter	15454-M2-DC-E=
NCS2002-DC=	NCS 2002 AC Power Supply with Backup Memory	15454-M2-DC=
NCS2002-AC=	NCS 2002 AC Power Supply with Backup Memory	15454-M2-AC=
NCS2002-FTA=	NCS 2002 Fan Tray	15454-M6-FTA2=
NCS2002-DR=	NCS 2002 Standard Door	15454-M6-DR=
NCS2002-DDR=	NCS 2006 Deep Door	15454-M2-DDR=
Use MSTP PID	Transport Node Controller for M2 and M6 Chassis	15454-M-TNC-K9=
Use MSTP PID	MSTP / NCS 2K Transport Node Controller with Ethernet PTP	15454-M-TNCE-K9=
Use MSTP PID	Transport Shelf Controller for M2 and M6 Chassis	15454-M-TSC-K9=
Use MSTP PID	MSTP / NCS 2K Transport Shelf Controller with Ethernet PTP	15454-M-TSCE-K9=
L-NCS2K-CH-10=	NCS 2K / MSTP Lic ROADM Add/Drop or Exp - 10Chs e-Delivery	15454-LIC-CH-10=
L-NCS2K-AR-10G-DM=	NCS 2K / MSTP Lic Any-Rate XP/MXP - 10G Data MXP e-Delivery	15454-LIC-10G-DM=
L-NCS2K-AR10G-MXP=	NCS 2K / MSTP Lic Any-Rate XP/MXP - 4x2.5G MXP e-Delivery	15454-LICMXP4X2.5=

Table 2-3 NCS PIDs

NCS PID	DESCRIPTION	MSTP PID
L-NCS2K-AR-MR-MXP=	NCS 2K / MSTP Lic Any-Rate XP/MXP - MultiRate MXP e-Delivery	15454-LIC-MXP-AR=
L-NCS2K-AR10G-REG=	NCS 2K / MSTP Lic Any-Rate XP/MXP - OTU2 Regen e-Delivery	15454-LIC-REG-10G=
L-NCS2K-AR-MR-TXP=	NCS 2K / MSTP Lic AnyRate XP/MXP - 8G FC/10GE TXP e-Delivery	15454-LIC-TXP-8G=
L-NCS2K-AR-VD-MXP=	NCS 2K / MSTP License Any-Rate XP - 3G Video MXP e-Delivery	15454-LIC-VD-XP=
L-NCS2K-WSE-1=	NCS 2K / MSTP License WSE - 1x Encryption Stream e-Delivery	L-P-O-WSE-1=
L-NCS2K-100G-10G=	NCS 2K / MSTP License 100G MXP - 1x 10G MR Port e-Delivery	15454-M-LIC-10G=
NCS2015-SA-DC=	NCS 2015 Shelf Assembly - DC Power	NCS2015-SA-DC=
NCS2K-TNCS-K9=	Transport Node Controller for NCS2002, 2006 & 2015 chassis	NCS2K-TNCS-K9=
NCS2015-FTA=	NCS 2015 Fan Tray	NCS2015-FTA=
NCS2015-ECU=	NCS 2015 External Connections Unit	NCS2015-ECU=
NCS2015-DOOR=	NCS 2015 Door	NCS2015-DOOR=
NCS2015-DDR=	NCS 2015 Door	NCS2015-DDR=
NCS2015-FTF=	NCS 2015 Fan tray Air Filter	NCS2015-FTF=
NCS4K-DC-PSU-V1=	NCS 4000 DC Power System Unit - 1750 W - Balanced A and B	NCS4K-DC-PSU-V1=
L-NCS2K-MRE100GK9=	NCS 2K / MSTP Lic for 100GE	L-NCS2K-MRE100GK9=
L-NCS2K-MRELRGK9=	NCS 2K / MSTP Lic for 10GE LAN PHY	L-NCS2K-MRELRGK9=
NCS2K-TNCS-O-K9=	NCS 2000 Transport Node Controller w/2x OTDR/OSC	NCS2K-TNCS-O-K9=
NCS2K-20-SMRFS-CV=	20-port SMR - Switch. Gain Flex Spectrum - Connection Verification	NCS2K-20-SMRFS-CV=
NCS2K-MF-6RU=	Mechanical Frame for Passive Units - 14slots w/USB Hub - 6RU	NCS2K-MF-6RU=
NCS2K-MF-DEG-5-CV=	5 Degrees Mesh Interconnect with Connection Verification	NCS2K-MF-DEG-5-CV=
NCS2K-MF-UPG-4-CV=	4-Deg Upgrade Mesh Interconnect with Connection Verification	NCS2K-MF-UPG-4-CV=
NCS2K-MF-M16LC-CV=	MPO-16 to 16xLC Fan-Out with Connection Verification	NCS2K-MF-M16LC-CV=
NCS2K-MF-MPO-20LC=	MPO-16 to 20xLC Fan-Out MF Unit - With Integrated Monitoring	NCS2K-MF-MPO-20LC=
NCS2K-MF10-6RU=	Mechanical Frame for Passive Units - 10slots w/USB Hub - 6RU	NCS2K-MF10-6RU=

**Table 2-3 NCS PIDs**

<b>NCS PID</b>	<b>DESCRIPTION</b>	<b>MSTP PID</b>
NCS2K-MF-6RU-CVR=	Cover for the 6RU Mechanical Frame for Passive Units	NCS2K-MF-6RU-CVR=
NCS2K-MF-6RU-CVR=	NCS 2006 External Connections Unit - with 2x USB 3.0 Ports	NCS2K-MF-6RU-CVR=
NCS2K-MF-1SL-CVR=	Cover for the Mechanical Frame with USB cable holder - 1slot	NCS2K-MF-1SL-CVR=
NCS2K-USB3-CBL-2=	USB 3.0 Cable - 2m	NCS2K-USB3-CBL-2=
NCS2K-USB3-CBL-3=	USB 3.0 Cable - 3m	NCS2K-USB3-CBL-3=
NCS2K-MF-2SL-CVR=	Cover for the Mechanical Frame w/USB cable holder - 2slot	NCS2K-MF-2SL-CVR=
NCS2K-MPO-LBK=	8-fiber MPO Loopback - Male connector	NCS2K-MPO-LBK=
NCS2K-LC-LBK=	LC Loopback - Male connectors	NCS2K-LC-LBK=
NCS2K-MPO16-LBK=	16-fiber MPO Loopback - Male connector	NCS2K-MPO16-LBK=
NCS2015-SA-AC=	NCS 2015 Shelf Assembly - AC Power	NCS2015-SA-AC=
NCS4K-AC-PSU=	NCS 4000 AC Power System Unit - 3000 W	NCS4K-AC-PSU=
NCS4K-AC-CBL-IEC=	NCS 4000 AC Power Cable - IEC compliant	NCS4K-AC-CBL-IEC=
NCS4K-AC-CBL-NEMA=	NCS 4000 AC Power Cable - NEMA compliant	NCS4K-AC-CBL-NEMA=
SF-NCS2K-R1051FSK9	NCS 2K/MSTP - R10.5.1 SW, TNCE, TSCE, TNCS/O - FlexSpectrum	SF-NCS2K-R1051FSK9
NCS2K-M-R1051FSK9=	NCS 2K/MSTP - R10.5.1 SW, Media (DVD) SW RTU - FlexSpectrum	NCS2K-M-R1051FSK9=
CRS-AC-CAB-NA	CRS AC Power Cord for Modular Power-North America	CRS-AC-CAB-NA
CRS-AC-CAB-AU	CRS AC Power Cord for Modular Power-Australia	CRS-AC-CAB-AU
CRS-AC-CAB-EU	CRS AC Power Cord for Modular Power-Europe	CRS-AC-CAB-EU

- **Connection Verification**—Validates the correct optical interconnection between the optical cards inside a Flex ROADM. This feature also measures the insertion loss of the external passive path, validates the quality of the connections to the patch panel, and checks if the insertion loss is within expected value.

The SMR-20 FS CV cards provide the connection verification feature along with the passive modules MF-DEG-5-CV, MF-UPG-4-CV, and MF-M16LC-CV. For more information, see [2.17 Connection Verification](#).

**Step 20** Click **Next**.  
The Span Parameters area appears.

**Step 21** In the Span Parameters area, complete the following.

- Span Label Tag—Enter the desired span label.
- Span Fiber Type—Choose the fiber type for each span in the network.
- Span Length—Enter the span length. The displayed unit of measure is retrieved from the Span Measurements Units field.
- EOL Ageing Factor—Enter the number to use when factoring fiber aging. This factor is multiplied by the SOL total span loss without connectors.
- EOL Ageing loss [dB]—Enter the EOL aging loss value. The EOL loss-per-span value is added at the end of life to each discrete fiber in the network (for example, to add an EOL margin for splicing).

**Note**

Enter a value in either EOL Ageing Factor or EOL Ageing loss; you do not need to enter a value in both fields. Use one of the following formulas to calculate the fiber loss at SOL:

$$\text{SOL} = \text{km} * \text{dB/km} + (2 * \text{connector loss})$$

$$\text{SOL} = \text{user entered loss} + (2 * \text{connector loss})$$

Use one of the following formulas to calculate the fiber loss at EOL:

$$\text{EOL} = \text{km} * \text{dB/km} * \text{EOL Aging Factor} + (2 * \text{connector loss}) + \text{EOL Aging Loss}$$

$$\text{EOL} = \text{user entered loss} * \text{EOL Aging Factor} + (2 * \text{connector loss}) + \text{EOL Aging Loss}$$

- Connector loss [dB]—Enter the concentrated loss at the end of the span.
- CD factor [ps/mn/km]—Enter the fiber chromatic dispersion (CD) factor. The default value is dependent on the selected fiber type. Any value that you enter in this field is lost whenever you change the fiber type. Chromatic dispersion is always entered in ps/nm/km. Fiber chromatic dispersion is defined for the middle of the wavelength band. C-band is defined at 1545.3 nm and L-band is defined at 1590.4 nm.
- PMD factor [ps/sqrt(km)]—Enter the polarization mode dispersion (PMD) factor. The default value is dependent on the selected fiber type. Any value that you enter in this field is lost whenever you change the fiber type. PMD is always entered per kilometer.
- Length Based Loss—If this check box is checked, the fiber loss is determined by multiplying the Span Length with the Loss Factor. If this check box is unchecked, you must enter the total span loss value for the Tot SOL Loss w/o Connectors property.
- Loss factor [dB/km]—Enter the value of the SOL fiber loss per kilometer that is used to calculate the loss of each span in the network. The fiber loss factor is always entered in dB/km.
- Tot SOL Loss w/o Connectors—Enter the start of life fiber loss value for each span, excluding the connector concentrated loss.  
This property is disabled if the Length Based Loss check box is checked.
- DCN extension—Check this check box to use DCN extensions on each of the spans in the network. This implies that the OSC channel is not used to connect the two nodes. All nodes facing a span with the DCN Extension option enabled require a ITU-T G.709 generic communications channel (GCC) access that must be provided by the customer.

**Note**

For HYBRID 15454 ONS configuration, this option is disabled by default.

- OSC Frame Type—Choose the OSC frame type. The options available are Auto, OC3 Frame, GE Frame, and FE Frame. The default option is Auto. When set in Auto, CTP will use FE Frame as the preferred frame type.

**Note**

- CTP does not allow connecting different types of frames through a pass-through site.

- CTP does not allow removing a node if different frame types are used in the node.

**Step 22** Click **Finish**. CTP checks the validity of the fiber factor values. If the fiber factor values are within the valid range (Table 2-4), CTP creates a visual representation of the network. If the values are out of range, CTP issues a warning, asking you to confirm the input values.



**Note**

All options set by the Network Creation wizard can be changed as needed per site and per span.

**Table 2-4 Valid Ranges for Fiber Factor Values**

Fiber Type	Parameter	Min. Error Value	Min. Warning Value	Default Value	Max. Warning Value	Max. Error Value	Unit
ITU-T G.652-SMF	Loss factor	0	0.2	—	0.4	10	dB/km
	Chromatic dispersion factor at 1545.3 nm (C-band)	0	16.2	16.7	17.1	30	ps/nm/km
	Chromatic dispersion factor at 1590.4 nm (L-band)	0	18.53	19.03	19.43	30	ps/nm/km
	PMD factor	0	0.0	0.1	0.5	10	ps/(√km)
ITU-T G.655-E-LEAF	Loss factor	0	0.2	—	0.4	10	dB/km
	Chromatic dispersion factor at 1545.3 nm	0	3.4	3.80	4.2	10	ps/nm/km
	PMD factor	0	0	0.1	0.5	10	ps/(√km)
ITU-T G.655-True Wave	Loss factor	0	0.2	—	0.4	10	dB/km
	Chromatic dispersion factor at 1545.3 nm	0	3.8	4.19	4.6	10	ps/nm/km
	PMD factor	0	0	0.1	0.5	10	ps/(√km)
ITU-T G.652-DS (Dispersion shifted)	Loss factor	0	0.2	—	0.4	10	dB/km
	Chromatic dispersion factor at 1590.4 nm (L-band)	0	2.43	2.83	3.23	30	ps/nm/km
	PMD factor	0	0	0.1	0.5	10	ps/(√km)

## 2.2 Adding Sites

Use the following procedure to add new sites to an existing network. A site is a customer premise equipment (CPE) where any equipment can be co-located in a rack within a building. The Cisco Transport Planner supports up to 150 sites in a network. The number of racks and nodes in a site is independent of the number of sites in the network. The maximum number of locations where the OSC can be terminated in a network is 40. When the number of locations where the OSC is terminated exceeds the maximum supported value, the tool completes the design, but in the summary report an alarm is reported to indicate this situation. The maximum number of add/drop locations in a network is 40. The maximum number of add/drop locations (equipped with WSS, WXC, multiplexer/demultiplexer, or OADM) traversed by an optical circuit is limited to 40.



### Note

Every new site added to a design is automatically configured as Multi-Shelf Integrated Switch with Same Shelf protection. To change this, you can edit the site properties after adding it to the network design. See the “[4.3 Editing Site Parameters](#)” section on page 4-3.

- 
- Step 1** Right-click the network folder in the Project Explorer pane and choose **Expand** from the shortcut menu.
- Step 2** Right-click the Sites folder and choose **New Site** from the shortcut menu. The Site Creation wizard appears. As an alternative, if sites already exist in the network design and you have the NtView *Name* tab open, click the **Create a new site** icon in the toolbar. For more information about the Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#)
- Step 3** Choose the **type of node from the Node Type drop-down list. The options available are:**
- MSTP 15454 ONS
  - HYBRID 15454 ONS
  - NG-DWDM
- Step 4** Choose the type of interface from the **Select line or terminal site drop-down list. The options available are:**
- Line—Two pairs of fibers are terminated at the node.
  - Terminal—A single pair of fibers is terminated at the node.
  - Line+—Two pairs of fibers are terminated at the node but the number of fibers can be increased. An MMU card (topology upgrade) must be installed.
  - Terminal+—A single pair of fibers is terminated at the node but the number of fibers can be increased. An MMU card (topology upgrade) must be installed.
  - Multi-degree—Nodes have two or more sides and face two or more fiber spans.
  - PSM Terminal - Optical Path Protection—Provides protection for terminal sites at Line level through an optical protection switching module (PSM). In this configuration, the PSM is directly connected to the fibers after the amplification stage.
  - PSM Terminal- Multiplex Section Protection—Provides protection for terminal sites at multiple levels through an optical protection switching module (PSM). In this configuration the PSM is equipped between the mux/demux stage and the amplification stage.



### Note

In the HYBRID 15454 ONS configuration, the supported interface types are line and terminal. In NG-DWDM configuration, the supported topologies are Terminal, Line and Multi-degree.

- Step 5** If you chose multi-degree in [Step 4](#), choose the number of sides from the No of Sides drop-down list. The default option is two.
- Step 6** Enable NCS—Check this check box to use NCS PIDs for the selected site. For more information, see [Table 2-3NCS PIDs, page 2-9](#).
- Step 7** Click **Finish**.

## 2.3 Adding Fiber Spans

Use the following procedure to manually add fiber spans between sites. A fiber span consists of a pair of fibers (one transmit and one receive) between two sites. A span is represented by a fiber duct in the *NetViewName* tab. Within a fiber duct, more than one fiber pair can exist.



**Note**

The number of fiber spans that each site can support is defined in the site properties. See the [“2.2 Adding Sites” section on page 2-14](#) or the [“4.3 Editing Site Parameters” section on page 4-3](#).

- Step 1** In the *NtView Name* tab, click the Create a new duct icon in the toolbar. For more information about the Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#)
- Step 2** Click one of the sites that you want to connect with a fiber span. This site becomes the source site for network analysis output, later.
- Step 3** Click the destination site. The New Duct dialog box appears. The selected site becomes the destination site for network analysis output, later. For the first span, the source site is set as A and the destination site is set as B. Cisco Transport Planner automatically adjusts East and West for additional spans. HYBRID 15454 ONS configuration cannot be connected to the 15454 MSTP configuration. However, a network can have two clusters, one being the 15454 MSTP and the other being the 15216 hybrid without any connections between the two.



**Note**

To connect any two sites using a duct, both the source and destination sites must have at least one unconnected side.



**Note**

For NG-DWDM nodes, the number of new ducts created is limited to the scalable upto degree value.

- Step 4** Choose the Connection Type:
- Line
  - Remote Add/Drop
- A Remote Add/Drop duct can be created only between a terminal site and the Remote Add/Drop side of any non-terminal site.
- The remote terminal site to which the remote add/drop side is connected must fulfill the following site functionality type, and equipment constraints in addition to the rules in [Table 4-2](#) and [Table 4-3](#):
- Site functionality must be Auto or Add/Drop.
  - Site type must be Auto or Mux/Demux.

- Add/Drop units can be 40-MUX-C/40-DMX-C, 15216-MD-40-ODD, 15216-MD-40-EVEN, 15216-EF-40-ODD, or 15216-EF-40-EVEN.

For more information see [“4.24 Modifying Site Properties” section on page 4-160](#).

**Step 5** Choose the sides of the source and destination site to connect.

If you chose **Line** in [Step 4](#), only the line sides are displayed here. If you chose **Remote Add/Drop**, the line side is displayed for the terminal site, while the pane of the other site lists the unconnected Remote Add/Drop ports of the site.

---

## 2.4 Creating an Optical Subnet

An optical subnet is a collection of spans with certain associated, defined, common properties. You can define distinct optical subnets on the same network and can also set a list of associated properties on each of them.

The following properties are supported in an optical subnet:

- C-band Rules—Allows you to define rules for the C-band channels, the maximum per channel power, and the channel spacing for the design.
- L-band Rules—Allows you to define, for the L-band channels, the maximum per channel power, and the channel spacing for the design.

When you create a new project (see [2.1 Creating a Project, page 2-1](#)), Cisco Transport Planner automatically creates an optical subnet associated to the network. At least one optical subnet (even if empty) must exist for each network in a project.

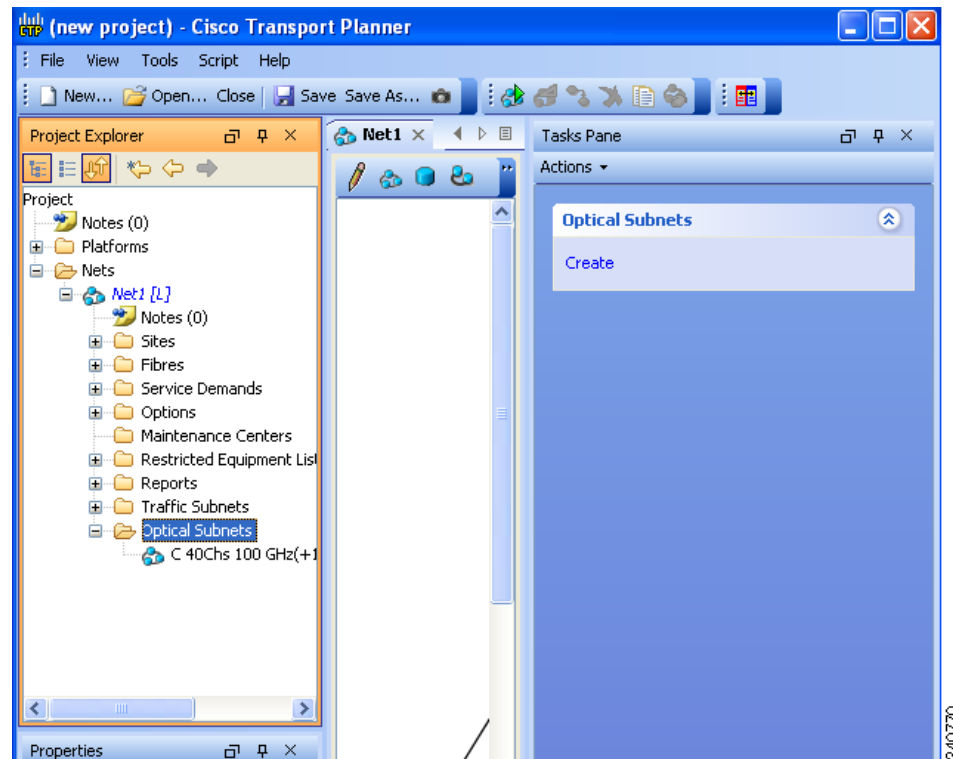
You can create an optical subnet using the Project Options (default) Optical Subnet property (Design Rules) values. To do this:

---

**Step 1** Select the **Optical Subnet** folder in the Project Explorer pane. The Optical Subnet Pane appears in the Task Pane on the right side of the screen ([Figure 2-2](#)).

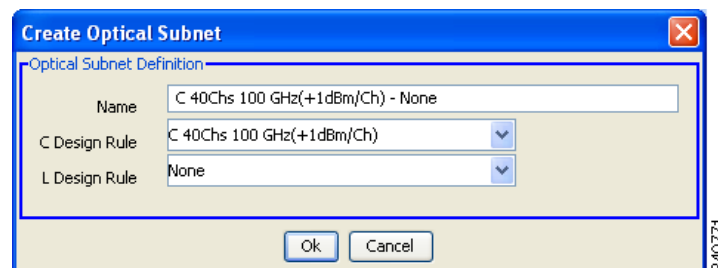


Figure 2-2 Creating Optical Subnet



- Step 2** Click **Create**. The Create Optical Subnet dialog box appears (Figure 2-3). Alternatively, right-click the **Optical Subnets** folder and select **Create**. The default name, which is a combination of the user-created C-band and L-band rules, and the wizard-created default C-band and L-band rules are displayed.

Figure 2-3 Create Optical Subnet Dialog Box



- Step 3** Select C-band and L-band design rules from the C Design Rule and L Design Rule drop-down lists for the new optical subnet that you want to create.
- Step 4** Click **OK**. A new optical subnet with the design properties you selected is created and placed in project explorer under the Optical Subnets folder.

**Note**

You cannot create more than one optical subnet with the same properties values and each span must be part of only one optical subnet.

Cisco Transport Planner allows you to do the add or remove spans, edit designs rules, define an optical subnet as current, and to delete an optical network. To do these, select the optical subnet you want to change under Optical Subnets in the Project Explorer pane. In the Tasks Pane, choose the following:

- Add/Remove Spans—Adds or removes the spans that are included in a given optical subnet.
- Edit Design Rule—Modifies the property value of the design rule of a new or existing optical subnet.
- Set as Current—CTP automatically defines the optical subnet with the greatest number of spans.
- Delete—Deletes the optical subnets in the Tasks Pane.

**Note**

When you delete an optical subnet, all the spans contained in the deleted optical subnet are placed within the current optical subnet. In case the current optical subnet is deleted, all their spans will be automatically placed within the optical subnet with the greatest number of spans. When the current optical subnet is removed, the tool automatically defines as current the optical subnet with the greatest number of contained spans.

## 2.5 Adding Notes to a Project

Use the following procedure to add a note to any item in the Project Explorer pane. Each network has a Notes folder in the Project Explorer pane. After you have created a note, it appears in the Notes folder for that particular network.

- Step 1** Right-click the desired item in the Project Explorer pane and choose **Edit Note** from the shortcut menu.
- Step 2** In the Edit Note creation box, enter the desired text.
- Step 3** To close the Edit Note creation box and to save the note, click the **X** in the upper right corner of the window.
- Step 4** To view notes, double-click the **Notes** folder. The Notes window appears. [Table 2-5](#) lists the columns in the Notes window.

**Table 2-5** Notes Window

Column	Description
Header	Displays the note text. To view the entire note, click the plus (+) sign next to the header to expand the text.
Action	Click <b>Go</b> to open the item in the Project Explorer pane where the note was created.
Source	Displays the location of the note, for example, ProjectManager.Nets.Net2.Sites.Site2.W.

- Step 5** To close the Notes window, click the **X** in the upper right corner of the window.

## 2.6 Creating Traffic Subnet

**Step 1** In the Project Explorer pane, scroll down to Traffic Subnets. Right-click Traffic Subnets, and select **Create**.

The Traffic Subnet Creation wizard appears.

**Step 2** Select the Topology for the subnet from the drop-down list (**Ring**, **Linear**, and **Mesh**), then click **Next**.



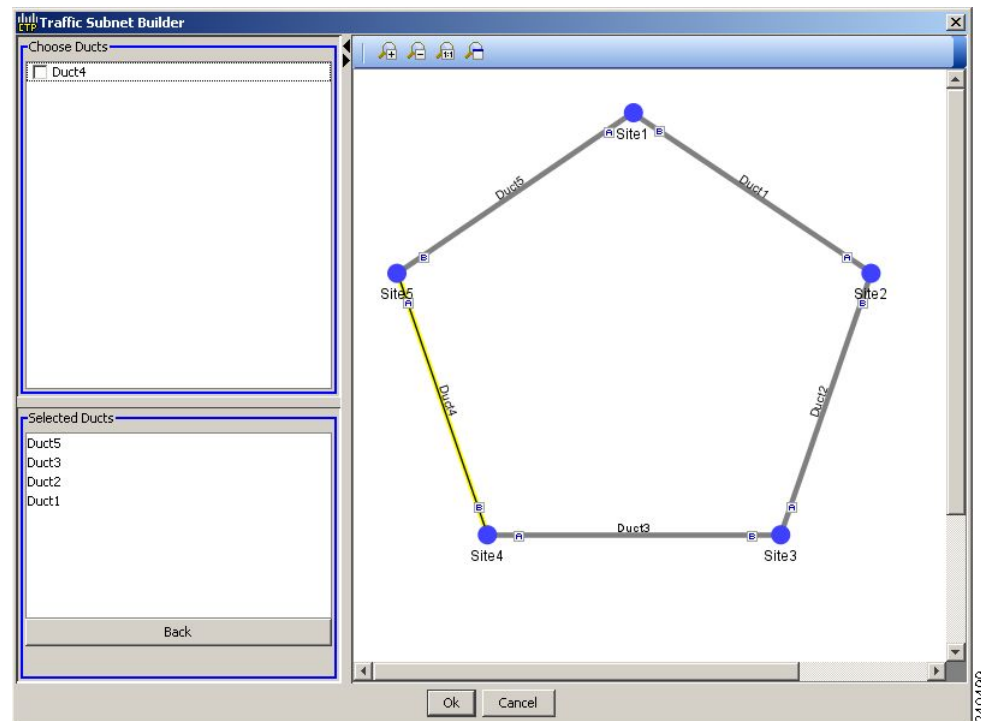
**Note** If Ring or Linear topology is selected for the subnet, the spans in the subnet must be adjacent and also ordered.

**Step 3** Click **Press** to build new subnet. The Traffic Subnet Builder Wizard appears (Figure 2-4).

**Step 4** Select the ducts that should be a part of the subnet from the list displayed on the left handside, and click **OK**. This takes you back to the Traffic Subnet Creation Wizard.

**Step 5** Click **Finish** to complete the creation of the traffic subnet. The created subnet appears under Traffic Subnets in the Project Explorer pane.

**Figure 2-4** Traffic Subnet Builder Wizard



## 2.7 Creating a Demand

Cisco Transport Planner provides five types of service demands:

- Point-to-point
- Protected ring (P-ring)
- ROADM
- Ethernet aggregated
- TDM aggregated

You can also create regeneration sites while creating a service demand.

CTP allows you to create property templates to design a set of property configurations for a demand. When you have a network that has similar sites, you can use these property templates to quickly and accurately set up common properties. For more information, see [4.31 Property Template](#).

### 2.7.1 Manual Regeneration

In optical networks, as the fiber length increases, a loss in the signal ratio and power could occur due to attenuation and dispersion. A regenerator is required 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 an electrical signal, and then convert the signals back to optical signals (O-E-O conversion).

Cisco Transport Planner supports the creation of regeneration sites in the network. Regeneration is supported for the following demands:

- Point-to-point
- P-ring
- Ethernet Aggregated
- TDM Aggregated

The demand is displayed in the following manner:

Demand > Service > Trail > Section

- “Service” is the circuit through which traffic flows between nodes.
- “Trail” is the network section joining two traffic nodes. By default, a trail has only one section. The trail can be split in different regeneration sections.
- “Section” is a contiguous subset of the span.

A new section is added whenever a regeneration site is created. The sections can have different wavelengths based on availability. Regeneration can be performed using any two cards back-to-back (OTU2\_XP, TXP, or MXP) or with a dedicated regenerator card.

### 2.7.2 Understanding Omnidirectional Functionality

The omnidirectional functionality on a side enables you to connect the side to a local multiplexer and demultiplexer that can add or drop traffic to or from any of the node directions. Omnidirectional traffic can be added or dropped only on the omnidirectional side.

Omnidirectional sides are different from standard add/drop sides in the following ways:

- Omnidirectional sides are internal sides that cannot be connected through fibers or ducts.
- Amplifiers on omnidirectional sides are placed between the 80-WXC-C card (bidirectional mode) and the Add/Drop (Mux/Demux) units.
- Raman amplification is excluded on omnidirectional sides, as the amplification depends on the Raman Amplified option on a duct.

Multi-degree sites that use the OXC functionality and are equipped with the following equipment can support omnidirectional sides:

- 40-WXC-C/MESH-PP-4
- 40-WXC-C/MESH-PP-8
- 80-WXC-C/MESH-PP-4
- 80-WXC-C/MESH-PP-8
- Flexible (nodes equipped with 80-WXC-C and 40-WXC-C equipment)
- 40-SMR2-C

Multi-degree OXC sites equipped with 40-WXC-C or 40-SMR2-C units can support both omnidirectional sides and the Omnidir Entry Point options. However, both options cannot be used on the same side.

For more information see the [“4.24 Modifying Site Properties”](#) section on page 4-160.

### 2.7.2.1 Omnidirectional Demands

In all service demands (except ROADM demands), the value of the omnidirectional property is independent for each section or trail of a service.

You can perform operations at the trail level. The following are some examples:

- Terminate a working trail on the omnidirectional stage, and connect the protected trail to a standard add/drop stage.
- Terminate a trail on a line side and regenerate the trail in an intermediate omnidirectional side.
- Force both working and protected trails (or consecutive trails in the case of a P-Ring demand) to terminate on the same omnidirectional side. By default, traffic from all demands (except ROADM demands) terminates on two different omnidirectional sides.

The omnidirectional property is available for the source and destination of each section of a service trail. A section terminating on an omnidirectional side can be routed in all possible directions. If multiple omnidirectional sides are available for a site, you can force the section to terminate on a specific side.

## 2.7.3 Understanding Colorless Functionality

The colorless property enables tuning of channel wavelengths without changing the optical interface of the port. A colorless side is connected to two 80-WXC-C cards configured as a multiplexer and demultiplexer.

A colorless stage is available at the local add/drop stage on line, terminal, or multi-degree sites. In line and terminal sites, you can implement colorless sides using the following configurations:

- Line or terminal ROADM site with 80-WXC-C cards




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**Note** For line sites, you must have 80-WXC-C cards on both sides even when only one of the ports is forced as colorless.

---

- Line or terminal sites equipped with 40-SMR1-C
- Line or terminal sites equipped with 40-SMR2-C

In multi-degree sites you can implement colorless sides through a node having OXC functionality and are equipped with the following:

- 40-WXC-C/MESH-PP-4
- 40-WXC-C/MESH-PP-8
- 80-WXC-C/MESH-PP-4
- 80-WXC-C/MESH-PP-8
- 40-SMR2-C

### 2.7.3.1 Colorless Demands

In all service demands (except ROADM) the colorless property is available separately for each trail and section of a service demand.

For example, in a P-ring demand you can terminate one trail on a colorless mux/demux stage and connect the other trail to a standard (colored) mux/demux stage.

Colorless sections must be associated to an 80-WXC-C colorless port and can be terminated on sides having colorless add/drop ports to achieve full wavelength tuning capability on fixed physical ports.

## 2.7.4 Understanding Colorless Omnidirectional Functionality

A colorless and omnidirectional side is connected to a multiplexer (80-WXC-C card) and demultiplexer (80-WXC-C card) that can add or drop traffic to or from any of the node directions. You can define an omnidirectional colorless side by adding one or more colorless ports to an omnidirectional side.

In all service demands (except ROADM), you can configure colorless termination points as omnidirectional, to achieve full routing capability for all possible wavelengths.




---

**Note** In a 50GHz design, an omnidirectional demand can be dropped only on a colorless omnidirectional side.

---

## 2.7.5 Understanding Contentionless Functionality

The 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 should be equal to ROADM degrees.

Multi-degree sites that use the OXC functionality and are equipped with the following equipment can support contentionless sides:

- 12-AD-CCOFS
- 16-AD-CCOFS

For more information see the [“4.24 Modifying Site Properties”](#) section on page 4-160.

## 2.7.6 Creating a Point-to-Point Demand

Use the following procedure to add a point-to-point traffic demand:

- Step 1** In the NtView *Name* tab, click the **Create new Point-to-Point demand** icon in the toolbar. For more information about the Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#)
- Step 2** Click the source site of the demand.
- Step 3** Click the destination site of the demand. The Point to Point Demand Creation wizard appears.
- Step 4** From the drop-down list, select **Traffic Subnet ALL** or any of the previously created traffic subnets to which this service demand should be part of, and proceed to [Step 5](#). If you wish to create a new traffic subnet see [“2.6 Creating Traffic Subnet” section on page 2-19.](#)
- Step 5** Click **Next**.
- Step 6** On the General Parameters page, complete the following:
- **Label**—Enter the name of the demand.
  - **Source**—(Display only) Displays the source site name.
  - **Destination**—(Display only) Displays the destination site name.
  - **Service Type**—Choose the service type from the drop-down list. For a list of services, see the [“1.1.2.5 Service Support” section on page 1-7.](#)
  - **Present # ch**—Enter the number of channels to be created. The Forecast # ch field automatically updates with the number entered in this field.
  - **Forecast # ch**—Enter the number of channels to be installed at a later date. This value includes the Present # ch value. For example, if you entered 4 in the Present # ch value and want to add two channels in the future, enter 6.
- Step 7** Click **Next**. The Platform Parameters page appears.
- Step 8** On the Platform Parameters page, complete the following in the Platform area:
- **Protection**—Choose the protection type from the drop-down list: **Client 1+1**, **Y-Cable**, **Fiber Switched**, **Unprotected**, or **PSM-OCH**. For more information on protection types, see the [“1.1.2.4 Protection Scheme Support” section on page 1-4.](#)




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**Note** Y-cable protection is not available for encrypted traffic types.

---

- **Path**—(Unprotected only) Choose the routing type from the drop-down list:
  - **Auto**—Allows the highest degree of flexibility in routing the channels. Cisco Transport Planner routes the channels with the lowest possible cost, given the other constraints.
  - **A**—Select this for a Terminal or a Terminal+ site.
  - **A or B**—Select either of these for a Line or a Line+ site.
  - **A, B, C, or D**—Select either of these for a Multidegree site if four ducts are connected.
  - **A, B, C, D, E, F, G, or H**—Select either of these for a Multidegree site if eight ducts are connected.
  - **Aw or Ap**—Select either of these for a PSM Terminal - Optical Path Protection or PSM Terminal - Multiplex Section Protection site.

- **Optical Bypass**—(Unprotected only) Choose the site where the channels for the current demand will be optically bypassed. A channel in optical bypass is dropped on one side of the node and added on the other side of the same node to allow the future use of that node as an add/drop location.




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**Note** Optical Bypass cannot be performed for an NG-DWDM node.

---

- **Colorless**— Choose an option from the colorless drop-down list. For more information on colorless property see “[2.7.3 Understanding Colorless Functionality](#)” section on page 2-21.
  - **Auto**—(Default) Disables colorless functionality on the demand.
  - **Yes**—Enables colorless functionality on the demand.
  - **No**—Disables colorless functionality on the demand.
- **Omni-directional**— Choose an option from the Omni-directional drop-down list. For more information on omnidirectional property see “[2.7.2 Understanding Omnidirectional Functionality](#)” section on page 2-20.
  - **Auto**—(Default) Dynamically enables omnidirectional functionality on a colorless demand, when the colorless demand needs to be dropped on an omnidirectional side with colorless ports, due to lack of any other colorless port on the side.
  - **Yes**—Enables omnidirectional functionality on the demand.
  - **No**—Disables omnidirectional functionality on the demand.
- **Contentionless**—Choose an option from the contentionless drop-down list. For more information on contentionless property see “[2.7.5 Understanding Contentionless Functionality](#)” section on page 2-22.
  - **Auto**—(Default) Disables contentionless functionality on the demand.
  - **Yes**—Enables contentionless functionality on the demand.
  - **No**—Disables contentionless functionality on the demand.
- **Encryption**—Choose an option from the Encryption drop-down list.
  - **Yes**—Enables encryption functionality on the demand.
  - **No**—Disables encryption functionality on the demand.




---

**Note** The Encryption option is available only if you have selected 100GE, 10GE LAN PHY, OTU2e, or OTU2 as Service Type in [Step 6](#).

---

- When the **Encryption Always ON** option is checked in the Network properties and the value of Encryption is Yes, the NCS2K-MR-MXP-K9 PID is used instead of the NCS2K-MR-MXP-LIC PID.
- When the **Encryption Always ON** option is unchecked and the value of Encryption is Yes for 100GE demands, CTP uses the L-NCS2K-MRE100GK9 PID along with the 200G-CK-LC and MR-MXP PIDs.
- When the **Encryption Always ON** option is unchecked and the value of Encryption is Yes for 10GE or 40GE demands, CTP uses the L-NCS2K-MRELRGK9 PID along with the 200G-CK-LC and MR-MXP PIDs.

**Step 9** In the Platform Parameters page, complete the following fields in the Interface/Card Type area. The options available are based on the service type selected in [Step 6](#).



- Transponder—Click to expand, then check the Card Type check box to select the card at the end sites of the service channels.
  - If you have selected 10G FICON, 10GE WAN PHY, Fiber Channel 10G, 8G FICON, 8G Fiber Channel, OC192/STM64, 10GE LAN PHY, OTU2e, or OTU2 as Service Type in [Step 6](#) and enabled encryption in [Step 8](#), then, the encryption feature is available in the WSE-TXP Mode card. If you choose not to encrypt, this card is still available and is used without encryption.
  - If you have chosen 100GE or OTU4 as Service Type in [Step 6](#), then the 100G-CK-LC-C card is available as a standalone card. If you have chosen 100GE as Service Type in [Step 6](#), then the 100GS-CK-LC (with SD-FEC) card is available as a standalone card. For other service types, 100G-CK-LC-C and 100GS-CK-LC cards are available only in combination with the 10X10G-LC card.
  - A 100 G demand which goes through a Cisco Aggregation Services Router (ASR) is labelled as an ASR demand in CTP. A one-port ASR demand contains one 100G-LC-C card, one pluggable and one cable associated with it. A two-port ASR demand contains two 100G-LC-C cards, two pluggables and two cables associated with it. To create an ASR demand, select the Service Type as 100GE in [Step 6](#). From the Transponder folder, select 100G-LC-C+ASR (with FEC, with EFEC, or with HG-FEC) or 100G-LC-C+ASR2 (with FEC, with EFEC, or with HG-FEC) demand and proceed to [Step 11](#).

ASR demands are available for ROADM demands and Point-to-Point demands with protection. To view the ASR bundle, see [“2.11.3.1 Viewing the ASR Bundle in the Site BoM”](#) section on [page 2-67](#).

- If you have selected the Service Type as LAN-WAN Conversion in [Step 6](#), when you expand the Transponder folder, select any one of the following OTU2-XP LAN-WAN modes and then proceed to [Step 10](#):
  - OTU2-XP- Mixed Mode—Select this mode if the Protection type is either Unprotected, Client 1+1, or PSM-OCH.
  - OTU2-XP- Txp Mode—Select this mode if the Protection type is either Unprotected, Client 1+1, or PSM-OCH.
  - OTU2-XP- Splitter Mode—Select this mode if the Protection type is Fiber-Switched.




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**Note** Y-cable protection is not supported on the LAN to WAN interface (ports 1 and 3).

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- From Release 10.6, you can choose Sub OpMode cards for 100GE, 10GE and 40GE service types. 200G-CK-LC+MR-MXP cards support MXP-100G+10x10G sub OpMode for 100 GE and 10 GE LAN PHY. 200G-CK-LC+MR-MXP+MR-MXP cards support the OPM-2x40G-2x10G sub OpMode for 10GE LAN PHY and 40GE LAN PHY.
- Line Card—Click to expand the Line Card folder and then check the Card Type check box to select the card at the end sites of the service channels. For a list of line cards supported for specific service types, see the [“1.1.2.5 Service Support”](#) section on [page 1-7](#).
- Alien Card—Appears only if you created a third-party interface as described in the [“1.6.5 Defining Third-Party DWDM Interfaces”](#) section on [page 1-38](#). Click to expand the Alien Card folder and then check the card type check box to select the card at the end sites of the service channels.
- Pluggable Card—Click to expand the Pluggable Card folder and then check the card type check box to select the card at the end sites of the service channels.

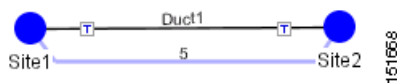
- Step 10** In the Client Interface area, define the client interface type for the source (SR, ZR, ER, or LR) and destination (EW, SW, or LW) from the Source and Destination drop-down list. This option is available for transponder and muxponder interfaces that have pluggable client interfaces that depend on the selected service type and card type.



**Note** In the LAN-WAN conversion mode, CTP automatically selects the Source and Destination client interface type if you have not selected the Source and Destination client interface type.

- Step 11** Click **Finish**. The Demand Editor dialog box appears listing the present and forecast channels. The demand appears in the NtView *name* tab and in the Project Explorer pane in the Service Demands > Point To Point folders. A demand is a solid line when selected and a dotted line when not selected. The line has a number above it that indicates the number of channels that are present. [Figure 2-5](#) shows a selected point-to-point demand with five channels between sites 1 and 2.

**Figure 2-5 Point-to-Point Demand Between Two Sites**



- Step 12** To add a new service, click the **Add new service** icon in the toolbar. A new row appears. Complete the parameters for the new channel.
- Step 13** To delete an existing channel, select the row and click the **Delete service** icon in the toolbar.
- Step 14** To set path constraints, click the **Path Constraints Editor** icon in the toolbar and complete the following as required:
- Output Node Interface—Choose from the drop-down list, the side through which the demand must be routed.
  - Exclude Sites—Choose the sites that must be excluded from the demand route.
  - Exclude Ducts—Choose the ducts that must be excluded from the demand route.

Click **OK** to save the changes and **Cancel** to close the dialog box without saving the changes.

- Step 15** This icon is available only at the trail level of the service demand.
- Step 16** To add a regeneration site, click the **Regeneration...** icon in the toolbar. The Regeneration editor appears. The regeneration site can be created only at the trail level. For more information, see the [“2.7.11 Creating a Regeneration Site”](#) section on page 2-47.
- Step 17** Click **OK** to save the changes to the channels and close the Demand editor dialog box, or **Cancel** to close the dialog box without saving the changes.



**Note** To make changes to the demand parameters, see the [“4.7 Editing a Point-to-Point Demand”](#) section on page 4-58, or click **Cancel** to close the Demand Editor dialog box.

**Note**

For each network, Cisco Transport Planner automatically creates a default subnet that exactly matches the overall network topology. This cannot be deleted.

## 2.7.7 Creating a Protected Ring Demand

Use the following procedure to create a P-ring traffic demand.

- 
- Step 1** Create a ring network using either the procedures in [2.1 Creating a Project, page 2-1](#) or by manually placing sites into a ring configuration.
- Step 2** In the Native Net# tab, click the **Create new P-Ring demand** icon in the toolbar. The P-Ring Creation wizard appears. For more information about the Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#)
- Step 3** For each network, the tool automatically creates, a default subnet that exactly matches the overall network topology. This cannot be deleted. From the drop-down list, select any previously created traffic subnet with a ring topology that this circuit should be part of and proceed to [Step 4](#). If you wish to create a new traffic subnet see [2.6 Creating Traffic Subnet, page 2-19](#).
- Step 4** On the General Parameters page, complete the following:
- **Label**—Enter the name of the demand.
  - **Service Type**—Choose the service type from the drop-down list. For a list of services, see the [“1.1.2.5 Service Support” section on page 1-7.f](#)
  - **Present # ch**—Enter the number of channels to be created. The Forecast # ch field automatically updates with the number entered in this field.
  - **Forecast # ch**—Enter the number of channels to be installed at a later date. This value includes the Present # ch value. For example, if you entered 4 in the Present # ch value and want to add two channels in the future, enter 6.
- Step 5** Click **Next**.
- Step 6** On the Sites Selection page, in the Protection Sites area, press **Ctrl** and click the sites that you want to add to the P-ring. A P-ring requires at least two sites. Click the right arrow button. To remove a site added to the list, click the site and click the left arrow button. In the Optical Bypass area, press **Ctrl** and click the sites that you want to add to the P-ring. Click the right arrow button. To remove a site added to the list, click the site and click the left arrow button.
- Step 7** Click **Next**. The WDM Client Selection page appears.
- Step 8** On the WDM Client Selection page, enter the following Platform Parameters:
- **Colorless**— Choose an option from the colorless drop-down list. For more information on colorless property see [“2.7.3 Understanding Colorless Functionality” section on page 2-21](#).
    - **Auto**—(Default) Disables colorless functionality on the demand.
    - **Yes**—Enables colorless functionality on the demand.
    - **No**—Disables colorless functionality on the demand.
  - **Omni-directional**— Choose an option from the Omni-directional drop-down list. For more information on omnidirectional property see [“2.7.2 Understanding Omnidirectional Functionality” section on page 2-20](#).

- **Auto**—(Default) Dynamically enables omnidirectional functionality on a colorless demand, when the colorless demand needs to be dropped on an omnidirectional side with colorless ports, due to lack of any other colorless port on the side.
- **Yes**—Enables omnidirectional functionality on the demand.
- **No**—Disables omnidirectional functionality on the demand.
- Encryption—Choose an option from the Encryption drop-down list.
  - **Yes**—Enables encryption functionality on the demand.
  - **No**—Disables encryption functionality on the demand.




---

**Note** The Encryption option is available only if you have selected 10GE LAN PHY, OTU2e or OTU2 as Service Type in [Step 4](#).

---

**Step 9** Complete the following in the Interface/Card Type area. The options available are based on the service type selected in [Step 4](#).

- Transponder—Click to expand, then check the Card Type check box to select the card at the end sites of the service channels.
  - If you have selected 10GE LAN PHY, OTU2e, or OTU2 as Service Type in [Step 4](#) and enabled encryption in [Step 8](#), then, the encryption feature is available in the WSE-Txp Mode card. If you choose not to encrypt, this card is still available and is used without encryption.

If you have selected the Service Type as LAN-WAN Conversion in [Step 4](#), when you expand Transponder, select any one of the following OTU2-XP LAN-WAN modes:

- OTU2-XP- Mixed Mode—Select the card type as OTU2-XP Mixed Mode if the Protection type is either Unprotected, Client 1+1, or PSM-OCH.
- OTU2-XP- Txp Mode—Select the card type as OTU2-XP Txp Mode if the Protection type is either Unprotected, Client 1+1, or PSM-OCH.
- OTU2-XP- Splitter Mode—Select the card type as OTU2-XP Splitter Mode if the Protection type is Fiber-Switched.
- Line Card—Click to expand, then check the card type check box to select the card at the end sites of the service channels. For a list of line cards supported for specific service types, see the [“1.1.2.5 Service Support” section on page 1-7](#).
- Alien Card—Appears only if you created a third-party interface as described in the [“1.6.5 Defining Third-Party DWDM Interfaces” section on page 1-38](#). Click to expand, and then check the card type check box to select the card at the end sites of the service channels.
- Pluggable Card—Click to expand, then check the card type check box to select the card at the end sites of the service channels.

In the Client Interface area, define the client interface type for the source (SR, ZR, ER, or LR) and destination (EW, SW, or LW) from the Source and Destination drop-down list. This option is available for transponder and muxponder interfaces that have pluggable client interfaces that depend on the selected service type and card type.




---

**Note** In the LAN-WAN Conversion mode, CTP automatically selects the Source and Destination client interface type if you have not selected the Source and Destination client interface type.

---

**Step 10** Click **Finish**. The Demand Editor dialog box appears.

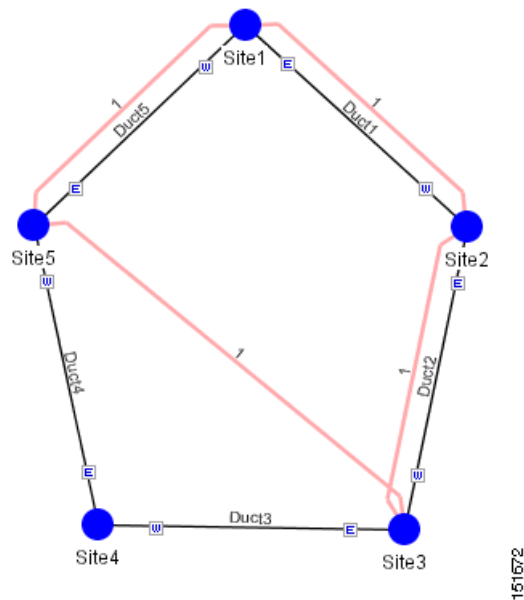
The demand appears in the NtView *name* tab and in the Project Explorer pane in the Service Demands > P-Rings folders. A demand is a solid line when selected and a dotted line when not selected. The line has a number above it that indicates the number of channels present. Figure 2-6 shows a selected one-channel P-ring between sites 1, 2, 3, and 5 with an optical bypass of site 4.

- Step 11** To add a new service, click the **Add new service** icon in the toolbar. A new row appears. Complete the parameters for the new channel.
- Step 12** To delete an existing channel, select the row and click the **Delete service** icon in the toolbar.
- Step 13** To add a regeneration site, click the **Regeneration...** icon in the toolbar. The Regeneration editor appears. The regeneration site can be created only at the trail level. For more information, see the “2.7.11 Creating a Regeneration Site” section on page 2-47.
- Step 14** Click **OK** to save the changes to the channels and close the Demand Editor dialog box, or **Cancel** to close the dialog box without saving the changes.



**Note** To make changes to the demand parameters, see the “4.8 Editing a P-Ring Demand” section on page 4-61, or click **Cancel** to close the Demand Editor dialog box.

**Figure 2-6 P-Ring Demand**



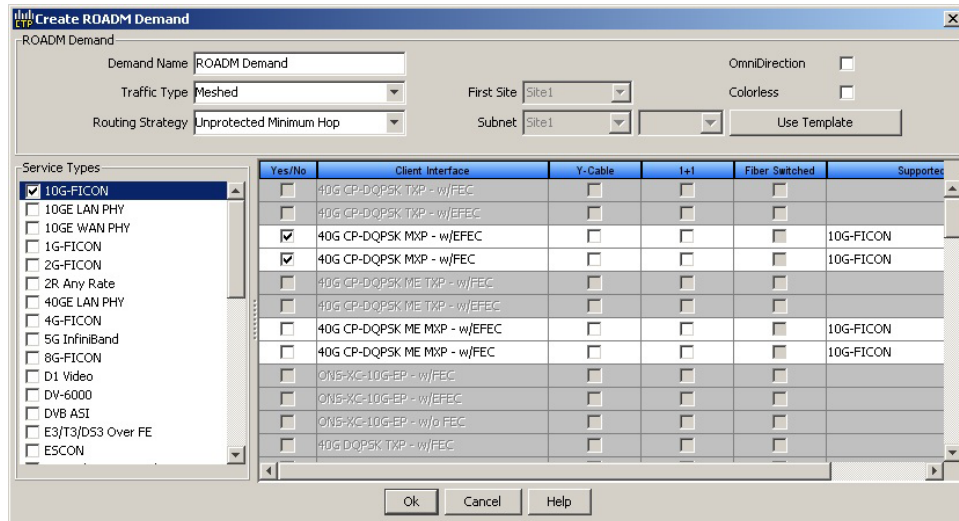
## 2.7.8 Creating a ROADM Demand

Use the following procedure to create ROADM traffic groups and demands:

- Step 1** In the Project Explorer pane, under Nets, right-click the **ROADM** folder and choose **New ROADM Group**. The ROADM Group Creation wizard appears.
- Step 2** Select the desired traffic subnet from the Traffic Subnet field. You can create a new traffic subnet if desired using the “2.6 Creating Traffic Subnet” section on page 2-19.

- Step 3** Enter the ROADM traffic group name in the Group Name field.
- Step 4** Check the desired sites.
- Step 5** Click **Finish**. The new ROADM traffic group appears under the ROADM folder in the Project Explorer pane.
- Step 6** Right-click the new ROADM traffic group and choose **Create new ROADM demand** from the shortcut menu. The Create ROADM Demand dialog box appears (Figure 2-7).

**Figure 2-7 Create ROADM Demand Dialog Box**



- Step 7** (Optional) If you copied properties of an existing ROADM demand, click Use Template to use the properties of the copied ROADM demand.
- Step 8** Enter a name for the demand in the Demand Name field.
- Step 9** Select a traffic pattern type (Hub, Meshed, or Ring) from the Traffic Type drop-down list:
- Hub—If you select Hub, select the originating site from the First Site drop-down list.
  - Meshed—If you select Meshed, go to [Step 10](#).
  - Ring—If you select Ring, select **Routing Strategy** as either **Unprotected Minimum Hop**, **Unprotected Optimum Path**, or **Unprotected Subnet**, and proceed to [Step 11](#)



**Note**

Refer to the “[1.1.5.2.3 ROADM Traffic Demands](#)” section on page 1-15 for more information on the connectivity choices.

- Step 10** Select a routing strategy from the **Routing Strategy** drop-down list: **Protected**, **Unprotected Minimum Hop**, **Unprotected Optimum Path**, or **Unprotected Subnet**. If you chose Unprotected Subnet, continue with the next step; otherwise proceed to [Step 12](#).
- Step 11** If you chose Unprotected Subnet, choose the starting site and the direction the ring must be traversed from the drop-down lists.

**Step 12** In the Service Types list, check the boxes for one or more client service types for the ROADM demand. The client interfaces that support each service type appear in the table to the right of the Service Types list. For a list of line cards supported for specific service types, see the “1.1.2.5 Service Support” section on page 1-7.

**Step 13** Check the OmniDirection check box to enable the omnidirectional property for the ROADM demand.

**Note**

- The omnidirectional property is applied to the unprotected ROADM demand only when all the sites in the ROADM group have a minimum of one omnidirectional side with two colorless ports on each side.
- The omnidirectional property is applied to the protected ROADM demand only when all the sites in the ROADM group has minimum two omnidirectional sides with two colorless ports on each side.
- When the ROADM demand is finalized, CTP shows the omnidirectional property as Yes irrespective of the source or destination.

**Step 14** Check the Colorless check box to enable the colorless property for the ROADM demand.

**Note**

- The colorless property is applied to the unprotected ROADM demand only when one line side with one colorless port is available in each site.
- The colorless property is applied to the protected ROADM demand only when two line sides with one colorless port are available in each site.
- If there are no colorless ports on the line side but available on the omnidirectional side, CTP displays an error message.
- When the ROADM demand is finalized, CTP shows the colorless property as Yes irrespective of the source or destination.

**Step 15** Check the Contentionless check box to enable the contentionless property for the ROADM demand.

**Step 16** To further define the client interfaces, complete the following options for each client interface listed in the table. Check boxes in gray are not available for selection.

- Yes/No—Check to select this card to implement the service type.
- Client Interface—(Display only) Displays the card type for the selected service type.
- Y Protected—Check to select Y-cable protection if the connectivity type is Protected.

**Note**

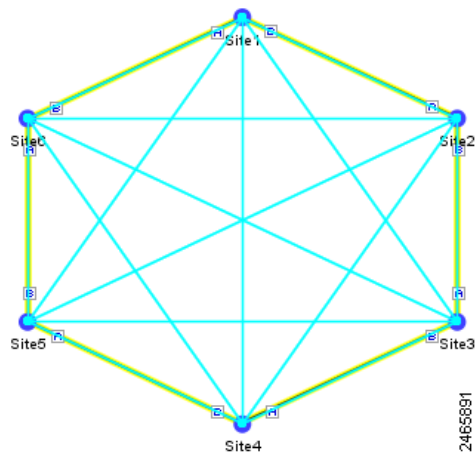
Y-cable protection is not available for encrypted traffic types.

- 1+1 Protected—Check to select 1+1 protection if the connectivity type is Protected.
- Fiber Switched—Check to select fiber-switching protection if the connectivity type is Protected.
- Supported Service—(Display only) Displays the service types supported for the card.

You can select more than one client interface to support the same service type. By default, Cisco Transport Planner checks the best client interface to support each service.

**Step 17** Click **OK** to create the demand. [Figure 2-8](#) shows an example of ROADM Demand.

Figure 2-8 ROADM Demand



**Step 18** Copy ROADM demand properties. The following properties are copied:

- Traffic Type
- Routing Strategy
- Service Types
- OmniDirection
- Colorless
- Contentionless
- DWDM Card Interface table (Yes/No, Client Interface, and Protection Type columns)

These properties can be used as a template while creating a new ROADM demand or editing an existing one. To copy the properties, select the ROADM demand, right-click, and choose the Copy Properties option. When the ROADM demand properties are copied, the Use Template button is enabled in the Create ROADM Demand and Edit ROADM Demand dialog boxes.



**Note**

- The Copy Properties option is not available when you log out of the CTP session.
- ROADM demand properties copied from Release 8.5 and later can be used in an upgraded network up to Release 10.1.
- ROADM demand properties copied in the later releases (for example, Release 10.1) is not available in the earlier releases (for example, Release 9.1).

**Step 19** Analyse the network.

Click the Analyze Network icon in the toolbar.

**Step 20** Finalize the Any-to-Any demand. Perform one of the following:

- To finalize Any-to-Any demand in design-analyzed state, complete [Step 21](#).
- To finalize Any-to-Any demand in upgrade state, complete [Step 22](#).

**Step 21** To finalize Any-to-Any demand in design-analyzed state, complete the following steps:



- a. Click the **Finalize Any-to-Any traffic** icon in the network view toolbar or right-click the ROADM group in the Project Explorer and choose the **Finalize Connectivity** option. The Finalize Any-to-Any Traffic window appears.
- b. Click **Please select a Site or Click here** in the left pane to select the required connectivity (for example, Site1 - Site2). Click **OK**.
- c. Select a card listed under the ROADM demand and click the **Finalize** button. The ROADM Finalize Connectivity wizard appears.
- d. On the General Parameters page, complete the following:
  - Label—Enter the name of the demand.
  - Service Type—Choose the service type from the drop-down list. For a list of services, see the [“1.1.2.5 Service Support” section on page 1-7](#).
  - Present # ch—Enter the number of channels to be created. The Forecast # ch field automatically updates with the number entered in this field.
  - Forecast # ch—Enter the number of channels to be installed at a later date. This value includes the Present # ch value.
- e. In the Platform area of the Platform Parameters page, complete the following:
  - Choose the protection type from the drop-down list: **Y-Cable Protected**, or **Client 1+1**. For more information on protection types, see the [“1.1.2.4 Protection Scheme Support” section on page 1-4](#).
  - Encryption—Choose an option from the Encryption drop-down list.
- f. In the 454DWDM area, complete the following:
  - Transponder—Click to expand, then check the card check box to select the card at the end sites of the service channels. If you have chosen Yes for Encryption in the platform area, select the WSE-Txp Mode card to enable encryption.
- g. In the Client Interface area, define the client interface type (SR, IR, or LR) for the source and destination from the Source and Destination drop-down lists. This option is available for transponder and muxponder interfaces that have pluggable client interfaces, which depend on the selected service type and card type.
- h. Click **Finish**. The Demand Editor dialog box appears listing the present and forecast channels.
- i. To add a new service, click the **Add new service** icon in the toolbar. A new row appears. Complete the parameters for the new channel.
- j. To delete an existing channel, select the row and click the **Delete service** icon in the toolbar.
- k. To add a regeneration site, click the **Regeneration...** icon in the toolbar. The Regeneration editor appears. The regeneration site can be created only at the trail level. For more information, see the [“2.7.11 Creating a Regeneration Site” section on page 2-47](#).
- l. Click **OK** to save the changes to the channels and close the Demand Editor dialog box, or **Cancel** to close the dialog box without saving the changes.
- m. Click **Close** to exit the Finalize Any-to-Any Traffic window.
- n. Analyse the network again. The A2A Finalization Report appears.
- o. Click **OK** to complete the finalization.



**Note** When the network state is changed, demands that were finalized before the change in the network state are deleted.

- Step 22** To finalize Any-to-Any demand in upgrade state, complete the following steps:
- Upgrade the analyses network.
  - In the upgraded network, go to the card listed under the ROADM demand, select the required connectivity (for example, Site1 - Site2), right-click and select the Finalize connectivity option. The ROADM Finalize Connectivity wizard appears.
  - Perform Steps 21d through 21i.
  - Analyse the upgraded network again.  
The demands that were finalized appear in the reports.
- Step 23** To edit any Any-to-Any finalized demand, complete the following steps:
- Click the Mgmt Tree tab and right-click the analyzed network.
  - Choose **A2A Finalized Circuits** from the drop-down list. The A2A Finalized Circuits tab appears.
  - Select any Any-to-Any Finalized demand and click **Edit** on the toolbar or double-click the demand in The A2A Finalized Circuits tab. CTP prompts to unlock the network. Choose **Yes** to open the demand editor. The network is set to Any-to-Any Finalization mode on unlocking the demand. Modify as required and click **OK** to close the demand editor.

**Note**

- CTP does not allow the card type to be edited in Any-to-Any Finalized demand.
- When multiple demands are selected in the A2A Finalized Circuits tab, the Edit option is disabled.

**Step 24** Finalize the demand again for the changes to be reflected in the A2A Finalized Circuits report.

- Step 25** To delete any Any-to-Any finalized demand, complete the following steps:
- Click the Mgmt Tree tab and right-click the analyzed network.
  - Choose **A2A Finalized Circuits** from the drop-down list. The A2A Finalized Circuits tab appears.
  - Select any Any-to-Any Finalized demand and click **Delete** on toolbar in The A2A Finalized Circuits tab. CTP prompts to confirm deletion. Choose **Yes** to delete the selected demand.

**Note**

When multiple demands are selected in the A2A Finalized Circuits tab, the Delete option is disabled.

## 2.7.9 Creating Ethernet Aggregated Demands

An Ethernet aggregated demand is a collection of low-rate Gigabit Ethernet/10Gigabit Ethernet services that can be aggregated on a single 10-Gbps wavelength division multiplexing (WDM) trunk. This demand is supported only by the GE\_XP, 10GE\_XP, GE\_EXP, and 10GE\_EXP cards when configured as an L2-Switch.

The Ethernet Aggregation Creation wizard allows you to:

- Create one WDM transport channel at a time over a predefined traffic subnet.

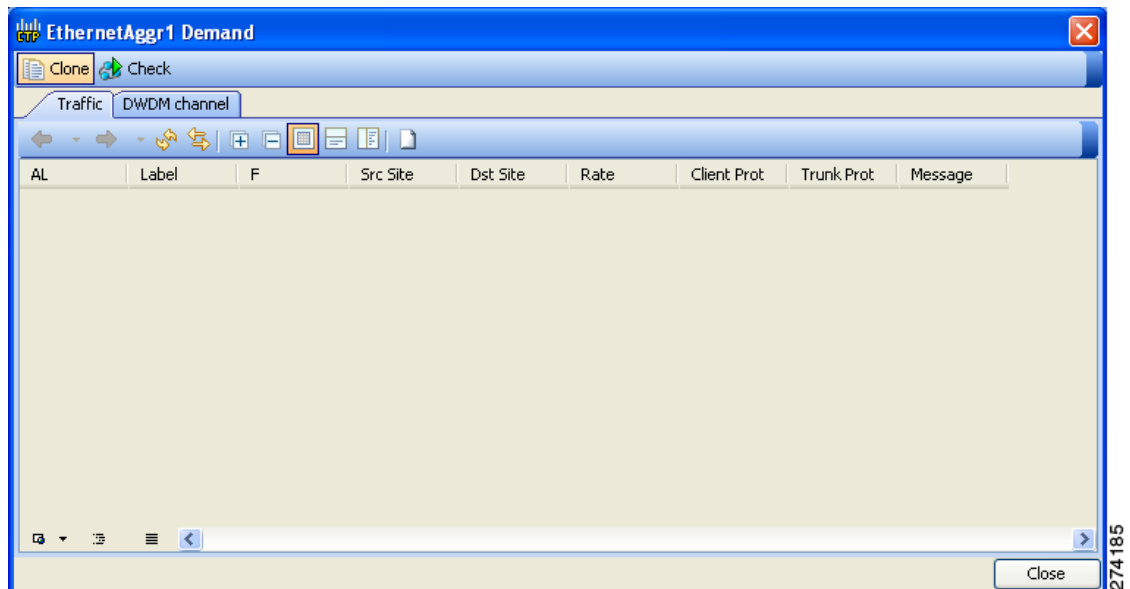
- Specify the wavelength to be used for the channel, and define a list of locations with add/drop VLAN circuit capability.
- Create a set of desired VLAN circuits on this WDM transport channel.
- The check functionality generates a report showing for each section of the subnet where the WDM transport channel is over allocated and then perform corrective action when required.
- The clone functionality creates an identical copy of the current WDM transport channel with the same add/drop sites and WDM channel configuration parameters. You can then start filling this channel with the desired circuits.

Use the following procedure to create Ethernet aggregated demands:

- 
- Step 1** In the NtView *name* tab, click the **Create new Aggregated Ethernet demand** icon in the toolbar. For more information about Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#) The EthernetAggr Creation wizard appears.
- Step 2** Choose the desired traffic subnet from the Traffic Subnet drop-down list. You can create a new traffic subnet if desired (see [2.6 Creating Traffic Subnet, page 2-19](#)).
- Step 3** Click **Next**. The General Parameters page appears.
- Step 4** In the General Parameters pane, enter values in the following fields:
- **Label**—Enter the name of the demand. The default value is EthernetAggr1.
  - **Present/Forecast**—Check this box if this demand will be needed in the future; uncheck this box if this demand is needed now. This parameter drives the list of pluggable port modules to be equipped on the card and will affect BoM reports.
  - **Colorless**— Choose an option from the colorless drop-down list. For more information on colorless property see [“2.7.3 Understanding Colorless Functionality”](#) section on page 2-21.
    - **Auto**—(Default) Disables colorless functionality on the demand.
    - **Yes**—Enables colorless functionality on the demand.
    - **No**—Disables colorless functionality on the demand.
  - **Omni-directional**—Choose an option from the Omni-directional drop-down list. For more information on omnidirectional property see [“2.7.2 Understanding Omnidirectional Functionality”](#) section on page 2-20.
    - **Auto**—(Default) Dynamically enables omnidirectional functionality on a colorless demand, when the colorless demand needs to be dropped on an omnidirectional side with colorless ports, due to lack of any other colorless port on the side.
    - **Yes**—Enables omnidirectional functionality on the demand.
    - **No**—Disables omnidirectional functionality on the demand.
- Step 5** Click **Next**.
- Step 6** In the Sites selection pane, complete the following tasks:
- In the Protection Sites area, press **Ctrl** and click the sites that you want to add to the Ethernet aggregated demand. An Ethernet aggregated demand requires at least two sites. Click the right arrow button. To remove a site added to the list, click the site and click the left arrow button.
  - In the Optical Bypass area, press **Ctrl** and click the sites that you want to add to the Ethernet aggregated demand. Click the right arrow button. To remove a site added to the list, click the site and click the left arrow button. If the Present/Forecast check box is checked, you cannot select Optical Bypass sites. A channel in optical bypass is dropped on one side of the node and added on the other side of the same node to allow the future use of that node as an add/drop location.

- Step 7** In the Node Configuration selection pane, enter values for the following options:
- DWDM Trunk—Select the DWDM trunk type. You can specify the kind of WDM trunk interface for the card in each add/drop site. Allowed values are:
    - Auto
    - w/EFEC
    - w/FEC
    - w/o FEC
  - Wavelength—Select the WDM transport channel wavelength. This option allows you to force the current WDM transport channel wavelength. Wavelengths are listed based on the selected band. Allowed values are:
    - Auto—Allows CTP to assign a wavelength to the channel with the lowest possible cost, given the other set of constraints.
    - C band-32 ch.odd
    - L band- 32 ch.odd
    - C band- 40 ch
    - C band- 64 ch
    - C band-72 ch
    - C band- 80 ch
  - New CFG—Choose the desired card type for each of the protected sites.
- Step 8** Click **Finish**. The *name* Demand window appears (Figure 2-9).

**Figure 2-9** EthernetAggr1 Demand Window, TrafficTab



- Step 9** Click Close.

- Step 10** To add a circuit, right-click the Ethernet Demand in the Project Explorer pane and choose **New point to point request**. The New Request window appears (Figure 2-10).

**Figure 2-10** New Request Window

- Step 11** The New Request window contains four areas of information: Quantity, General, Src, and Dest.

#### Quantity Area

Quantity—Enter the number of circuits to be created.

#### General Area

- Label—Enter the label for the circuit. By default, VLAN\_Circuit\_x is used.
- Trunk Protection—Enter the trunk protection type. Allowed values are:
  - Unprotected
  - Protected
- P/F—Select Forecast if this demand will be needed in the future. Select Present if this demand is needed now. This parameter drives the list of pluggable port modules to be equipped on the card and affects BoM reports.
- Path Forcing—This option allows you to force the circuit routing on the traffic subnet associated with this demand. Allowed values are:
  - Auto—(Default) Causes the tool to automatically define the trunk path.

- Side  $x$ —Represents the label of the side on the Src site where the circuit is routed.
- Client Protection—Allowed values are:
  - Unprotected
  - Client 1+1
- Circuit rate—Displays the allowed circuit rates.

#### Src Area

- Site—Select the source site. Allowed values include the list of sites added in the WDM traffic channel.
- SFP lambda—Select the desired SFP/XFP for this port or set it to Auto to allow the tool to select an appropriate value.
- Card—Select the Card. Allowed values are Auto, 10GE-XP, 10GE-EXP, GE-XP, and GE-EXP. Auto allows the tool to select an appropriate card type based on other constraints.

The Src area contains Working and Protected subareas.

#### Working sub-area

- Port CIR—Select the Committed Information Rate (CIR), with 1 being the highest and 0.1 being the lowest.
- Port Rate-Reach—Select the desired PPM for this port, or set it to Auto to allow the tool to select an appropriate value.
- Port Num—Select the port number. Allowed values are Auto, 1, and 2. Auto allows the tool to select an appropriate port number based on other constraints.

#### Protected sub-area

These fields are enabled only if client protection is enabled in the Client Protection field.

- Port CIR—Select the CIR, with 1 being the highest and 0.1 being the lowest.
- Port Rate-Reach—Select the desired PPM for this port, or set it to Auto to allow the tool to select an appropriate value.
- Port Num—Select the port number. Allowed values are Auto, 1, and 2. Auto allows the tool to select an appropriate port number based on other constraints.

#### Dest Area

- Site—Select the destination site. Allowed values include the list of sites added in the WDM traffic channel.
- SFP lambda—Select the desired SFP/XFP for this port or set it to Auto to allow the tool to select an appropriate value.
- Card—Select the card. Allowed values are Auto, 10GE-XP, 10GE-EXP, GE-XP, and GE-EXP. Auto allows the tool to select an appropriate card type based on other constraints.

The Dest area contains Working and Protected subareas.

#### Working sub-area

- Port CIR—Select the CIR, with 1 being the highest and 0.1 being the lowest.
- Port Rate-Reach—Select the desired PPM for this port, or set it to Auto to allow the tool to select an appropriate value.

- Port Num—Select the port number. Allowed values are Auto, and 1 to 20. Auto allows the tool to select an appropriate port number based on other constraints.

### Protected sub-area

These fields are enabled only if the client protection is enabled in the Client Protection field.

- Port CIR—Select the CIR, with 1 being the max and 0.1 being the lowest.
- Port Rate-Reach—Select the desired PPM for this port, or set it to Auto to allow the tool to select an appropriate value.
- Port Num—Select the port number. Allowed values Auto, 1, to 20. Auto allows the tool to select an appropriate port number based on other constraints.

**Step 12** Click **OK**.

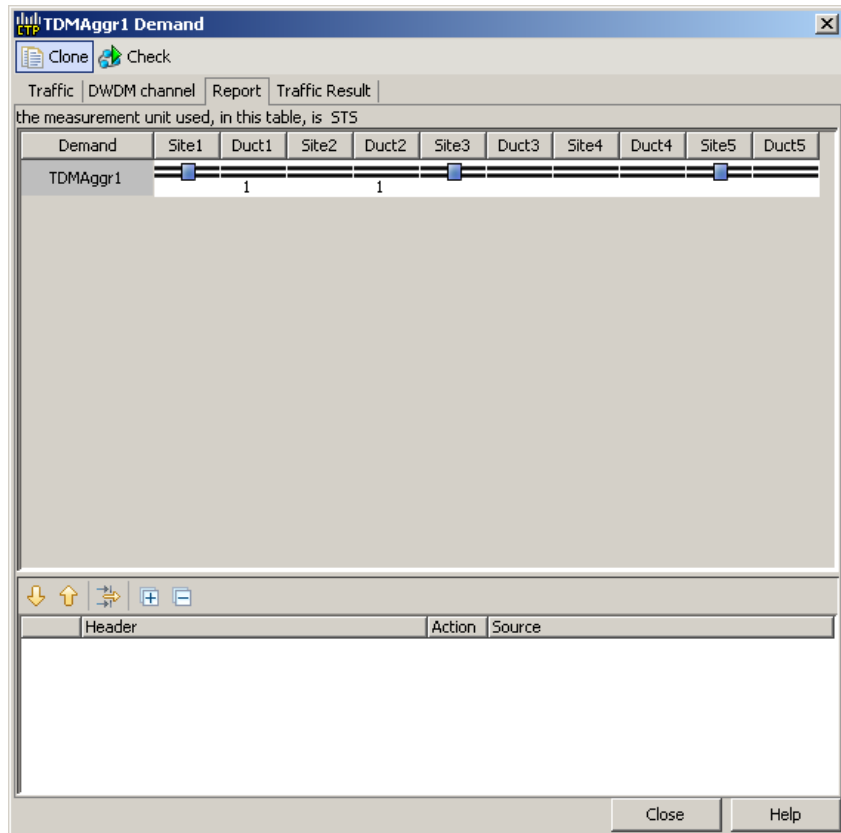
**Step 13** The **Traffic** tab displays the following details about the circuit:

- AL—Displays the alarm (if any) for the circuit.
- Label—Displays the name of the circuit.
- F—If checked, it is a forecast circuit. If unchecked, it is a present circuit.
- Src Site—Displays the source site.
- Dst Site—Displays the destination site.
- Rate—Displays the circuit rate/bandwidth.
- Client Prot—Displays the client protection scheme.
- Trunk Prot—Displays the trunk protection scheme.
- Message—Displays a message related to the circuit.

**Step 14** If you want to clone this demand, click the **Clone** button in the left corner of the screen. A new demand, which is a copy of this demand, is created and appears in the Project Explorer pane.

**Step 15** Click the **Check** tab in the left corner of the window to generate a report showing the circuit path in the WDM traffic channel and to check any over-allocation of bandwidth (Figure 2-11). The **Report** tab displays, in a row, each of the sites on the subnet, and each span in between.

**Figure 2-11** Circuit Path View in a Ethernet Aggregated Demand



**Step 16** The **Traffic Result** tab displays the following:

- Label—Displays the name of the circuit.
- F—If checked, it is a forecast circuit. If unchecked, it is a present circuit.
- Src Site—Displays the source site.
- Dst Site—Displays the destination site.
- Trunk Protection—Displays the trunk protection scheme.
- Path Forcing—Displays the output Node interface. If no client or trunk protection is used, displays NA.
- Client Protection—Displays the client protection scheme.
- Circuit Rate—Displays the circuit rate/bandwidth.
- Src Wrk Port Num—Displays the source working port number.
- Src Prt Port Num—Displays the source protect port number.
- Dst Wrk Port Num—Displays the destination working port number.
- Dst Prt Port Num—Displays the destination protect port number.
- Src Wrk Port CIR—Displays the source working port CIR. The highest is 1 and 0 the lowest.
- Src Prt Port CIR—Displays the source protect port CIR. The highest is 1 and 0 the lowest.
- Dst Wrk Port CIR—Displays the destination working port CIR. The highest is 1 and 0 the lowest.



- Dst Prt Port CIR—Displays the destination protect port CIR. The highest is 1 and 0 the lowest.
  - Src Wrk Port Rate-Reach—Displays the PPM for the source working port. For example, Rack 1.Shelf 1. Slot 5.
  - Src Prt Port Rate-Reach—Displays the PPM for the source protect port. For example, Rack 1.Shelf 1. Slot 4.
  - Dst Wrk Port Rate-Reach—Displays the PPM for the destination working port.
  - Dst Prt Port Rate-Reach—Displays the PPM for the destination protect port.
  - Src Card—Displays the source card.
  - Dst Card—Displays the destination card.
  - Working Src Card Rack-Shelf-Slot—Displays the rack, shelf, and slot position of the working source card.
  - Working Dst Card Rack-Shelf-Slot—Displays the rack, shelf, and slot position of the working destination card.
  - Protecting Src Card Rack-Shelf-Slot—Displays the rack, shelf, and slot position of the protect source card.
  - Protecting Dst Card Rack-Shelf-Slot—Displays the rack, shelf, and slot position of the protect source card.
  - Alarm—Displays the alarm status.
- Step 17** To add a regeneration site, click the **Regeneration...** icon in the toolbar of the DWDM channel tab. The Regeneration Editor appears. The regeneration site can be created only at the trail level. For more information, see the [“2.7.11 Creating a Regeneration Site”](#) section on page 2-47.
- Step 18** Click **Close**. To edit circuits, see the [“4.10 Editing an Ethernet Aggregated Demand”](#) section on page 4-65.
- 

## 2.7.10 Creating TDM Aggregated Demands

A TDM aggregated demand is a collection of low-rate SONET and Gigabit Ethernet services that is aggregated on a single 10-G WDM trunk. The TDM aggregated demand is a specific service demand that is carried only by the ADM-10G card.

The TDM Aggr Creation wizard allows you to:

- Create one WDM transport channel at a time over a predefined traffic subnet
- Specify the wavelength to be used for the channel, and define a list of locations with add/drop STS circuit capability.
- Create a set of STS circuits on this WDM transport channel to pass traffic.
- The check functionality generates a report showing, for each section of the subnet, where the WDM transport channel is over allocated and then perform, when required, the corrective action.

The total amount of bandwidth used by all the defined circuits in each section of the WDM transport channel cannot exceed the maximum channel capacity of STS-192c. Sections exceeding the maximum capacity are colored red in the report. Demands that fail the check are flagged as invalid demands and the Analyzer stops.

The clone functionality allows you to create an empty copy of the current WDM transport channel, with the same add/drop sites and WDM channel configuration parameters. You can then start filling this channel with the desired circuits.

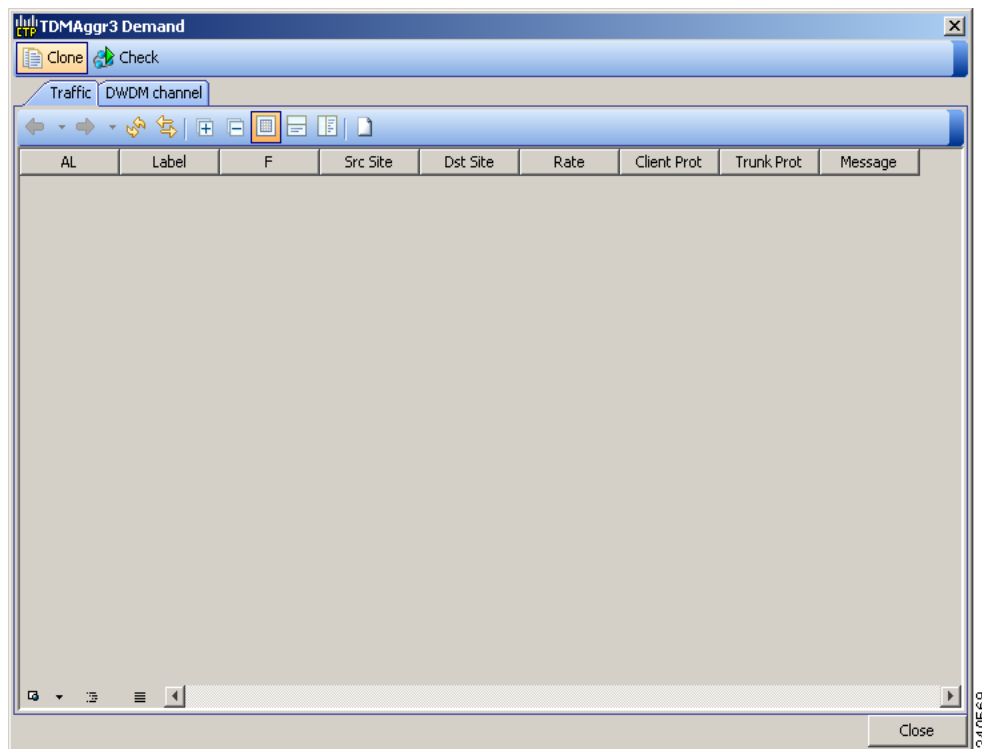
Use the following procedure to create TDM aggregated demands:

- 
- Step 1** In the NtView *name* tab, click the Create new TDM Aggregated demand icon in the toolbar. For more information about CTP icons, see [Appendix A, “GUI Information and Shortcuts.”](#) The TDMAggr wizard appears.
- Step 2** Select the desired traffic subnet from the Traffic Subnet drop-down list. You can create a new traffic subnet if desired using (see [2.6 Creating Traffic Subnet, page 2-19](#)).
- Step 3** Click **Next**. The General Parameters page appears.
- Step 4** In the General Parameters pane, complete the following tasks:
- **Label**—Enter the name of the demand. The default value is TDMAggr1.
  - **Present/Forecast**—Check this box if this demand will be needed in the future; uncheck this box if this demand is needed now. This parameter drives the list of pluggable port modules to be equipped on the card and will affect BoM reports.
  - **Colorless**— Choose an option from the colorless drop-down list. For more information on colorless property see [“2.7.3 Understanding Colorless Functionality” section on page 2-21](#).
    - **Auto**—(Default) Disables colorless functionality on the demand.
    - **Yes**—Enables colorless functionality on the demand.
    - **No**—Disables colorless functionality on the demand.
  - **Omni-directional**— Choose an option from the Omni-directional drop-down list. For more information on omnidirectional property see [“2.7.2 Understanding Omnidirectional Functionality” section on page 2-20](#).
    - **Auto**—(Default) Dynamically enables omnidirectional functionality on a colorless demand, when the colorless demand needs to be dropped on an omnidirectional side with colorless ports, due to lack of any other colorless port on the side.
    - **Yes**—Enables omnidirectional functionality on the demand.
    - **No**—Disables omnidirectional functionality on the demand.
- Step 5** Click **Next**.
- Step 6** In Sites selection pane, complete the following tasks:
- In the Protection Sites area, press **Ctrl** and click the sites that you want to add to the TDM aggregated demand. A TDM aggregated demand requires at least two sites. Click the right arrow button. To remove a site added to the list, click the site and click the left arrow button.
  - In the Optical Bypass area, press **Ctrl** and click the sites that you want to add to TDM aggregated demand. Click the right arrow button. To remove a site added to the list, click the site and click the left arrow button. If the Present/Forecast check box is checked, you cannot select Optical Bypass sites. A channel in optical bypass is dropped on one side of the node and added on the other side of the same node to allow the future use of that node as an add/drop location.
- Step 7** In the Node Configuration selection pane, complete the following tasks:
- **DWDM Trunk**—Select the DWDM trunk type to specify the kind of WDM trunk interface for the card in each allowed add/drop site. Allowed values are:
    - Auto

- w/EFEC
- w/FEC
- w/o FEC
- Wavelength—Allows you to force the current WDM transport channel wavelength. Allowed values are:
  - Auto—Allows CTP to assign a wavelength to the channel with the lowest possible cost, given the other set of constraints.
  - C band-32 ch.odd
  - L band- 32 ch.odd
  - C band- 40 ch
  - C band- 64 ch
  - C band- 72 ch
  - C band- 80 ch

**Step 8** Click **Finish**. The *name* Demand window appears (Figure 2-12).

**Figure 2-12** TDMAggr Demand Window



**Step 9** Click Close.

**Step 10** To add a circuit, right-click the Ethernet Demand in the Project Explorer pane and choose **New point to point request**. The New Request window appears (Figure 2-13).

Figure 2-13 New Request Window

**Step 11** The New Request window contains four areas of information: Quantity, General, Src, and Dest.

#### Quantity Area

Quantity—Enter the number of circuits to be created.

#### General Area

- Label—Enter the label for the circuit. By default, VLAN\_Circuit\_x is used.
- Trunk Protection—Enter the trunk protection type. Allowed values are:
  - Unprotected
  - UPSR
- P/F—Select Forecast if this demand will be needed in the future. Select Present if this demand is needed now. This parameter drives the list of pluggable port modules to be equipped on the card and affects BoM reports.
- Path Forcing—This option allows you to force the circuit routing on the traffic subnet associated with this demand. Allowed values are:
  - Auto—(Default) Causes the tool to automatically define the trunk path.
  - Side *x*—Represents the label of the side on the Src site where the circuit is routed.
- Client Protection—Allowed values are:

- Unprotected
- 1+1 APS
- Circuit rate—Displays the allowed circuit rates.

#### Src Area

- Site—Select the source site. Allowed values include the list of sites added in the WDM traffic channel.
- SFP lambda—Select the desired SFP/XFP for this port or set it to Auto to allow the tool to select an appropriate value.
- Card—Select the Card. Allowed values are Auto and ADM-*x*. Auto allows the tool to select an appropriate card type based on other constraints.

The Src area contains Working and Protected sub-areas.

#### Working sub area

- Port Num—Select the port number. The allowed values are Auto, and from 1 to 17. Selecting Auto allows the tool to select an appropriate port number based on other constraints.

In addition to ports 1 to 16, port 17 also acts like a client port in TDM aggregated demands.

Following are the guidelines to use port 17:

- Port 17 must be selected only when the ADM-10G card is used in a single-card configuration.
- Port 17 supports the circuit rates VC4-64C/STS-192C. It also supports the circuit rates from STS1/VC4 to STS-48c/VC4-16c or a combination of them.
- For circuit rates VC4-64C/STS-192C with the port number as Auto, port 17 automatically becomes the source and the destination port. Port 17 will not be selected for any other circuit rate unless the user specifically forces the port.
- Port 17 supports UPSR Client Protection on ANSI platform and SNCP client protection on ETSI platform, except for the circuit rates VC4-64C/STS-192C.
- Port Rate-Reach—Select the desired PPM for this port or set it to Auto to allow the tool to select an appropriate value.

#### Protected sub area

The following fields are available only if client protection is enabled:

- Port Num—Select the port number. The allowed values are Auto, and from 1 to 17. Selecting Auto allows the tool to select an appropriate port number based on other constraints.  
You can force port 17 as protected source or destination port for Client UPSR/SNCP protection with circuit rates less than VC4-64/STS-192c.
- Port Rate-Reach—Select the desired PPM for this port or set it to Auto to allow the tool to select an appropriate value.

#### Dest Area

- Site—Select the destination site. Allowed values include the list of sites added in the WDM traffic channel.
- SFP lambda—Select the desired SFP/XFP for this port or set it to Auto to allow the tool to select an appropriate value.
- Card—Select the card. Allowed values are Auto and ADM-*x*. Auto allows the tool to select an appropriate card type based on other constraints.

The Dest area contains Working and Protected sub areas.

#### Working sub area

- Port Num—Select the port number. The allowed values are Auto, and from 1 to 17. Selecting Auto allows the tool to select an appropriate port number based on other constraints.

In addition to ports 1 to 16, port 17 also acts like a client port in TDM aggregated demands. The guidelines to use the port are the same as given in the [Working sub area](#) for source ports.

- Port Rate-Reach—Select the desired PPM for this port, or set it to Auto to allow the tool to select an appropriate value.

#### Protected sub-area

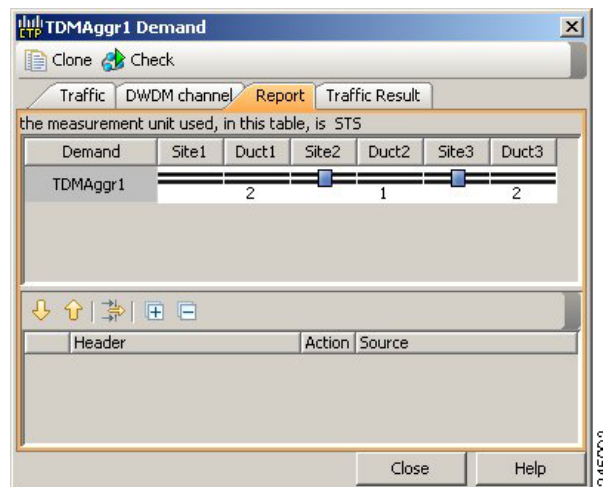
- Port Num—Select the port number. Allowed values are Auto and 1 to 16. Auto allows the tool to select an appropriate port number based on other constraints.
- Port Rate-Reach—Select the desired PPM for this port, or set it to Auto to allow the tool to select an appropriate value.

**Step 12** Click **OK**.

**Step 13** If you want to clone this demand, click the **Clone** button in the left corner of the screen. A new demand, which is a copy of this demand, is created and appears in the Project Explorer pane.

**Step 14** Click the **Check** tab on the left corner of the window to generate a report showing the circuit path in the WDM traffic channel and to check any over-allocation of bandwidth ([Figure 2-14](#)). The report shows, in a row, each of the sites on the subnet, and each span in between.

**Figure 2-14** Circuit Path View in a TDM Aggregated Demand



**Step 15** To add a regeneration site, click the **Regeneration...** icon in the toolbar of the DWDM channel tab. The Regeneration Editor appears. The regeneration site can be created only at the trail level. For more information, see the [“2.7.11 Creating a Regeneration Site”](#) section on page 2-47.

**Step 16** Click **Close**. To edit circuits, see the [“4.11 Editing a TDM Aggregated Demand”](#) section on page 4-69.

## 2.7.11 Creating a Regeneration Site

A regeneration site is required when the optical communications link has to span long distances. The optical signal has to be regenerated when the optical signal-to-noise ratio (OSNR) goes beyond a critical limit. After a network is analyzed, the Optical Results highlights if any site requires regeneration. For more information about optical results, see the “3.2.10 Viewing Optical Results” section on page 3-23.

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



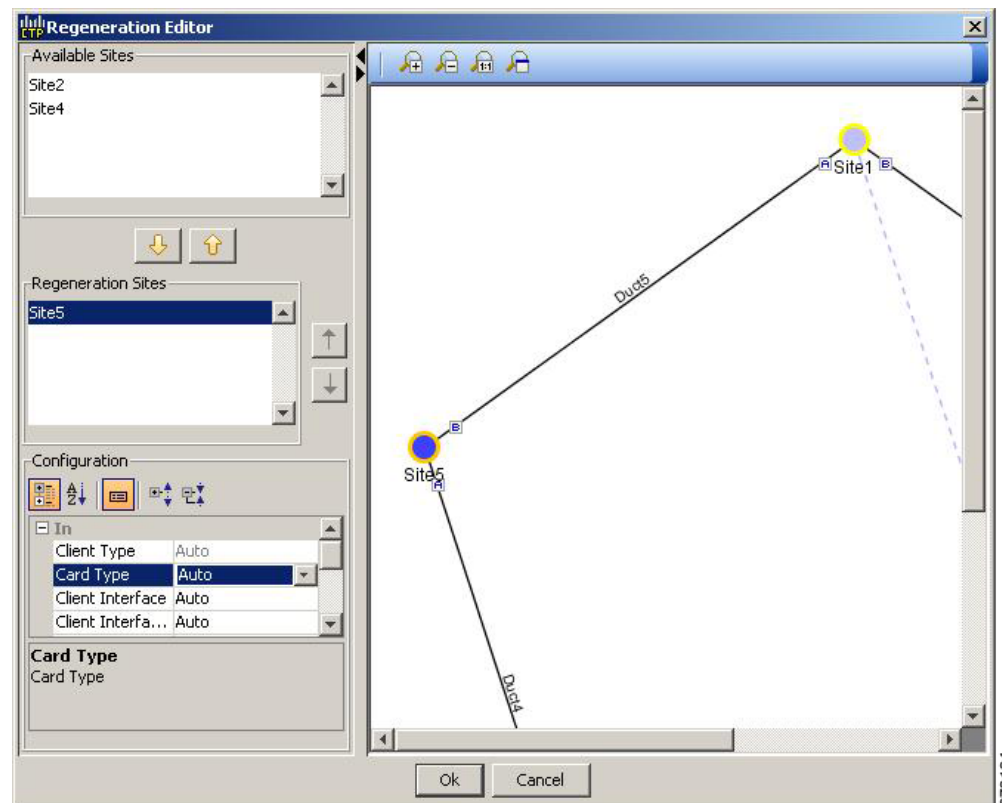
**Note** A regeneration site cannot be a site with the functionality as OLA, OSC, pass-through, or hub.



**Note** The **Regeneration...** icon is active only when you select a trail in the Demand Editor.

- Step 1** In the Demand Editor, click the **Regeneration...** icon in the toolbar. The Regeneration Editor appears, [Figure 2-15](#). For more information about Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts”](#).

**Figure 2-15** Regeneration Editor



- Step 2** In the Available Sites area, choose the site and click the down arrow icon. To remove a site added to the Regeneration Sites list, choose the site and click the up arrow icon.

**Note**

When adding more than one regeneration site to the path, ensure the regeneration sites are added in the correct sequence to avoid unfeasible routing. For example, if you create a point-to-point demand from site1 (source) to site 3 (destination), the sites available in the path are site 4 and site 5. Site 5 must be selected first, followed by site 4, because site 5 is closer to site 1.

**Step 3** To sort the regeneration sites in the list, use the up and down arrow icons located on the left.

**Step 4** If you chose a source or destination card for a regeneration site, choose the card type for the site from the drop-down list. The regeneration cards that are compatible with the source and destination cards are displayed in the interface.

**Note**

The OTU2\_XP card has four modes. For more information on these modes, refer to the [“2.7.11.1 Configurations for OTU2\\_XP” section on page 2-49](#).

**Note**

The encryption card (WSE-Txp Mode) is available in the card drop-down list only if you have selected OTU2e as the service type during demand creation.

**Step 5** Colorless— Choose an option from the drop-down list. Colorless traffic demands are terminated at colorless add/drop ports, so that, these demands can be tuned in all possible wavelengths without changing the optical interface of the port.



**Note** These values apply only to the selected trail.

- Auto—(Default) Disables colorless functionality on the demand.
- Yes—Enables colorless functionality on the demand.
- No—Disables colorless functionality on the demand.

**Step 6** Omnidir Src Side, Omnidir Dest Side— Choose an option to enable omnidirectional functionality on a source or destination side. An omnidirectional side allows routing of the added and dropped traffic in all the possible directions associated to Line sides.

- Auto—(Default) Disables omnidirectional functionality on the sides.
- Yes—Enables omnidirectional functionality on the sides.
- No—Disables omnidirectional functionality on the sides.

**Step 7** Click **OK**.

**Note**

To allow different wavelengths to be used for regeneration, choose the Allow different wavelengths option in the Properties pane in Net > Options > Traffic Mapping > System Release 10.5.



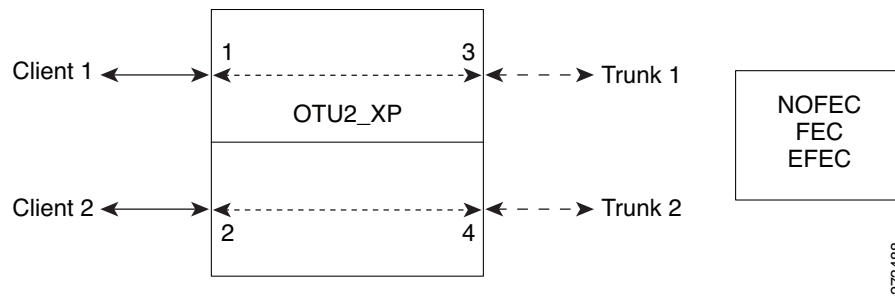
### 2.7.11.1 Configurations for OTU2\_XP

The OTU2\_XP card operates in six different configurations as shown in the following table:

Configuration	Card listed as	Port 1	Port 2	Port 3	Port 4
<b>Dual Transponder</b> (2 x 10G transponder)	OTU2-XP-Txp mode	Client port 1	Client port 2	Trunk port 1	Trunk port 2
<b>Dual Regenerator</b> (2 x 10G standard regenerator with enhanced FEC [E-FEC] only on one port)	OTU2-XP-Regen mode	Trunk port 1	Trunk port 2	Trunk port 1	Trunk port 2
<b>Single Regenerator</b> (1 x 10G E-FEC regenerator with E-FEC on two ports))	OTU2-XP-Single Regen mode	Not used	Not used	Trunk port	Trunk port
10 GE LAN Phy to WAN Phy	OTU2-XP-Txp mode Mixed mode Splitter mode	Client port	Client port in transponder or trunk port in regenerator configuration	Trunk port <b>Note</b> In a Multi trunk card, the LAN port is always on Port 1, and not on port 2.	Trunk port in transponder or regenerator configuration.
<b>Protected Transponder</b> (1 x 10G splitter protected transponder)	OTU2-XP-Splitter mode	Client port	Not used	Trunk port (working)	Trunk port (protect)
<b>Mixed Mode</b> (1 x 10G transponder and 1 x 10G standard regenerator)	OTU2-XP-Mixed mode	Client port	Trunk port 4 without FEC or with FEC	Trunk port 1 without FEC or with FEC or E-FEC	Trunk port 2 without FEC or with FEC or E-FEC

#### 2.7.11.1.1 Dual Transponder (OTU2-XP-Txp)

You can configure the OTU2\_XP card as a dual transponder (Figure 2-16). When configured as a dual transponder (OTU2-XP-Txp), the card supports two completely independent bidirectional 10-Gbps services. Port 1 and Port 2 support traffic from or to port 3 and port 4, respectively. Both paths are completely independent and can support different services. G.709 wrapping or unwrapping and FEC correction capability can be independently activated on each path.

**Figure 2-16 Dual Transponder Configuration**

You can assign one of the following service types as the client:

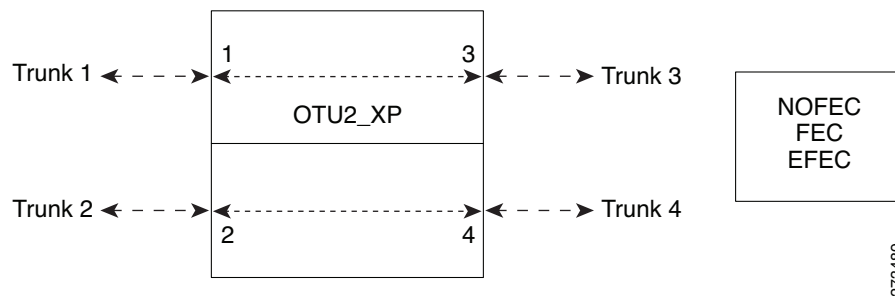
- OC-192/STM64
- 10GE WAN-PHY
- 10GE LAN-PHY
- 10G-FC
- LAN-WAN Conversion

You can set one of the following trunk modes on both trunks for any of the service types:

- No FEC
- FEC
- E-FEC

### 2.7.11.1.2 Dual Regenerator (OTU2-XP-Regen)

You can configure the OTU2\_XP card as a dual regenerator (Figure 2-17). When configured as a dual regenerator (OTU2-XP-Regen), the unit regenerates two completely independent bidirectional 10-Gbps signal paths (similar to the OTU2-XP-Txp configuration). In this configuration, all four ports support DWDM XFPs. You can also independently set G.709 framing and FEC capability for all four ports. You can enable E-FEC encoding only on ports 3 and 4.

**Figure 2-17 Dual Regenerator Configuration**

You can use the following combinations of trunk modes according to the framing of the service to be regenerated:

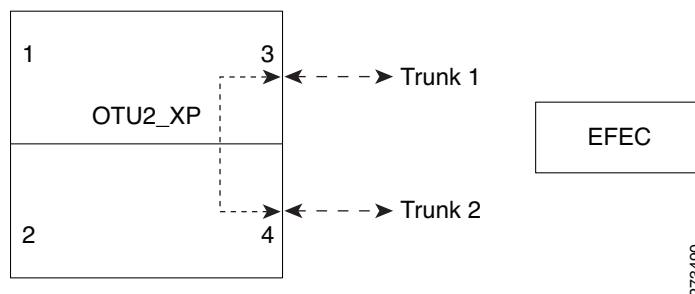
- OC-192/STM-64 service type:

- Trunk ports 1 and 2: No FEC
- Trunk ports 3 and 4: No FEC
- OTU-2 service type:
  - Trunk ports 1 and 2: FEC
  - Trunk ports 3 and 4: FEC
  - or
  - Trunk ports 1 and 2: E-FEC
  - Trunk ports 3 and 4: FEC

### 2.7.11.1.3 Single Regenerator (OTU2-XP- Single Regen)

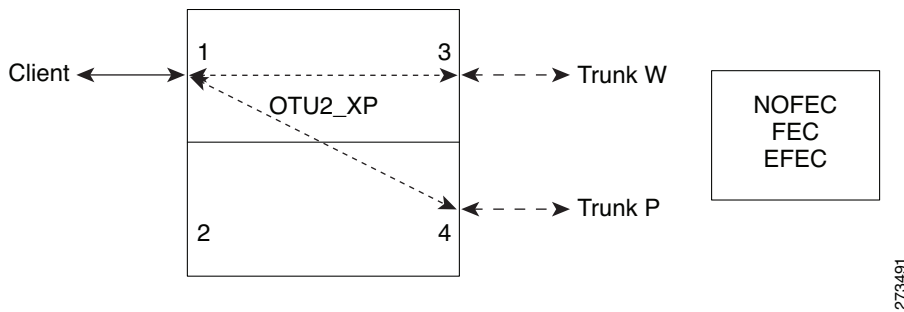
You can configure the OTU2\_XP card as a single regenerator (Figure 2-18). When configured as a single regenerator (OTU2-XP- Single Regen), the card regenerates only one bidirectional 10-Gbps signal path. The ports 3 and 4 support DWDM XFPs and G.709 framing as well as E-FEC.

**Figure 2-18** Single-Regenerator Configuration



### 2.7.11.1.4 Protected Transponder (OTU2-XP- Splitter)

You can configure the OTU2\_XP card as a protected transponder (Figure 2-19). When configured as a protected transponder (OTU2-XP- Splitter), the card implements the fiber-switched protection. In this configuration, the client service on port 1 is transmitted to ports 3 and 4 and then on to both trunks. Only one signal received from the two trunks on ports 3 and 4 is transmitted to port 1 (the signal from the other port is only monitored). After detecting a failure on one trunk, the unit automatically switches on the other port, which restores the signal on port 1. In protected-transponder configurations, port 2 is always disabled.

**Figure 2-19 Protected-Transponder Configuration**

You can set one of the following service type for the client port:

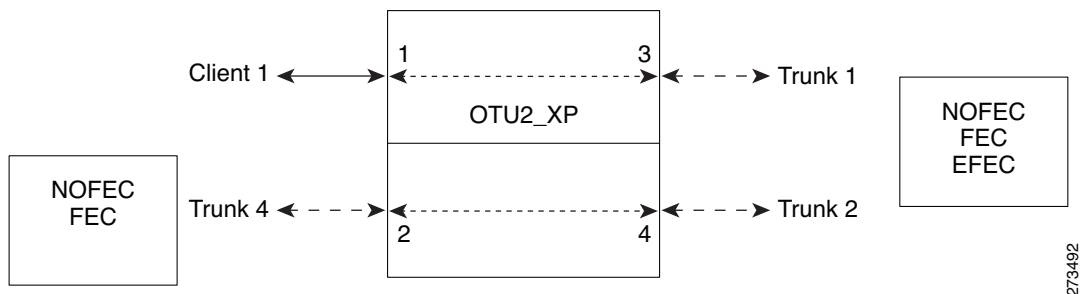
- OC-192/STM64
- 10GE WAN-PHY
- 10GE LAN-PHY
- 10G-FC
- LAN-WAN Conversion

You can set one of the following trunk modes on both trunks for any of the service types:

- No FEC
- FEC
- E-FEC

### 2.7.11.1.5 Mixed Mode (OTU2-XP- Mixed)

You can configure the OTU2\_XP card in mixed mode (Figure 2-20). When configured in mixed mode (OTU2-XP- Mixed), the card is a regenerator on one set of the ports and a transponder on the other set. The two sets are completely independent and can be configured to transmit or regenerate different services. You can independently set G.709 framing and FEC capability on each trunk port, but ports 1 and 2 cannot have E-FEC encoding.

**Figure 2-20 Mixed-Mode Configuration**

You can swap the configuration of the two sets, that is, ports 1 to 3 set as the regenerator and ports 2 and 4 as the transponder.

You can set one of the following service types for the client port:

- OC-192/STM64
- 10GE WAN-PHY
- 10GE LAN-PHY
- 10G-FC
- OTU2
- LAN-WAN Conversion

You can set one of the following trunk modes on all the trunks for all service types:

- No FEC (all)
- FEC (all)
- E-FEC (only to ports 3 and 4)

CTP does not automatically select mixed mode for OTU2\_XP cards. You need to select mixed mode for an OTU2\_XP card to force it.



**Note**

The FI and FC demands are not supported on port 2 as a source when the LAN-WAN traffic is fed as a source on port 1.

For further information on the OTU2\_XP card, refer to the *Cisco ONS 15454 DWDM Configuration Guide, Release 9.6.x*.

## 2.8 Viewing Circuits in a Network

You can view all the circuits that have been created in any of the Service Demands folders in the **Traffic** tab of the **Net1** tab.

The following columns are displayed:

- SA—Indicates the system alarms that affect the circuit. This indication is available only after the network is analysed.
- AL— Indicates the optical alarms that affect the circuit. This indication is available only after the network is analysed.
- F—Indicates if the demand will be needed in the future.
- Demand —Displays the name of the demand.
- Group—Displays the demand group to which the circuit belongs.
- Label —Displays the label of the circuit.
- TMSubnet—Displays the name of the traffic subnet in which the circuit is defined.
- SrvType— Displays the service type value.
- Sites—Lists the add/drop site.
- Card/TrunkType—Displays the card type and trunk type.
- Protection type— Displays the protection type of the demand.
- Wavelength —Displays the assigned wavelength.
- Encryption—Displays whether the traffic is encrypted or not.

You can edit the circuits for any demand by double-clicking the circuit or by choosing the circuit and clicking the **Edit** button in the toolbar.

Use any one of the following options to group and order the circuits:

- Type\Demand\Group— The circuits are first grouped and ordered by demand name. Each set of circuits with the same demand name is then ordered by the group name.
- SrvType\Type\group—The circuits are first grouped and ordered by service type. Each set of circuits with the same service type is then ordered by the group name.

**Note**

You can also select a set of fields in a particular order in the Group by dialog box to build a grouping rule to be applied to the table.

## 2.9 Analyzing the Network

After you have created the desired sites, fiber spans, and service demands, you must analyze the network to determine network performance. The network must be in the Design, Install, or Upgrade state before you can analyze it. Cisco Transport Planner automatically optimizes the design and summarizes the optical transmission performance. If there are problems with the design, Cisco Transport Planner lists the problems and descriptions in the Analyzer Messages pane.

Use the following procedure to analyze the network:

- 
- Step 1** Click the **Mgmt Tree** tab, and click the network that you want to analyze.
- Step 2** Click the Analyze Network icon in the toolbar. For more information about the Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#) As an alternative, click **Analyze** in the Tasks Pane.
- The Cisco Transport Planner analysis status bar indicates when the network analysis is complete.
- Step 3** If any problems occur during the analysis, click the **Analyzer** tab to view the results on the Analyzer Messages pane. The Summary report appears. See the “[3.2.1 Viewing the Summary Report](#)” section on [page 3-2](#) for more information. Warning and error messages help you identify problems with your current design. For a list of all system messages, see [Appendix C, “Troubleshooting.”](#)
- Step 4** If necessary, resolve the problems listed in the Summary report. After you resolve the problems in the network, you can analyze the network again.

**Note**

You can return a Design-Analyzed network to the design state to make further changes by clicking the network icon in the Mgmt Tree and clicking **Design** in the Tasks Pane.

### 2.9.1 Viewing the Site Functional View

The Site Functional View displays a graphical view of the circuit connections, optical power, alarms, and signal loss of a selected site. After you have created the desired sites, fiber spans, and service demands, and analyzed the network, you can now view the Site Functional View. All the cards in each side are grouped together.

You can view the site functional view in either of the following ways:

- Right-click on the Site in the Project Explorer pane and select **Open Site Functional View**.
- In the Network view, right-click on the Site and select **Open Site Functional View**.
- Select the Site in the Network view and click **Open Site Functional View** in the **Tasks Pane**.

The Site Functional View of a selected site is displayed in a new tab. Double-click a side to see the details of that side. To return to the normal view, right-click on the side and click **Close Node**.

### 2.9.1.1 Changing the View

You can change the view of the graphical display to view the layout information in detail. Right-click on the sides of the image (grey area outside the image) to change the view.

You can select the following:

- Fit to View—Fits the side view into the available display space.
- Zoom In—Magnifies the view of the graphical display.
- Zoom Out—Shrinks the view of the graphical display

### 2.9.1.2 Alarm Information

Within the side display, an alarm box is shown that gives the alarm count for the Critical (CR), Major (MJ), and Minor (MN) alarms that affect that side. The alarm associated with the card is indicated to reflect the severity of the alarm (red, orange, and yellow).

### 2.9.1.3 Transponder and Muxponder Connections

All the transponder and muxponder cards with the patchcords are grouped together. To open and view the transponder and muxponder connections, right-click the patch panel and select **Open Patch Panel**.

## 2.10 Managing the Network Design

After creating and analyzing a network design, you must prepare the design for installation at a customer site. After a network has been installed, you can reanalyze to correct any problems.

A tooltip is displayed when a network is selected for a copy, upgrade, release upgrade, install, or upgrade to design operation.

Network designs have several possible states:

- Design—The initial state for any new network design. You can add, delete, or change any aspect of the network design. In the Design state, no locks exist. After analyzing a design, you can put it back into the Design state to modify it by choosing Design in the Tasks Pane.
- Design-Analyzed—The state of the network design after you run the network analyzer. All reports are available and updated. You cannot change any aspect of the network design. You can modify the BoM, such as changing global discounts and spare parts. You can return to the Design state after analyzing the network by choosing Design in the Tasks Pane.

- **Copy**—A copy of a network. You can create a copy of a network in any state. A copy is useful for testing different design options. You can copy a network before or after analyzing it. A copied network inherits the set of project options defined in the original network. For more information, see the [“2.10.1 Creating a Copy of the Network” section on page 2-56](#).
- **Install**—A network is initially designed with theoretical fiber values (such as loss, length, etc.). When a network is installed in the field, you can move the network into the Install state so that you can enter and check the real fiber parameter values. You can create an Install network from a network in the Design-Analyzed or Upgrade-Analyzed state. A network in the Install state inherits the set of project options defined in the analyzed network. All sites in an Install network are locked. You cannot modify any aspect of the network design except the span parameters and (on unlocked sites) amplifiers. You can, however, modify the BoM. All routed circuits are fixed, and cannot be changed while in this state. For more information, see the [“2.10.3 Creating a Network in the Install State” section on page 2-57](#).
- **Install-Analyzed**—The state of the Install network design after you run the network analyzer. All reports are available and updated. Cisco Transport Planner locks all sites, spans, demands, and equipment when a network is in the Install-Analyzed state.
- **Upgrade**—During network design, you define a number of the channels to be implemented at the present time and a number of channels to be implemented in the future (forecast). After installing the network, you might decide to implement the forecast circuits. To do this, you create an Upgrade network and then select the forecast or traffic demand services that you want to implement. You can create an Upgrade network from a network in the Design-Analyzed or Install-Analyzed state. You can unlock specified parameters to alter the design to include forecasted channels and traffic demands. A network in the Upgrade state inherits the set of project options defined in the analyzed network. For more information, see the [“2.10.4 Creating an Upgrade Network” section on page 2-57](#).
- **Upgrade-Analyzed**—The state of the Upgrade network design after you run the network analyzer. All reports are available and updated. Cisco Transport Planner locks all sites, spans, demands, and equipment when a network is in the Upgrade state.

To complete the procedures in this section, you must have a project open and the network(s) loaded. See the [“1.4.1 Opening a Project” section on page 1-20](#) and the [“1.4.2 Loading and Unloading Networks” section on page 1-21](#).

## 2.10.1 Creating a Copy of the Network

To create a copy of a network in any state, right-click the network and choose **Copy** from the shortcut menu. A new copy appears in the Network Mgmt Tree tab.

## 2.10.2 Creating a Copy of the Network in Design State

To create a copy of a network in the design state, right-click the network and choose the **Upgrade to Design** option from the shortcut menu or click **Copy & Go back to Design Mode** on the toolbar. A new copy appears in the Network Mgmt Tree tab. This copy retains all the forcing options and removes the reports, BoM, and output data.

The **Upgrade to Design** and **Copy & Go back to Design Mode** options are available only for networks in “Upgrade” or “Upgrade Analyzed” state from Release 8.5 and later.



## 2.10.3 Creating a Network in the Install State

Use the following procedure to create a network in the Install state:

- 
- Step 1** If the network is not analyzed, complete the “[2.9 Analyzing the Network](#)” section on page 2-54.
  - Step 2** Click the **Mgmt Tree** tab.
  - Step 3** Right-click the network and choose **Install** from the shortcut menu. A new network appears in the Mgmt Tree in the Install state. All results from the analyzed network are imported into the Install network and are placed in the Locked mode.
  - Step 4** Make the necessary changes to the Install network. You can edit the following fiber parameters: fiber loss value, fiber CD, fiber PMD, and fiber length. See the “[4.14 Editing Fiber Span, Pair, and Fiber Parameters](#)” section on page 4-74. Cisco Transport Planner also allows you to unlock site parameters for modification. To change site parameters, see the “[4.3 Editing Site Parameters](#)” section on page 4-3.
  - Step 5** In the Mgmt Tree view, click the **Analyze Network** icon in the toolbar. For more information about the Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#) The Transport Planner Analyzer status window appears to indicate the progress. As an alternative, click **Analyze** in the Tasks Pane. The Cisco Transport Planner analysis status bar indicates when the network analysis is complete. The network now appears in the Install-Analyzed state.



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**Note** If you have changed parameters that are inconsistent with the present network layout (for example, if you set an output tilt value that the amplifier cannot reach), during network analysis an error message on the Analyzer Messages pane identifies which parameter is causing the problem. Warning and error messages help you identify problems with your current design. For a list of all system messages, see [Appendix C, “Troubleshooting.”](#)

---

- Step 6** When you have analyzed the network and are satisfied with the results, import the new generated installation parameters to each site of the network. For more information, see the “[3.2.2 Saving the NE Update File](#)” section on page 3-4.
- 

## 2.10.4 Creating an Upgrade Network

Use the following procedure to put a network in the Upgrade state:

- 
- Step 1** If the network is not analyzed, complete [Analyzing the Network, page 54](#).
  - Step 2** Click the **Mgmt Tree** tab.
  - Step 3** Right-click the analyzed network and choose **Upgrade** from the shortcut menu. A new Upgrade network appears in the Mgmt Tree tab. All results from the analyzed network are imported into the Upgrade network.
  - Step 4** Make the necessary changes to the Upgrade network. For more information, see the [Editing Fiber Span, Pair, and Fiber Parameters, page 74](#) and the “[4.3 Editing Site Parameters](#)” section on page 4-3.

**Step 5** In the Mgmt Tree view, click the **Analyze Network** icon in the toolbar. For more information about Cisco Transport Planner icons, see [Appendix A, “GUI Information and Shortcuts.”](#) The Transport Planner Analyzer status window appears to indicate the progress. As an alternative, click **Analyze** in the Tasks pane in any view. The Cisco Transport Planner analysis status bar indicates when the network analysis is complete. The network now appears in the Upgrade-Analyzed state.



**Note** If you have changed parameters that are inconsistent with the present network layout (for example, if you set an output tilt value that the amplifier cannot reach), during network analysis an error message on the Analyzer Messages pane identifies which parameter is causing the problem. Warning and error messages can help you identify problems with your current design. For a list of all system messages, see [Appendix C, “Troubleshooting.”](#)

In an Upgrade network, you can perform the following tasks:

- Modify the fiber span properties (such as length, dispersion, PMD coefficient, excess losses, and aging).
- Add or delete traffic
- Convert forecasted traffic to present traffic
- Finalize ROADM traffic to present traffic
- Modify the type of a node
- Force the presence or the absence of a card or a module (this includes amplifiers, OSC modules, OADM cards, and DCU modules)

In an Upgrade network, you can force certain installation parameters:

- Amplifier per-channel output power setpoint
- Amplifier output tilt setpoint
- OADM card aggregate output power setpoint
- Full multiplexer/demultiplexer or ROADM output power setpoint



**Note** If a network is analyzed in the Upgrade state when the cards are in the unlocked state, CTP replaces any existing TCC2P card with a TCC3 card in the M12 shelf.

You cannot change the following parameters when in Upgrade state:

- Node input channel fail threshold
- Node OSC channel fail threshold
- Preamplifier input power threshold
- OADM card aggregate input power setpoint
- Full muxponder/demuxponder or ROADM input power setpoint
- Channel drop power

When upgrading a network that has a point-to-point demand, you can:

- Move Future circuits to become Present. This move can be done without unlocking the circuit.
- Add new, present, or future point-to-point services to the existing demand.

- Delete any present or future channel originally defined in the baseline network.
- Change any unlocked point-to-point circuit or unlocked point-to-point service demand parameter.

When upgrading a network that has an any-to-any demand, you can:

- Move any of the Any-to-Any (future) services to become Present. This move can be done without unlocking the circuit.
- Create a new Any-to-Any demand on an already existing Any-to-Any group.
- Create a new Any-to-Any group.
- Delete an existing Any-to-Any demand from an Any-to-Any group.
- Delete an Any-to-Any group with all of its Any-to-Any demands.



**Note**

Any-to-Any services that have been moved to Present will be represented as Point-to-Point services.

## 2.10.5 Unlocking Parameters in the Network Design

The Locked state occurs when no value is set for a parameter and Auto option is selected. During network analysis, Cisco Transport Planner assigns a value for each parameter set with Auto and puts them in the Locked state. The Locked state indicates that the next time the network is analyzed, the analyzer cannot change the value. Locking a site forces the presence or absence of all preamplifiers, boosters, add/drop filters, TDCU, and DCU units that the site/network requires as a result of running the analyzer previously.

Locked elements are indicated by a closed padlock icon in the Project Explorer pane. For more information on the Auto, forced, and locked states, see the “[1.1.6 Auto, Forced, and Locked Parameters](#)” section on page 1-16.

To unlock network components, right-click the desired element in Upgrade or Install mode in the Project Explorer pane and choose **Unlock** from the shortcut menu. You can unlock at the network level or the site level or the element level. Unlocking items at higher level unlocks all elements under that level.

### 2.10.5.1 Forcing Manager

Forcing Manager enables you to unlock multiple interfaces connected to various ducts and sites. This helps you unlock a group of sites and ducts based on individual units such as amplifiers, DCUs, add/drop units, band parameters, and node layout.

For example, you can unlock all the amplifiers, TDCUs, and DCUs of all the sites in the network in one go, with the help of Forcing Manager.

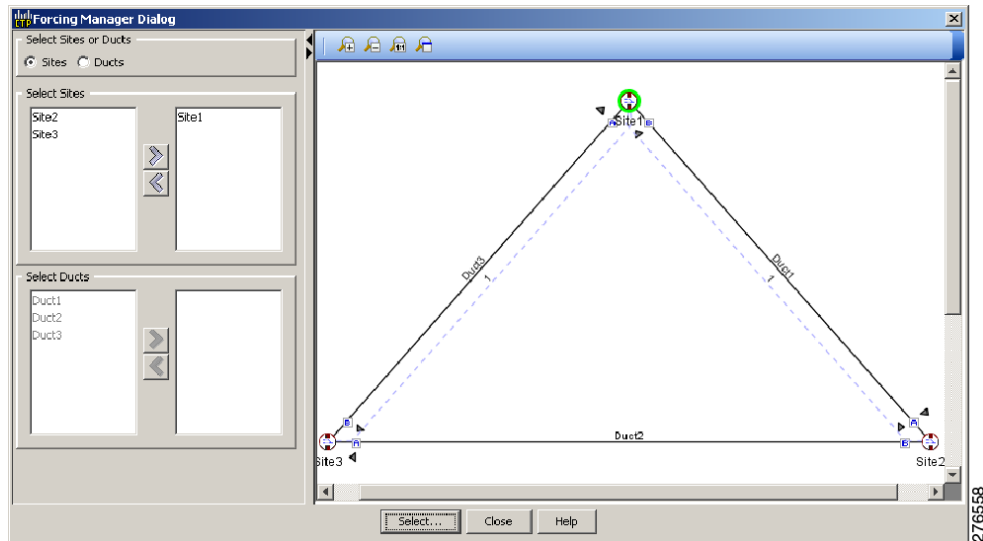
Use the following procedure to unlock multiple units in different sites/ducts:

- 
- Step 1** Right-click the network folder in the Project Explorer pane and choose Forcing Manager from the shortcut menu. The Forcing Manager dialog appears ([Figure 2-21](#)).
- To create a network in design mode, see [2.10.2 Creating a Copy of the Network in Design State](#).
- To create an upgrade network, see [2.10.4 Creating an Upgrade Network](#).
- Forcing Manger can be used in both the design mode and the upgrade mode.
- Step 2** Choose any one of the following options from the left pane of the Forcing Manager dialog:

- Sites—When a site is selected, all the interfaces under that site will be selected.
- Ducts—When a duct is selected, both the interfaces associated with the duct are selected.

The list of sites and ducts available for selection is displayed in the left pane. If you choose the option sites, the list of ducts are disabled. When you choose ducts, the list of sites are disabled.

**Figure 2-21 Forcing Manager Dialog Box**



**Step 3** Choose the required sites/ducts that need to be unlocked.

The network layout is displayed in the right pane of the Forcing Manager dialog. The chosen sites/ducts are highlighted in a different color.

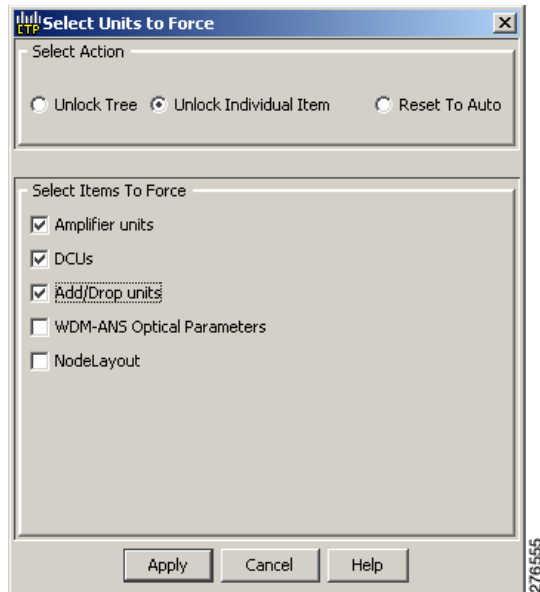
**Step 4** Click **Select** to select the individual units from the site/duct.

**Step 5** Click **Close** to close the Forcing Manager dialog.

**Step 6** Click **Help** to display the Help content for CTP.

**Step 7** Clicking **Select** to open the Select Units to Force dialog box.

Figure 2-22 Select Units to Force Dialog Box



- Step 8** Select any one of the following options from the Select Units to Force dialog box (Figure 2-22):
- **Unlock Tree**—Unlocks all the units from the selected sites/ducts.
  - **Unlock Individual Item**—From the chosen sites/ducts, you can unlock one or more of the following items:
    - Amplifier units—Unlocking an amplifier will unlock the DCUs in a particular interface.
    - TDCU—Can be unlocked without unlocking amplifiers.
    - DCUs—Can be unlocked without unlocking amplifiers.
    - Add/Drop units
    - WDM-ANS Optical Parameters
    - NodeLayout—Unlocking a node unlocks all its children. This option is not available for ducts, as it is a site parameter.
  - **Reset to Auto**—Choose one or more of the following items to reset the values:
    - Amplifier units
    - DCUs
    - Add/Drop units
- Step 9** Click **Apply** to apply the changes to the network.
- Step 10** Click **Cancel** to cancel the changes and close the dialog box.
- Step 11** Click **Help** to display the Help content for CTP.
- Step 12** Click **OK** to close the Forcing Manager Dialog box.

## 2.10.6 Creating a JPEG of the Network Design

Use the following procedure to create a snapshot of your network design in JPEG format:

- 
- Step 1** Click the **NtView Name** tab.
  - Step 2** Complete the “[4.23 Arranging Sites](#)” section on page 4-155 as necessary so that the sites in the network appear in the tab in the desired arrangement.
  - Step 3** Click the Save network view image icon in the toolbar.
  - Step 4** In the Save network view image dialog box, navigate to the desired directory.
  - Step 5** Enter the file name in the File Name field and click **Save**.
- 

## 2.10.7 Upgrading to CTP Software Release 10.6

Use the following procedures to upgrade a release to CTP Software Release 10.6:



### Note

- 
- You can upgrade a software release only to its next highest supported release. For example, Release 7.0 can be upgraded to Release 8.0 but not to Release 8.5.
  - If you upgrade from an OSMINE compatible release to a non-OSMINE compatible release and attempt to analyze the network, CTP displays an error message. To correct this, do one of the following:
    - Continue upgrading till you reach an OSMINE compatible release and then analyze the network.
    - Remove the OSMINE compliance (uncheck the OSMINE compliance option under the Layout section in the Properties pane) from all the nodes and unlock the site layout in the existing network. Then, analyze the network.
- 

- 
- Step 1** From the File menu, click **Open** to load the saved CTP project.
  - Step 2** Right-click on the network loaded in the Project Explorer pane and choose **Release Upgrade**. CTP automatically creates a copy of the initially loaded network and updates the system release to the next highest release. The newly created copy is moved into the Upgrade administrative state.

**Step 3** Repeat [Step 2](#) until the release is upgraded to Release 10.6.



**Note** CTP allows you to manually enter the details of a deployed network even if the Cisco Transport Planner design file is not available. You can perform a release upgrade only on a network that has been analyzed.



**Note** If a network is analyzed in the Release Upgrade state when the cards are in the unlocked state, CTP replaces any existing TCC2P card with a TCC3 card in the M12 shelf.

## 2.11 Viewing a BoM

You can generate a BoM when a network is in the Install or Upgrade state or after you have successfully analyzed your network design. The price database selected during project creation is used to generate the BoM.

The BoM can be exported in BoM to Excel spreadsheet. The Excel spreadsheet contains the following tabs:

- Net View (BoM)
- Site View (BoM)
- Salesforce BOM (BoM)

In addition to the above tabs, the Excel spreadsheet contain the following tabs when the Use Spare Parts check box is checked in the BoM report.

- Net View (Spare)
- Site View (Spare)
- Salesforce BOM (Spare)




**Note** When the unit discount or the quantity of a unit of any site is updated in the Net View (BoM) or the Site View (BoM) tab of the Excel spreadsheet, the associated fields such as the total price, discounted total price, and the quantity of the unit are updated. The cumulative BoM price and the cumulative discounted BoM price are also updated.

To complete the procedures in this section, you must have a project open and the network(s) loaded. See the [“1.4.1 Opening a Project”](#) section on page 1-20 and the [“1.4.2 Loading and Unloading Networks”](#) section on page 1-21.

### 2.11.1 Viewing BoM Report Totals

Use the following procedure to view the BoM report totals:

**Step 1** Click the **Mgmt Tree** tab and click the network.

- Step 2** In the Tasks Pane, click **Bill of Material**. The Bill of Material tab appears. As an alternative, you can access this report by choosing **Bill of Materials** from the Reports folder in the Project Explorer pane. The upper section of the BoM tab (in the Net view, Site view, and Spare subtabs) displays the following information:
- **BoM total discounted**—Displays the price for the overall network (without spare parts) for each item in the BoM. If Use global discount is checked, the total includes the discount from the Global discount percentage field.
  - **Spare total discounted**—Displays the price for all of the recommended spare parts in all of the maintenance centers for the overall network. It is the sum of each spare item using the discounted price. The total appears after you check the Spare Part Report check box.
  - **BoM + Spare total discounted**—Displays the sum of the BoM total discounted price and spare total discounted price.
  - **Price List**—Displays the name of the price list database selected for the project.
  - **Price List last update**—Displays the date that the selected price list was last updated.
  - **Currency**—Displays the value of the currency used for each of the price values as specified within the selected price list database.
- Step 3** To use the Multishelf Management Integrated Kit bundle when generating the BoM instead of the single items, check **Use MSM bundle**.
- Step 4** Check **Use Spare Parts** to include the spare parts in the report totals.
-  **Note** You can check the Use Spare Parts check box only if the network is in Design mode.
- Step 5** The Global discount percentage field shows the percentage from the Global Discount Percentage option in the Default Project Options window. To change the global discount for the entire network, check **Use global discount** and enter a new global discount in the form of a percentage in the **Global discount percentage** field. The global discount is applied to all components in the BoM and will overwrite any discount specified in the Global Price List.

## 2.11.2 Viewing a Network BoM

Use the following procedure to generate a BoM for the network:

- Step 1** Click the **Mgmt Tree** tab and click the network.
- Step 2** In the Tasks Pane, click **Bill of Material**. The Bill of Material tab (see [Figure 2-23](#)) appears. The Net View subtab is selected by default. Items that are not found appear in yellow in the BOM.



Figure 2-23 Bill of Material Tab, Net View Subtab

Product ID	Description	Quantity	Unit Price	Unit Discount
15454-M-TNC-K9=	Transport Node Controller for M2 and M6 Chassis	4	6,500.00	0.0
SF15454M-R9.6.0K9=	15454 ANSI MSTP R9.6.0 5W,Pre-loaded on T...	4	0.00	0.0
15216-EF-40-ODD=	ONS 15216 40ch Mux/DeMux fixed patch panel...	2	20,000.00	0.0
15454-M6-LCD=	6 service slot MSTP chassis LCD Display with ba...	2	80.00	0.0
15454-BLANK=	Empty slot Filler Panel	6	225.00	0.0
ONS-SE-155-1510=	SFP - OC3/STM1 CWDM, 1510 nm, EXT	4	2,100.00	0.0
15454-M6-ECU=	6 service slot MSTP chassis external cable conn...	2	150.00	0.0
15454-SMR1-LIC=	5M ROADM 1-PRE-AMP 100GHZ-CBAND-Licens...	4	16,500.00	0.0
15454-LC-LC-2=	Fiber patchcord - LC to LC - 2m	16	90.00	0.0
15454-M-USBCBL=	USB cable for passive devices	2	80.00	0.0
15454-M-100G-LC-C=	100G OTU-4 ITU-T CP-DQPSK Full C Band Tune...	2	242,000.00	0.0
15454-M6-SA=	6 service slot MSTP shelf, includes M-SHIPKIT, ...	2	800.00	0.0
15454-M6-DC=	6 service slot MSTP chassis 40A DC power filter	4	125.00	0.0
15454-M6-FTA2=	6 service slot MSTP chassis 2nd gen Fan tray	2	200.00	0.0
15454-M-ALMCBL2=	SCSI Alarm cable 24AWG 6 inputs	2	75.00	0.0
15454-R9.6.0SWK9=	15454 ANSI ETSI MSTP Rel.9.6.0 Pkgs.,DVD,R...	2	1,995.00	0.0
15216-ATT-LC-10=	Bulk Attenuator - LC Connector - 10dB	2	200.00	0.0
ONS-CXP-100G-SR10=	CXP-100GBASE-SR-Commercial temp	2	10,000.00	0.0

Table 2-6 describes the Net view subtab columns. See the “2.11.1 Viewing BoM Report Totals” section on page 2-63 for a description of the data, check boxes, and fields at the top of the window.

Table 2-6 BoM Net View Columns

Column Label	Description
Product ID	Displays the ordering code used to order the BoM from Cisco.
Description	Displays a description of the product.
Quantity	Displays the number of specific products in the BoM.
Unit price	Displays the price for each unit. If the price does not appear, Invalid will display. This occurs when the price list reports “NaN” (Not a Number) for the item because the price list has never been updated. Invalid items appear in the list in red. Items that have not been updated from CCO appear in yellow.
Unit Discount	Displays the per-unit discount amount that you assigned in the Global Discount Percentage field. If you leave the field blank, the field displays the default value from the Price List database.

Table 2-6 BoM Net View Columns (continued)

Column Label	Description
Total price	Displays the total price of the products before applying the discount.
Discounted Total Price	Displays the total price of the products after applying the discount.
Site #	Displays the number of products to be assigned to a particular site. The number of Site columns is the same as the number of sites in the network.

**Step 3** To close the Bill of Material report, click the **X** in the upper right corner of the Bill of Material tab.

## 2.11.3 Viewing a Site BoM

A site BoM lists all of the hardware and software parts required for the system to work as designed at a given site. Use the following procedure to generate a BoM for a site:

- Step 1** Click the **NtView Name** tab and click the site.
- Step 2** In the Tasks Pane, click **Bill of Material**. The Site view subtab is selected by default (Figure 2-24). Items that do not appear in the price list appear in red.

Figure 2-24 Bill of Material Tab, Site View Subtab

Networks Mgmt Tree | NtView Net1 x | NtReports Net1 x

Details

April 26, 2006 at 11:11:30

Export | Messages

BoM total discounted: 224,880.00  
Spare total discounted: 0.00  
BoM + Spare total discounted: 224,880.00

Price List: Master Price DB  
Price List last update: Wed Apr 26 11:07:42 CDT 2006 (CCO)  
Currency: Usd

Use MSM Bundle     Use Spare Parts     Use Global Discount    Global Discount (%) 0.0

BoM Spare |

Name	PID	Quantity	Unit Price	Unit Disco...
Site1				
Mech Unit				
15454 SA HD NEBS3 ANSI w/ RCA and Ship Kit	15454-SA-HD	1	2,000.00	0.0
Empty slot Filler Panel	15454-BLANK=	9	225.00	0.0
Ethernet Adapater Panel	15454-EAP	2	550.00	0.0
Ethernet Adapater Panel Mechanical Frame	15454-EAP-MF	1	400.00	0.0
Fiber Storage Shelf	15454-FBR-STRG=	1	800.00	0.0
ONS 15454 Air Ramp / Baffle for the ANSI Chassis	15454-AIR-RAMP=	1	120.00	0.0
Shelf Fan Tray Assembly, ANSI, 15454, HPCFM, I...	15454-FTA3-T	1	500.00	0.0
Common Unit		4		
SW License		3		
Opt Common Unit		2		
Oadm		1		
Transponder		1		
PPM		1		

Net view | Site view

Summary | Bill Of Material x

151.992

Table 2-7 describes the Site view subtab columns. See the “2.11.1 Viewing BoM Report Totals” section on page 2-63 for a description of the data, check boxes, and fields at the top of the window.

**Table 2-7 BoM Site View Columns**

Column Label	Description
Name	Displays the site name. Click the plus (+) sign to expand the site and display the categories. Click the plus (+) sign to expand each category to view the items in the BoM.
Product ID	Displays the ordering code used to order the BoM from Cisco.
Quantity	Displays the number of that specific item in the BoM.
Unit price	Displays the price for each unit. If the price does not appear, Invalid will display. This occurs when the price list reports “NaN” (Not a Number) for the item because the price list has never been updated. Invalid items appear in the list in red. Items that have not been updated from CCO appear in yellow.
Unit Discount	Displays the per-unit discount amount that you assigned in the Global Discount Percentage field. If you leave the field blank, the field displays the default value from the Price List database.
Total Price	Displays the total price of the products before applying the discount.
Discounted Total Price	Displays the total price of the products after applying the discount.

**Step 3** To close the Bill of Material report, click the **X** in the upper-right corner of the Bill of Material tab.

### 2.11.3.1 Viewing the ASR Bundle in the Site BoM

Use the following procedure to view the BoM for 100 G ASR demands. This is applicable for both ASR one-port and two-port demands. Table 2-8 displays the components of the ASR bundle in the Site view of the BoM.

- 
- Step 1** Click the **NtView Name** tab and click the site.
- Step 2** In the Tasks Pane, click **Bill of Material**. The Site view subtab is selected by default (Figure 2-24). The various units and components associated with each site are displayed.
- Step 3** Locate **Payg Bundle** and click on the plus (+) sign next to it. The 100 G ASR demand is displayed. The associated pluggables, cables, 100 G transponder cards, and PID for the 100 G ASR demand are bundled together and displayed as a single component.
- Step 4** Click on the plus (+) sign next to the 100 G ASR demand to expand and display the items present in the bundle.

**Table 2-8 ASR Bundle in the Site View**

Name	PID	Quantity
Payg Bundle of ASR one-port		
ASR 9K 1-port 100G IP+DWDM upgradable kit	A9K-100G-WDM-1P-U	1
• ASR 9K 2-port 100GE - TR LC	A9K-2X100GE-TR	1
• CXP-CFP MPO cable, 10m long	A9K-CCC-100G-10	1
• CXP - 100GBASE-SR - Commercial temp	A9K-CXP-100G-SR10	1
• 100G OTU-4ITU-T CP-DQPSK Full C-band Tuneable LC	A9K-M-100G	1
Payg Bundle of ASR two-port		
ASR 9K 2-port 100G IP+DWDM Starter kit	A9K-100G-WDM-2P-K	1
• ASR 9K 2-port 100GE - TR LC	A9K-2X100GE-TR	1
• CXP-CFP MPO cable, 10m long	A9K-CCC-100G-10	2
• CXP - 100GBASE-SR - Commercial temp	A9K-CXP-100G-SR10	2
• 100G OTU-4ITU-T CP-DQPSK Full C-band Tuneable LC	A9K-M-100G	2

## 2.11.4 Generating a Spare Parts Report

After you generate the BoM, use the following procedure to determine the spare parts required by the network. If the network is in the Upgrade state, the report includes the parts required to support the implemented services and the new additional present services. To generate a spare parts report, you must associate a site with a maintenance center before network analysis. For more information, see the [“4.3 Editing Site Parameters”](#) section on page 4-3.

- 
- Step 1** Click the **Mgmt Tree** tab and click the network.
- Step 2** In the Tasks Pane, click **Bill of Material**. Click the **Spare** subtab ([Figure 2-25](#)).

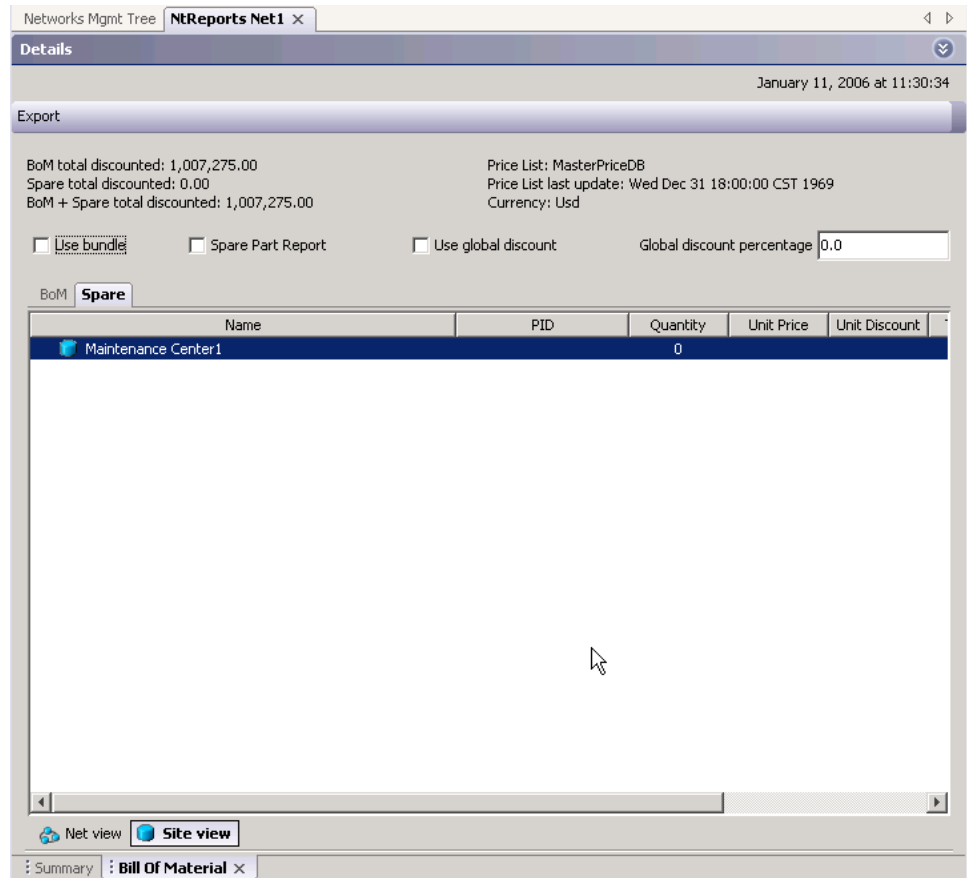
**Figure 2-25** Bill of Material Tab, Spare Subtab

Table 2-9 describes the Spare subtab columns. See the “2.11.1 Viewing BoM Report Totals” section on page 2-63 for a description of the data, check boxes, and fields at the top of the window.

**Table 2-9** BoM Spare Subtab Columns

Column Label	Description
Name	Displays the name of the item at the site. Right-click the maintenance center and choose <b>Expand All</b> from the shortcut menu to view all spare parts.
Product ID	Displays the ordering code used to order the BoM from Cisco.
Quantity	Displays the number of specific items in the BoM.
Unit price	Displays the price for each unit. If the price does not appear, Invalid will display. This occurs when the price list reports “NaN” (Not a Number) for the item because the price list has never been updated. Invalid items appear in the list in red. Items that have not been updated from CCO appear in yellow.
Unit Discount	Displays the per-unit discount amount that you assigned in the Global Discount Percentage field. If you leave the field blank, the field displays the default value from the Price List database.

**Table 2-9** BoM Spare Subtab Columns (continued)

Column Label	Description
Total Price	Displays the total price of the parts before applying the discount.
Discounted Total Price	Displays the total price of the parts after applying the discount.

**Step 3** To close the Bill of Material report, click the **X** in the upper right corner of the Bill of Material tab.

## 2.11.5 Exporting a BoM

Use the following procedure to export the BoM to an external file in XML, Excel spreadsheet, HTML, or text format:

- 
- Step 1** Click the **Mgmt Tree** tab and click the network.
  - Step 2** In the Tasks Pane, click **Bill of Material**. The Bill of Material tab appears.
  - Step 3** Click **Export**. The BoM export dialog box appears.
  - Step 4** In the BoM export dialog box, type the name of the file, choose the file type (**.xls** and **.html**) from the drop-down list, and navigate to the desired folder. Click **Save**.
- 

## 2.12 Managing the Price List

A price list is defined for each project and is used to generate a BoM. Cisco Transport Planner can manage multiple price lists. You can even change a project price list after a project has been established. The Master Price list is the Global Price List in US dollars. You can download new price lists from Cisco Connection Online (CCO).

Only the selected price value is saved with a project; the actual price database is not saved with the project. When opening a saved project (for example, a project received from another designer), the associated price database might not be available. If this is the case, Cisco Transport Planner notifies you that the Master Price list will be used.

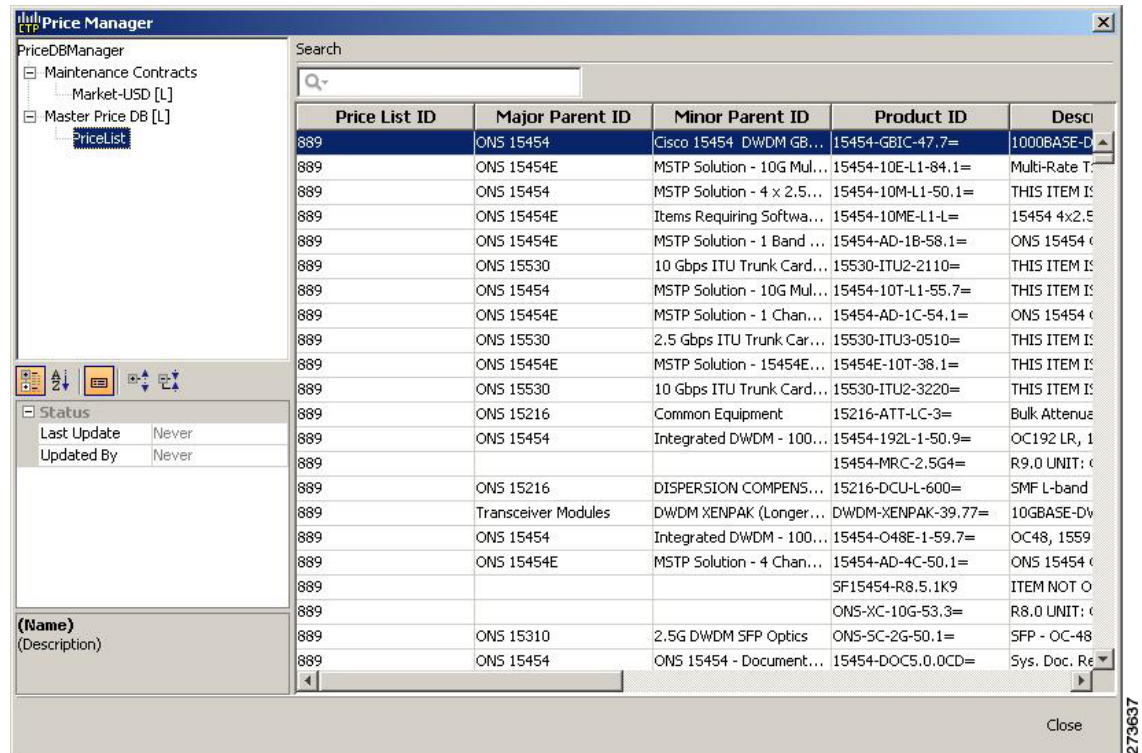
To save memory, Cisco Transport Planner automatically loads only the price list selected for the current project.

### 2.12.1 Creating a New Price List

Use the following procedure to download a price list from CCO. You can download price lists from CCO if no projects are currently open.

- 
- Step 1** If a project is open, close the project. See the [“1.4.4 Closing a Project” section on page 1-22](#).
  - Step 2** From the Tools menu, choose **Price List Mgmt**. The Price Manager dialog box appears ([Figure 2-26](#)).

Figure 2-26 Price Manager Dialog Box



- Step 3** In the Price Manager dialog box, right click **PriceDBManager** and choose **New Price DB** from the shortcut menu.
- Step 4** In the Create a New Price DB dialog box, enter the price list name.
- Step 5** From the drop-down list, choose the desired CCO price list.
- Step 6** Click **OK**.
- Step 7** Click **OK** to update from CCO.
- Step 8** In the CCO User Name/Password dialog box, type your user name and password, and click **OK**. Cisco Transport Planner downloads the CCO price list.
- Step 9** When the update is complete, click **OK** to close the confirmation dialog box. The new price list appears in the PriceDBManager tree.
- Step 10** Click **Close** to close the Price Manager dialog box.

## 2.12.2 Viewing a Price List

Use the following procedure to view and filter a price list:

- Step 1** From the Tools menu, choose **Price List Mgmt**. The Price Manager dialog box appears (Figure 2-26 on page 2-71).

The PriceDB Manager tree lists all of the created price lists. To save memory, Cisco Transport Planner automatically loads only the price list selected for the current project (unless the user requests otherwise). An L indicates that the price list is loaded in memory and is available. A U indicates that a price list is currently not loaded in memory and is not available.

**Step 2** To load or unload a price list, right-click a price list and choose **Load** or **Unload** from the shortcut menu.

**Step 3** Click **PriceList** under the desired price list identifier in the PriceDBManager tree. The list displays in the right pane of the Price Manager dialog box. The properties of the price list appear in the bottom left corner of the Price Manager dialog box:

- Last update—Indicates the date of the last download from CCO for this price list. If Never appears, this indicates that the user created a price list without downloading from CCO.
- Updated by—Identifies the way in which the price list was updated.

The price list displays the following columns:

- Price List ID—For internal use.
- Major Parent ID—Lists the platform.
- Minor Parent ID—Lists the equipment type.
- Product ID—Identifies the ordering code for the specific unit.
- Description—Provides detail about the item.
- Service Category—For future use.
- List Price—Indicates the price of the item. If NaN (Not a Number) appears in the field, the list has not been updated.
- Major ID—For internal use.
- Minor ID— For internal use.
- Update Status—Identifies how the last update was made to an item:
  - None—Indicates that the price list has never been updated.
  - local\_file—Indicates that the price list has been updated from a local file.
  - cco—Indicates that the price list has been updated from CCO.
  - user—Indicates that the price list has been manually updated by the user who directly edited the price list. The user can modify the Discount field.
- Discount—If a discount applies, identifies the discount percentage. To modify this field, enter the new percentage.

**Step 4** To search for a specific item in a price list, type the desired item in the Search field at the top of the list. As you type, Cisco Transport Planner filters the list items to match your search entry. To choose Search options, click the Search Tool icon to the left of the Search field and choose one of the following:

- Column name—Searches only the specified column for the search string. The All option searches all columns.
- Case sensitive—Matches the case of the search string.
- Case insensitive—Disregards the case of the search string.
- Match from start—Searches only for the search string if it appears at the beginning of column text.
- Match any where—Searches for the search string if it appears anywhere in the price list.

**Step 5** To sort the items in the price list, click on a column to sort by that column.



- Step 6** Click **Close** to close the Price Manager dialog box.
- 

## 2.12.3 Loading and Unloading Price Lists

To save memory, Cisco Transport Planner automatically loads only the price list selected for the current project. An “L” by a price list in the Price Manager dialog box indicates that the price list is loaded; a “U” in the Price Manager dialog box indicates that the price list is not loaded. Use the following procedure to load or unload price lists in Cisco Transport Planner:

- Step 1** From the Tools menu, choose **Price List Mgmt**. The Price Manager dialog box appears ([Figure 2-26 on page 2-71](#)).
- Step 2** Right-click the price list and choose **Load** or **Unload** from the shortcut menu.
- 

## 2.12.4 Updating a Price List from CCO

Use the following procedure to update a specified price list from CCO or from a local file. You can also update all price lists, even the lists that are not currently loaded. You can update a price lists from CCO if no projects are currently open.

- Step 1** If a project is open, close the project. See the [“1.4.4 Closing a Project” section on page 1-22](#).
- Step 2** From the Tools menu, choose **Price List Mgmt**. The Price Manager dialog box appears ([Figure 2-26 on page 2-71](#)).
- Step 3** Right-click the desired price list identifier in the PriceDBManager tree and choose **Expand** from the shortcut menu.
- Step 4** Right-click the desired price list in the expanded tree and choose **UpdateFromCCO** from the shortcut menu.
- Step 5** In the Update from CCO dialog box, choose **Update single price list** to download data for the specified list or **Update all price lists** to download the latest data for all price lists.
- Step 6** In the CCO User Name/Password dialog box, type your user name and password and click **OK**. Cisco Transport Planner downloads the price list.
- Step 7** When the update is complete, click **OK** to close the confirmation dialog box.
- Step 8** Click **Close** to close the Price Manager dialog box.
-

## 2.12.5 Copying a Price List

Use the following procedure to create a new price list by copying from an existing one. The new price list will have all of the attributes and values of the original price list (such as Updated By, Last Update, unit price, discounts, and so on). You can copy a price list if no projects are currently open.

- 
- Step 1** If a project is open, close the project. See the “1.4.4 Closing a Project” section on page 1-22.
  - Step 2** From the Tools menu, choose **Price List Mgmt.** The Price Manager dialog box appears (Figure 2-26 on page 2-71).
  - Step 3** Right-click the desired price list in the PriceDBManager tree and choose **Copy** from the shortcut menu.
  - Step 4** Enter the name for the new price list and click **Ok**. The new price list appears in the PriceDBManager tree.
  - Step 5** Click **Close** to close the Price Manager dialog box.
- 

## 2.12.6 Deleting a Price List

Use the following procedure to delete a price list. You cannot delete the Master Price List or a price list that is in use by a project. You can delete a price list if no projects are currently open.

- 
- Step 1** If a project is open, close the project. See the “1.4.4 Closing a Project” section on page 1-22.
  - Step 2** From the Tools menu, choose **Price List Mgmt.** The Price Manager dialog box appears (Figure 2-26 on page 2-71).
  - Step 3** Right-click the desired price list in the PriceDBManager tree and choose **Delete** from the shortcut menu.
  - Step 4** Click **Close** to close the Price Manager dialog box.
- 

## 2.12.7 Viewing Maintenance Contracts

Use the following procedure to view maintenance contracts:

- 
- Step 1** From the Tools menu, choose **Price List Mgmt.** The Price Manager dialog box appears (Figure 2-26 on page 2-71).
  - Step 2** Right-click **Maintenance Contracts** and choose **Expand** from the shortcut menu.
  - Step 3** Click **ContractsList**. The Contract PID column lists the service contract identifiers for the hardware and software parts used by Cisco Transport Planner. The Contract Category column describes the service programs.
  - Step 4** Click **MapPidsContracts**. The PID column lists the product identifiers. The Contracts column lists the service contract identifier.
  - Step 5** Click **Close** to close the Price Manager dialog box.
-

## 2.13 Importing Designs Created in the Sherpa Tool

The Sherpa tool is used to create Layer 2 network designs using Cisco Carrier Packet Transport (CPT) system. These network designs can be saved as XML files and imported into CTP. Use the following procedure to import designs created in the Sherpa tool.

- 
- Step 1** From the Tools menu, choose **Import From Sherpa**. The Sherpa file import wizard is displayed.
- Step 2** In the Import XML area:
- Click the **Browse** button to browse for the Sherpa generated XML file. Select the XML file and click **Open**. The file path is displayed in the Import field.
  - Select one of the following radio buttons to define the import mode:
    - Custom—The Sherpa network is manually mapped to an existing CTP network that is in the Design or Upgrade mode.
    - Green Field—Sherpa design is imported into a new network in a new CTP project. Ensure that there is no project currently open in CTP, as two projects cannot be simultaneously open.
- Step 3** Click **Next**.
- Step 4** In the Project/Network Options area, these radio buttons are available under two categories—Project and Network:
- The following radio buttons define project creation:
    - Use existing CTP project—The Sherpa design is imported into an existing CTP project, which is currently open. This option is unavailable if Green Field is selected as the import mode.
    - Create a new project—The Sherpa design is imported into a new CTP project. This option is unavailable if Custom is selected as the import mode.
  - The following radio buttons define network creation:
    - Use existing network—The sites in the Sherpa design are imported into an existing network, which can be selected in the adjacent drop-down list. This option is unavailable if Green Field is selected as the import mode.
    - Create a new Network—The sites in the Sherpa design are imported into a new network. This option is unavailable if Custom is selected as the import mode.
- Step 5** To complete importing the Sherpa file, do one of the following:
- If you have selected the Green Field option, click **Finish**. The Sherpa design is imported into CTP. The sites, ducts, and demands are created in CTP with the same parameters as defined in the Sherpa design.
  - If you have selected the Custom option, click **Next** to choose the settings to map the Sherpa elements to CTP elements.

You can map sites, fibers, and demands. The elements present in the Sherpa project are displayed as a tree structure on the left side of the Sherpa file import wizard.

- Step 6** In the Sherpa - CTP Site Mappings area:
- Check the check box corresponding to the Sherpa site that needs to be mapped to a CTP site. By default, all the check boxes are selected.
  - Click the cell in the CTP Match column. The list of available sites in the CTP network are displayed as a drop-down list. You can select:
    - Create New—A new site is created in CTP with the same name as that of the Sherpa site.

- Site name—The Sherpa site is mapped to the selected CTP site. If there is any conflict between the fibers at the Sherpa site and the fibers at the CTP site being mapped, those fibers in the Sherpa Project tree structure are displayed in red. The conflict is resolved once the fibers are correctly mapped, as described in step 8.

**Step 7** Click **Next**.

**Step 8** In the Sherpa - CTP Fiber Mappings area:

- Check the check box corresponding to the Sherpa fiber that needs to be mapped to a CTP fiber. By default, all the check boxes are selected.
- Click the cell in the CTP Match column. The list of available ducts in the CTP network are displayed as a drop-down list. You can select:
  - Create New—A new duct is created in CTP with the same name as that of the Sherpa duct.
  - Duct name—The Sherpa duct is mapped to the selected CTP duct.

**Step 9** Click on a duct in the Fibers Imported From Sherpa column. In the Fiber Property Chooser area, check the check box to retain either the Sherpa value or the CTP value for the duct parameters. No parameters are displayed in the Fiber Property Chooser area if the CTP match for the duct is set as Create New.

**Step 10** Click **Next**.

**Step 11** In the Sherpa - CTP Demand Mappings area:

- Check the check box corresponding to the Sherpa demand that needs to be mapped to a CTP demand. By default, all the check boxes are selected.
- Click the cell in the CTP Match column. The list of available demands in the CTP network are displayed as a drop-down list. You can select:
  - Create New—A new demand is created in CTP with the same name as that of the Sherpa demand. This is the only option available when the Sherpa design is being imported for the first time.
  - Demand name—The Sherpa demand is mapped to the selected CTP demand. This option is available only when the Sherpa design is reimported into the same CTP project.

**Step 12** Click the cell in the Circuits Imported From Sherpa column. In the Demand Property Chooser area, check the check box to retain either the Sherpa value or the CTP value for the demand parameters. No parameters are displayed in the Demand Property Chooser area if the CTP match for the demand is set as Create New.

**Step 13** Click **Finish**. The Sherpa design is imported into CTP. All the imported Sherpa elements are now converted as standard CTP elements.



**Note**

The sites, fibers, and demands in the Sherpa Project tree structure are displayed in blue if the elements they are being mapped to are in the locked state in CTP. This can occur while importing a Sherpa design into a CTP network that is in the upgrade or release upgrade state. In case of locked fibers, and demands, a message window is displayed after clicking Next in the Fibre Options page or Finish in the Demand Options page, respectively. Click **Yes** to unlock the elements.

However, the sites do not get unlocked during the import process. If the analysis generates any error due to the sites being locked, you have to unlock the sites manually.

**Note**

The CPT cards like fabric card, line card, and CPT 50 panel are not included in CTP reports and layouts. However, CTP supports the two CPT trunk pluggables—ONS-XC-10G-C and ONS-XC-10G-EPxx.x. These pluggables are visible in Optical Results, Traffic Matrix, and Internal Connections reports.

## 2.14 Bidirectional Communication with the Network Element

CTP communicates with the network element to import and export node parameters of the network. Use the following procedure to import a network from the node, analyze the network, and export the network to the node element.

**Important Notes**

- CTP 10.6 supports importing 9.603, 9.604, 9.605, 9.8, 10.1, 10.3, and 10.5 networks with hardware limited to 9.8 system release.
- From CTP 10.5.2, networks with PSM-OCH protection can be imported into CTP.
- From CTP 10.6, you can import omnidirectional and colorless configurations of a network. This feature is only MSTP nodes.

- Step 1** From the CTP File menu choose **Import Network** or click **Import Network** in the Start Page. The Node Login dialog box appears.
- Step 2** In the Node Login dialog box, complete the following:
- Node IP—Enter the IP address of the Cisco Transport Controller (CTC) node.
  - Username—Enter the CTC username.
  - Password—Enter the CTC password.
- Step 3** Click **Ok**. The CTC window opens. The CTP window becomes inactive.
- Step 4** (Optional) Perform node provisioning as required in the CTC window.
- Step 5** In the network view, click **Circuits > Circuits** tabs. Verify that all the circuits are in the DISCOVERED state in Status column.
- Step 6** From the Tools menu in the CTC window, choose **Export XML** to export the node data to CTP. The Export Network Information into XML window appears listing all the nodes that are discovered. Verify that all nodes are discovered.

**Note**

The Export XML option is available only when CTC is launched through CTP.

- Step 7** Select the nodes to be exported into XML and click **OK**. The Export Successful dialog box appears when all the node data is exported.

For release 9.8 and later, CTP supports importing the following cards from CTC:

- 100G-LC-C, 100G-CK-LC-C and 10 X 10 G-LC standalone cards.
- 100G-CK-LC-C + 10X10G-LC, 100G-CK-ME-C+10X10G-LC, 100G-CK-LC-C+CFP-LC, 100G-CK-ME-C+CFP-LC, 100G-LC-C + CFP -LC, 100G-ME-C + CFP-LC, 100G-ME-C + 10 X 10G TXP, and 100G-LC-C + 10 X 10 G-LC combination cards.

- TNC-E and TSC-E cards.

**Step 8** Click **OK**.

**Step 9** Close the CTC window.

- From the File menu, choose **Exit**.
- Click **Yes** to confirm exit.

The CTC window closes, the CTP window becomes active, and the Import Network wizard appears. This may take about 1 minute depending on the size of the network.

**Step 10** In the Project/Network Options area, these radio buttons are available under two categories—Project and Network:

- The following radio buttons define project creation:
  - Use existing CTP project—This imports the node data from CTC into an existing CTP project. This option is disabled.
  - Create a new project—This imports the node data from CTC into a new CTP project.
- The following radio buttons define network creation:
  - Use existing network—This imports the sites from the CTC node into an existing network. This option is disabled.
  - Create a new Network—This imports the sites from the CTC node into a new network.

**Step 11** Click **Next** to choose the settings to map the node elements to CTP elements.

**Step 12** In the Site Options area, check the check box corresponding to the site that needs to be modelled to a CTP site. By default, all the check boxes are selected.




---

**Note** CTP does not support omnidirectional and colorless sites or cascading 80-WXC-C cards.

---

**Step 13** Click **Next**.

**Step 14** In the Node - CTP Fibre Modelling area, check the check box corresponding to the fiber that needs to be modelled to a CTP fiber. By default, all the check boxes are selected.

**Step 15** Click on a duct in the Fibre Imported From Node column. In the Fiber Property Chooser area, for fibre type, select the fiber type from the drop-down list in the Node column.

**Step 16** Click **Next**.

**Step 17** In the Node - CTP Demand Modelling area, check the check box corresponding to the demand that needs to be modelled to a CTP demand. By default, all the check boxes are selected.




---

**Note** CTP supports the import of only point-to-point demands.

---

**Step 18** Click **Finish**. The Network creation done dialog box appears indicating that the imported OCHNC circuits may not be associated with TXP/MXP properly and requires the card and client/trunk pluggables to be forced appropriately.

**Step 19** Click **OK**. The Importing Complete dialog box appears when the node properties are imported into CTP.

**Step 20** To view the import logs, click **Yes** else click **No**. All the imported node elements are now converted as standard CTP elements. The Log Viewer displays the import log. This log file is saved in the CTP cache directory.

The network is imported in the design mode.

**Step 21** In the **Project Explorer** pane, the invalid demands are underlined in red. Double-click on the invalid OCHNC demands and edit the parameters as required.



**Note** An invalid OCHNC demand is one in which Traffic Type may be set to 10GE LAN PHY, Source and Destination Client Cards may be set to Auto and Protection Type may be set to Unprotected because their values could not be found. Therefore, set the values as required for these parameters and then validate the demand.

**Step 22** In the **Project Explorer** pane, right-click the edited demand and choose **Validate**. Next, proceed to [Step 25](#).

**Step 23** To validate multiple demands, right-click the demand and choose **Select Similar**.

**Step 24** After multiple demands are selected, right-click the selected demands and choose **Validate**.



**Note** If you try to analyze the network when any demand is still invalid, a warning message is displayed indicating that the invalid demand must be validated before analysis.

**Step 25** (Optional/Not recommended) Modify the network in CTC as required.

**Step 26** Analyze the network for the imported node data to be applied. Perform the “Analyzing the Network” task described in [“2.9 Analyzing the Network” section on page 2-54](#). After the network is analyzed, CTC provides an option to export the CTC NE Update Configuration file to the node.

**Step 27** To export NE Update Configuration file to the node, right-click on any node in the analyzed network and choose **Provision Node**. The Node Login window appears.

**Step 28** In the Node Login window, complete the following:

- Username—Enter the CTC username.
- Password—Enter the CTC password.



**Note** The Node IP field is prepopulated with the node IP address.

**Step 29** Click **Ok**. The CTC window opens with the node setup selection window for the selected node. The CTC window becomes inactive.

**Step 30** In the node setup selection window for the selected node, choose the node to be provisioned. Click **OK**.

**Step 31** On the Node Setup for *node name* page, choose one or more of the following:

- Node/Shelves Layout—Choose to preprovision the slots when no DWDM cards are installed. The slots are preprovisioned in each shelf in CTC for the cards defined in the network plan. (Errors will occur if cards are installed or the slots are preprovisioned). Preprovisioning the slots before the physical cards are installed ensures that card installers place the cards in the correct slots. Preprovisioning the slots is also useful if you want to set up the network prior to card installation. The node layout also preprovisions the chassis and passive units.
- Passive Units—Choose to preprovisions the passive units.
- Card Parameters—Check this check box to provision the following parameters, if the cards are installed.
  - TXP, MXP, GE\_XP, 10GE\_XP, GE\_XPE, 10GE\_XPE, ADM-10G, and OTU2\_XP cards—Provisions the OTN and FEC parameters.

- OPT-AMP-L, OPT-AMP-17-C, OPT-AMP-C, GE\_XP, 10GE\_XP, GE\_XPE, and 10GE\_XPE cards—Provisions the card mode.
- Pluggable Port Modules—Check this check box to allow the provisioning of PPMs on TXP, MXP, GE\_XP, 10GE\_XP, GE\_XPE, 10GE\_XPE, ADM-10G, and OTU2\_XP cards, including PPM payloads.
- Internal Patchcords—Check this check box to allow creation of internal patchcords among cards provisioned in the node.
- Optical Sides—Check this check box to allow the provisioning of optical sides.
- ANS Parameters—Check this check box to install the ANS parameters. ANS parameters provision the values required for the node to function within the specified network design. ANS parameters include span losses, optical power, optics thresholds, amplifier working mode, gain, tilt, and so on.
- Select All—Check this check box to select all the options.
- Skip Interactive Mode—Check this check box to enable CTC to provision all the chosen setup components automatically without displaying the results after each step.
- Save Installation Files (XML and log) On Node—Check this check box to enable CTC to save the XML and log files on the node.

**Step 32** Click **OK**. The NE Update wizard appears. If you chose **Skip Interactive Mode** in [Step 31](#), continue with [Step 33](#). If not, the wizard page that appears depends on the options chosen in [Step 31](#). [Table 2-10](#) describes the NE Update wizard options.



Table 2-10 NE Update Wizard Options

NE Update Function	Action
Node/Shelves Layout	<p>View the cards and slots on the left side of the page and verify that they are the same as the layout in the Cisco Transport Planner Shelf Layout. If the cards and slots match, click <b>Apply</b>. If not, click <b>Cancel</b> and contact your next level of support to verify that you have the correct node setup file. If the site has a multishelf configuration, click <b>Next</b> and repeat this step for each shelf at the site.</p> <p>CTC preprovisions the slots. (This might take a few seconds.) The results appear in the Log window. Slots that are successfully provisioned display an “Applied” status. A “Slot not empty” status appears if slots cannot be provisioned because a card is physically installed or the slot is already provisioned. If this occurs, complete the following steps. Otherwise, continue with the next NE Update function.</p> <ol style="list-style-type: none"> <li>1. Click <b>Cancel</b>, then click <b>Yes</b> in the confirmation dialog box. The slot preprovisioning does not revert when you click Cancel.</li> <li>2. If a physical card is installed, remove it from the shelf.</li> <li>3. Perform one of the following steps: <ul style="list-style-type: none"> <li>– Delete all the preprovisioned slots.</li> <li>– Delete the slot where the Slot Not Empty error occurred. Provision the slot manually, then repeat Steps 31 and 32 making sure to uncheck the Provision Node Layout option in Step 31.</li> </ul> </li> </ol> <p><b>Note</b> When you preprovision a slot, the card is purple in the CTC shelf graphic and “NP” (not present) appears on the card. After the physical card is installed, the card changes to white and “NP” is removed from the CTC shelf graphic.</p>
Passive Units Layout	<ol style="list-style-type: none"> <li>1. Review the passive unit settings.</li> <li>2. Click <b>Apply</b>.</li> <li>3. Click <b>Next</b>.</li> </ol>
Pluggable Port Modules	<ol style="list-style-type: none"> <li>1. Review the PPM settings for each TXP, MXP, GE_XP, 10GE_XP, GE_XPE, 10GE_XPE, and OTU2_XP card.</li> <li>2. Click <b>Apply</b>.</li> <li>3. Click <b>Next</b>.</li> </ol>
Card Parameters	<ol style="list-style-type: none"> <li>1. Review the OTN, FEC, and card mode settings for each TXP, MXP, GE_XP, 10GE_XP, GE_XPE, 10GE_XPE, and OTU2_XP card.</li> <li>2. Click <b>Apply</b>.</li> <li>3. Click <b>Next</b>.</li> </ol>
Internal Patchcords	<ol style="list-style-type: none"> <li>1. Review the internal patchcords.</li> <li>2. Click <b>Apply</b>.</li> <li>3. Click <b>Next</b>.</li> </ol>
Optical Sides	<ol style="list-style-type: none"> <li>1. Review the optical side assignments.</li> <li>2. Click <b>Apply</b>.</li> <li>3. Click <b>Next</b>.</li> </ol>

Table 2-10 NE Update Wizard Options

NE Update Function	Action
ANS Parameters	<ol style="list-style-type: none"> <li>1. Review the ANS parameters on the left half of the page.</li> <li>2. Click <b>Apply</b>. The log file displays the results. At the end, a Done status will appear. If a parameter could not be applied, a Setting Refused status appears. If this occurs, contact your next level of support.</li> </ol>
Select All	If checked, selects all the options.
Skip Interactive Mode	If checked, CTC provisions all the chosen setup components automatically without displaying the results after each step.
Save Installation Files (XML and log) On Node	If checked, CTC saves the XML and log files on the node.

**Step 33** Click **Finish**, then click **OK** in the Wizard Complete confirmation dialog box. The confirmation box indicates whether importing the NE Update Configuration file to the node was completed successfully.



**Note** Common control cards are not provisioned by CTP. Common control cards are not provisioned by CTP.



**Note** From release 10.1 onwards, CTP supports import of Span length and Span loss, and DCU.

## 2.14.1 Limitations

The following limitations apply when CTP imports and exports node parameters of the network:

- Imports or exports node parameter data from the network element running Software Release 9.1 and later releases.
- Prompts to create a default rack layout when importing individual shelf configuration.
- Fails to import the internal patch cord connections in correctly if they are not provisioned completely in CTC.
- Fails to export omnidirectional and colorless properties of an optical side.
- Fails to export PSM unit data.
- Requires passive units like Mux/Demux units to be provisioned in CTC before importing the node parameters into CTP.
- Imports passive units like DCU only if the initial provisioning is made using the NeUpdate.XML file generated by CTP.
- Sets 10G-LAN-PHY as the default service rate for incomplete OCHNC circuits while the wavelength and path are forced appropriately.
- Defaults protection for OCHNC circuits to Unprotected. If there is a working and protected trail for the same demand, each will be a separate point-to-point demand.
- Displays any demands on muxponder cards as a single demand and aggregation is not visible.

The following limitations apply to Split ROADMs:

- Supports hardware only till release 9.8.
- Supports only Fiber Switch Protection.
- Does not support import of dangling transponders/transponder only shelves.
- Does not support import of OCH-NC, OCHNC-DCN, STS/VCAT/VLAN/Partial circuits.
- Does not support Split ROADM nodes.
- Does not support attenuators.
- Does not support TNC/OTS/TXP/MXP port forcing.
- Does not support import of FLD-OSC based sites.
- Does not support Omni/Colorless/Remote Spur.
- Does not support OSMINE/Insulator.
- Does not support import of Shelf Management, Node protection, Regeneration, Fan tray, AC/DC power supply.
- Limitations in importing Optical/ANS parameters.

## 2.15 Split ROADM

CTP supports node splitting. The ROADM node can be configured to have separate Network Elements for different Line Sides (Per-side NE). Split Node feature is available only for the below configurations:

- Line > ROADM > 80WXC
- Multi-degree > OXC > 80WXC MESH-PP-4
- Multi-degree > OXC > 80WXC MESH-PP-8
- Line > ROADM > SMR-1

When a node is split, each line side becomes a separate NE. TXPs/MXPs associated with specific side are placed under the specific NE side. TXPs/MXPs associated with multiple sides (multi-trunk, Y-cable, Fiber-Switched) are placed under a separate non co-located NE called as “Common NE”.

So, on applying node split on an N-degree site, CTP converts it into N separate Per-Side NEs with an optional Common NE (if needed).

A split node scenario is described in the following steps.

- 
- Step 1** Release upgrade the network to Release 10.1 or a later release and modify network (if required) except node-split.
- Step 2** Go to the network tasks pane on the right side and click **Copy** to take a backup copy of the network (modified) created in Step 1.
- Step 3** Node splitting can be done at any time (before and after analysis). For splitting a node before analysis go to Step 4. For splitting a node after analysis go to Step 6.
- Step 4** To enable node splitting at the network level (all sites), check the node split check box in the network properties pane and analyze the network. The (s) next to the site indicates that the specific site is split.
- Step 5** Or, to enable node splitting in a specific site, click on the site and check the node split check box in the site properties pane. To force the functionality and type parameters, see [4.24 Modifying Site Properties](#). Then, analyze the network.

- Step 6** To enable node splitting at the network level (all sites), right click on the network and select the Split Node option. Or, to enable node splitting in a specific site, right click on the required site and select the node split option.
- Step 7** During the analysis, the Split Roadm IP dialog box appears displaying the sites in which node split has been enabled.
- Step 8** Expand each site to enter the IP address for each NE (optional). To assign the IP addresses at a later time, click Cancel. After analysis, expand the site in the project explorer and enter the IP addresses for each NE.
- Step 9** To export the NeUpdate.xml file, click the NE Update link on the reports pane. To export the circuits in the XML, check mark the export circuit flag option in the “Network Element Update File” Dialog Box.
- Step 10** To view the NE IDs, double-click on the layout. Each NE is colored differently.
- Step 11** For protected cards (for example, Y - cable) and multi- trunk cards (for example, OTU2-XP), a common NE is created and the cards are moved to this common NE. The following table describes the card positions for various Protection cards.

**Table 2-11 Card Positions for Protection Cards**

Protection Schemes	TXP/MXP position	Common Card/Module Position
Unprotected	Corresponding Side NE	-
Client 1+1	Corresponding Side NE	-
Y-Cable	Common NE	Common NE (Y-Cable module)
Fiber Switched	Common NE	-

- Step 12** To view the common NE IDs, double-click on the layout. The common NE ID is displayed.
- Step 13** To view the Virtual PP-Mesh Unit IDs, click on the PP-MESH Unit in layout.



**Note** Virtual PP Mesh units are created to interconnect different NEs. These are visible only in the NeUpdate file.

The following tables display the ports for virtual PP Mesh 4 and virtual PP Mesh 8.

**Table 2-12 Ports for Virtual PP Mesh 4**

VPASSIVE_1_PPMESH4		VPASSIVE_2_PPMESH4		VPASSIVE_3_PPMESH4		VPASSIVE_4_PPMESH4	
1	COM-RX A	1	COM-RX B	1	COM-RX C	1	COM-RX D
2	EXP-TX A-1	2	EXP-TX B-1	2	EXP-TX C-1	2	EXP-TX D-1
3	EXP-TX A-2	3	EXP-TX B-2	3	EXP-TX C-2	3	EXP-TX D-2
4	EXP-TX A-3	4	EXP-TX B-3	4	EXP-TX C-3	4	EXP-TX D-3
5	EXP-TX A-4	5	EXP-TX B-4	5	EXP-TX C-4	5	EXP-TX D-4
6	VEXP-RX-2	6	VEXP-RX-1	6	VEXP-RX-1	6	VEXP-RX-1
7	VEXP-TX-2	7	VEXP-TX-1	7	VEXP-TX-1	7	VEXP-TX-1
8	VEXP-RX-3	8	VEXP-RX-3	8	VEXP-RX-2	8	VEXP-RX-2
9	VEXP-TX-3	9	VEXP-TX-3	9	VEXP-TX-2	9	VEXP-TX-2

Table 2-12 Ports for Virtual PP Mesh 4 (continued)

VPASSIVE_1_PPMESH4		VPASSIVE_2_PPMESH4		VPASSIVE_3_PPMESH4		VPASSIVE_4_PPMESH4	
10	VEXP-RX-4	10	VEXP-RX-4	10	VEXP-RX-4	10	VEXP-RX-3
11	VEXP-TX-4	11	VEXP-TX-4	11	VEXP-TX-4	11	VEXP-TX-3

Table 2-13 Ports for Virtual PP Mesh 8 (1 to 4)

VPASSIVE_1_PPMESH8		VPASSIVE_2_PPMESH8		VPASSIVE_3_PPMESH8		VPASSIVE_4_PPMESH8	
1	COM-RX A	1	COM-RX B	1	COM-RX C	1	COM-RX D
2	EXP-TX A-1	2	EXP-TX B-1	2	EXP-TX C-1	2	EXP-TX D-1
3	EXP-TX A-2	3	EXP-TX B-2	3	EXP-TX C-2	3	EXP-TX D-2
4	EXP-TX A-3	4	EXP-TX B-3	4	EXP-TX C-3	4	EXP-TX D-3
5	EXP-TX A-4	5	EXP-TX B-4	5	EXP-TX C-4	5	EXP-TX D-4
6	EXP-TX A-5	6	EXP-TX B-5	6	EXP-TX C-5	6	EXP-TX D-5
7	EXP-TX A-6	7	EXP-TX B-6	7	EXP-TX C-6	7	EXP-TX D-6
8	EXP-TX A-7	8	EXP-TX B-7	8	EXP-TX C-7	8	EXP-TX D-7
9	EXP-TX A-8	9	EXP-TX B-8	9	EXP-TX C-8	9	EXP-TX D-8
10	VEXP-RX-2	10	VEXP-RX-1	10	VEXP-RX-1	10	VEXP-RX-1
11	VEXP-TX-2	11	VEXP-TX-1	11	VEXP-TX-1	11	VEXP-TX-1
12	VEXP-RX-3	12	VEXP-RX-3	12	VEXP-RX-2	12	VEXP-RX-2
13	VEXP-TX-3	13	VEXP-TX-3	13	VEXP-TX-2	13	VEXP-TX-2
14	VEXP-RX-4	14	VEXP-RX-4	14	VEXP-RX-4	14	VEXP-RX-3
15	VEXP-TX-4	15	VEXP-TX-4	15	VEXP-TX-4	15	VEXP-TX-3
16	VEXP-RX-5	16	VEXP-RX-5	16	VEXP-RX-5	16	VEXP-RX-5
17	VEXP-TX-5	17	VEXP-TX-5	17	VEXP-TX-5	17	VEXP-TX-5
18	VEXP-RX-6	18	VEXP-RX-6	18	VEXP-RX-6	18	VEXP-RX-6
19	VEXP-TX-6	19	VEXP-TX-6	19	VEXP-TX-6	19	VEXP-TX-6
20	VEXP-RX-7	20	VEXP-RX-7	20	VEXP-RX-7	20	VEXP-RX-7
21	VEXP-TX-7	21	VEXP-TX-7	21	VEXP-TX-7	21	VEXP-TX-7
22	VEXP-RX-8	22	VEXP-RX-8	22	VEXP-RX-8	22	VEXP-RX-8
23	VEXP-TX-8	23	VEXP-TX-8	23	VEXP-TX-8	23	VEXP-TX-8

Table 2-14 Ports for Virtual PP Mesh 8 (5 to 8)

VPASSIVE_5_PPMESH8		VPASSIVE_6_PPMESH8		VPASSIVE_7_PPMESH8		VPASSIVE_8_PPMESH8	
1	COM-RX E	1	COM-RX F	1	COM-RX G	1	COM-RX H
2	EXP-TX E-1	2	EXP-TX F-1	2	EXP-TX G-1	2	EXP-TX H-1
3	EXP-TX E-2	3	EXP-TX F-2	3	EXP-TX G-2	3	EXP-TX H-2
4	EXP-TX E-3	4	EXP-TX F-3	4	EXP-TX G-3	4	EXP-TX H-3
5	EXP-TX E-4	5	EXP-TX F-4	5	EXP-TX G-4	5	EXP-TX H-4
6	EXP-TX E-5	6	EXP-TX F-5	6	EXP-TX G-5	6	EXP-TX H-5
7	EXP-TX E-6	7	EXP-TX F-6	7	EXP-TX G-6	7	EXP-TX H-6
8	EXP-TX E-7	8	EXP-TX F-7	8	EXP-TX G-7	8	EXP-TX H-7
9	EXP-TX E-8	9	EXP-TX F-8	9	EXP-TX G-8	9	EXP-TX H-8
10	VEXP-RX-1	10	VEXP-RX-1	10	VEXP-RX-1	10	VEXP-RX-1
11	VEXP-TX-1	11	VEXP-TX-1	11	VEXP-TX-1	11	VEXP-TX-1
12	VEXP-RX-2	12	VEXP-RX-2	12	VEXP-RX-2	12	VEXP-RX-2
13	VEXP-TX-2	13	VEXP-TX-2	13	VEXP-TX-2	13	VEXP-TX-2
14	VEXP-RX-3	14	VEXP-RX-3	14	VEXP-RX-3	14	VEXP-RX-3
15	VEXP-TX-3	15	VEXP-TX-3	15	VEXP-TX-3	15	VEXP-TX-3
16	VEXP-RX-4	16	VEXP-RX-4	16	VEXP-RX-4	16	VEXP-RX-4
17	VEXP-TX-4	17	VEXP-TX-4	17	VEXP-TX-4	17	VEXP-TX-4
18	VEXP-RX-6	18	VEXP-RX-5	18	VEXP-RX-5	18	VEXP-RX-5
19	VEXP-TX-6	19	VEXP-TX-5	19	VEXP-TX-5	19	VEXP-TX-5
20	VEXP-RX-7	20	VEXP-RX-7	20	VEXP-RX-6	20	VEXP-RX-6
21	VEXP-TX-7	21	VEXP-TX-7	21	VEXP-TX-6	21	VEXP-TX-6
22	VEXP-RX-8	22	VEXP-RX-8	22	VEXP-RX-8	22	VEXP-RX-7
23	VEXP-TX-8	23	VEXP-TX-8	23	VEXP-TX-8	23	VEXP-TX-7

**Step 14** Before un-splitting a node, take a backup copy of the Split Node. To unsplit the nodes in a site after analysis, right-click on the site and select UnSplit. This can be performed in the project explorer pane also. When a node is unsplit:

- Per-side NEs are combined to single NE and reflected in site navigation and net view.
- Common NE is removed.
- Layout is unlocked.
- Unit IDs/MSM IDs are regenerated for the combined layout.
- Reserved Virtual-PPMesh unit IDs are removed.
- IP addresses are removed.

To unsplit or split multiple sites, select the sites and perform the required action.

## 2.15.1 Limitations

The following limitations apply to Split ROADM for this release:

- No support for splitting of site having omnidirectional sides and/or colorless ports.
- No support for creating OCH-CC circuits for Ethernet aggregate and TDM aggregate demands. Creating OCH-NC circuits is recommended.
- No support for creating OCH-CC circuits with alien/line/pluggable cards. Creating OCH-NC circuits is recommended.
- No support for exporting PSM-OCH protected circuits in NeUpdate XML.
- No support for circuit regenerating on a split node. Delete such circuits before splitting the node to avoid invalid reports.
- No support for circuit having optical bypass on a split node. Delete such circuits before splitting the node to avoid invalid reports.
- Information related to PPC and virtual PP-MESH is available only in NeUpdate XML file.
- PPM port types are not available in NeUpdate XML for the following cards. Creating OCH-NC circuits is recommended.
  - 40E-TXP-C
  - 40G-TXP-C
  - MXP\_MR\_10DMEX\_C
  - MXP\_2.5G\_10EX\_C
  - TXP\_MR\_10EX\_C
  - ADM\_10G
  - MXP\_MR\_10DME
  - TXP\_MR\_10E\_y
  - MXP\_2.5G\_10E\_y
  - TXP\_MR\_10E
  - 40G DWDM ITU-T MXP
  - 40G DWDM ITU-T TXP
  - MXP\_MR\_2.5G
  - MXPP\_MR\_2.5G
  - 530 MR MXP
  - 530 MR TXP
  - TXP\_MR\_10E
  - MXP\_2.5G\_10E
  - 530 MR TXP/MXP
  - TXP\_MR\_2.5G
  - TXPP\_MR\_2.5G
  - TXP\_MR\_10G
  - MXP\_2.5G\_10G

- 15454-10GE-XPE
  - 15454-10GE-XP
  - 15454-GE-XPE
  - 15454-GE-XP
  - 15454-40EX-TXP-C
  - 15454-40G-TXP-C
- Virtual PP-MESH Unit IDs are not editable.
  - Merging two side NEs is not recommended.
  - All circuits originating or terminating from the same transponder/muxponder cards should be OCH-NC or OCH-CC or OCH-NCDCN.
  - Circuits are exported in NeUpdate XML only if at least one of the nodes is split and the circuit is originating/terminating or expressing through the split node.

## 2.16 Flex SMR with Inline DCU

The embedded amplifiers of the Flex SMR-9 and SMR-20 units, introduced in CTP 10.5, do not support DCUs. When 10G optical channels pass through the Flex SMR-9 or SMR-20 cards, you can use inline DCUs to provide the required chromatic dispersion compensation. An inline DCU provides chromatic dispersion compensation before a signal enters the node. You can either use a single inline DCU or cascade two inline DCUs for a higher chromatic dispersion compensation.



### Note

In CTP 10.6, inline DCU is supported only on SMR-9 and SMR-20 cards of Release 10.5.

To use an inline DCU along with an SMR-9 or SMR-20 card, use the following procedure:

- Step 1** Create a demand using the Point to Point Demand Creation wizard.
- Step 2** Complete any one of the following:
  - In the **Project Explorer pane**, right-click the site you want to modify and select **Edit**.
  - In the **NetView Name** tab, double-click the site icon.
  - In the **NetView Name** tab, right-click the site icon and select **Edit**.

The Site Edit dialog box appears.
- Step 3** From the **Structure** drop-down list, choose Terminal, Line, or Multidegree.
- Step 4** From the **Node** drop-down list, choose Flex NG-DWDM.
- Step 5** From the **Functionality** drop-down list, choose one of the following:
  - R-OADM or Gain Equalizer (for Line)
  - ROADM (for Terminal)
  - OXC (for Multidegree)
- Step 6** From the **Type** drop-down list, choose SMR-9, SMR-20, or Auto.
- Step 7** Click **Apply** and **OK**.
- Step 8** Click C-Band Amplifiers in the **Project Explorer pane**.



- Step 9** For C-Band Amplifiers, check the **Enable Inline DCU** check box in the **General** area of the **Properties** pane to use an inline DCU along with an SMR-9 or SMR-20 card.
- Step 10** For C-Band Amplifiers, choose an inline DCU from the **Inline DCU** drop-down list in the **From Fibre** area of the **Properties** pane. The different options are:
- Auto—Sets the default option
  - None—No inline DCU
  - DCU-100—Provides compensation level of 100 ps/nm
  - DCU-350—Provides compensation level of 350 ps/nm
  - DCU-450—Provides compensation level of 450 ps/nm
  - DCU-550—Provides compensation level of 550 ps/nm
  - DCU-750—Provides compensation level of 750 ps/nm
  - DCU-950—Provides compensation level of 950 ps/nm
  - DCU-1150—Provides compensation level of 1150 ps/nm
  - DCU-1350—Provides compensation level of 1350 ps/nm
  - DCU-1550—Provides compensation level of 1550 ps/nm
  - DCU-1950—Provides compensation level of 1950 ps/nm

If you want a higher chromatic dispersion compensation, you can choose a second inline DCU from the **Inline DCU2** drop-down list. In this case, both DCUs are cascaded.

- Step 11** Click the **Analyze Network** icon in the toolbar.

The Cisco Transport Planner analysis status bar indicates the completion of the network analysis. The Summary report appears.

- Click the Optical Results Report to view the Residual CD, which is the total dispersion value of the circuit.
- Click the site and click Layout in the **Tasks** pane to view the graphical representation of the layout for the single site in the analyzed network. You can view the selected DCU unit in the layout.
- Click Bill of Material in the **Tasks** pane to view the product ID and cost of the chosen inline DCU.

## 2.17 Connection Verification

Connection Verification validates the correct optical interconnection between the optical cards inside a Flex ROADM. This feature also measures the insertion loss of the external passive path, validates the quality of the connections to the patch panel, and checks if the insertion loss is within expected value..

The SMR-20 FS CV cards provide the connection verification feature along with the passive modules MF-DEG-5-CV, MF-UPG-4-CV, and MF-M16LC-CV.

The highlights of this feature are:

- Validation of the SMR20 FS CV card connection with other nodes or local Add/Drop elements.
- Detection of any incorrect cabling of the ROADM network element.
- Collection of insertion losses of every possible optical path inside the network element, in order to predict any possible failure.

- Verification of the connection every six hours, by default.

To enable the connection verification feature on the network, use the following procedure:

- 
- Step 1** In the Project Explorer pane, click the required network or site.
- Step 2** Check the **Connection Verification** check box in the **Bill of Material** area of the **Properties** pane.
- 

## 2.17.1 Connection Verification Pre-Requisites

Following are the prerequisites for connection verification:

- Flex nodes must be present.
- Loopback caps must be installed on all the unused ports of the passive modules.
- At least one SMR20 FS CV card must be present in the node.
- All sides of the node must have a SMR20 FS CV card to test all cables and patchcords.
- All passive modules must be connected with an USB cable and associated so that power readings can be calculated.

### Supported Cards

The cards that support connection verification are:

- 16-AD-FS
- SMR20 FS CV
- MF-DEG-5-CV
- MF-MPO-16LC-CV
- MF-UPG-4-CV