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EPUSP, 2021

Reference: CISCO Transport Planner DWDM Operations Guide v11.1

CTP version 11

Cisco Transport Planner software provides a simple tool set for designing optical networks with Cisco ONS

15454 MSTP and NCS products.

You enter all network parameters, or minimal information, such as site distance, and Cisco Transport Planner models the network you need to build and generate a detailed BOMwith ordering information.

Designing optical networks requires the verification of multiple constraints such, as optical budget limitations and platform architectural restrictions.

A single Cisco Transport Planner project can contain multiple copies of a network. This duplication allows you to change parameters in one network copy, and then analyze and compare it with another network copy to study the differences.

CTP uses 5us/km for fiber and DCU as a length-based latency.

New Features

Features	Description
SMR9 support on SSON	From Release 11.0, SMR9 with Contentionless Configuration is supported on all SSON Networks. From Release 11.0, Layer2 SMR flag can be enabled on an SSON Network, but no Layer2 Contentionless Side support is present.
Support of Regeneration on Alien	From Release 11.1 onwards, Regeneration is supported on the NCS 1004 with the Alien NCS4K-4H-OPW-QC2 Line Card and Denali Alien.
Support of RAMAN-COP-CTP on SSON	From Release 11.1, RAMAN-COP-CTP is supported on SSON Networks.
Support of MER Pluggable on 400G-XP-LC card (OTNXC and MR-MXP mode)	From Release 11.1, the 400-XP-LC card with MXP and OTNXC mode supports QSFP-4X10-MER pluggable on 10GE, OC192/STM64, OTU2, OTU2e client interfaces.
8GFC Client Interface blocking on CDR ports of 400G-XP-LC card	From Release 11.0, the 8GFC Blocking is enabled on the CDR ports of the 400G-XP-LC card.

Installation and Lauching

Installing Cisco Transport Planner (1/2)

Step 1 To download the installer, go to the Cisco software download site.

Step 2 Navigate to the location where you want to save the CTP executable file to a local hard drive.

Step 3 Click **Save**.

Step 4 To start the installation of CTP:

- Windows—Navigate to the folder containing the CTP executable file and double-click it.
- Linux—Assuming the CTP.bin file is accessible from the current shell path, navigate to the directory containing the CTP.bin file and enter: % ./CTP.bin

The graphical CTP installation wizard is displayed.

Step 5 Click **Next**. The license agreement is displayed.

Step 6 To accept the license, select the I accept the terms of the License Agreement radio button.

Step 7 Click **Next**.

Step 8 Specify the installation folder. On Windows 7 or Windows 10, the default is C:\Program Files\Cisco\CTP_11.1.

To choose a different folder, click the **Choose...** button and browse to the required folder. To restore the default path, click the **Restore Default Folder** button.

Step 9 Click **Next**.

Step 10 Specify the shortcut folder by choosing any one of the following options:

- In a new Program Group—Specify a new folder. The default option is CTP_11.1.

Installing Cisco Transport Planner (2/2)

- In an existing Program Group—Select a folder from the list of existing folders.
- In the Start Menu
- On the Desktop
- In the Quick Launch Bar
- Other—Use this option to specify a commonly used folder.
- Don't create icons—Choose this option if you do not want to create a shortcut.

Note Check the Create Icons for All Users check box if you want to create shortcuts for all the users of a system.

Step 11 Click **Next**. The pre-installation summary is displayed.

Step 12 Review the pre-installation summary. If no changes are required, click **Install**; otherwise, click **Previous** to make modifications.

A progress bar displays the installation status. Click **Cancel** at any time to stop the installation.

When the installation process is complete, a screen indicates whether the installation succeeded or failed.

Step 13 Click **Done** to exit the installation wizard.

Launching the Cisco Transport Planner (1/2)

Before you start the Cisco Transport Planner (CTP), you need to save the user profiles provided by Cisco Systems to the profiles folder available at the installation location. Access to CTP features depends on the user profile you select when you start CTP. The default profile is Base Network Designer.

Step 1 Launch Cisco Transport Planner using any of the following options:

- Click the CTP icon in the **Start** > **All Programs** > **CTP**menu.
- Double-click the CTP icon in the quick launch bar.
- Double-click the CTP icon on the desktop.
- Browse to the installation folder and double-click the ctp.jar file.

CTP validates the installed Java version in the system. If the installed version is Java 1.7 or Java 1.8, the CTP login dialog box is displayed.

Note If Java 1.7 or Java 1.8 is unavailable, CTP displays the JVM Version Error dialog box that lists the incompatible Java versions. Install the required Java version from the http://www.oracle.com/technetwork/java/index.html website. Repeat Step 1.

Step 2 From the Current selected profile drop-down list, select the user profile.

Launching the Cisco Transport Planner (2/2)

Step 3 Click **Continue** to open the Cisco Transport Planner.

The login profile type appears in the lower-right corner of the CTP window.

The Start Page is displayed. The Start Page provides the following options:

- **New**—Click to create a new project.
- **Open**—Click to open an existing project.
- **Import Network**—Click to import node parameters from a network.
- **Recent Network File**s area—Select an existing project to open it.

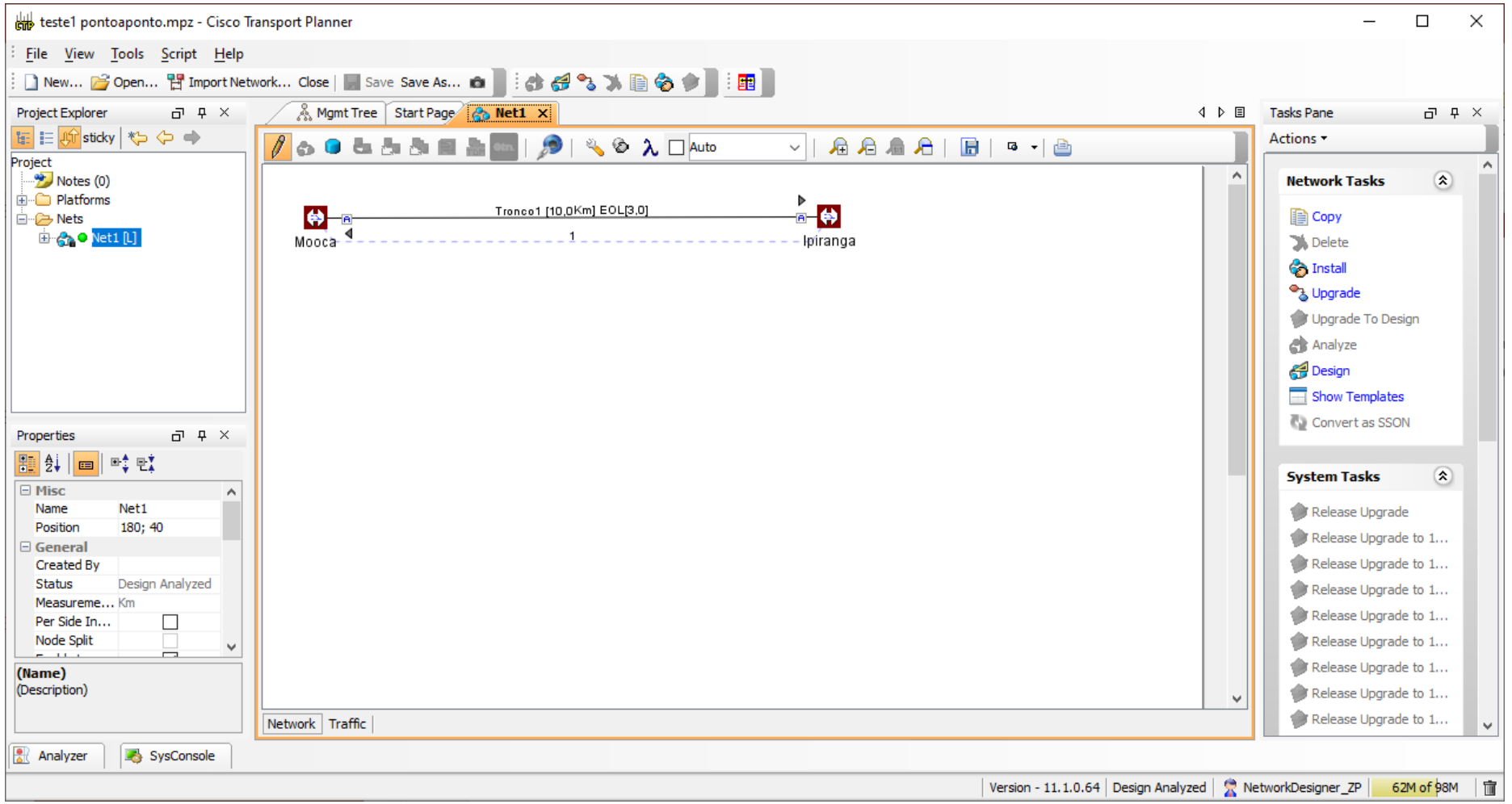
Selecting any of the above options opens a new tab.

Step 4 Check the **Do not show Start Page at startup** check box to disable viewing the start page when Cisco Transport Planner is started.

Check **View Start Page** check box under **Tools** > **Option** > **Graphic** > **Start Page** to enable displaying the Start Page when launching the CTP.

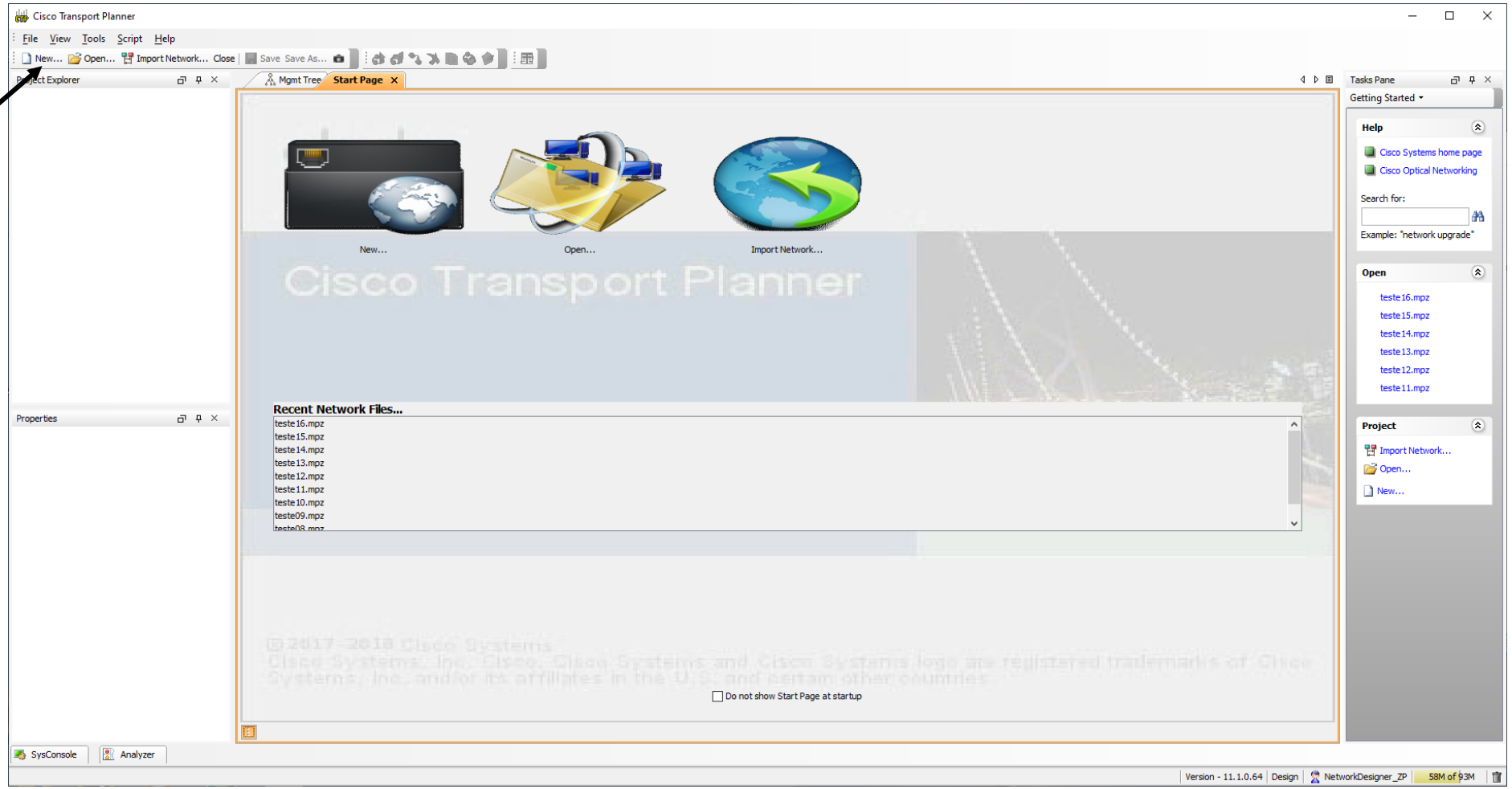
Creating a Simple Network

Example 1: point-to-point simple network

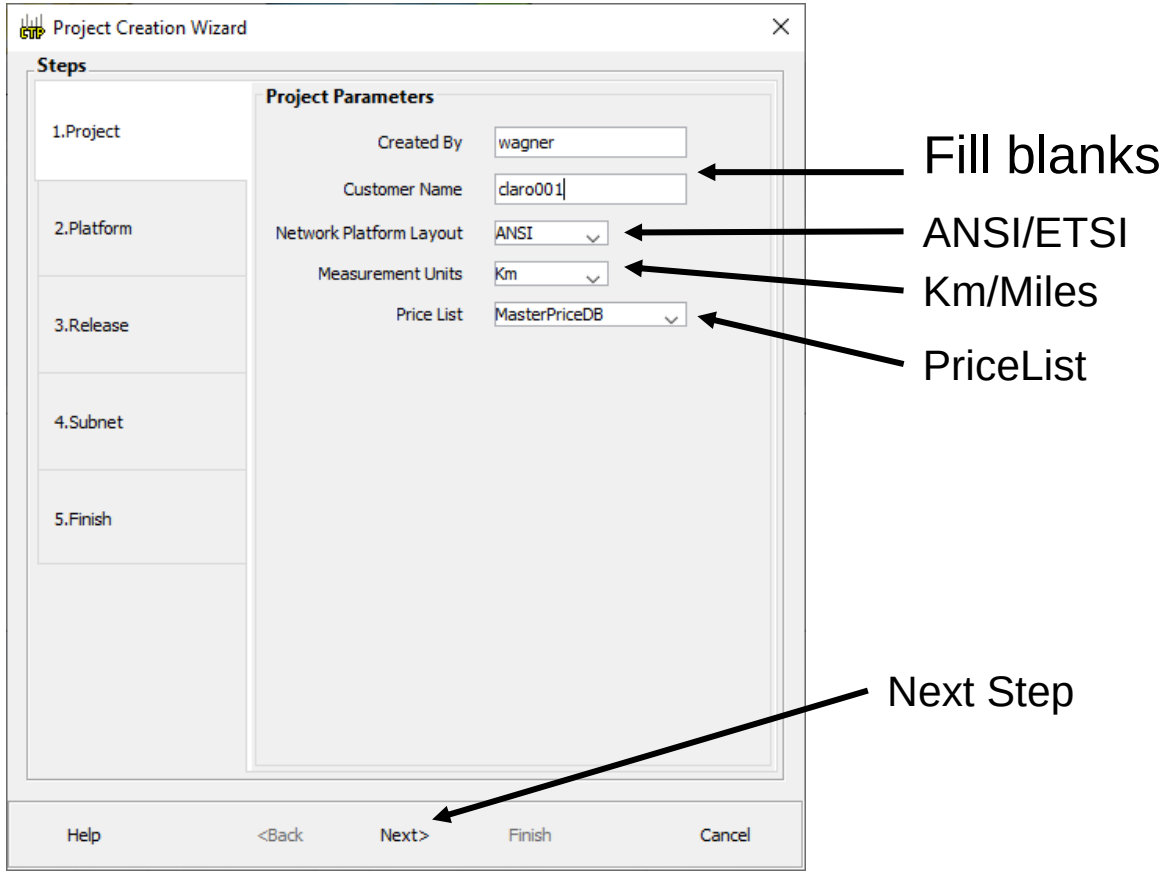


Initial Screen

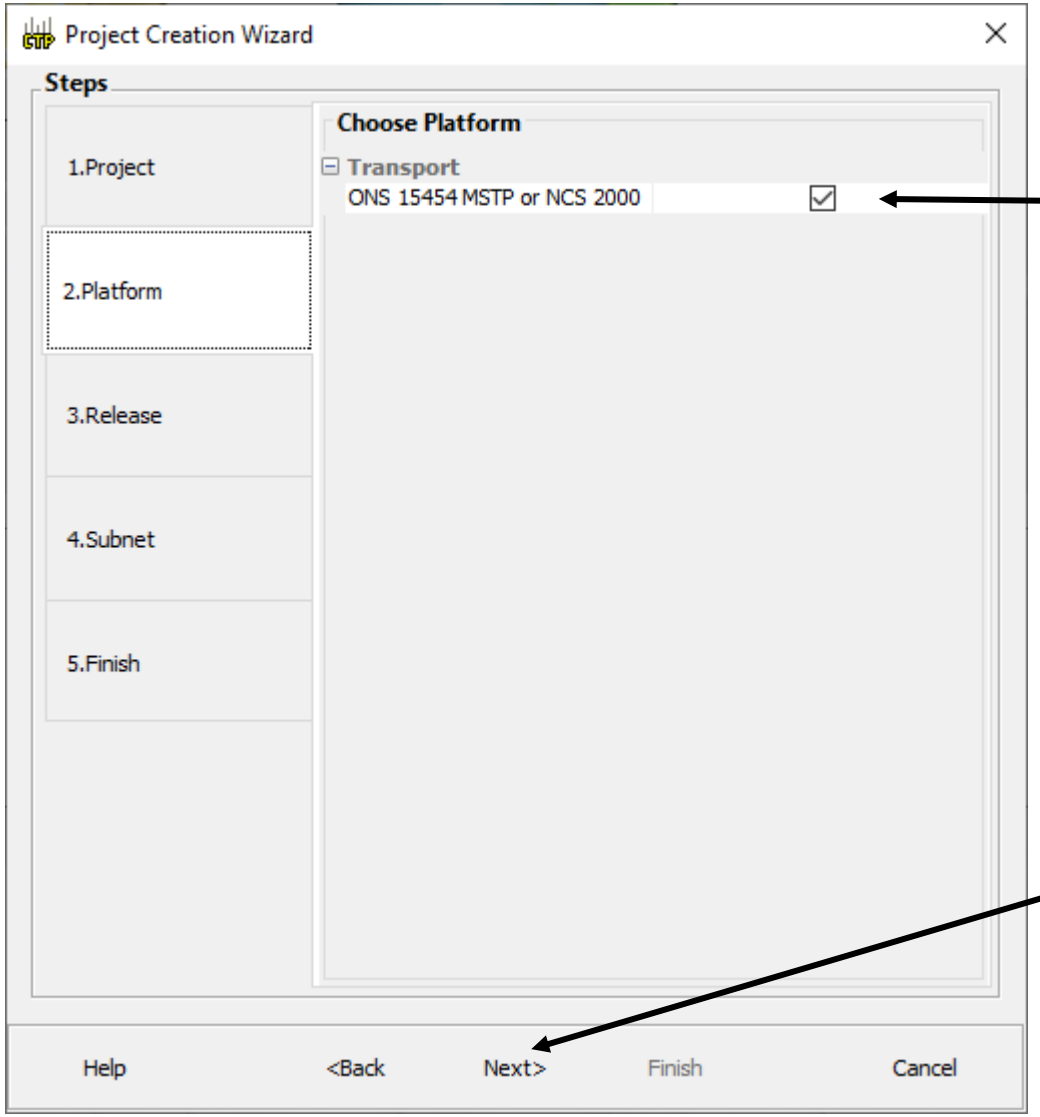
Open new



Project Wizard



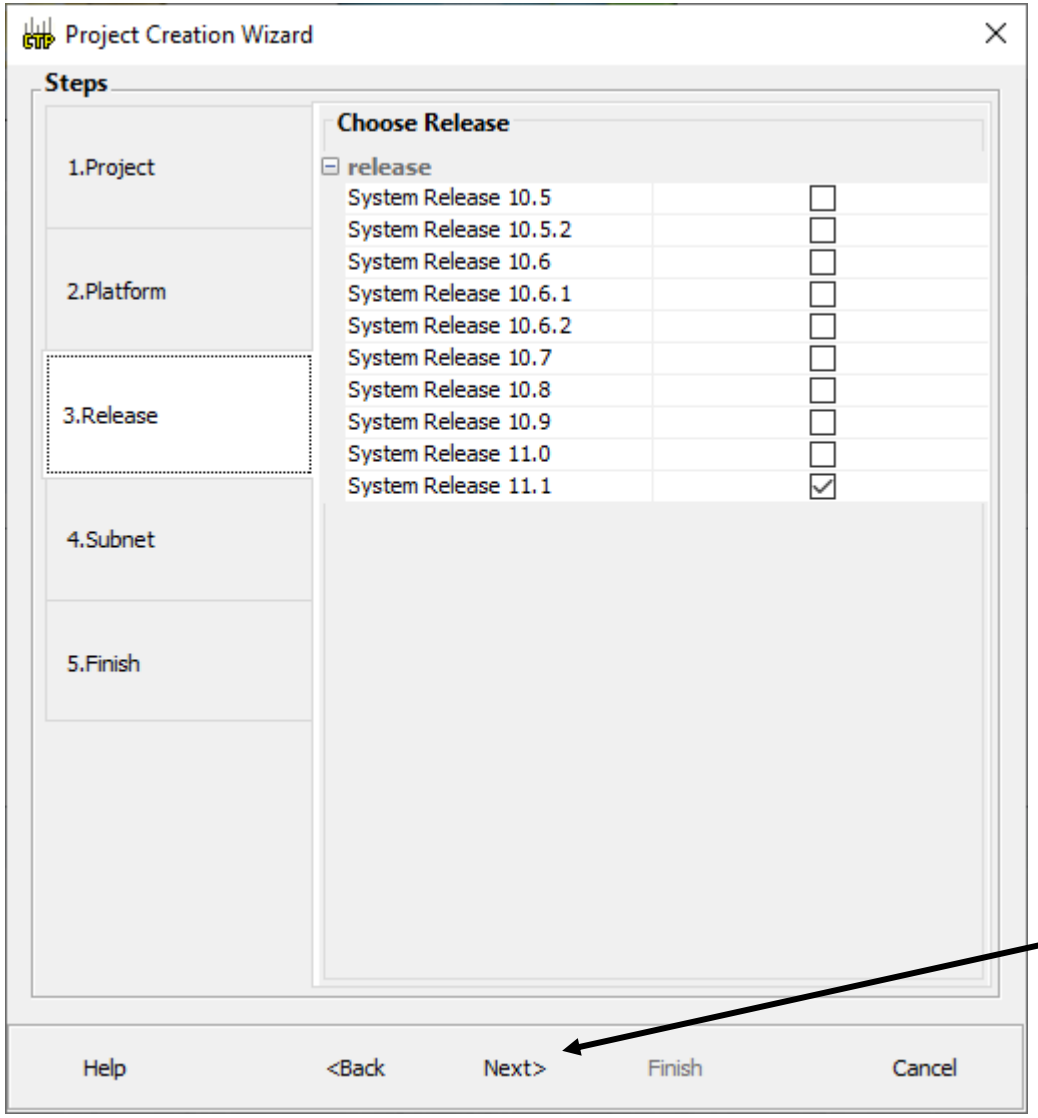
Choose Plataform



single option

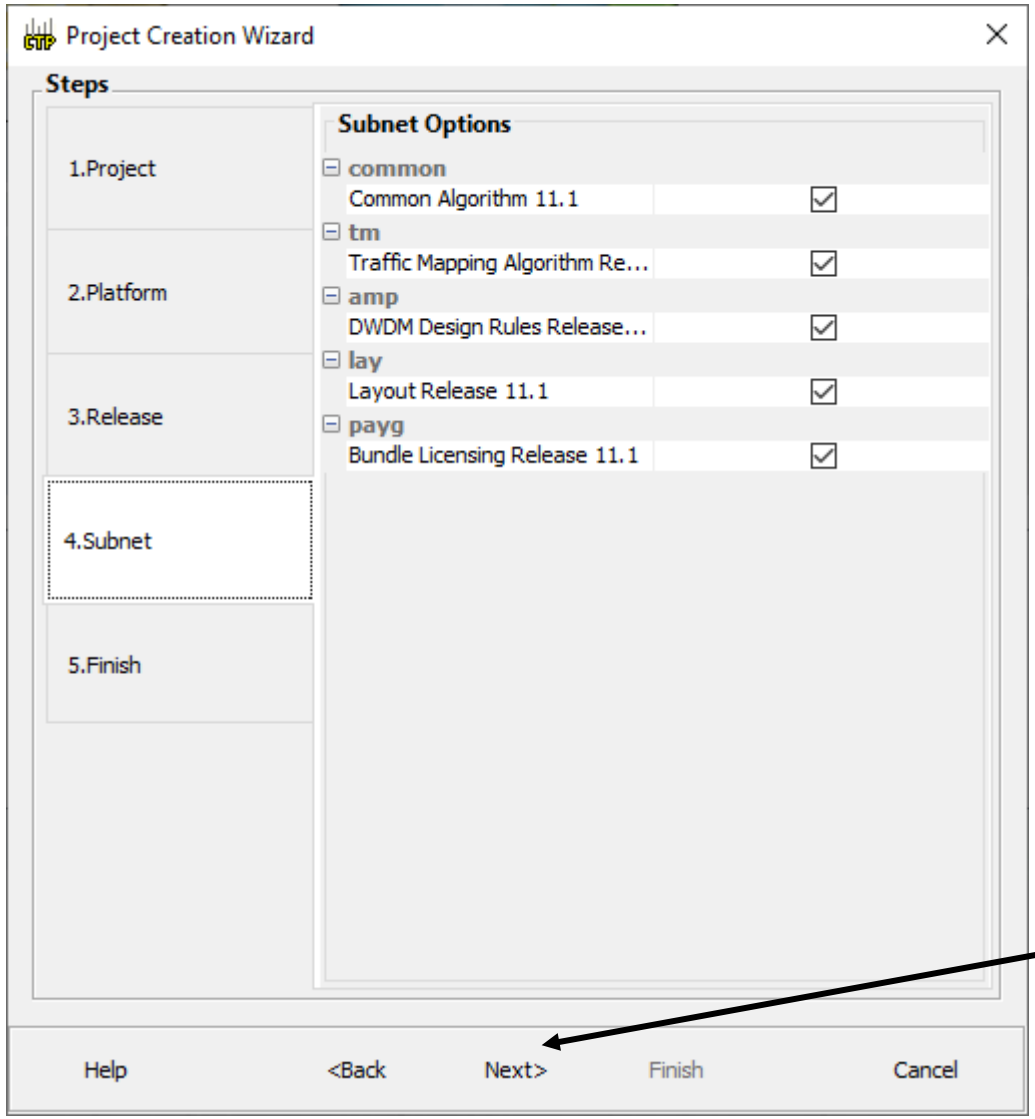
Next Step

System Release



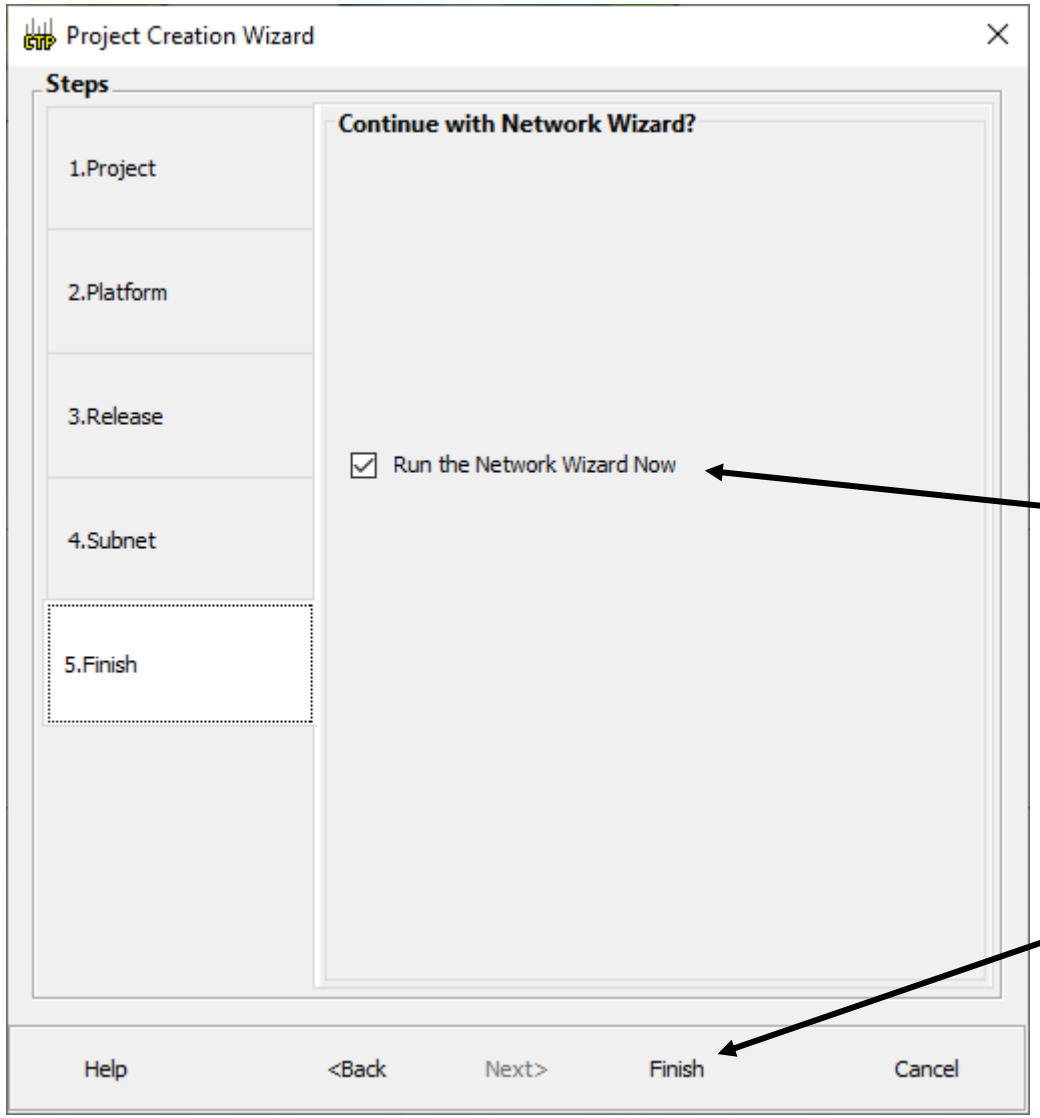
Next Step

Subnet Options



Next Step

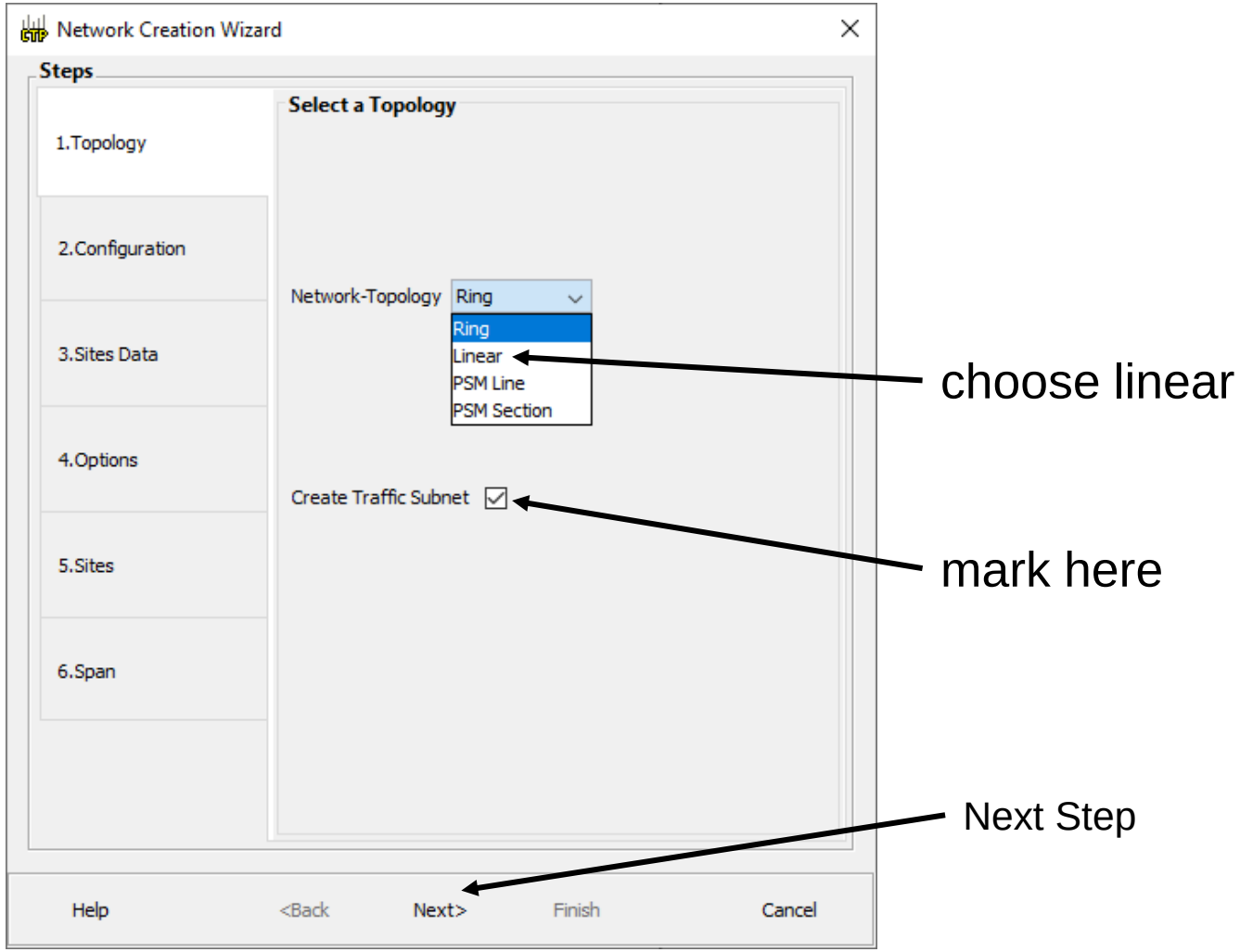
Finish Creation



Set here

Click here

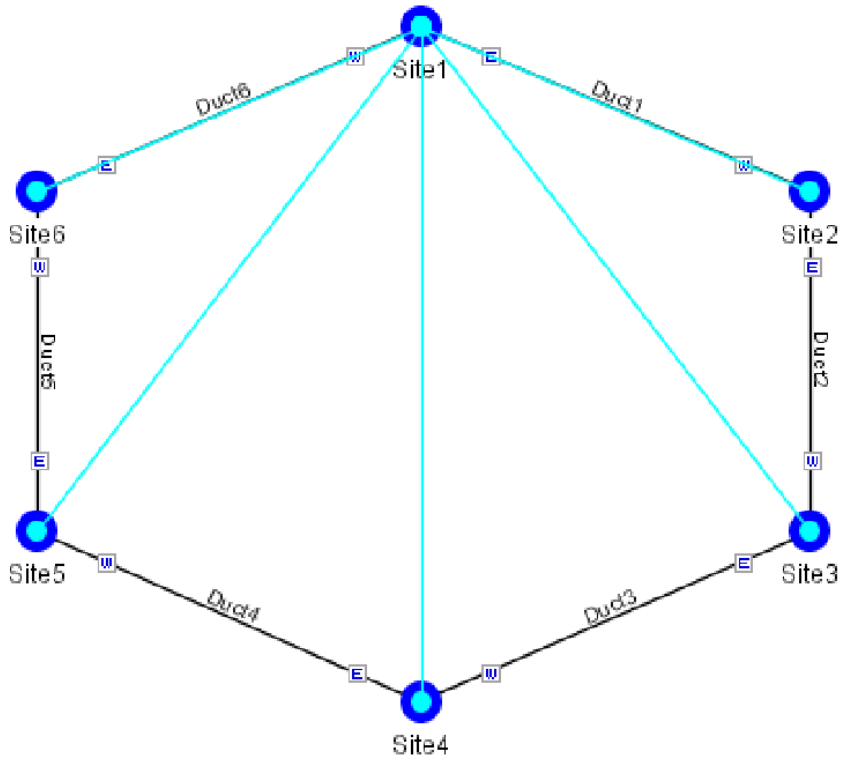
Select Topology



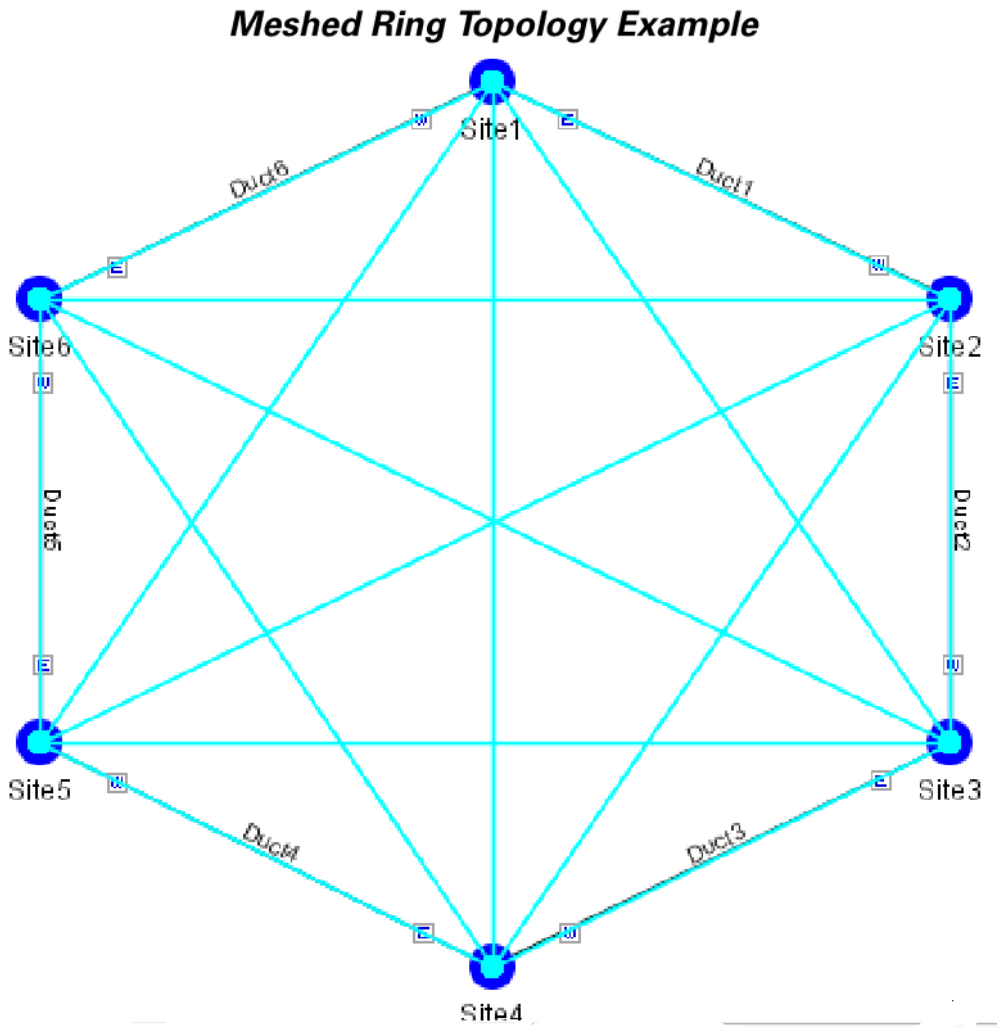
Modeled Network Examples

Linear Topology Example

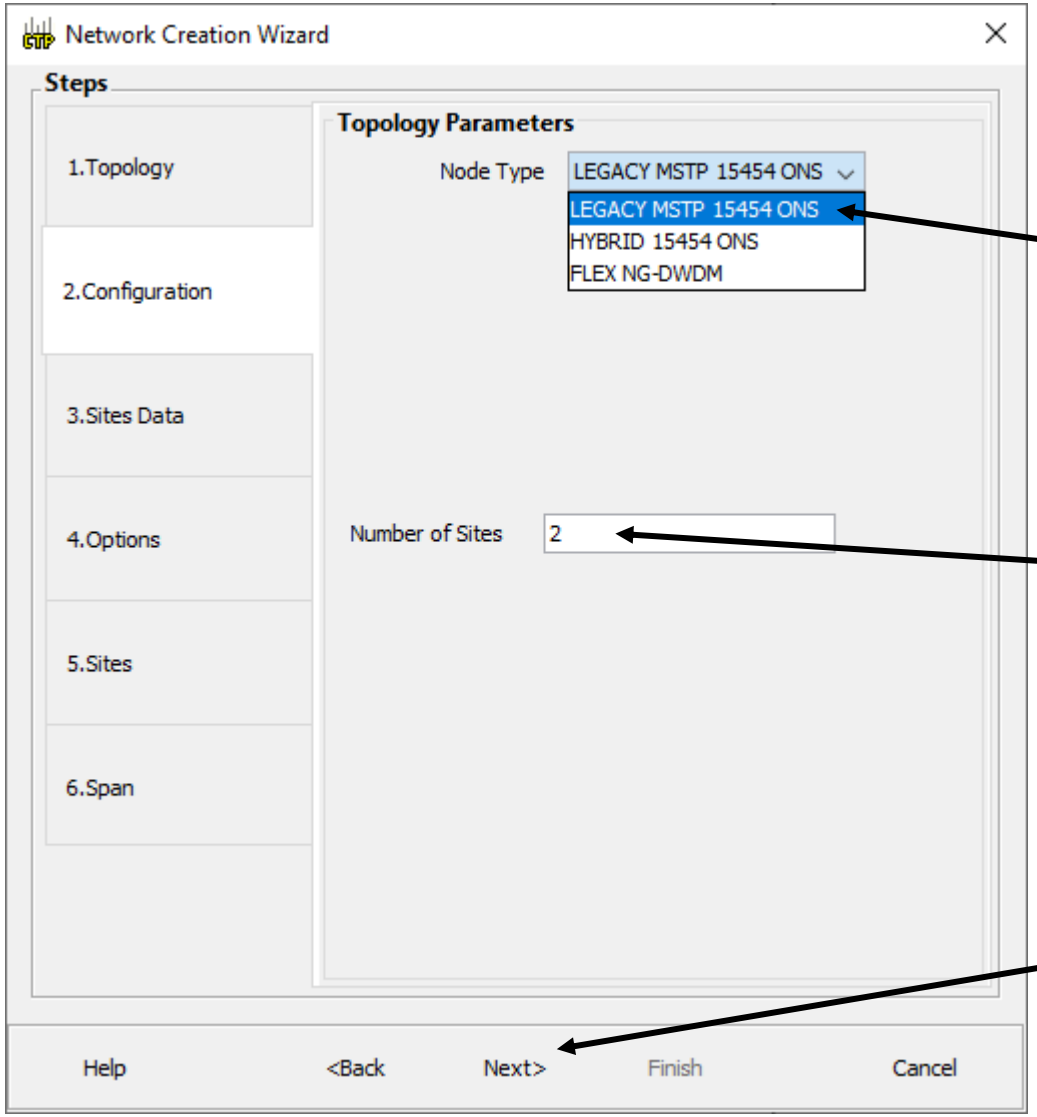
Hubbed Ring Topology Example



Modeled Network Examples



Topology Parameters

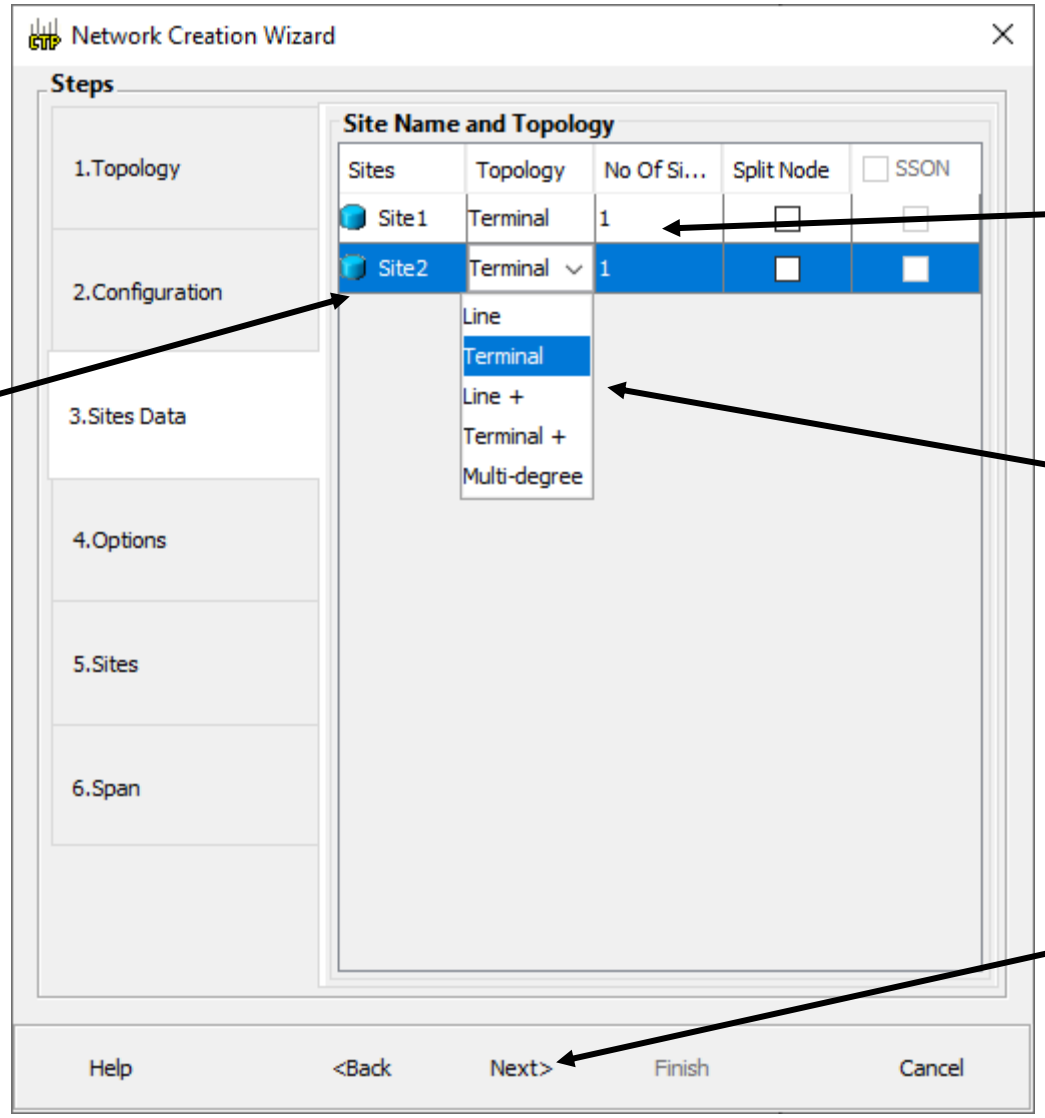


choose legacy

2 sites is a minimum

Next Step

Site Topology



Names can be changed later

Number of sides

there are restriction on node type

Next Step

Hybrid Configurations

Typically a node has ONS 15454 MSTP configuration with add/drop units like 40-MUX40-DMX-C1,ROADM units and so on.

However, the node configuration can also have ONS 15454 amplifiers along with

ONS 15216 FlexLayer add/drop units like FLB-2s, FLA-8s, and FLD-4s, and is known as Hybrid 15454 ONS configuration.

A network design can have up to 80 channels in a typical MSTP configuration; however, in a

Hybrid configuration the number of channels is restricted to 40.

In a Hybrid configuration, the Data Connection Network (DCN) manages the traffic instead of Optical Service Channel (OSC).

Hybrid nodes are add/dropnodes with express traffic and are comparatively less expensive than MSTP nodes.

Many components can be in phase-out. See: Cisco Transport Planner DWDM Operations Guide, Software
EOS PIDs [Cisco TransportPlanner] - Cisco

Pay as you Grow

The Pay As You Grow (PAYG) feature enables you to implement a cost effective solution when the wavelength requirements are comparatively less than the maximum capacity of the network. Instead of purchasing a standard card that is configured to work on maximum supported wavelengths, you can purchase a PAYG license that comprises of license restricted cards and a base license. The license restricted cards support only a number of wavelengths for which the licenses are installed on the card. The base license supports only 10 wavelengths. Therefore, a license restricted card having only the base license will support only ten wavelengths even if its maximum capacity is to support 40 wavelengths. The cost of the PAYG license is less than the cost of the standard card.

When there is a need of more than ten wavelengths, additional licenses can be purchased to support the increased demand. Each new license supports ten additional wavelengths. Therefore, the PAYG functionality significantly reduces the initial setup cost and enables the purchase of additional wavelength capacity on a need basis.

Topology and Sites

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	• Intermediate Sites on Working path • Intermediate Sites on Protected path	Both for working and protected paths: Maximum: 74 Minimum: 0 Default: 0
PSM Section	• Intermediate Sites on Working path • Intermediate Sites on Protected path	Both for working and protected paths: Maximum: 74 Minimum: 0 Default: 0

Topologies Description

Structure	Supported Configurations	Description
Line	• MSTP 15454 ONS • HYBRID 15454 ONS • NG-DWDM	Site with two sides facing two fiber spans. The default site value for ring topology is Line.
Terminal	• MSTP 15454 ONS • HYBRID 15454 ONS • NG-DWDM	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.
Multi-degree	• MSTP 15454 ONS • NG-DWDM	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.

Topologies Description

If the Network Topology is...	then...
Ring	You cannot choose the following options: • Terminal • Terminal+ • PSM Terminal - Optical Path Protection • PSM Terminal - Multiplex Section Protection
Linear	You cannot choose the following options: • Terminal for the intermediate sites • Terminal+ for the intermediate sites • PSM Terminal - Optical Path Protection • PSM Terminal - Multiplex Section Protection
PSM Line	You cannot set any topology for the sites. CTP automatically sets the site topology as follows: • PSM Terminal - Optical Path Protection for the two PSM sites • Line for the intermediate sites
PSM Section	You cannot set any topology for the sites. CTP automatically sets the site topology as follows: • PSM Terminal - Optical Path Protection for the two PSM sites • Line for the intermediate sites

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

16 degrees is also possible

Fibers per Site

- 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.

Site Structure Modification

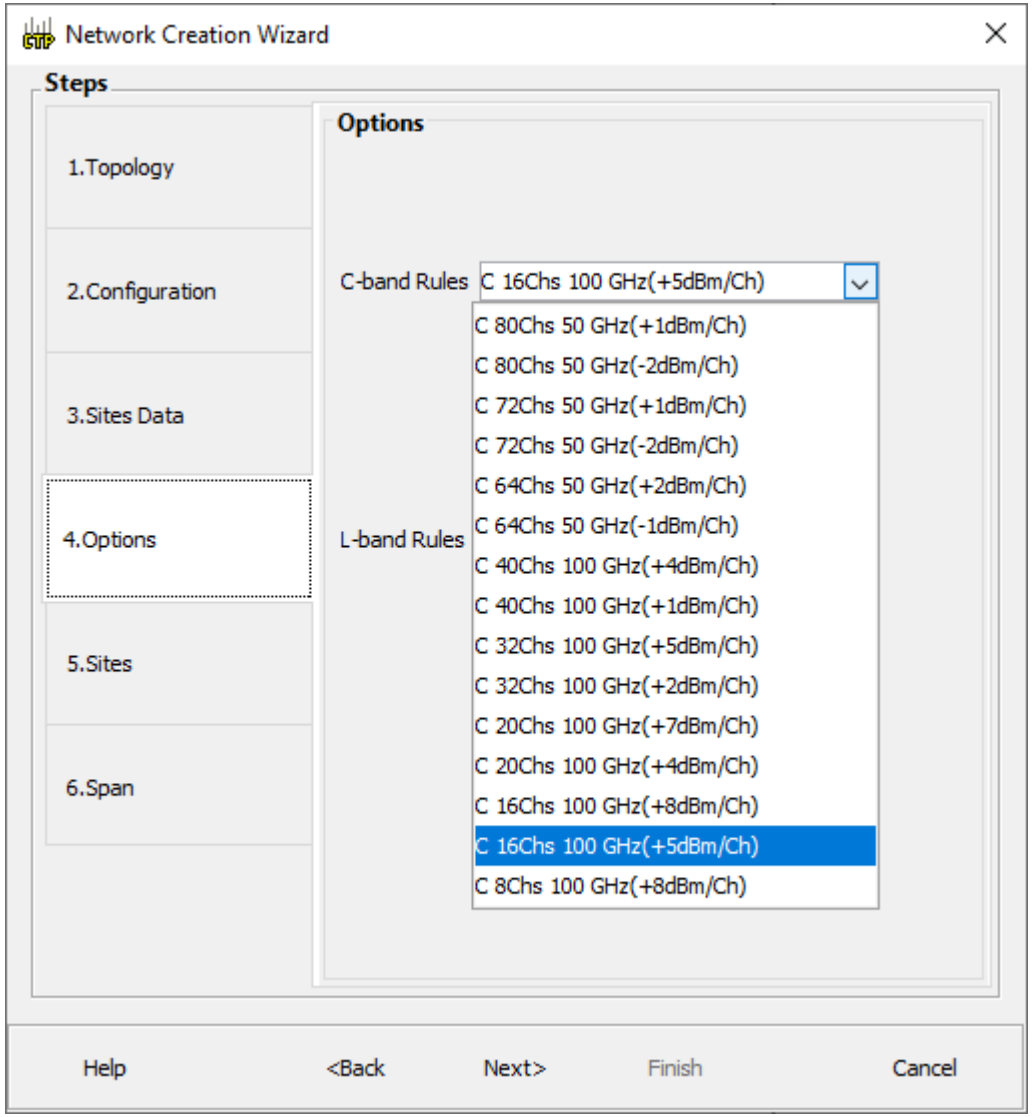
Structure	Supported Configurations	Description	Possible Structure Edits
Line	• MSTP 15454 ONS • HYBRID 15454 ONS • NG-DWDM	Two pairs of fibers are terminated at the node.	Can be changed to Line+ site. **Note** Line+site structure edit is applicable only on MSTP 15454 ONS
Terminal	• MSTP 15454 ONS • HYBRID 15454 ONS • NG-DWDM	A single pair of fiber is terminated at the node.	Can be changed to a Terminal+ site.
Line+	• MSTP 15454 ONS	Two pairs of fibers are terminated at the node, but the number of fibers can be increased when an MMU card (topology upgrade) is installed. This node is ready to scale to become a multidegree node after MMUs are installed in this node.	Can be changed to a Line site.
Terminal+	MSTP 15454 ONS	A single pair of fiber is terminated at the node, but the number of fibers can be increased if an MMU card (topology upgrade) is installed. This node is ready to scale to become a multidegree node after MMUs are installed in this node.	Can be changed to a Terminal site.
Multi-degree	• MSTP 15454 ONS • NG-DWDM	Nodes have more than two sides and face more than two fiber spans.	

To change any other structure (such as changing Line to Terminal), you must delete and reinsert the site.

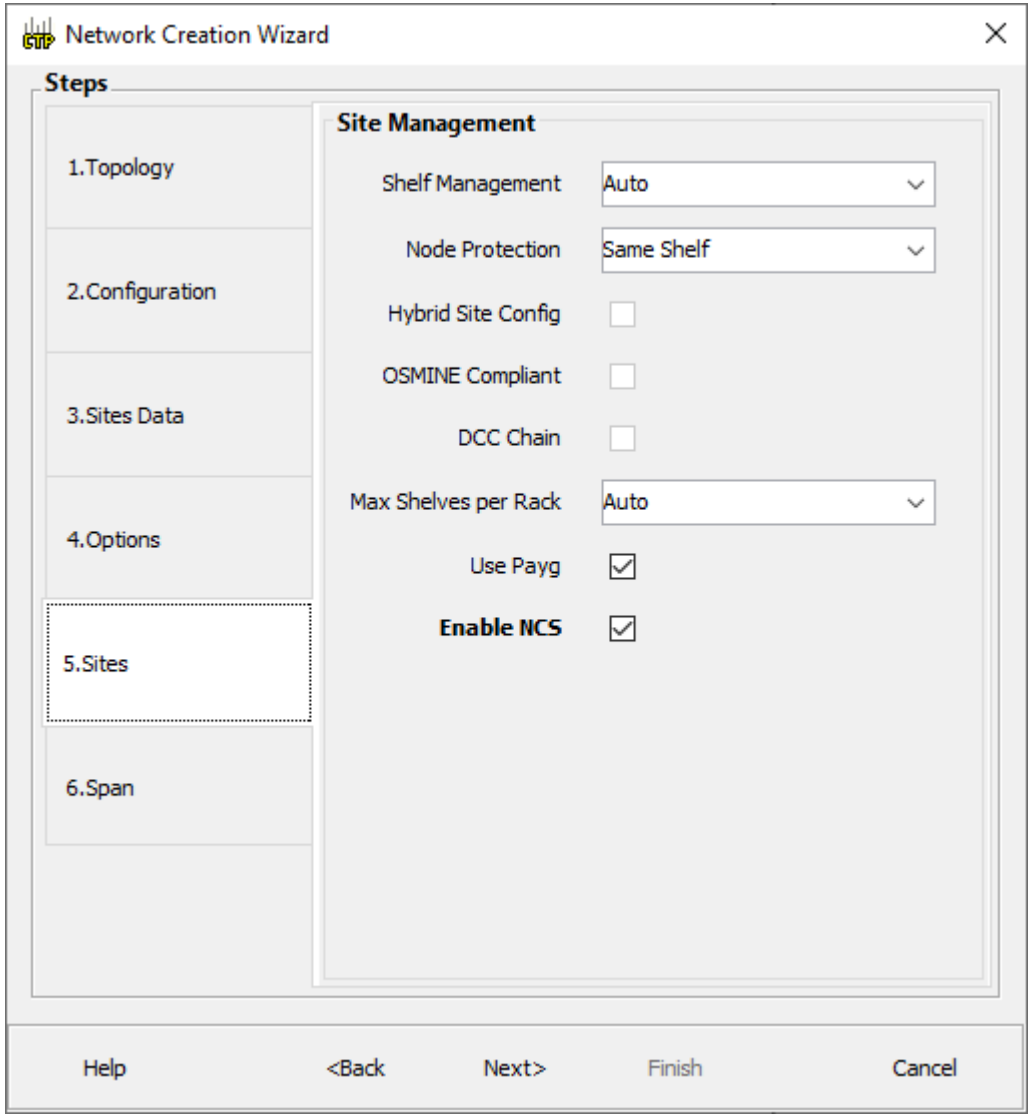
ROADM Options

Functionality	Type	Colorless ports (50 GHz)	Colorless ports (100 GHz)
ROADM	80-WXC-C (mux/demux)	72	72
ROADM / Hub / Terminal	40-SMR1-C	9	9
	40-SMR2-C	9	9
Hub / Terminal	80-WXC-C (mux/demux)	80	80
OIC	80-WXC-C (mux/demux)	72 if 2 sides are connected to ducts.63 if 3 sides are connected to ducts.54 if 4 sides are connected to ducts.45 if 5 sides are connected to ducts.36 if 6 sides are connected to ducts. 27 if 7 sides are connected to ducts. 18 is 8 sides are connected to ducts.	72 if 2 sides are connected to ducts.63 if 3 sides are connected to ducts.54 if 4 sides are connected to ducts.45 if 5 sides are connected to ducts.36 if 6 sides are connected to ducts. 27 if 7 sides are connected to ducts. 18 is 8 sides are connected to ducts.
OXC	80-WXC-C	9	9
	40-SMR2-C	9	9
	Flexible	9	9

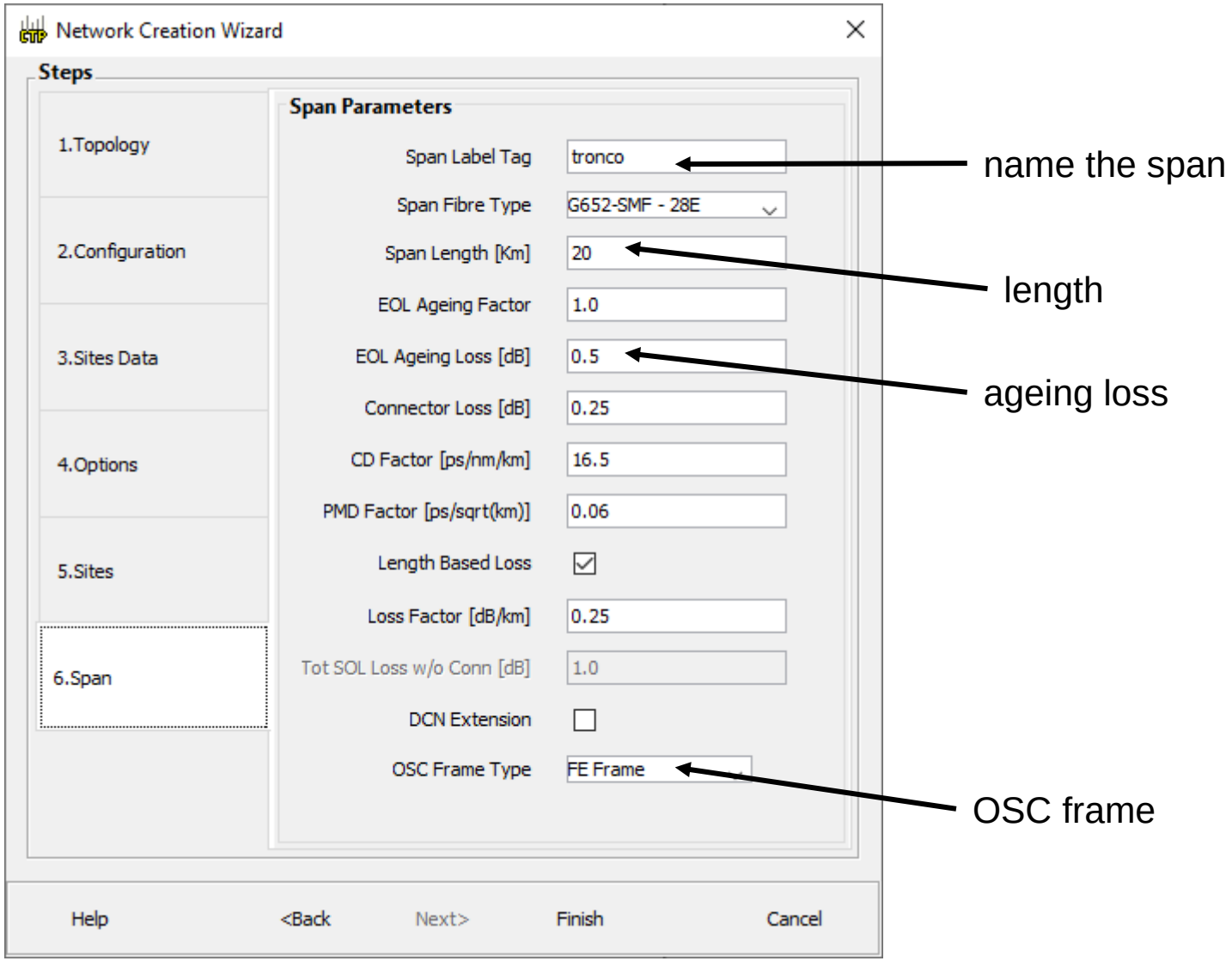
Subnet Options



Site Management

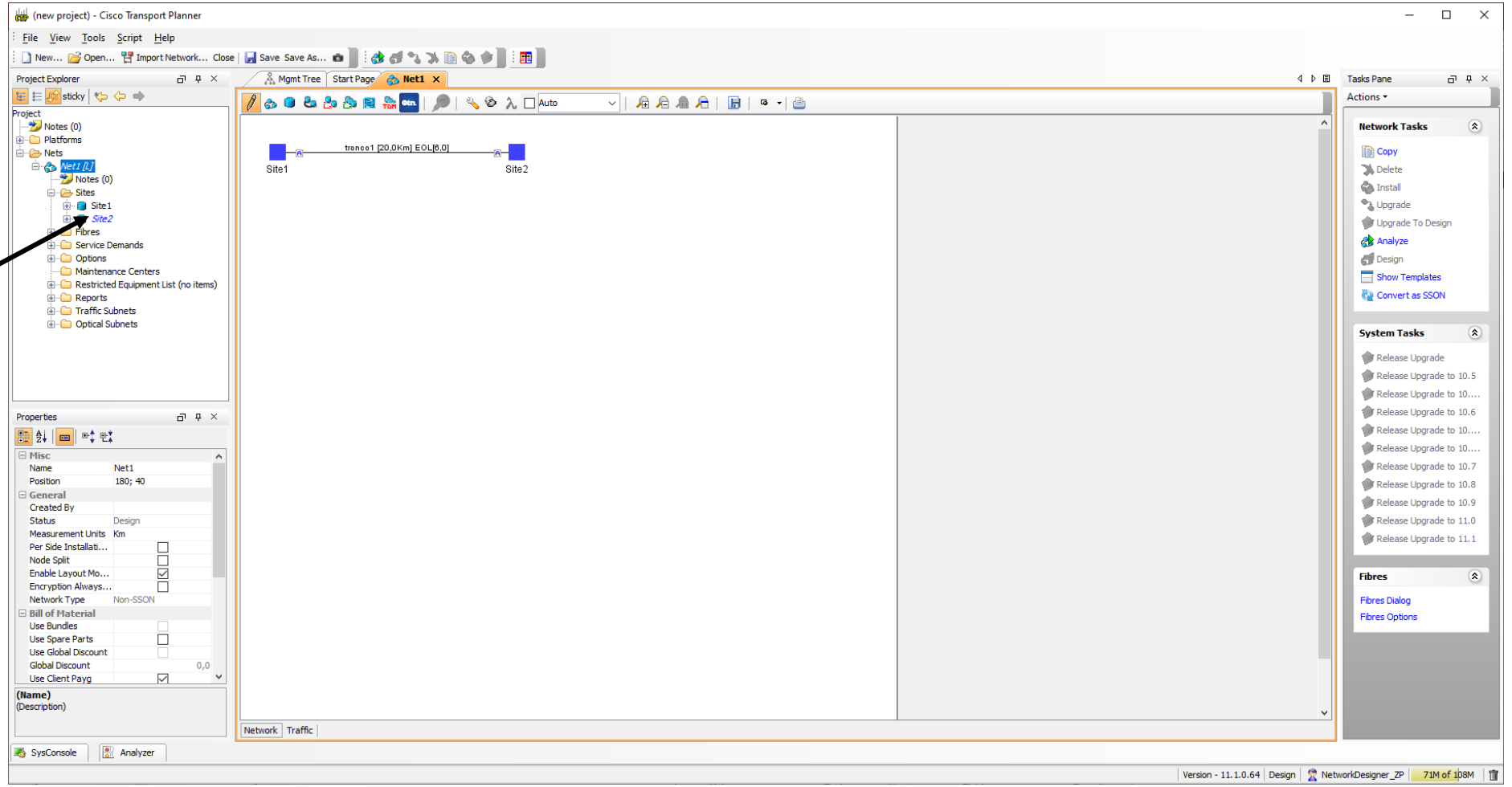


Span Parameters



Network is Created

change names



Side Labelling

Sites	Labeling in Previous Releases	Default labeling in Cisco Transport Planner Software R8.5 and later
Terminal/Terminal+	Only one side is created and labeled, T.	Label A is used for the existing side.
Line/Line+	Two sides are created and are labeled, West and East.	Labels A and B are used for the existing sides.
Multidegree with PP-MESH-4	—	Labels A, B, C, and D are used for the existing sides.
Multidegree with PP-MESH-8	—	Labels A, B, C, D, E, F, G, and H are used for the existing sides.
PSM Line	—	Labels Aw and Ap are used for the existing sides, where w stands for working and p stands for protection.
PSM Section	—	Labels Aw and Ap are used for the existing sides, where w stands for working and p stands for protection.

New Naming Convention for Contentionless sides

New naming convention is introduced in CTP Release 10.6.2 and applicable for Release 10.5.2 onwards.
The new naming convention is enabled by default for the new designs. For the existing network, follow the below steps to enable the new naming convention for the sides.

1. Unlock the Net.

2. Right click the Net, and select Side naming convention.

New Naming Scheme

• If you enable the new naming convention then the Layer-1 sides will be named from T, S, R, Q, P, O, N, M, L, K, J, I, H, G, F, E and index depending upon the used Scalable Upto parameter.

• To use Layer-2 sides new naming convention, you must enable the Layer-2 flag.

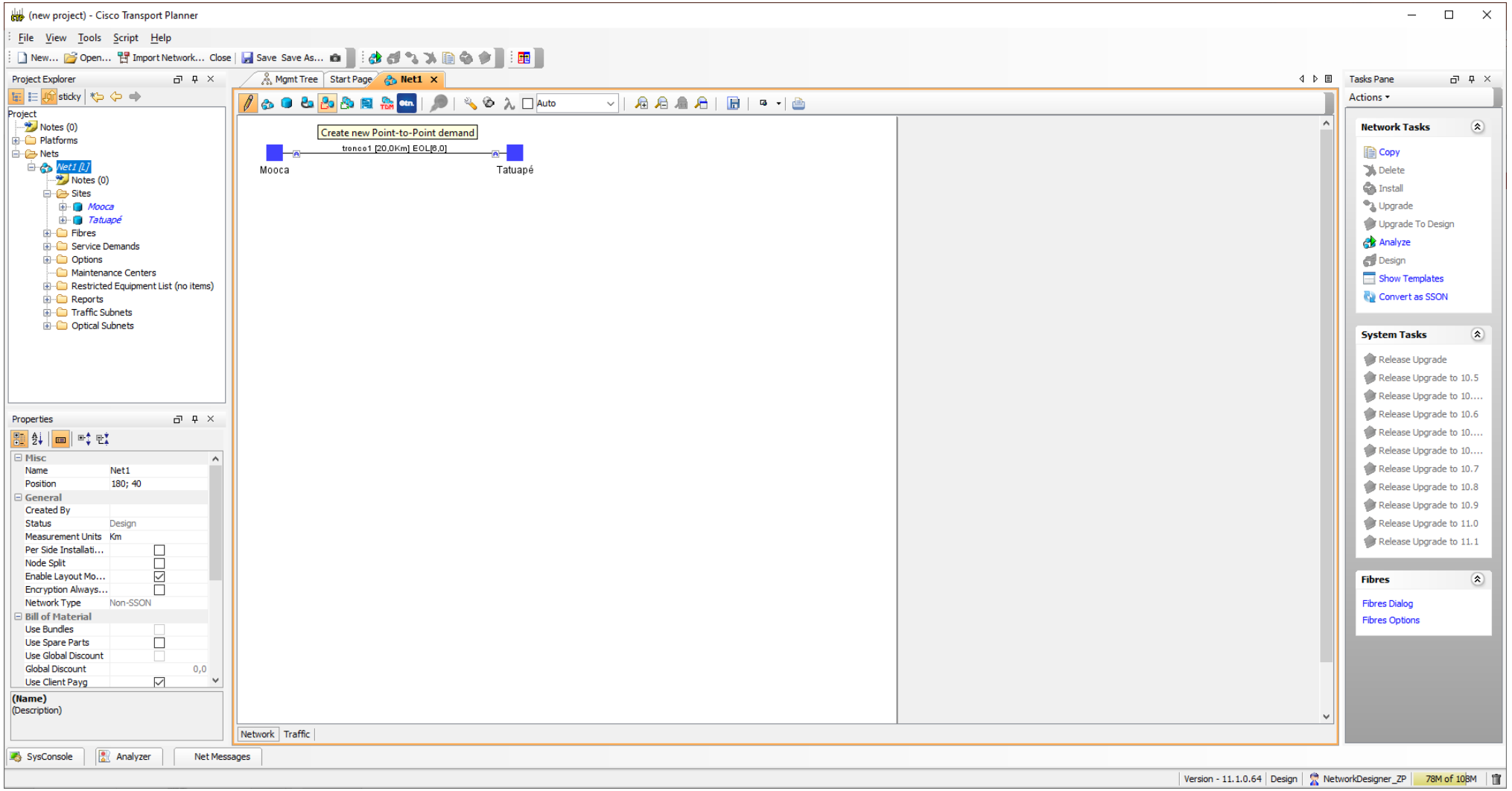
• The Layer-2 sides are named from AA to AT, as maximum of 20 sides can be created per site.

• Demand level forcing option is applicable for both contention-less side and extended sides (layer-2 sides).

Layout template support is extended for Layer-2 SMR with new sides are as follows:

Scalable Up to Degree	Line Side Ordering (Default as per Convention)	Contention-less Side Ordering (Default as per Convention)
4	A to D [0 - 3]	T to E [4 - 19]
8	A to H [0 - 7]	T to I [8 - 19]
12	A to L [0 - 11]	T to M [12 - 19]
16	A to P [0 - 15]	T to Q[16 - 19]

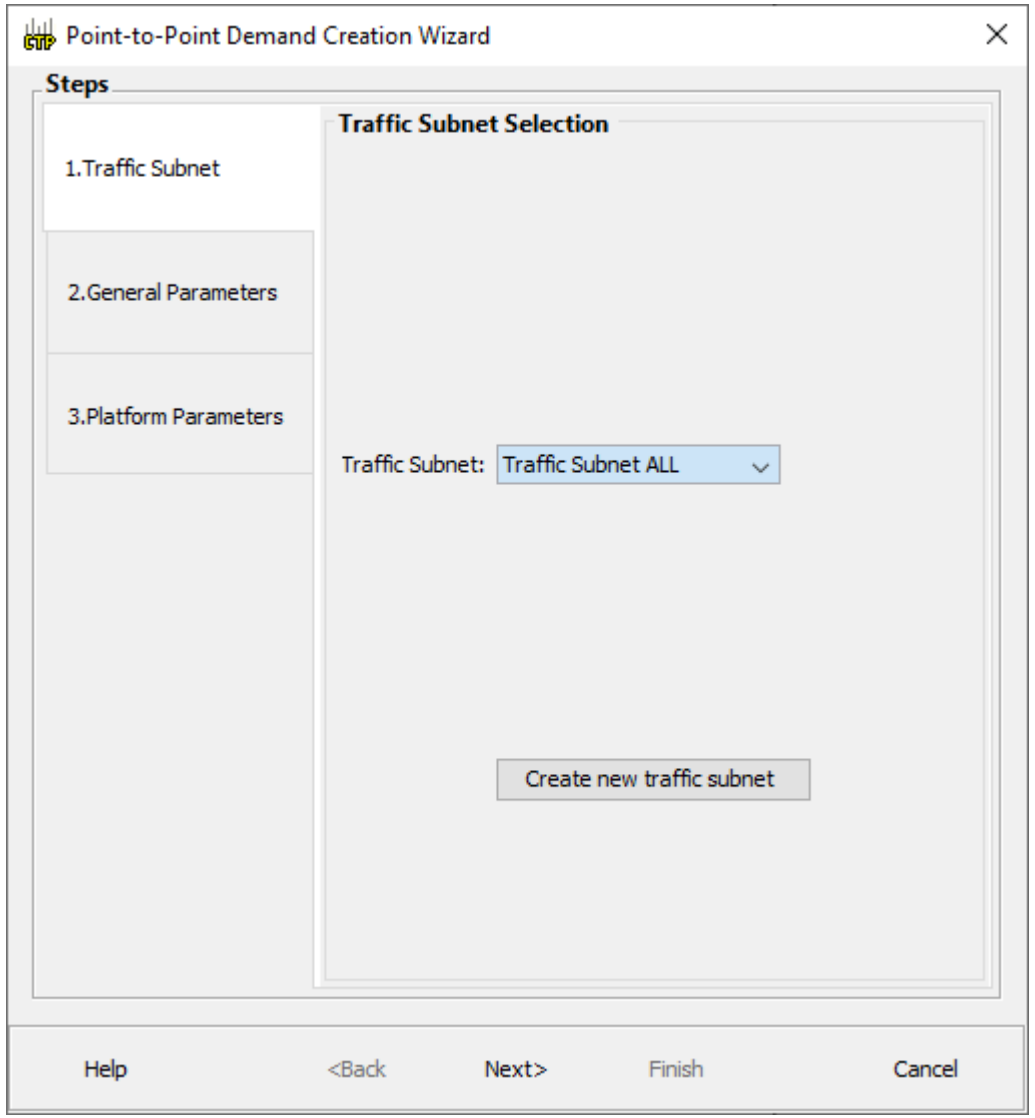
Create New Demand



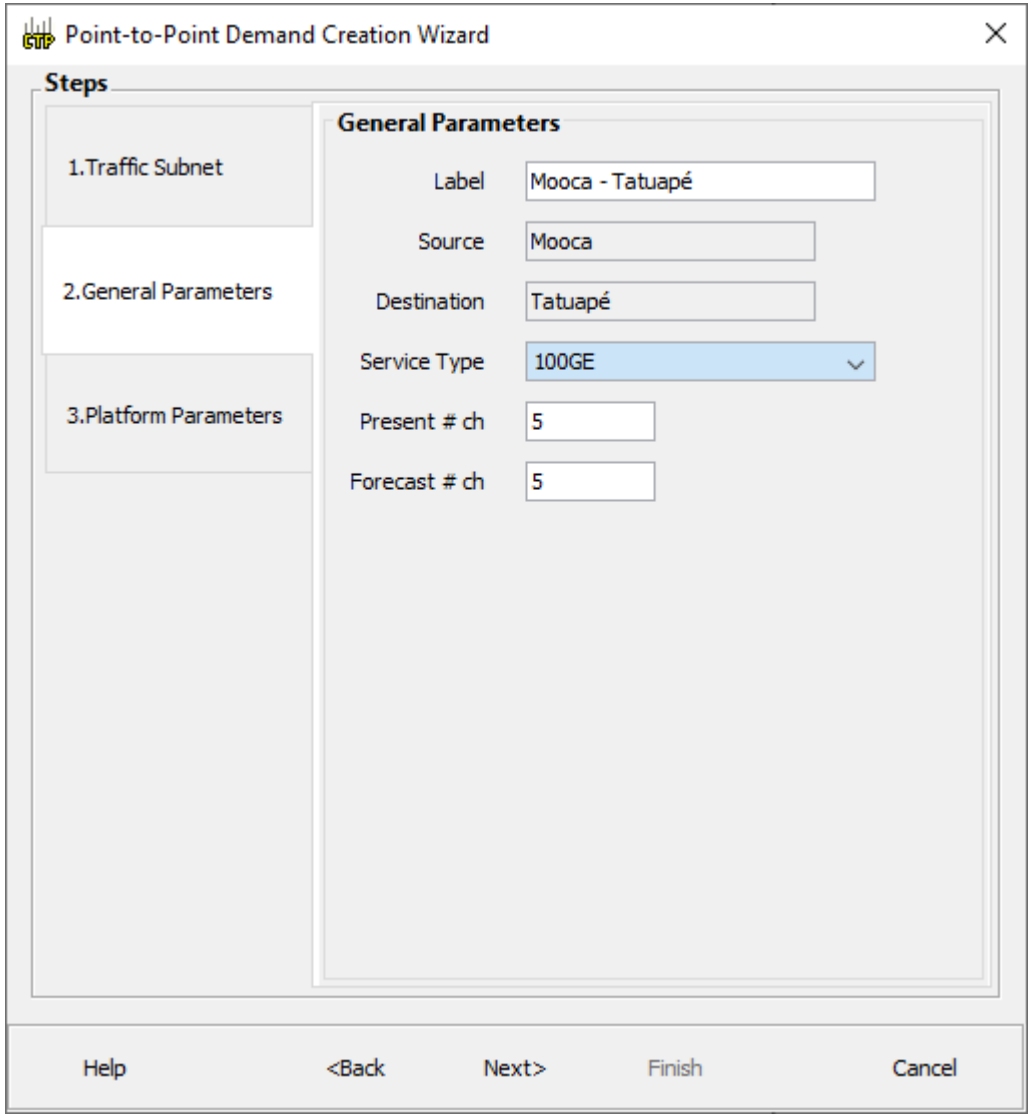
Demand Creation Wizard

Click on source and destination for the demand

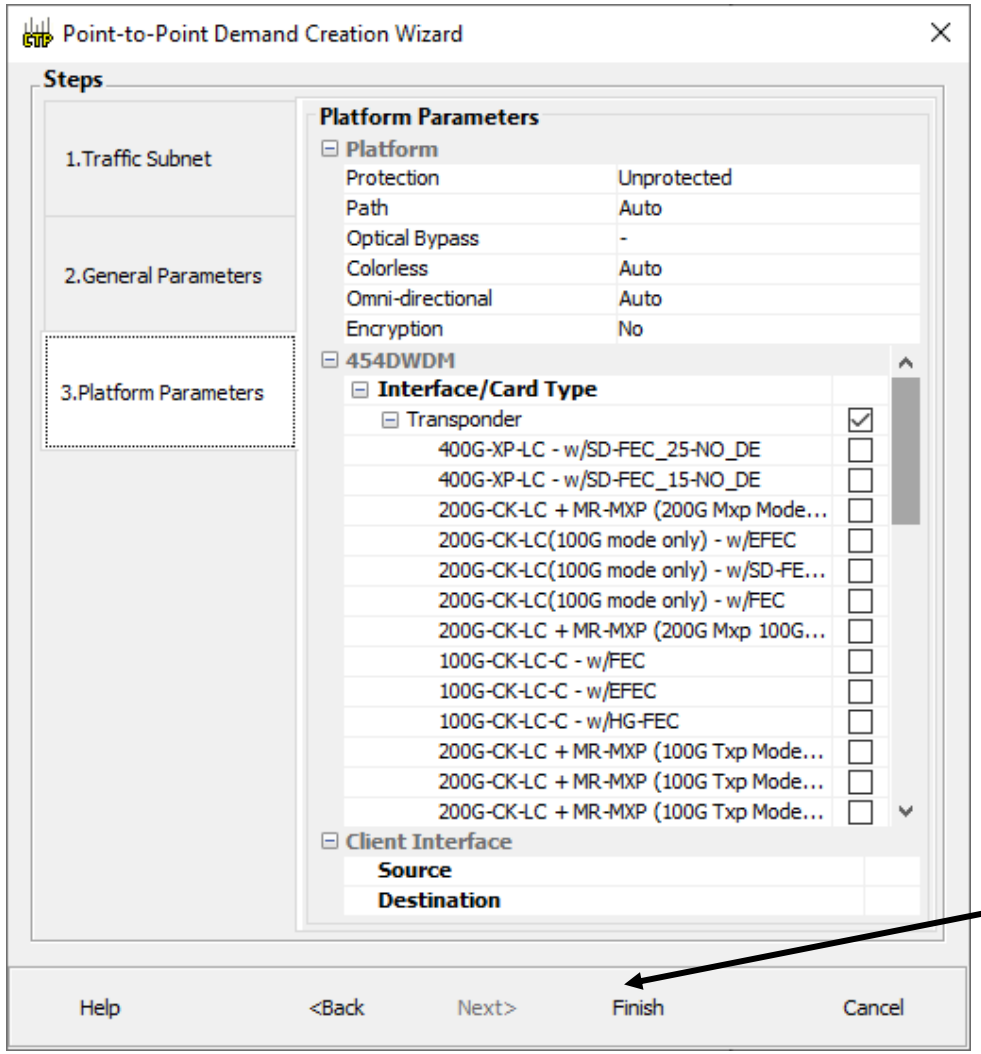
The wizard will open



Type and Rate of Demand

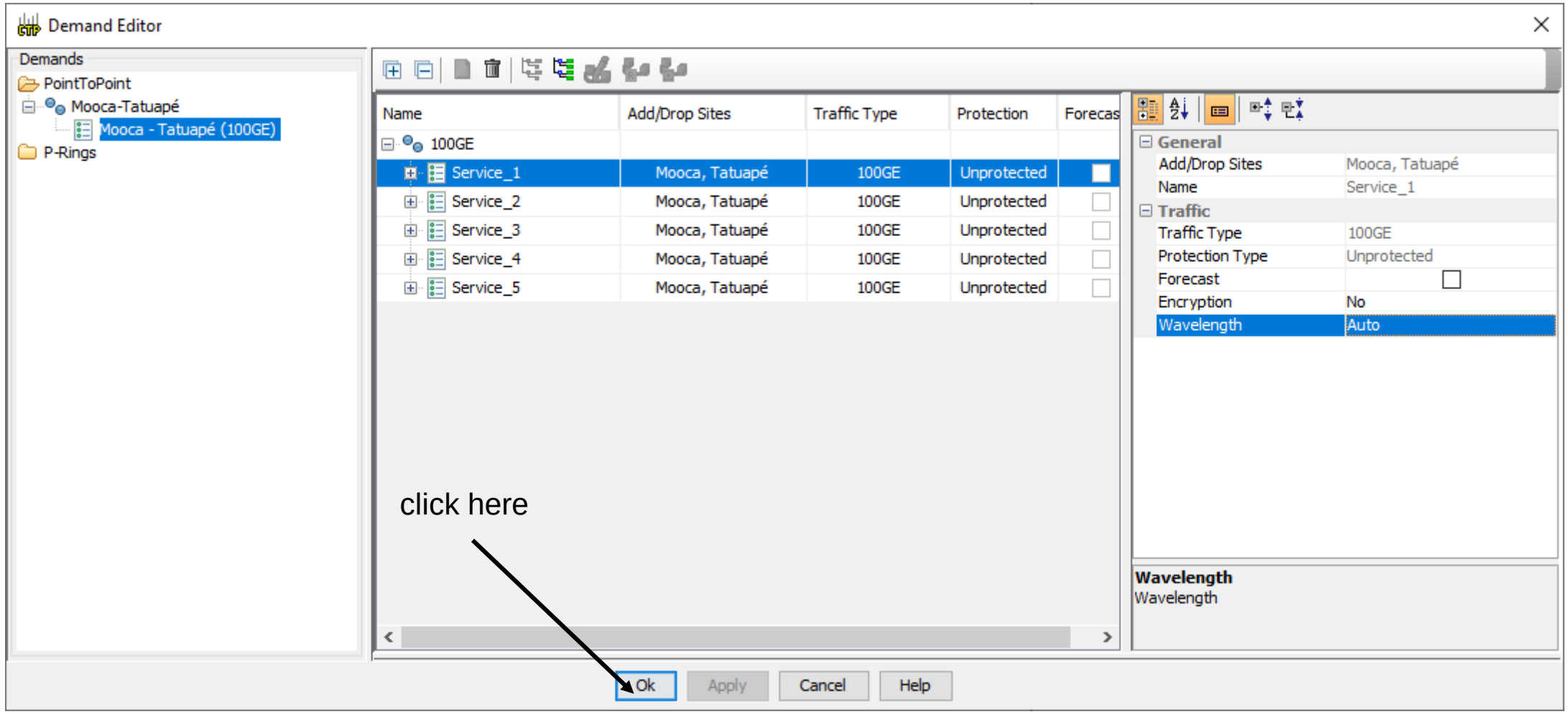


Demand Options

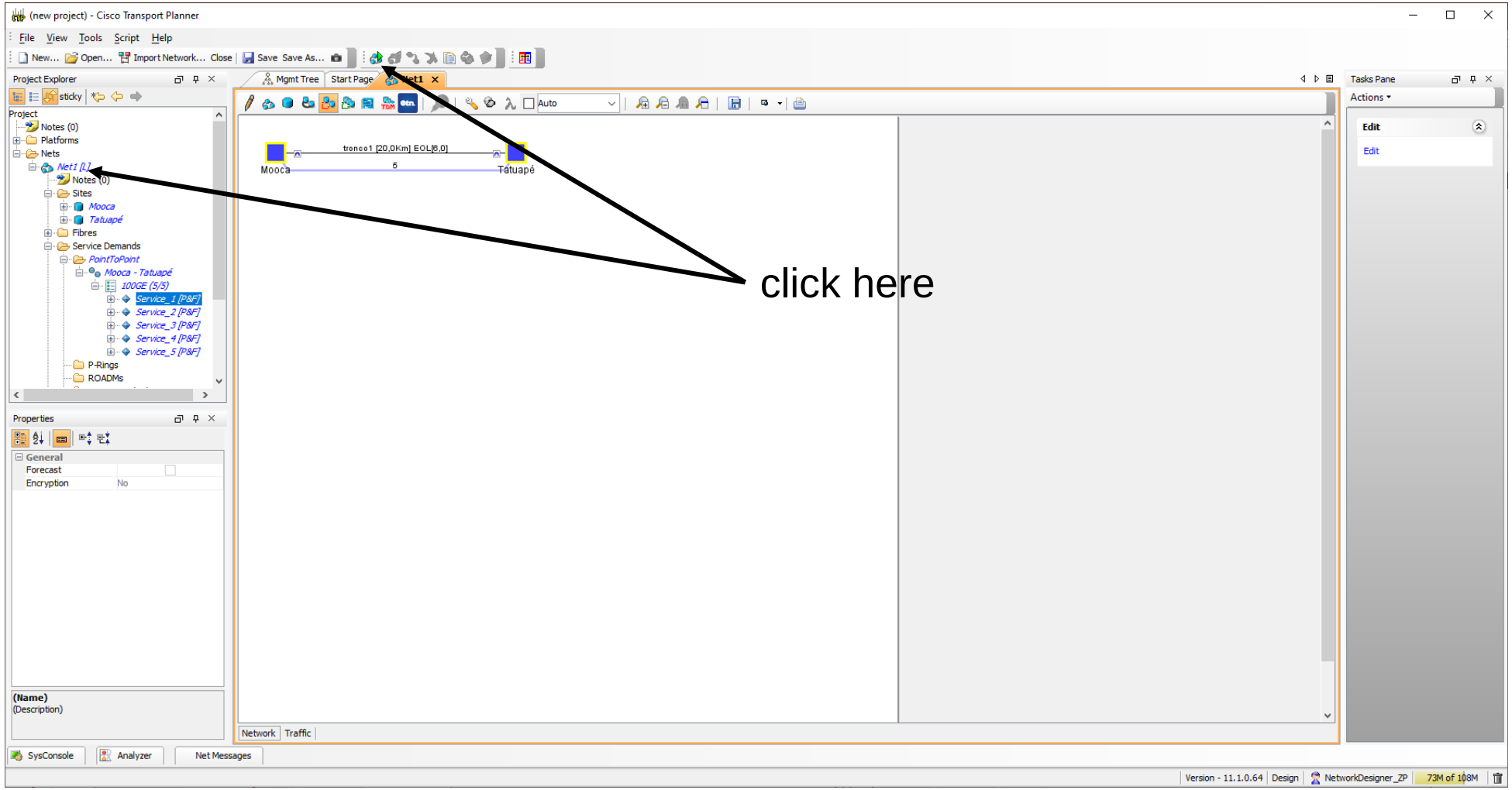


click here when you are done

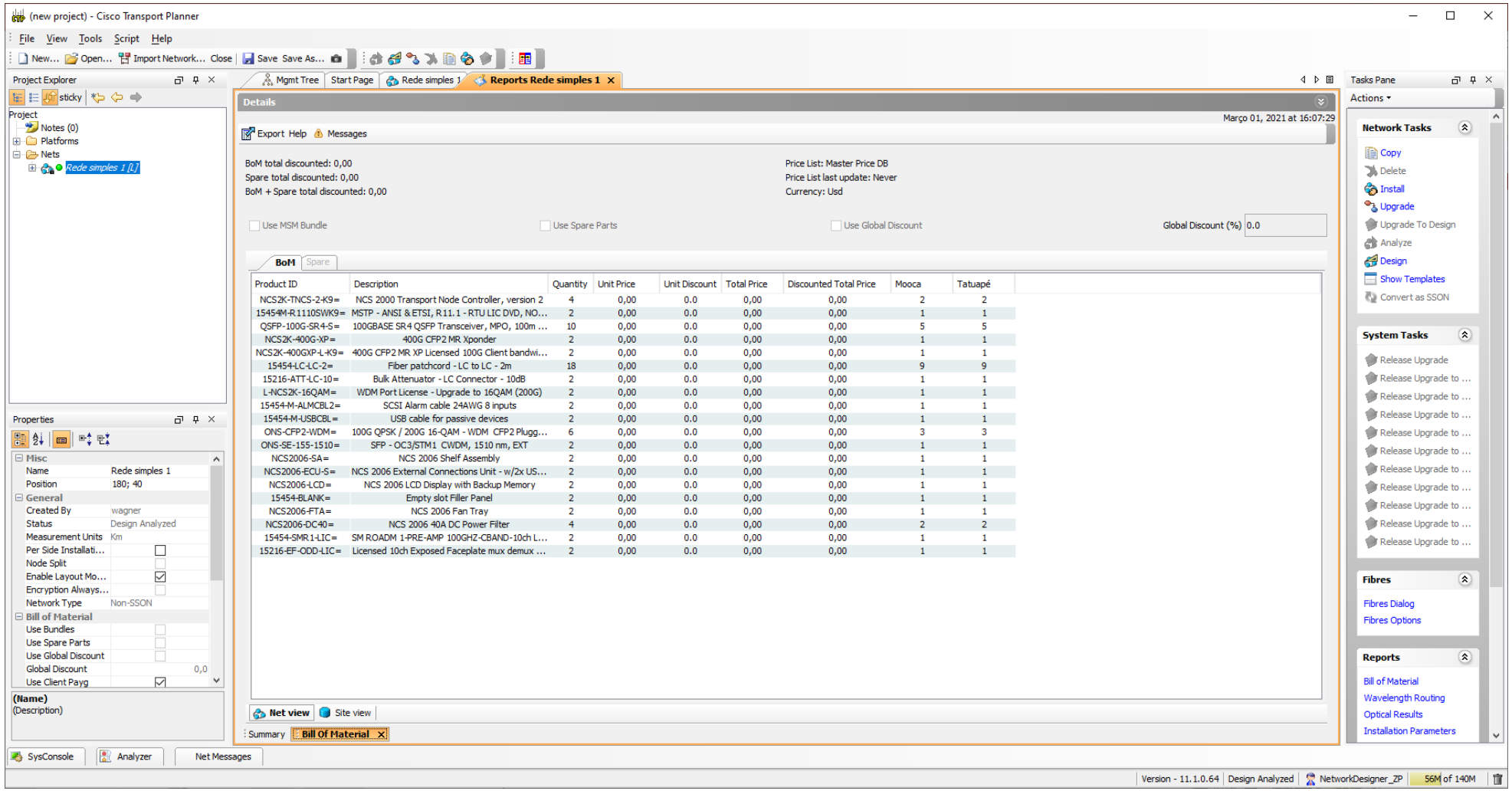
Demand Editor



Network with demand

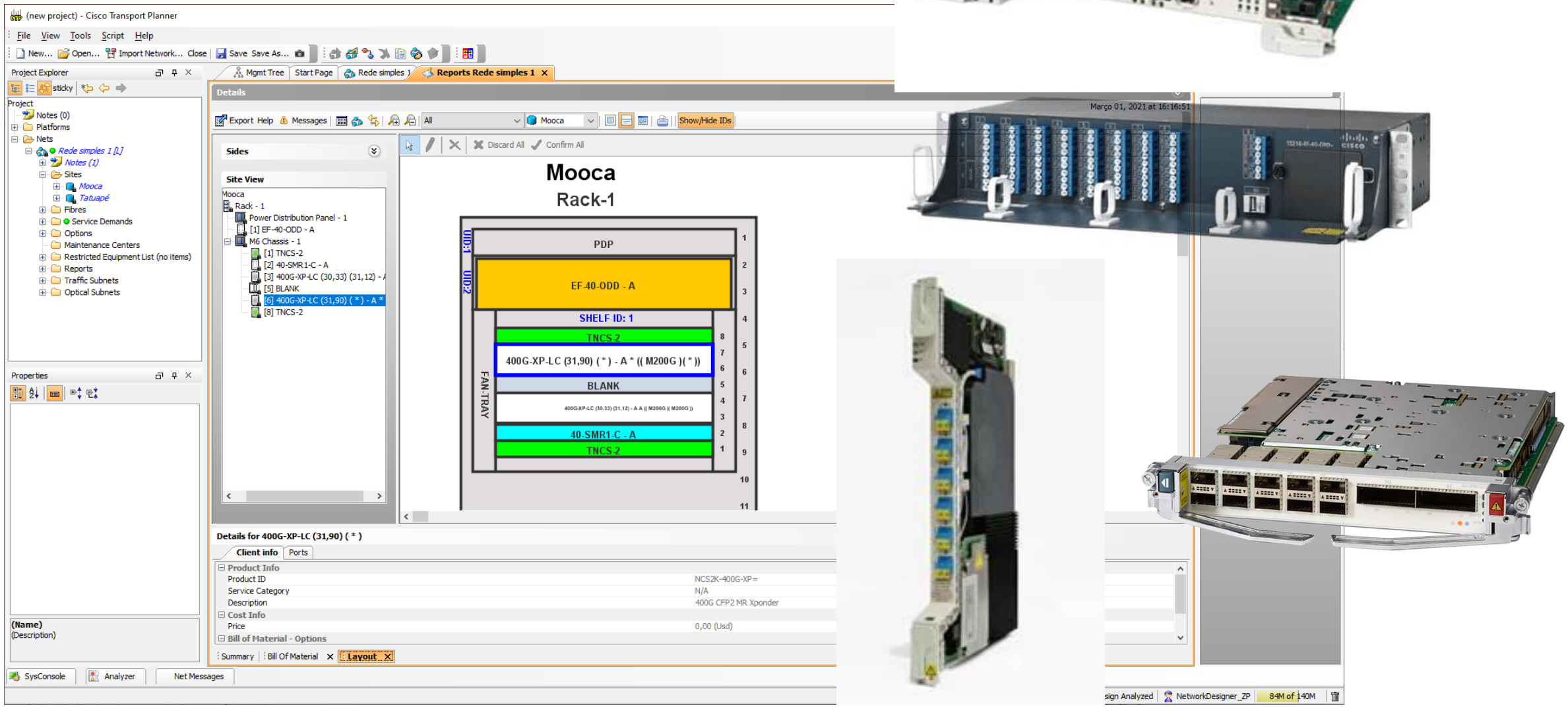


Bill of Material

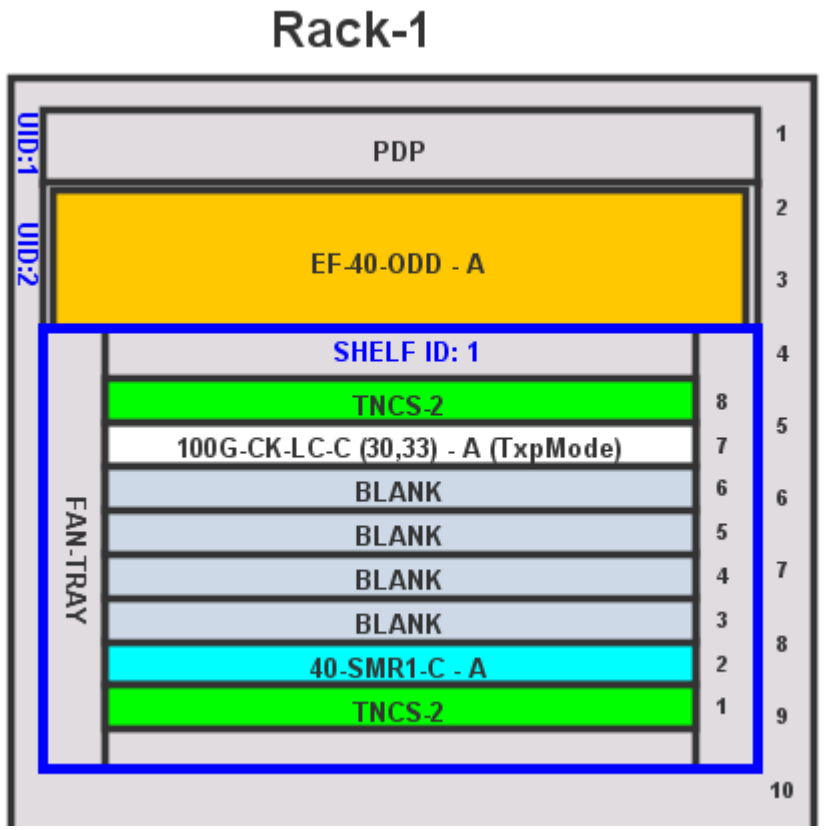


Controller
Sofw license controller
100GE transceiver
400G card
Sotw license card
fiber patchcord
attenuator
WDM port license
Alarm cable
USB cable
interface DWDM 2 port
interface DWDM 1 port
chassis 2006
SMR1 Roadm
mux/demux external

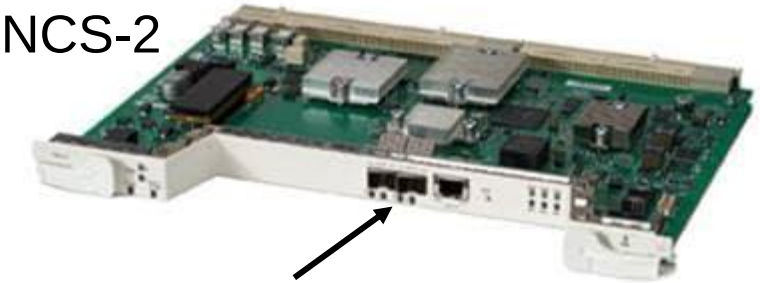
NE Layout


(new project) - Cisco Transport Planner
File View Tools Script Help
Project Explorer
Project
Notes (0)
Platforms
Nets
Rede simples 1 [1]
Notes (1)
Sites
Mooca
Tatuapé
Fibres
Service Demands
Options
Maintenance Centers
Restricted Equipment List (no items)
Reports
Traffic Subnets
Optical Subnets
Properties
(Name)
(Description)
Mgmt Tree
Start Page
Rede simples 1
Reports Rede simples 1
Details
Export Help Messages
Show/Hide IDs
Sides
Site View
Mooca
Rack - 1
Power Distribution Panel - 1
[1] EF-40-ODD - A
M6 Chassis - 1
[1] TNCS-2
[2] 40-SMR1-C - A
[3] 400G-XP-LC (30,33) (31,12) - A
[5] BLANK
[6] 400G-XP-LC (31,90) (*) - A *
[8] TNCS-2
Discard All
Confirm All
Mooca
Rack-1
UID:1
UID:2
PDP
EF-40-ODD - A
SHELF ID: 1
TNCS-2
400G-XP-LC (31,90) (*) - A * ((M200G)(*))
BLANK
FAN-TRAY
40-SMR1-C - A
TNCS-2
Details for 400G-XP-LC (31,90) (*)
Client info
Ports
Product Info
Product ID
NCS2K-400G-XP=
Service Category
N/A
Description
400G CFP2 MR Xponder
Cost Info
Price
0,00 (Usd)
Bill of Material - Options
Summary
Bill Of Material
Layout
SysConsole
Analyzer
Net Messages
Março 01, 2021 at 16:16:51
NetworkDesigner_ZP
84M of 140M

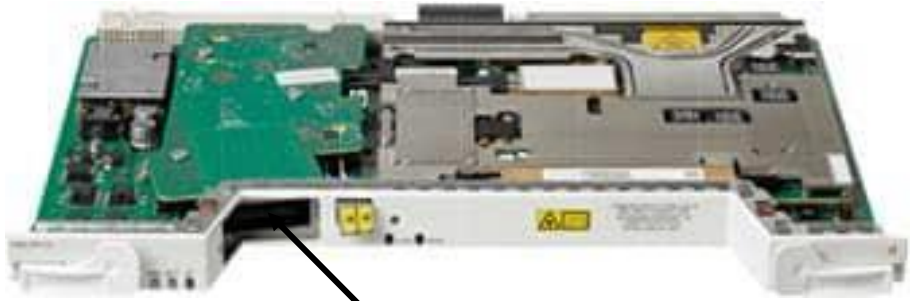
Layout



TNCS-2

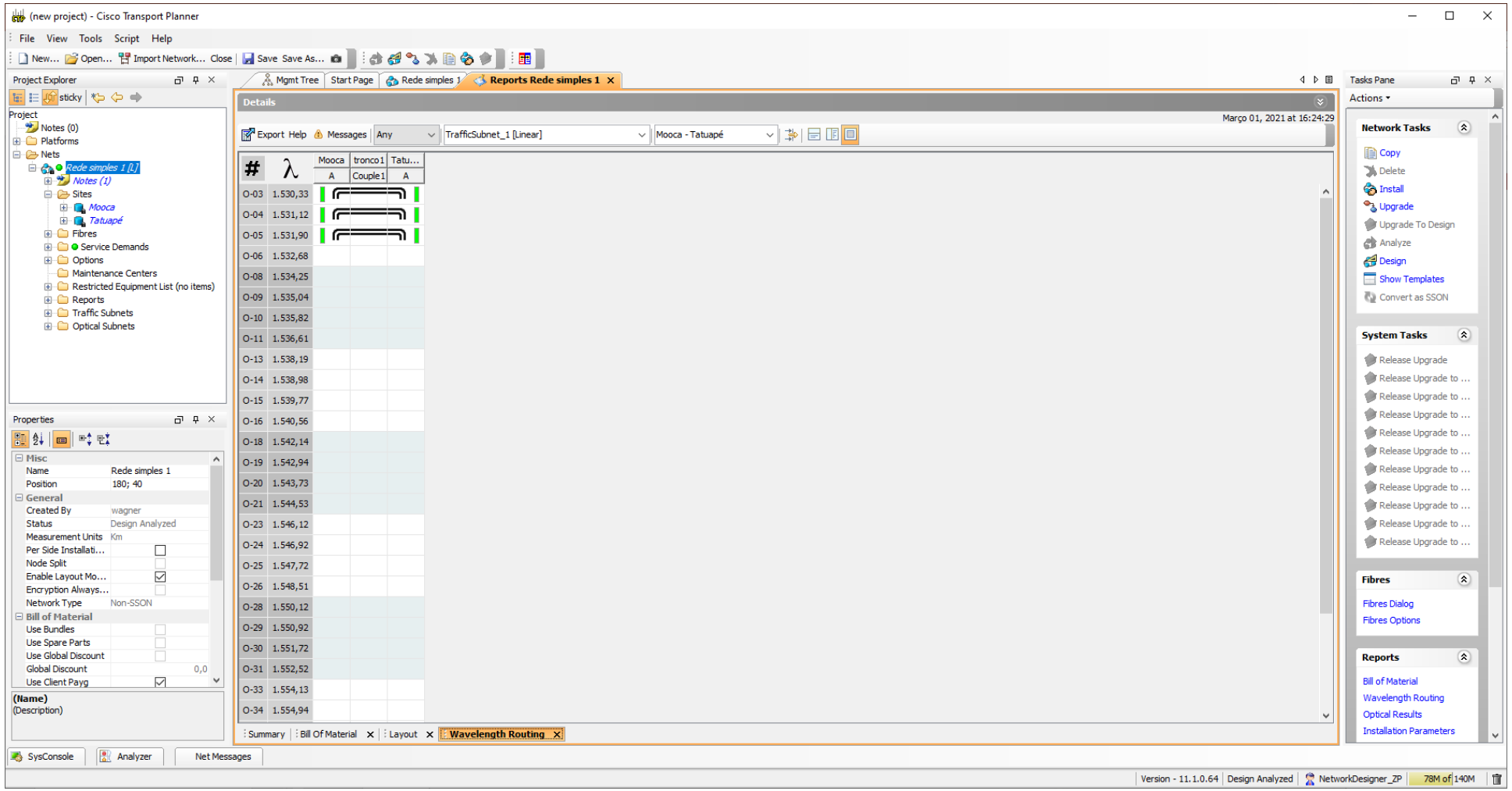


2 SFP ports to OSC channel. Only Ethernet formats are availabel

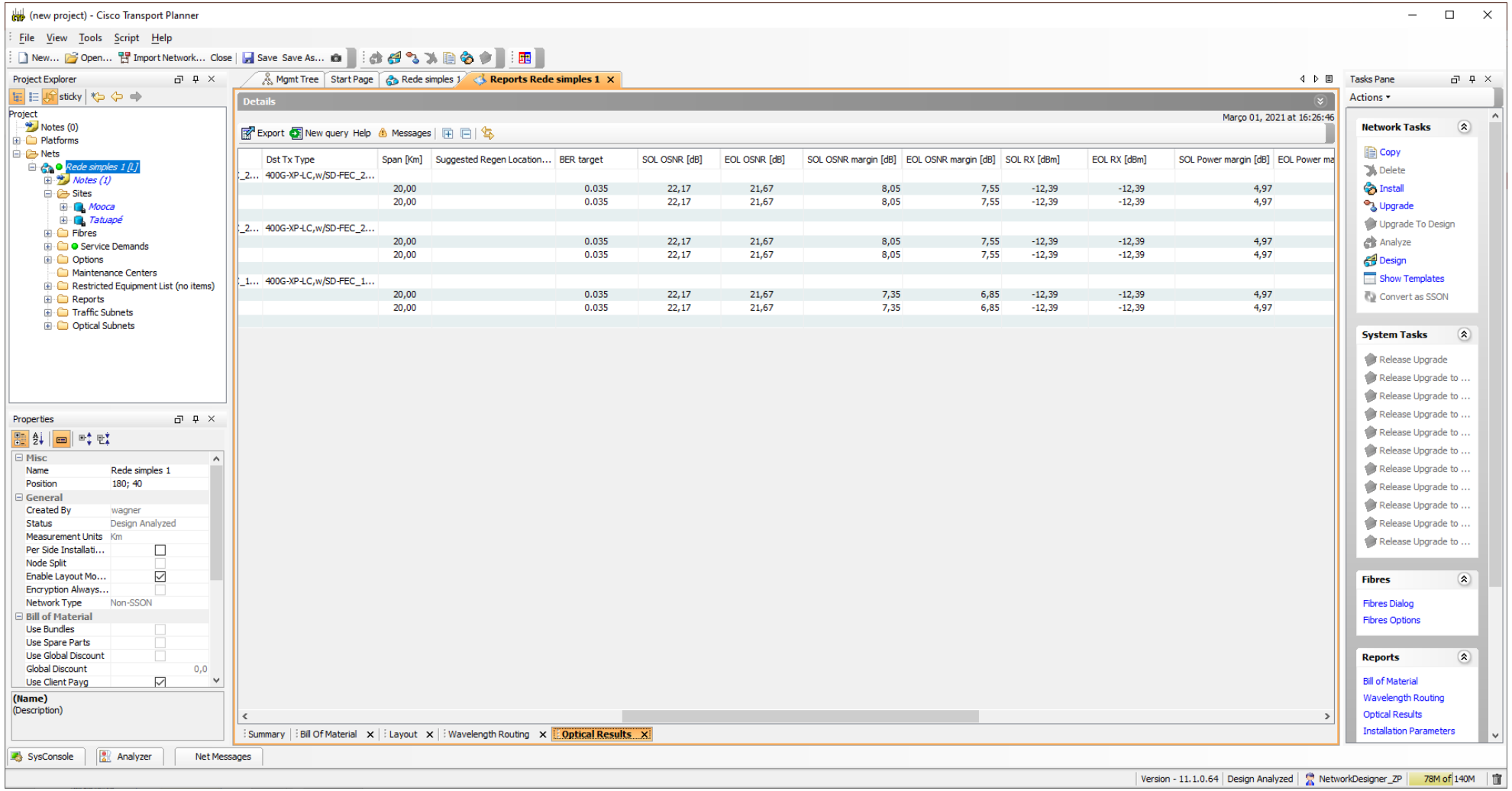


100G Transponder

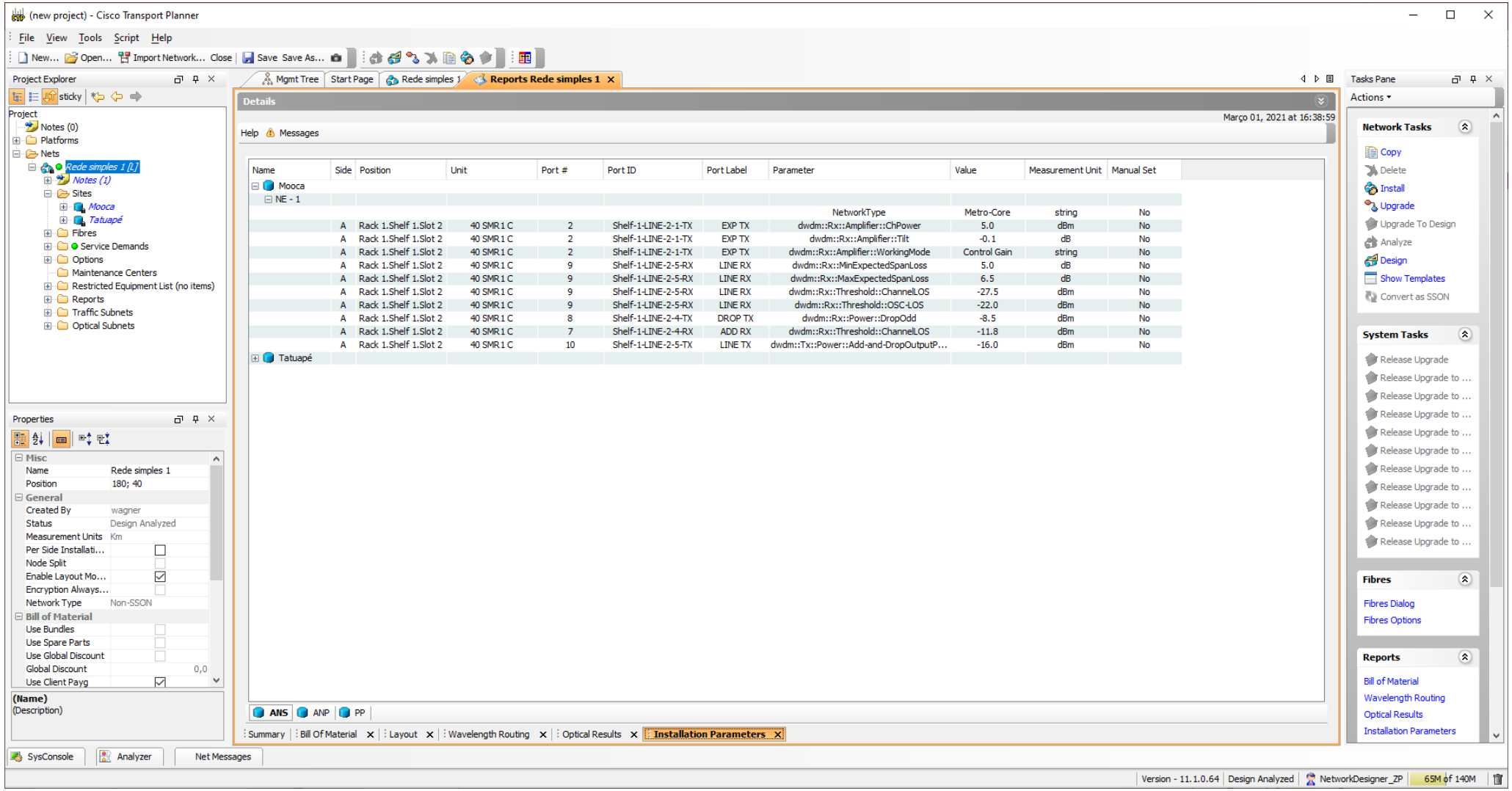
Wavelength Routing



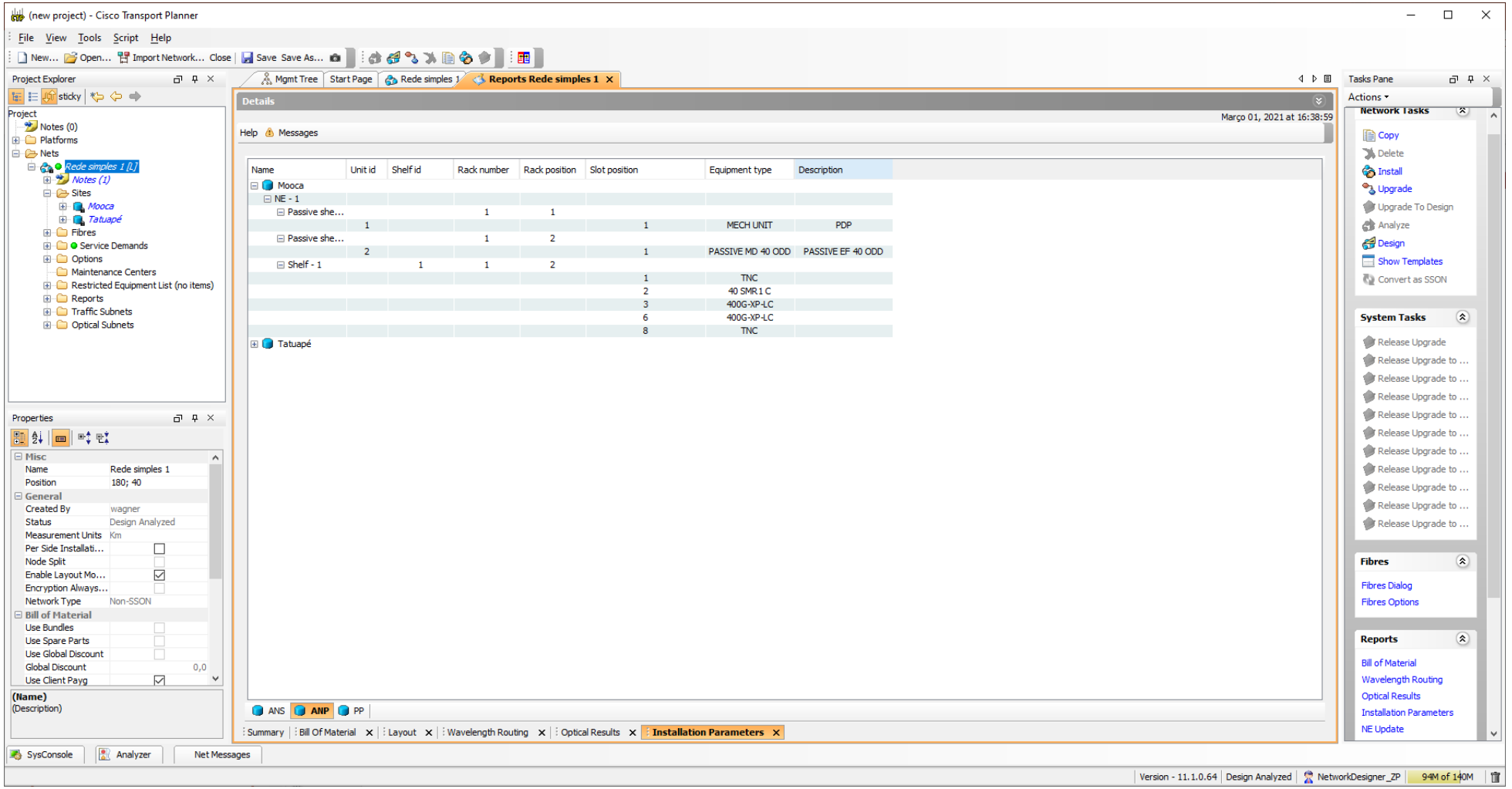
Optical results



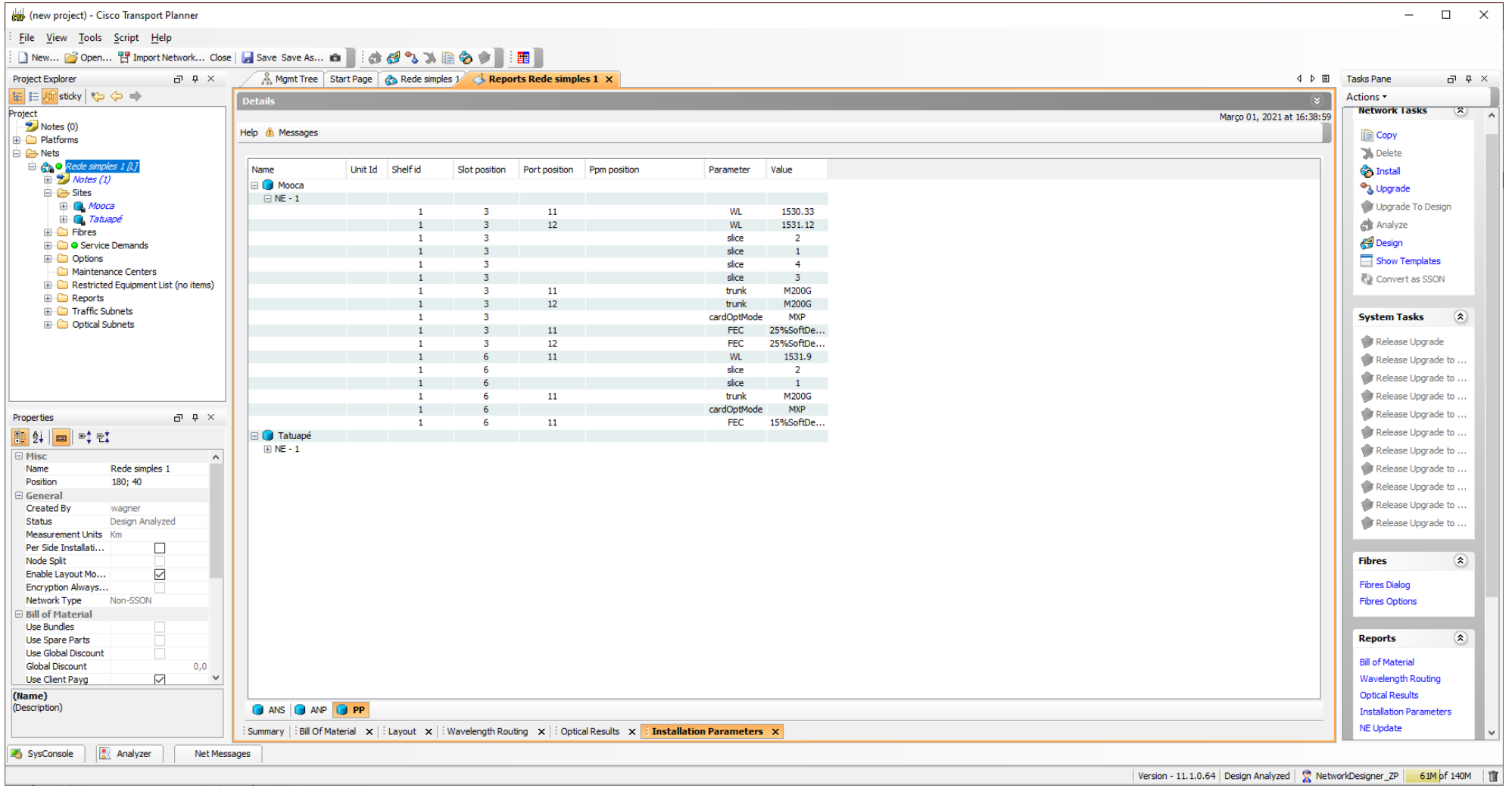
Configuration Parameters - ANS (Automatic Node Setup)



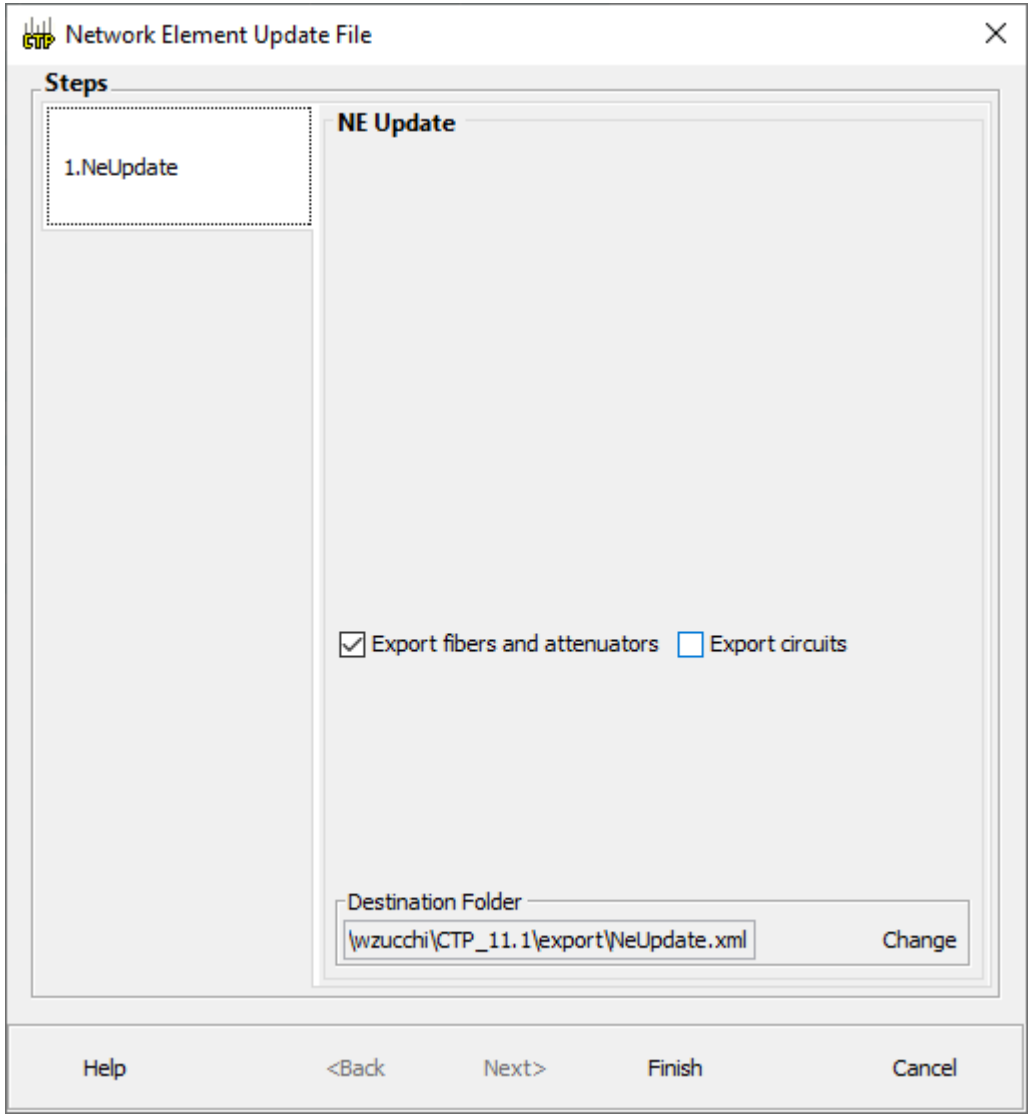
Configuration Parameters - ANP (Automatic Node Provisioning)



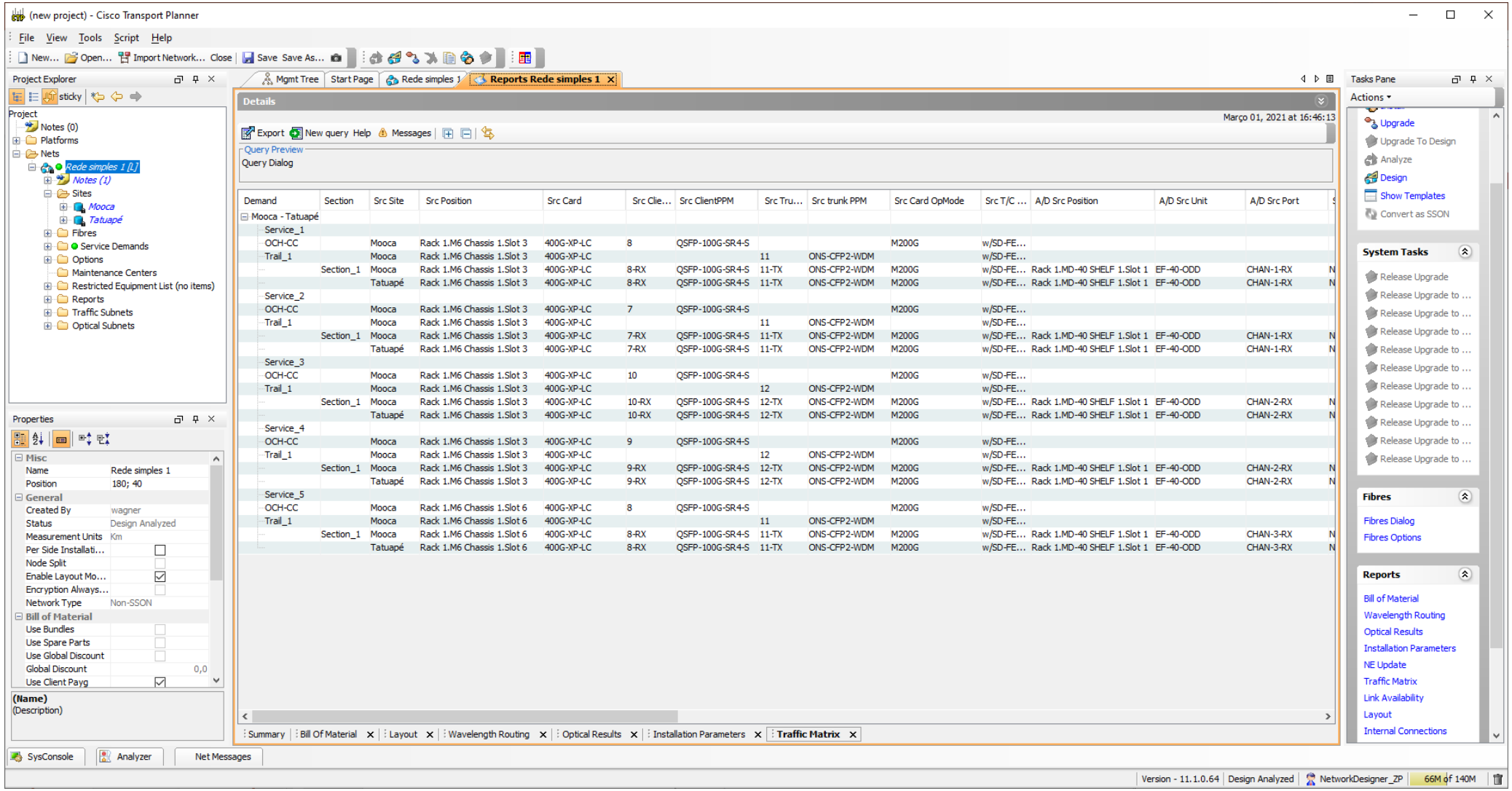
Installation Parameters (PP - Provisioning Parameters)



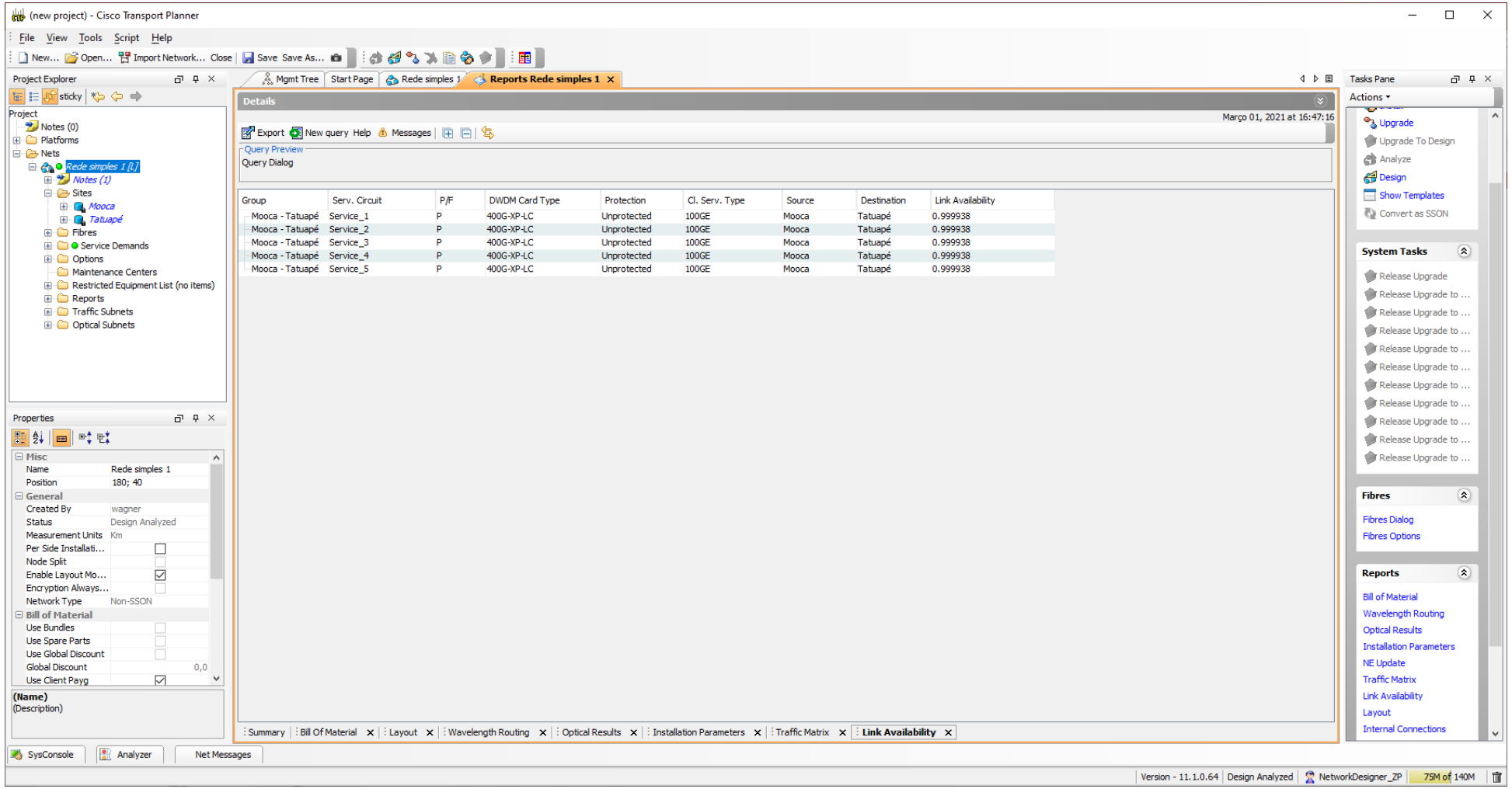
NE Update


Network Element Update File
Steps
1.NeUpdate
NE Update
Export fibers and attenuators
Export circuits
Destination Folder
\wzucchi\CTP_11.1\export\NeUpdate.xml
Change
Help
<Back
Next>
Finish
Cancel

Traffic Matrix



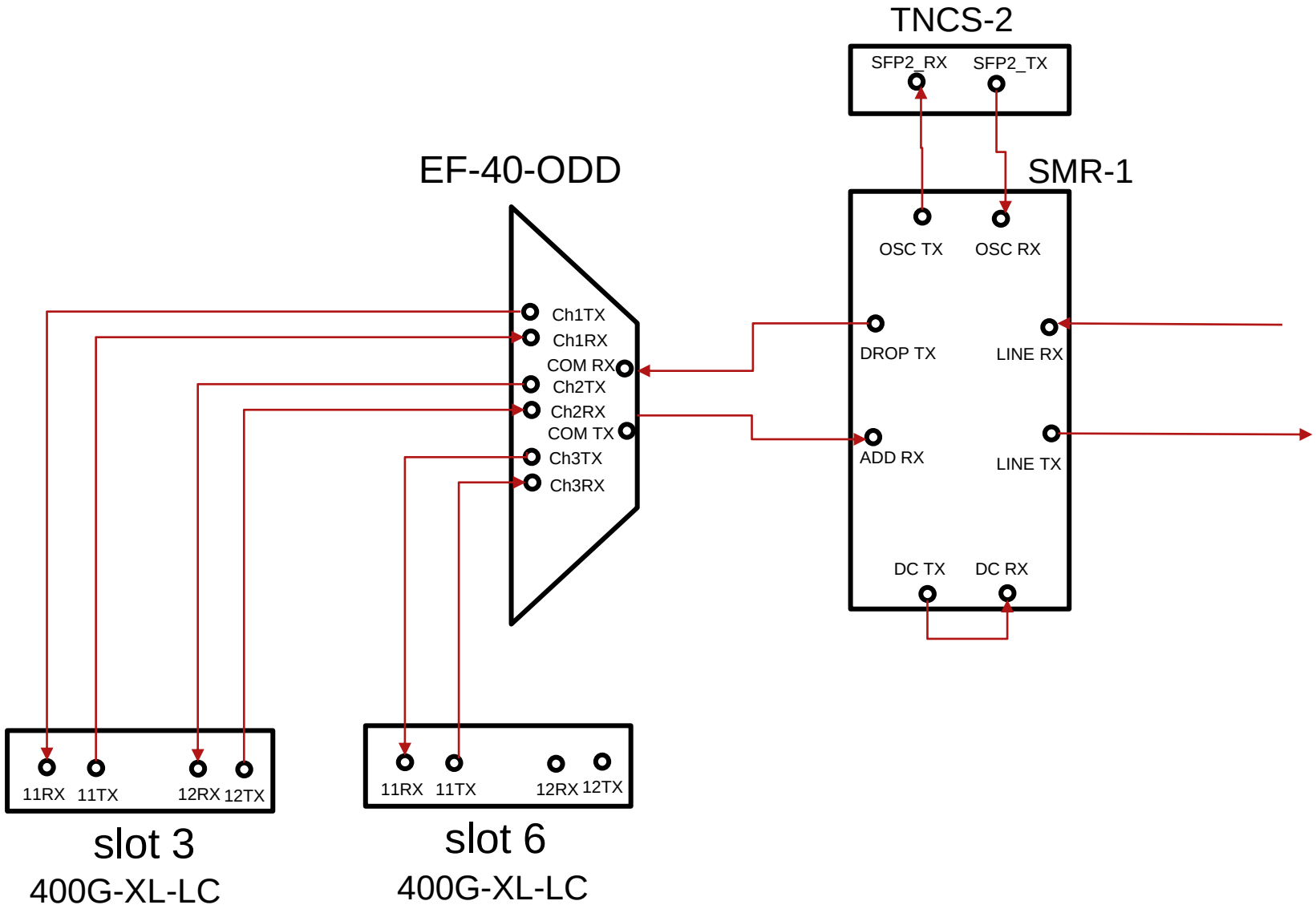
Link Availability



Internal Connections

Name	Position	Unit	Port label	Attenuator	Position	Unit	Port label	P/F
Mooca								
Fiber	NA	Fiber Distribution Pa...	FDPTx		Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	LINE RX	P
Fiber	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	LINE TX		NA	Fiber Distribution Pa...	FDPRx	P
ATT-0dB	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	DC TX		Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	DC RX	P
LC-LC-2	Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-1-TX		Rack 1.M6 Chassis 1.Slot 3	400G-XP-LC	11-RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 3	400G-XP-LC	11-TX		Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-1-RX	P
LC-LC-2	Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-2-TX		Rack 1.M6 Chassis 1.Slot 3	400G-XP-LC	12-RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 3	400G-XP-LC	12-TX		Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-2-RX	P
LC-LC-2	Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-3-TX		Rack 1.M6 Chassis 1.Slot 6	400G-XP-LC	11-RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 6	400G-XP-LC	11-TX		Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-3-RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	DROP TX		Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	COM RX	P
LC-LC-2	Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	COM TX		Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	ADD RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	OSC TX		Rack 1.M6 Chassis 1.Slot 1	TNCS-2	SFP2_RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 1	TNCS-2	SFP2_TX	15216-ATT...	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	OSC RX	P
Tatuapé								

Site Layout

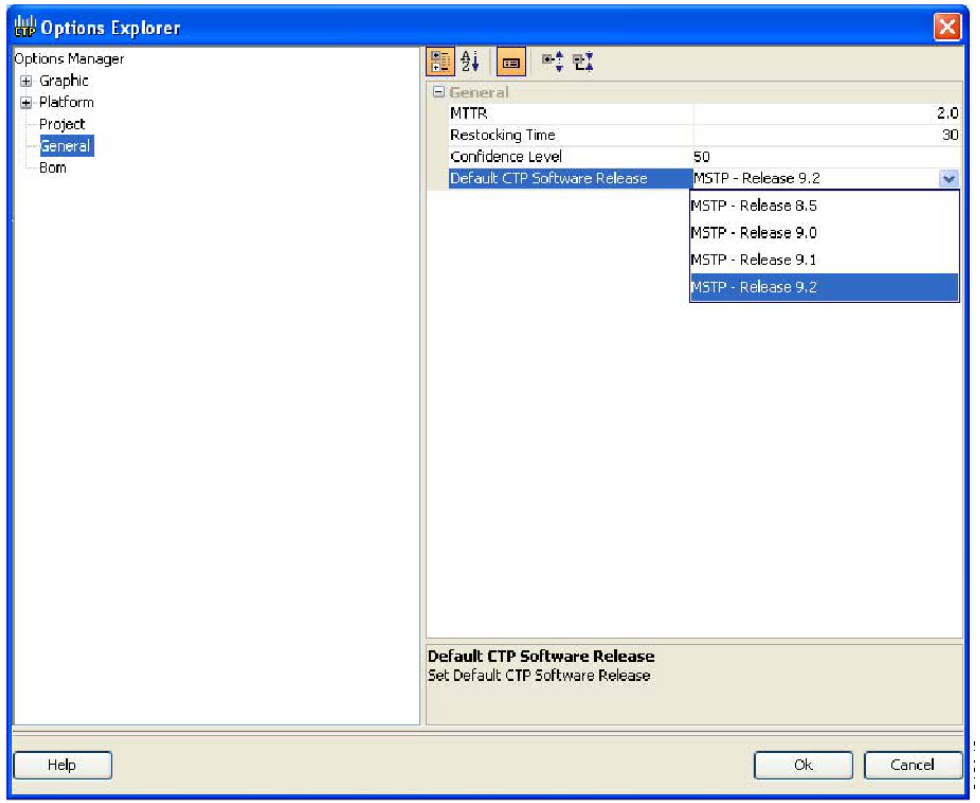

TNCS-2
SFP2_RX
SFP2_TX
EF-40-ODD
SMR-1
OSC TX
OSC RX
Ch1TX
Ch1RX
COM RX
Ch2TX
Ch2RX
COM TX
Ch3TX
Ch3RX
DROP TX
LINE RX
ADD RX
LINE TX
DC TX
DC RX
11RX
11TX
12RX
12TX
slot 3
400G-XL-LC
11RX
11TX
12RX
12TX
slot 6
400G-XL-LC

Program Options

Setting the Default Platform Values

Step 1 - From the Tools menu, choose Options.

Step 2- In the Options Explorer dialog box, right-click Platform and choose Expand from the shortcut menu.



Setting the Default Platform Values

Step 3 - Click the desired System Release folder and complete the following tasks as needed:

Step 4 - Click the Restricted Equipment folder. To restrict a card, check the check box in the Restricted column for that card.

Step 5 - Enter the Fiber Options details.

Note:

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

SOL = km * dB/km + (2 * connector loss)

SOL = user entered loss + (2 * connector loss)

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

EOL = km * dB/km * EOL Aging Factor + (2 * connector loss) + EOL Aging Loss, or EOL = user entered loss * EOL Aging Factor + (2 * connector loss) + EOL Aging Loss

Setting the Default Platform Values

Step 6 - Click the Traffic Mapping folder and complete the following tasks as needed.

Step 7 - Select the C-band and L-band rules.

Step 8 - Click the DWDM Design Rules folder and complete the following tasks as needed

Step 9 - To define the shelf configuration parameters, select a site complete the following tasks under property tree.

Step 10 - Click OK.

Creating a project

Fiber Type	Parameter	Min. Error Value	Min. Warning Value	Default Value	Max. Warning Value	Max. Error Value	Unit
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)

Project Steps

To generate a network design, the SE enters the following parameters:

- The topology of the network—ring, linear, or meshed
- The type of equipment used at each site
- The distance separating the sites
- The type of fiber connecting the sites
- Service demands, including the service type, the protection type, and the number of channels between nodes
- The number of network sites

When the network parameters are entered, Cisco Transport Planner finds the best routing, defines the required add/drop filters, places optical amplifiers with dispersion compensation units (DCUs) or tunable dispersion compensation units (TDCU) to fit the user traffic demands at a minimum cost.

The TDCU operates only over the C-band.

Optimization is performed to meet the boundary conditions. The optimization includes attenuation and amplification.

Reports

Cisco Transport Planner generates a BOM, which includes the product codes, the quantities, and pricing information.

In addition, it creates other reports, such as a shelf-level view of the configuration, which can be printed.

This information helps the SE understand how the shelf is built and helps to avoid confusion and errors during the actual deployment.

Within the BOM is the total network cost, which allows a quickcomparison of various design options.

The total network cost is the cost of the equipment for all of the sites in the designed network.

Topologies & Network Size

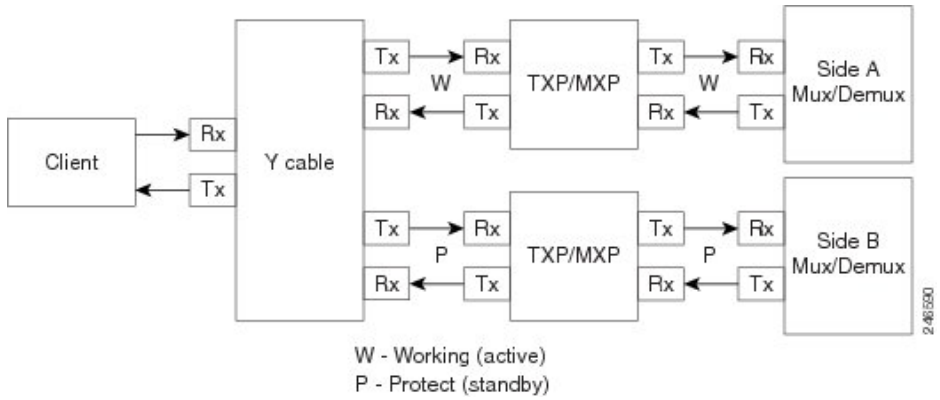
The Cisco Transport Planner supports the following network topologies:

- Linear (single-span or multispan)
- Ring (open or closed)
- Meshed

The Cisco Transport Planner enables you to design flexible networks with up to 150 site locations. A flexible network uses ROADM nodes to allow traffic modification or reconfiguration, or both as traffic requirements change.

In Cisco Transport Planner Software R11.1, the maximum number of locations where the optical service channel (OSC) is terminated is 40. The maximum number of add/drop locations supported is 40.

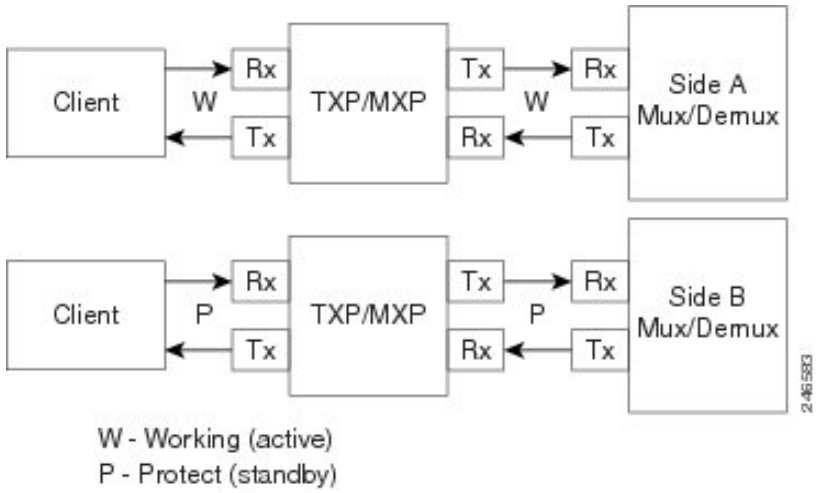
Y-Cable Protection



one transponder card is designated as active and the other as standby.
The standby transponder card has the client-side laser turned off to avoid corrupting the signal transmitted back to the client.
The active transponder monitors the signal from the trunk side and in the event of loss or signal failure, the system switches to the standby path.

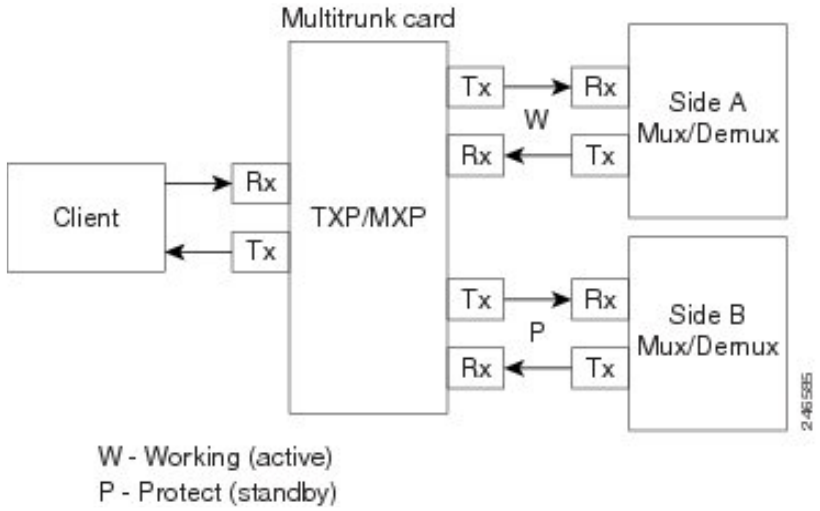
Client 1 + 1 Protection

Two client signals are transmitted to separated line cards or transponder cards instead of using a Y-cable to split one client signal into two line cards or transponder cards.
In client 1+1 protection, the failure and switchover is controlled by the client system



Fiber-switched protection

The single client signal is injected into the client receive (Rx) port. It is then
split into two separate signals on the two trunk transmit (Tx) ports.
The two signals are transmitted over diverse paths.
The far-end card chooses one of the two trunk Rx port signals and injects it into the Tx client port.



PSM-OCH Protection

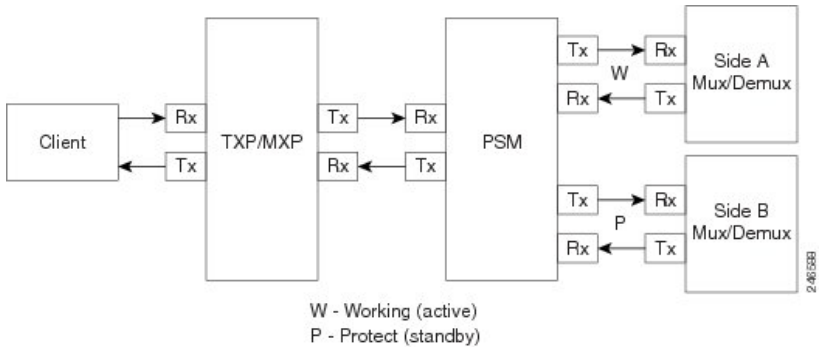
PSM-OCH—Channel protection configuration provides protection at trunk level (like Fiber-Switched protection) for TXP/MXP that do not have dedicated Fiber-Switched cards.

PSM splits the traffic originated by transponder trunk on working and protected TX ports.

Working Tx (W-Tx) and protected TX (P-Tx) are connected to the add ports of Add-Drop stages adding the channel in two different directions.

On the receiving direction PSM W-RX and P-RX are connected to the drop ports of Add-Drop stages receiving the channel from the two different directions.

PSM switch selects a path among W-Rx and P-Rx ports so that only one direction at a time is connected to COM-RX ports and therefore to the TXP/MXP.

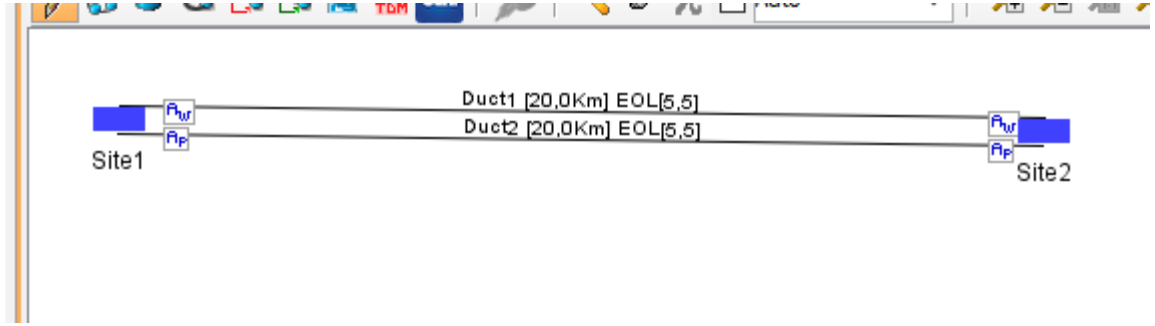


Transmission Definitions in DWDM

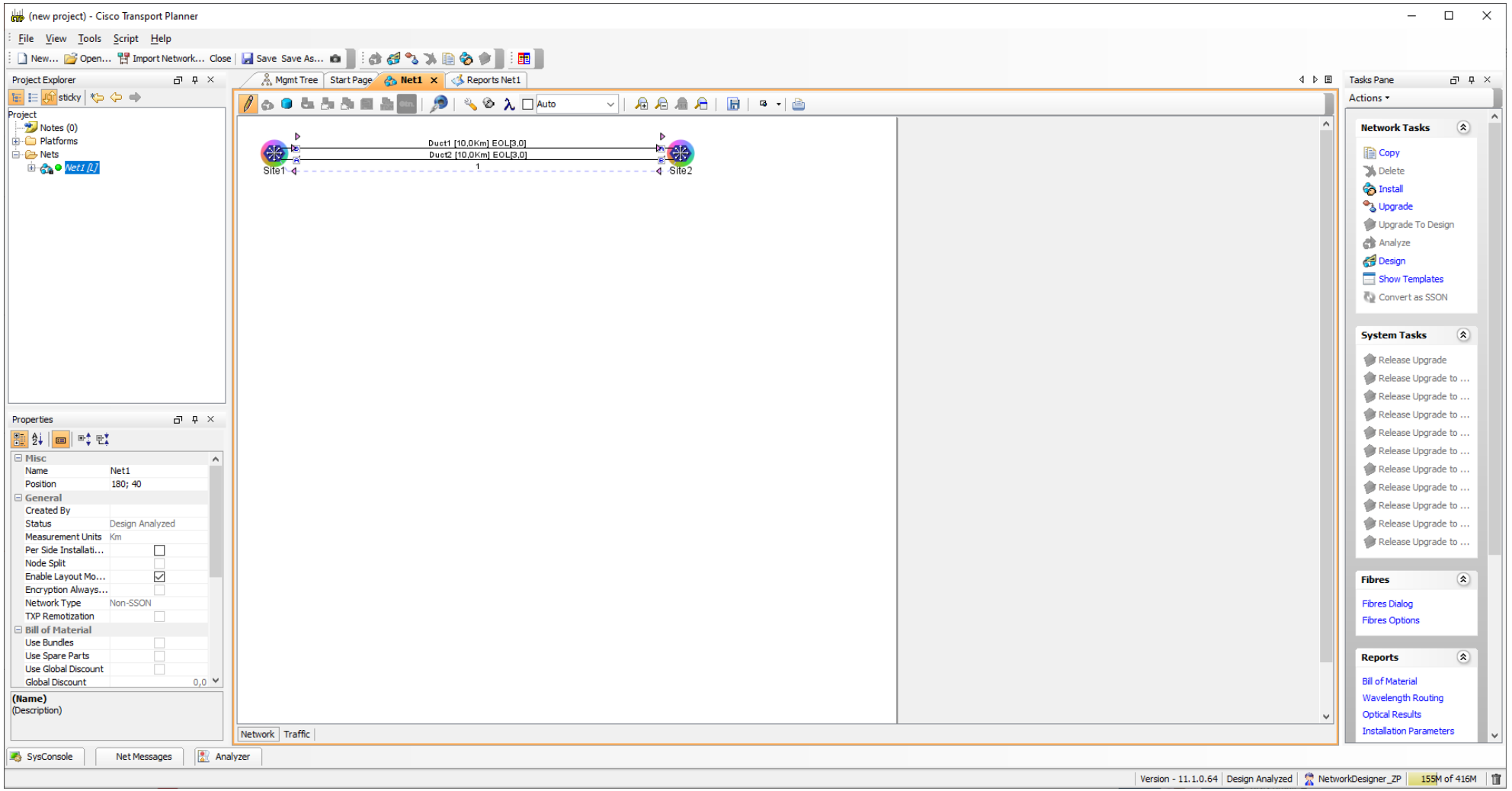
Traffic in Cisco Transport Planner is defined as an optical path for each pair of nodes requiring a service demand. An optical path is the combined channels between the two nodes. The following list gives definitions for some basic traffic items:

- Circuit—A single channel between a pair of source and destination nodes. In addition to the source and destination nodes and all the attributes that are common to the service containing the circuit, a circuit has the following attributes:
  - Present/forecast indication
  - Routing direction for unprotected service
  - ITU channel
  - Optical bypass indication
- Demand—A set of circuits with common characteristics
- Traffic demand—All traffic between the same set of nodes. Both L-band and C-band are supported. The following traffic demands are supported: P-ring, Fixed (point-to-point), and Any-to-any (ROADM).

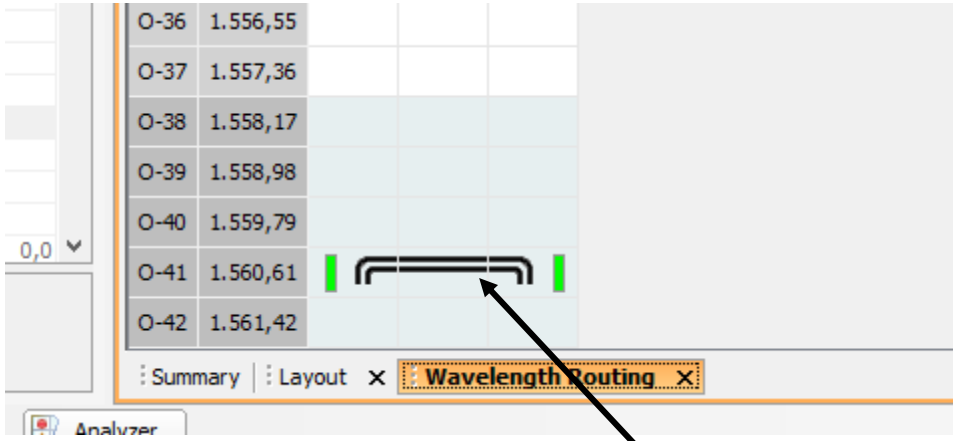
Point-to-Point Protected Line



Y-Cable Protection



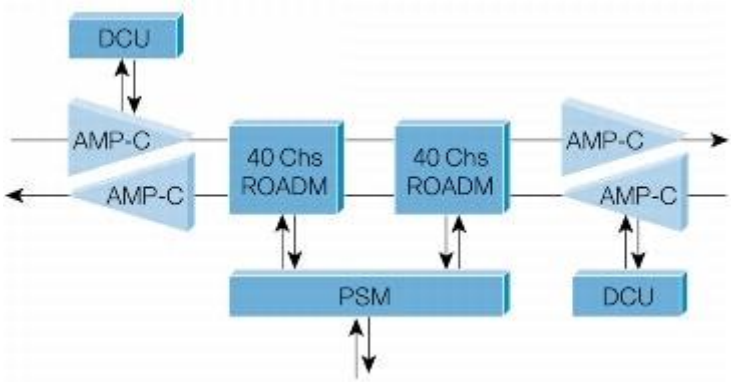
Wavelength Plan with Y-Cable



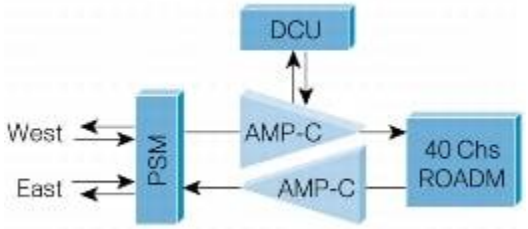
Same frequency over
two different fibers

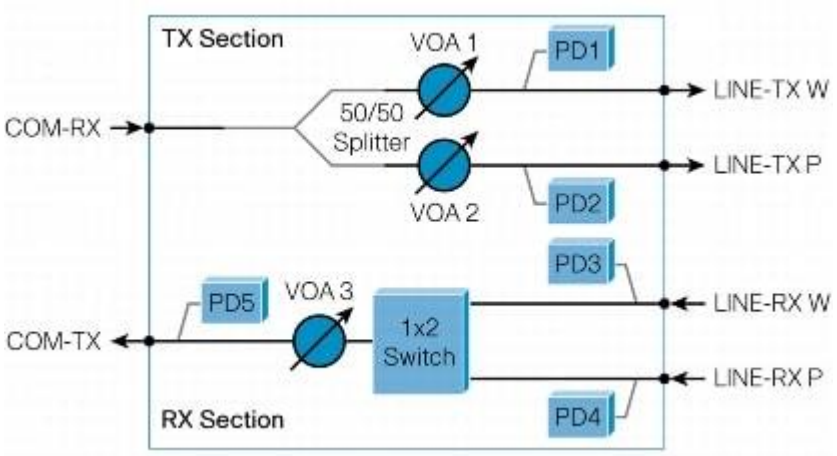
PSM Fiber Protection

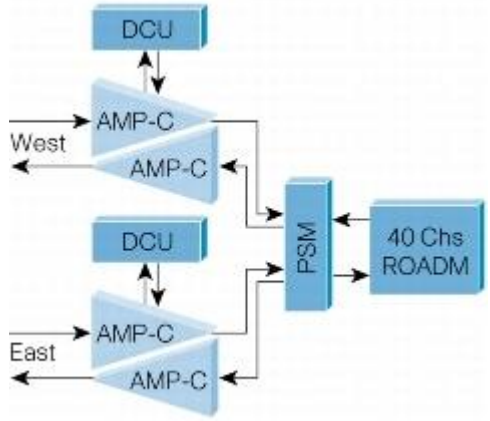
Channel protection



Multiplex section protection







Example 2

Build a point-to-point network with two nodes of type “line”

Create a 10 GE demand with:

a) Y-Cable
b) Client 1 + 1 protection
c) Fiber Switched protection
d) PSM-OCH protection
e) PSM path protection

Understanding Sides Labeling

Sides Labeling in Cisco Transport Planner

Sites	Labeling in Previous Releases	Labeling in Cisco Transport Planner Software R8.5 and later
Terminal/Terminal+	Only one side is created and labeled, T.	Only A can be used for the existing side.
Line/Line+	Two sides are created and are labeled, West and East.	Only A and B can be used for the existing sides.
Multidegree with PP-MESH-4	—	Only A, B, C, and D can be used for the existing sides.
Multidegree with PP-MESH-8	—	Only label A, B, C, D, E, F, G, and H can be used for the existing sides.
PSM Line	—	Only Aw and Ap can be used for the existing sides, where w stands for working and p stands for protection.
PSM Section	—	Only Aw and Ap can be used for the existing sides, where w stands for working and p stands for protection.

CTP Process Flow

1. Create a project using the Project Creation wizard.

2. Create a network using the Create Network wizard. The Create Network wizards adds sites and places the fiber spans between the sites. A span represents a pair of fibers.

3. Create a point-to-point, Aggregated Ethernet, OTN Aggregated, TDM Aggregated, protected ring (P-ring), and/or ROADM service demand.

4. Analyze the network design.

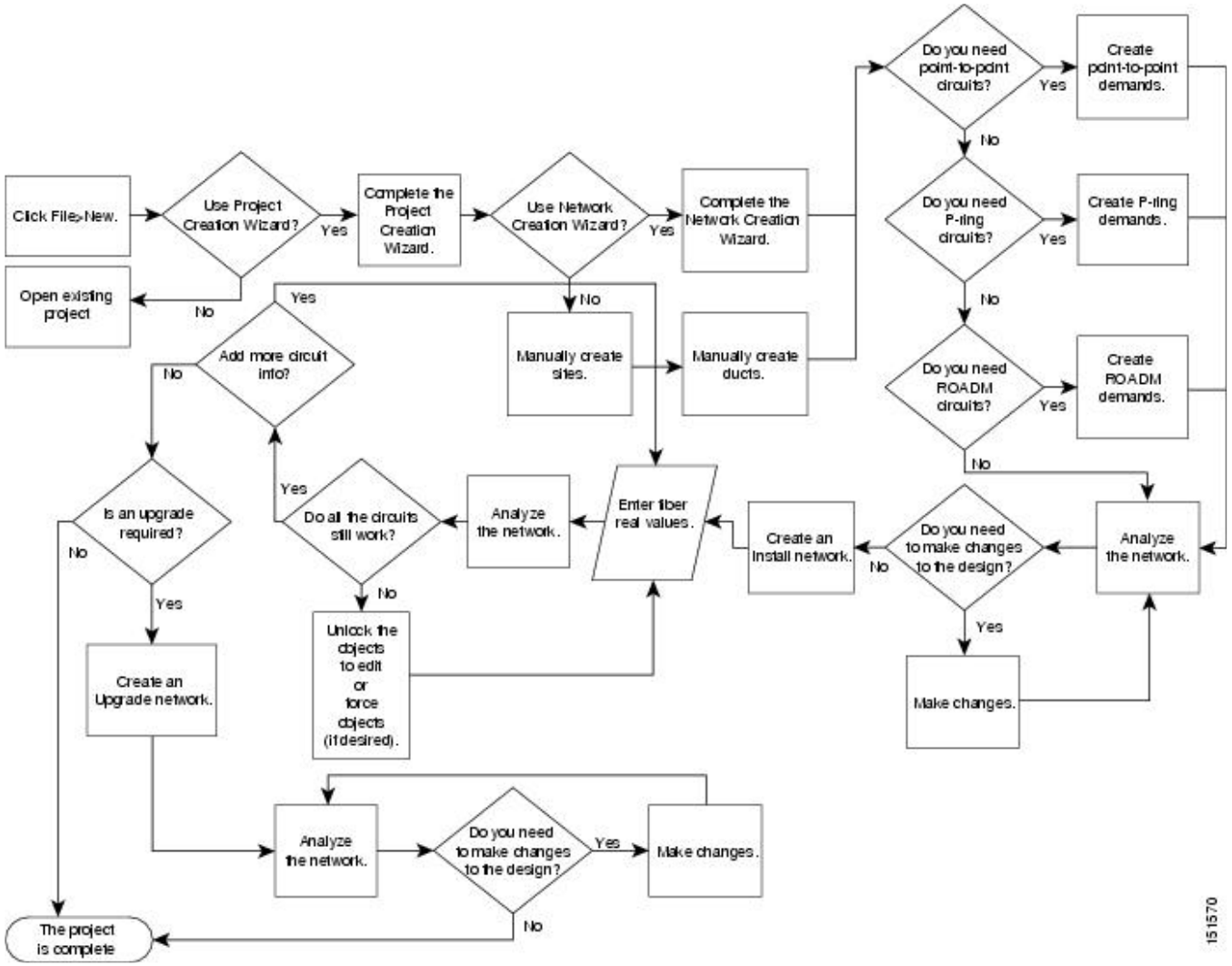
5. If you would like to force automatic tool choices, adjust the design and repeat the analysis until you have reached the desired configuration.

6. Create an Install copy of the network and update the parameters with real data from the field.

7. Analyze the Install network.

8. Create an upgrade copy of the network, as needed, to add forecasted channels.

Workflow Diagram in CTP



Planning Traffic

Traffic in Cisco Transport Planner is defined as an optical path for each pair of nodes requiring a service demand. An optical path is the combined channels between the two nodes. The following list gives definitions for some basic traffic items:

• Circuit—A single channel between a pair of source and destination nodes. In addition to the source and destination nodes and all the attributes that are common to the service containing the circuit, a circuit has the following attributes:

  – Present/forecast indication
  – Routing direction for unprotected service
  – ITU channel
  – Optical bypass indication

Planning Traffic

- Demand—A set of circuits with common characteristics, such as:
  - Service demand label
  - Number of existing circuits
  - Number of forecasted circuits
  - Client service type
  - Protection type
  - Optical bypass (number of channels and/or sites)
  - Present/forecast indication WDM interface type (TXT or ITU-LC)
  - WDM card type
  - Source client interface (SR, IR, or LR) (short, intermediate, long reach)
  - Destination client interface (SR, IR, or LR)

Planning Traffic

• Traffic demand—All traffic between the same set of nodes. Both L-band and C-band are supported. The following traffic demands are supported: P-ring, Fixed (point-to-point), and Any-to-any (ROADM).

– In **P-ring traffic demands**, all the demands are used to support traffic topologies similar to bidirectional line switched rings (BLSRs) or multiplex section-shared protection rings (MS-SPRings). Each P-ring demand is between a pair of added/dropped nodes where BLSR-like (or MS-SPRing-like) traffic must exist. The number of circuits is the same for each demand, and is user-specified (from 1 to 40).

– In **fixed (point-to-point) traffic demands**, the set of nodes is restricted to two sites. The number of circuits is user-specified (from 1 to 40).

– In **any-to-any (ROADM) traffic demands**, a minimum of two nodes and a maximum of 40 ROADM nodes are supported. The any-to-any traffic demand allows each node to establish one or more circuits with the other nodes, either as a hub or meshed configuration. In a meshed configuration, each node defined in the set is connected to each of the nodes. This is the most common traffic type. In a hub configuration, the user-defined hub node is connected to each of the other nodes. ROADM circuits have the same protection types and services. The number of circuits is not user-specified and can vary from 0 to 40.

Service Support

Cisco Transport Planner can support any subset of the following services:

- Alien (third-party DWDM interface)
- Cisco ONS 15530 2.5 Gbps Aggregated
- ONS 15530 10 Gbps Aggregated
- ONS 15530 Multirate (MR) Transport
- ONS 15530 Data Multiplexer (MXP)
- 2R Any Rate
- Gigabit Ethernet
- 10GE—10 Gigabit Ethernet (LAN and WAN)

Service Support

- D1 Video
- DVB-ASI—Digital Video Broadcast-Asynchronous Serial Interface
- DV-6000
- DPSK—Different Phase Shift Keying
- ESCON—Enterprise System Connection
- Fast Ethernet
- Fiber Channel 1G
- Fiber Channel 2G
- Fiber Channel 4G
- Fiber Channel 8G
- Fiber Channel 10G
- FICON—Fiber Connection 1G
- FICON Express 2G

Service Support

- FICON 4G
- FICON 8G
- FICON 10G
- E3 over FE
- T3 over FE
- DS3 over FE
- High Definition Television (HDTV)
- ISC-3 Peer (1G)
- ISC-3 Peer (2G)
- ISC-3 Peer (2R)
- ISC-Compat (ISC-3 Compatibility mode)
- OC-3
- OC-12
- OC-48
- OC-192
- OC-768
- OTU2
- SDI—Serial Data Input
- STM-1
- STM-4
- STM-16
- STM-64
- STM-256
- 10GE WAN-Phy
- 10GE LANtoWAN
- OTU2
- OTU2e
- OTU3
- Sysplex CLO—control link oscillator
- Sysplex ETR—external throughput rate

Example 3

Create a point-to-point network with 3 nodes:

node a: terminal

node b: line

node c: terminal

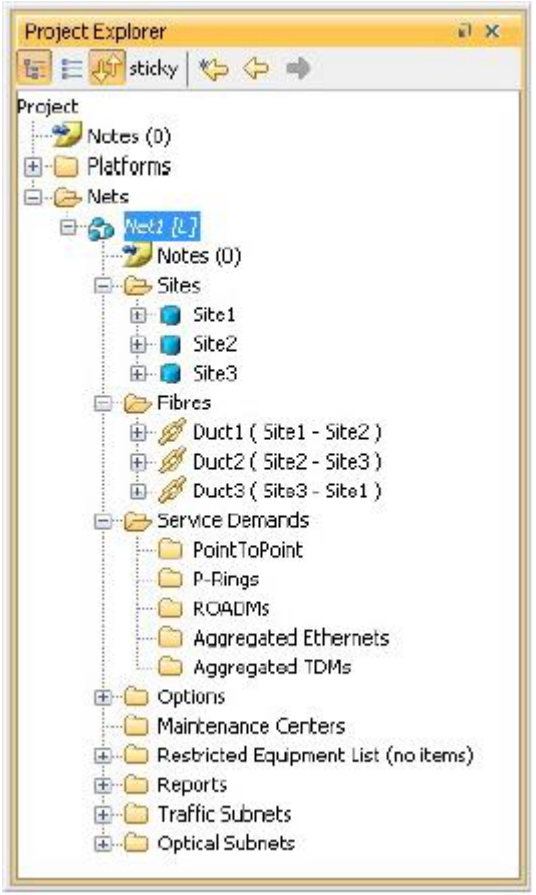
Use the mode NOS 15454 legacy first

Repeat the same problem using the mode FLEX-NG

Compare both solutions

Editing and Configuring Demands

Project Pane



The Project Explorer pane shows all of the open project information, including networks, network dependencies, sites, fibers, services, and so on.

The user-defined traffic services are displayed as folders and icons in the Project Explorer pane.

After you analyze a network design, the colors of the icons change according to the error/warning condition of the network design.

Traffic on Explorer Pane

Cisco Transport Planner represents all of the user-defined traffic services as folders and icons within the Project Explorer pane.

Point-to-Point Traffic Demands

Point-to-point traffic demands appear in the **Service Demands > PointToPoint** folder in the Project Explorer pane. Each point-to-point traffic demand is categorized by its source and destination site names. All of the point-to-point services between the two sites appear under the designated demand name.

A point-to-point traffic demand includes the following information:

- Client service type
- Site# – Site# (source and destination site labels for this demand)

Traffic on Explorer Pane

P-Ring Traffic Demands

Each protected ring (P-ring) traffic demand appears in the Project Explorer pane under the **Service Demands > P-Rings** folder.

All the P-ring channels between each site pair are listed under each P-ring traffic demand. Each demand is labeled with the following information:

- P-ring number
- Client service type
- Site# – Site# (source and destination site labels for this demand)

Traffic on Explorer Pane

ROADM Traffic Demands

Each ROADM traffic demand appears in the Project Explorer pane under the **Service Demands > ROADMs** folder. The ROADM folder contains each defined ROADM demand. You can define more demands for the same ROADM for the same set of nodes.

In the **Project Explorer** pane, each ROADM includes the ROADM demand name and a list of DWDM card types that support the client service types. Protection types appear in parentheses.

Aggregated Ethernet Demand

Each aggregated ethernet traffic demand appears in the **Project Explorer** pane under the **Service Demands > Aggregated Ethernet** folder. The Aggregated Ethernet folder contains each defined aggregated ethernet demand. Aggregated Ethernet demands are supported on ring and linear traffic subnets.

Traffic on Explorer Pane

TDM Aggregated Demand

Each TDM aggregated demand appears in the **Project Explorer** pane under the **Service Demands** > **Aggregated TDMs** folder.

Note: TDM aggregated demands are supported only on a ring traffic subnet.

OTN Aggregated Demand

OTN Aggregated Demand appear in the **Service Demands** > **Aggregated OTN** folder in the Project Explorer pane. OTN Aggregated demands are supported on ring and linear traffic subnets.

Parameters States

Parameters in CTP can be in one of three states:

- Auto— This parameter allows the highest degree of flexibility to CTP in designing a network. When you select Auto, CTP chooses the parameter value during network analysis.
- Forced—When you set a specific parameter value, other than Auto, CTP designs the network using these constraints. When a setting is forced, the item appears in blue italics in the Project Explorer pane.
- Locked—The state of a parameter after network analysis. The next time the analyzer is run, Cisco Transport Planner cannot change the value when it is in the Locked state. You can unlock an item using the Unlock command.

Opening a Project

Step 1 Click the project name under Open in the Tasks Pane. The project opens. If you do not see the project name listed, continue with Step 2.

Step 2 Click **Open** in the Start Page, click **Open** under Project in the Tasks Pane, or in the File menu.

Step 3 In the Open Project dialog box, navigate to the desired folder and choose the project. Click **Open**. The Cisco Transport Planner project appears.

Note You cannot open an existing CTP project in multiple CTP instances. The saved project (.MPZ file) is locked for the use of that CTP. If you try to open the project in another instance of CTP, an error message is displayed. The .MPZ project file is unlocked and released only after you close the Network.

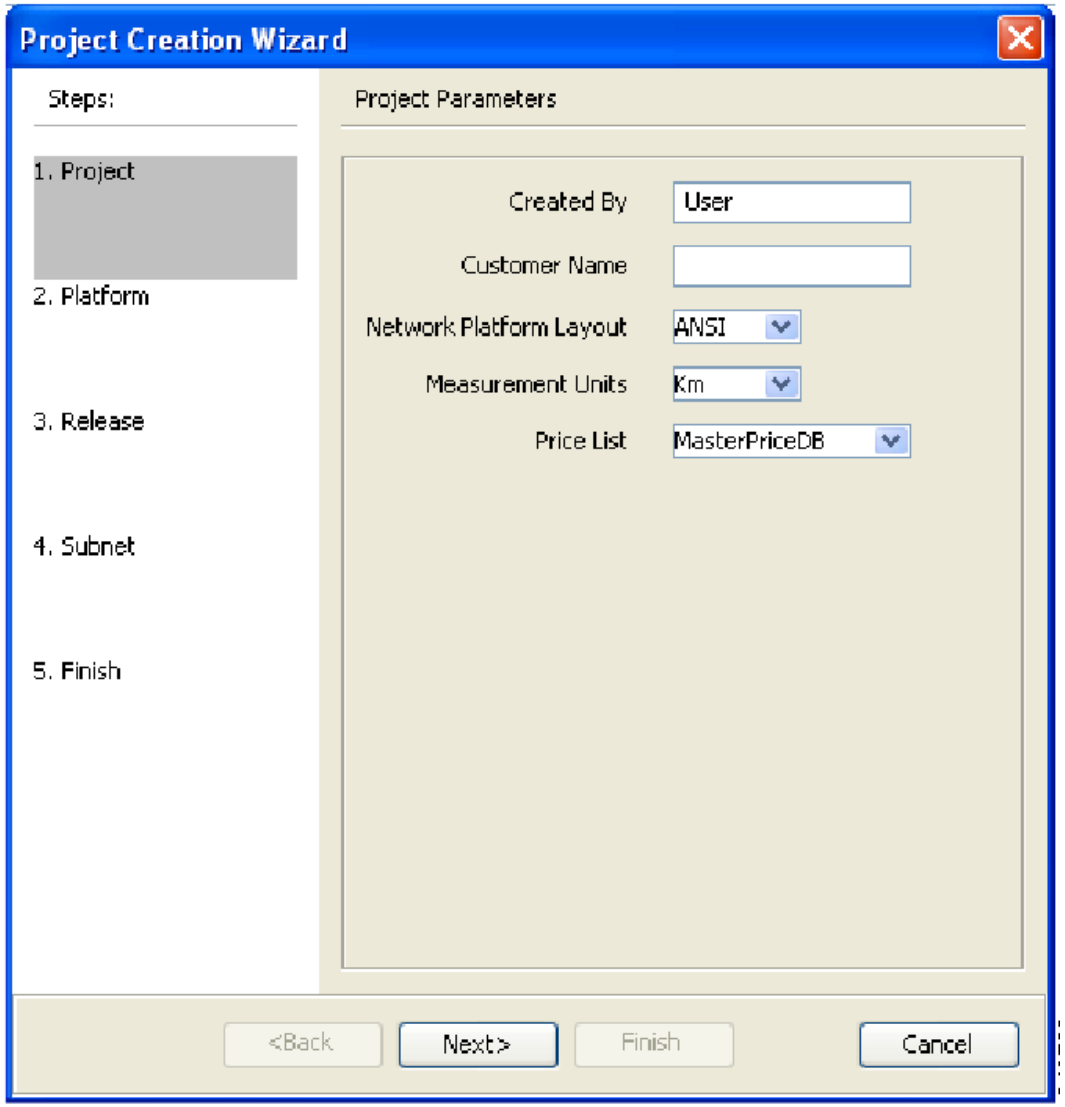
Creating a Project

Step 1 – From the File menu, choose New. The Project Creation Wizard appears

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

- Created by
- Customer
- Network
- Measurement
- Price List

Step 3 – Click Next



Creating a project

Step 4 - In the Choose Platform area, check the desired platform and click Next.
The Choose Release area appears.

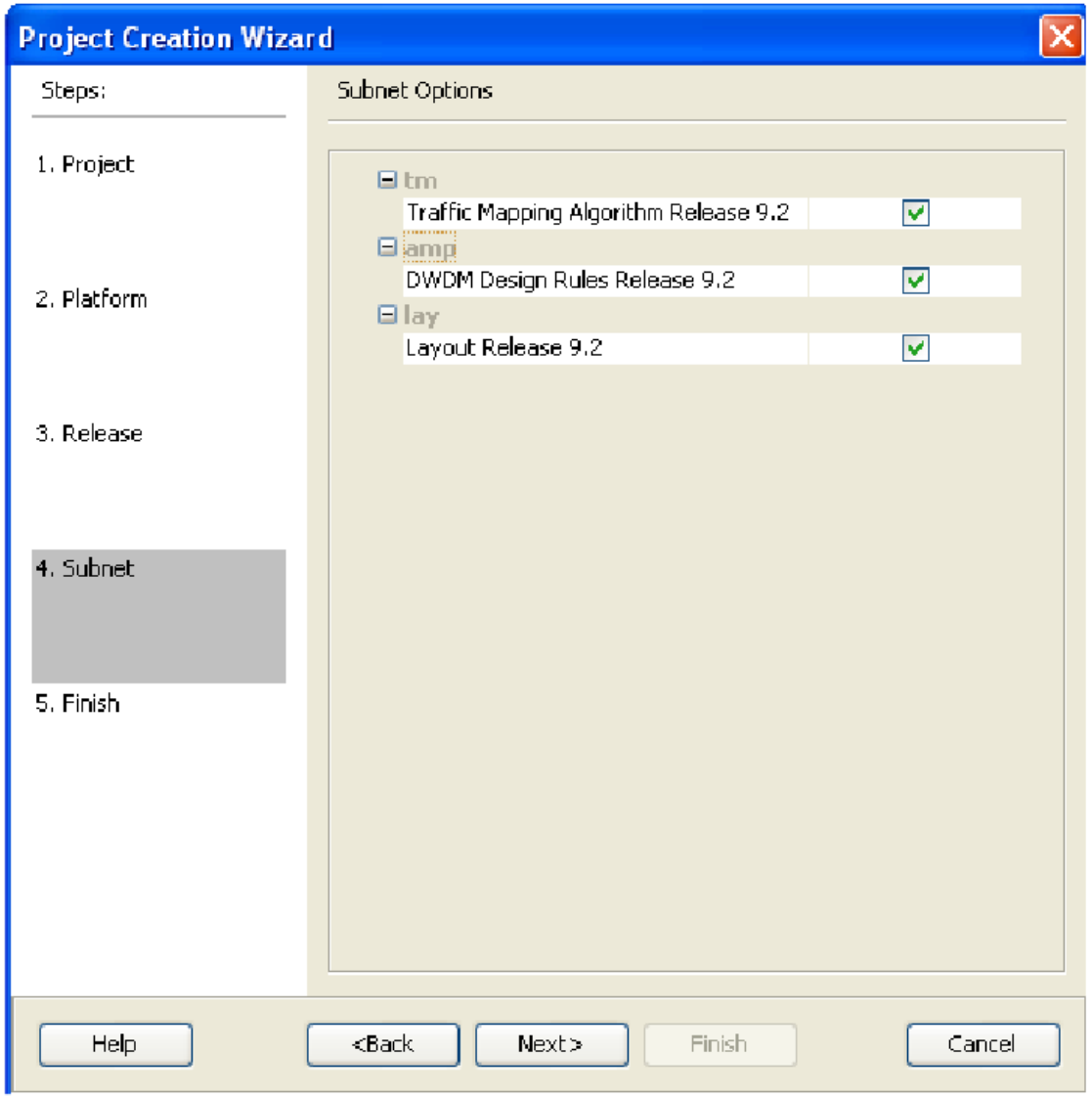
Step 5 - In the Choose Release area, check the desired software release for the network design and click Next.The Subnet Options area appears.

Step 6 - In the Subnet Options area, complete the following.

- Traffic Mapping Algorithm Release 9.2
- Design Rules Release 9.2
- Layout Release 9.2

Creating a project

Step 7 – click next



Creating a project

Step 8 -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

Creating a project

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

Creating a project

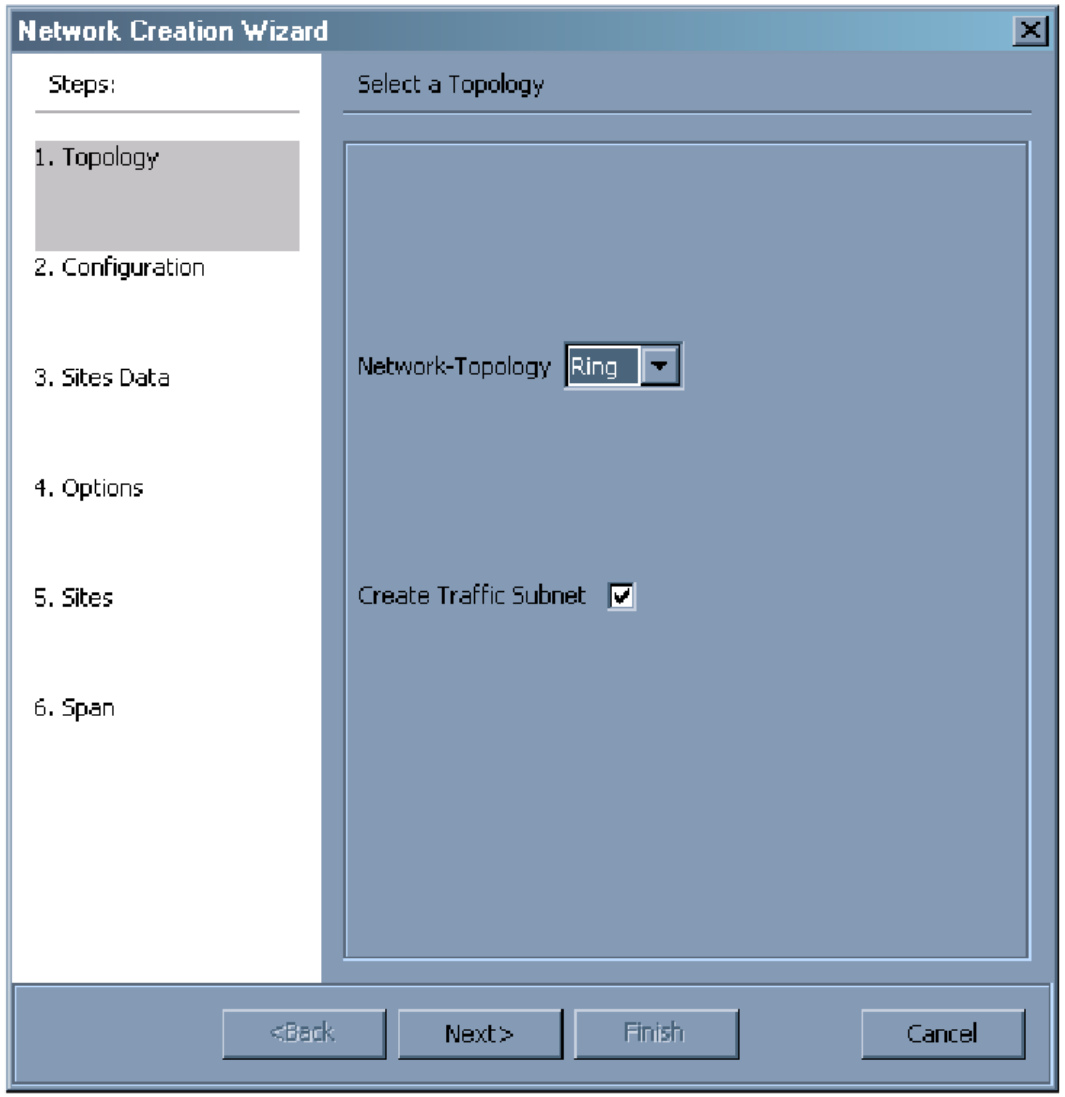
Step 10 - To instruct Cisco Transport Planner to automatically create a traffic subnet associated with the created network, check the Create Traffic Subnet check box

Step 11 -Click Next.

The Configuration page appears.

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

- MSTP 15454 ONS—To create an MSTP 15454 configuration.
- HYBRID 15454 ONS—To create a 15216 Flex Layer Hybrid configuration.



Creating a project

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: 100 Minimum: 2 Default: 3
PSM Line	• Intermediate Sites on Working path • Intermediate Sites on Protected path	Both for working and protected paths: Maximum: 60 Minimum: 0 Default: 0
PSM Section	• Intermediate Sites on Working path • Intermediate Sites on Protected path	Both for working and protected paths: Maximum: 60 Minimum: 0 Default: 0

Creating a project

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.

Available Site Topology options are:

Structure	Supported Configurations	Description
Line	• MSTP 15454 ONS • HYBRID 15454 ONS	Site with two sides facing two fiber spans. The default site value for ring topology is Line.
Terminal	• MSTP 15454 ONS • HYBRID 15454 ONS	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.

Creating a project

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	MSTP 15454 ONS	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.

Creating a project

Step 15 – Click Next

The Options area appears.

Step 16 - The Options area allows you to define C band and L band rules for the network design. Options area complete the following:

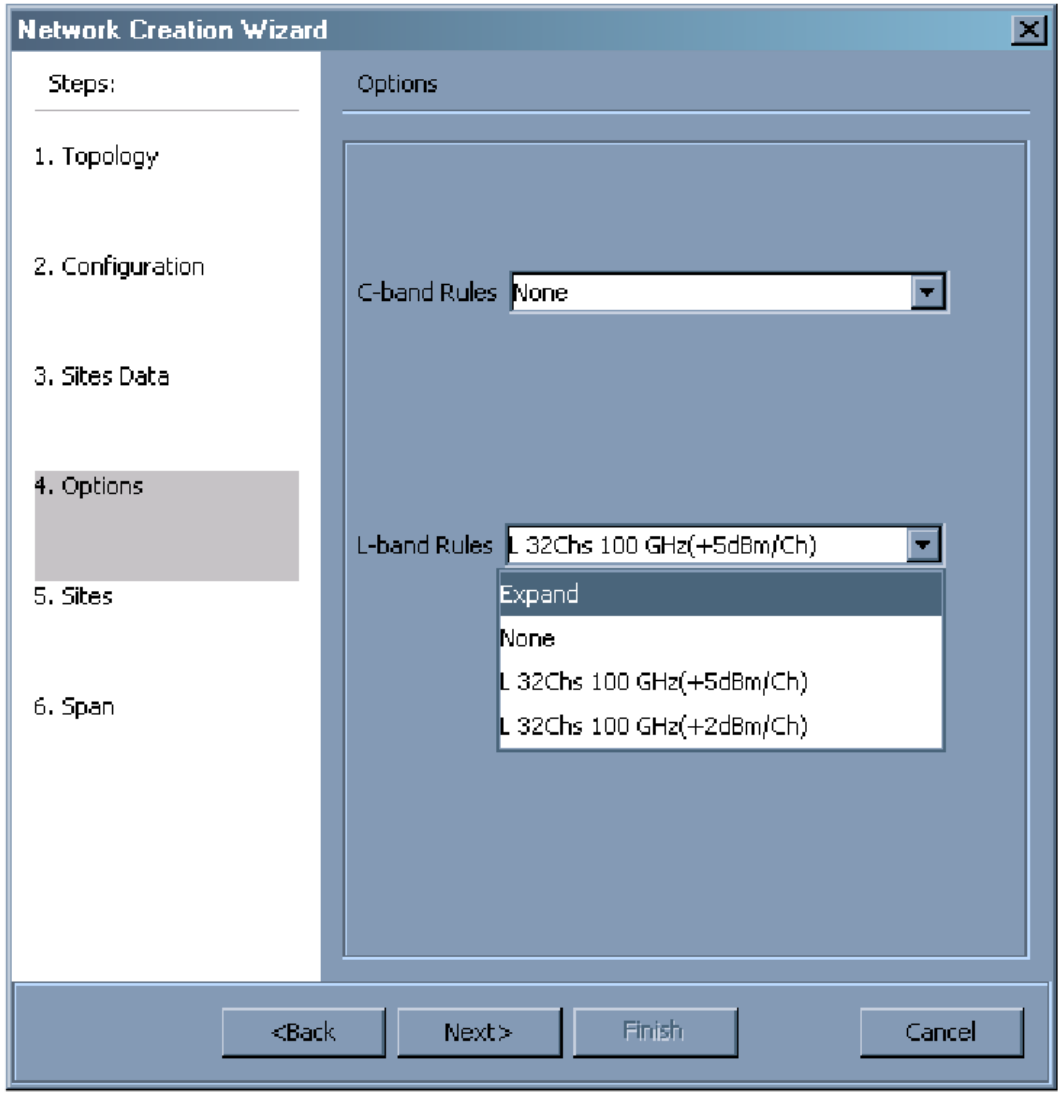
C-band rules—The C-band options appear in the following format: 80Ch. 50 GHz +1dBm. The channels available are 80, 72, 64, 40, 32, 20, 16, or 8; the reference per channel power options available are -1 dBm, +1 dBm, 2 dBm, -2 dBm, +4 dBm, 5 dBm, 7 dBm and 8 dBm; and the spacing options available are 100 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) –

Creating a project



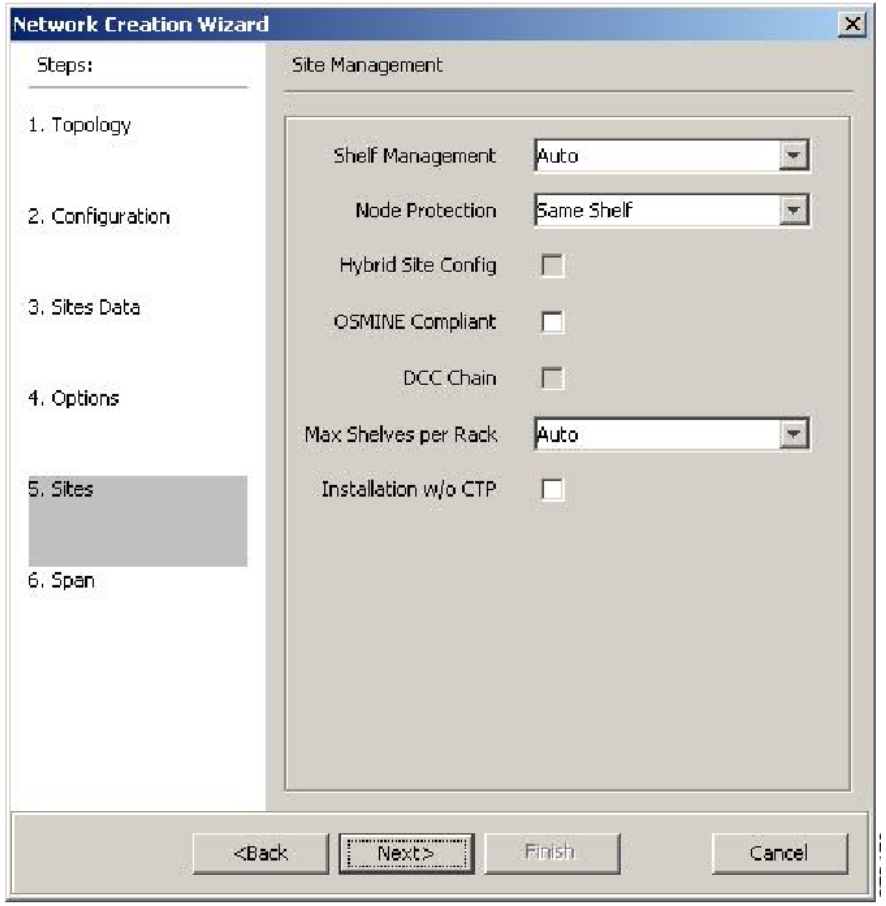
Creating a project

Step 17 – Click Next

The Site Management area appears.

Step 18 - In the Site Management area, complete the following:

- Shelf Management—Choose the shelf management configuration
- Node Protection
- Node Protection
- Hybrid Site Config
- OSMINE Compliant
- DCC Chain
- Max Shelves per Rack
- Installation w/o CTP



Creating a project

Step 19 - Click Next -The Span Parameters area appears.

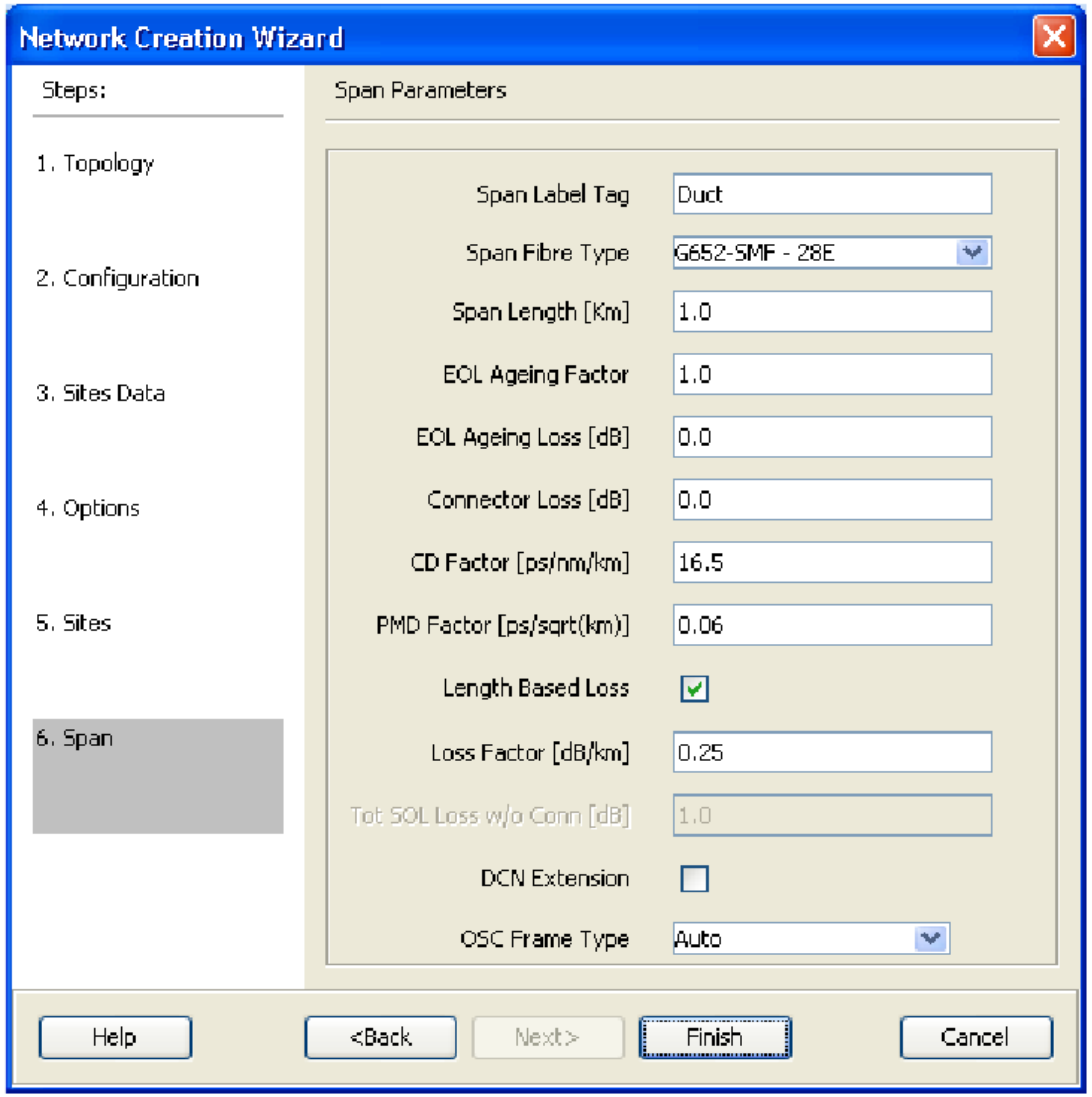
Step 20 -In the Span Parameters area, complete the following.

- 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—Type the number to use when factoring fiber aging. This factor is multiplied by the SOL total span loss without connectors.
- EOL Ageing loss [dB]—Type 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).

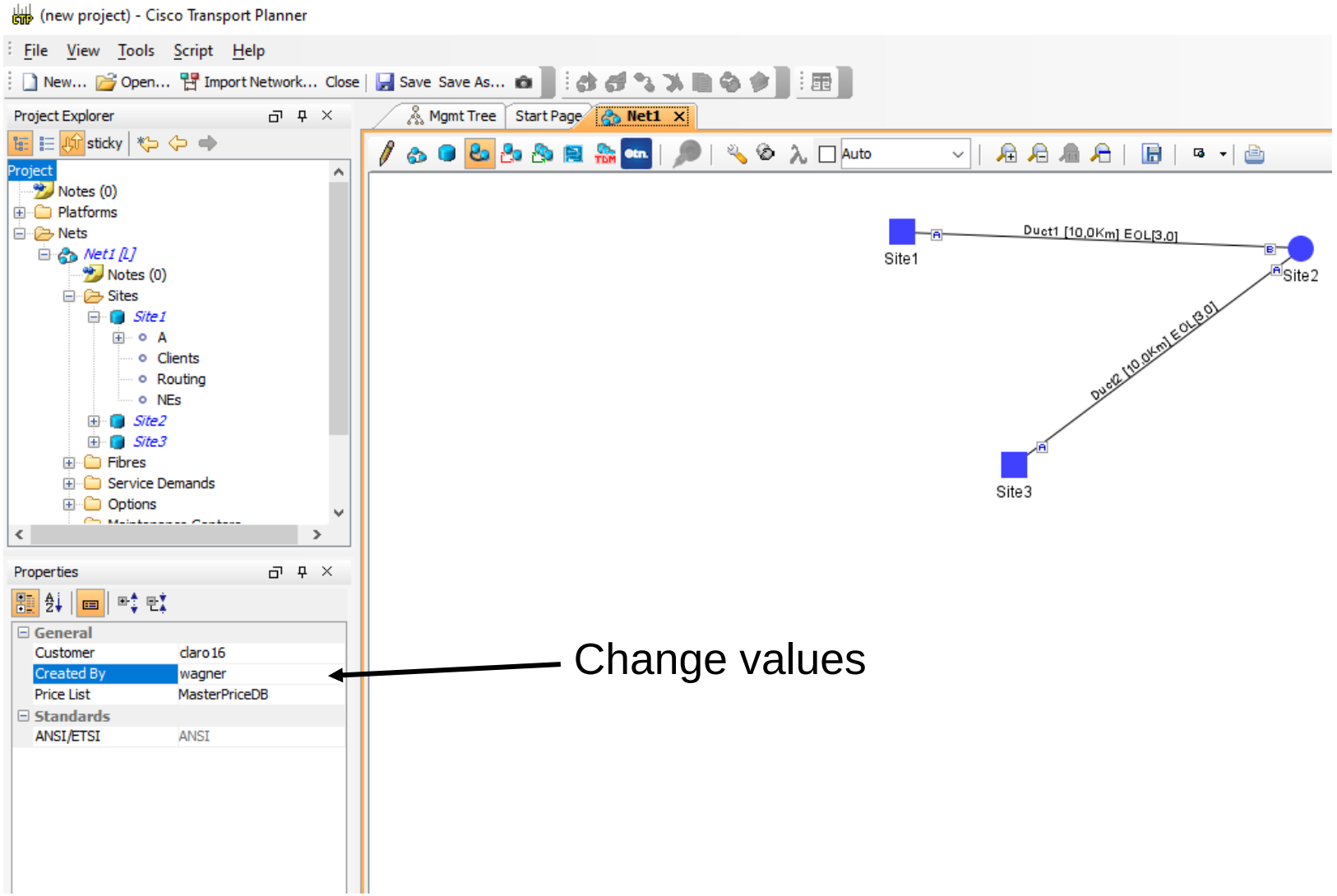
Creating a project

- CD factor [ps/mn/km]
- PMD factor [ps/sqrt(km)]
- Length Based Loss
- Loss factor [dB/km]
- Tot SOL loss w/o conn [dB]
- DCN extension
- OSC Frame Type

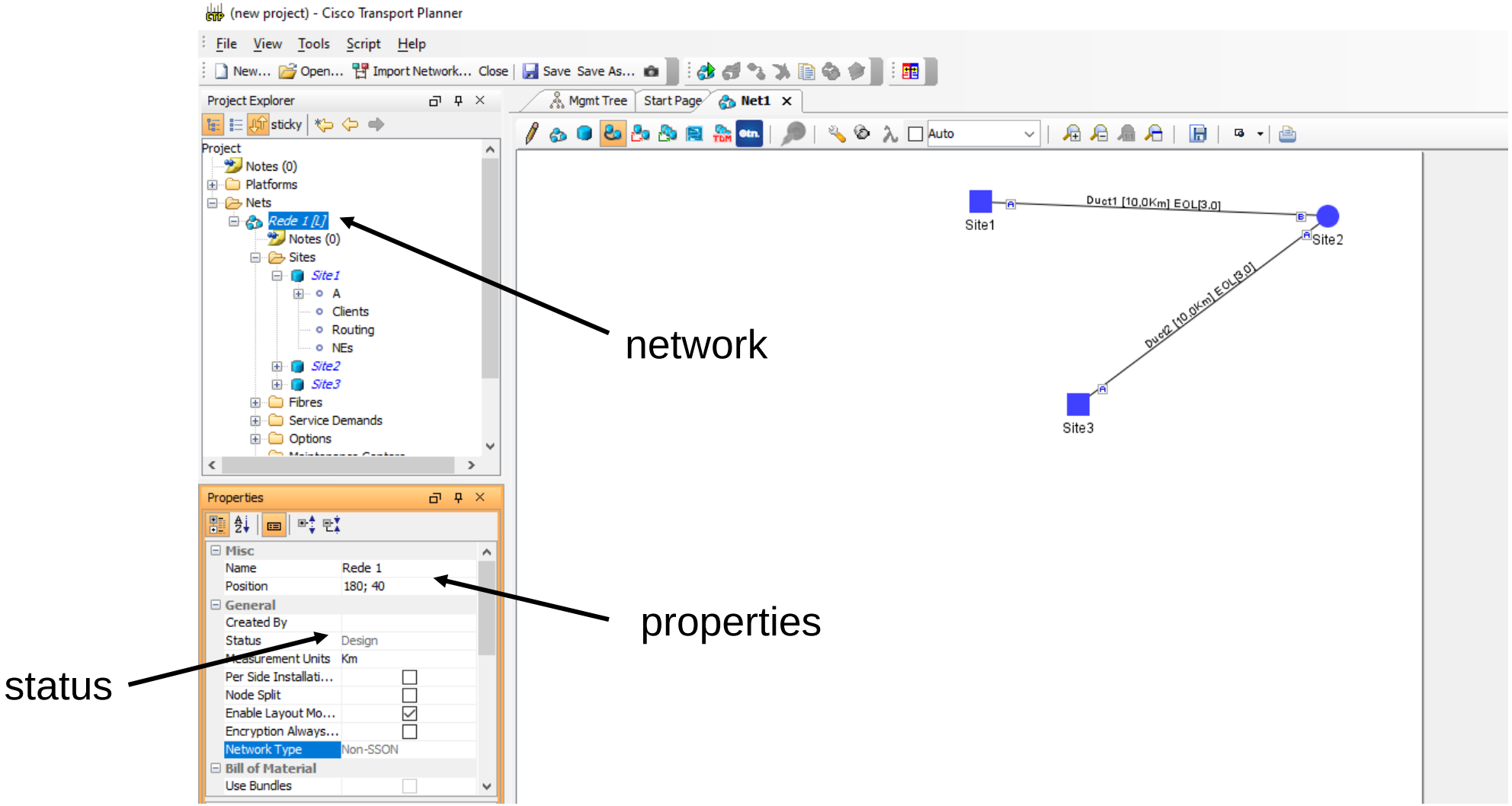
Step 21 – Click Finish



Editing Project Properties



Editing Network Properties



Loading and Unloading Networks

Each network in a project requires memory.

To save memory, when Cisco Transport Planner opens a project, all networks are in the Unloaded state.

An unloaded network appears in the Project Explorer pane with a “U” next to the network identifier.

To load an unloaded network, double-click on the network folder in the Project Explorer pane, or right-click the network and choose **Load** from the shortcut menu.

Saving a Project

Step 1 Choose one of the following:

- To save an existing project with the same filename, choose **File** > **Save**. You have completed this procedure.
- To save a new project, choose **File** > **Save** and go to Step2.
- To save an existing project with a different filename, choose **File** > **Save As** and go to Step2.

Step 2 In the Save Project dialog box, navigate to the desired folder and enter the filename. Click **Save**. Cisco Transport Planner saves projects as zipped files with the MPZ extension.

Closing a Project

Step 1 Choose one of the following:

- To save an existing project with the same filename, choose **File** > **Save**. You have completed this procedure.
- To save a new project, choose **File** > **Save** and go to Step2.
- To save an existing project with a different filename, choose **File** > **Save As** and go to Step2.

Step 2 In the Save Project dialog box, navigate to the desired folder and enter the filename. Click **Save**. Cisco Transport Planner saves projects as zipped files with the MPZ extension.

Deleting the CTP Cache

Step 1	From the Tools menu, choose **Delete Cache**.
Step 2	Click **Yes** to delete the CTP cache or **No** to postpone cache deletion.
Step 3	When you click **Yes**, an information message is displayed prompting you to restart CTP now or later. If you do not want to restart CTP immediately, cache deletion is postponed to the next restart.
Step 4	Before you restart, save your project and choose **File** > **Close** to close the project.
Step 5	If you click on **Restart Now**, CTP cache is deleted and CTP restarts automatically.
Step 6	To restart CTP later, choose **File** > **Restart**. A message is displayed prompting you to continue with restart. Click **Yes** to restart CTP. A message is displayed prompting you to continue with cache deletion now or later.
Step 7	Click **Yes** to delete the CTP cache or **No** to postpone cache deletion.

Optical Subnets

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.
- Spectral Density—When SSON is enabled, you can choose the spectral density from the drop-down list box.

When you create a new project, 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.

Creating an Optical Subnet

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.
Step 2	Click **Create**. The Create Optical Subnet dialog box appears. 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.
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.

Add and Remove Spans from Subnets

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.

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.

Create Traffic Subnet

Step 1 In the Project Explorer pane, scroll down to Traffic Subnets.

Step 2 Right-click Traffic Subnets, and select **Create**.

The Traffic Subnet Creation wizard appears.

Step 3 Select the Topology for the subnet from the drop-down list (**Ring**, **Linear**, and **Mesh**), then click **Next**.

Note For creating OTN Aggregated Demand, only **Ring** and **Linear** options appear.

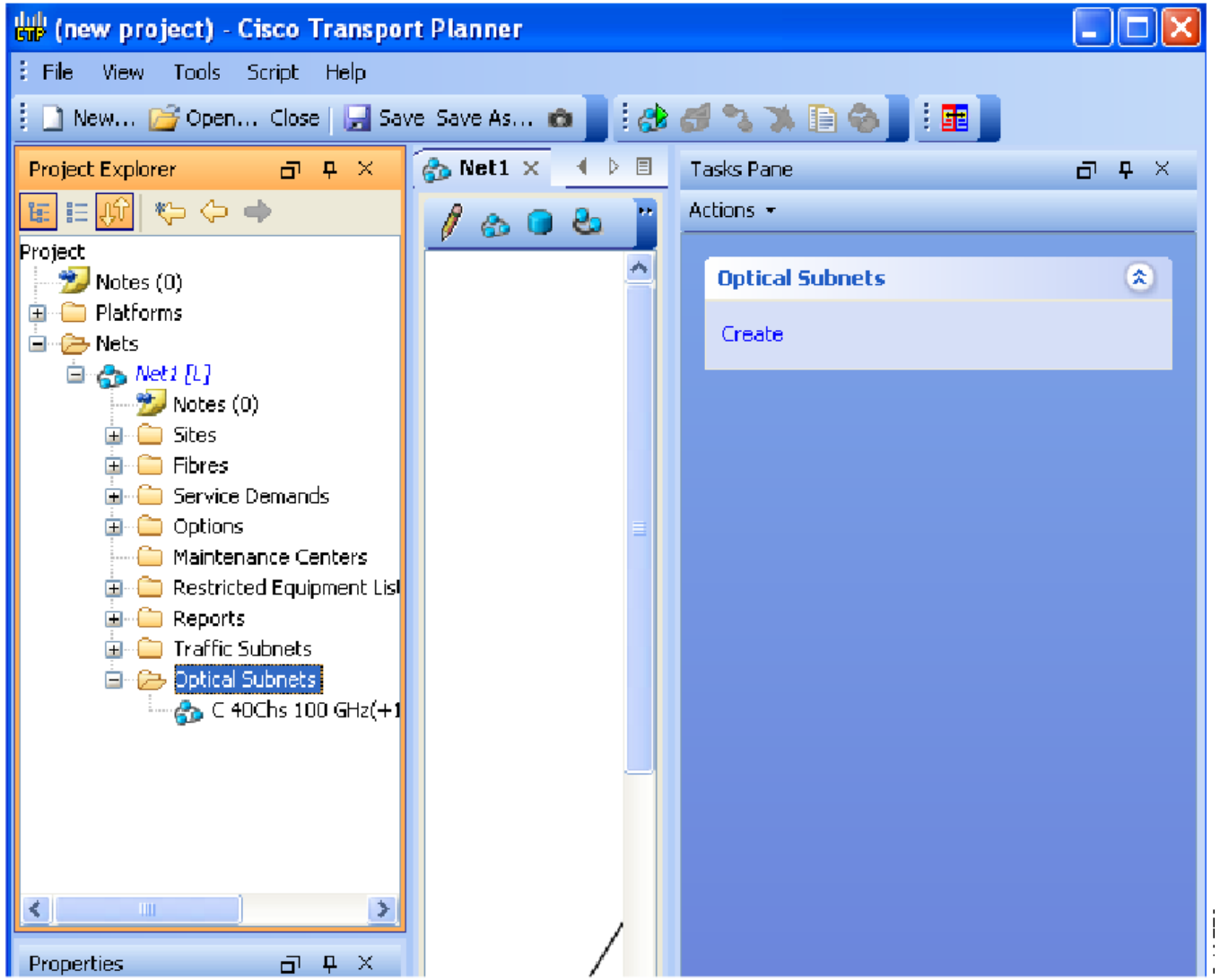
Note If Ring or Linear topology is selected for the subnet, the spans in the subnet must be adjacent and also ordered.

Step 4 Click **Press** to build new subnet. The Traffic Subnet Builder Wizard appears.

Step 5 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.

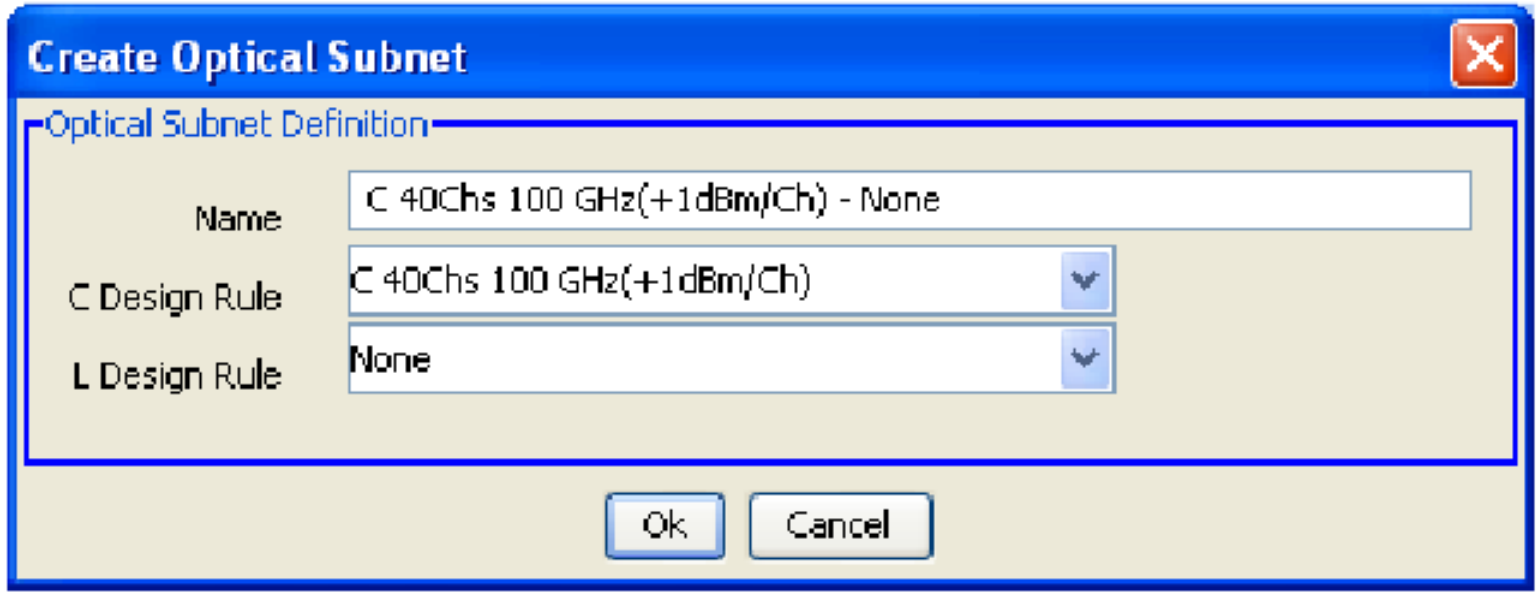
Step 6 Click **Finish** to complete the creation of the traffic subnet. The created subnet appears under Traffic Subnets in the Project Explorer pane.

Creating an Optical Subnet



Creating an Optical Subnet

Step 2 - Click Create. The Create Optical Subnet dialog box appears .Alternatively, right-click the Optical Subnets folder and select Create



Adding Notes to a Project

Step 1- Right-click the desired item in the Project Explorer 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. Lists the columns in the Notes window.

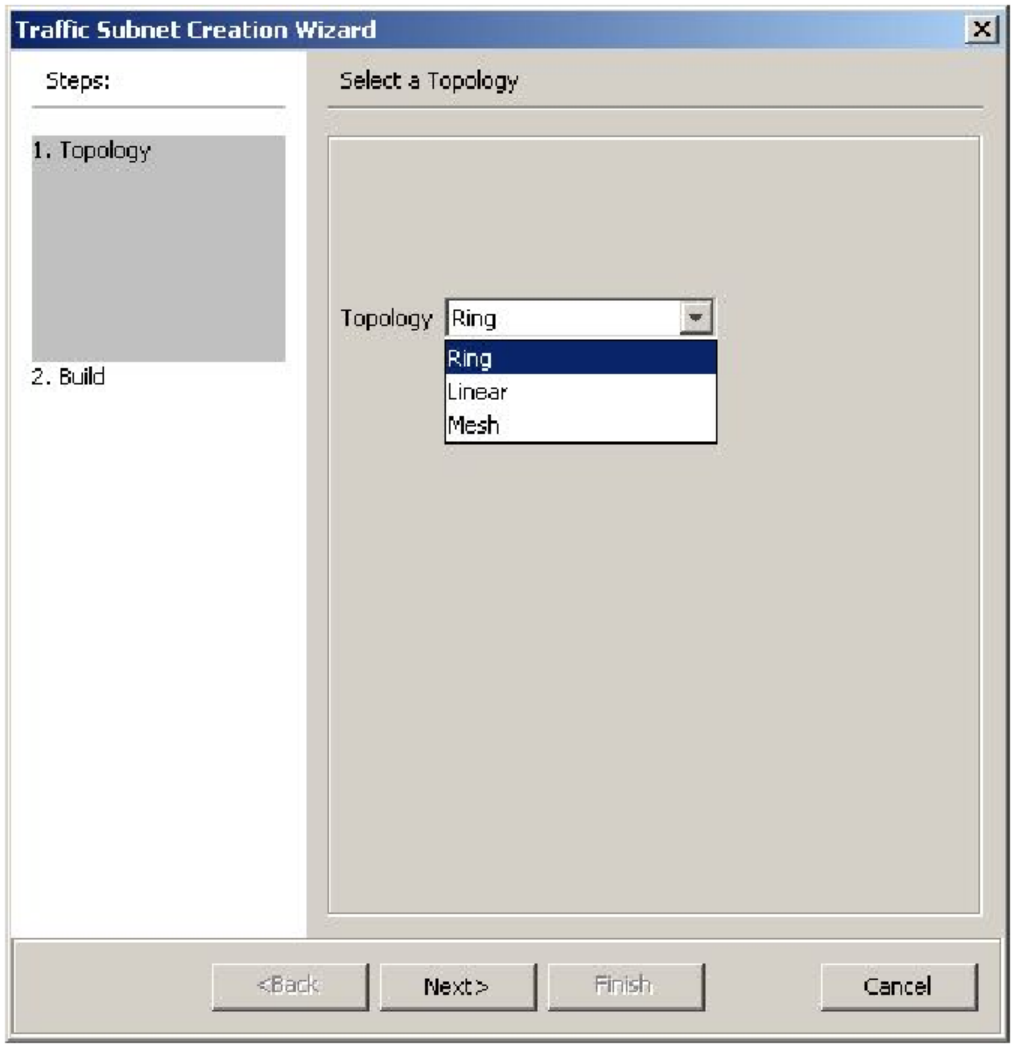
Step 5 - To close the Notes window, click the X in the upper right corner of the window.

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 **Go** to open the item in the Project Explorer where the note was created.
Source	Displays the location of the note, for example, ProjectManager.Nets.Net2.Sites.Site2.W.

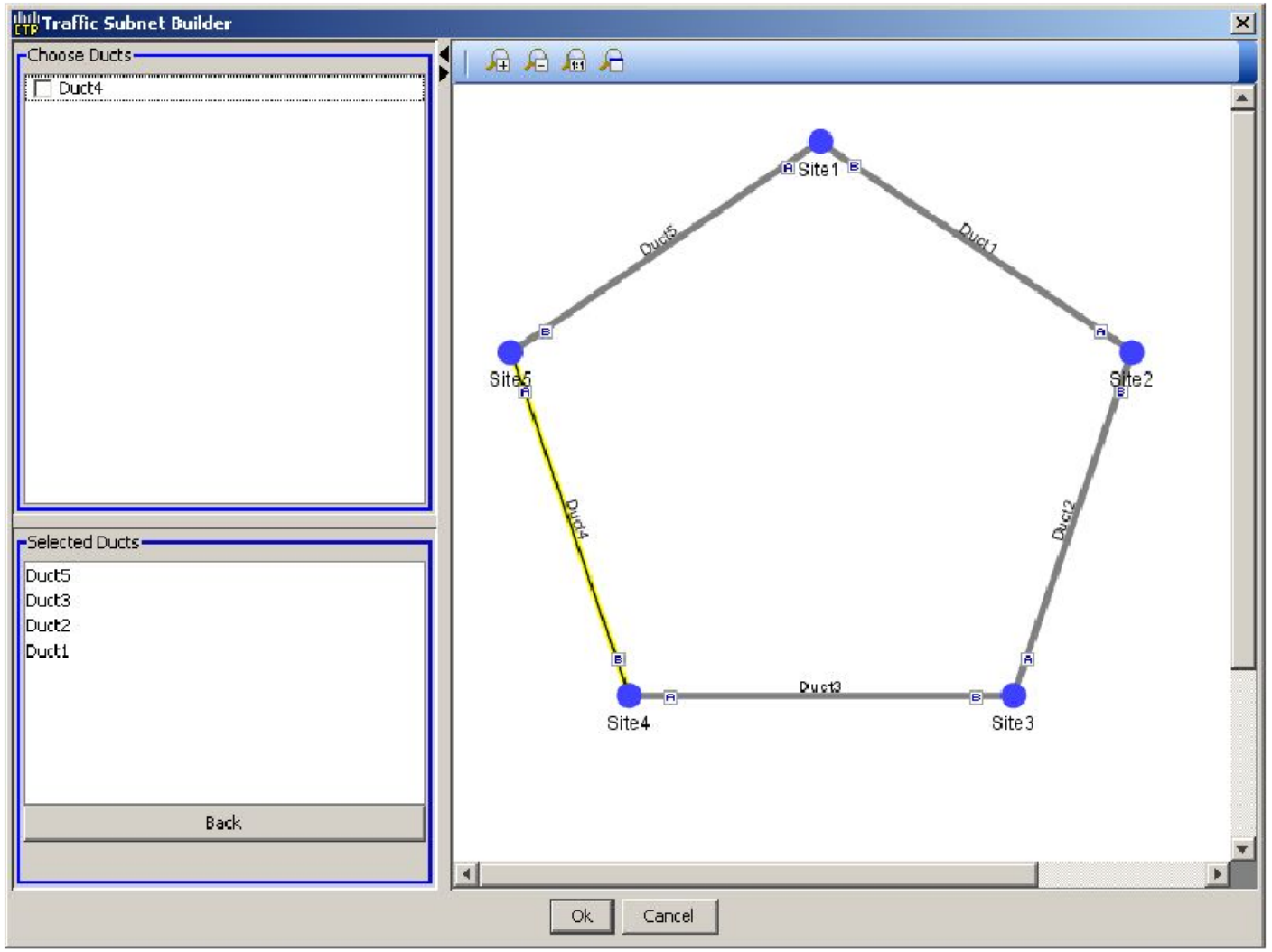
Creating Traffic Subnet

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

A traffic subnet is a routing tool. Choose the subnet according with your network.



Creating Traffic Subnet



Example 4

Create a ring network with 5 nodes, all of them of type line

Create two traffic network between neighbors node. One by the shorter side and one by the longer side.

Create two linear demands. One over each traffic network

Analyze the network and examine wavelengths routing

Creating Demands

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.

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 anddistortion, 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

Manual Regeneration

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.

Creating a Point-to-Point Demand

Step 1- In the NtView Name tab, click the Create new Point-to-Point demand icon in the toolbar.

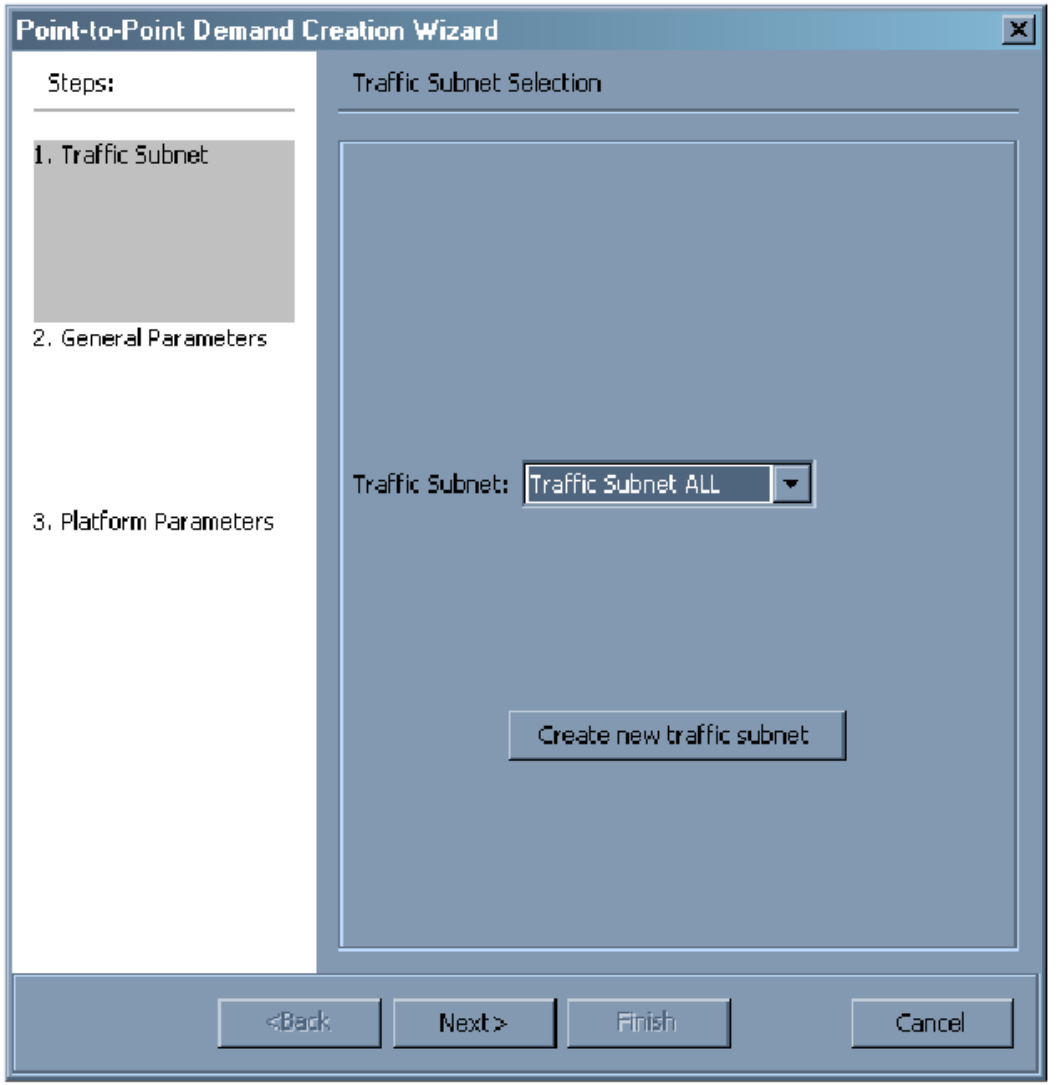
Step 2 -Click the source site of the demand.

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

Step 5 -Click Next.

Creating a Point-to-Point Demand



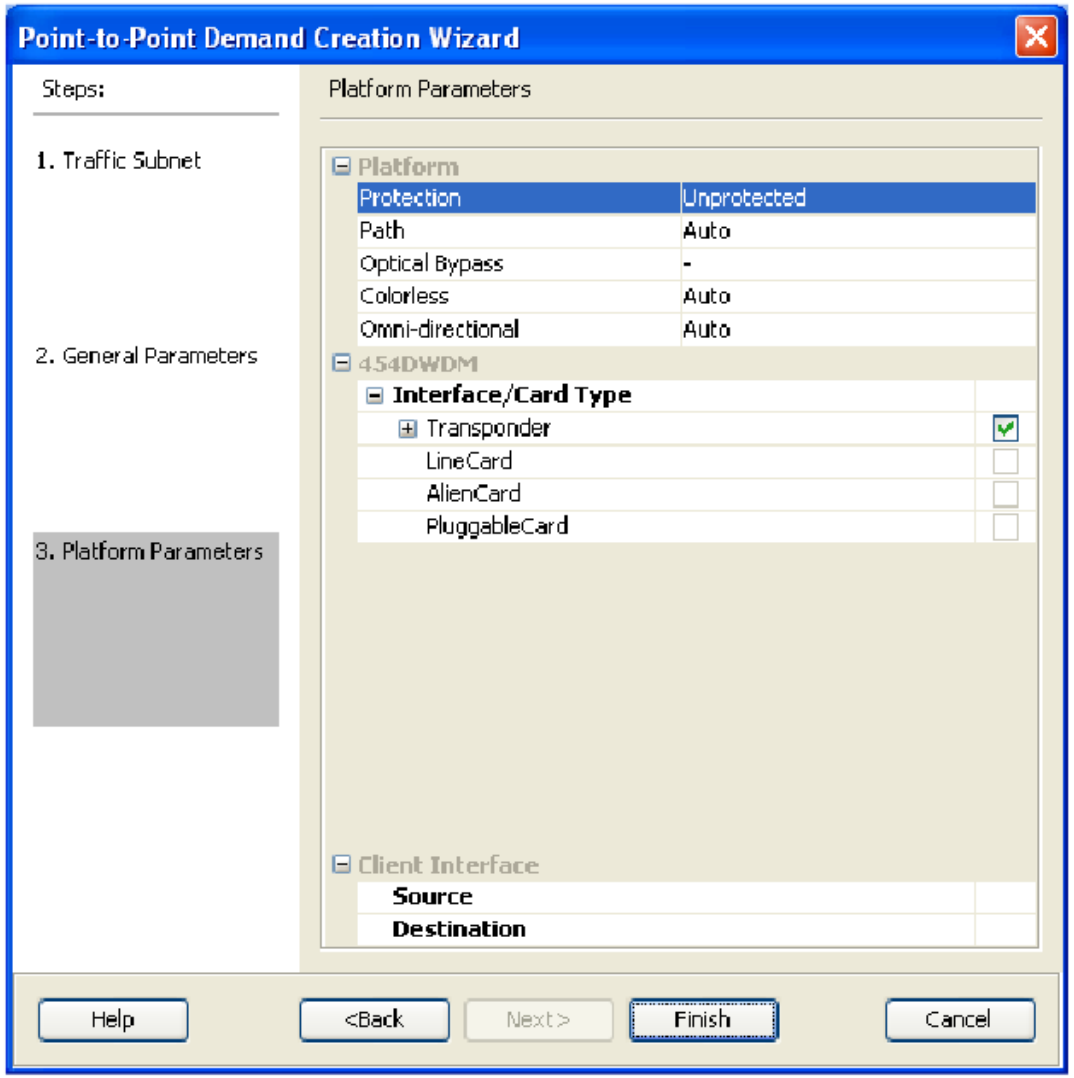
Creating a Point-to-Point Demand

Step 6 - On the General Parameters page, complete the following:

- Label—Type 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.
- 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.

Creating a Point-to-Point Demand



Creating a Point-to-Point Demand

Step 8 - On the Platform Parameters page, complete the following in the Platform area

- Protection
- Path
- Optical Bypass
- Colorless

Creating a Point-to-Point Demand

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
- Line Card
- Alien Card
- Pluggable Card

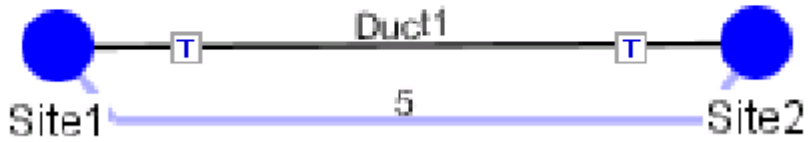
Creating a Point-to-Point Demand

Step 10 - 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 Note interface type if you have not selected the Source and Destination client interface type.

Step 11 - Click Finish

Point-to-Point Demand Between Two Sites



Creating a Point-to-Point Demand

Step 12 - To add a new service, click the Add new service icon in the toolbar

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.

Creating a Point-to-Point Demand

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

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.

Example 5

Create a point-to-point network with 3 nodes:

node a: line

node b: line

node c: terminal

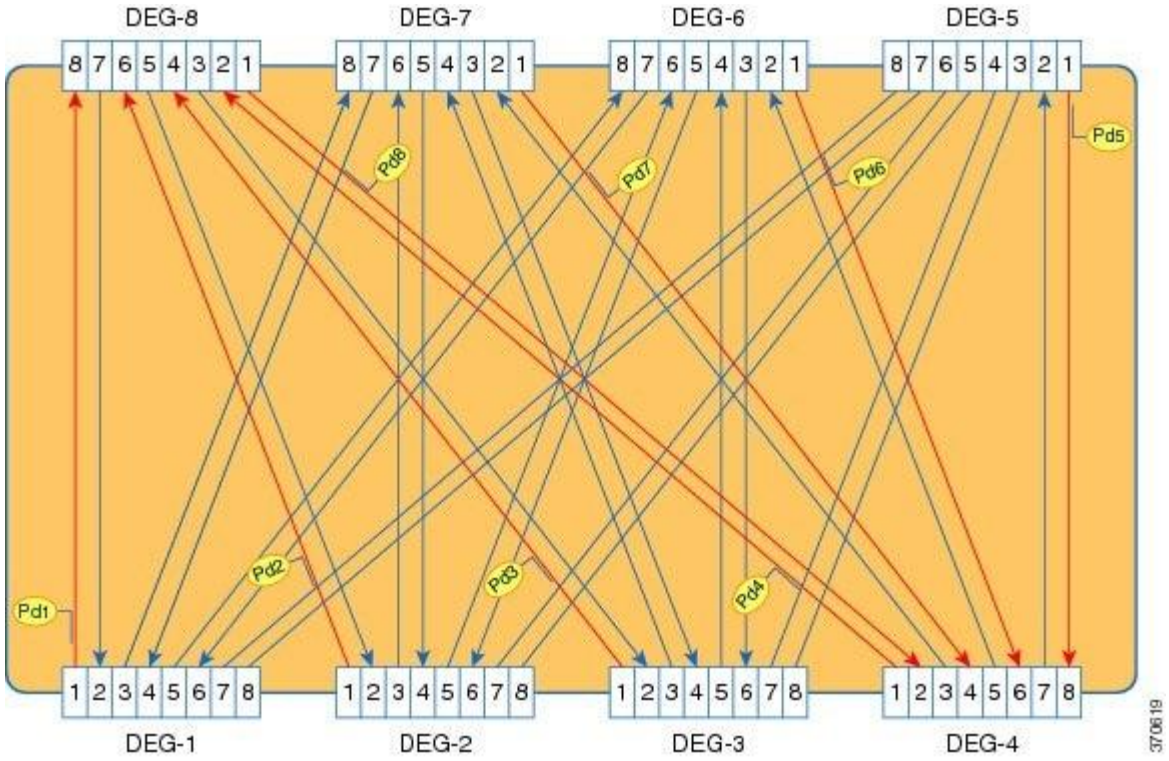
Use the mode FLEX NG with 96 channel

Configure a demand between node a e node b with 4 x 100GE omnidirecional

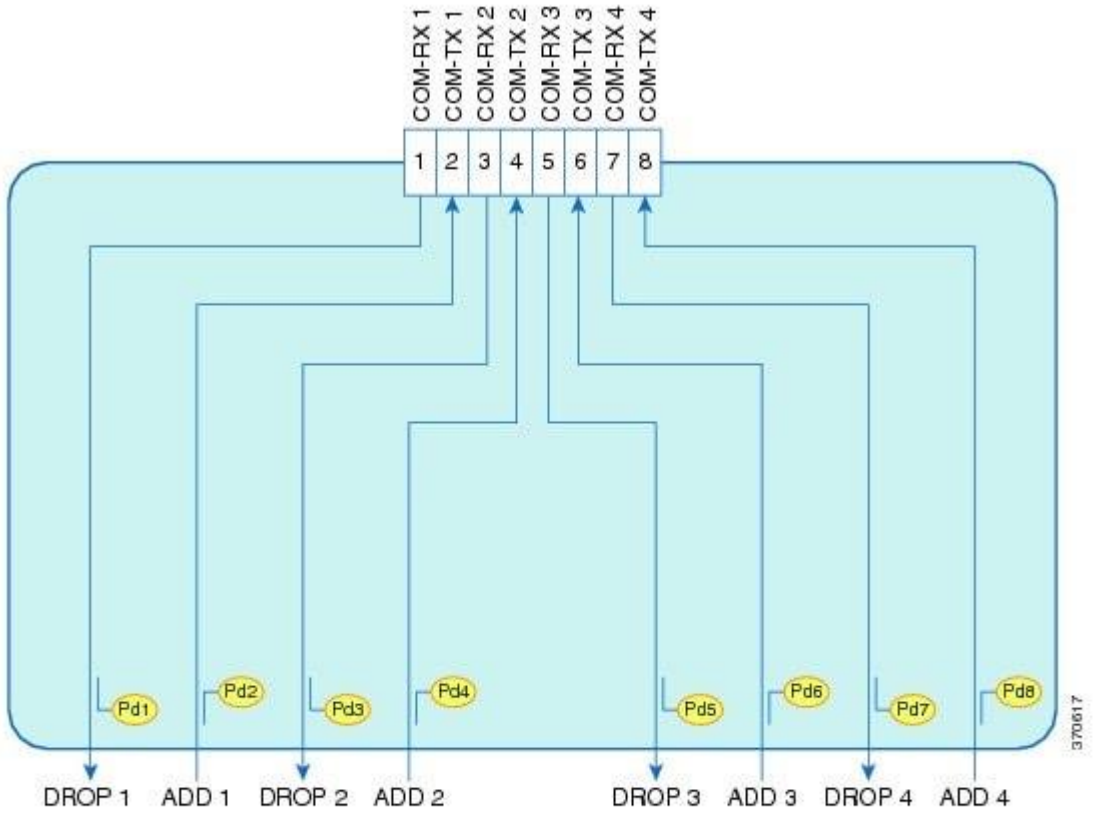
Configure a simple demand between node b e node c with 5 x 10GE

Examine how node C is configured

MF-UPG-4


DEG-8
DEG-7
DEG-6
DEG-5
8 7 6 5 4 3 2 1
Pd1
Pd2
Pd3
Pd4
Pd5
Pd6
Pd7
Pd8
1 2 3 4 5 6 7 8
DEG-1
DEG-2
DEG-3
DEG-4
370619

MF-MPO-8LC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COM-TX 1
COM-RX 2
COM-TX 2
COM-RX 3
COM-TX 3
COM-RX 4
COM-TX 4
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2
3
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6
7
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Pd1
Pd2
Pd3
Pd4
Pd5
Pd6
Pd7
Pd8
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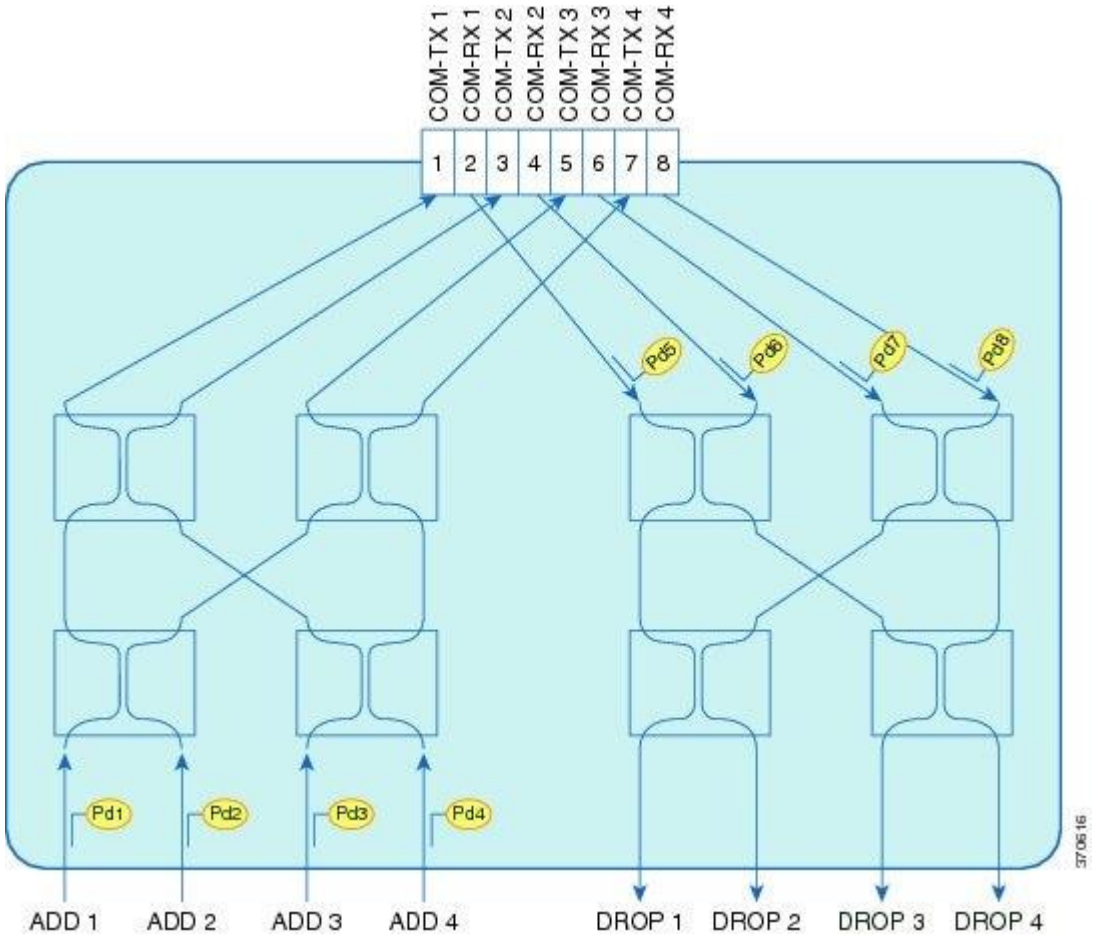
DROP 2
ADD 2
DROP 3
ADD 3
DROP 4
ADD 4
370617

MF 4x4 COFS-T


COM-TX 1
COM-RX 1
COM-TX 2
COM-RX 2
COM-TX 3
COM-RX 3
COM-TX 4
COM-RX 4
1
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3
4
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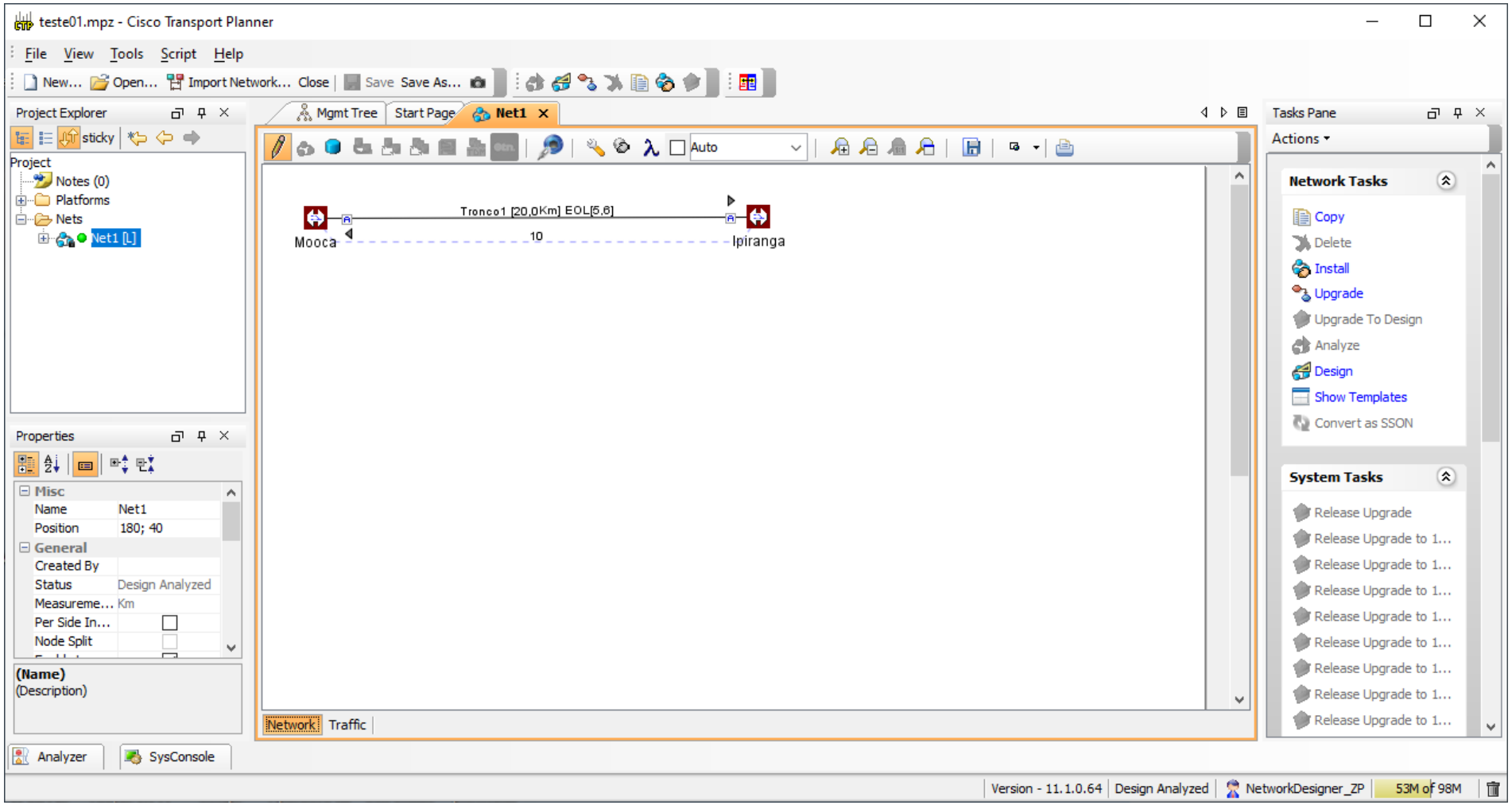
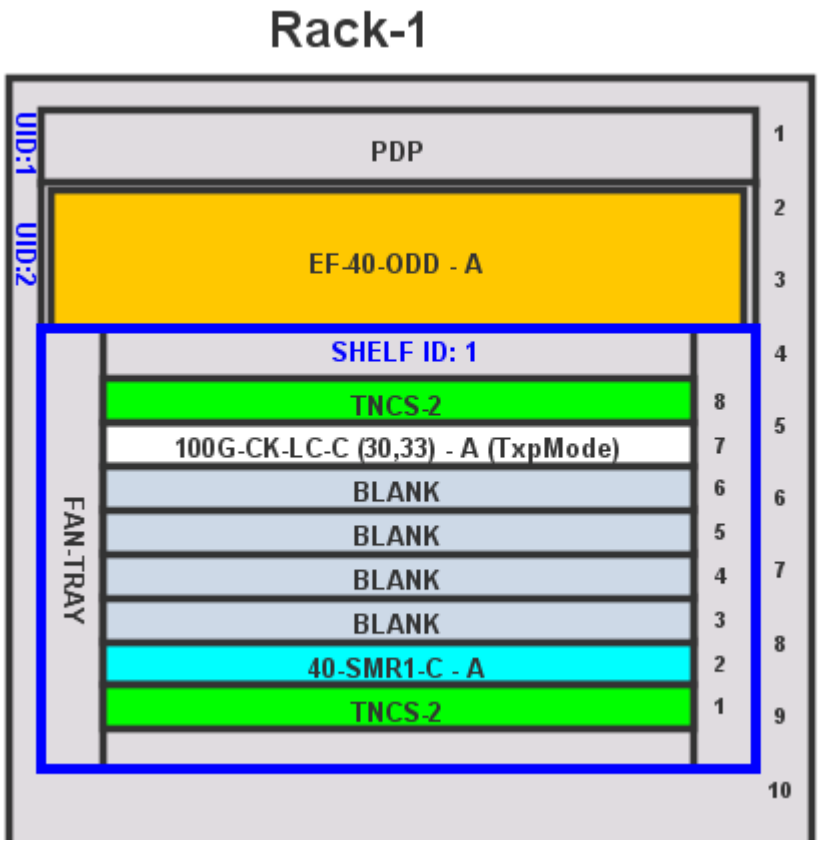
7
8
Pd5
Pd6
Pd7
Pd8
Pd1
Pd2
Pd3
Pd4
ADD 1
ADD 2
ADD 3
ADD 4
DROP 1
DROP 2
DROP 3
DROP 4
37061 6

Exemplo 6: point-to-point 10 channels



Layout with components



TNCS-2

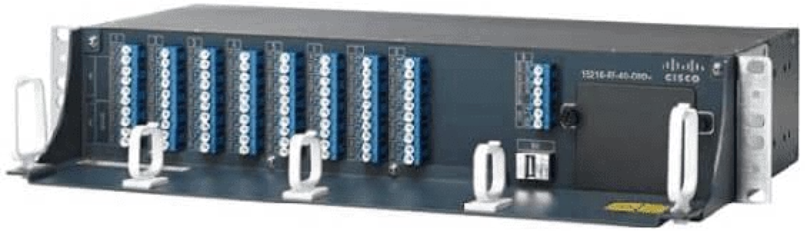
2 SFP ports to OSC channel. Only Ethernet formats are availabel

100G Transponder

Other Components

40-SMR1-C-A

OSC add/drop filter, a pre-amplifier, and a 2x1 wavelength selective switch (WSS)-based ROADM core into a single-slot unit.

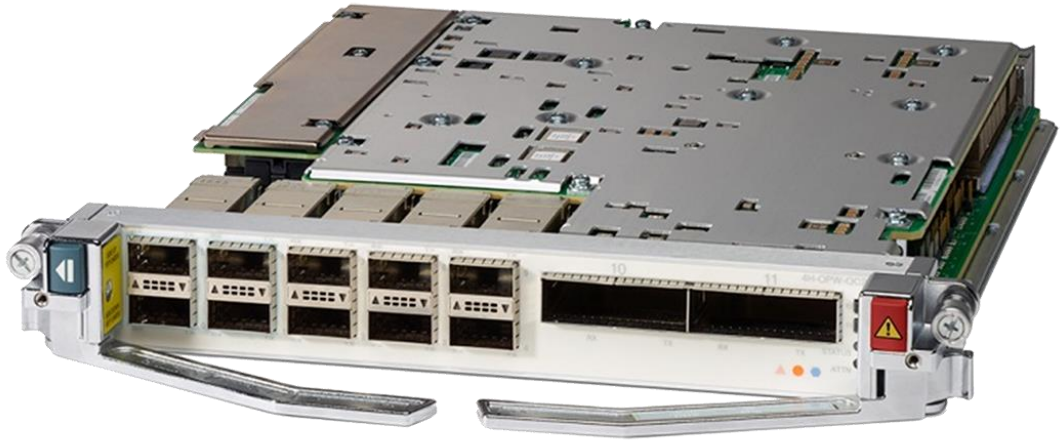


EF-40-ODD-A

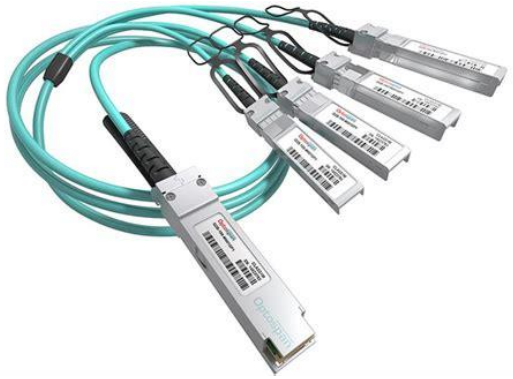
Cisco 15454 PP-80-LC

400G-XP-LC

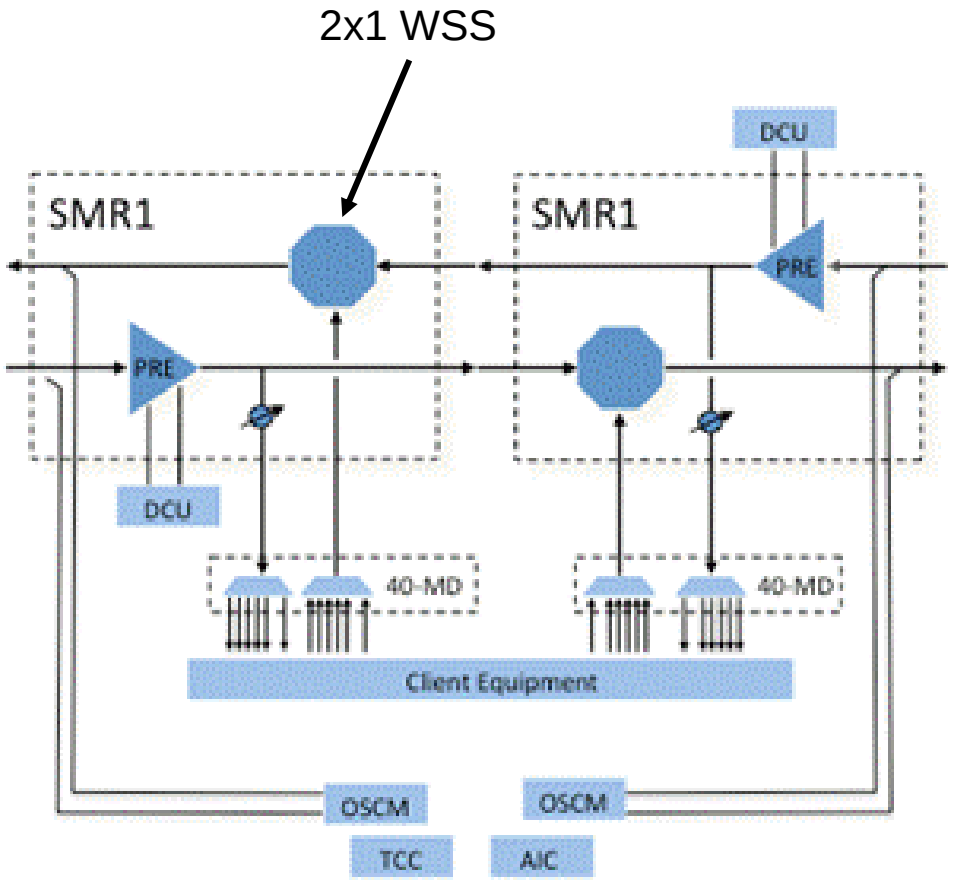
The 400G-XP-LC card is a tunable DWDM trunk card that simplifies the integration and transport of 10 Gigabit and 100 Gigabit Ethernet interfaces and services into enterprises and service provider optical networks. The card is a double- slot unit that provides 400 Gbps of client and 400 Gbps of trunk capacity. The card supports six QSFP+ based client ports that can be equipped with 4x 10 Gbps optics and four QSFP28 or QSFP+ based client ports that can be equipped with 100 Gbps QSFP28 and 4x 10 Gbps QSFP+ optics. The card is capable of aggregating client traffic to either of the two 200 Gbps coherent CFP2 trunk ports.



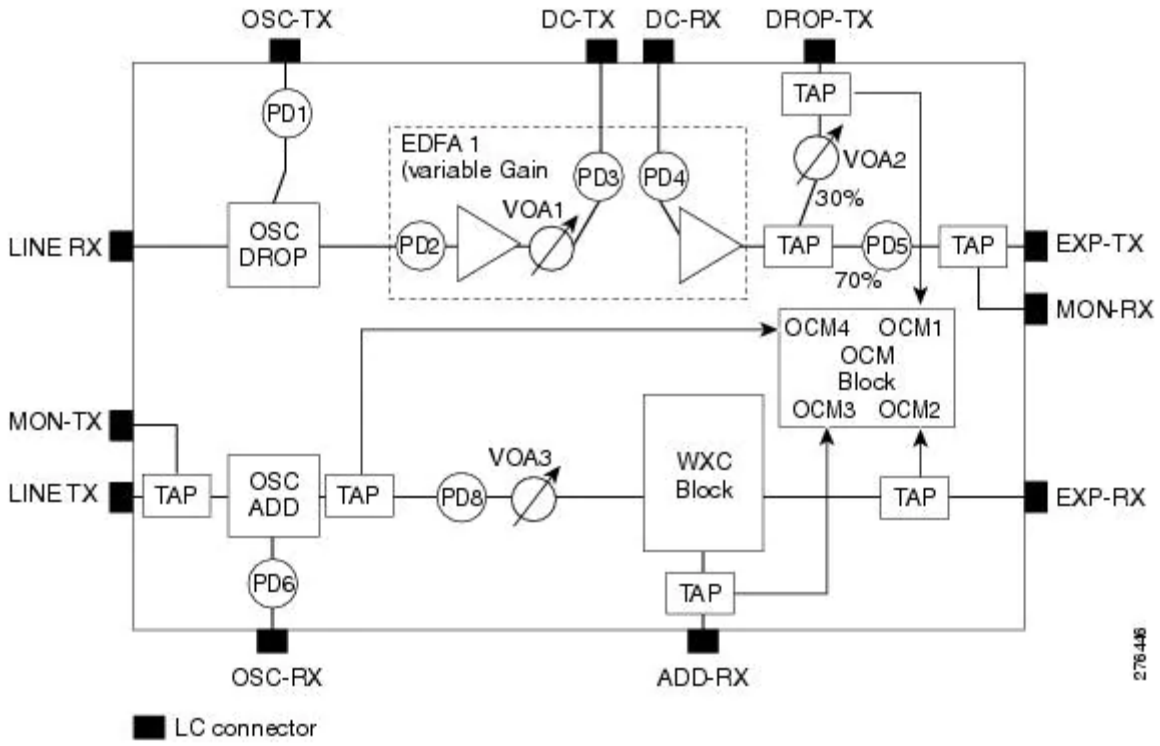
6 QSFP+ (4 x 10Gbps)
4 QSFP28 ou QSFP+ (100G or 4 x10G)
2 Trunk Ports 200 Gbps CFP2



WSS Components



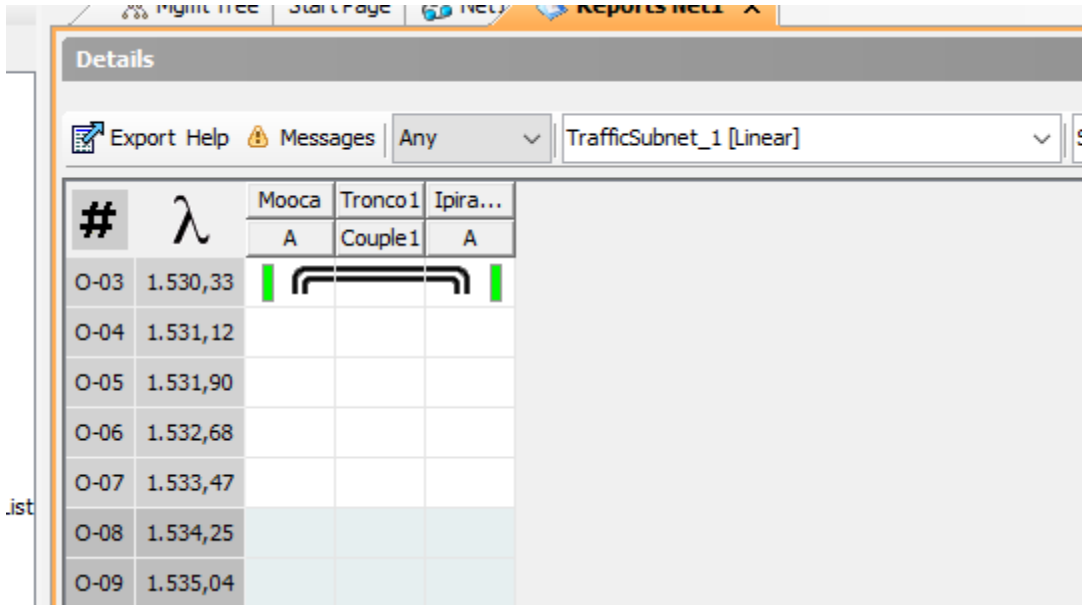
SMR-1 Block Diagram



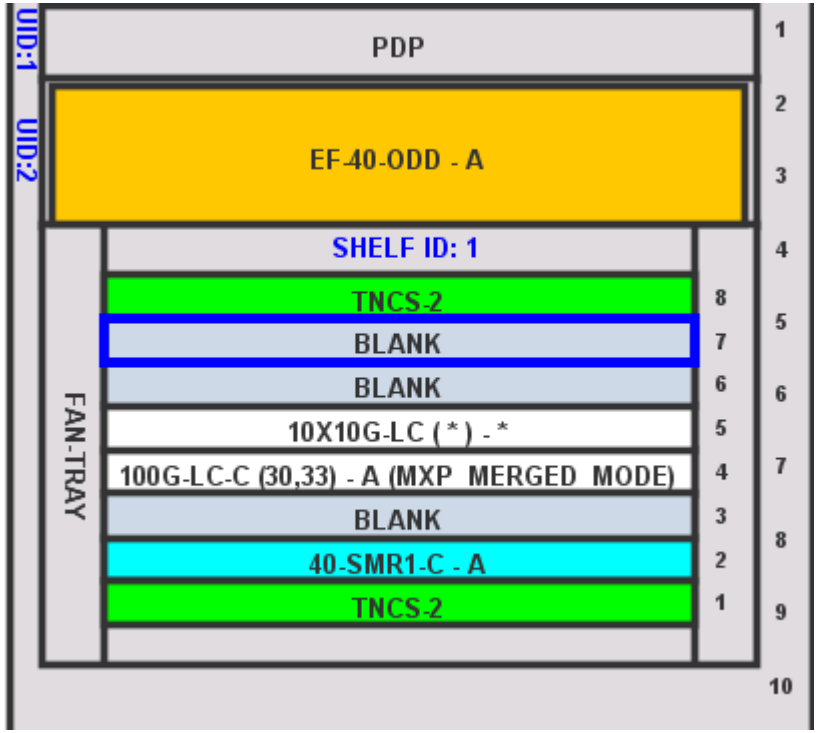
Patchcords Map

Name	Position	Unit	Port label	Attenuator	Position	Unit	Port label	P/F
Mooca								
Fiber	NA	Fiber Distribution Pa...	FDPTx		Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	LINE RX	P
Fiber	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	LINE TX		NA	Fiber Distribution Pa...	FDPRx	P
ATT-0dB	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	DC TX		Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	DC RX	P
LC-LC-2	Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-1-TX		Rack 1.M6 Chassis 1.Slot 7	100G-CK-LC-C	2-RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 7	100G-CK-LC-C	2-TX		Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	CHAN-1-RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	DROP TX		Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	COM RX	P
LC-LC-2	Rack 1.MD-40 SHELF 1.Slot 1	EF-40-ODD	COM TX		Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	ADD RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	OSC TX		Rack 1.M6 Chassis 1.Slot 1	TNCS-2	SFP2_RX	P
LC-LC-2	Rack 1.M6 Chassis 1.Slot 1	TNCS-2	SFP2_TX	15216-ATT...	Rack 1.M6 Chassis 1.Slot 2	40-SMR1-C	OSC RX	P

Wavelength Routing

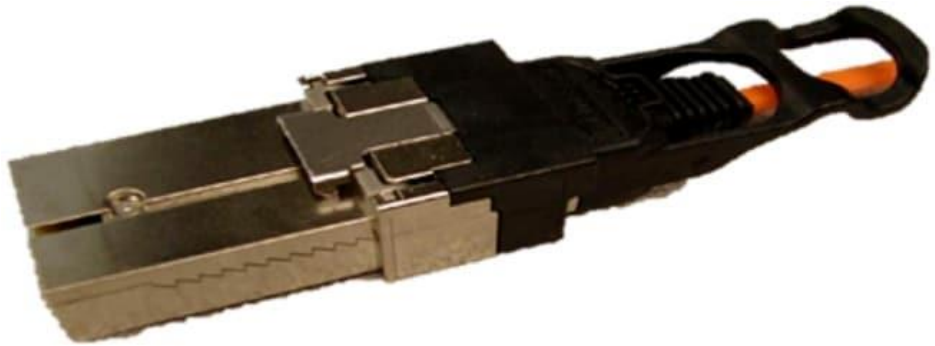


10 x 10G Muxponder



100G-LC-C

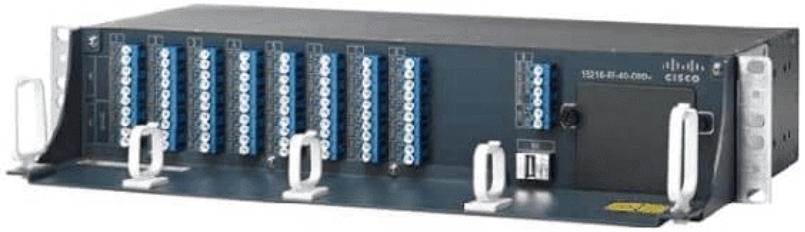
10x10G-LC

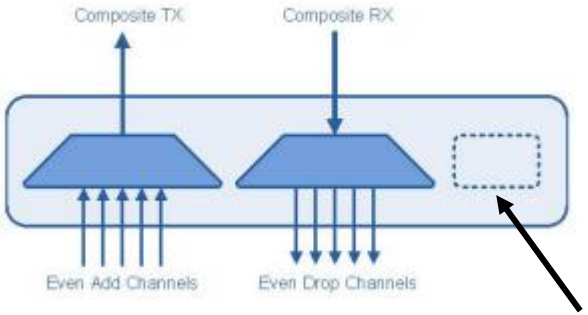


The Cisco CXP 100GBASE-SR10 module supports link lengths of 100m and 150m on laser-optimized OM3 and OM4 multifiber cables, respectively. The module delivers high-bandwidth 100-gigabit links over 24-fiber ribbon cables terminated with MPO/MTP-24 optical connectors. It can also be used in 10 x 10-Gb mode along with ribbon-to-duplex-fiber breakout cables for connectivity to ten 10GBASE-SR optical interfaces.

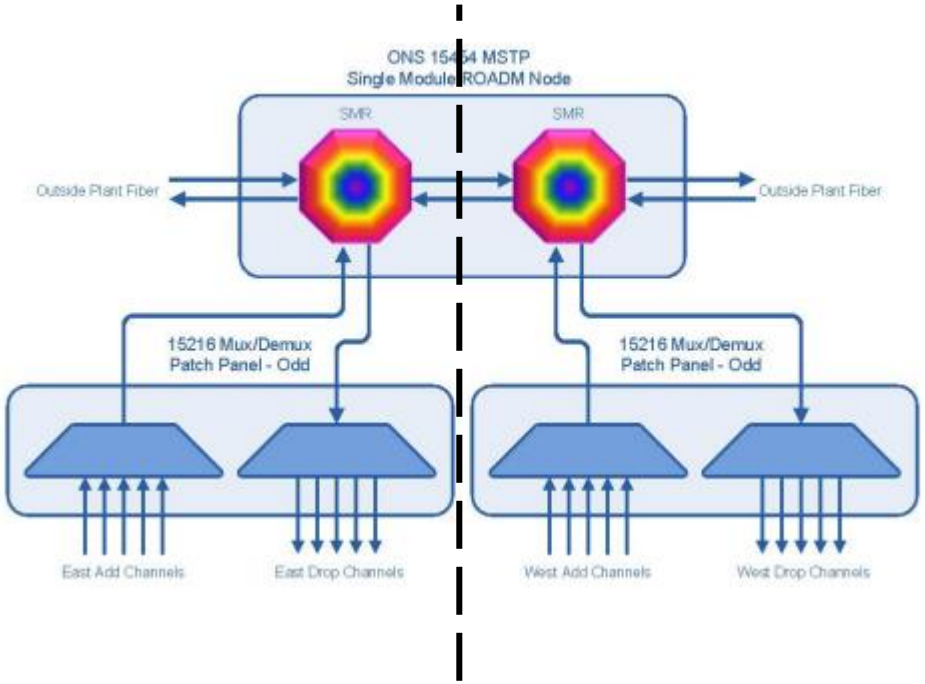
Multiplex 40 channels

EF-40-ODD-A



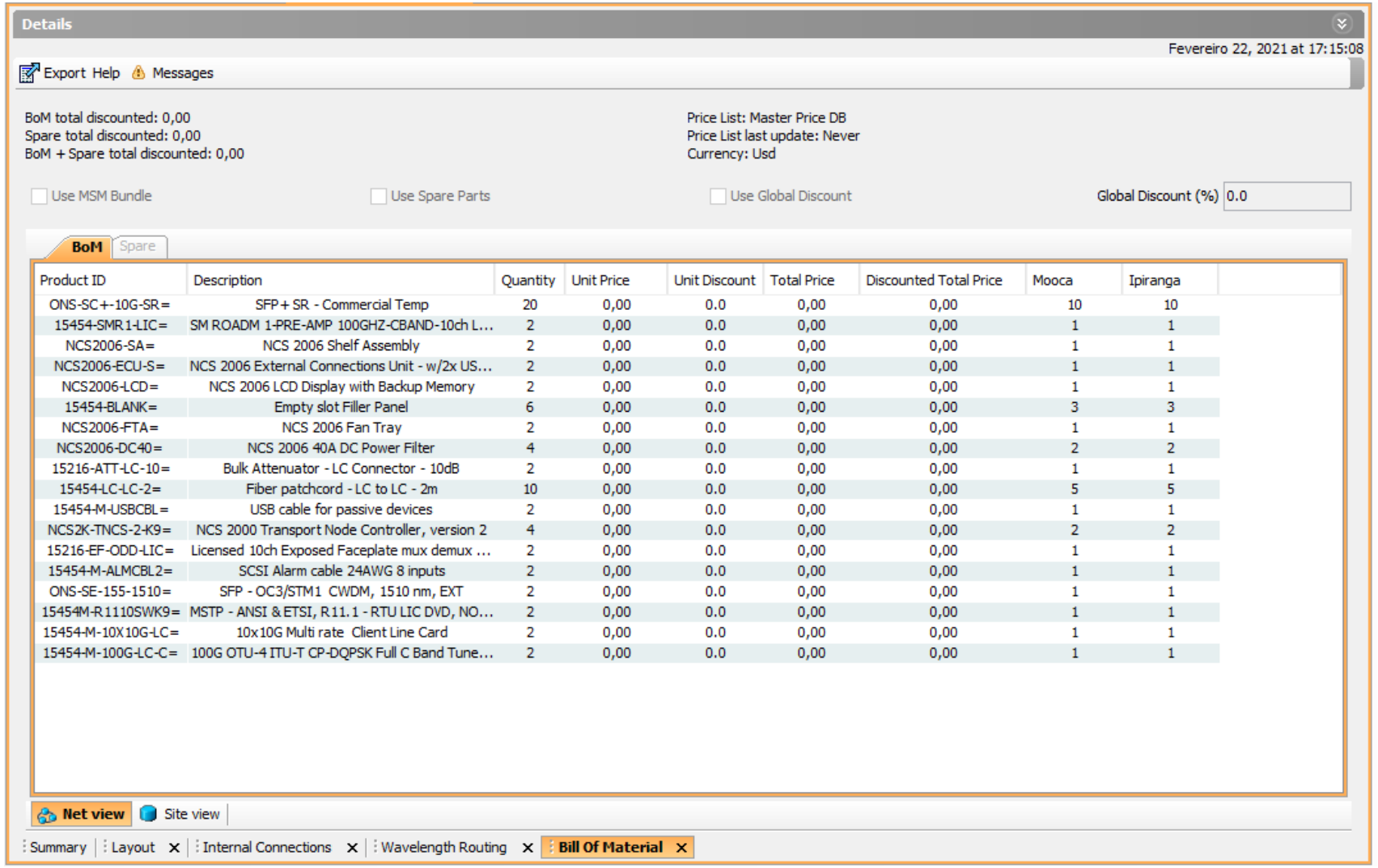


Expansion module



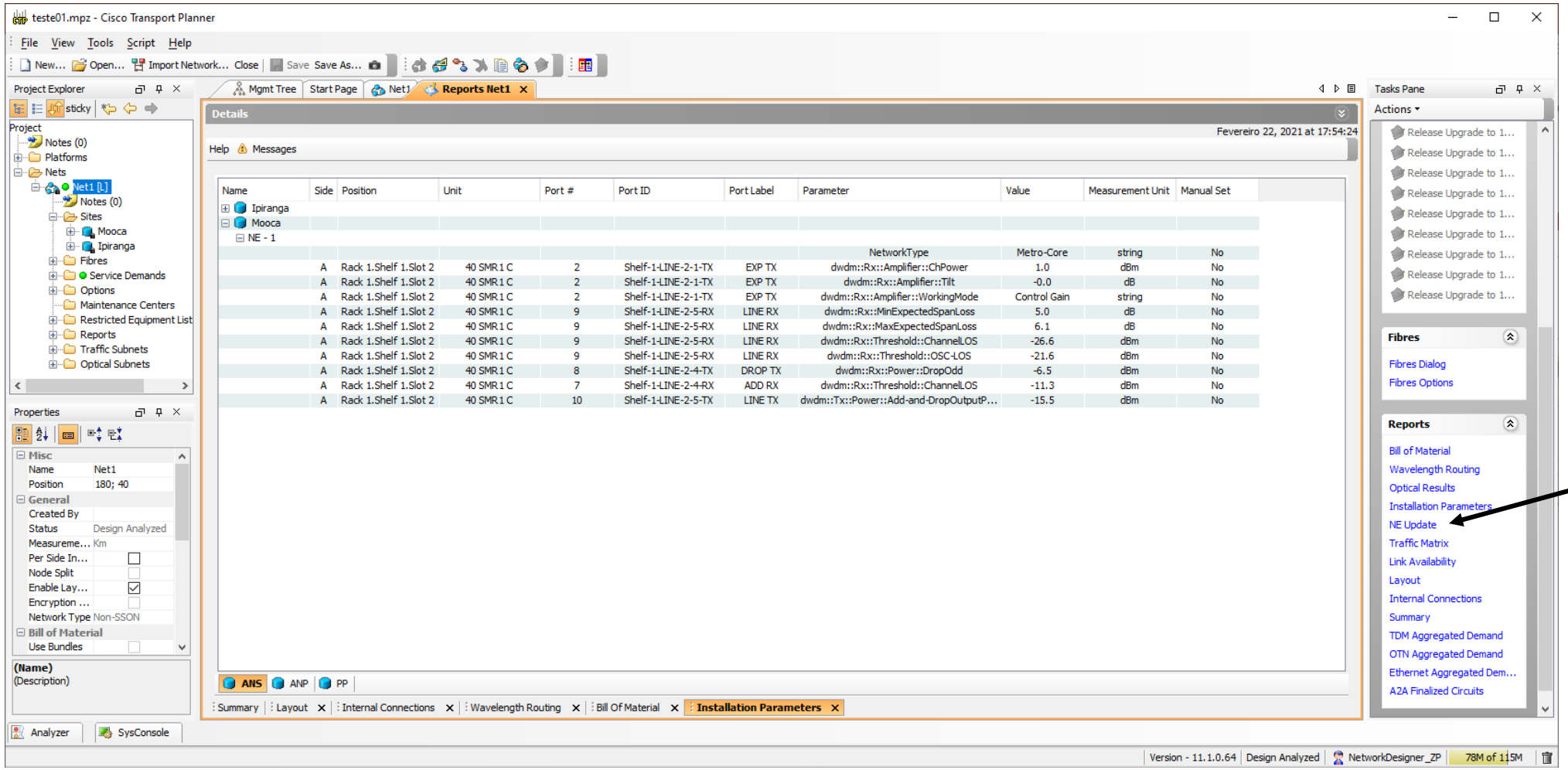
Channel Wavelength					
15216-MD-40-ODD			15216-MD-40-EVEN		
Channel ID	Frequency (THz)	Wavelength (nm)	Channel ID	Frequency (THz)	Wavelength (nm)
1	195.9	1530.33	1	195.85	1530.72
2	195.8	1531.12	2	195.75	1531.51
3	195.7	1531.90	3	195.65	1532.29
4	195.6	1532.68	4	195.55	1533.07
5	195.5	1533.47	5	195.45	1533.86
6	195.4	1534.25	6	195.35	1534.64
7	195.3	1535.04	7	195.25	1535.43

Bill of Materials



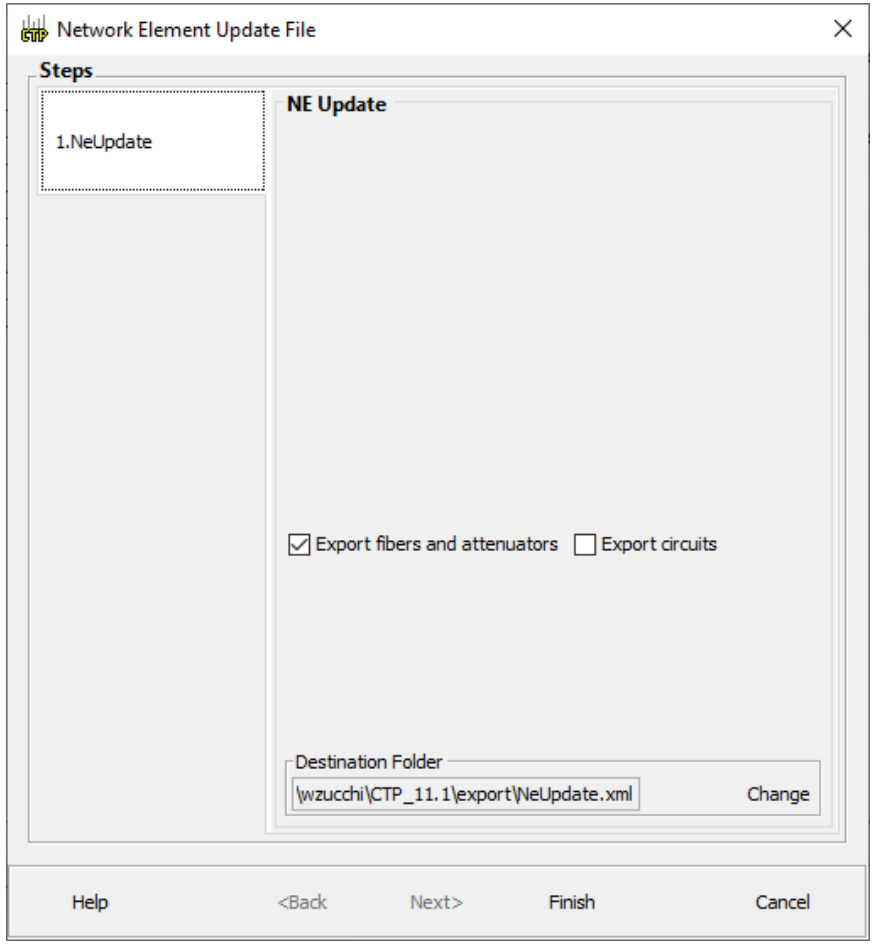
Product ID	Description	Quantity	Unit Price	Unit Discount	Total Price	Discounted Total Price	Mooca	Ipiranga
ONS-SC+-10G-SR=	SFP+ SR - Commercial Temp	20	0,00	0.0	0,00	0,00	10	10
15454-SMR1-LIC=	SM ROADM 1-PRE-AMP 100GHZ-CBAND-10ch L...	2	0,00	0.0	0,00	0,00	1	1
NCS2006-SA=	NCS 2006 Shelf Assembly	2	0,00	0.0	0,00	0,00	1	1
NCS2006-ECU-S=	NCS 2006 External Connections Unit - w/2x US...	2	0,00	0.0	0,00	0,00	1	1
NCS2006-LCD=	NCS 2006 LCD Display with Backup Memory	2	0,00	0.0	0,00	0,00	1	1
15454-BLANK=	Empty slot Filler Panel	6	0,00	0.0	0,00	0,00	3	3
NCS2006-FTA=	NCS 2006 Fan Tray	2	0,00	0.0	0,00	0,00	1	1
NCS2006-DC40=	NCS 2006 40A DC Power Filter	4	0,00	0.0	0,00	0,00	2	2
15216-ATT-LC-10=	Bulk Attenuator - LC Connector - 10dB	2	0,00	0.0	0,00	0,00	1	1
15454-LC-LC-2=	Fiber patchcord - LC to LC - 2m	10	0,00	0.0	0,00	0,00	5	5
15454-M-USBCBL=	USB cable for passive devices	2	0,00	0.0	0,00	0,00	1	1
NCS2K-TNCS-2-K9=	NCS 2000 Transport Node Controller, version 2	4	0,00	0.0	0,00	0,00	2	2
15216-EF-ODD-LIC=	Licensed 10ch Exposed Faceplate mux demux ...	2	0,00	0.0	0,00	0,00	1	1
15454-M-ALMCBL2=	SCSI Alarm cable 24AWG 8 inputs	2	0,00	0.0	0,00	0,00	1	1
ONS-SE-155-1510=	SFP - OC3/STM1 CWDM, 1510 nm, EXT	2	0,00	0.0	0,00	0,00	1	1
15454M-R1110SWK9=	MSTP - ANSI & ETSI, R11.1 - RTU LIC DVD, NO...	2	0,00	0.0	0,00	0,00	1	1
15454-M-10X10G-LC=	10x10G Multi rate Client Line Card	2	0,00	0.0	0,00	0,00	1	1
15454-M-100G-LC-C=	100G OTU-4 ITU-T CP-DQPSK Full C Band Tune...	2	0,00	0.0	0,00	0,00	1	1

Installation Parameters

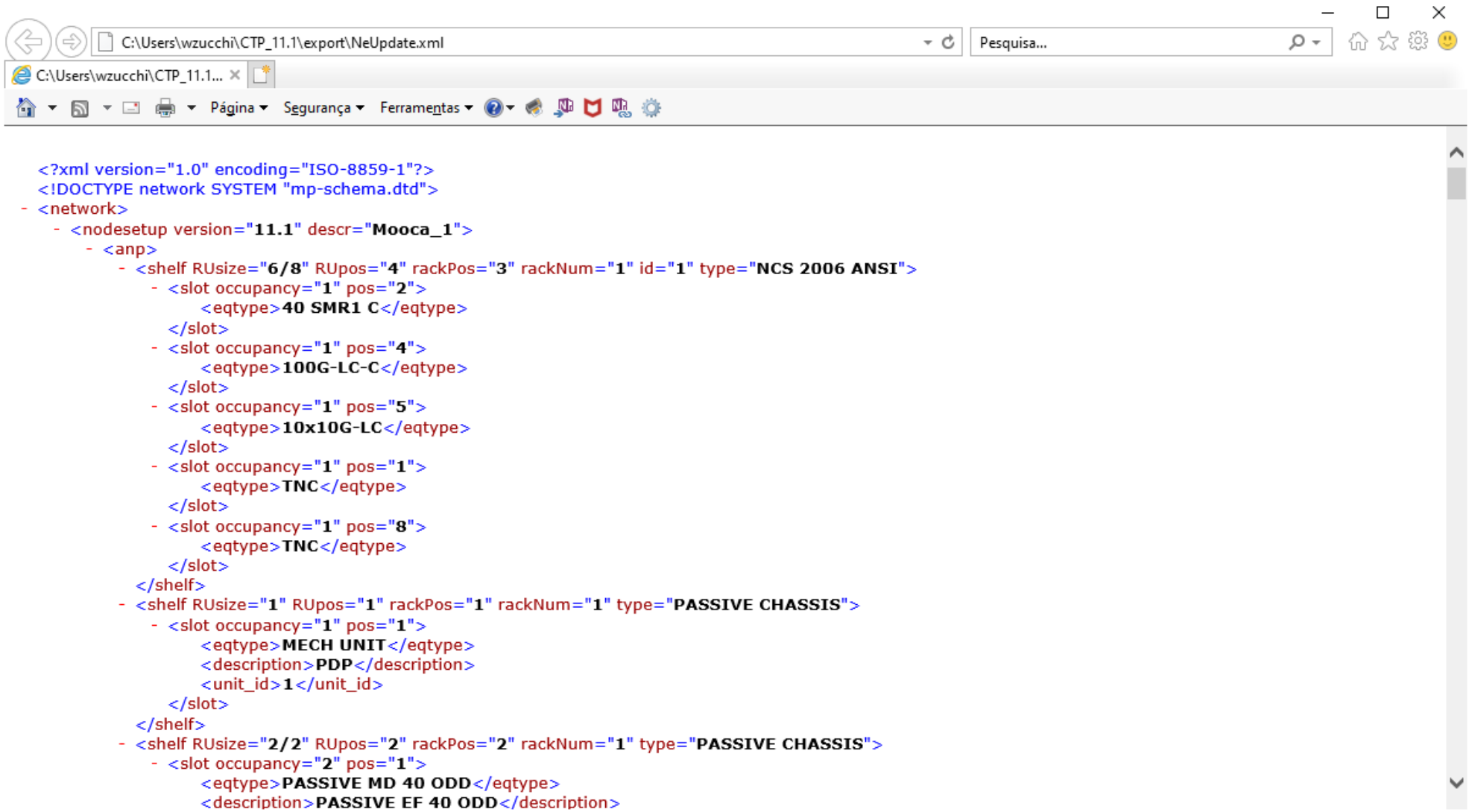


Save parameters

NE Update File

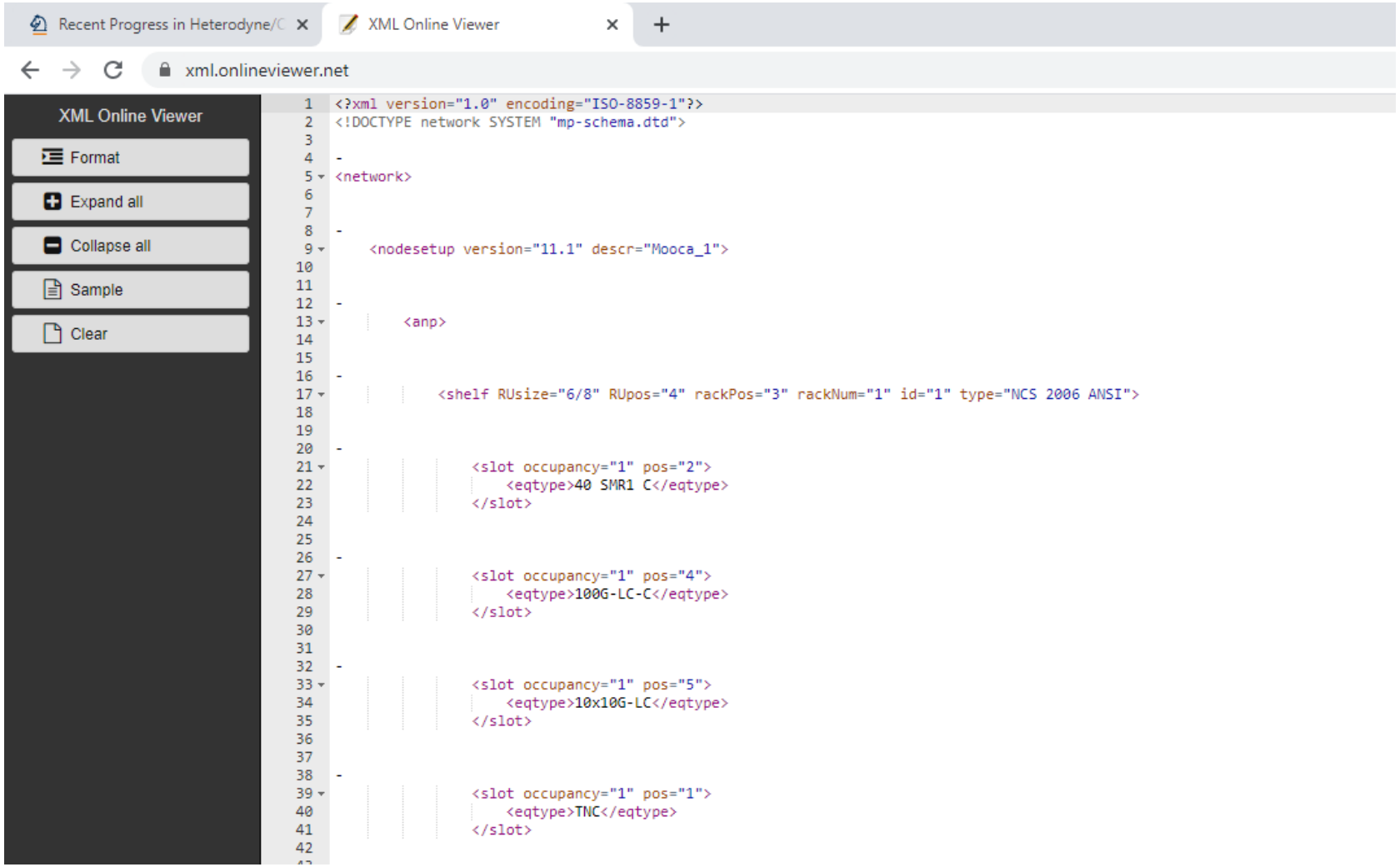


XML Encoding

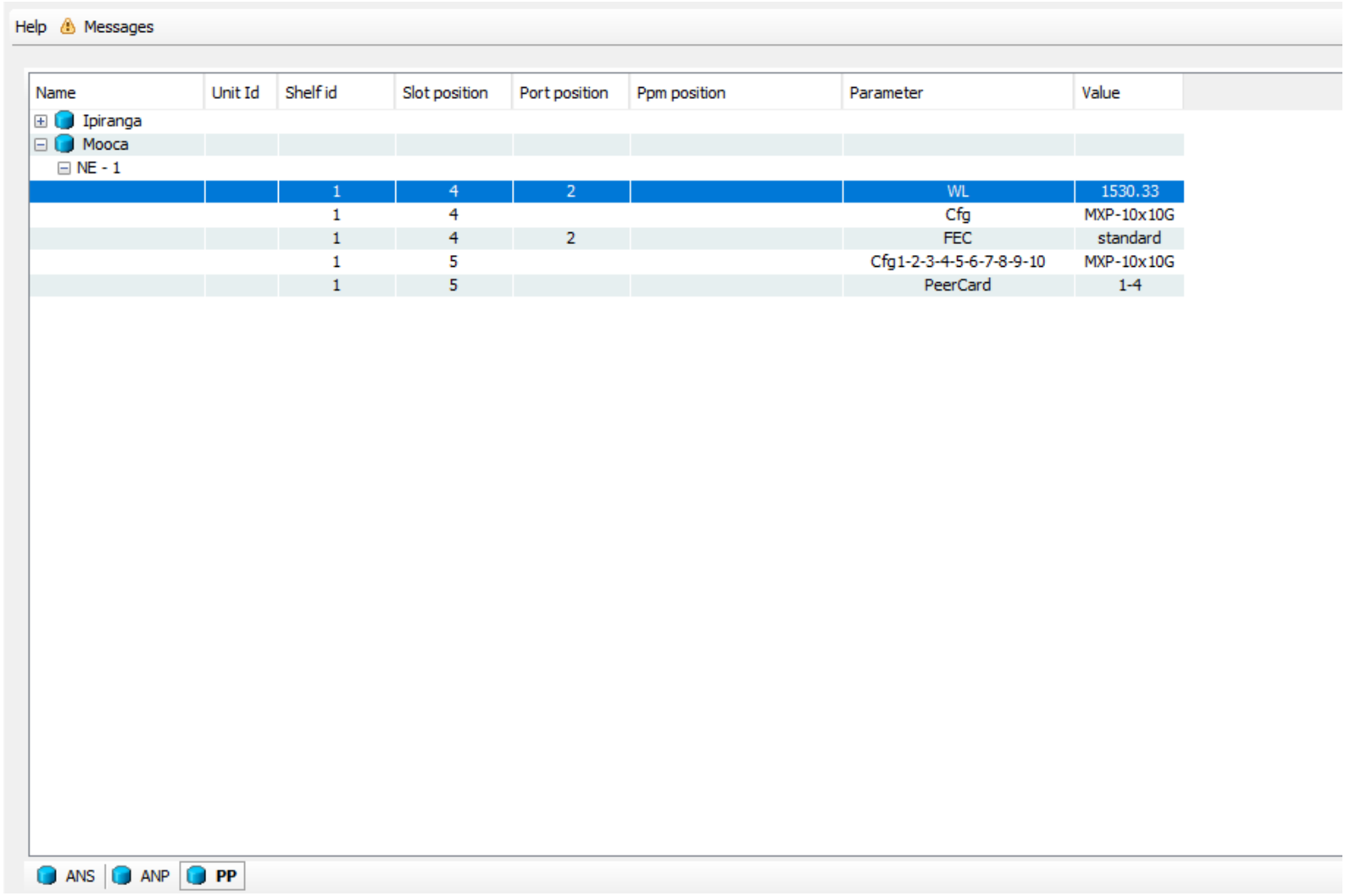



```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE network SYSTEM "mp-schema.dtd">
- <network>
  - <nodesetup version="11.1" descr="Mooca_1">
    - <anp>
      - <shelf RUsize="6/8" RUpos="4" rackPos="3" rackNum="1" id="1" type="NCS 2006 ANSI">
        - <slot occupancy="1" pos="2">
            <eqtype>40 SMR1 C</eqtype>
          </slot>
        - <slot occupancy="1" pos="4">
            <eqtype>100G-LC-C</eqtype>
          </slot>
        - <slot occupancy="1" pos="5">
            <eqtype>10x10G-LC</eqtype>
          </slot>
        - <slot occupancy="1" pos="1">
            <eqtype>TNC</eqtype>
          </slot>
        - <slot occupancy="1" pos="8">
            <eqtype>TNC</eqtype>
          </slot>
        </shelf>
      - <shelf RUsize="1" RUpos="1" rackPos="1" rackNum="1" type="PASSIVE CHASSIS">
        - <slot occupancy="1" pos="1">
            <eqtype>MECH UNIT</eqtype>
            <description>PDP</description>
            <unit_id>1</unit_id>
          </slot>
        </shelf>
      - <shelf RUsize="2/2" RUpos="2" rackPos="2" rackNum="1" type="PASSIVE CHASSIS">
        - <slot occupancy="2" pos="1">
            <eqtype>PASSIVE MD 40 ODD</eqtype>
            <description>PASSIVE EF 40 ODD</description>
```

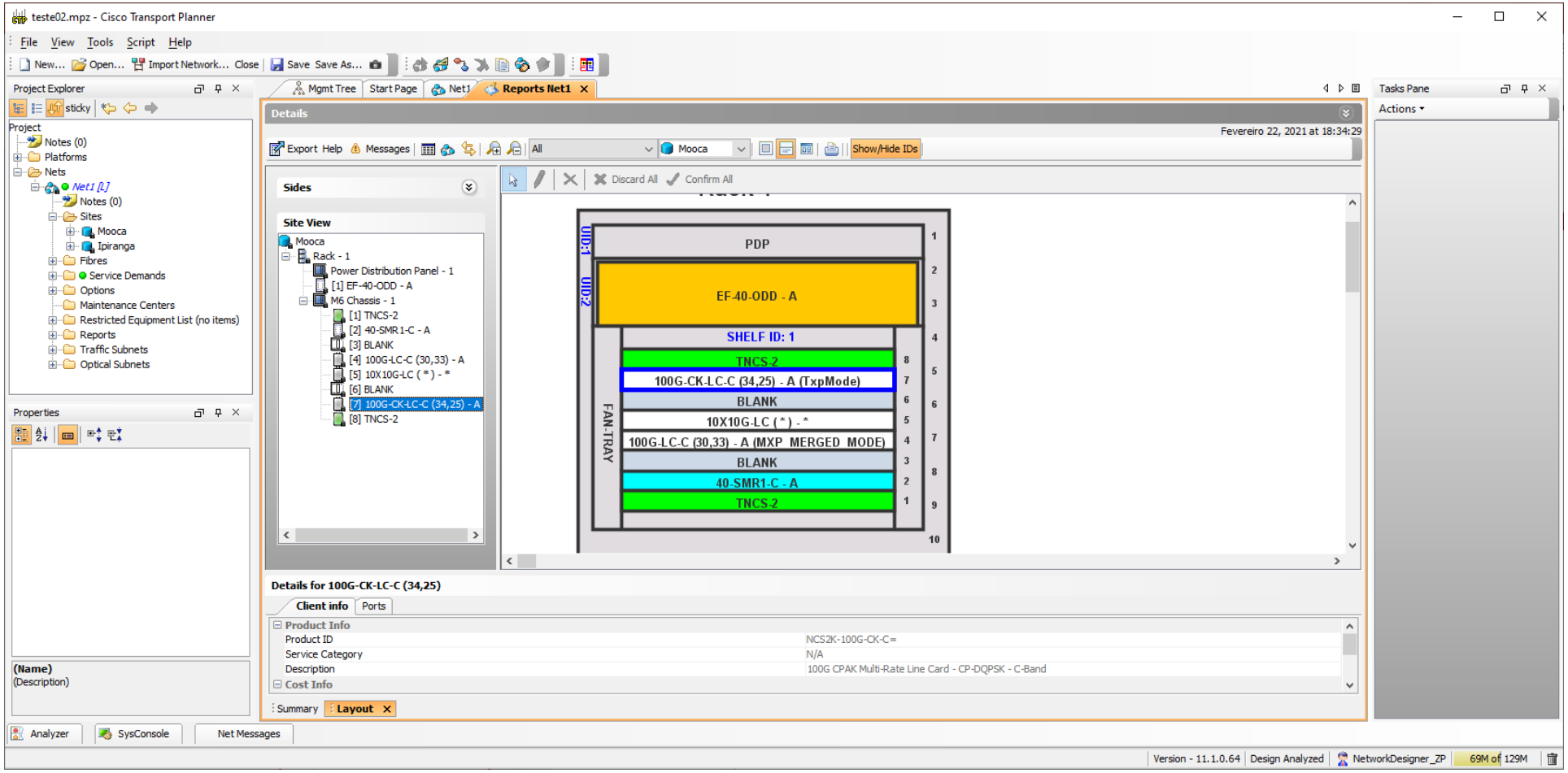
XML Viewer (online tool)



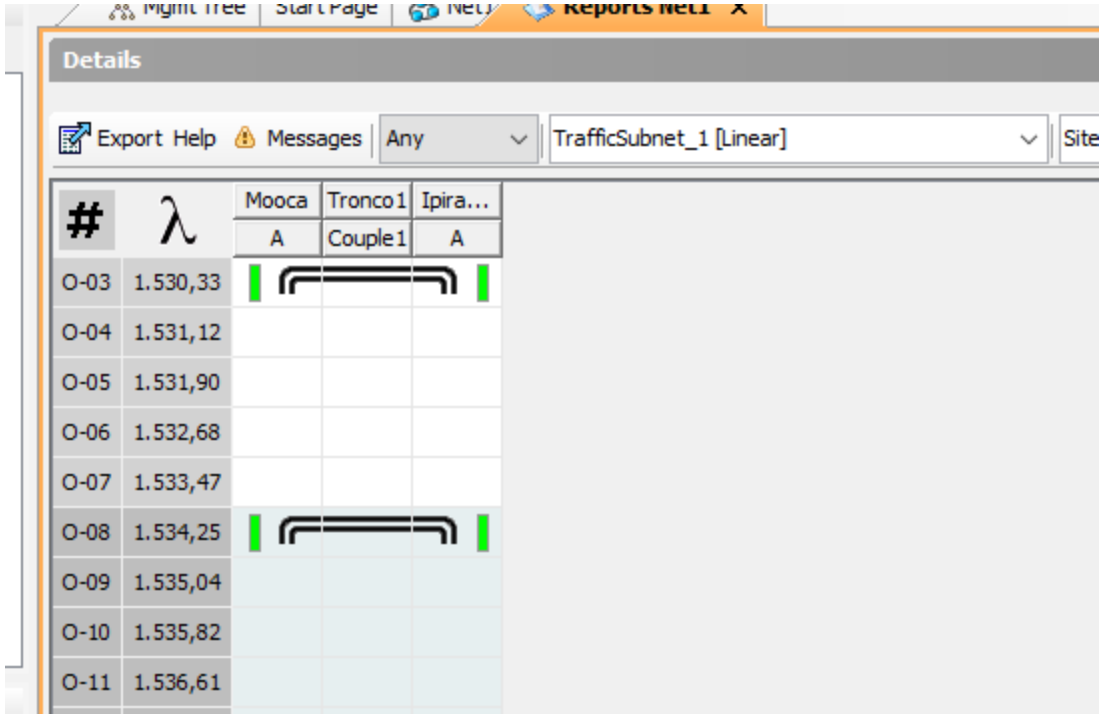
Provisioning Parameters



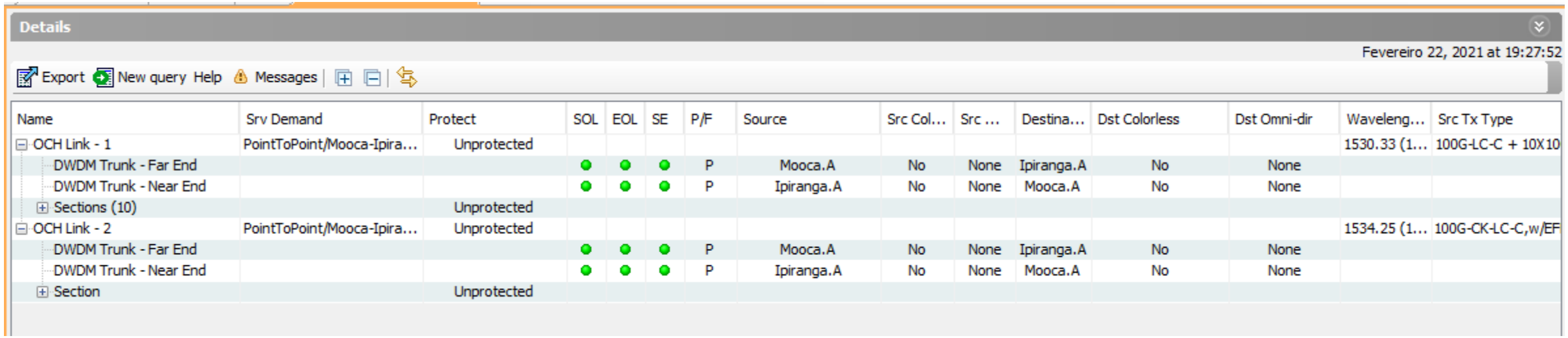
Adding a new demand



Wavelength Routing



Optical Results



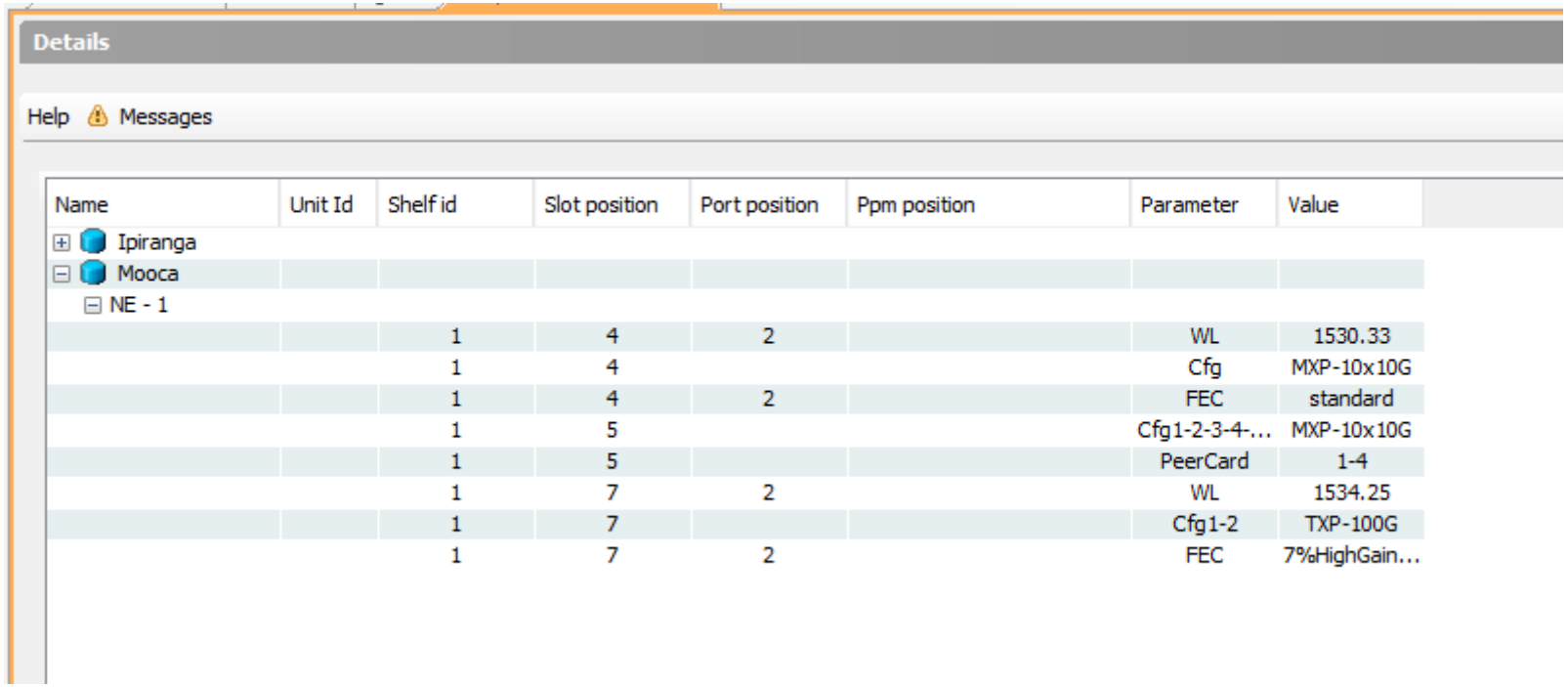
Details

Fevereiro 22, 2021 at 19:27:52

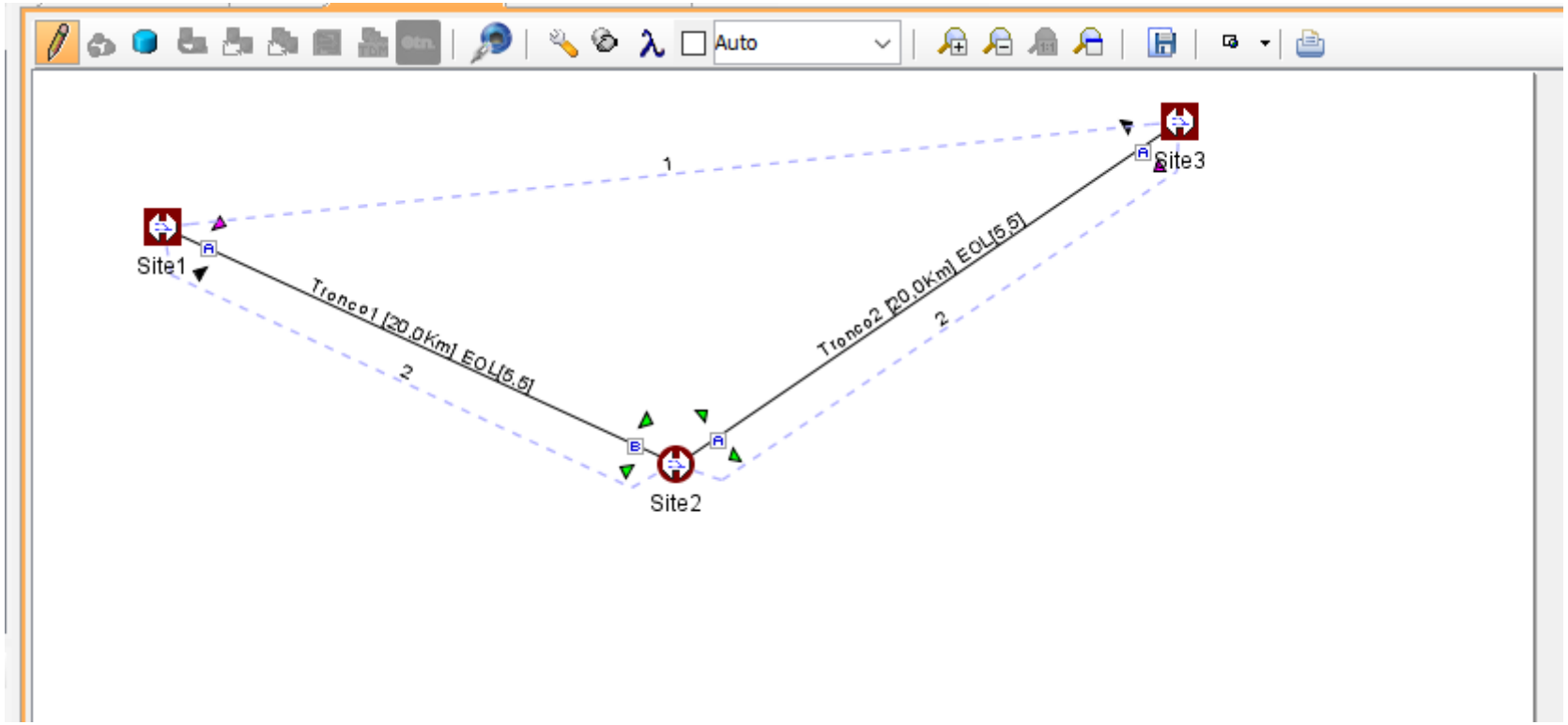
Export | New query | Help | Messages

Name	Srv Demand	Protect	SOL	EOL	SE	P/F	Source	Src Col...	Src ...	Destina...	Dst Colorless	Dst Omni-dir	Waveleng...	Src Tx Type
OCH Link - 1	PointToPoint/Mooca-Ipira...	Unprotected											1530.33 (1...	100G-LC-C + 10X10
DWDM Trunk - Far End			●	●	●	P	Mooca.A	No	None	Ipiranga.A	No	None		
DWDM Trunk - Near End			●	●	●	P	Ipiranga.A	No	None	Mooca.A	No	None		
Sections (10)		Unprotected												
OCH Link - 2	PointToPoint/Mooca-Ipira...	Unprotected											1534.25 (1...	100G-CK-LC-C,w/EF
DWDM Trunk - Far End			●	●	●	P	Mooca.A	No	None	Ipiranga.A	No	None		
DWDM Trunk - Near End			●	●	●	P	Ipiranga.A	No	None	Mooca.A	No	None		
Section		Unprotected												

Installation Parameters (PP)



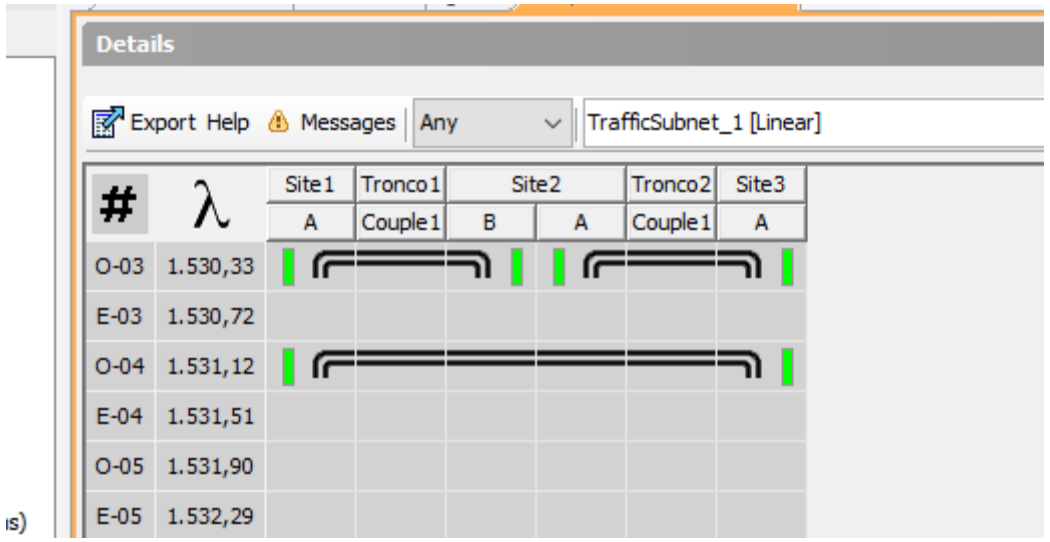
Line Configuration (50 GHz)



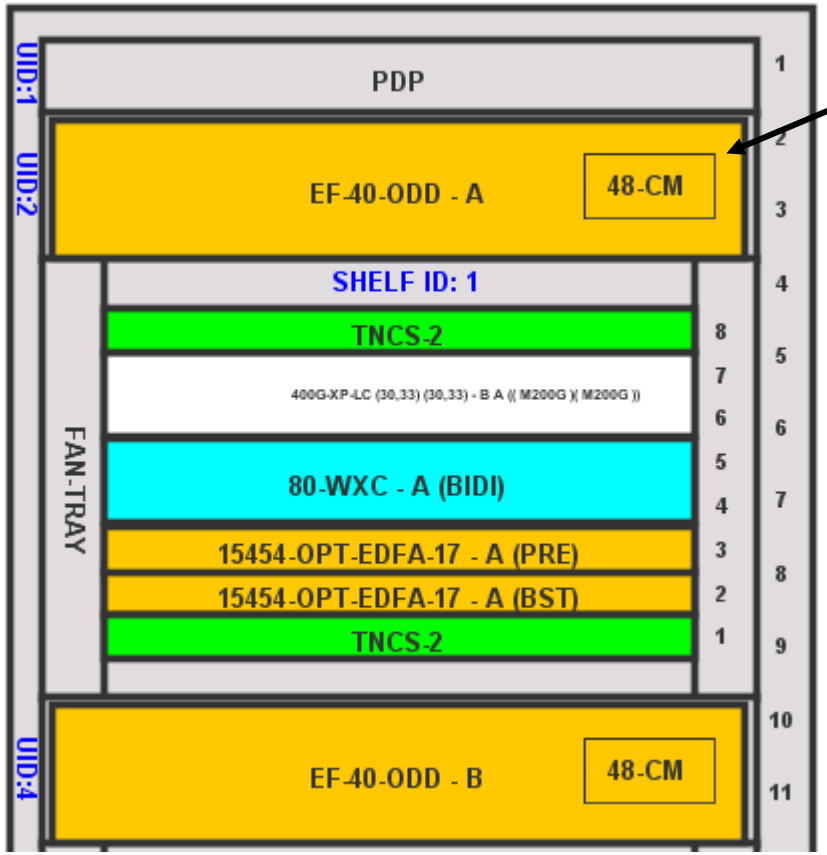
All demands are 100GE

Optical Network: 64 ch 50GHz

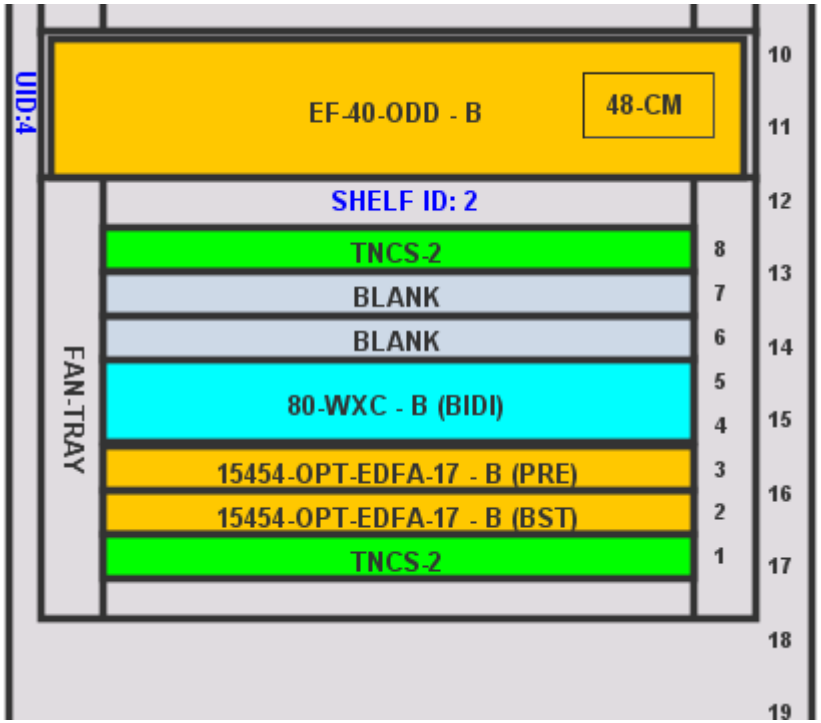
Wavelength Routing



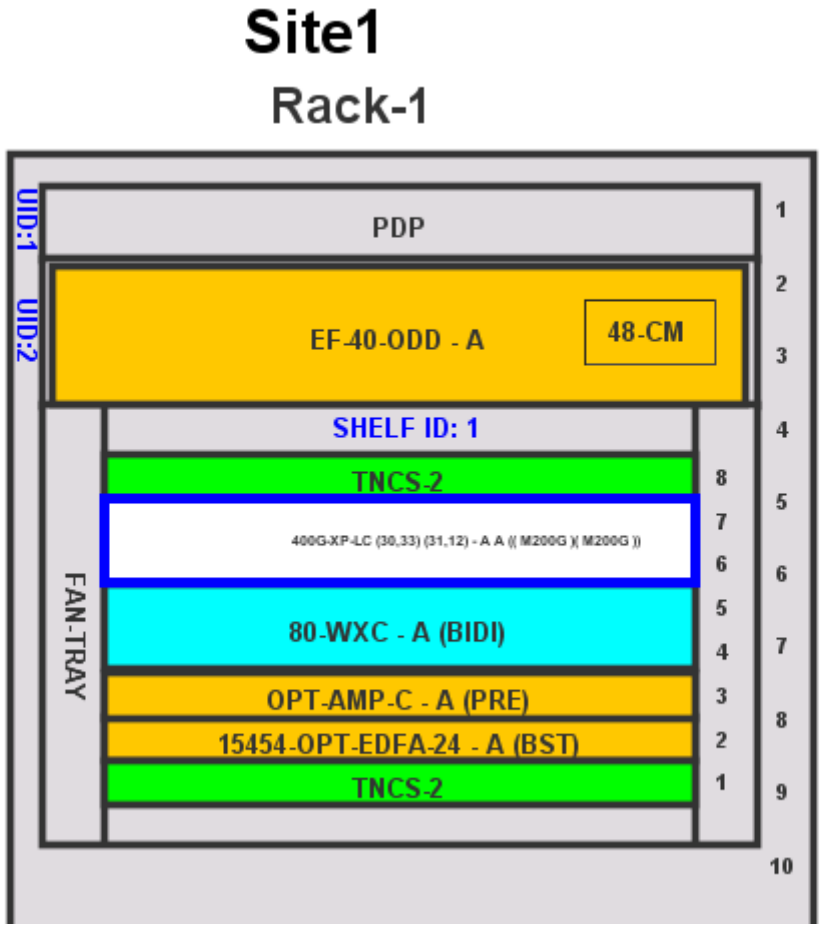
Line Site Rack 1 Module 1



Line Site Rack 1 Module 2



Terminal Site



Point-Point Demand - Putting all together

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 the GUI Information and Shortcuts, on page 367.

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 the Creating Traffic Subnet, on page 64.

Step 5 Click Next.

Step 6 When SSON is enabled, there will be two options in the General Parameters page, such as Media Channel and Media Channel Group. You can add both Media Channel Group and Media Channel or either of them, when SSON is enabled. On the General Parameters page, complete the following:

SSON Configuration

Media Channel—Check the check box to enable Media Channel when SSON is enabled.

- 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 theService Support, on page 6.
- 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.

Media Channel Group—Check the check box to enable Media Channel Group, when SSON is enabled. You can associate Media Channel to Media Channel group.

- Media Channel Group Name — Enter the name of the Media Channel Group.
- Source — (Display only) Displays the source site name.
- Destination — (Display only) Displays the destination site name.

Platform Configuration

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 Protection Scheme Support, on page 4.

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.

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

Platform Configuration (cont.)

- Media Channel Group — Choose the media channel that has to be associated with the Media Channel Group.
- Colorless— Choose an option from the colorless drop-down list. For more information on colorless property see the Understanding Colorless Functionality, on page 66.
  - **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 the Understanding Omnidirectional Functionality, on page 65.
  - **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 the Understanding Contentionless Functionality, on page 67.
  - **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, OTU2, OC192, or STM64 as Service Type in Step 6.

Transponder

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.

  – 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 Service Support, on page 6.

  – Alien Card—Appears only if you created a third-party interface as described in the Defining Third-Party DWDM Interfaces, on page 35. 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.

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.

Demand Editor

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. The following figure shows a selected point-to-point demand with five channels between sites 1 and 2.

Encryption for 400G-XP-LC card can be enabled/disabled in demand editor under **Service**.

Figure 11: 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.

Point-To-Point Final Steps

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 Creating a Regeneration Site, on page 94.

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 Editing a Point-to-Point Demand, on page 239, 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.

Example 6

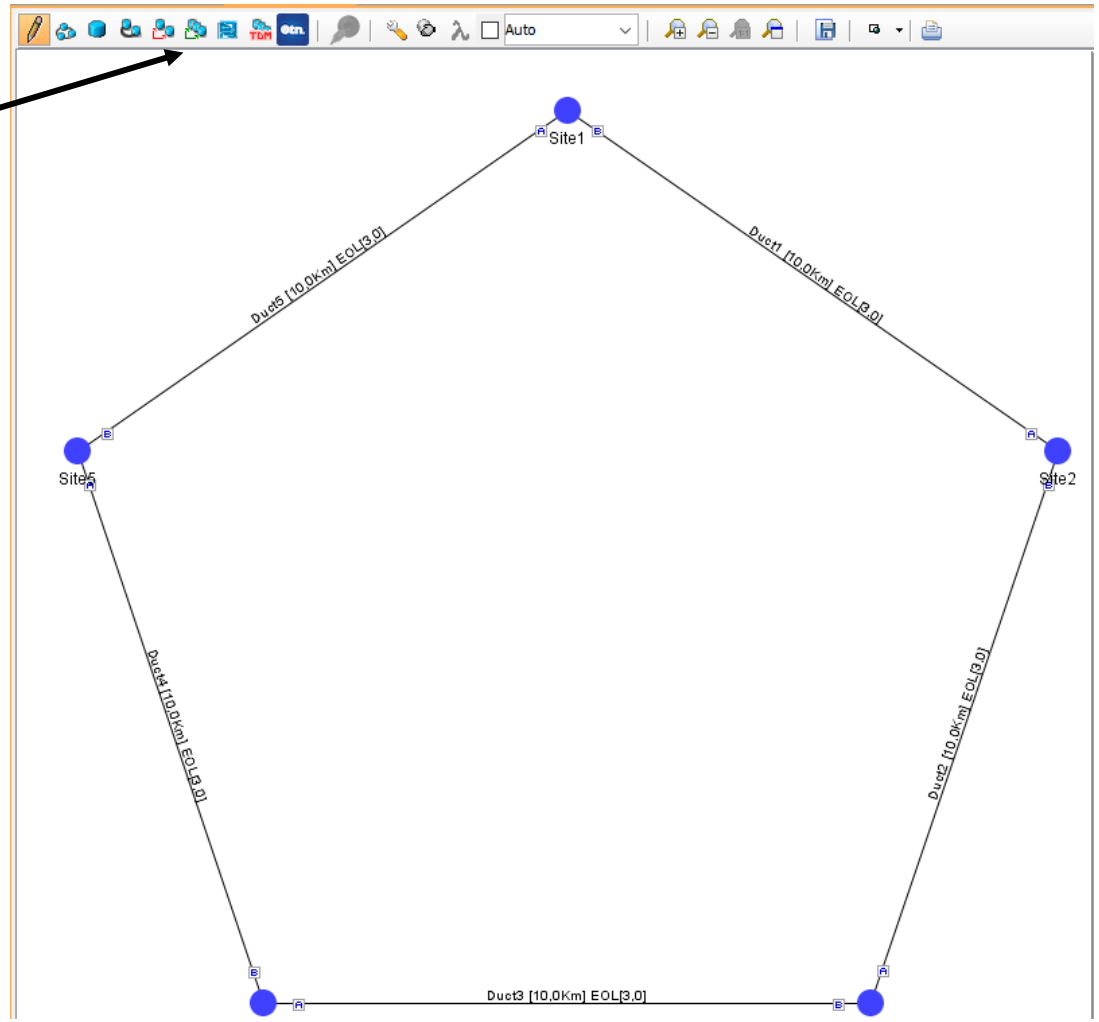
Create a point-to-point demand and test
all options previously described

Create the same network with omnidirectional,
colorless and contentionless interfaces

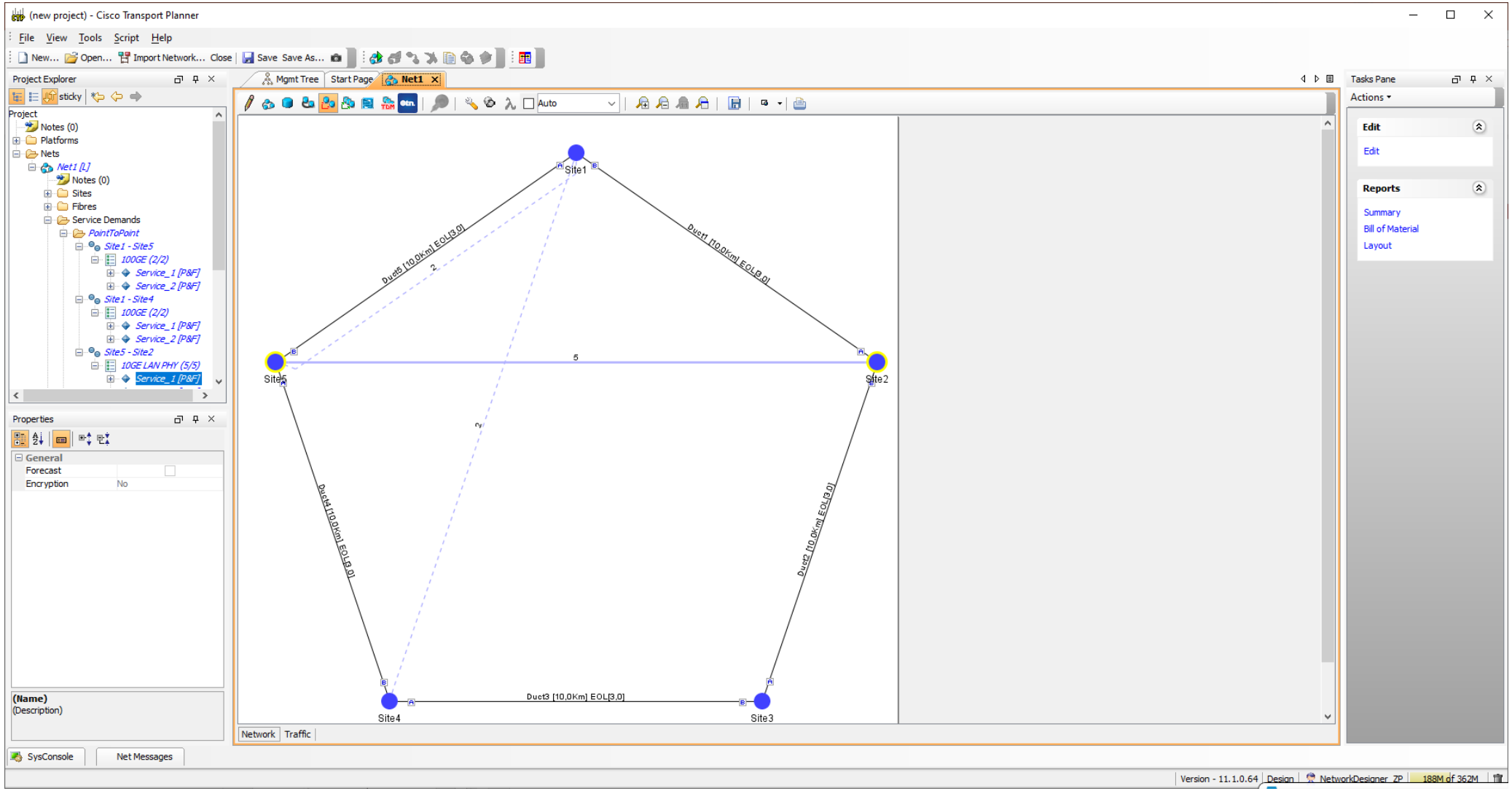
Compare the results

RING TOPOLOGY

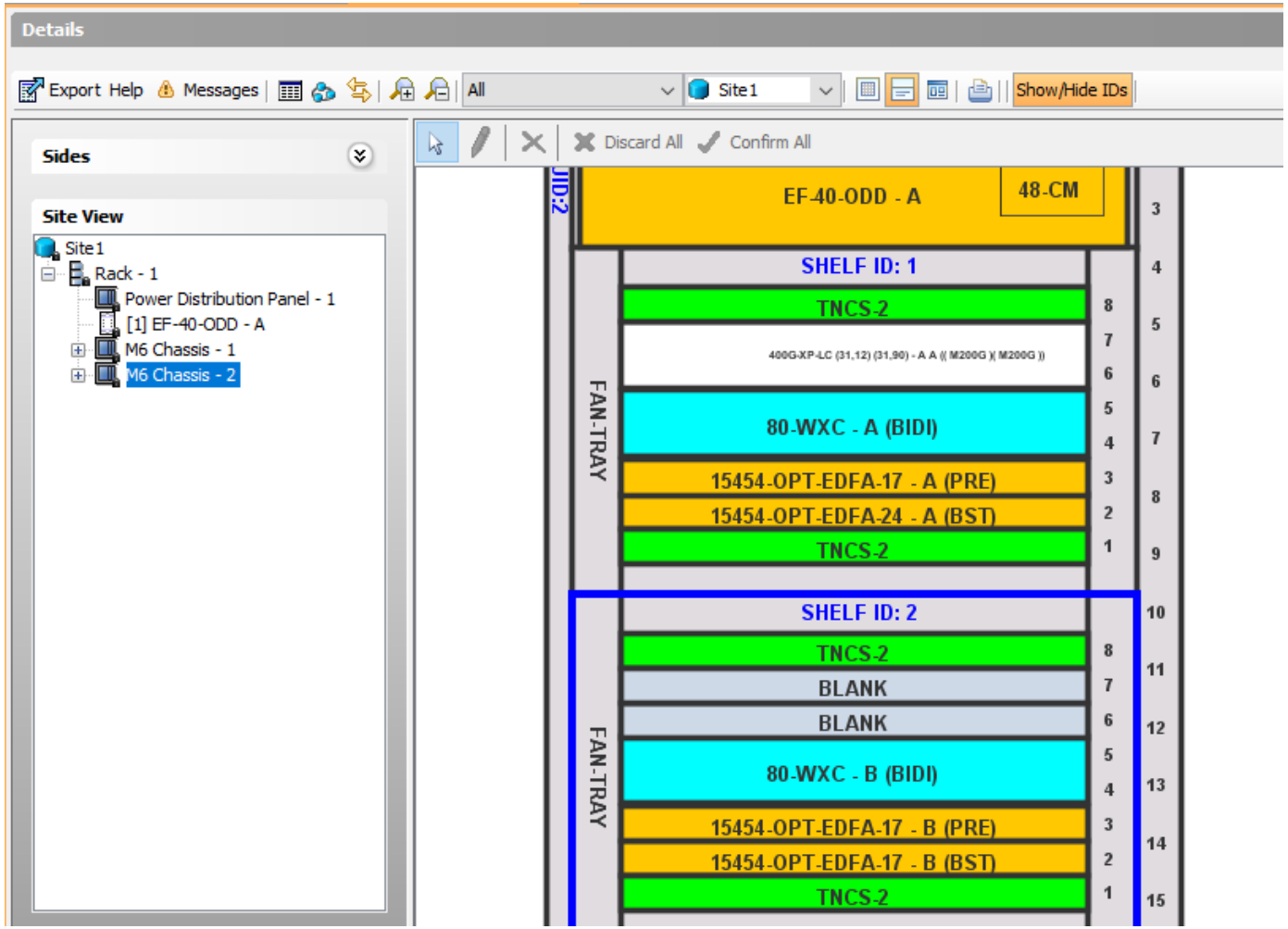
create demand



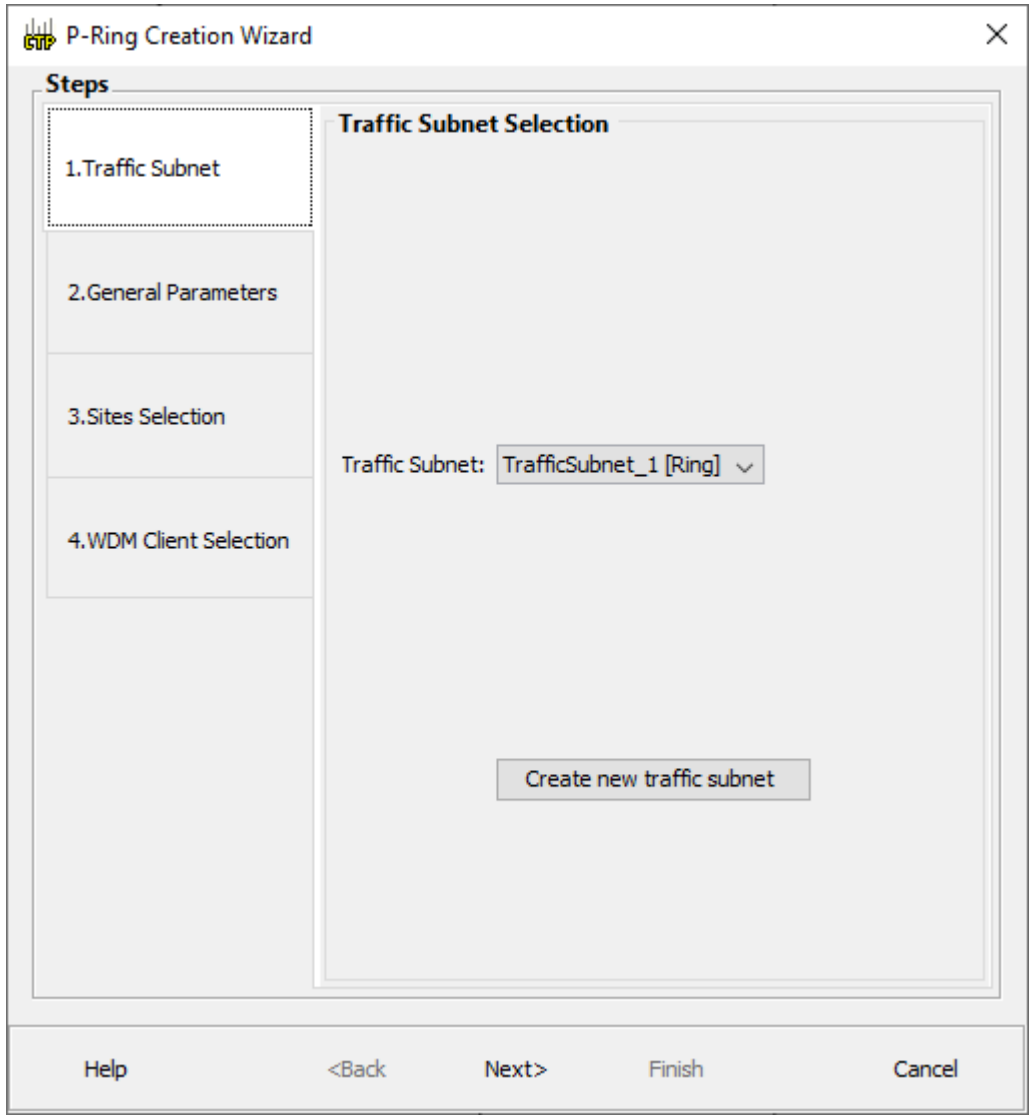
Ring Topology



Node 1 - Ring Topology

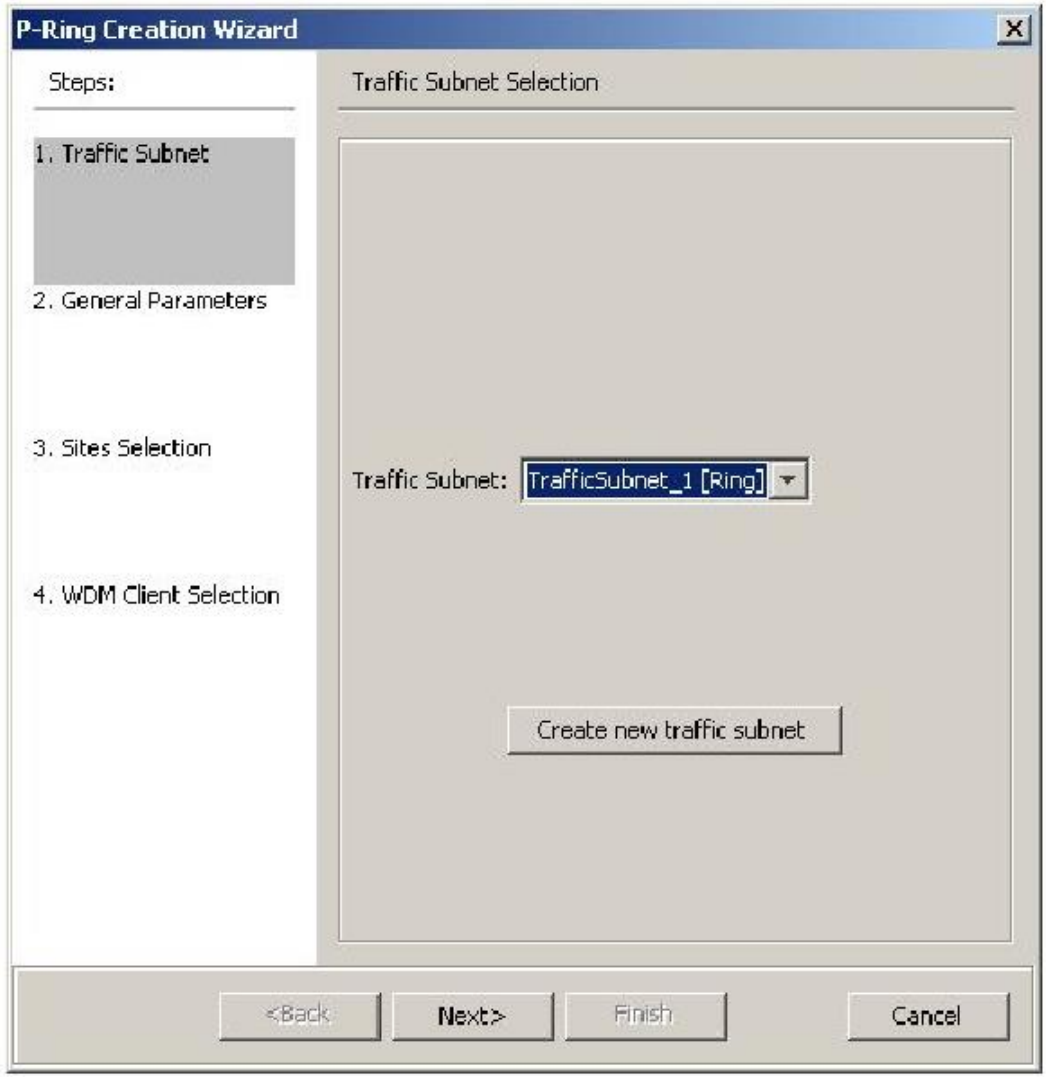


Creating a Protected Ring Demand



all nodes are on this subnet

Creating a Protected Ring Demand



Creating a Protected Ring Demand

Step 1 - Create a ring network

Step 2 - In the Native Net# tab, click the Create new P-Ring demand icon in the toolbar

Step 3 - For each network, the tool automatically creates, a default subnet that exactly matches the overall network topology. This cannot be deleted

Step 4 - On the General Parameters page, complete the following:

- Label—Enter the name of the demand.
- Service Type
- Present # ch—Enter the number of channels to be created
- Forecast # ch—Enter the number of channels to be installed at a later date

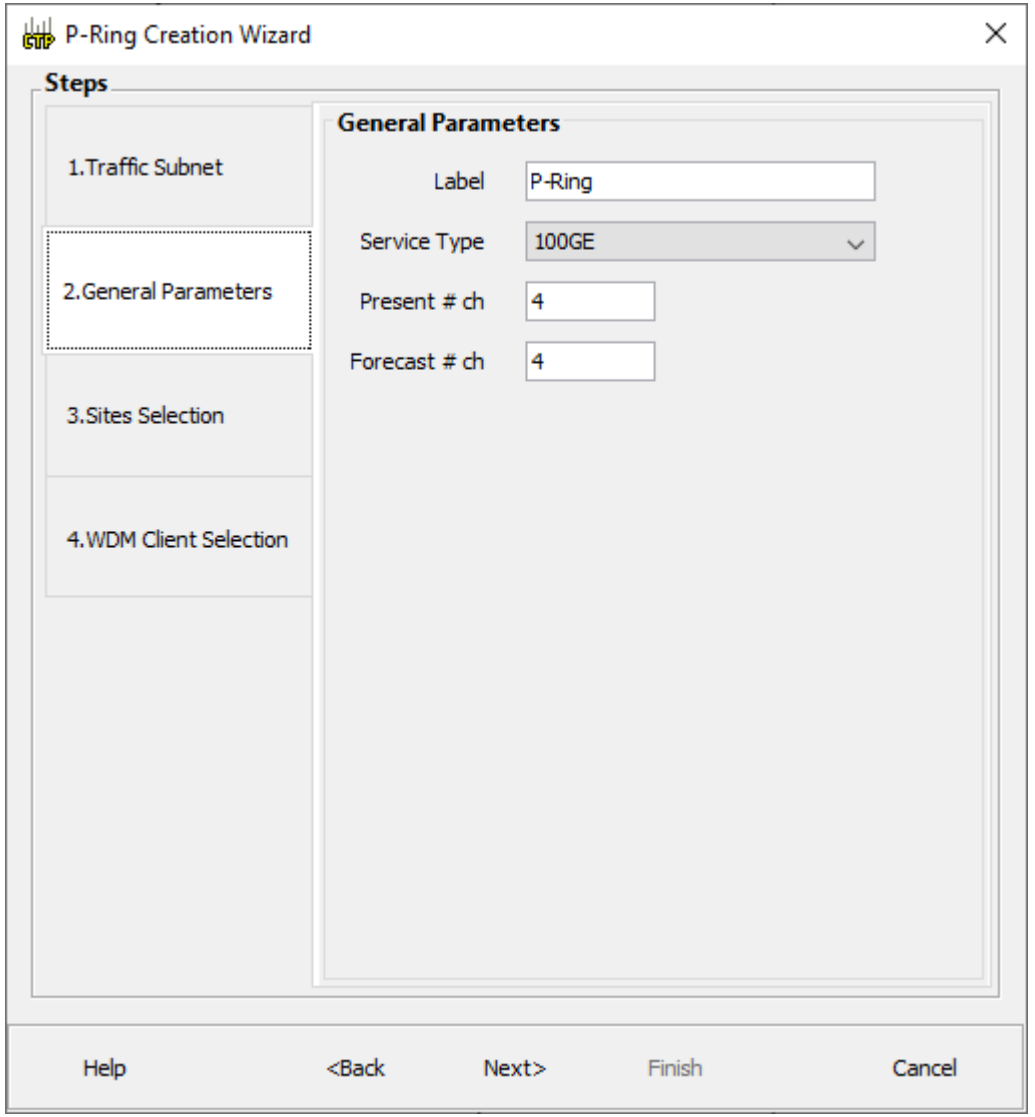
Step 5 - Click Next.

Creating a Protected Ring Demand

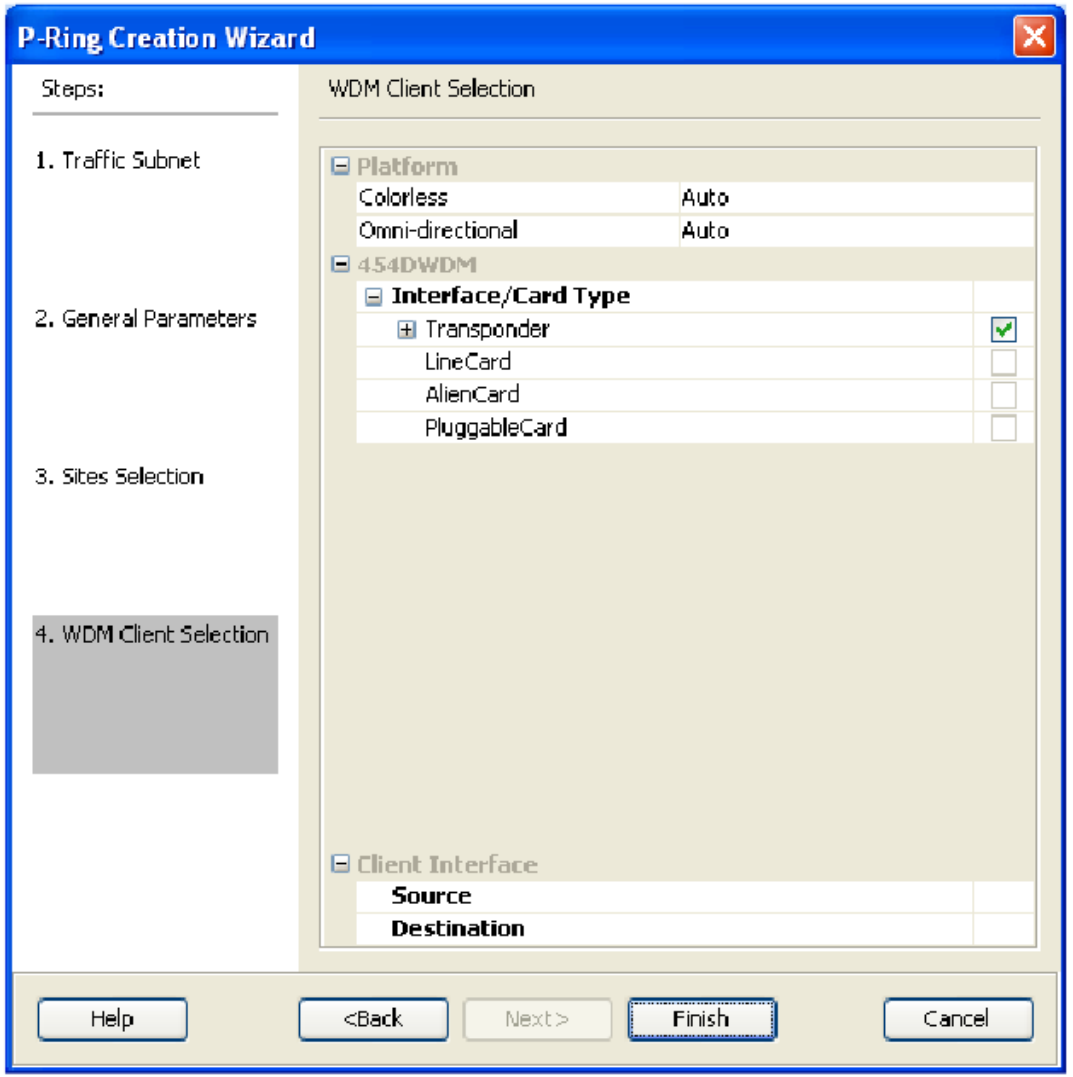
Step 6 - On the Sites Selection page, in the Protection Sites area, press Ctrl and click the sites that you want to add to the P-ring. A P-ring requires at least two sites.

Step 7 - Click Next. The WDM Client Selection page appears.

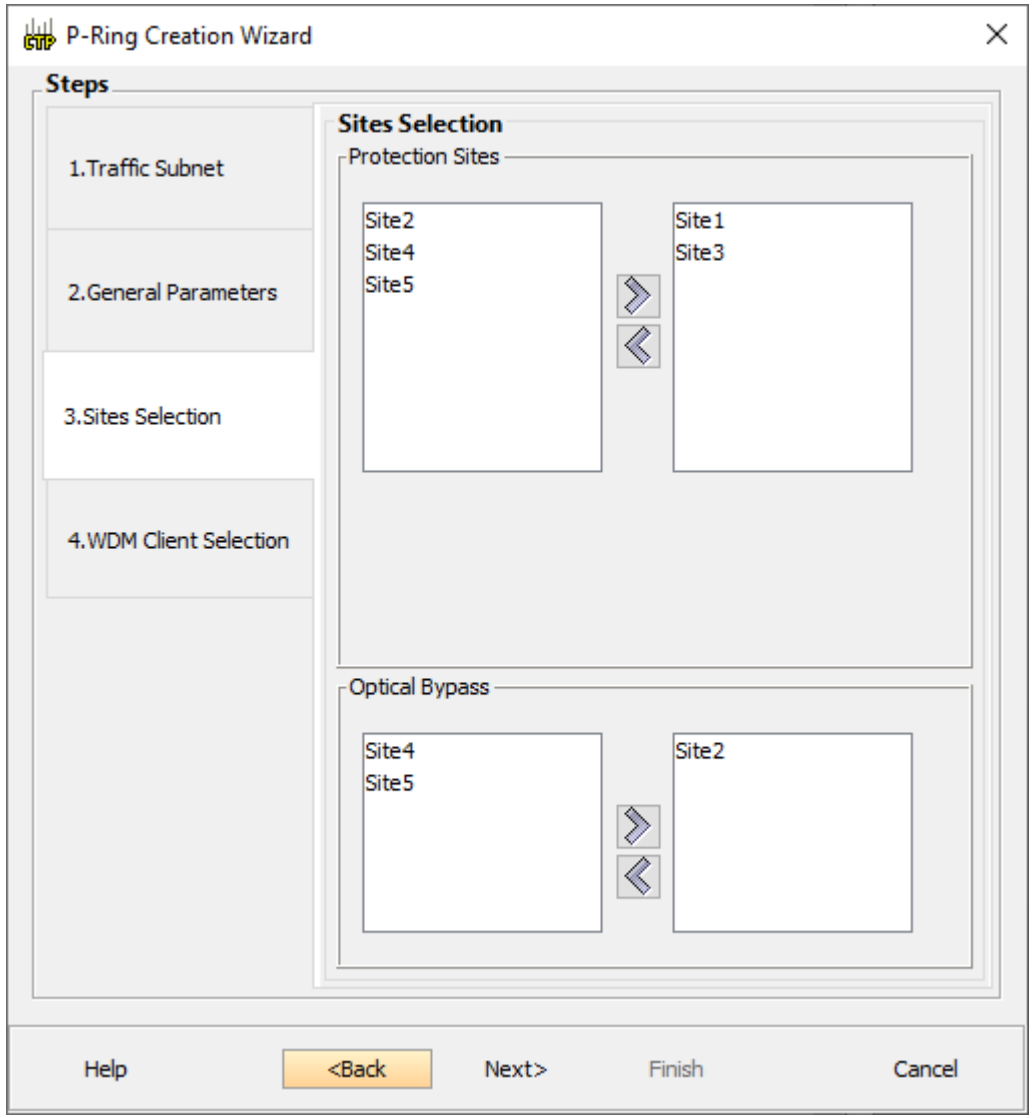
Defining Demand



Creating a Protected Ring Demand



Sites Selection



Creating a Protected Ring Demand

Step 8 - On the WDM Client Selection page, enter the following Platform Parameters:

- Colorless
- Omni-directional

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
- Line Card
- Alien Card
- Pluggable Card

Creating a Protected Ring Demand

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

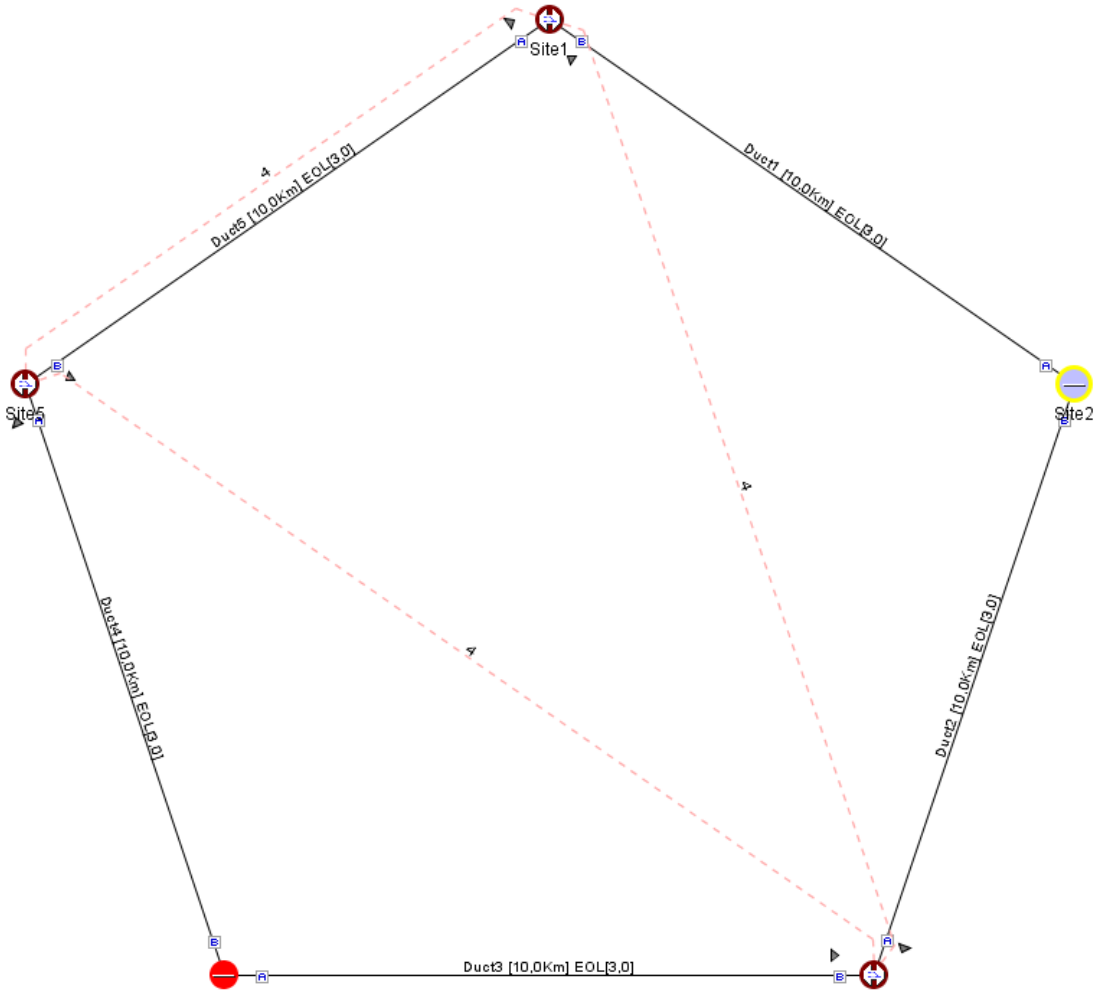
Step 11 - To add a new service, click the Add new service icon in the toolbar. A new row appears. Complete the parameters for the new channel.

Step 12 - To delete an existing channel, select the row and click the Delete service icon in the toolbar.

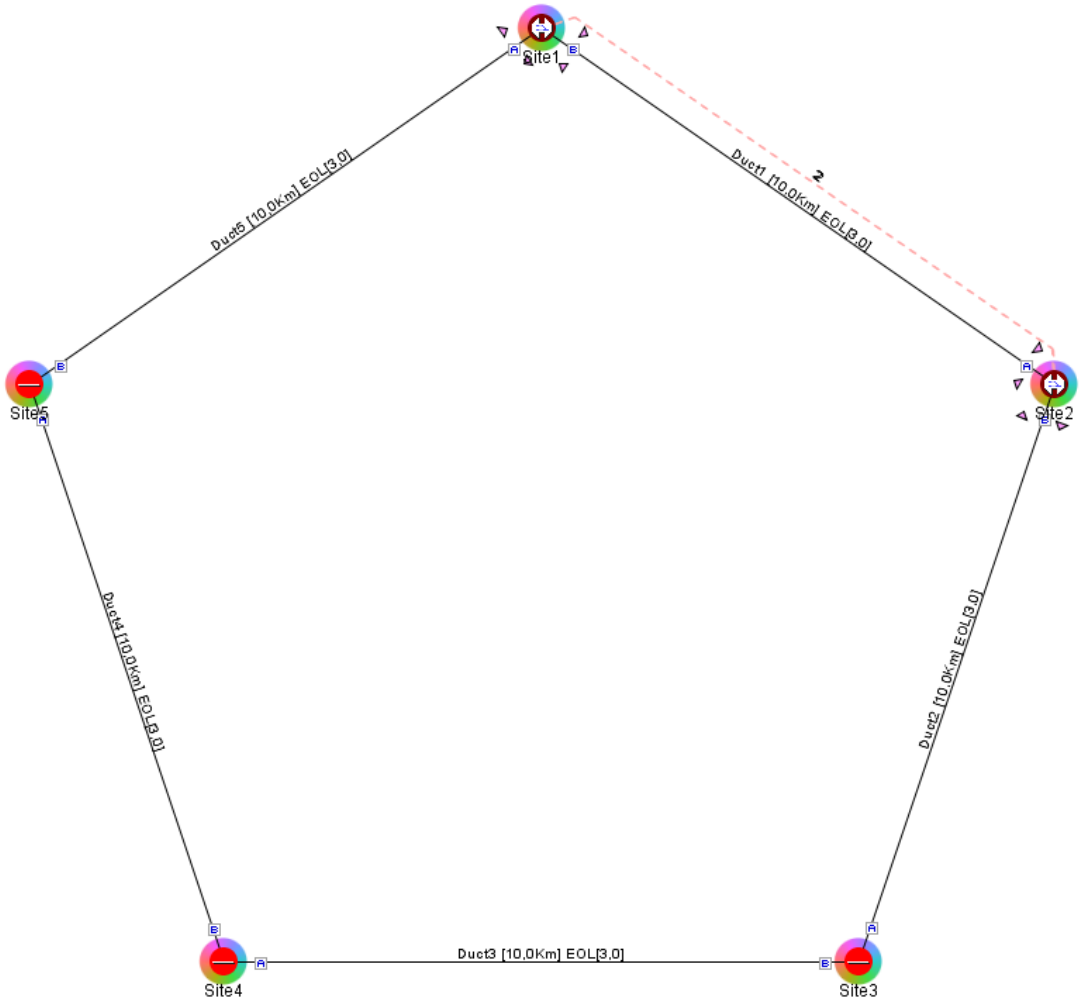
Step 13 - To add a regeneration site, click the regeneration... icon in the toolbar

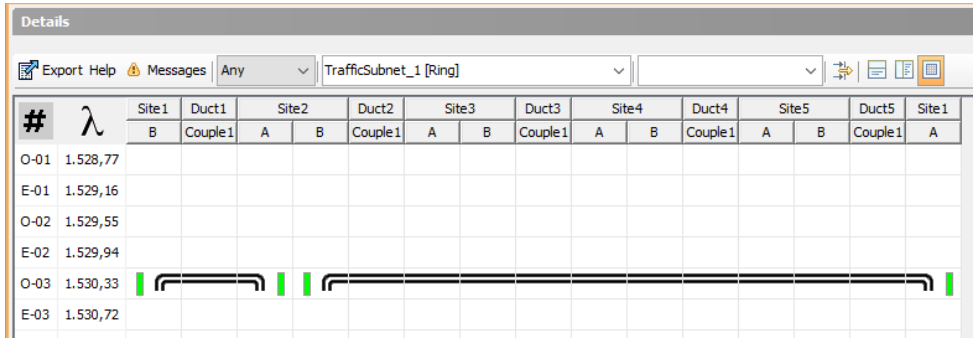
Step 14 - Click OK to save the changes

P-Ring Demand



Another Example





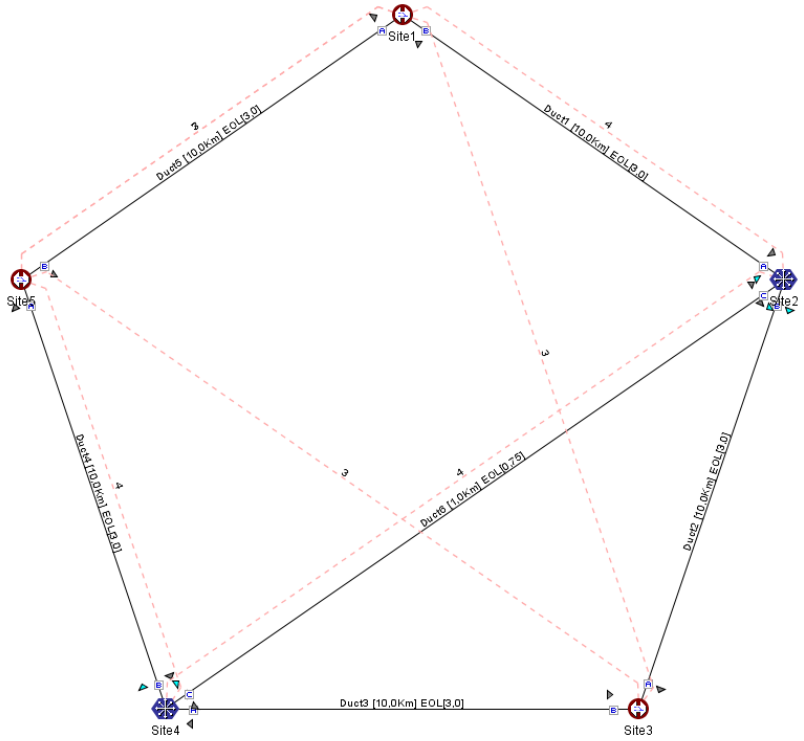
Example 7

Create a ring network with 5 nodes and two alternative path

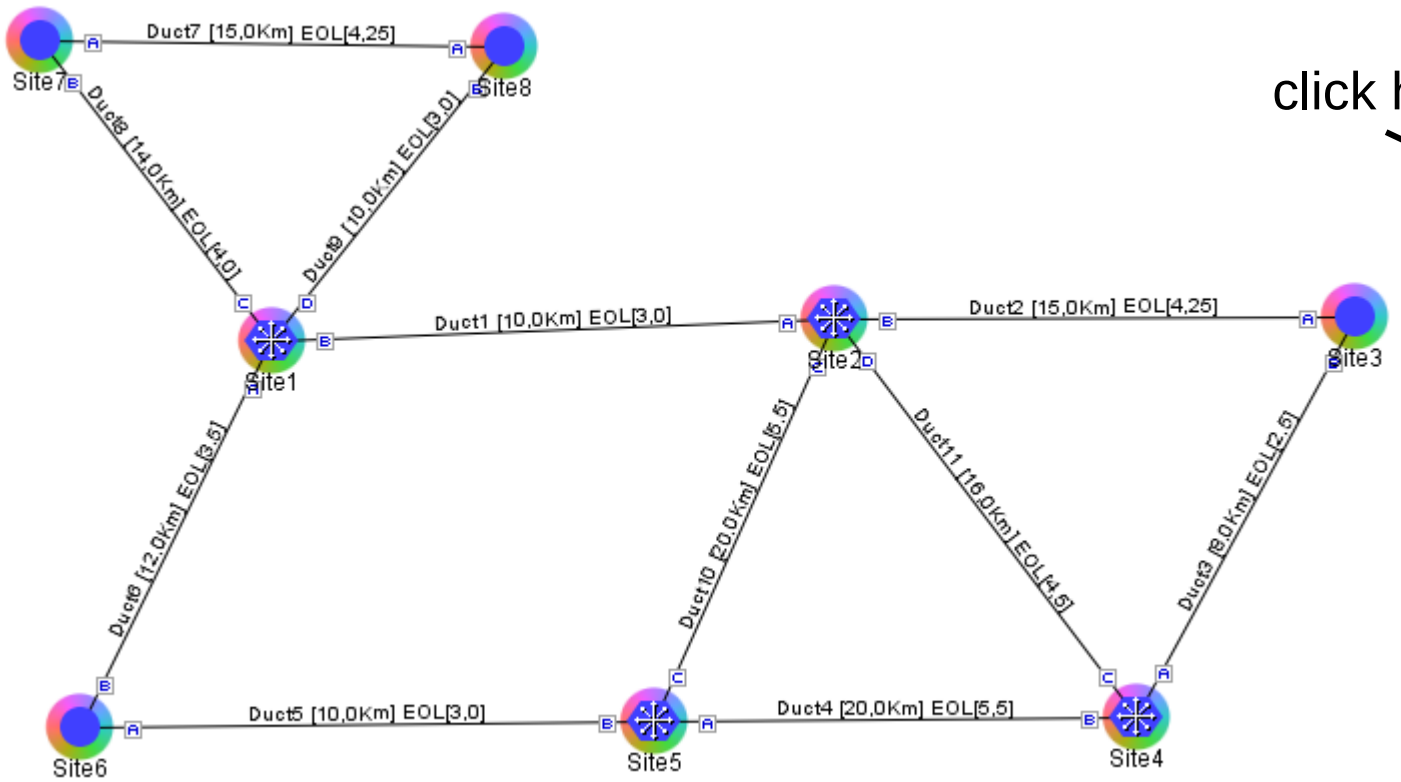
Create two traffic subnets

Create demands for each traffic subnet

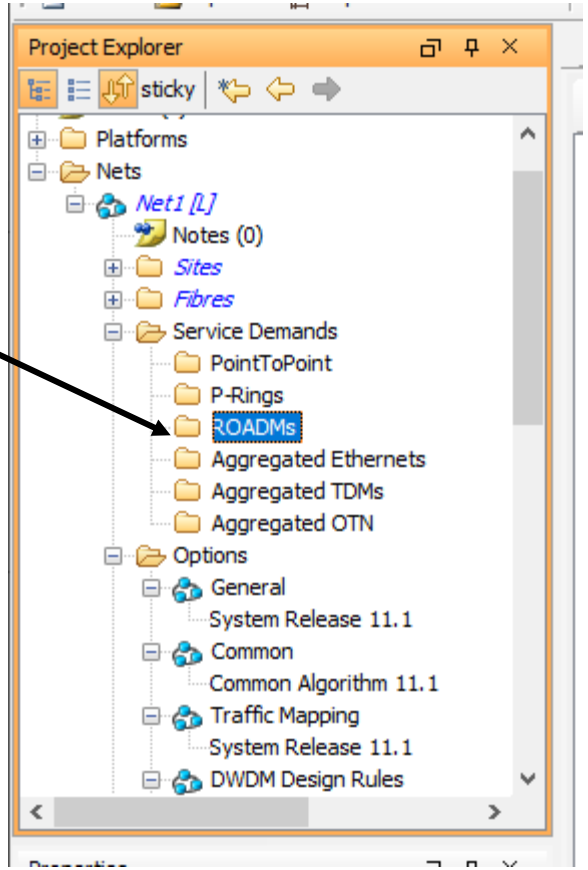
Examine the configuration generated by CTP



Mesh Networks and ROADM Demands



click here



Creating a ROADM Demand

Step 1 - In the Project Explorer, 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.

Step 3 -Type 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.

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

Creating a ROADM Demand

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)

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.

Step 13 - To further define the client interfaces, complete the following options for each client interface listed in the table

Creating a ROADM Demand

Step 14 - Click OK to create the demand.

Step 15 - Copy ROADM demand properties

Step 16 - To finalise the ROADM demand, complete the following steps:

- Analyse the network.
- Upgrade the analysed network.
- On the General Parameters page, complete the following:
  - Label
  - Service Type
  - Present # ch
  - Forecast # ch

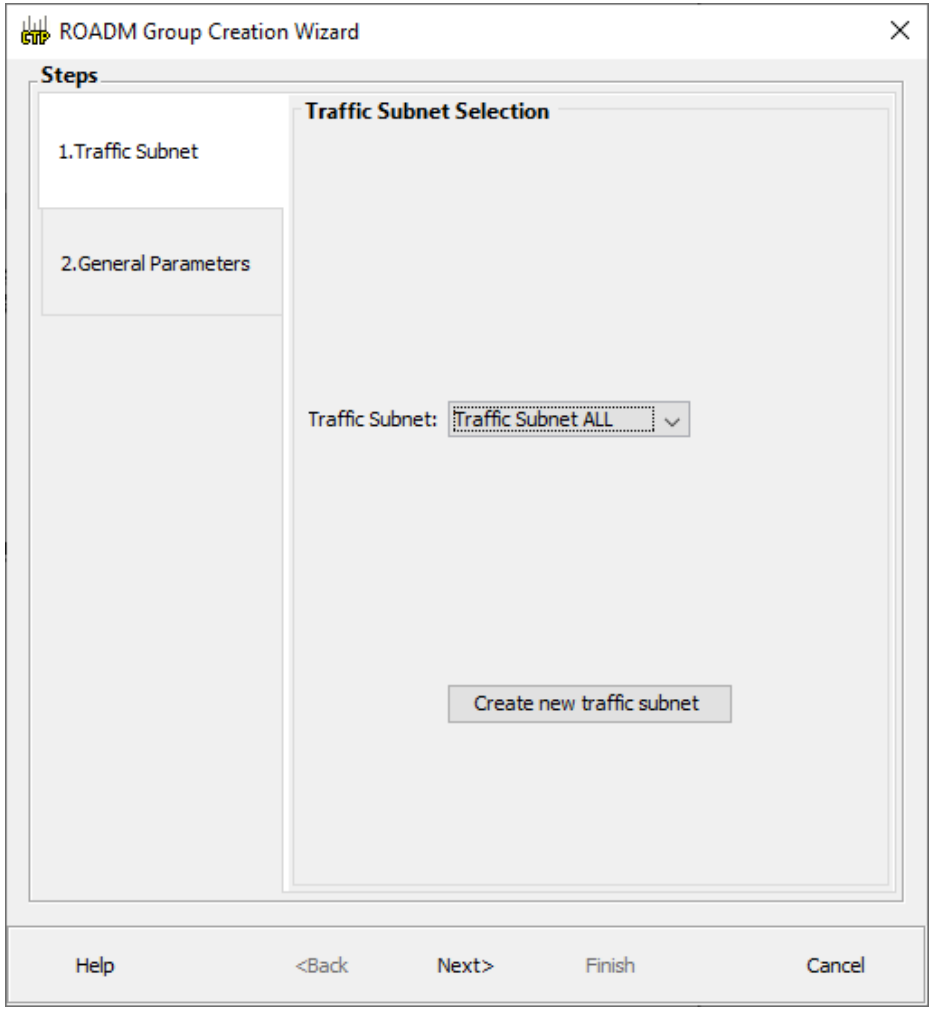
Routing Strategies for ROADM demands

– **Unprotected optimum optical path**—Each node pair is connected using one connection. The unprotected optimum optical path minimizes the number of required optical amplifiers, but also restricts the number of channels that can be deployed among the nodes of the traffic demand (maximum of 40 channels between each node pair) in the installed network.

– **Unprotected minimum hop count**—Each node pair in the traffic demand is connected by one connection. The unprotected minimum hop count maximizes the number of channels (for unprotected traffic types only) that can be deployed among the nodes of the traffic demand, but requires a higher number of optical amplifiers on the unprotected optimum optical path (maximum of 40 channels between each node pair) in the installed network.

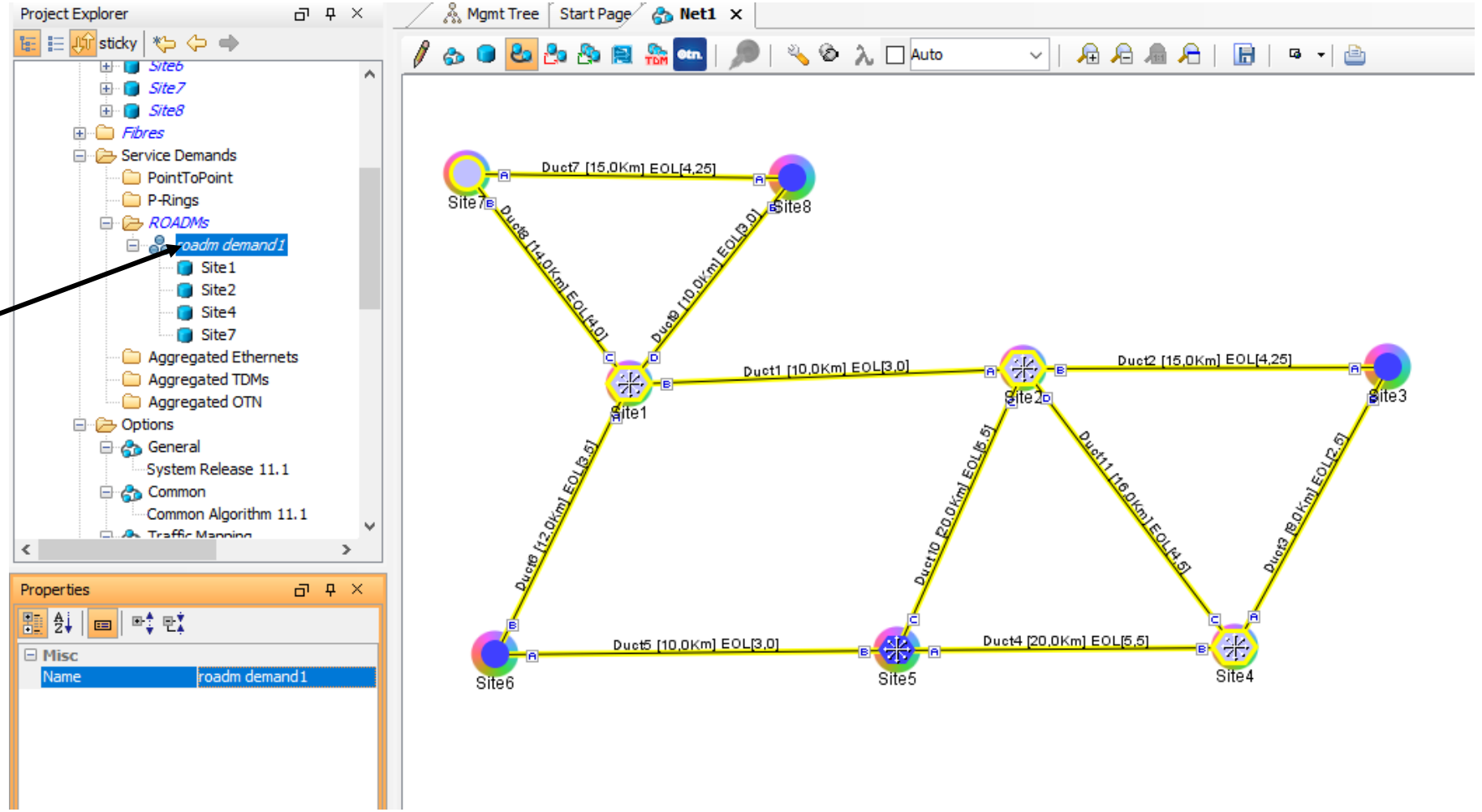
– **Unprotected subnet**—Each node pair in the traffic demand is connected using one connection. You can manually force connections on only one branch of the ring. For unprotected subnets, you must manually select one starting node of the branch and the direction the ring must be traversed to define the subnet, starting from the initial site. The branch direction is specified by defining the outgoing side first, referred to as the starting node. This routing strategy option allows you to exclude some critical paths and (with ROADM traffic demands containing two sites) to force each ROADM connection clockwise or counterclockwise.

Traffic subnet

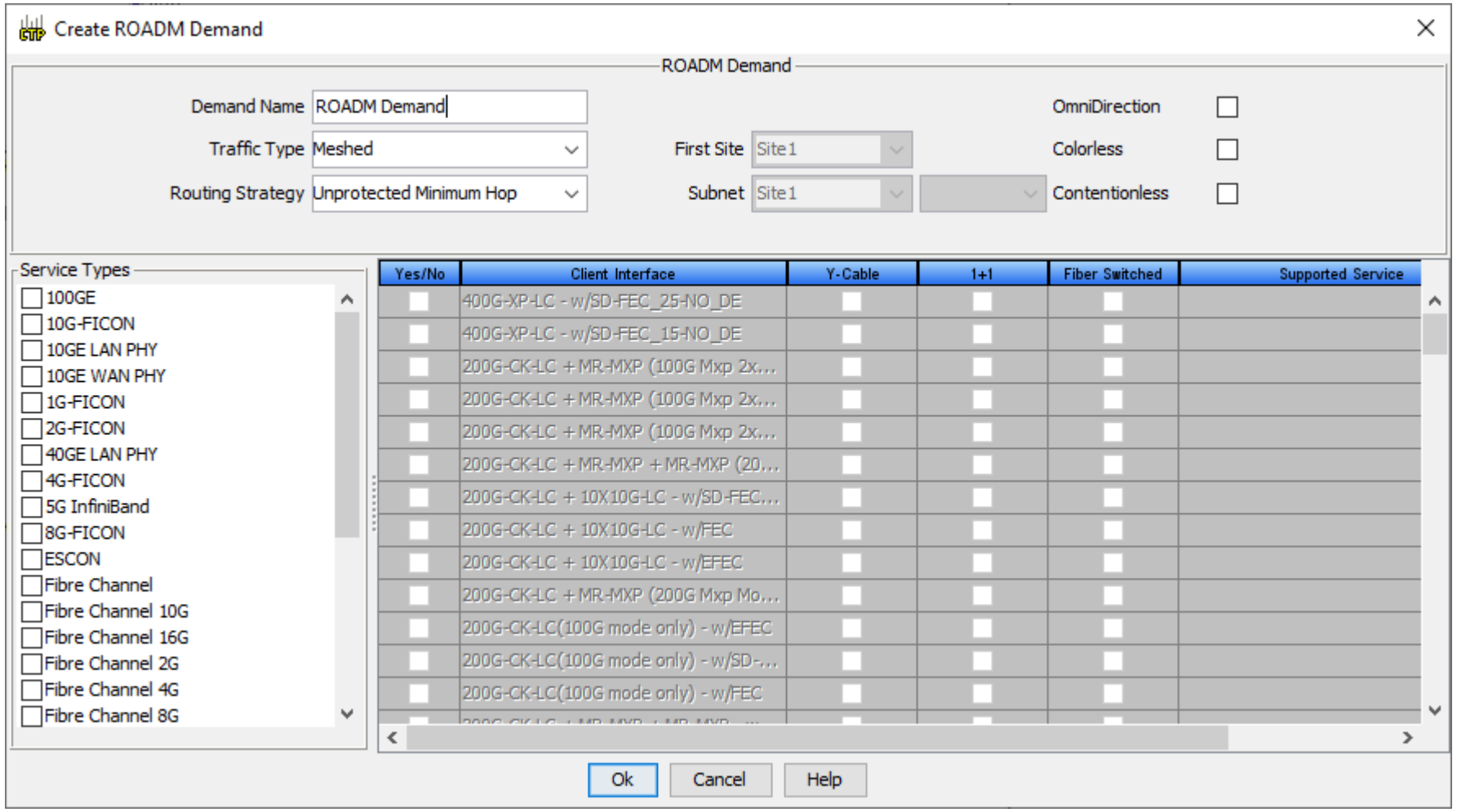


New ROADM demand

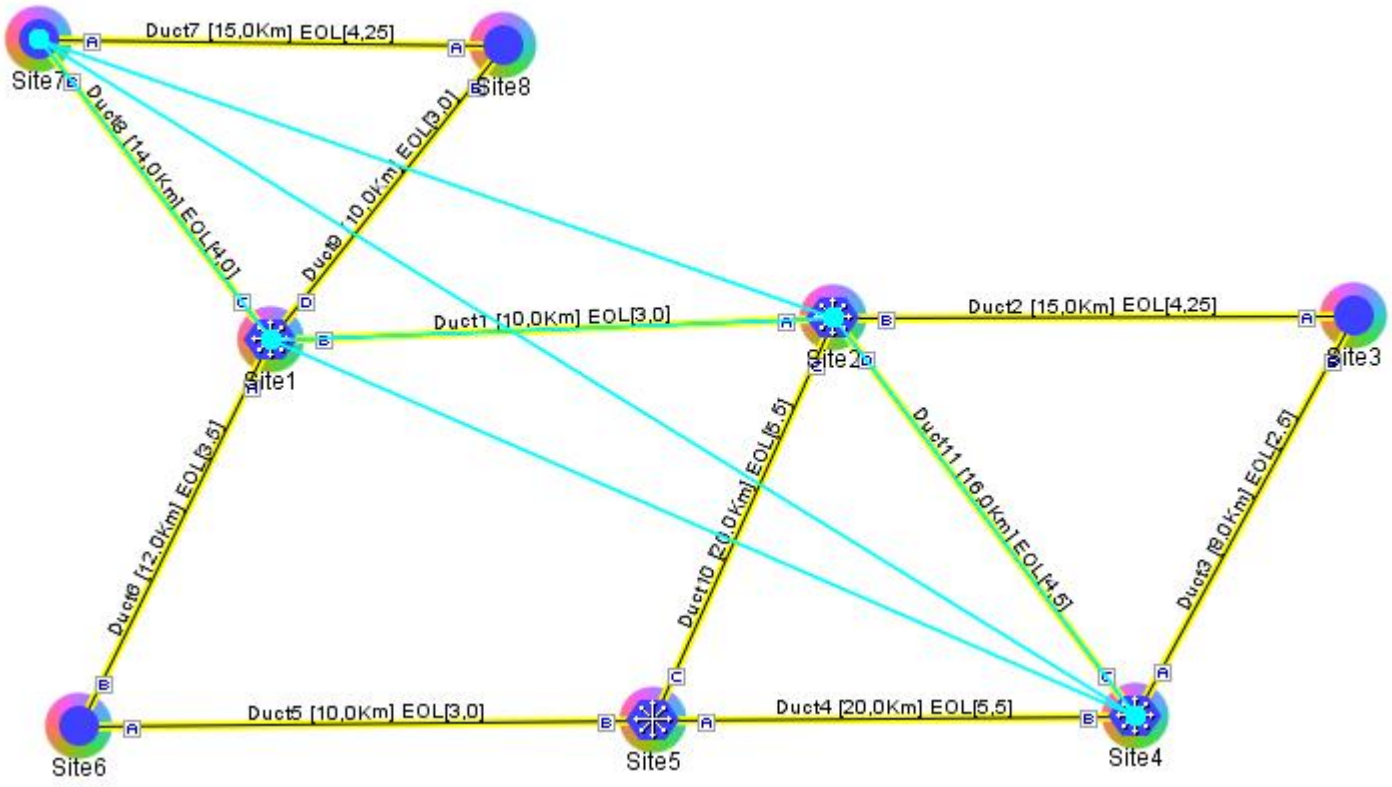
right click here



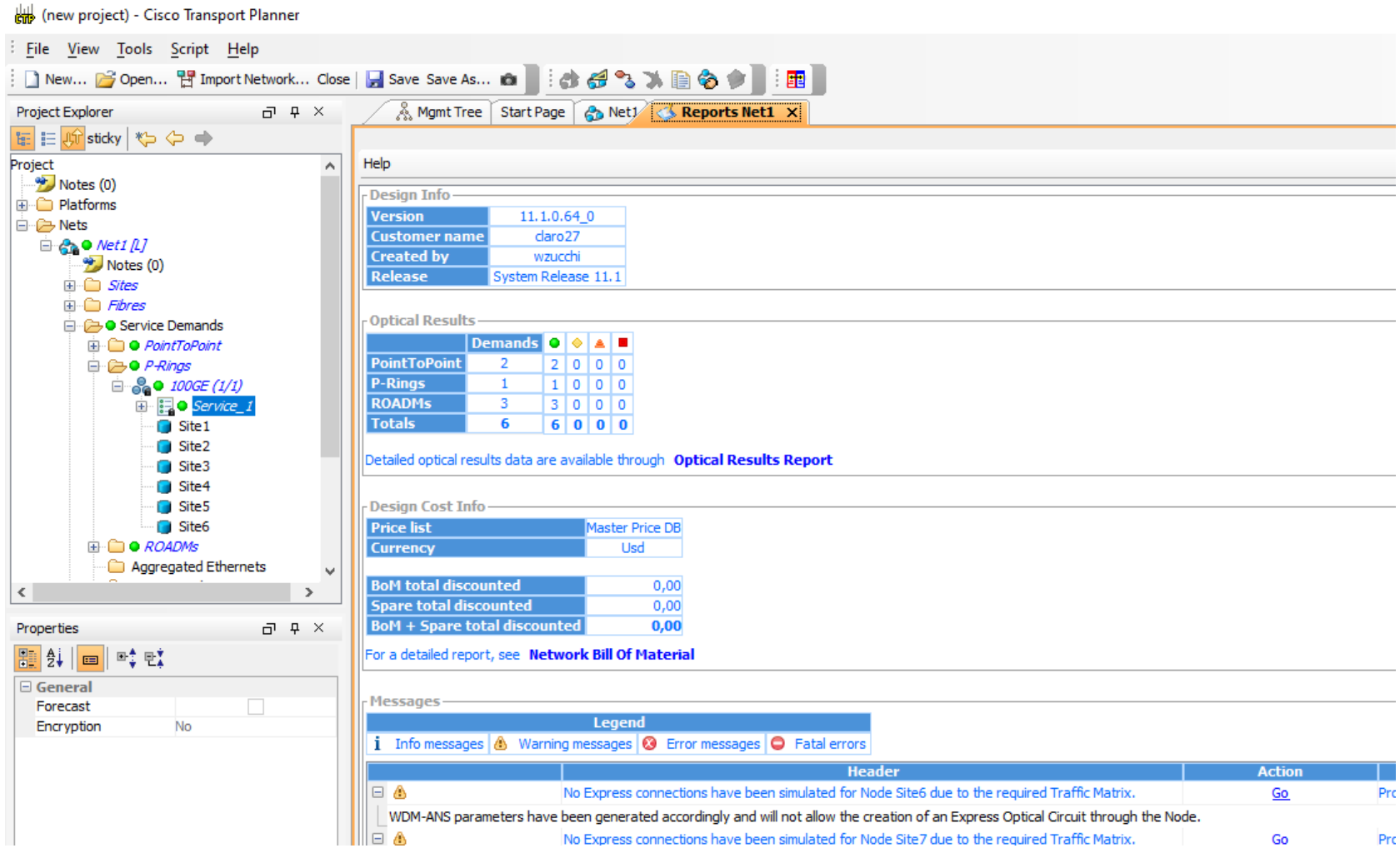
Create ROADM Demand



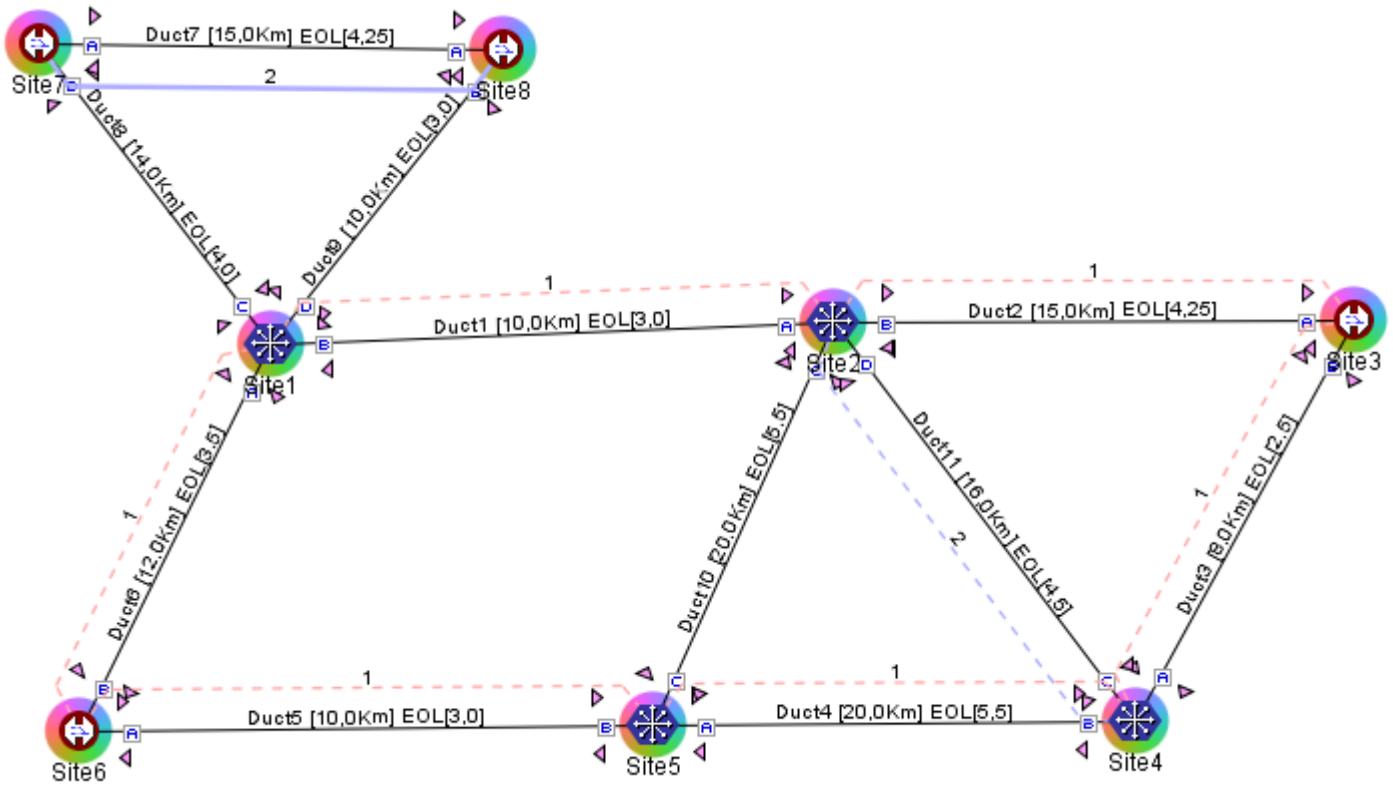
Mesh Demand


Duct7 [15,0Km] EOL[4,25]
Site7
Site8
Duct8 [14,0Km] EOL[4,0]
Duct9 [10,0Km] EOL[3,0]
Duct1 [10,0Km] EOL[3,0]
Duct2 [15,0Km] EOL[4,25]
Site1
Site2
Site3
Duct6 [12,0Km] EOL[3,5]
Duct10 [20,0Km] EOL[5,5]
Duct11 [16,0Km] EOL[4,5]
Duct3 [8,0Km] EOL[2,5]
Duct5 [10,0Km] EOL[3,0]
Duct4 [20,0Km] EOL[5,5]
Site6
Site5
Site4

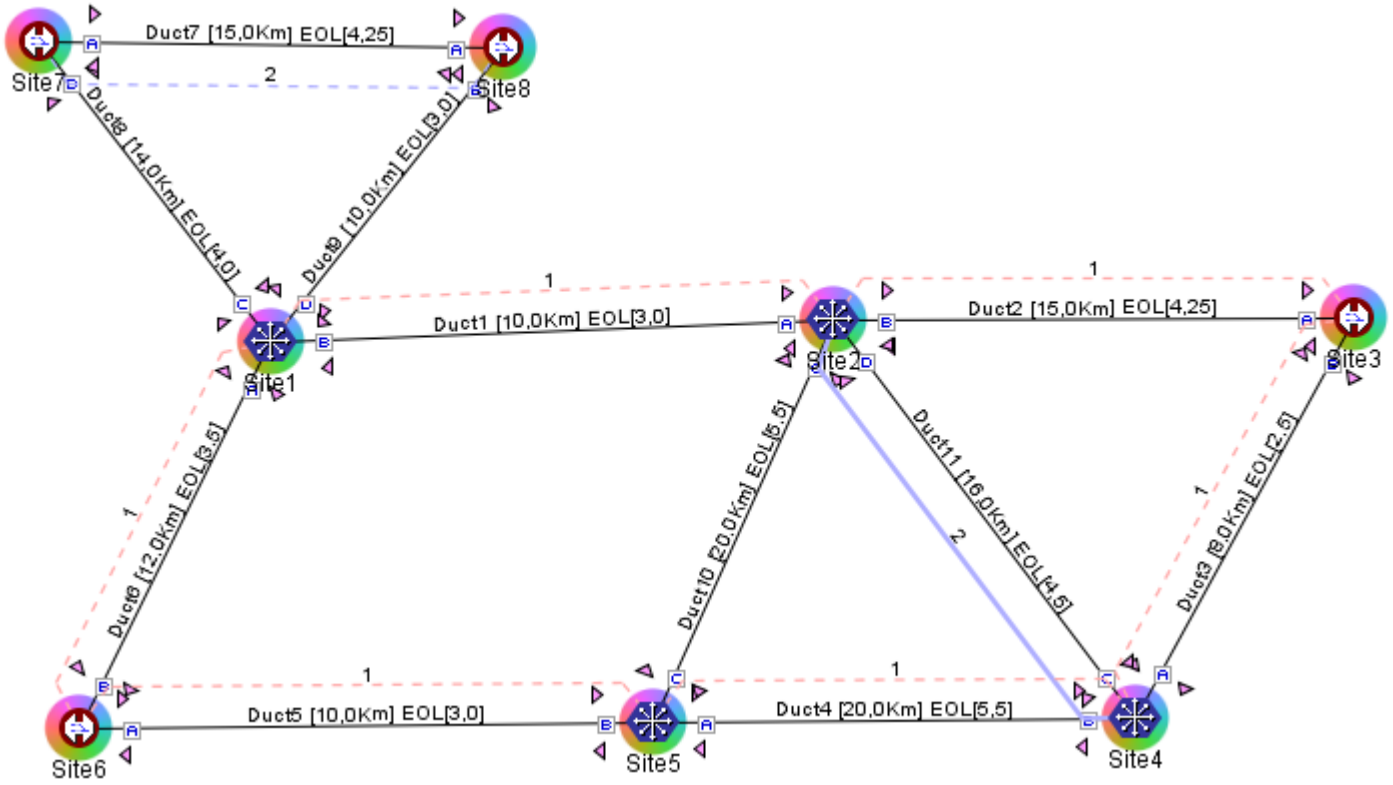
Summary Report



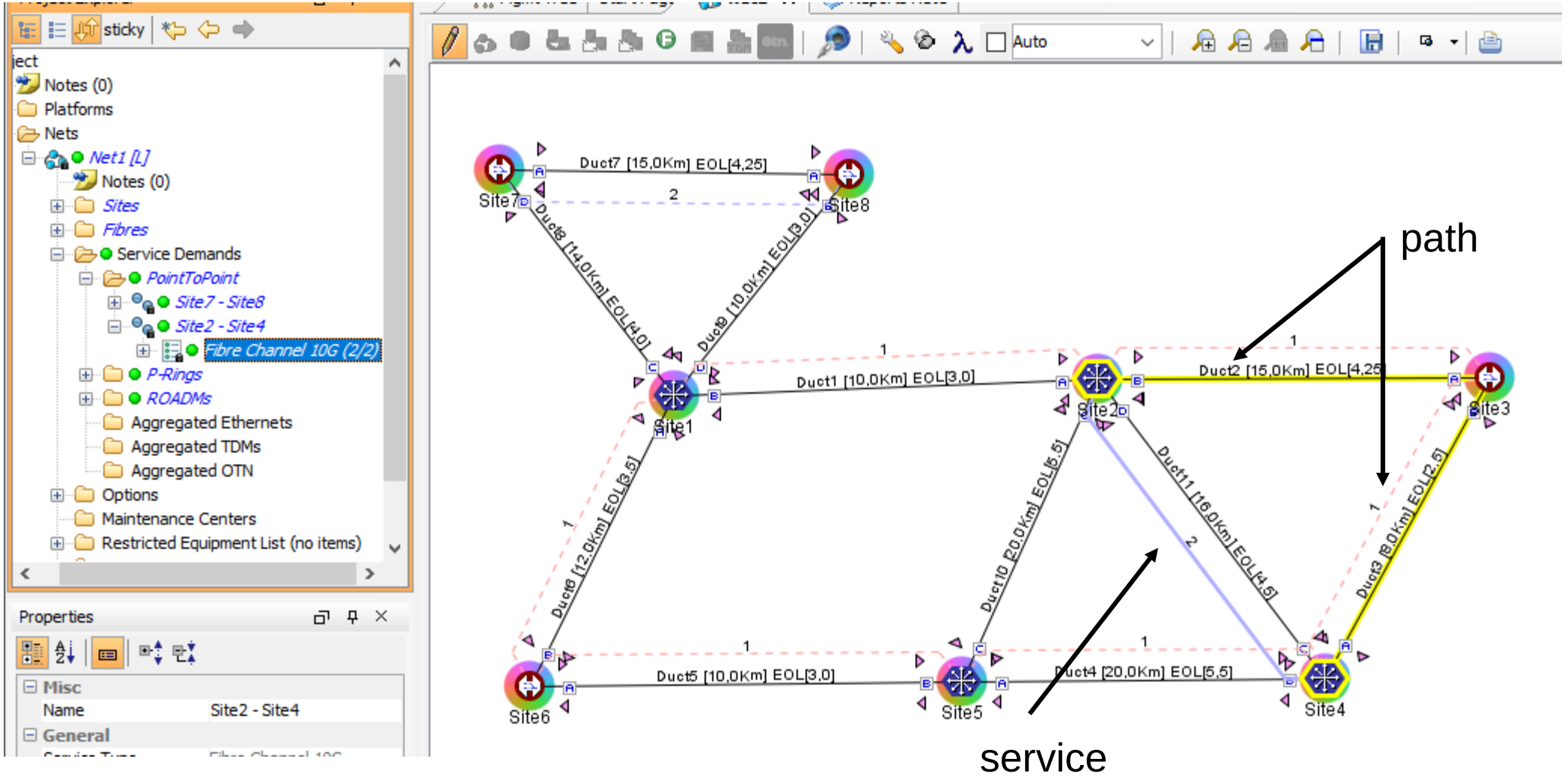
Service Point-to-Point: Site 7 - Site 8



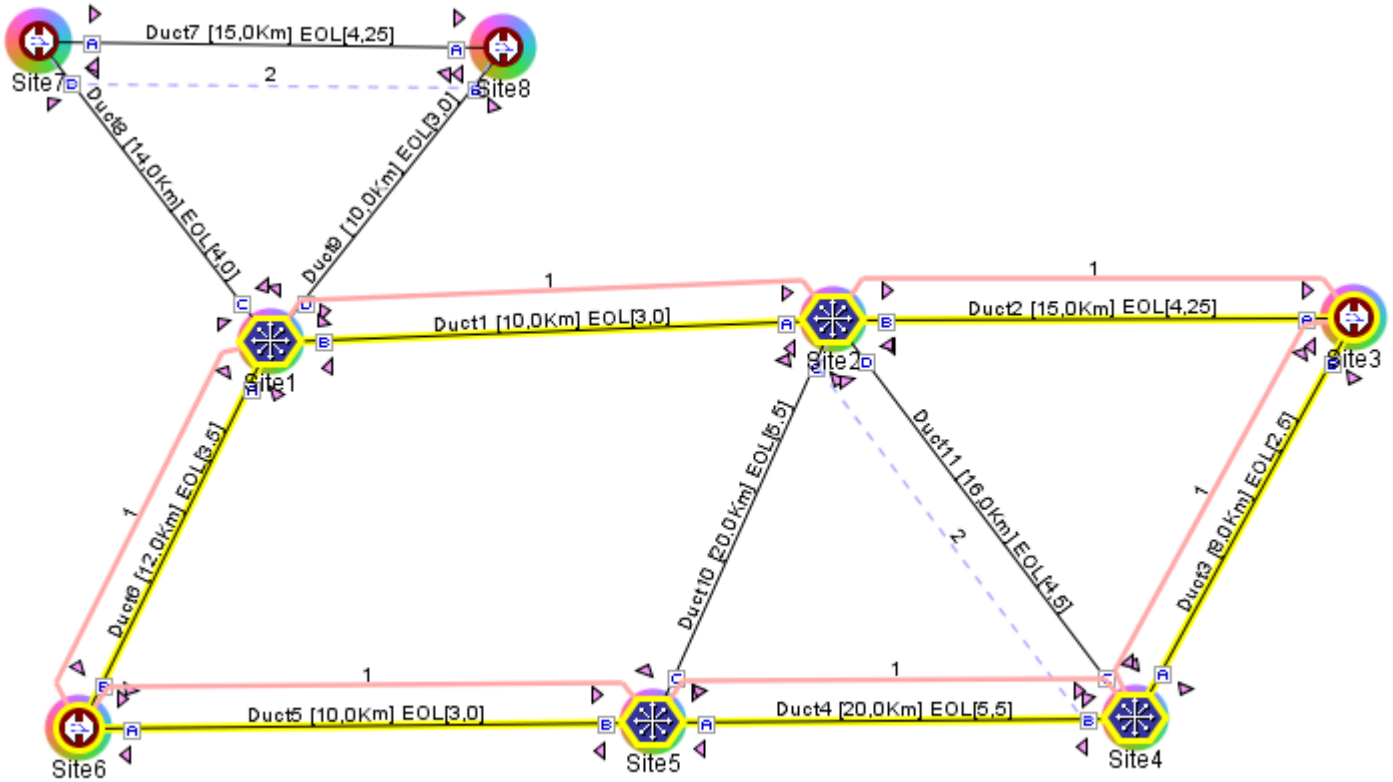
Service Point-to-Point: Site 4 - Site 2



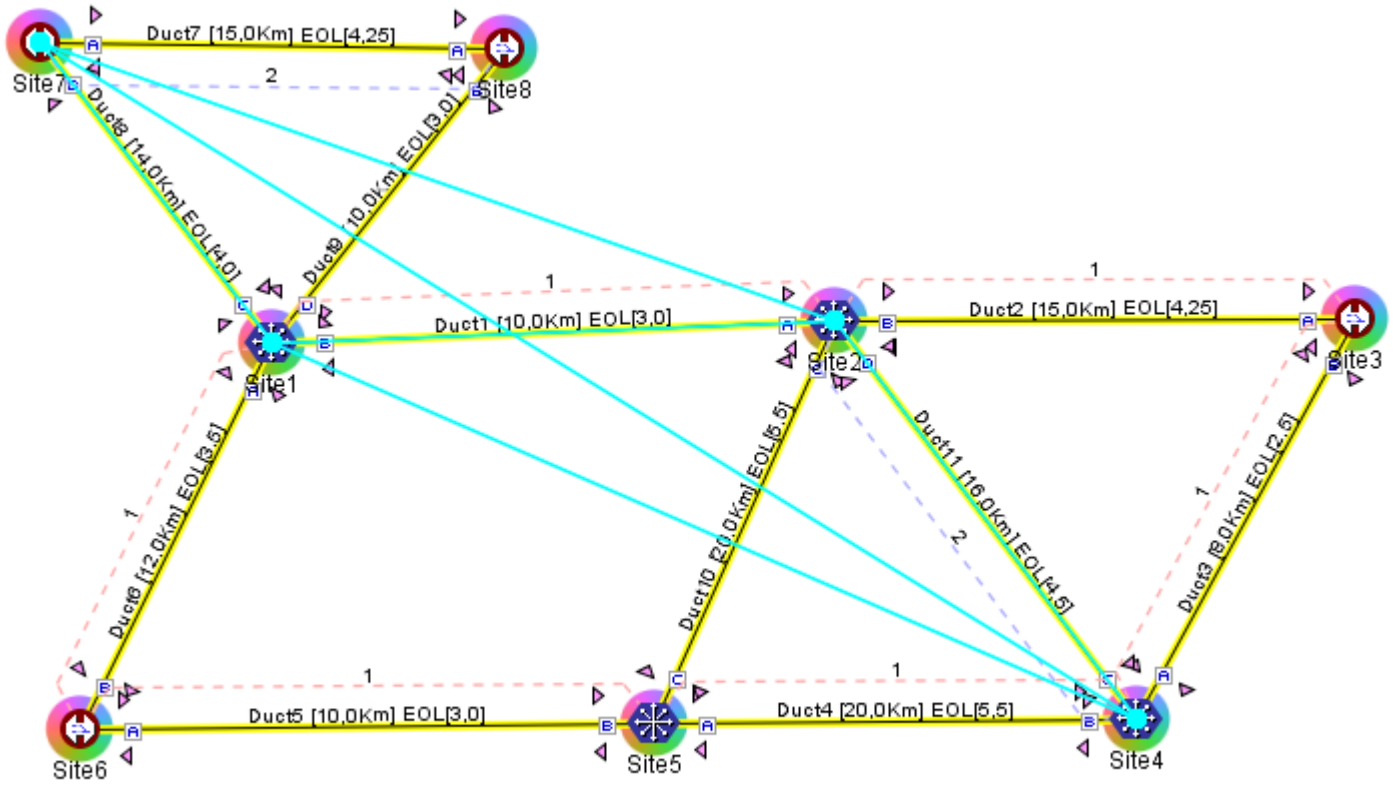
Service Point-to-Point: Site 4 - Site



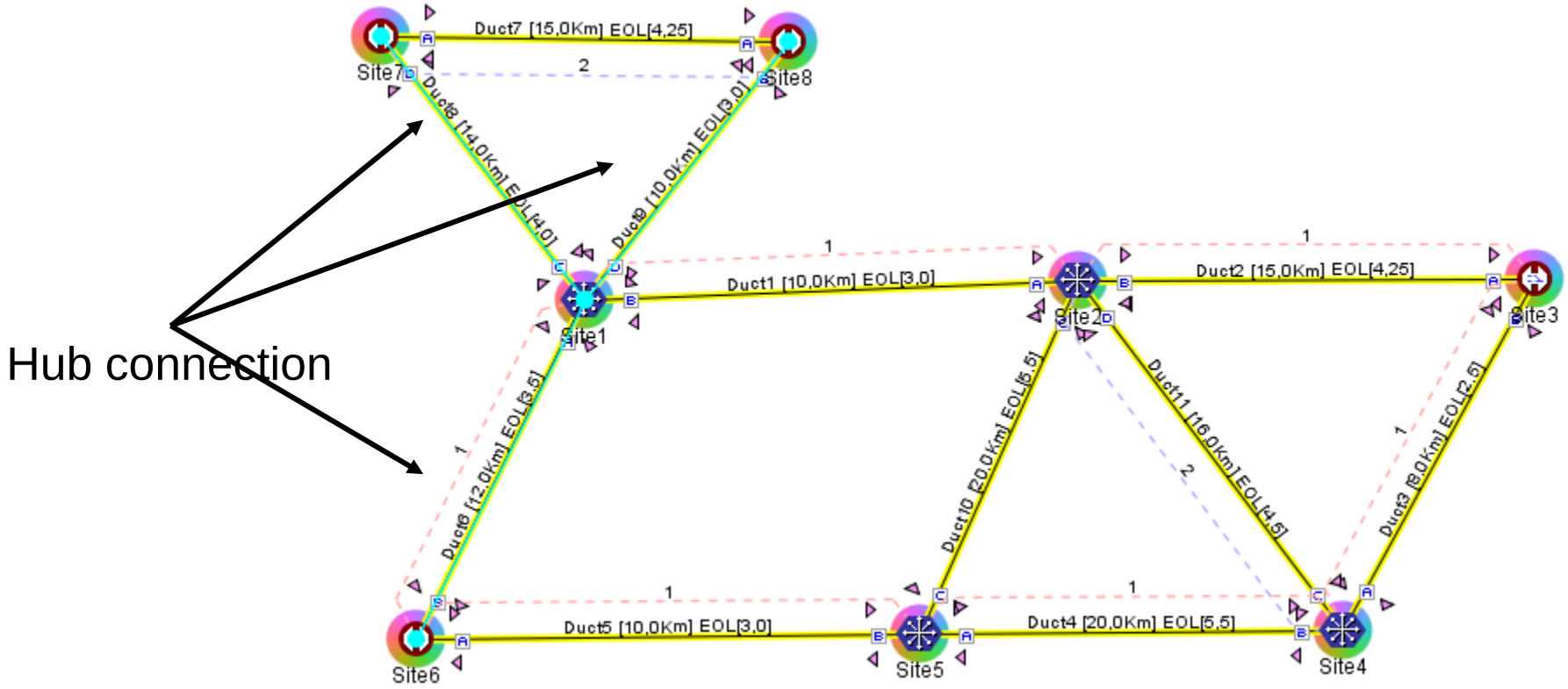
P_Ring Service



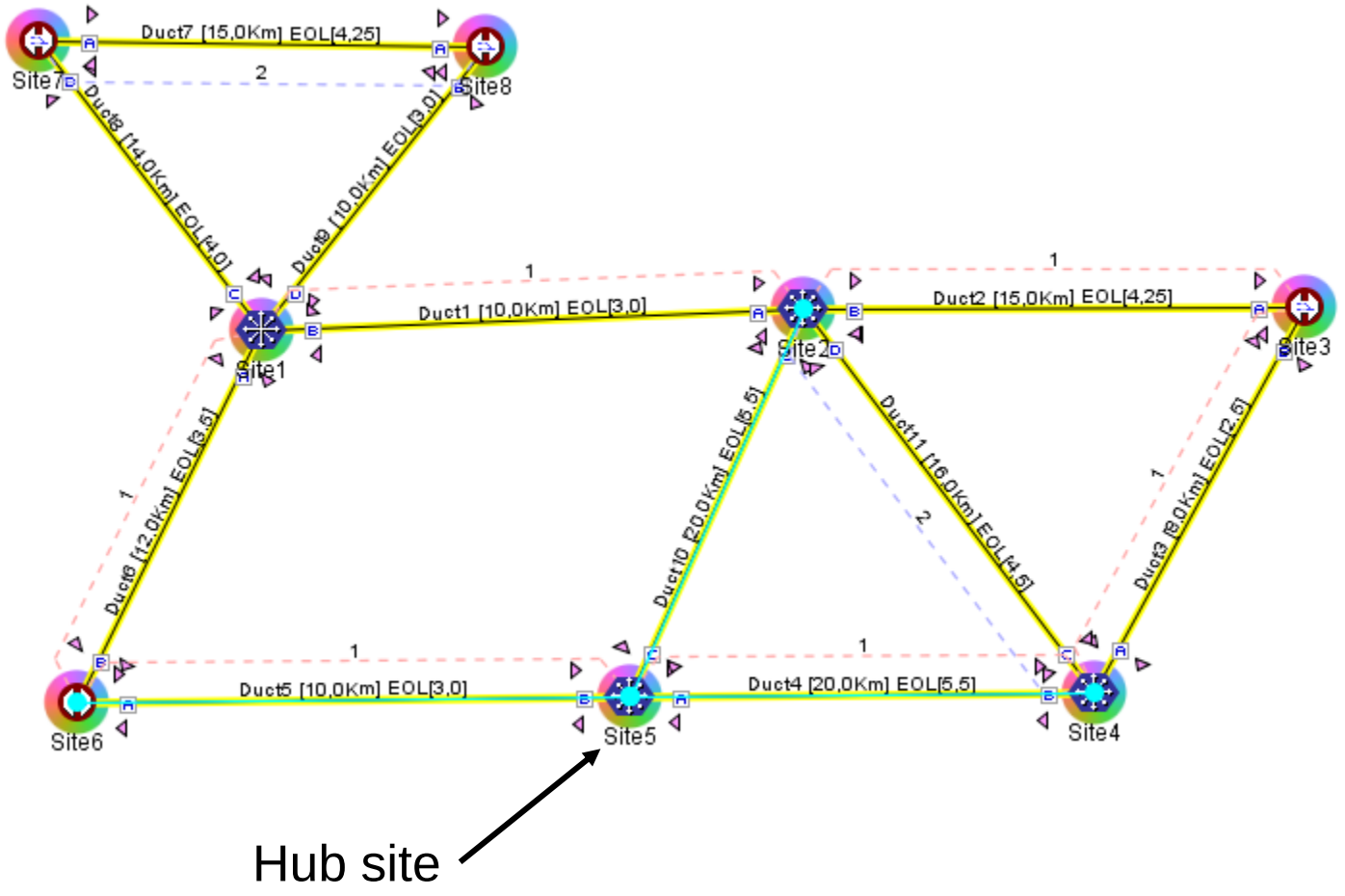
ROADM demand 1



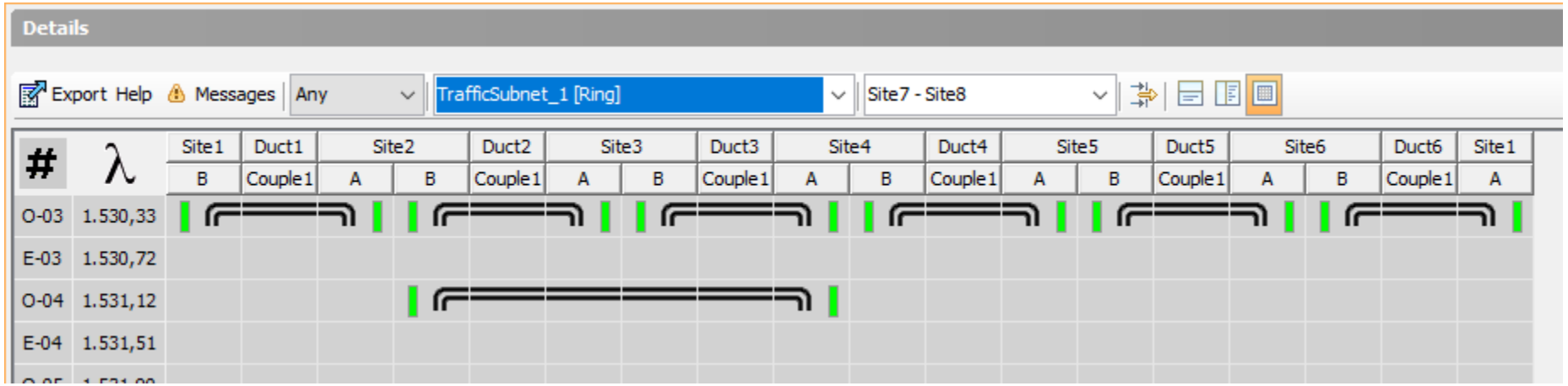
Roadm Demand 2



Roadm Demand 3



Wavelength Report



Viewing Wavelength Routing

Use the following procedure to view the wavelength routing map for the network that was analyzed:

Procedure

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

Step 2 In the **Tasks** pane, click **Wavelength Routing**. The Wavelength Routing tab appears. Each wavelength supported by the platform is represented by a row.

Note ROADM (Any-to-Any) demands are not shown in this report.

Traffic Matrix

Cisco Transport Planner Version: 11.1.0.64
Customer name: claro27
Created by: wzucchi
System release: System Release 11.1

Março 03, 2021 at 14:44:06

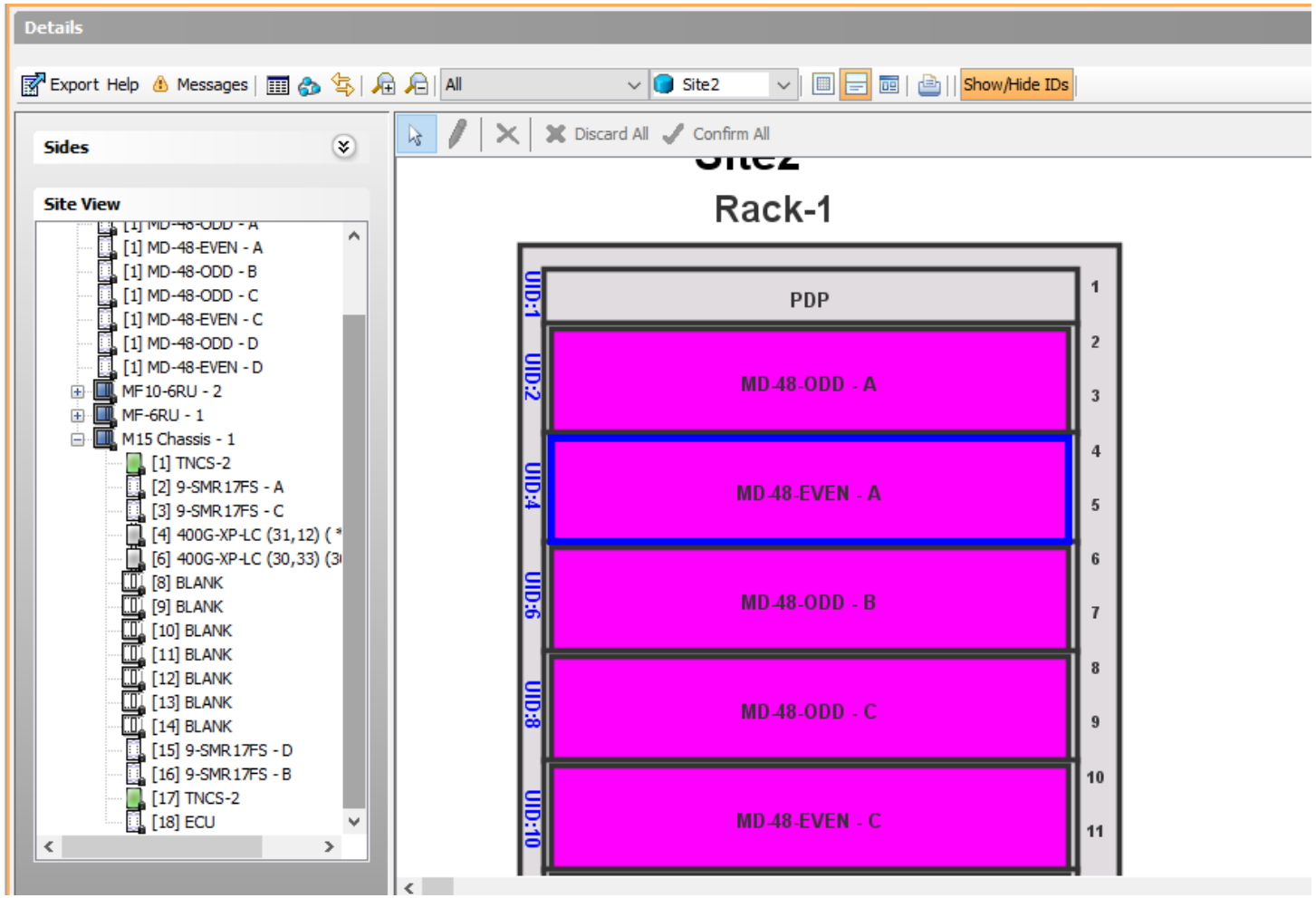
Export | New query | Help | Messages

Query Preview

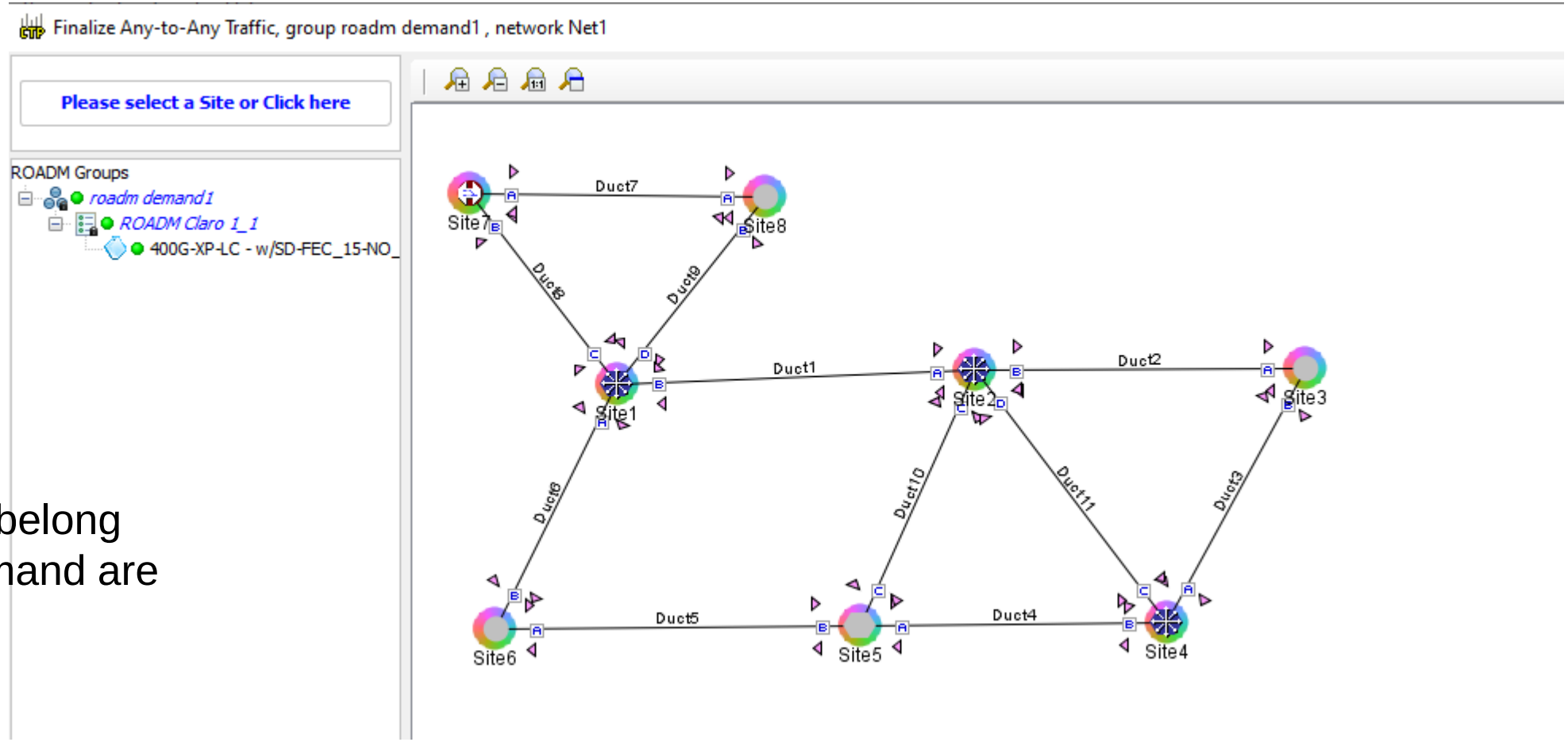
Query Dialog

Demand	Section	Src Site	Src Position	Src Card	Src Clie...	Src ClientPPM	Src Tru...	Src trunk PPM	Src Card OpMode	Src T/C ...	A/D Src Position	A/D Src Unit	A/D Src Port
Site7 - Site8													
Service_1													
OCH-CC		Site7	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC	8	QSFP-100G-SR4-S			M200G	w/SD-FE...			
Trail_1		Site7	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC			11	ONS-CFP2-WDM		w/SD-FE...			
	Section_1	Site7	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC	8-RX	QSFP-100G-SR4-S	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 1.Slot 1	MD-48-ODD	CHAN-3-RX
		Site8	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC	8-RX	QSFP-100G-SR4-S	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 1.Slot 1	MD-48-ODD	CHAN-3-RX
Service_2													
OCH-CC		Site7	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC	7	QSFP-100G-SR4-S			M200G	w/SD-FE...			
Trail_1		Site7	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC			11	ONS-CFP2-WDM		w/SD-FE...			
	Section_1	Site7	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC	7-RX	QSFP-100G-SR4-S	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 1.Slot 1	MD-48-ODD	CHAN-3-RX
		Site8	Rack 1.M15 Chassis 1.Slot 3	400G-XP-LC	7-RX	QSFP-100G-SR4-S	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 1.Slot 1	MD-48-ODD	CHAN-3-RX
Site2 - Site4													
Service_1													
OCH-CC		Site2	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8-1	ONS-QSFP-4X10-...			M200G	w/SD-FE...			
Trail_1		Site2	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC			11	ONS-CFP2-WDM		w/SD-FE...			
	Section_1	Site2	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8-1-RX	ONS-QSFP-4X10-...	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 3.Slot 1	MD-48-ODD	CHAN-4-RX
		Site4	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8-1-RX	ONS-QSFP-4X10-...	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 1.Slot 1	MD-48-ODD	CHAN-4-RX
Service_2													
OCH-CC		Site2	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8-2	ONS-QSFP-4X10-...			M200G	w/SD-FE...			
Trail_1		Site2	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC			11	ONS-CFP2-WDM		w/SD-FE...			
	Section_1	Site2	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8-2-RX	ONS-QSFP-4X10-...	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 3.Slot 1	MD-48-ODD	CHAN-4-RX
		Site4	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8-2-RX	ONS-QSFP-4X10-...	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 1.Slot 1	MD-48-ODD	CHAN-4-RX
P-Ring													
Service_1													
OCH-CC		Site1	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8	QSFP-100G-SR4-S			M200G	w/SD-FE...			
Trail_1		Site1	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC			11	ONS-CFP2-WDM		w/SD-FE...			
	Section_1	Site1	Rack 1.M15 Chassis 1.Slot 4	400G-XP-LC	8-RX	QSFP-100G-SR4-S	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 3.Slot 1	MD-48-ODD	CHAN-3-RX
		Site2	Rack 1.M15 Chassis 1.Slot 6	400G-XP-LC	8-RX	QSFP-100G-SR4-S	11-TX	ONS-CFP2-WDM	M200G	w/SD-FE...	Rack 1.MD-40 SHELF 1.Slot 1	MD-48-ODD	CHAN-3-RX
OCH-CC		Site2	Rack 1.M15 Chassis 1.Slot 6	400G-XP-LC	10	QSFP-100G-SR4-S			M200G	w/SD-FE...			
Trail_2		Site2	Rack 1.M15 Chassis 1.Slot 6	400G-XP-LC			12	ONS-CFP2-WDM		w/SD-FE			

Rack Layout - site 4

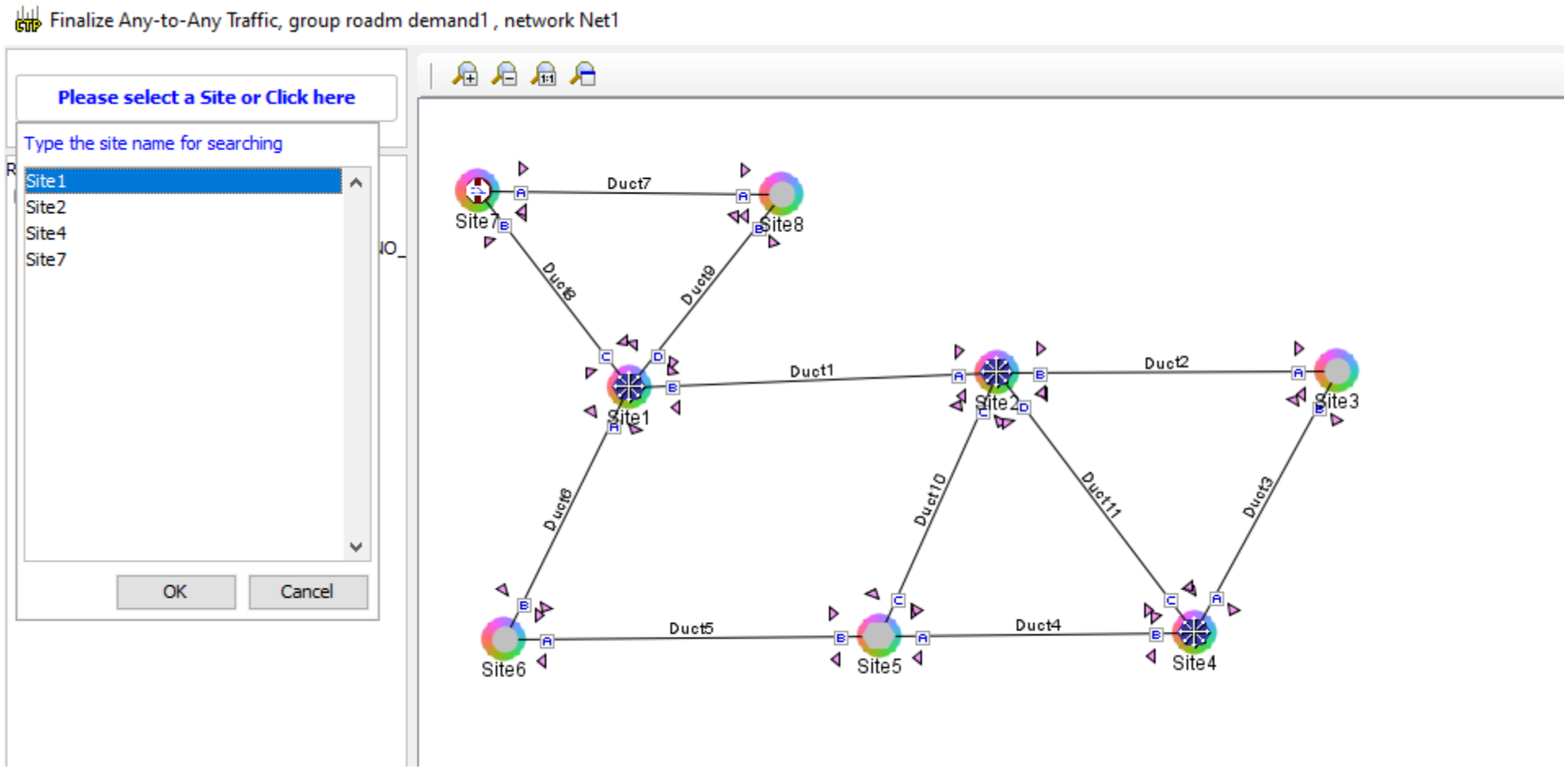


Finalize ROADM Demands



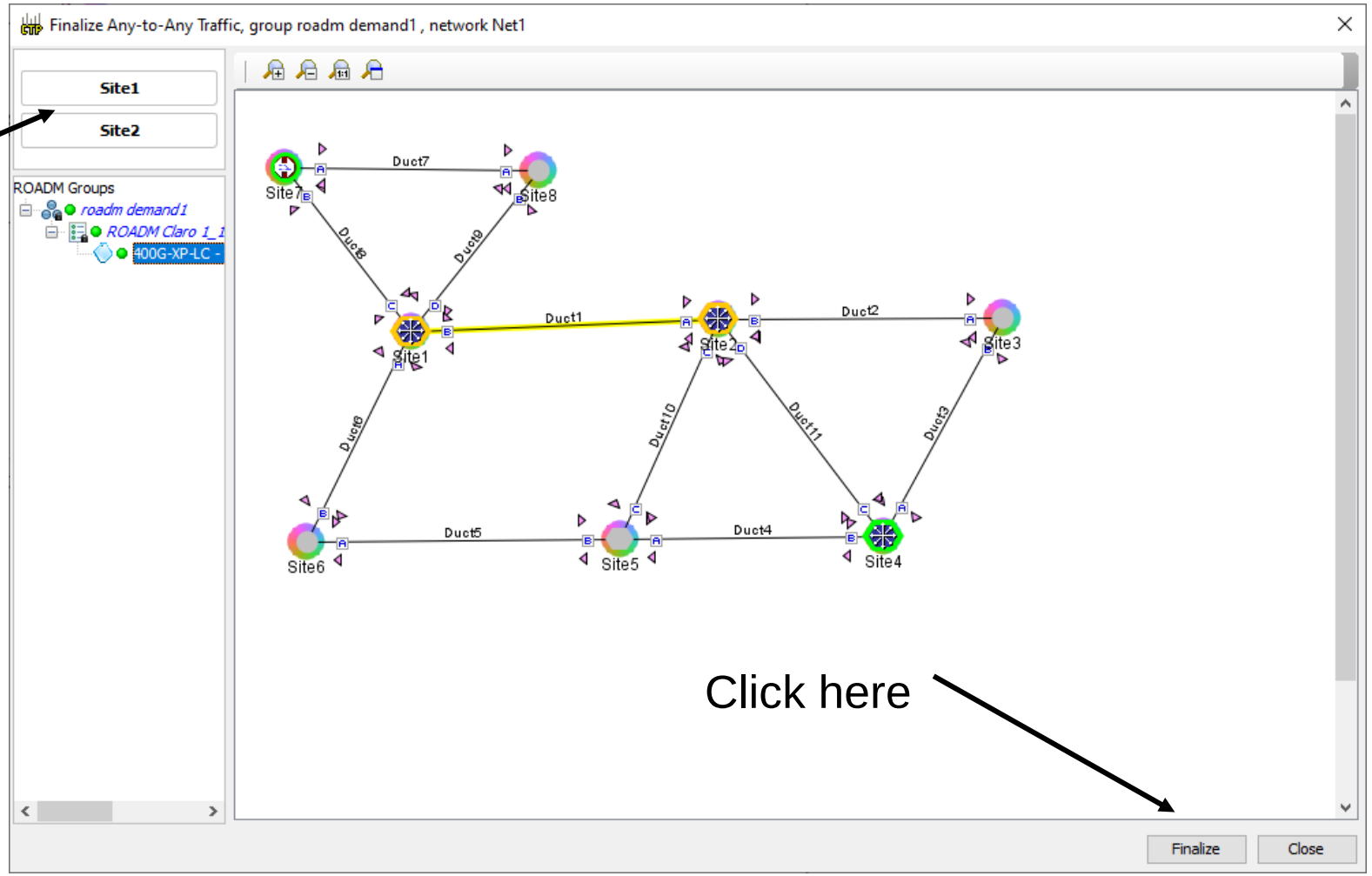
Sites that belong
To the demand are
highighted

Select a Site



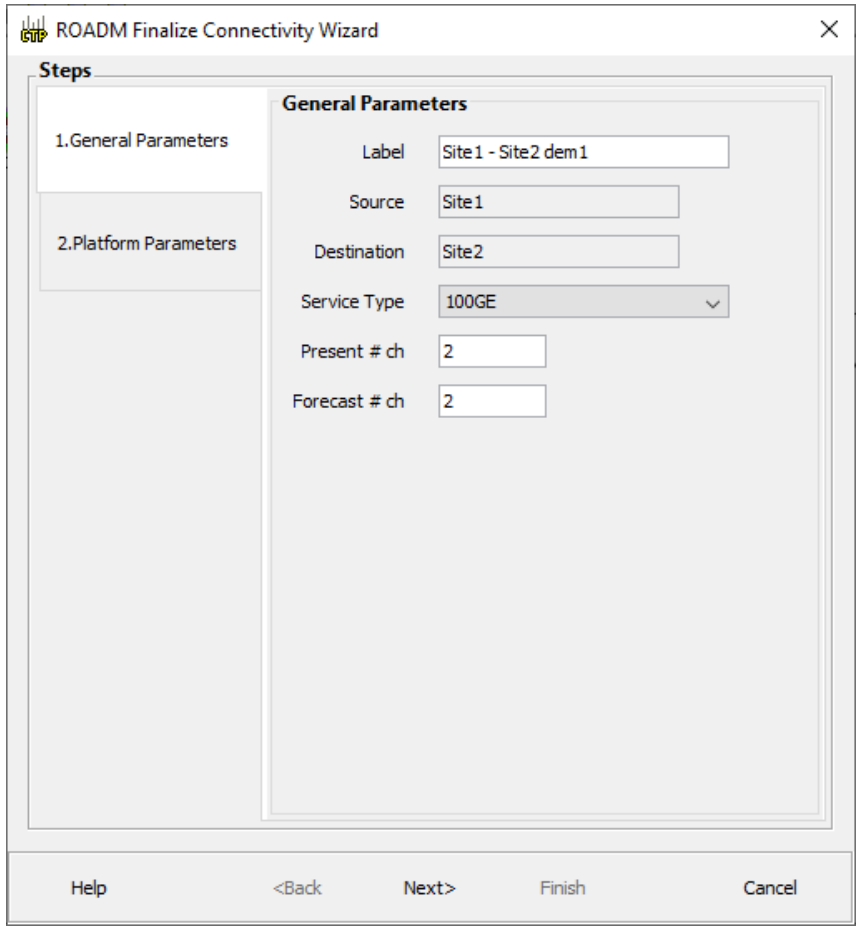
Select a Connectivity

select



Click here

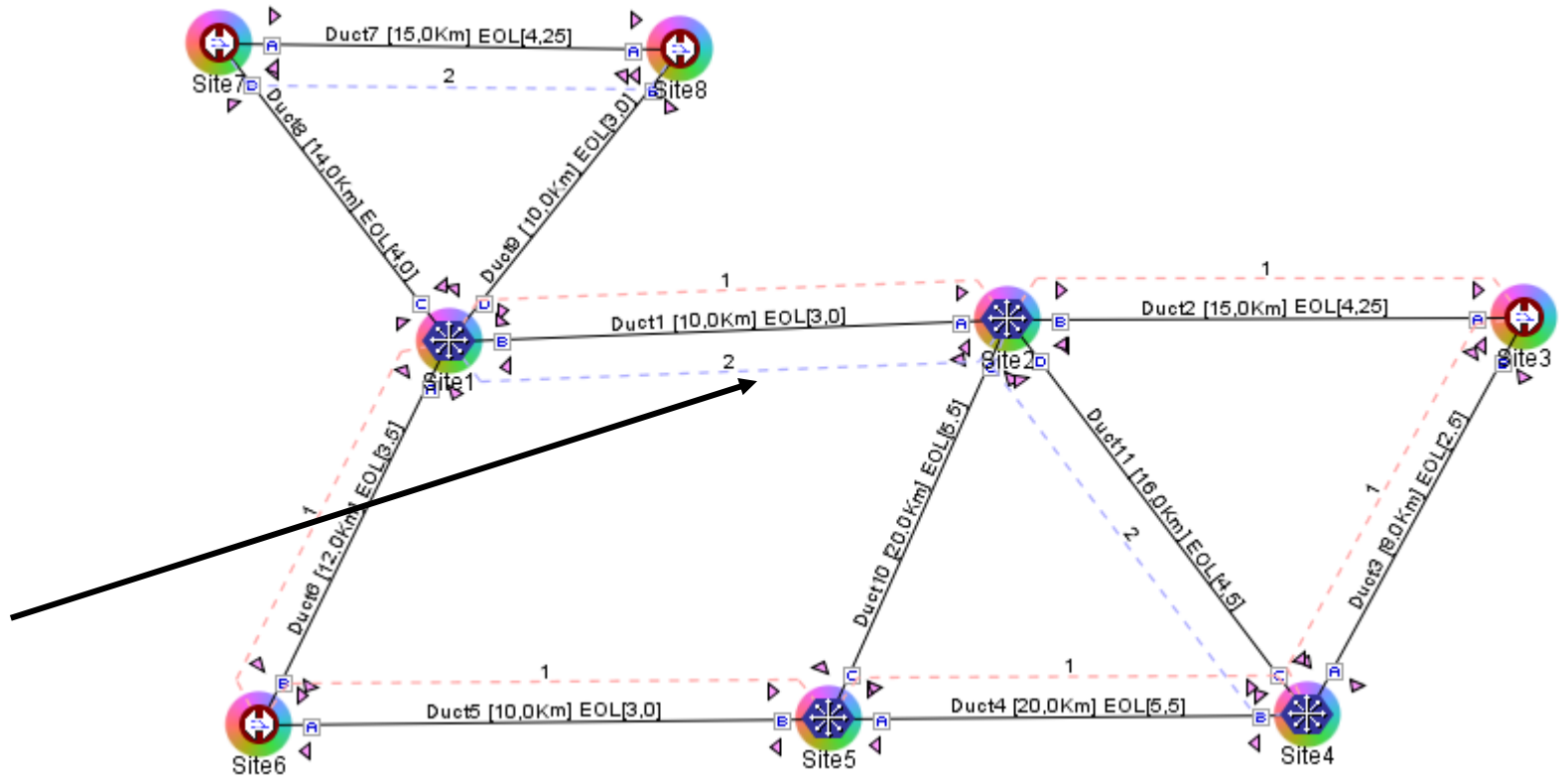
ROADM Finalize



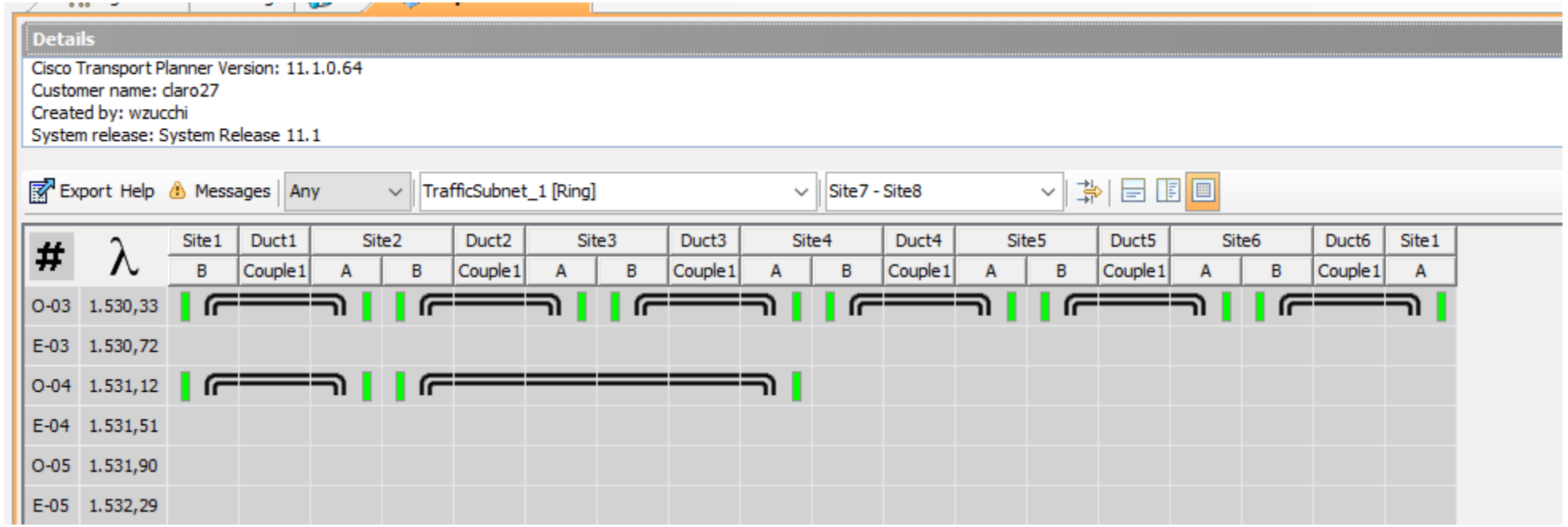
New Services Finalized

Analyze the network again

New service



Wavelength Report with New Service



Example 8

Create a mesh network with 4 multi-degree nodes

Create a ROADM demand between all nodes

Finalize all the demands with 100GE traffic

Between nodes

Examine the configuration generated by CTP

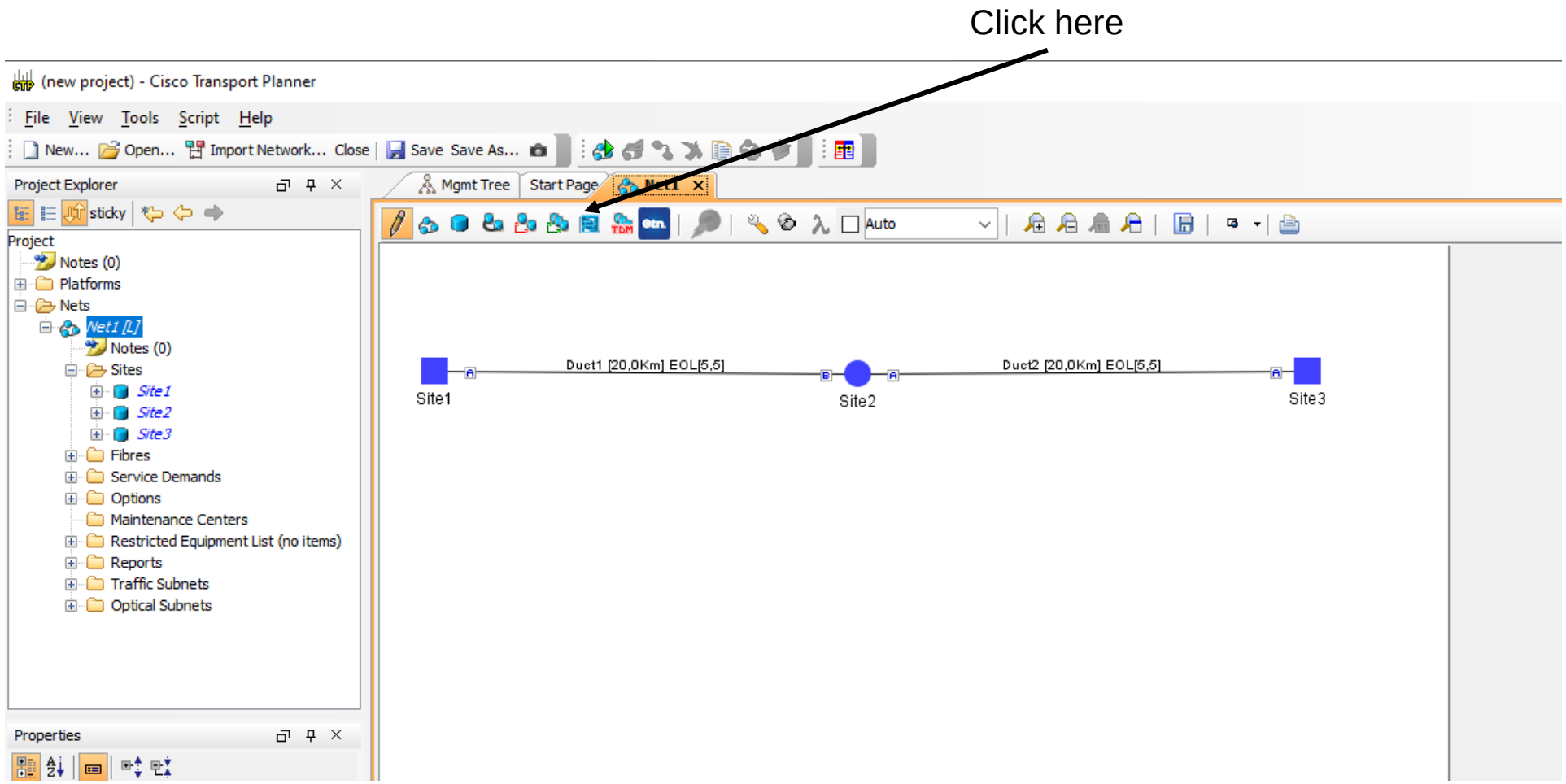
Ethernet Aggregated Demands

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.

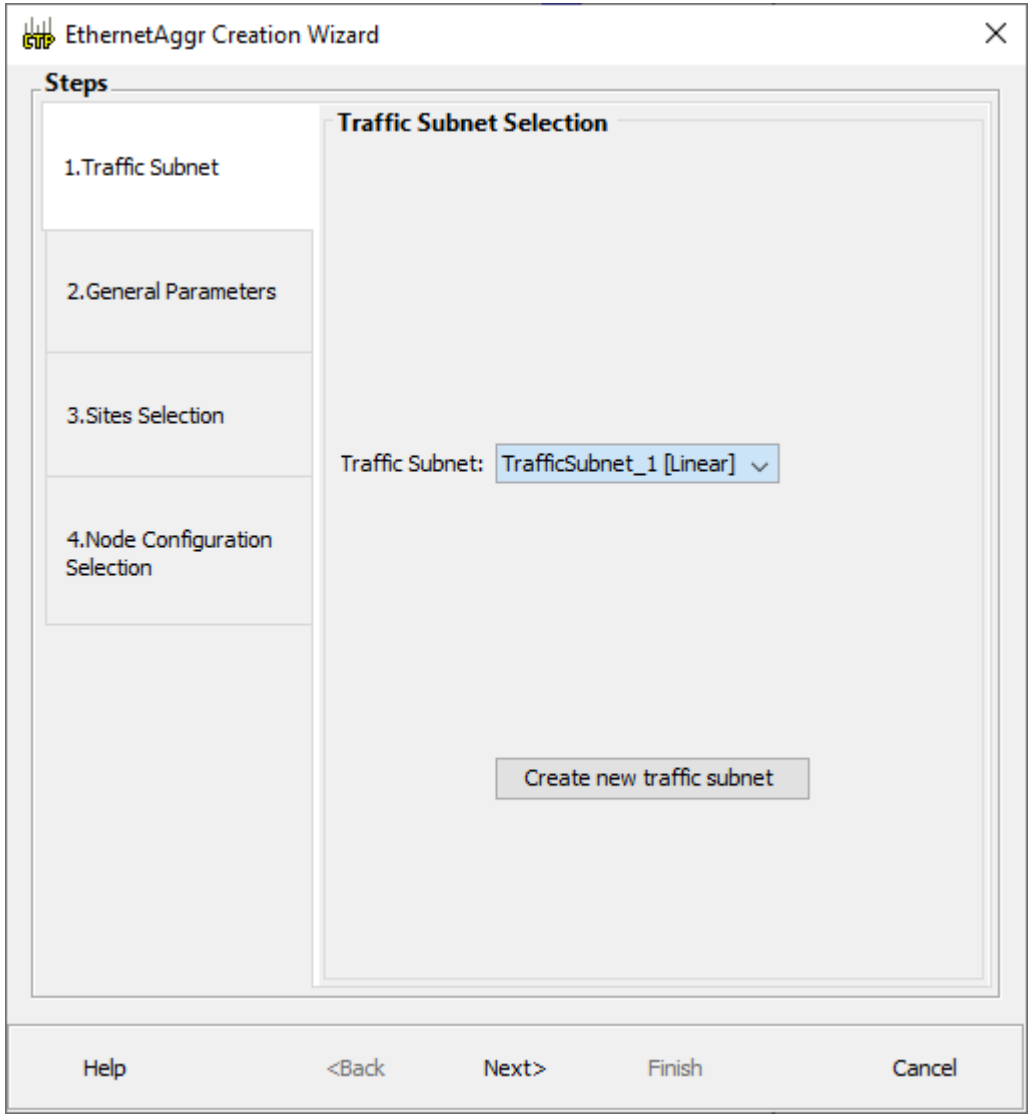
The Ethernet Aggregation Creation wizard allows you to:

- 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.

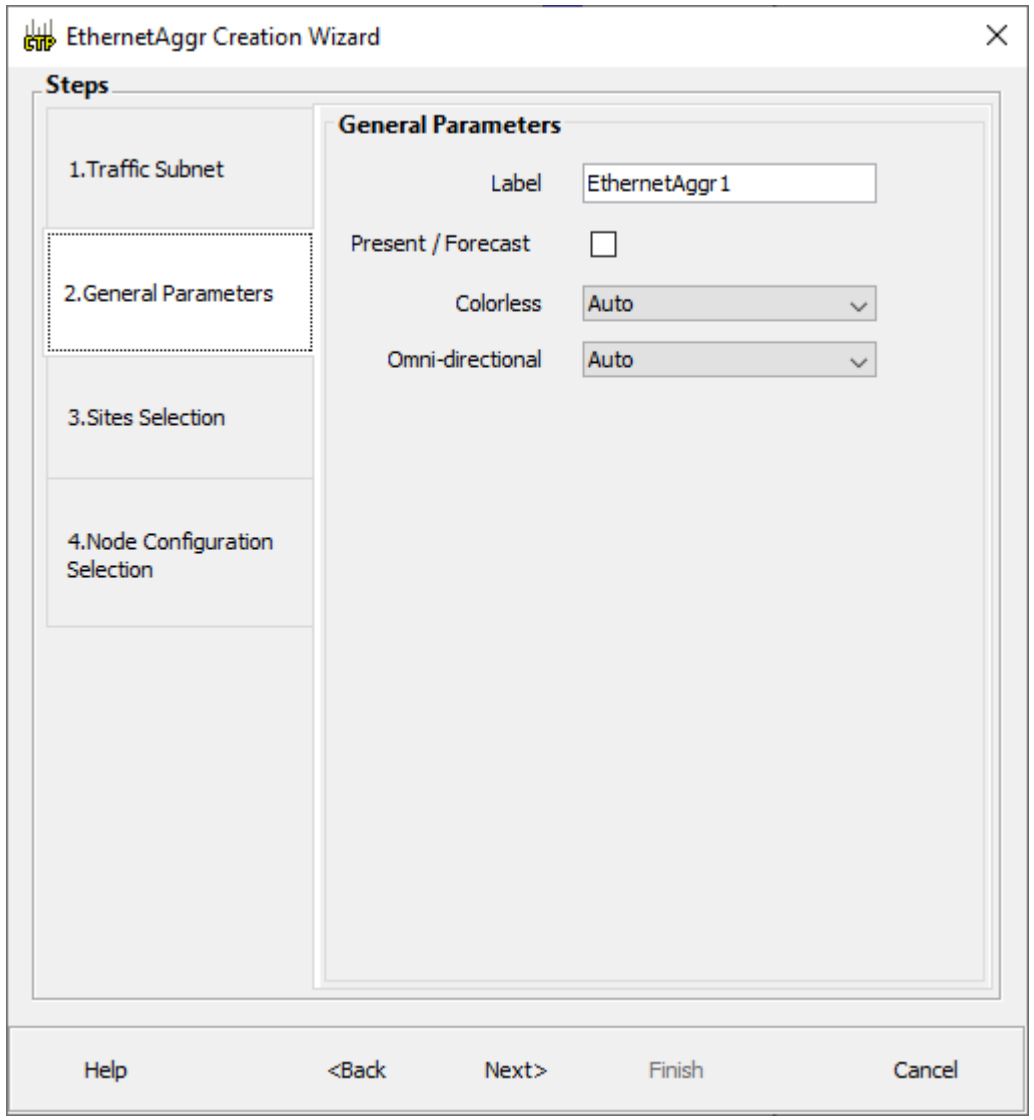
Aggregate Ethernet Example



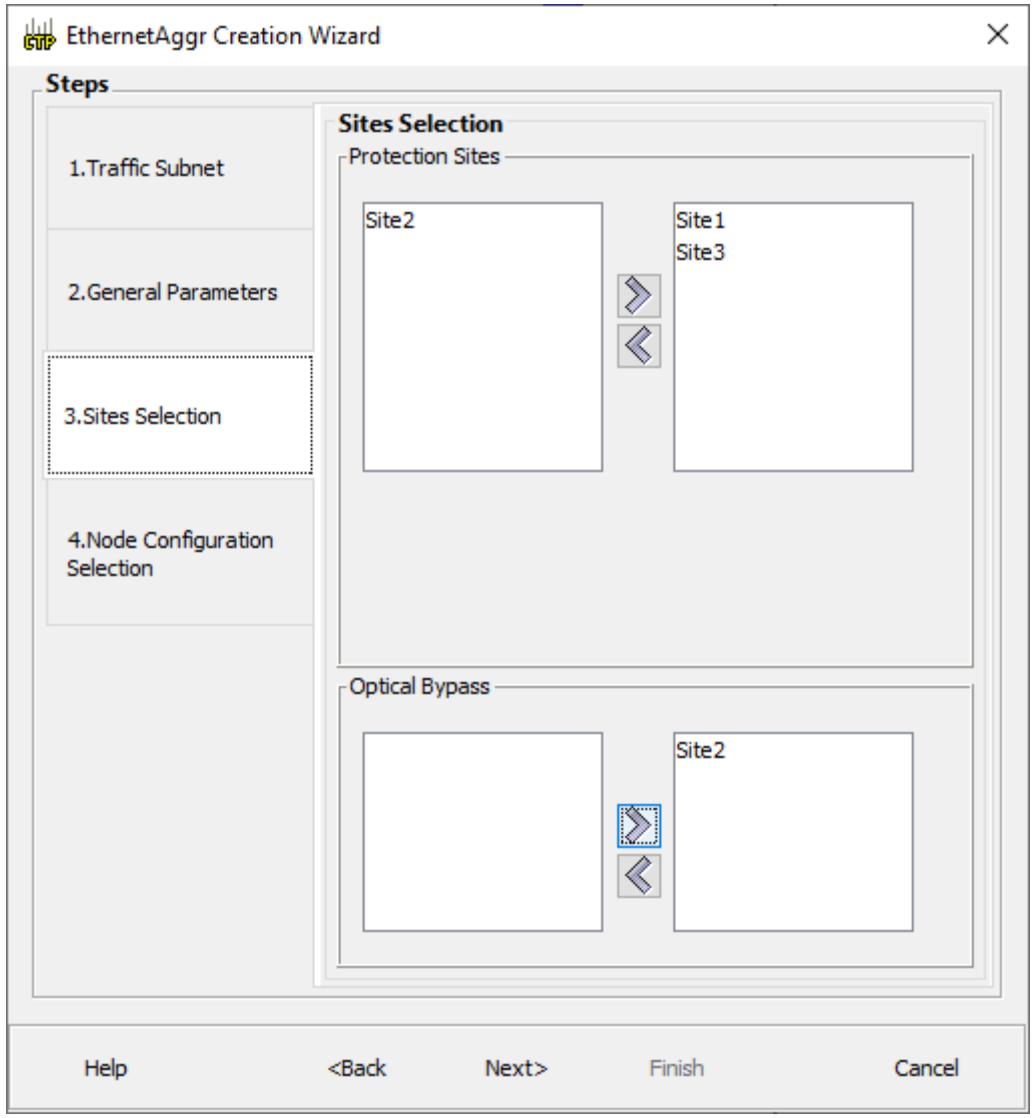
Creation Wizard



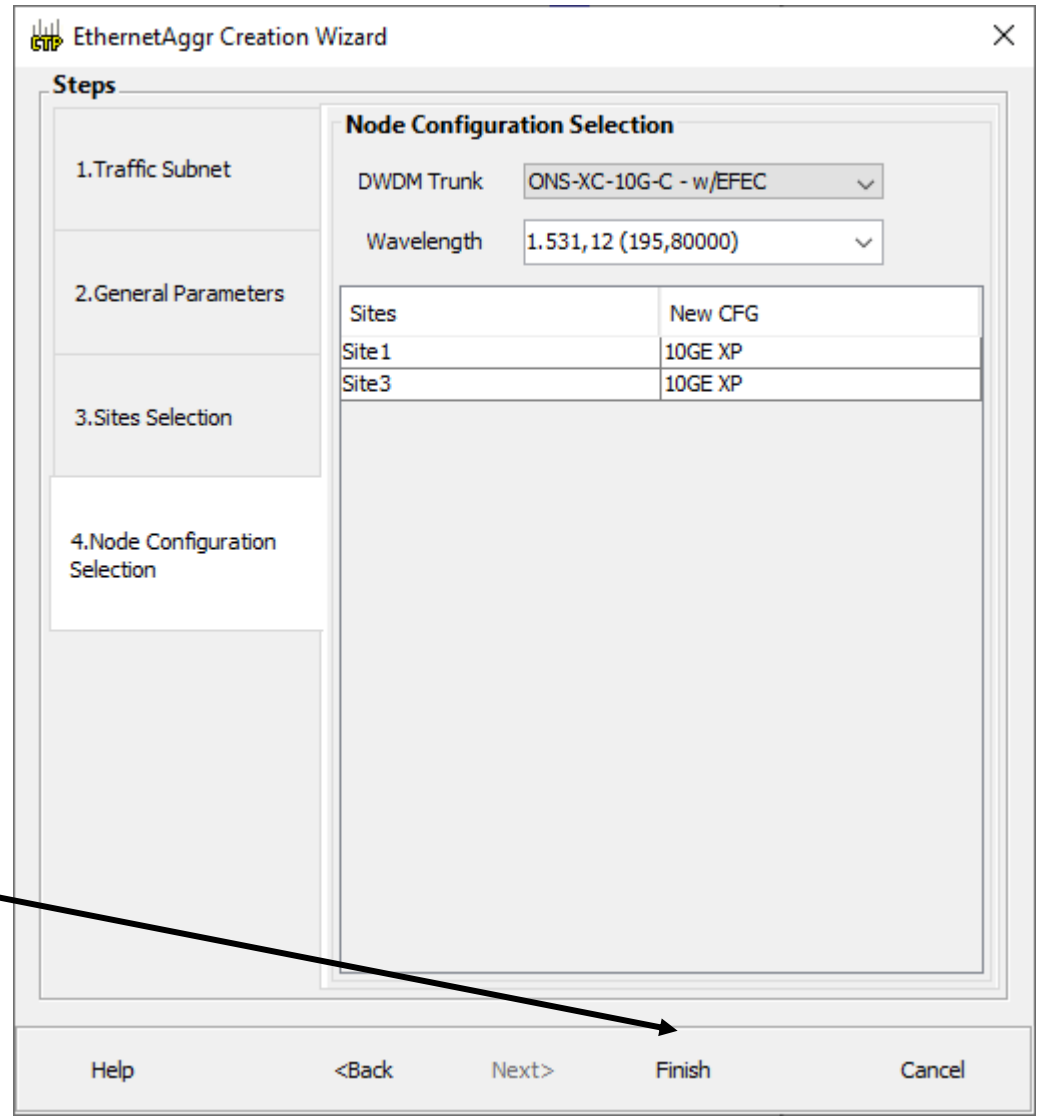
General Parameters



Site Selection

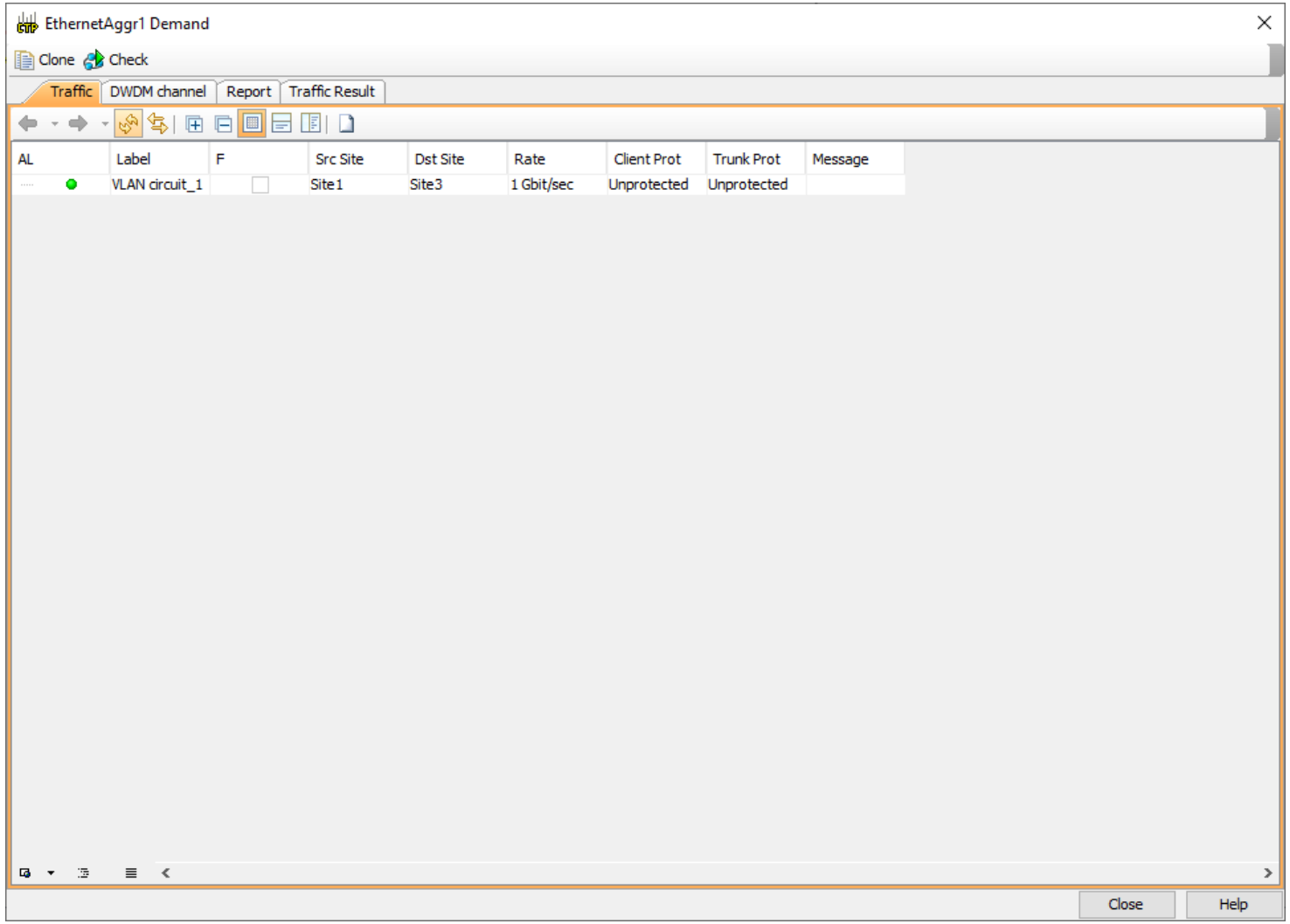


Node Configuration

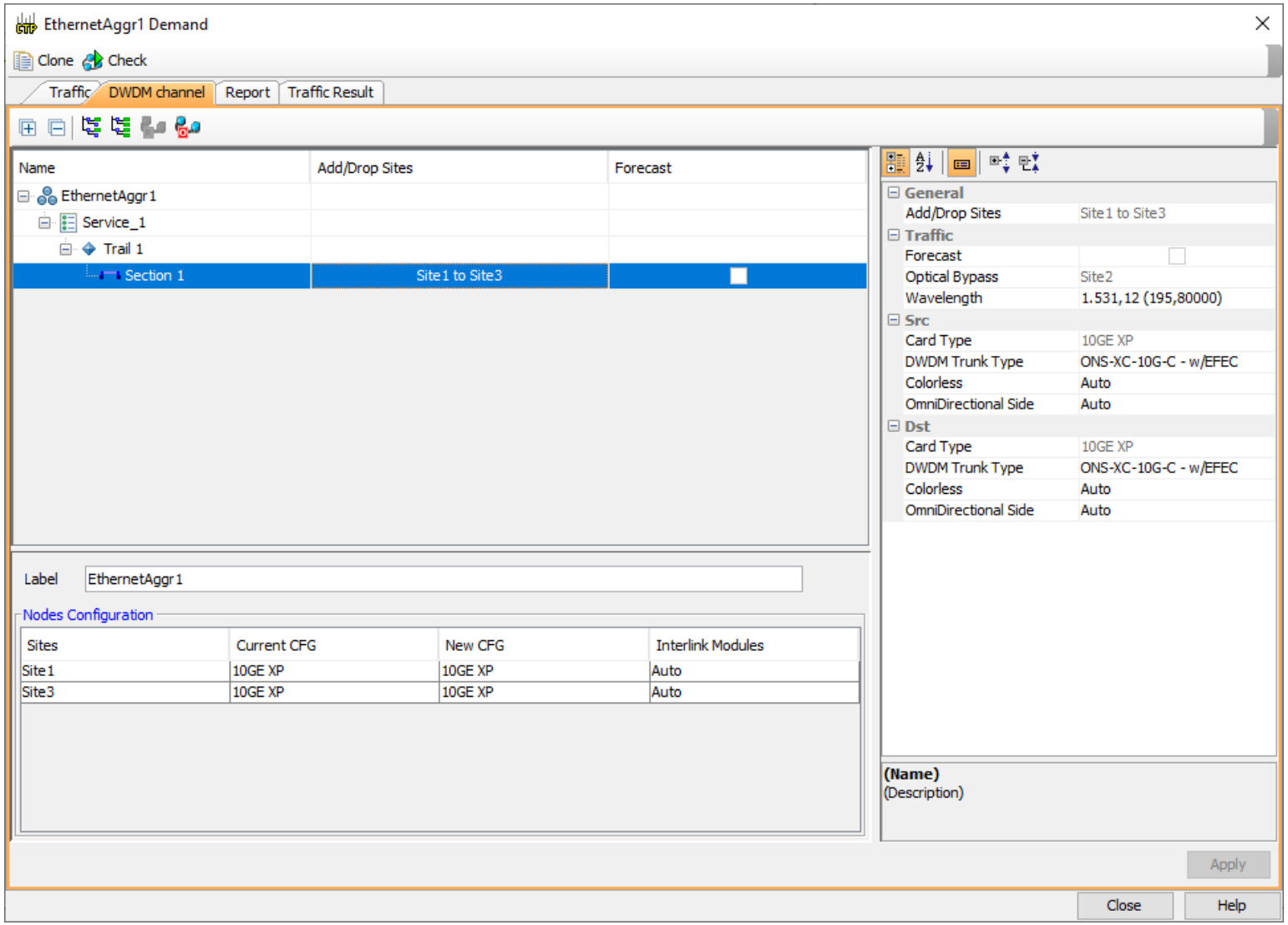


Click here

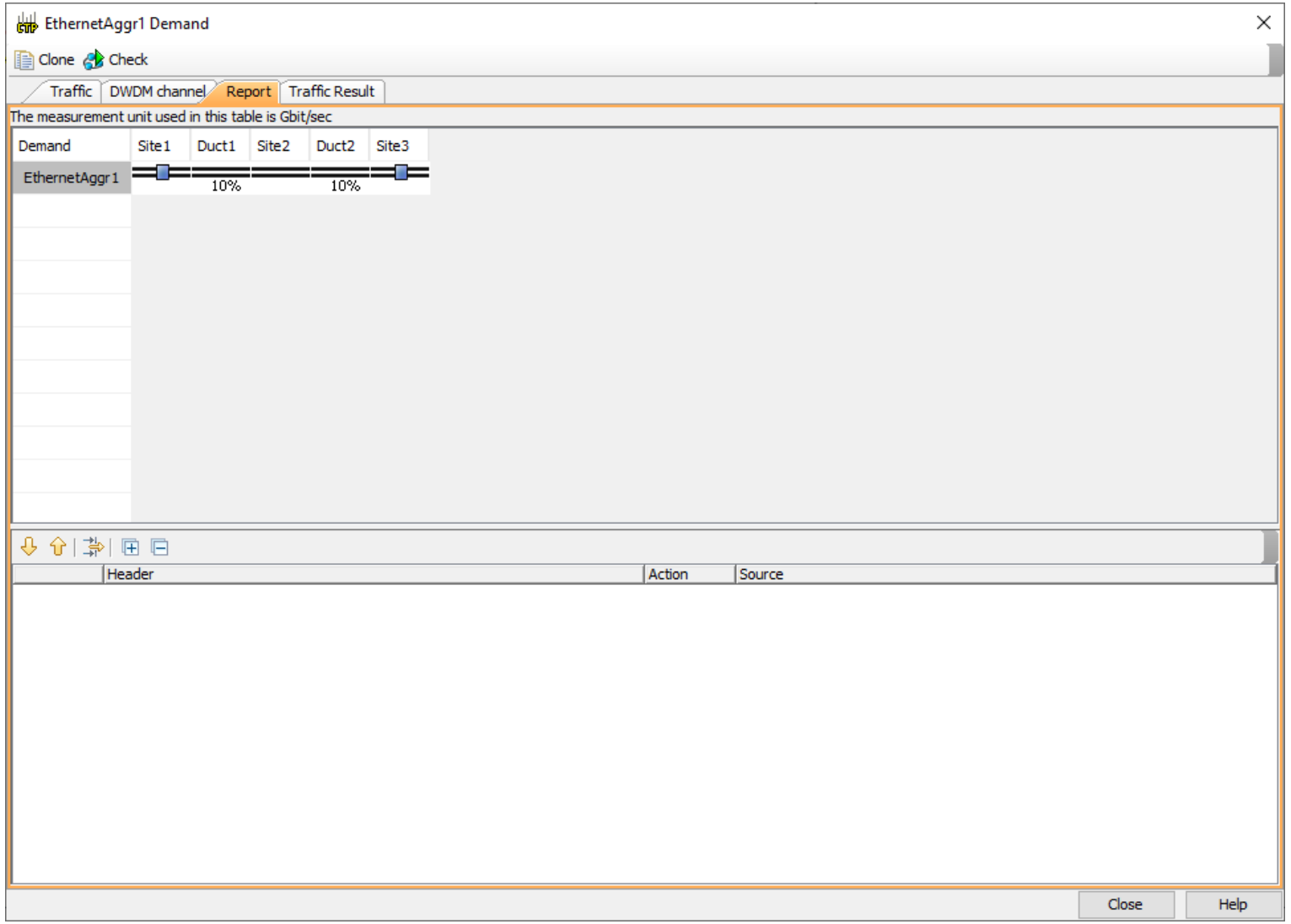
Traffic


EthernetAggr1 Demand
Clone
Check
Traffic
DWDM channel
Report
Traffic Result
AL
Label
F
Src Site
Dst Site
Rate
Client Prot
Trunk Prot
Message
VLAN circuit_1
Site1
Site3
1 Gbit/sec
Unprotected
Unprotected
Close
Help

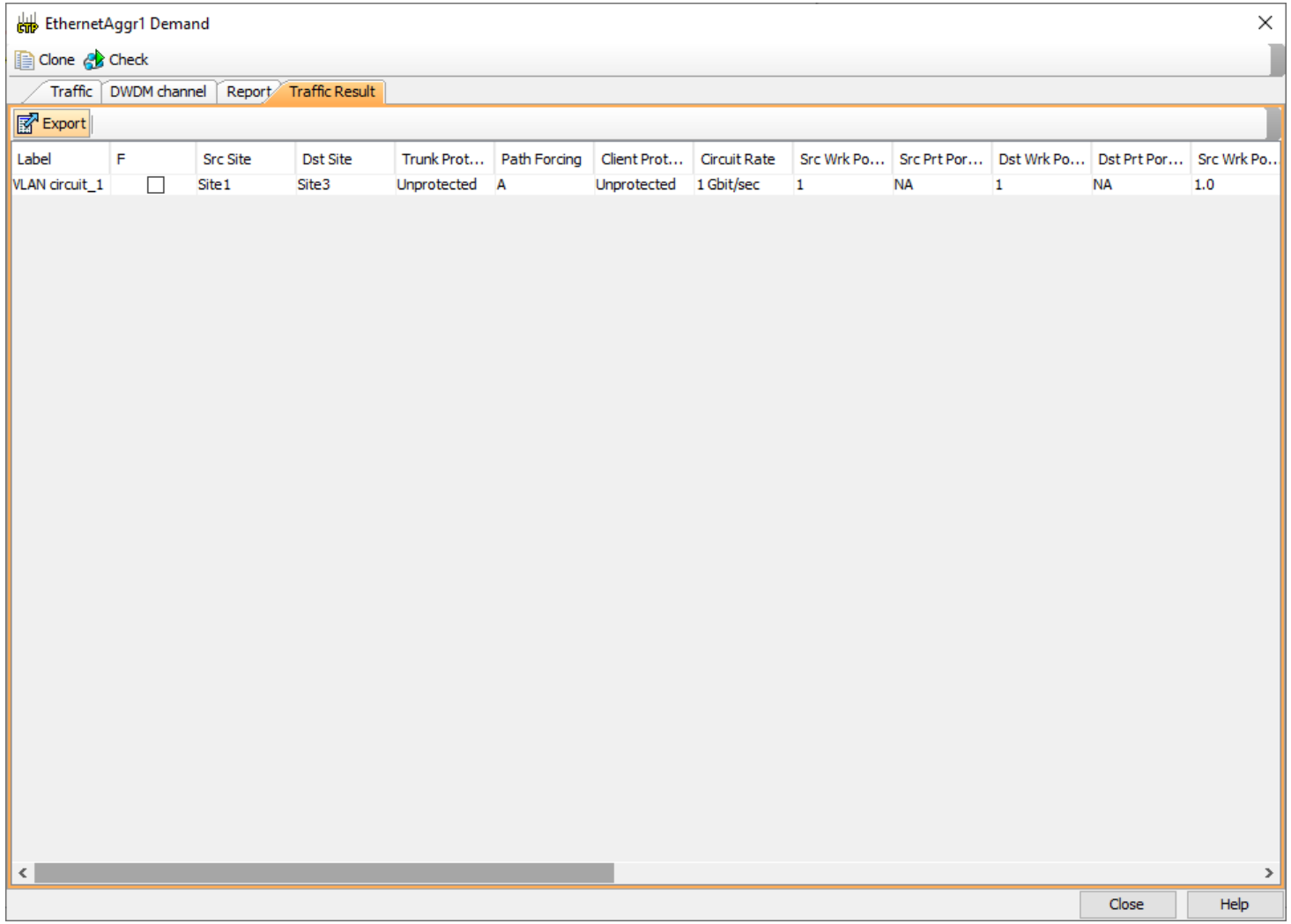
DWDM Channel



Report


EthernetAggr1 Demand
Clone
Check
Traffic
DWDM channel
Report
Traffic Result
The measurement unit used in this table is Gbit/sec
Demand
Site1
Duct1
Site2
Duct2
Site3
EthernetAggr1
10%
10%
Header
Action
Source
Close
Help

Traffic Result



Example 9

Create a point-to-point network with 3 nodes

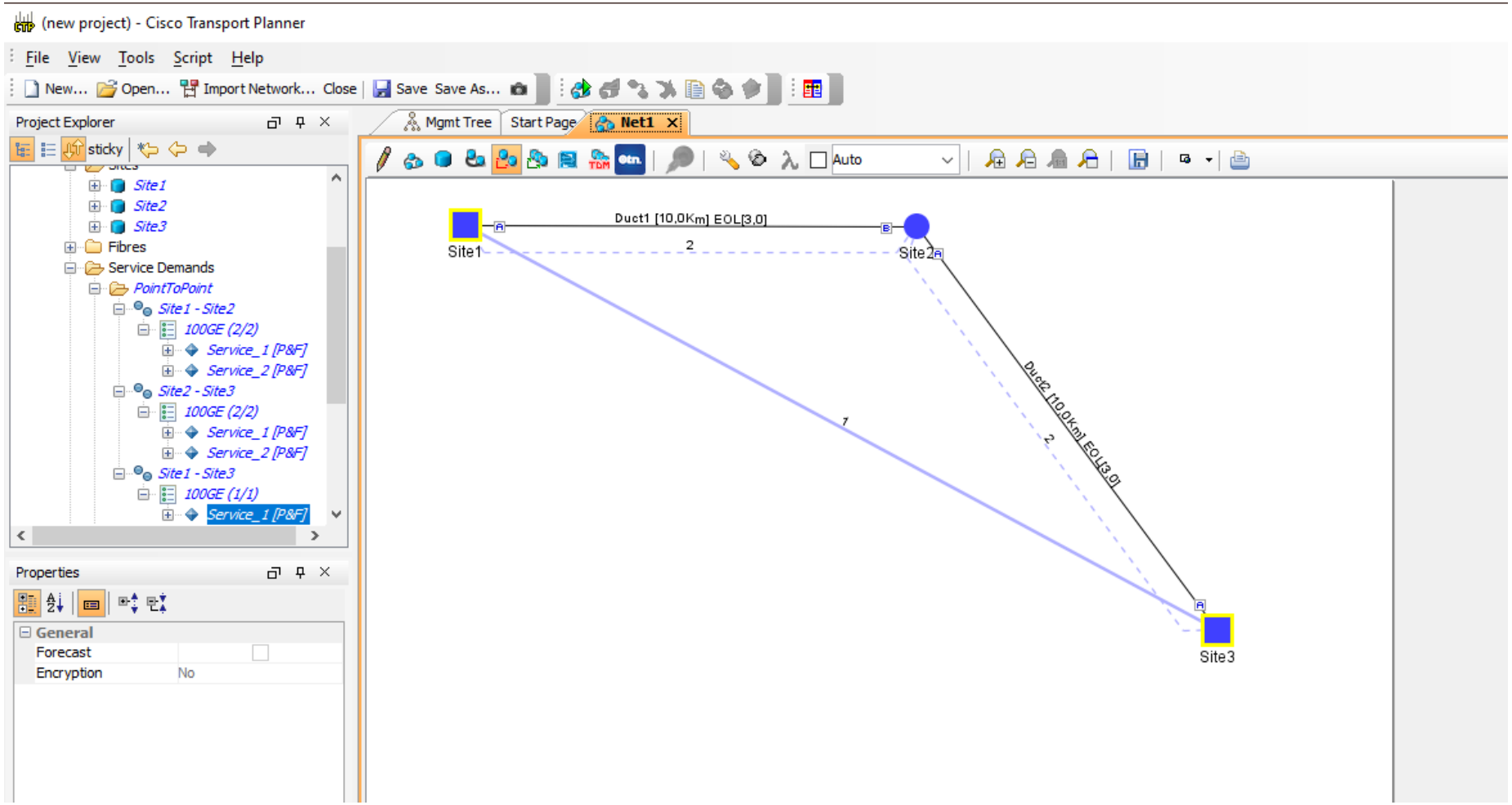
Create a ethernet aggregated demand between the sites. Which cards can be used?

Identify the VLAN number used by each demand

Examine the layout of each site

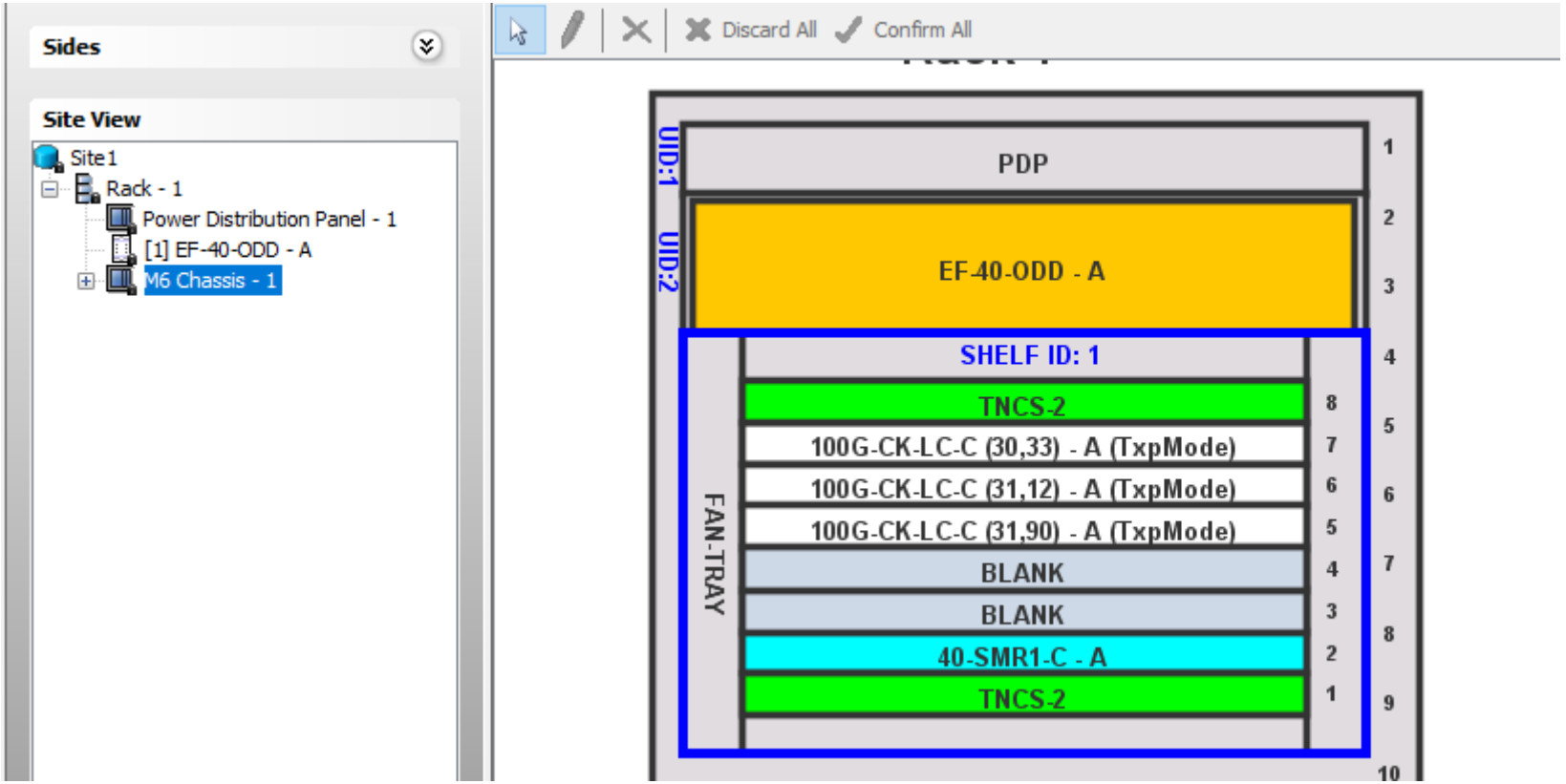
Comparing Node Types

Rede Linear -MSTP 15454 100G 40 channel non hybrid

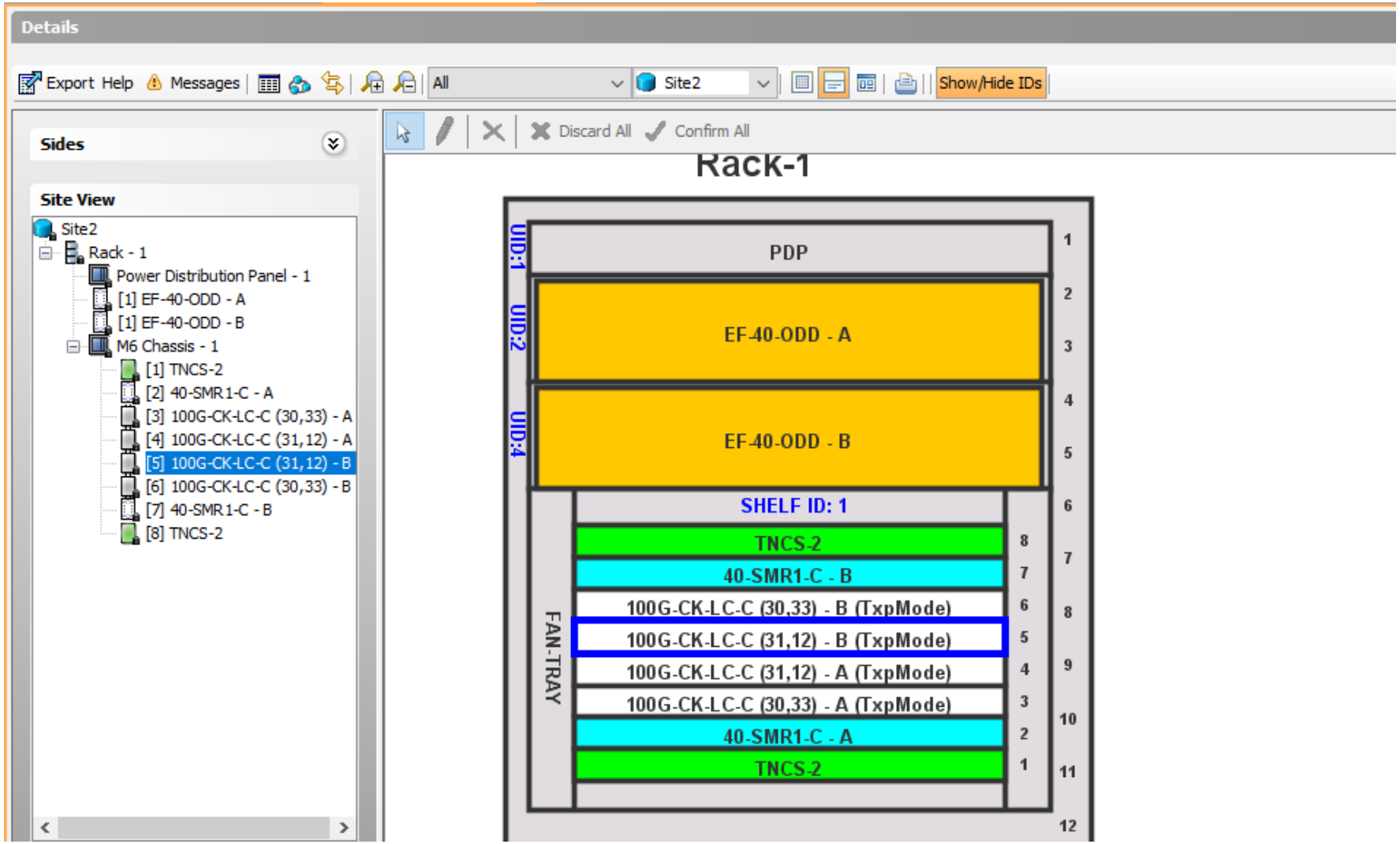


Transceiver: 100GK-LC-C

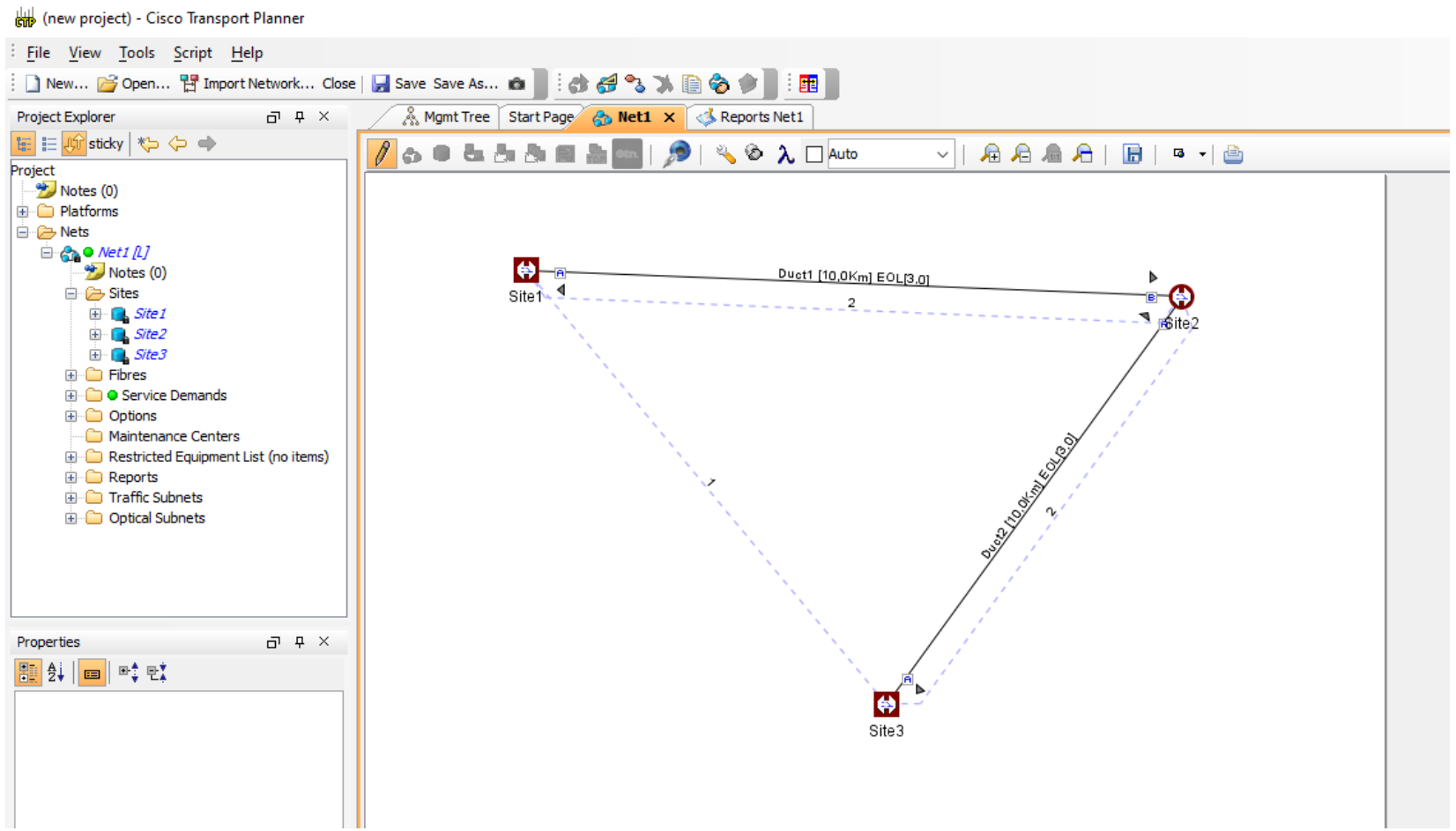
Rede Linear -MSTP 15454 100G 40 channel non hybrid



Rede Linear -MSTP 15454 100G 40 channel non hybrid

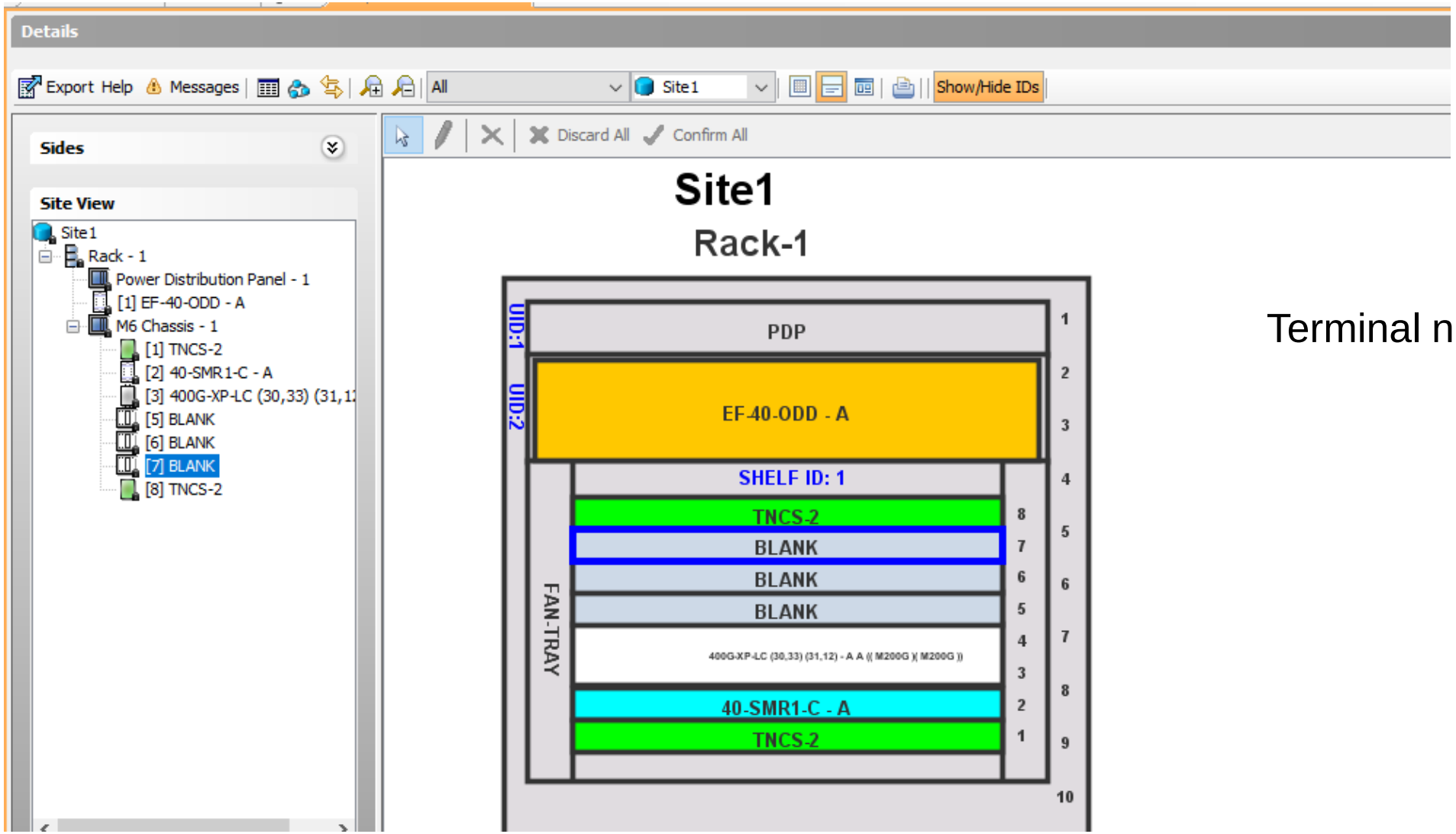


Rede Linear -MSTP 15454 100G 40 channel non hybrid



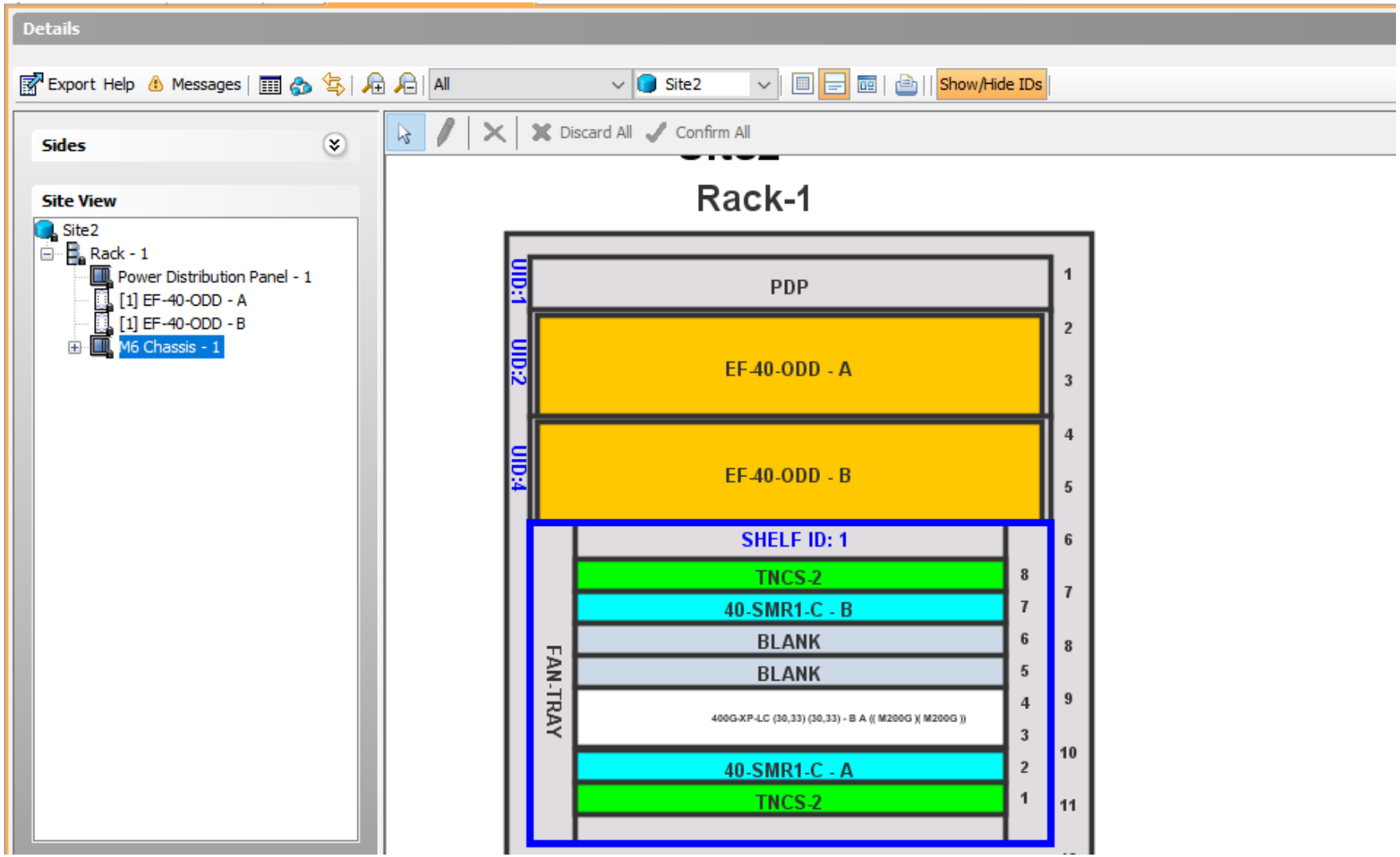
Transceiver free

Rede Linear -MSTP 15454 100G 40 channel non hybrid



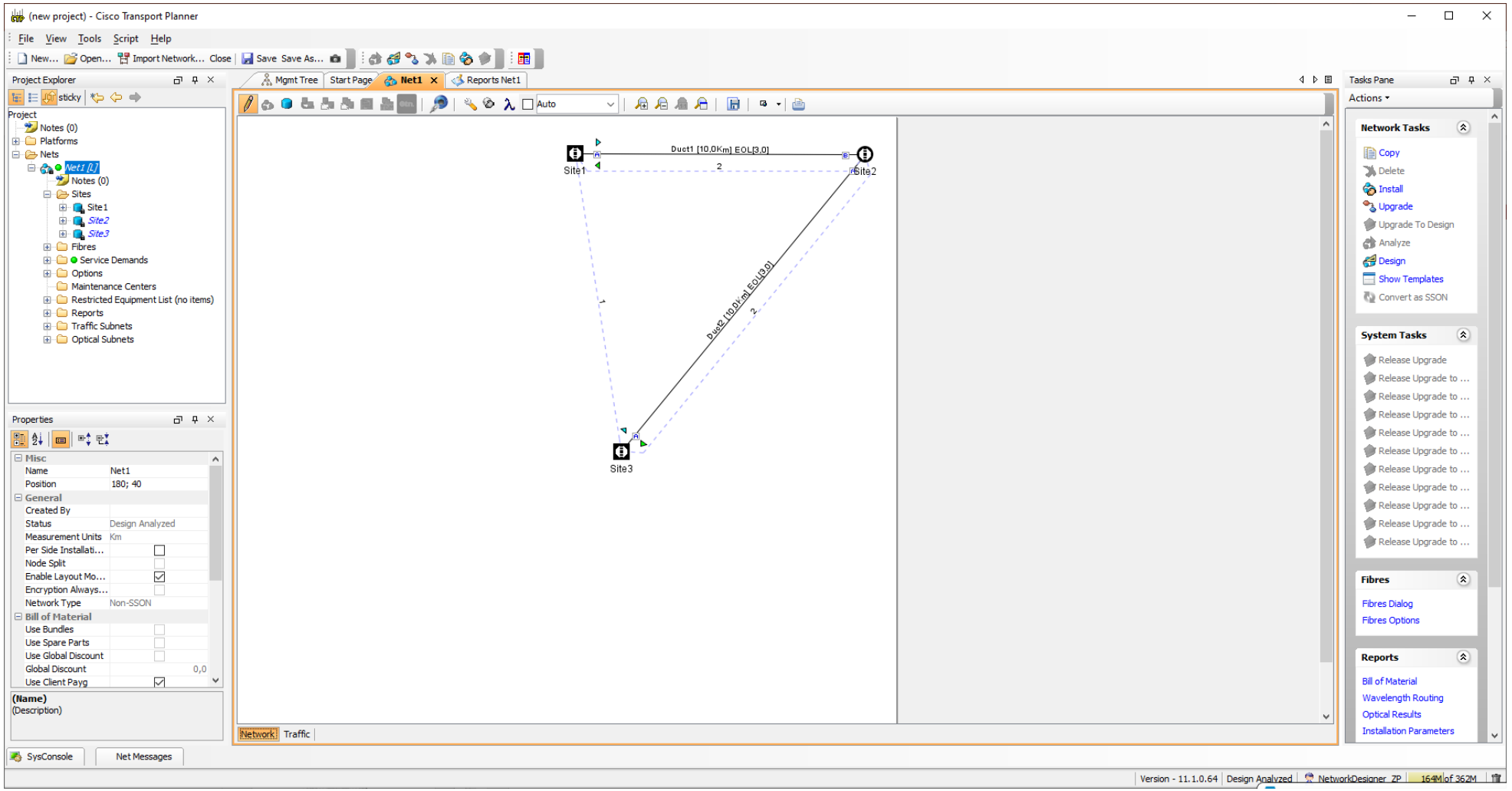
Terminal node

Rede Linear -MSTP 15454 100G 40 channel non hybrid

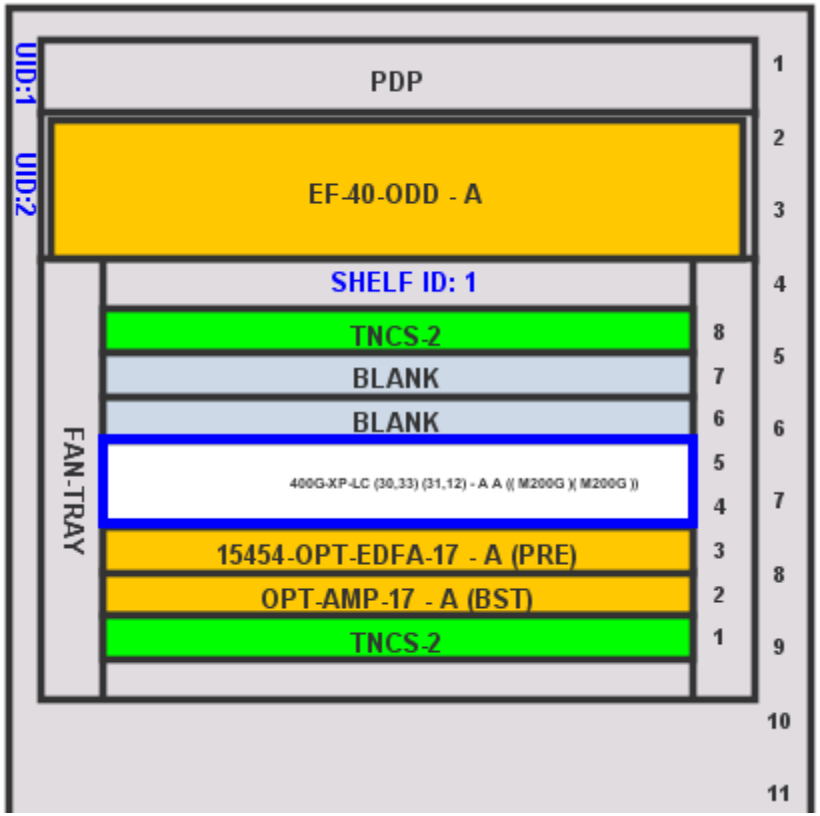


Line Node

Rede Linear -MSTP 15454 100G 40 channel hybrid

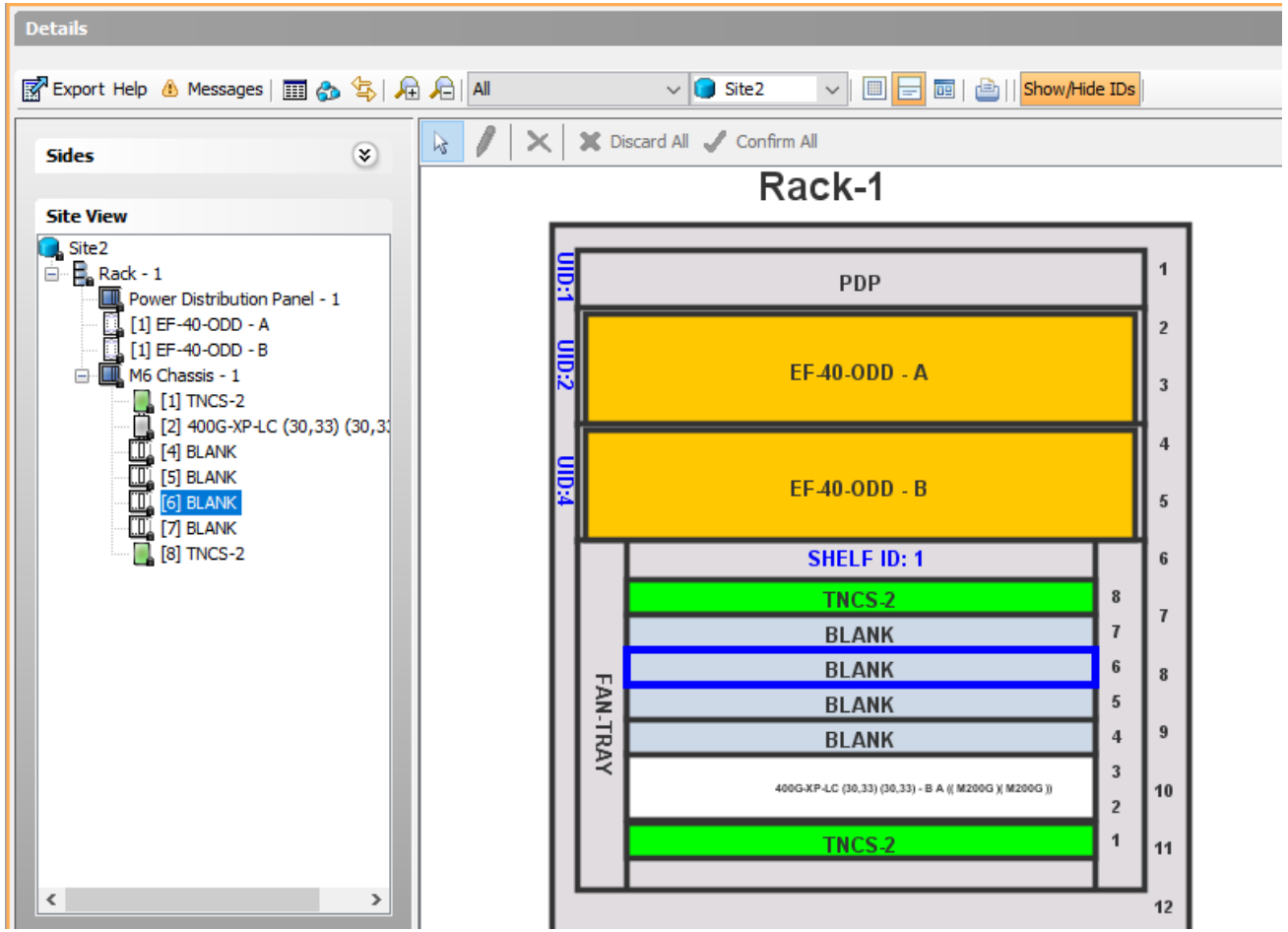


Rede Linear -MSTP 15454 100G 40 channel hybrid



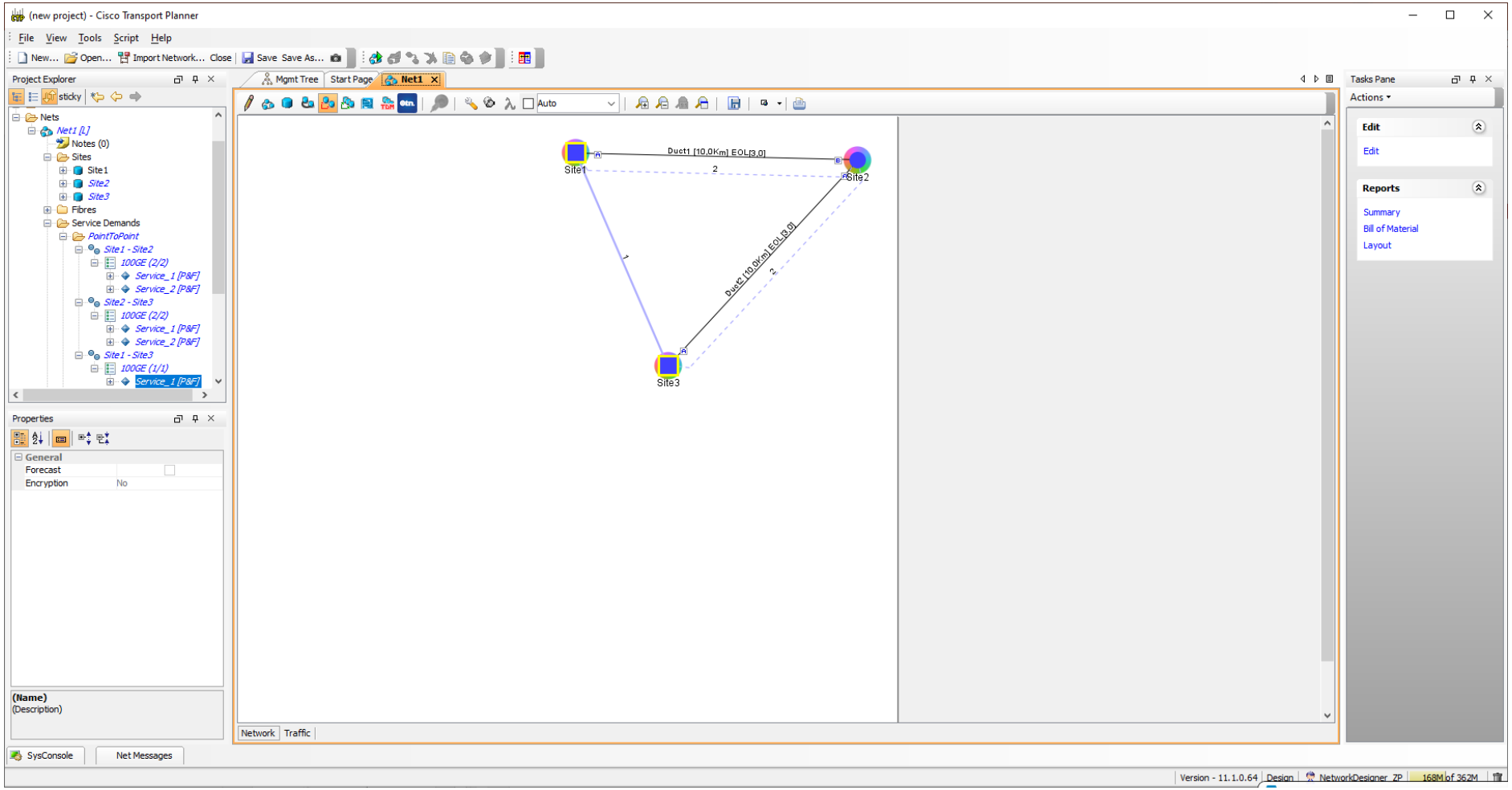
Terminal node

Rede Linear -MSTP 15454 100G 40 channel hybrid

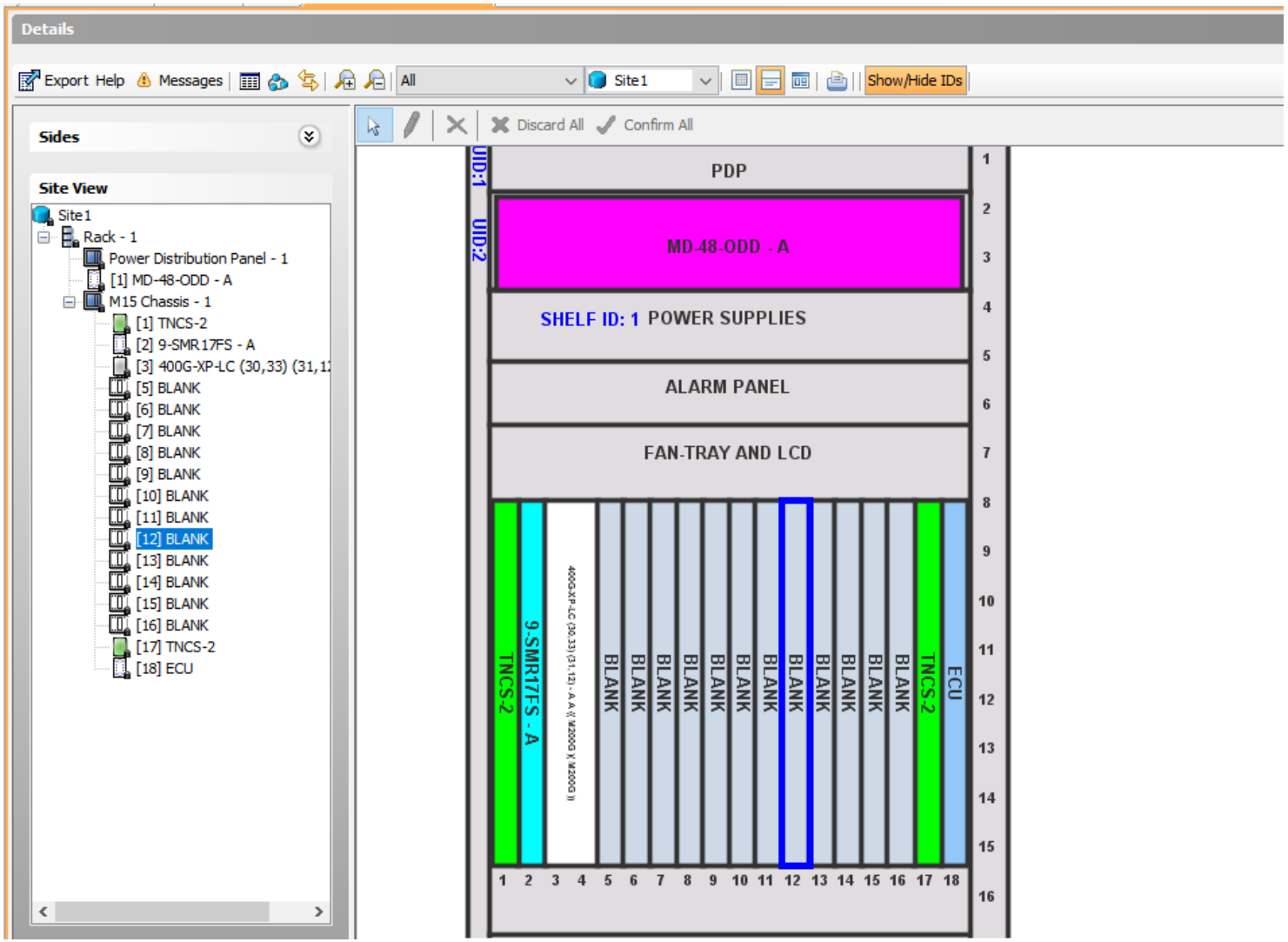


Line Node

Rede Linear - Flex Spectrum 100G 40 channel



Rede Linear - Flex Spectrum 100G 40 channel

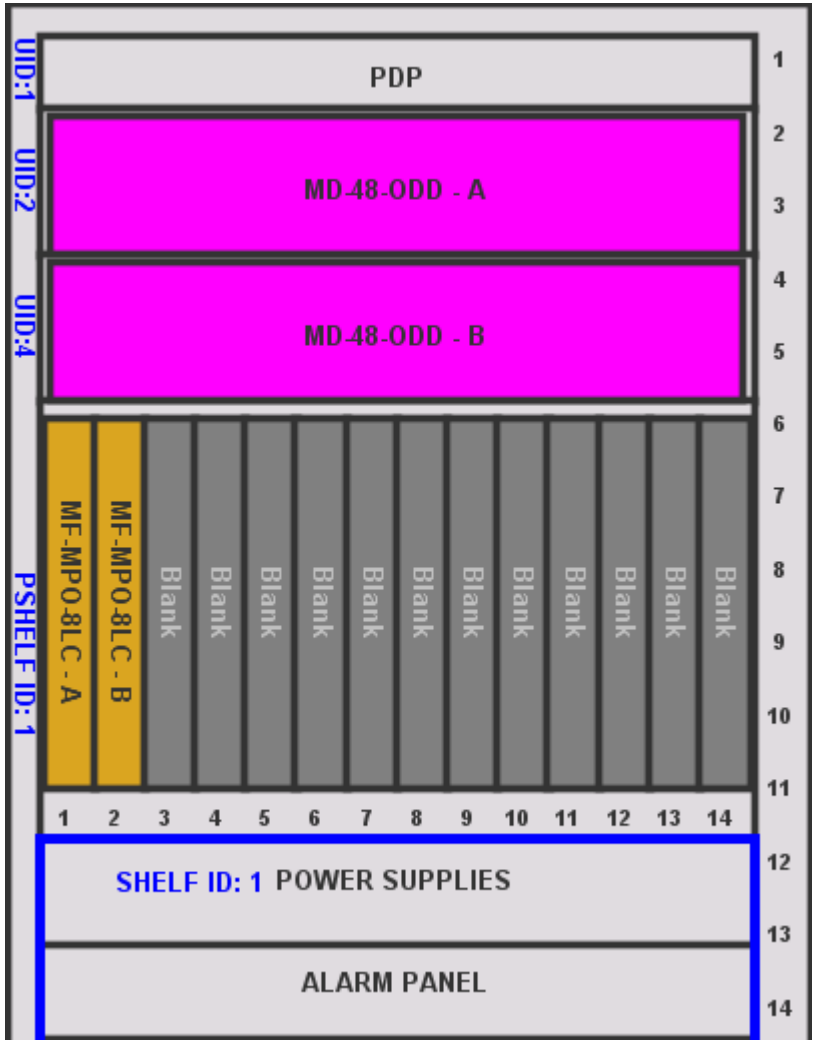


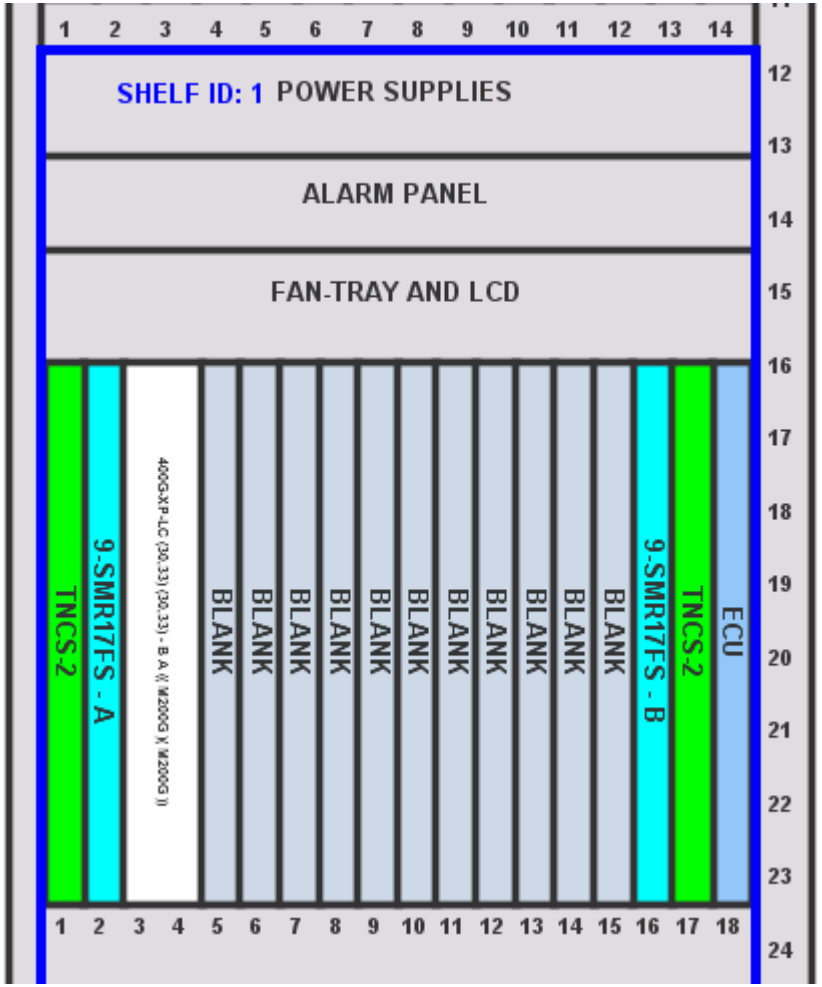
Terminal node

Example 10

Design the same network with legacy, hibrid and Flex Spectrum configuration and compare the results

Rede Linear - Flex Spectrum 100G 40 channel





Line node

OTDR

Optical Time Domain Reflectometry is used to provide information about basic characteristic of the Optical fiber among Optical nodes, like Insertion Loss and concentrate point of reflection.

OTDRs are widely used for detecting fiber anomalies, such as fiber-to-fiber connection losses and reflectance. They can be fusion splices, butt joints and connectors. Typically an OTDR instrument transmits a pulse along an optical fiber (the Pulse method). A portion of the light of the pulse is returned toward the transmitter from each point along the optical fiber. Such returns are produced both from the natural light backscattering (Rayleigh Scattering), and from localized Fresnel reflection from fiber-to-fiber connections.

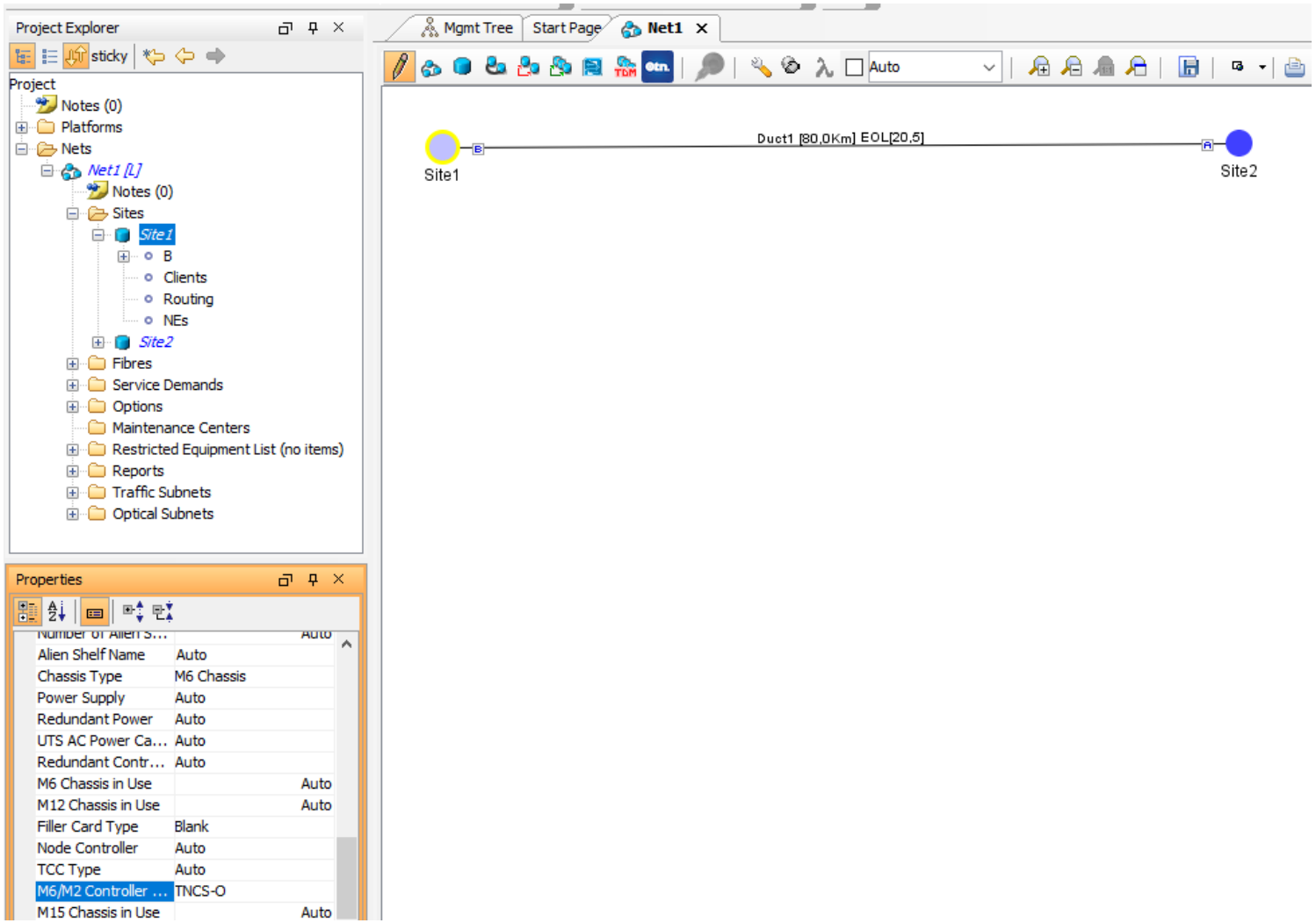
By measuring the amount of light returned back at a given delay from pulse injection into the fiber, and comparing this light pulse with the original probe signal injected into the fiber, it is possible to detect many fiber characteristics and anomalies, such as fiber Insertion Loss (dB/km) and fiber-to-fiber Connections Loss and Reflection Loss (dB).

OTDR & TNCS-O

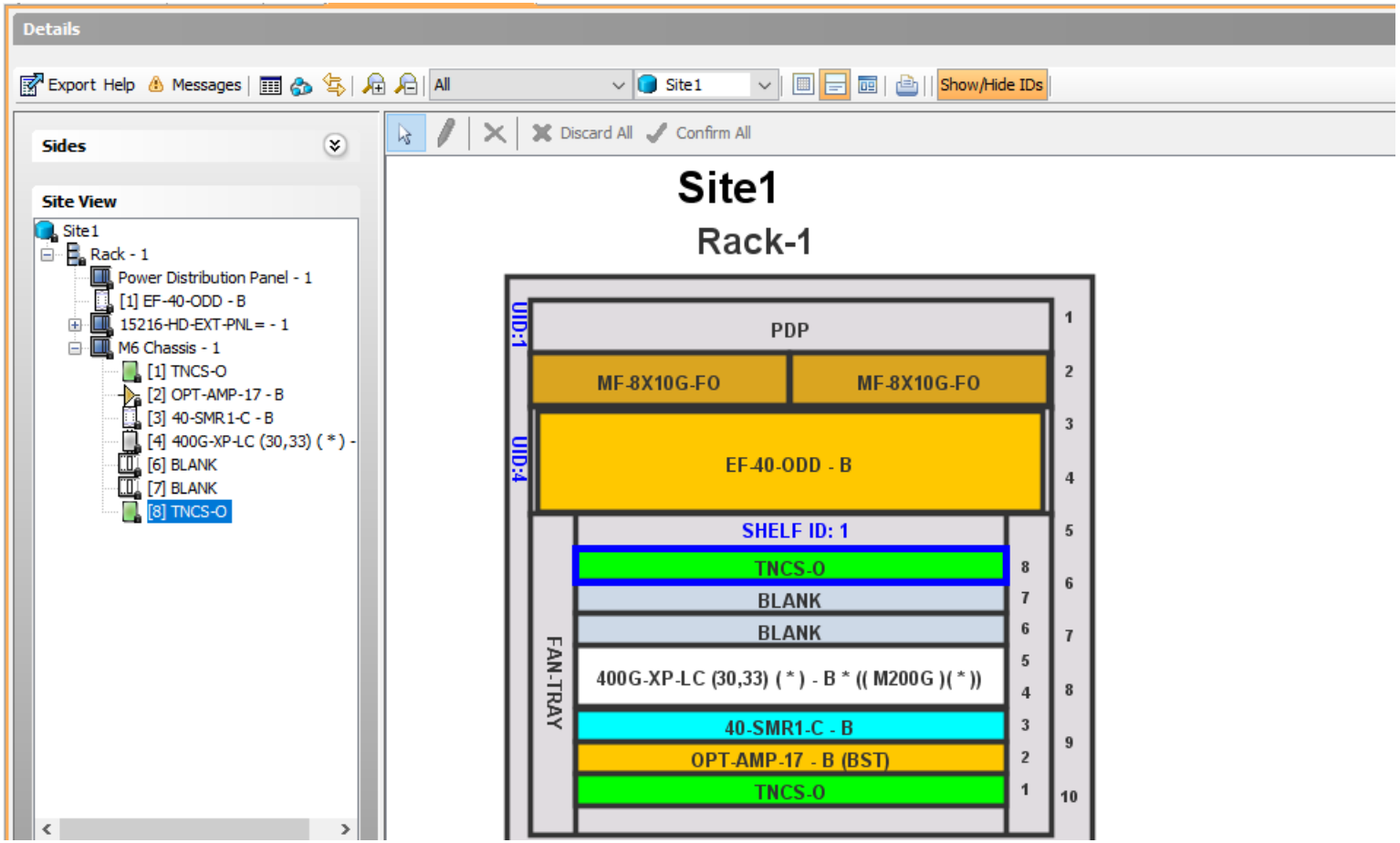
Pulse OTDR, however, requires laser pulses with relatively high peak power, which do not fit very well with the objective of integrating OTDR capabilities into TNCS-O. For this reason a different measurement strategy has been selected, the correlation method.

In the correlation method, a Pseudo Noise Bit Sequence is transmitted in the fiber instead of just an optical pulse. The reflected light is sampled against time and mathematically correlated with the original probe sequence. Similar to the Pulse method, the correlation of transmitted and received signals at a given time delay provides information about losses and reflections. The correlation method allows for better noise filtering, providing a significant noise advantage respect to pulse method (12 dB measured). Also, since pulse probe energy spreads along a bit stream, this method better adapts to the typical lasers used in pluggable interfaces, which can provide lower TX Power. OTDR signals operate at 1518nm offering bi-directional operations, allowing so Tests both fibers and both directions of the fiber with a single device.

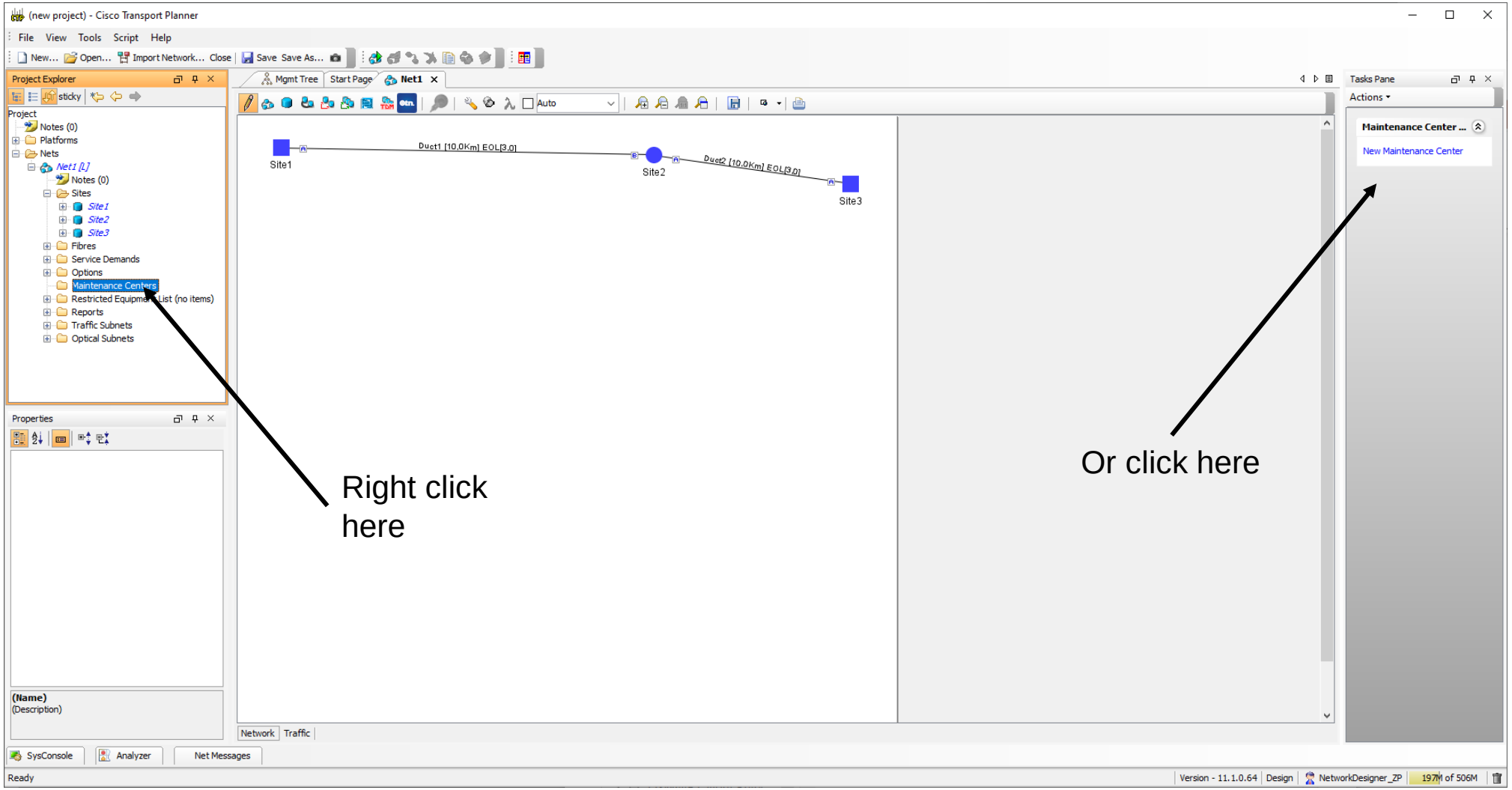
Configuring TNCS-O



Point-to-point with OTDR



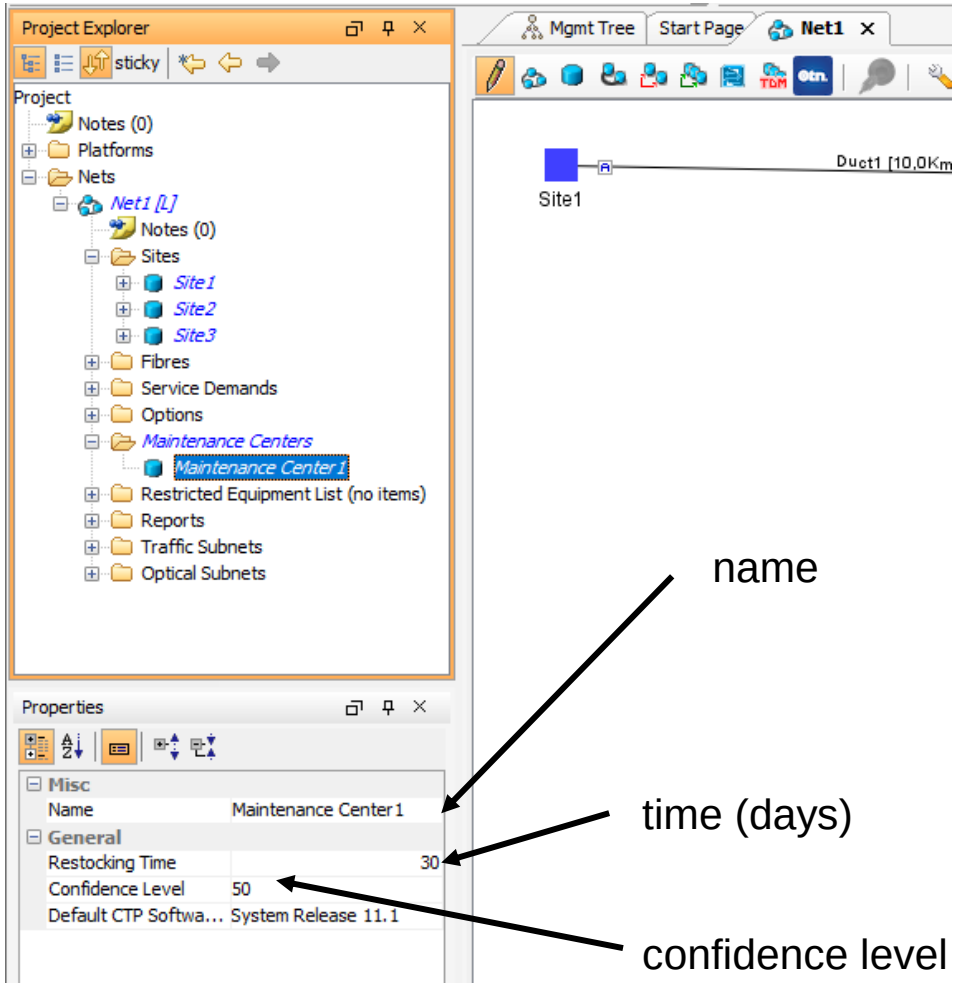
Maintenance Center



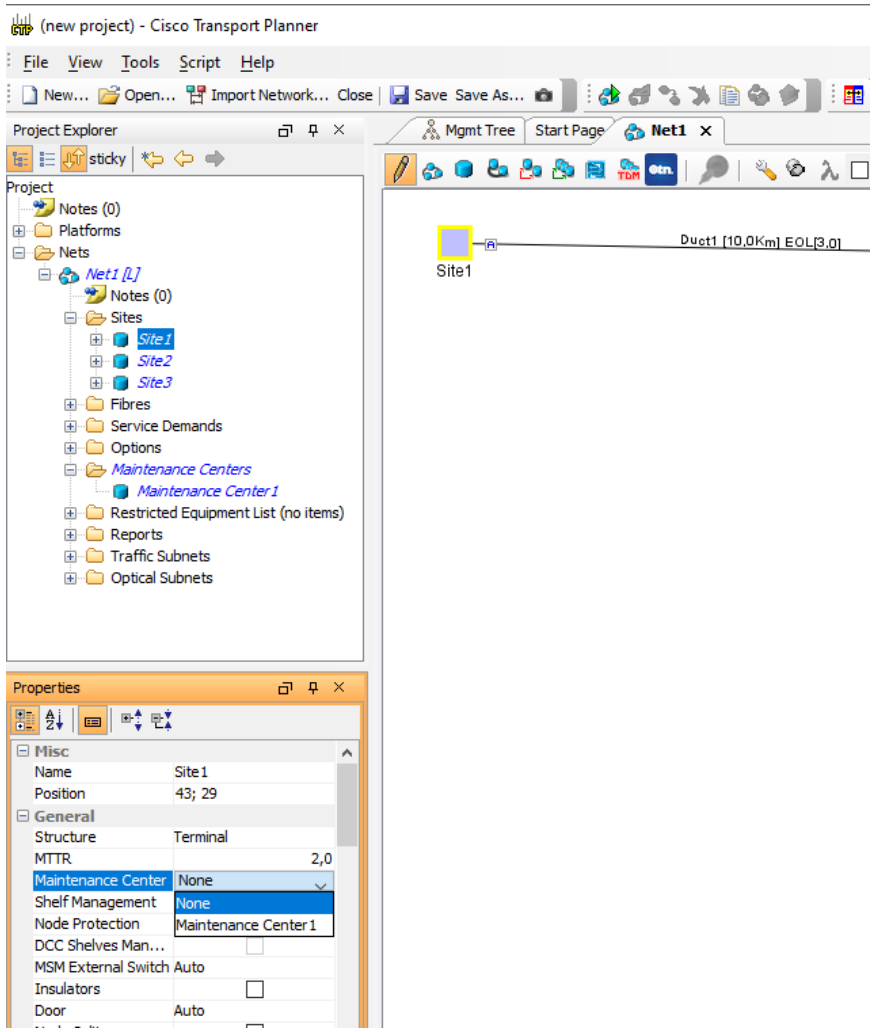
Example 11

Design a point-to-point network with OTDR controller

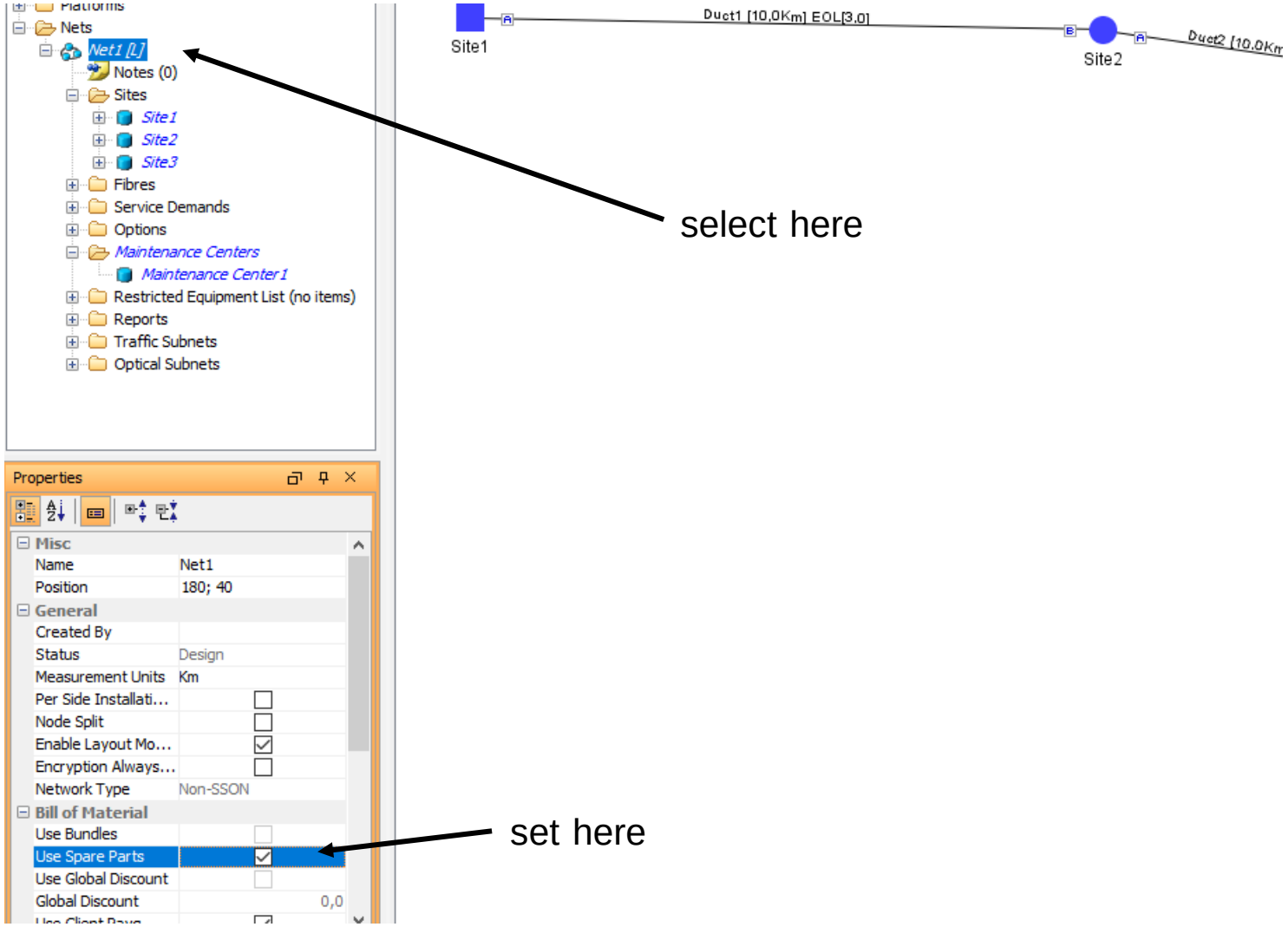
Maintenance Center Parameters



Associate Site with Maintenance Center



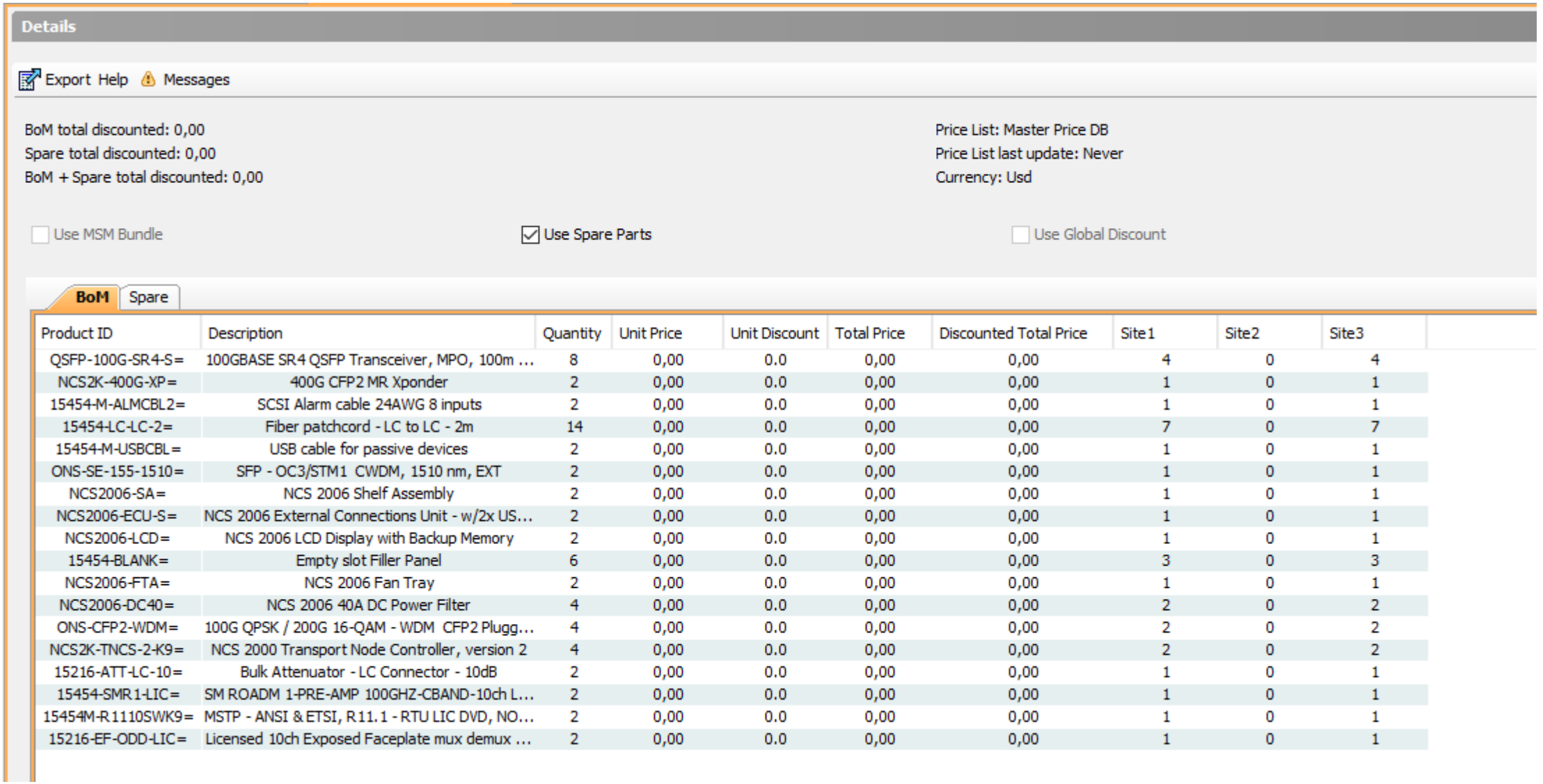
Using Spare Parts



select here

set here

Bill of Materials



Details

Export Help Messages

BoM total discounted: 0,00
Spare total discounted: 0,00
BoM + Spare total discounted: 0,00

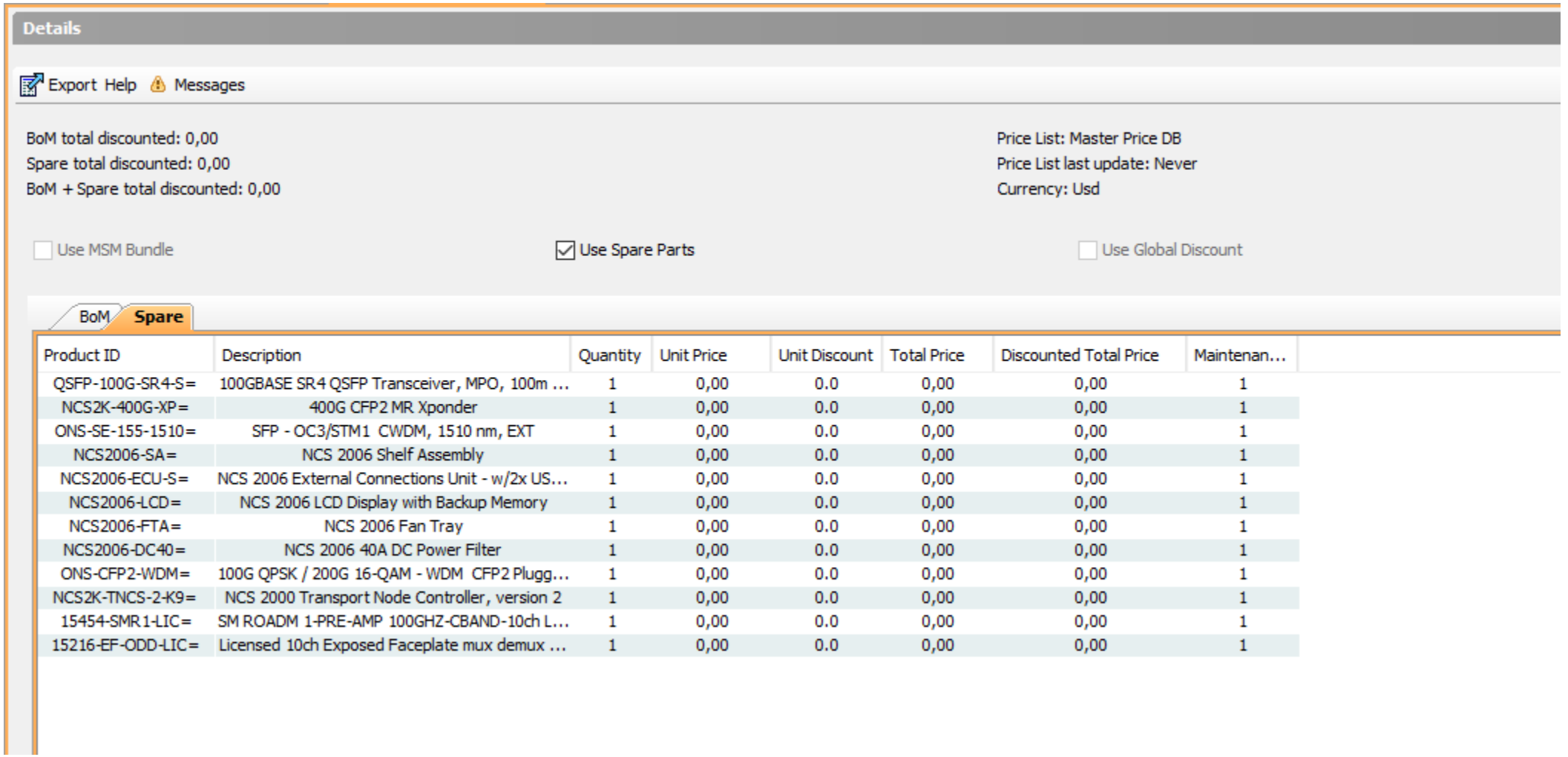
Price List: Master Price DB
Price List last update: Never
Currency: Usd

Use MSM Bundle Use Spare Parts Use Global Discount

BoM | Spare

Product ID	Description	Quantity	Unit Price	Unit Discount	Total Price	Discounted Total Price	Site1	Site2	Site3
QSFP-100G-SR4-S=	100GBASE SR4 QSFP Transceiver, MPO, 100m ...	8	0,00	0.0	0,00	0,00	4	0	4
NCS2K-400G-XP=	400G CFP2 MR Xponder	2	0,00	0.0	0,00	0,00	1	0	1
15454-M-ALMCBL2=	SCSI Alarm cable 24AWG 8 inputs	2	0,00	0.0	0,00	0,00	1	0	1
15454-LC-LC-2=	Fiber patchcord - LC to LC - 2m	14	0,00	0.0	0,00	0,00	7	0	7
15454-M-USBCBL=	USB cable for passive devices	2	0,00	0.0	0,00	0,00	1	0	1
ONS-SE-155-1510=	SFP - OC3/STM1 CWDM, 1510 nm, EXT	2	0,00	0.0	0,00	0,00	1	0	1
NCS2006-SA=	NCS 2006 Shelf Assembly	2	0,00	0.0	0,00	0,00	1	0	1
NCS2006-ECU-S=	NCS 2006 External Connections Unit - w/2x US...	2	0,00	0.0	0,00	0,00	1	0	1
NCS2006-LCD=	NCS 2006 LCD Display with Backup Memory	2	0,00	0.0	0,00	0,00	1	0	1
15454-BLANK=	Empty slot Filler Panel	6	0,00	0.0	0,00	0,00	3	0	3
NCS2006-FTA=	NCS 2006 Fan Tray	2	0,00	0.0	0,00	0,00	1	0	1
NCS2006-DC40=	NCS 2006 40A DC Power Filter	4	0,00	0.0	0,00	0,00	2	0	2
ONS-CFP2-WDM=	100G QPSK / 200G 16-QAM - WDM CFP2 Plugg...	4	0,00	0.0	0,00	0,00	2	0	2
NCS2K-TNCS-2-K9=	NCS 2000 Transport Node Controller, version 2	4	0,00	0.0	0,00	0,00	2	0	2
15216-ATT-LC-10=	Bulk Attenuator - LC Connector - 10dB	2	0,00	0.0	0,00	0,00	1	0	1
15454-SMR1-LIC=	SM ROADM 1-PRE-AMP 100GHZ-CBAND-10ch L...	2	0,00	0.0	0,00	0,00	1	0	1
15454M-R1110SWK9=	MSTP - ANSI & ETSI, R11.1 - RTU LIC DVD, NO...	2	0,00	0.0	0,00	0,00	1	0	1
15216-EF-ODD-LIC=	Licensed 10ch Exposed Faceplate mux demux ...	2	0,00	0.0	0,00	0,00	1	0	1

Spare Parts



Product ID	Description	Quantity	Unit Price	Unit Discount	Total Price	Discounted Total Price	Maintenan...
QSFP-100G-SR4-S=	100GBASE SR4 QSFP Transceiver, MPO, 100m ...	1	0,00	0.0	0,00	0,00	1
NCS2K-400G-XP=	400G CFP2 MR Xponder	1	0,00	0.0	0,00	0,00	1
ONS-SE-155-1510=	SFP - OC3/STM1 CWDM, 1510 nm, EXT	1	0,00	0.0	0,00	0,00	1
NCS2006-SA=	NCS 2006 Shelf Assembly	1	0,00	0.0	0,00	0,00	1
NCS2006-ECU-S=	NCS 2006 External Connections Unit - w/2x US...	1	0,00	0.0	0,00	0,00	1
NCS2006-LCD=	NCS 2006 LCD Display with Backup Memory	1	0,00	0.0	0,00	0,00	1
NCS2006-FTA=	NCS 2006 Fan Tray	1	0,00	0.0	0,00	0,00	1
NCS2006-DC40=	NCS 2006 40A DC Power Filter	1	0,00	0.0	0,00	0,00	1
ONS-CFP2-WDM=	100G QPSK / 200G 16-QAM - WDM CFP2 Plugg...	1	0,00	0.0	0,00	0,00	1
NCS2K-TNCS-2-K9=	NCS 2000 Transport Node Controller, version 2	1	0,00	0.0	0,00	0,00	1
15454-SMR1-LIC=	SM ROADM 1-PRE-AMP 100GHZ-CBAND-10ch L...	1	0,00	0.0	0,00	0,00	1
15216-EF-ODD-LIC=	Licensed 10ch Exposed Faceplate mux demux ...	1	0,00	0.0	0,00	0,00	1

Example 12

Create a maintenance center and a DWDM project with spare parts

Alien Interfaces

Cisco Transport Planner allows you to define a third-party DWDM interface to be used in project creation.
After you define third-party DWDM interfaces, you can choose them when creating traffic demands.
If you create a network design with a third-party interface and need to share the design with other users, you must provide not only the saved network MPZ file but also the exported database file containing the third-party interface definition. To view this project, the other user first must import the database with the third-party interface values.

Step 1 Click **Tools** > **DB Parts Mgmt**. The DB Parts Manager dialog box appears.

Note You cannot open the DB Parts Manager if a project is open or if you are using the Base Network Designer profile.

Step 2 Right-click **Platform Parts** and choose **Expand** from the shortcut menu.

Step 3 Right-click **Group** and choose **New Group** from the shortcut menu. The new group appears under Group and in each system release under parts DB.

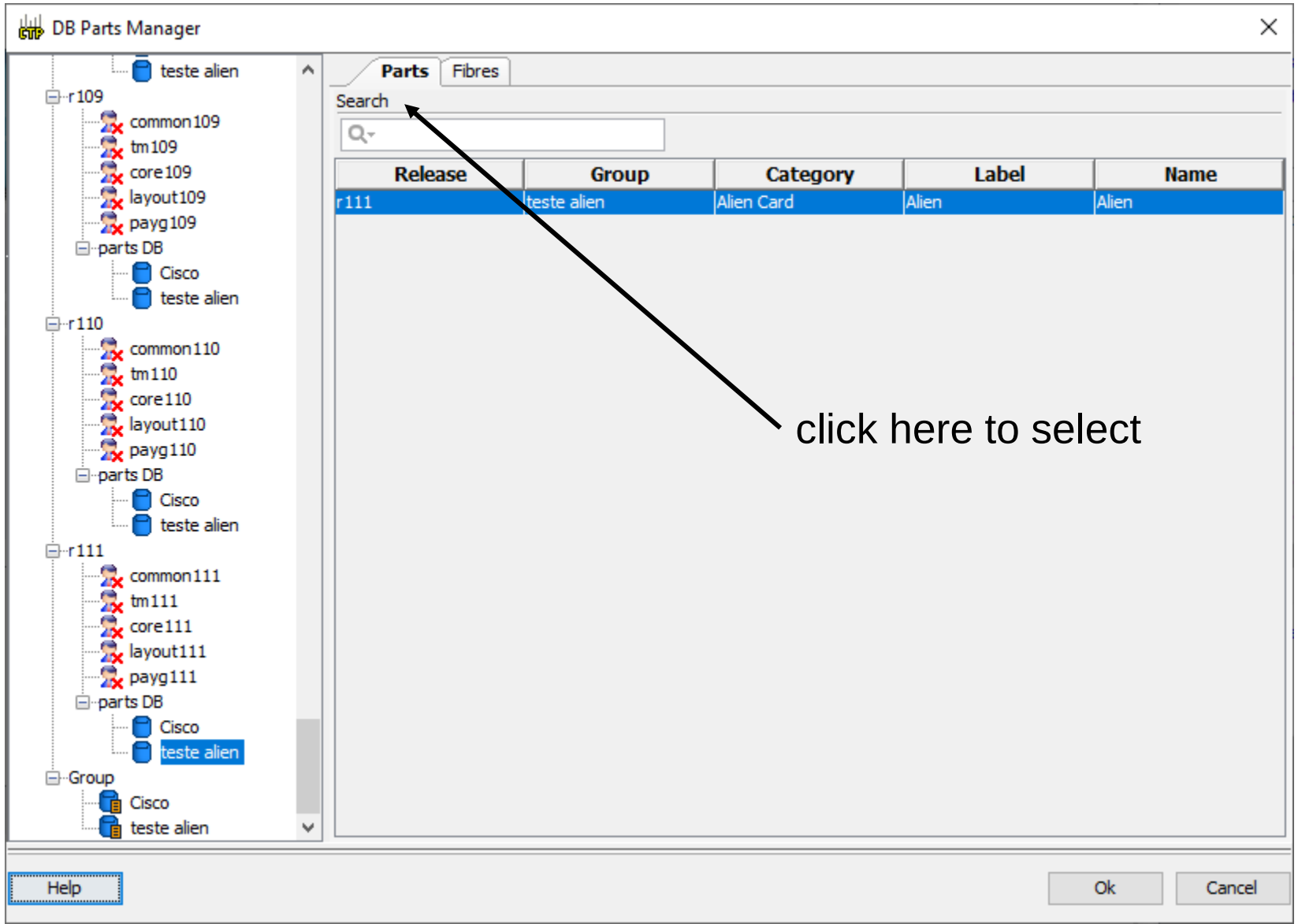
Step 4 In the Group Editor dialog box, complete the following information:

- Name of group—Enter the name of the new database.
- Note—(Optional) Enter a description of the group.

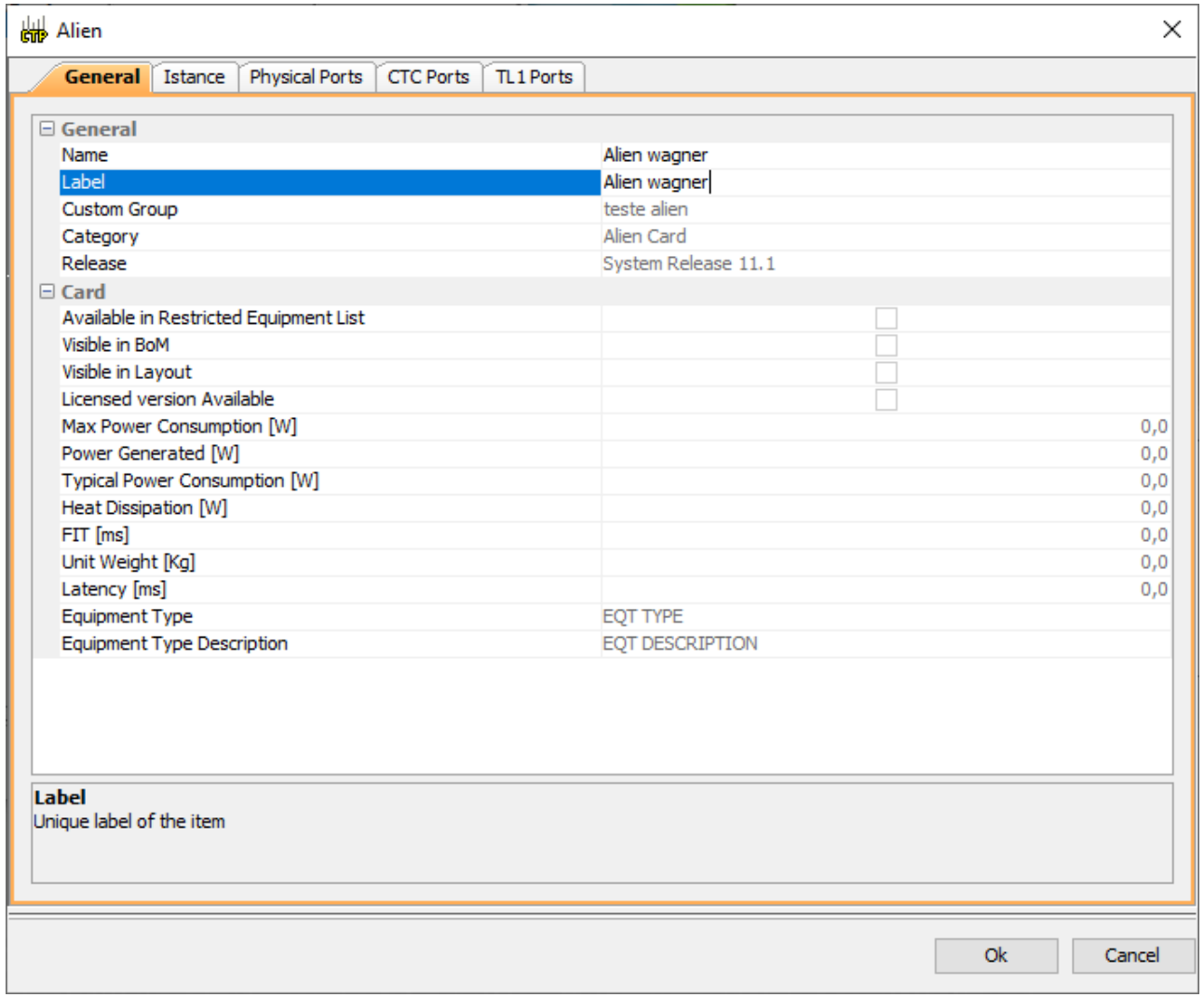
Step 5 In the parts DB for the desired system release, click the group that you created.

Step 6 In the Parts tab of the DB Parts Manager dialog box, right-click and choose **Client** and then **Alien** from the shortcut menu. A new row appears on the Parts tab for the client hardware.

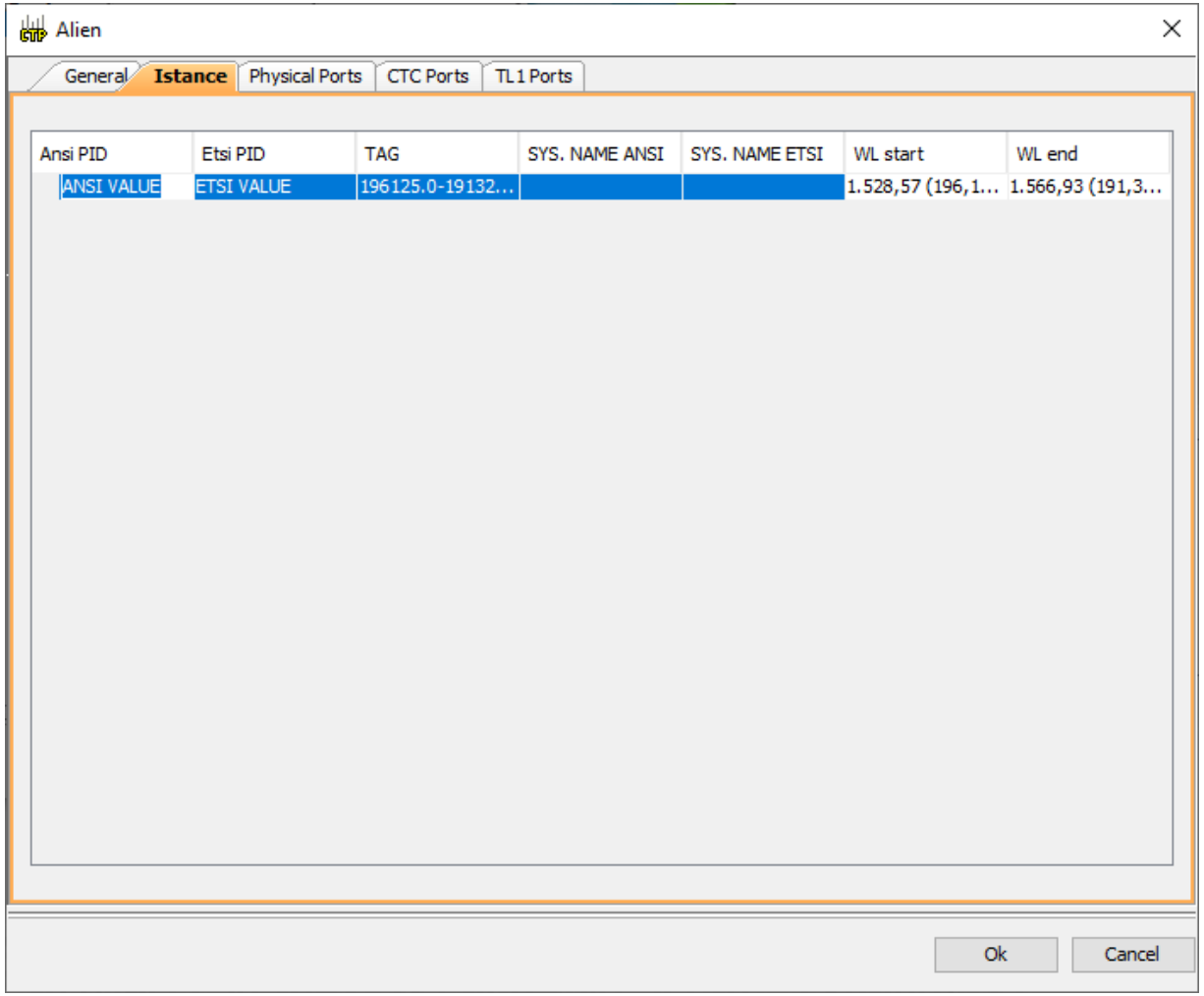
Creating New Component



Edit General Parameters

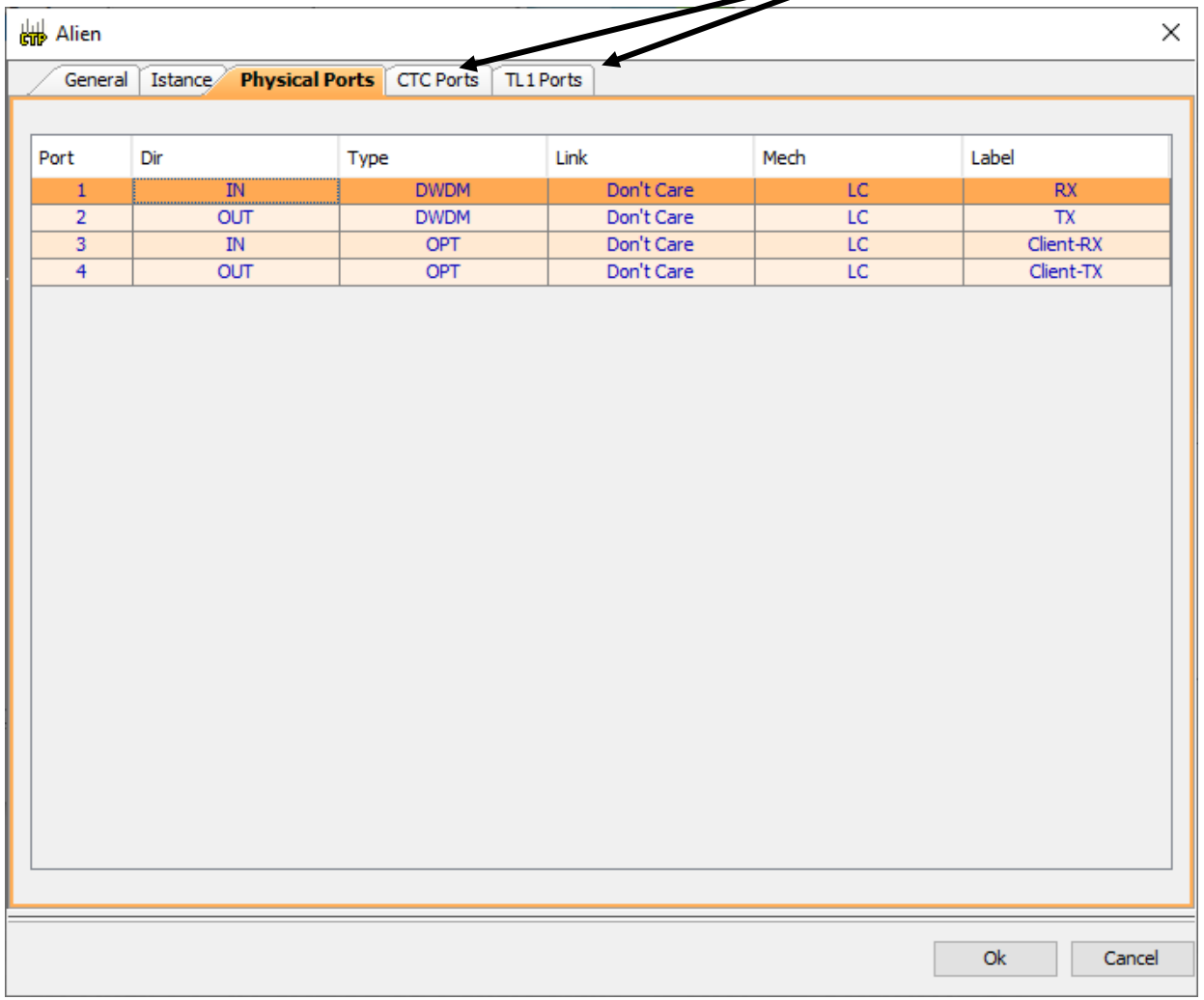


Interface Identification

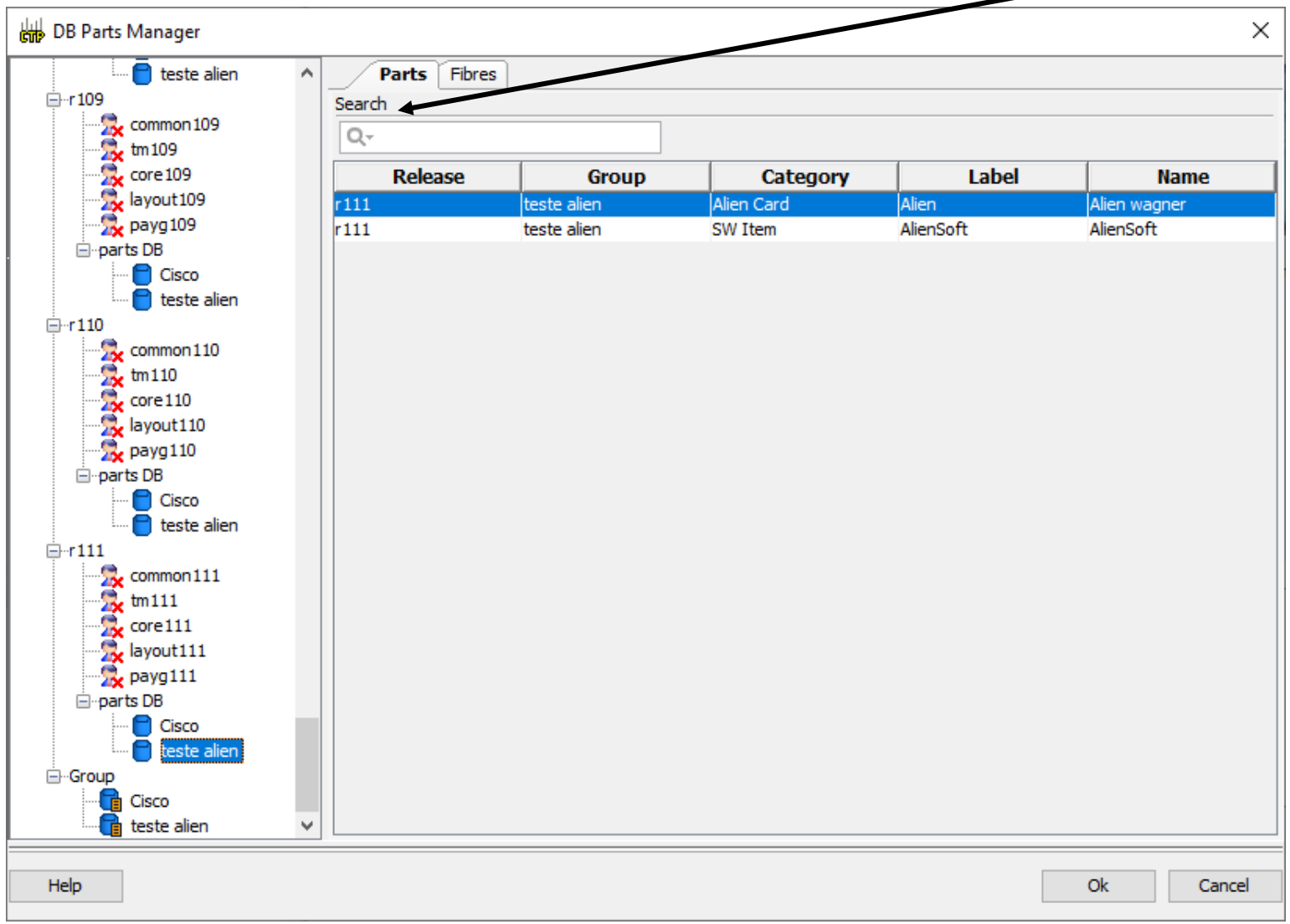


Physical Ports

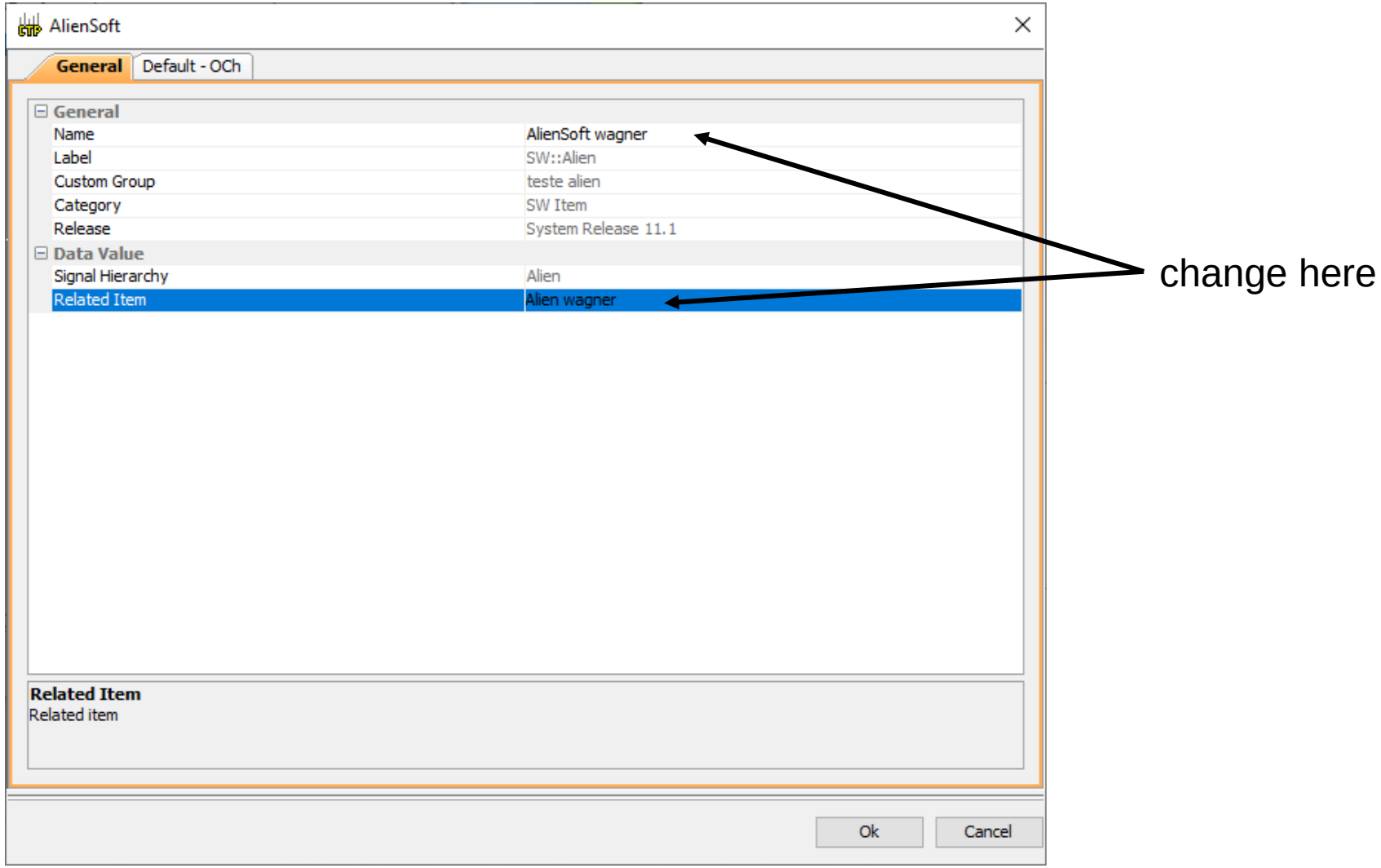
not applicable



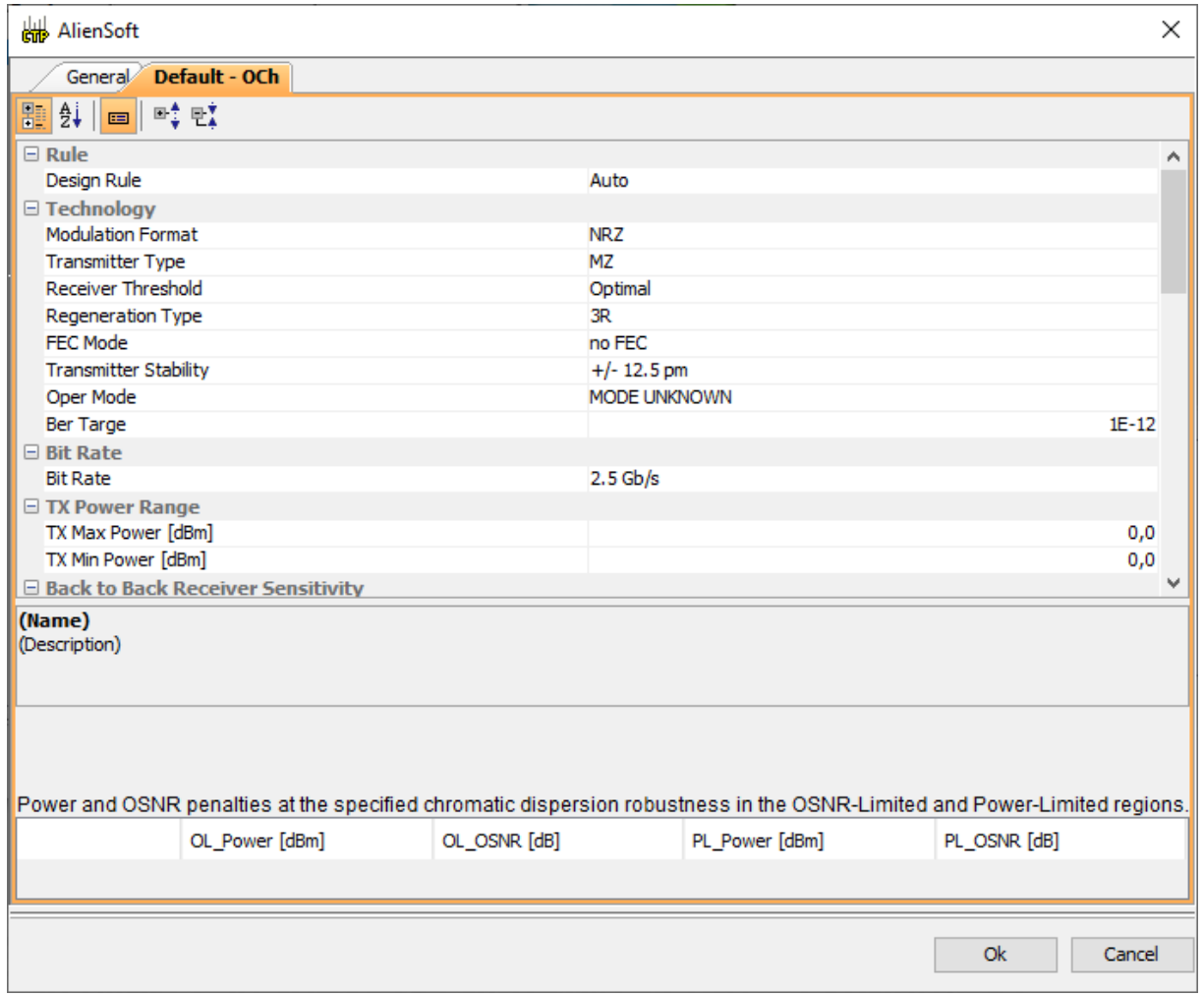
Software Definitions



Alien Soft Definitions



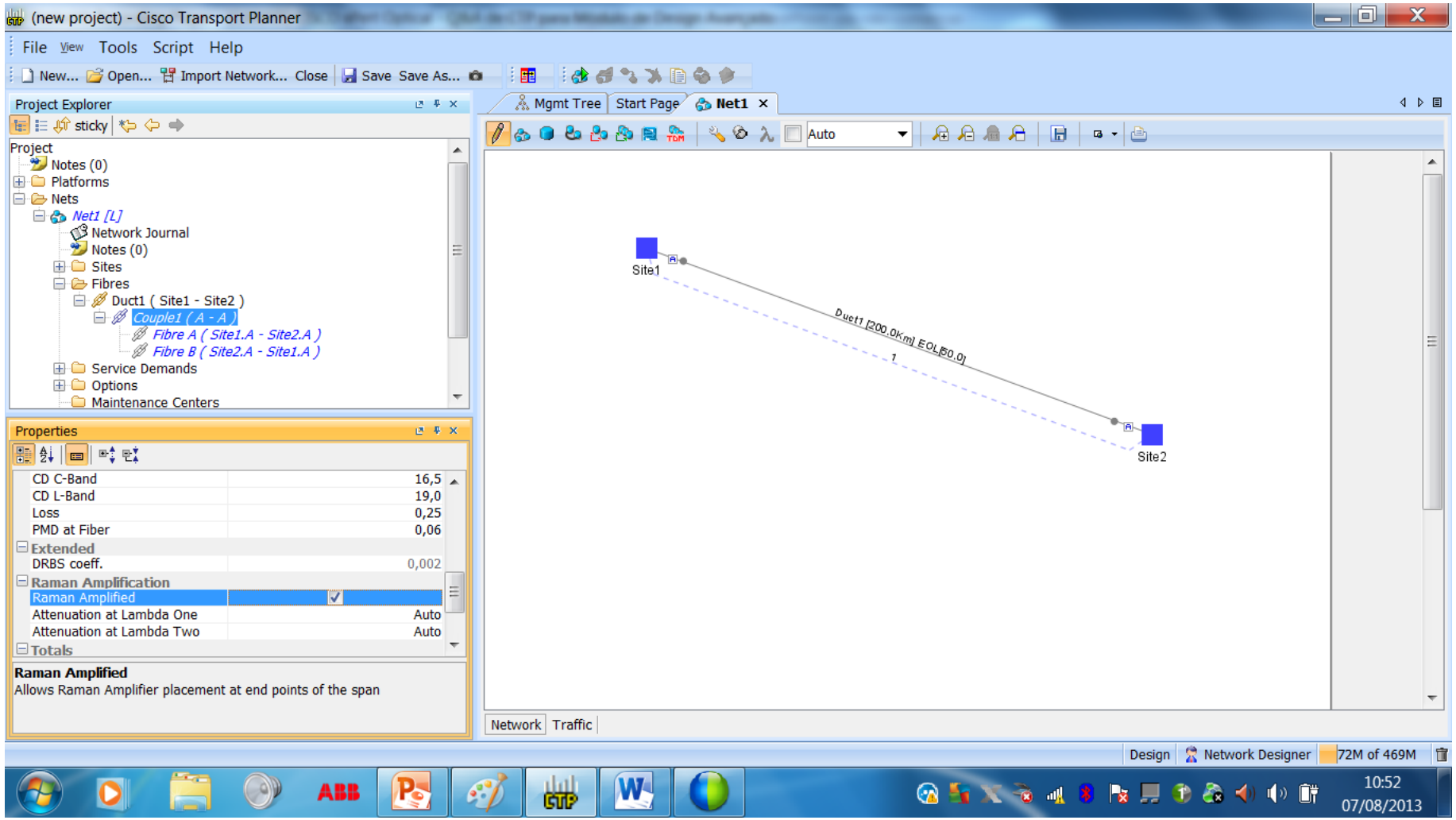
Optical parameters



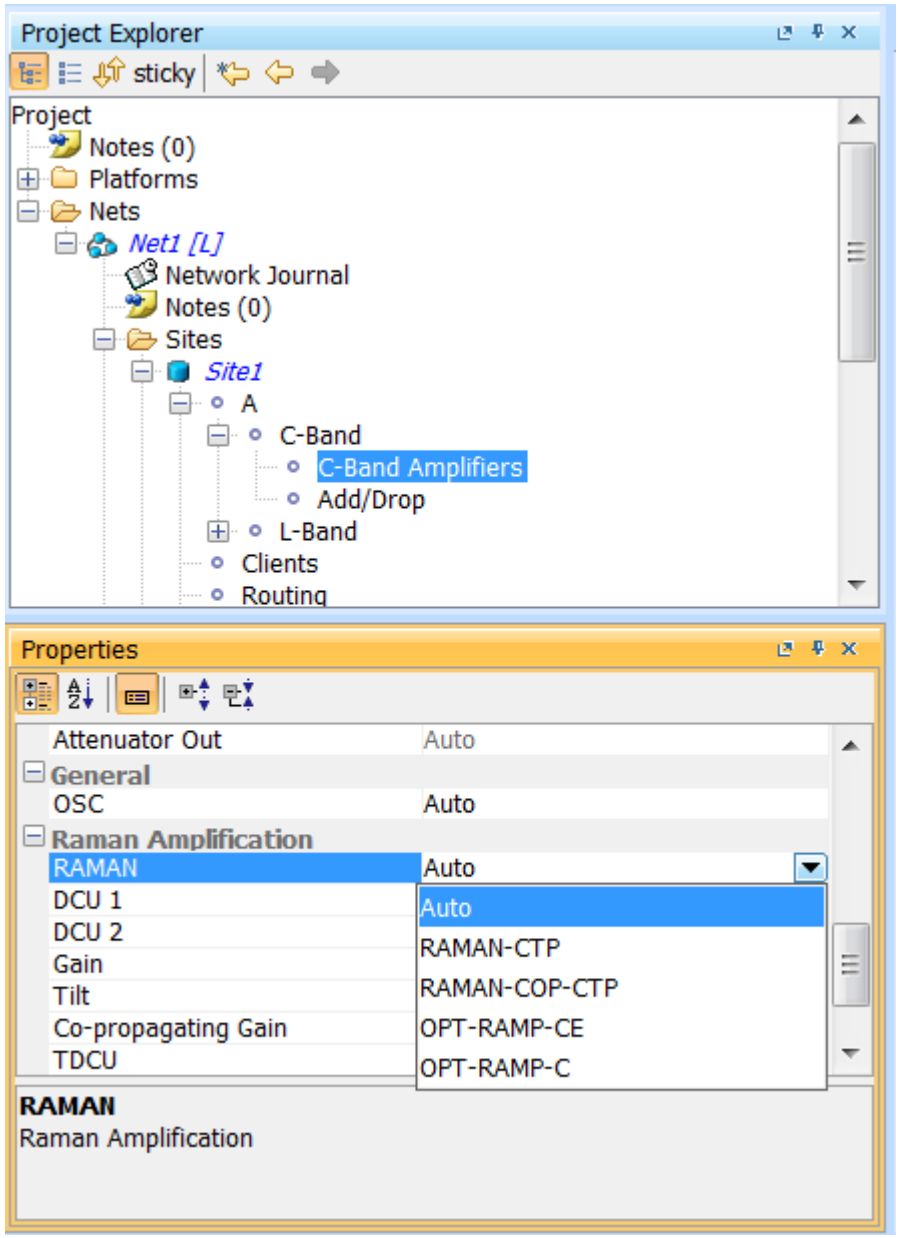
The OCh parameters are defined according to a Cisco defined model.

See CTP manual p.36

Including RAMAN



RAMAN


Project Explorer
sticky
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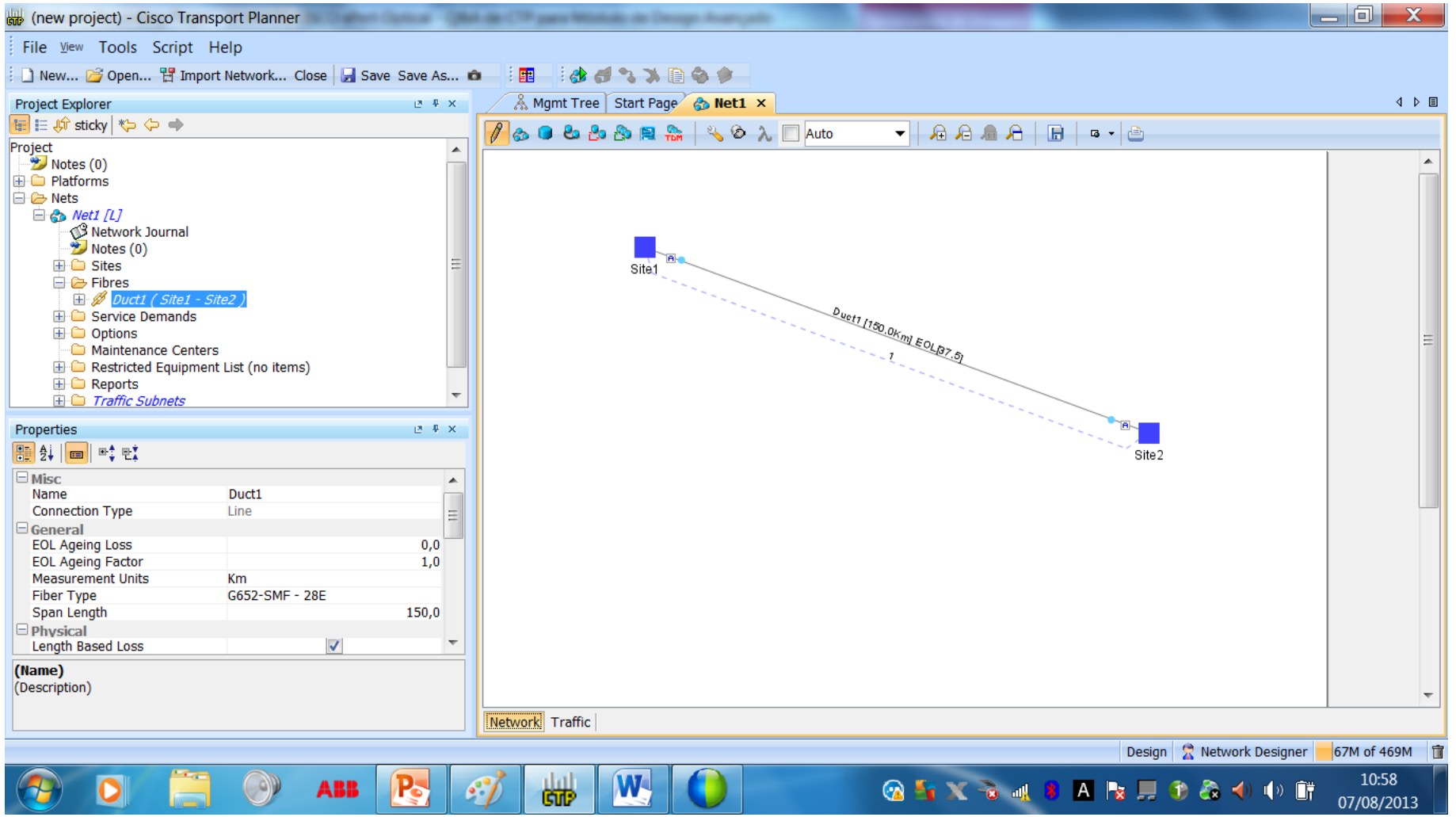
Notes (0)
Platforms
Nets
Net1 [L]
Network Journal
Notes (0)
Sites
Site1
A
C-Band
C-Band Amplifiers
Add/Drop
L-Band
Clients
Routing
Properties
Attenuator Out
Auto
General
OSC
Auto
Raman Amplification
RAMAN
Auto
DCU 1
DCU 2
Gain
Tilt
Co-propagating Gain
TDCU
Auto
RAMAN-CTP
RAMAN-COP-CTP
OPT-RAMP-CE
OPT-RAMP-C
RAMAN
Raman Amplification

RAMAN


(new project) - Cisco Transport Planner
File View Tools Script Help
New... Open... Import Network... Close Save Save As...
Project Explorer
sticky
Project
Notes (0)
Platforms
Nets
Net1 [L]
Network Journal
Notes (0)
Sites
Fibres
Duct1 (Site1 - Site2)
Service Demands
Options
Maintenance Centers
Restricted Equipment List (no items)
Reports
Traffic Subnets
Properties
Misc
Name Duct1
Connection Type Line
General
EOL Ageing Loss 0,0
EOL Ageing Factor 1,0
Measurement Units Km
Fiber Type G652-SMF - 28E
Span Length 150,0
Physical
Length Based Loss
(Name)
(Description)
Mgmt Tree
Start Page
Net1
Auto
Site1
Site2
Duct1 [150.0Km] EOL[37.5]
1
Network
Traffic
Design
Network Designer
67M of 469M
10:58
07/08/2013

RAMAN

Without RAMAN

SOL OSNR [dB]	EOL OSNR [dB]	SOL OSNR margi...	EOL OSNR margi...	SOL RX [dBm]	EOL RX [dBm]	SOL Power marg...	EOL Power marg...
6,25	6,25	-5,51	-5,51	-11,80	-11,80	1,76	1,7
6,25	6,25	-5,51	-5,51	-11,80	-11,80	1,76	1,7

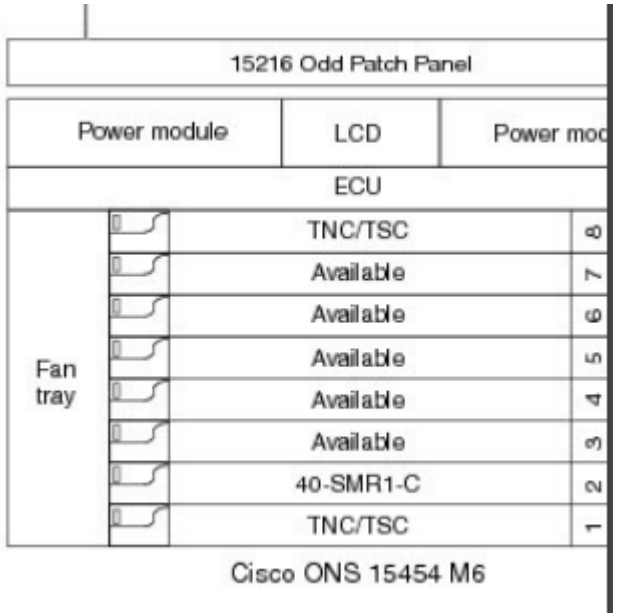
With RAMAN

EOL OSNR [dB]	SOL OSNR margi...	EOL OSNR margi...	SOL RX [dBm]	EOL RX [dBm]	SOL Power marg...	EOL Power marg...	SOL Overload...
20,61	8,76	8,76	-13,49	-13,49	4,29	4,29	4,27
20,61	8,76	8,76	-13,49	-13,49	4,29	4,29	4,27

Example 13

Design a point-to-point network with two long spans (150 km) and modify the project to use RAMAN amplifiers


Fast Lane


15216 Odd Patch Panel
Power module
LCD
Power mod
ECU
Fan tray
TNC/TSC
Available
Available
Available
Available
Available
40-SMR1-C
TNC/TSC
8
7
6
5
4
3
2
1
Cisco ONS 15454 M6

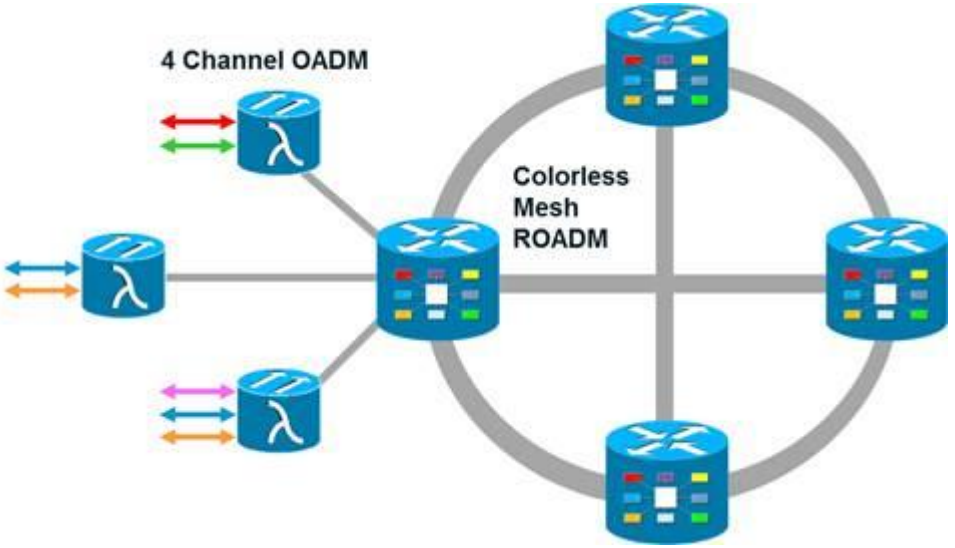

4 Channel OADM
Colorless
Mesh
ROADM

Table 6. 40-Channel Wavelength Plan – Odd – C band

λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)
1530.3	1534.2	1538.1	1542.1	1546.1	1550.1	1554.1	1558.1
1531.1	1535.0	1538.9	1542.9	1546.9	1550.9	1554.9	1558.9
1531.9	1535.8	1539.7	1543.	1547.7	1551.7	1555.7	1559.7
1532.6	1536.6	1540.5	1544.5	1548.5	1552.5	1556.5	1560.6
1533.4	1537.4	1541.3	1545.3	1549.3	1553.3	1557.3	1561.4

Table 7. 40-Channel Wavelength Plan – Even – C band

λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)
1530.7	1534.6	1538.5	1542.5	1546.5	1550.5	1554.5	1558.5
1531.5	1535.4	1539.3	1543.3	1547.3	1551.3	1555.3	1559.3
1532.2	1536.2	1540.1	1544.1	1548.1	1552.1	1556.1	1560.2
1533.0	1537.0	1540.9	1544.9	1548.9	1552.9	1556.9	1561.0
1533.8	1537.7	1541.7	1545.7	1549.7	1553.7	1557.7	1561.8

Table 8. 32-Channel Wavelength Plan – L band

λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)	λ (nm)
1577.8	1581.1	1584.5	1587.8	1591.2	1594.6	1598	1601.4
1578.6	1582.0	1585.3	1588.7	1592.1	1595.4	1598.8	1602.3
1579.5	1582.8	1586.2	1589.5	1592.9	1596.3	1599.7	1603.1
1580.3	1583.6	1587	1590.4	1593.7	1597.1	1600.6	1604.0