



# Provisioning Optical Circuits

---

Cisco<sup>®</sup> EPN Manager 2.0

Job Aid



## Copyright Page

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at [www.cisco.com/go/trademarks](http://www.cisco.com/go/trademarks). Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1005R)

THIS DOCUMENT IS CONSIDERED CISCO PROPERTY AND COPYRIGHTED AS SUCH. NO PORTION OF COURSE CONTENT OR MATERIALS MAY BE RECORDED, REPRODUCED, DUPLICATED, DISTRIBUTED OR BROADCAST IN ANY MANNER WITHOUT CISCO'S WRITTEN PERMISSION.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

*Provisioning Optical Circuits Job Aid*

© Copyright 2017 Cisco Systems, Inc. All rights reserved.

## Contents

<b>Basics.....</b>	<b>1</b>
Overview.....	1
Introduction .....	1
The Provisioning Wizard .....	2
Provisioning Pre-Requisites .....	4
Skills .....	5
Network Operators .....	5
Optical Provisioners .....	5
<b>Fulfilling Orders for Optical Services .....</b>	<b>6</b>
Fulfilling Optical Provisioning Service Requests .....	6
Auto-Provisioning Process Overview .....	7
Auto-Provisioning Process Steps .....	8
Optical Provisioning Settings for Complex Orders .....	20
Configuring Circuit Properties .....	21
Configuring Circuit Route Constraints .....	25
Validating and Evaluating Provisioned Circuits .....	26
Reviewing Maps .....	26
Reviewing Circuit Details.....	26
<b>Video Demonstration .....</b>	<b>35</b>
Fulfilling Orders for Optical Services .....	35
<b>Links.....</b>	<b>36</b>
To Product Information .....	36
To Training .....	36
To Contact Us.....	36

# Basics

## Overview

### Introduction

Cisco® Evolved Programmable Network Manager (EPN Manager) design supports the rapid provisioning of optical circuits by operators with fundamental knowledge of networking and provisioning concepts.

The automated circuit provisioning, or auto-provisioning, process provisions a bi-directional, working route for the circuit based on the availability of applicable device ports, bandwidths, and frequencies, and brings the circuit online when the provisioning process is complete.

This design supports an environment that is highly responsive to customer orders and data transport requirements.

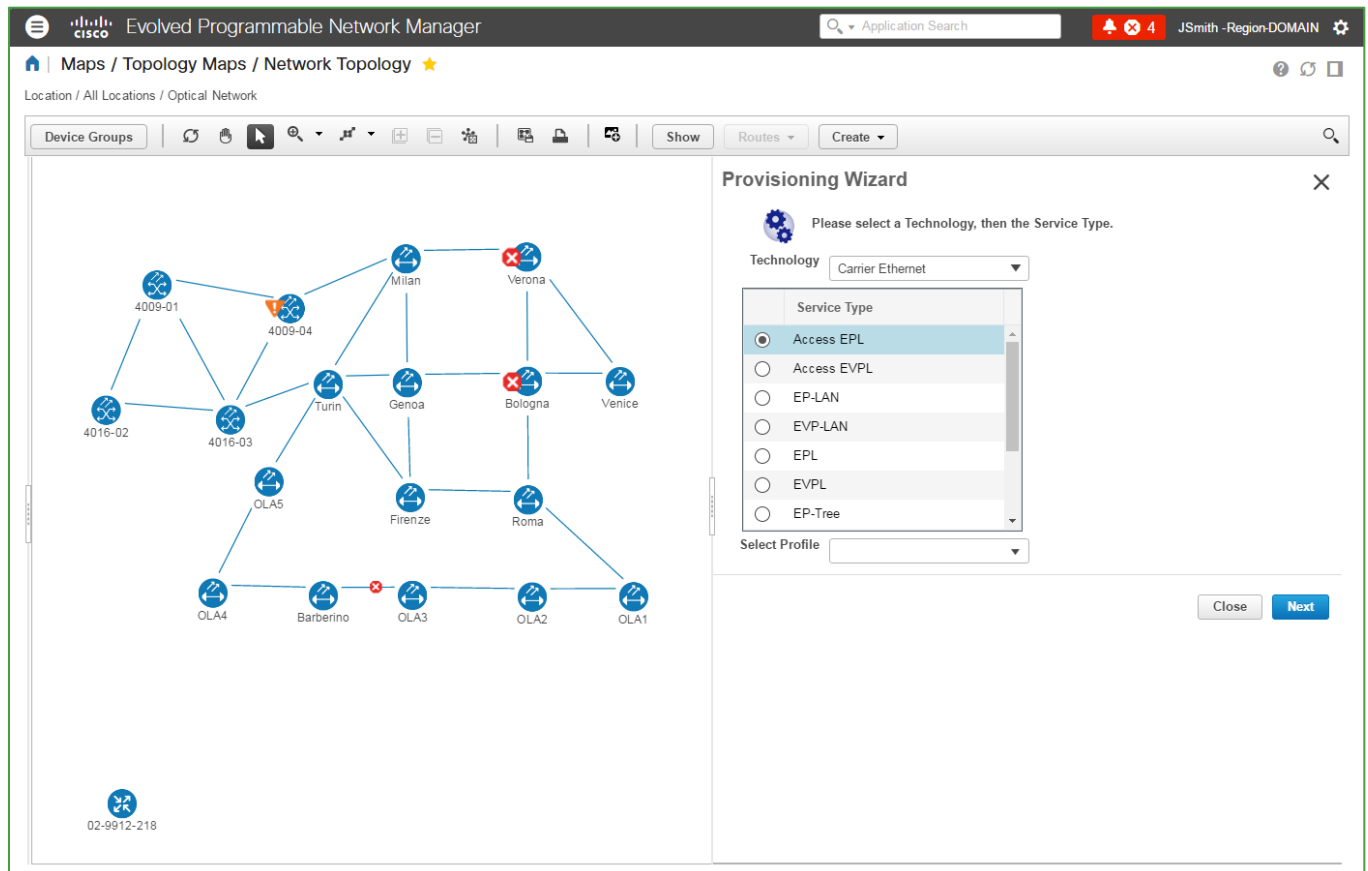
This job aid introduces you to:

- ❖ The auto- provisioning process.
- ❖ The types of settings that optical provisioners can configure for more complex orders, including the circuit:
  - ◆ Properties.
  - ◆ Route constraints.
- ❖ The methods available for validating and evaluating the provisioned circuit.

## The Provisioning Wizard

As an operator, you use the automated circuit provisioning functions, or auto-provisioning, in the **Provisioning Wizard** to fulfill orders for services.

Provisioners who are fulfilling more complex orders for optical services also use the **Provisioning Wizard** to configure circuit, endpoint, and route settings, as needed.

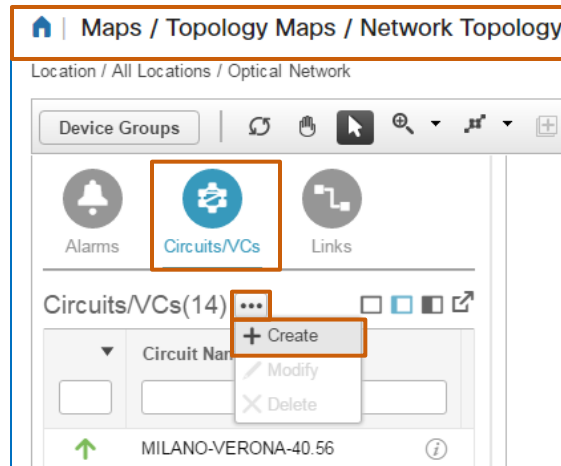


The screenshot displays the Cisco Evolved Programmable Network Manager interface. The main area shows a network topology map with various nodes and connections. The nodes include labels like 4009-01, 4009-04, 4016-02, 4016-03, OLA5, OLA4, Barberino, OLA3, OLA2, OLA1, Milan, Verona, Genoa, Bologna, Venice, Firenze, and Roma. The Provisioning Wizard panel is open on the right, prompting the user to select a Technology and a Service Type. The Technology dropdown is set to 'Carrier Ethernet'. The Service Type dropdown is open, showing options: Access EPL (selected), Access EVPL, EP-LAN, EVP-LAN, EPL, EVPL, and EP-Tree. Below the Service Type dropdown is a 'Select Profile' dropdown. The panel includes 'Close' and 'Next' buttons.

You can access the **Provisioning Wizard** in several areas of the application.

**To access the Provisioning Wizard by using the topology map:**

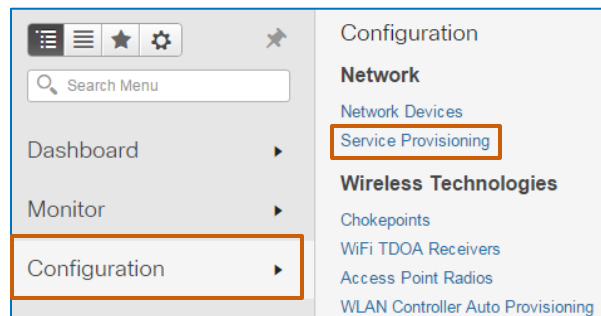
1. On the topology map, open the location that contains the devices that you need to provision.
2. Below the toolbar, click **Circuits/VCs**.
3. Beside the **Circuits/VCs** list heading, click the ellipsis button, and then click **Create**.



The system opens the **Provisioning Wizard** to the right of the map.

**To access the Provisioning Wizard by using the Configuration | Network submenu:**

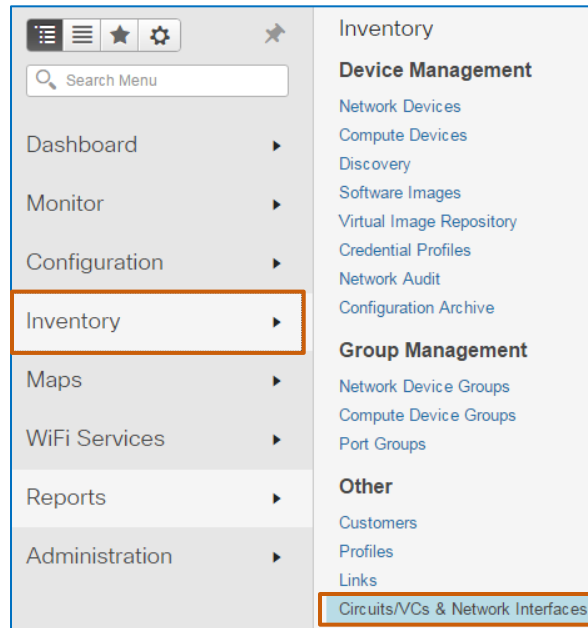
- ❖ Click **Service Provisioning**.



The system navigates to the topology map and opens the **Provisioning Wizard** to the right of the map.

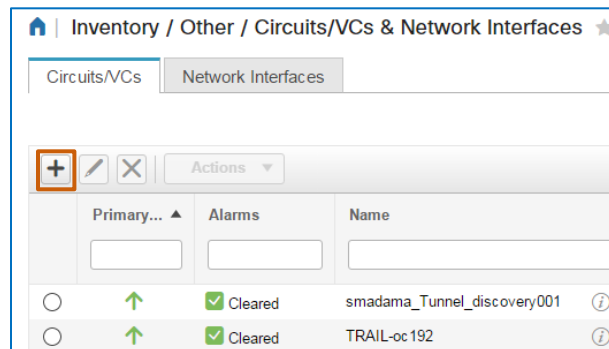
To access the Provisioning Wizard by using the Inventory | Other submenu:

1. Click **Circuits/VC & Network Interfaces**.



The **Circuits/VC & Network Interfaces** page opens with the **Circuits/VCS** tab active by default.

2. On the **Circuits/VC & Network Interfaces** page, on the toolbar, click **Create**.



The system navigates to the topology map and opens the **Provisioning Wizard** to the right of the map.

## Provisioning Pre-Requisites

Before provisioning devices:

- ❖ The device discovery process must be completed and include the devices that require provisioning.
- ❖ After discovery, EPN Manager must be actively managing the devices.

## Skills

### Network Operators

---

When performing straightforward circuit provisioning by applying the **Provisioning Wizard** default settings, you need the following experience.

#### Basic

- ❖ EPN Manager navigation and behaviors
- ❖ Networking and provisioning concepts

### Optical Provisioners

---

When performing complex circuit provisioning by changing system default optical settings, you need the following experience.

#### Proficient

- ❖ EPN Manager navigation and behaviors

#### Expert

- ❖ Networking and provisioning concepts
- ❖ Optical networking technologies and devices



# Fulfilling Orders for Optical Services

## Fulfilling Optical Provisioning Service Requests

You, as a network operator, manage orders that you receive from the order management system.

In this case, you receive a request to provision an optical channel network connection (OCH NC) for network customer NDV Mobile. The request also indicates the device ports that you need to provision for the circuit.



**Important Note:** To prepare for configuring termination points when provisioning a circuit, you need to know the devices and ports that you need to configure as endpoints.

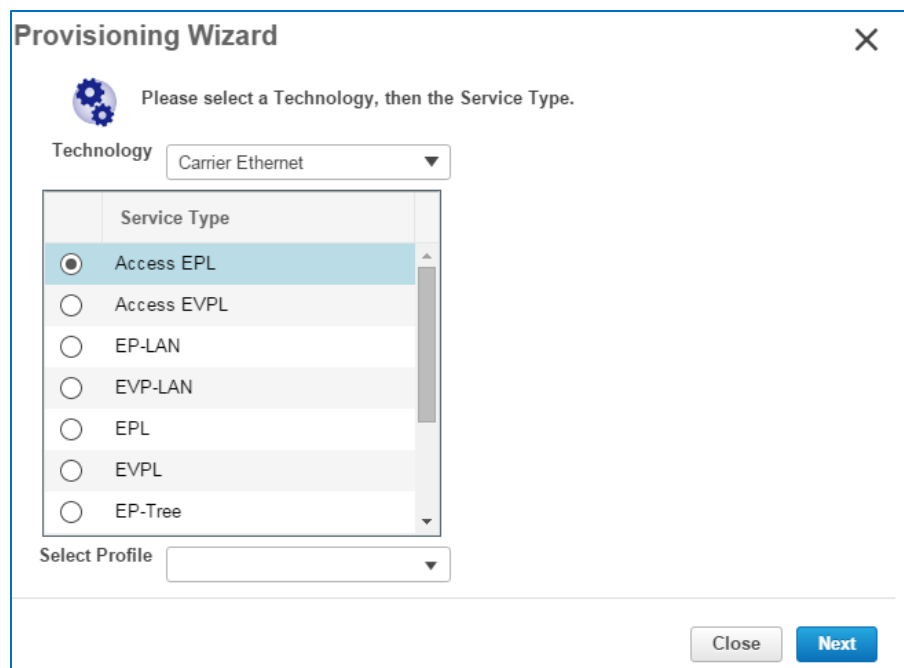
In situations in which optical provisioners are determining the devices and ports that want to support the circuit, they need to understand device relationships on the network.

This understanding helps ensure that provisioning is successful.

As soon as you initiate the process, the system begins circuit provisioning and brings the circuit online when the process is complete.

### To start this use case:

- ❖ Based on your location in the application, [open the Provisioning Wizard](#).



The screenshot shows the 'Provisioning Wizard' dialog box. It has a title bar with a close button (X). Inside, there is a gear icon and the text 'Please select a Technology, then the Service Type.' Below this, there is a 'Technology' dropdown menu with 'Carrier Ethernet' selected. Underneath is a 'Service Type' list box containing several options: 'Access EPL' (selected with a radio button), 'Access EVPL', 'EP-LAN', 'EVP-LAN', 'EPL', 'EVPL', and 'EP-Tree'. Below the list box is a 'Select Profile' dropdown menu. At the bottom right, there are 'Close' and 'Next' buttons.

## Auto-Provisioning Process Overview

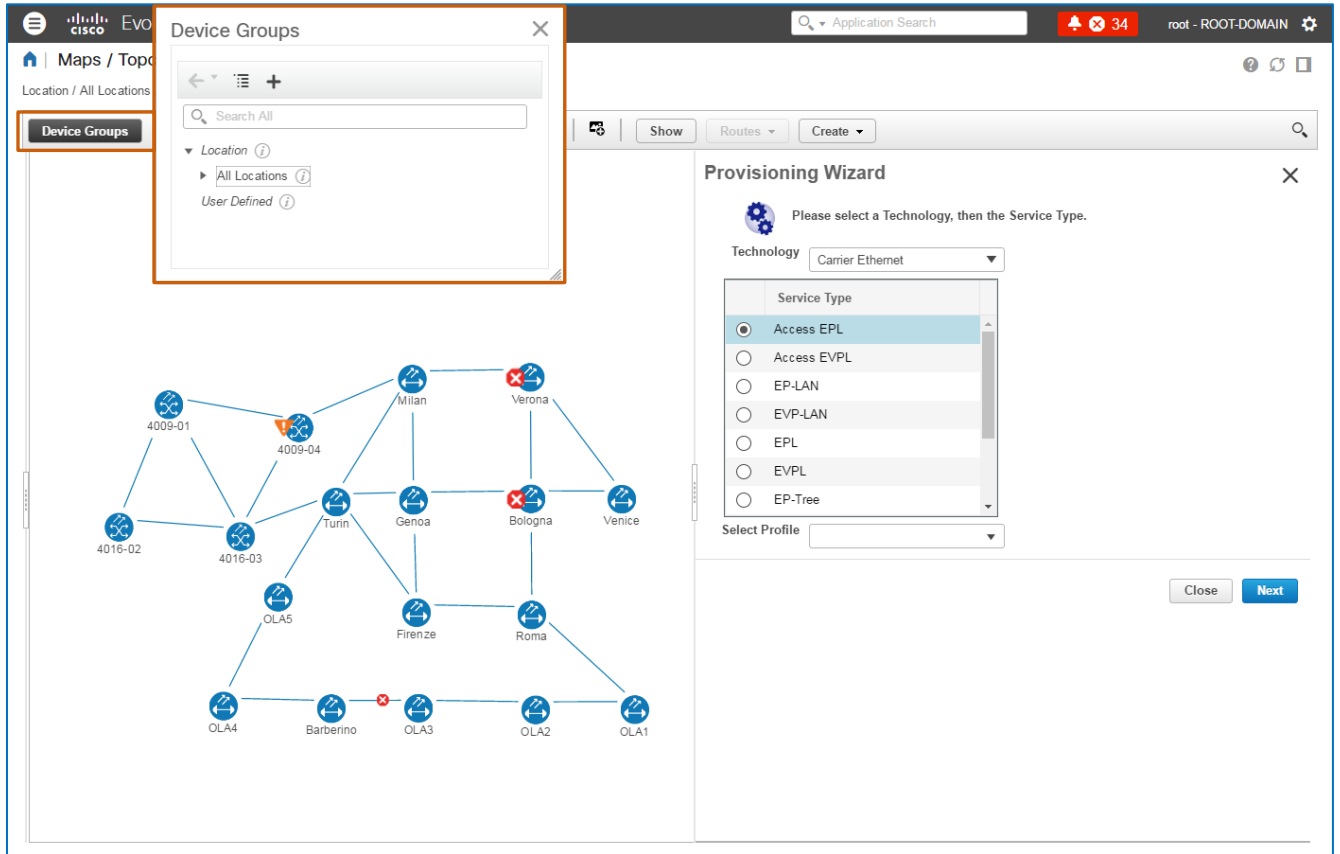
To complete the use case, follow these steps:

- ❖ With the applicable device group open on the map, in the **Provisioning Wizard**, select the optical technology, and then provision the OCH NC circuit.

## Auto-Provisioning Process Steps

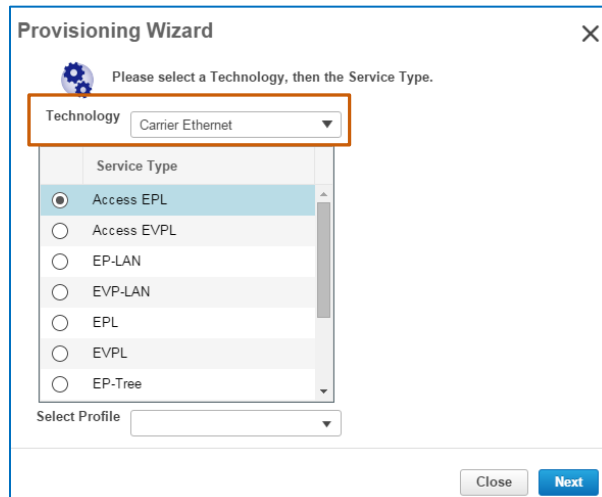
Based on the use case, follow these steps:

1. With the **Provisioning Wizard** open, on the topology map, open the device group that contains the devices on which you need to provision services.



The screenshot shows the Cisco Evolved Network Manager (ENM) interface. On the left, a topology map displays various network devices and their connections. A 'Device Groups' dialog box is open, showing a search bar and a list of locations: 'All Locations' and 'User Defined'. The 'Provisioning Wizard' is open on the right, displaying the 'Technology' dropdown set to 'Carrier Ethernet' and a list of 'Service Type' options: 'Access EPL' (selected), 'Access EVPL', 'EP-LAN', 'EVP-LAN', 'EPL', 'EVPL', and 'EP-Tree'. The 'Select Profile' dropdown is also visible.

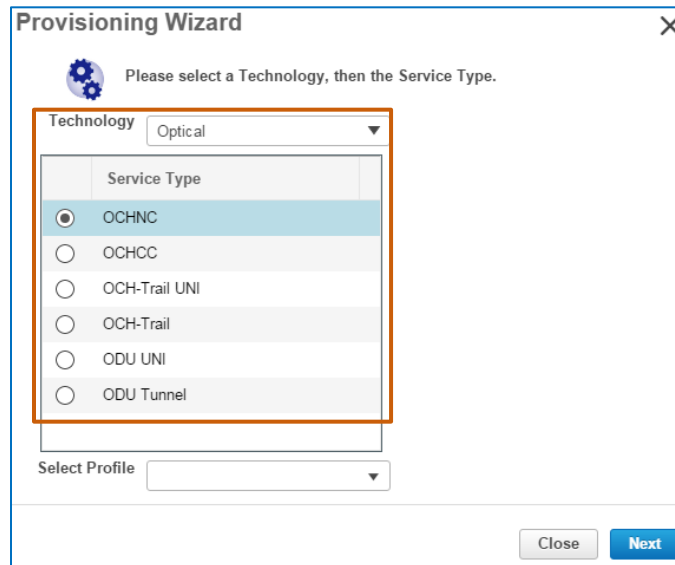
When you open the **Provisioning Wizard**, the first page populates with the **Carrier Ethernet** service types by default.



This is a close-up of the 'Provisioning Wizard' dialog box. It shows the 'Technology' dropdown set to 'Carrier Ethernet' and the 'Service Type' list with 'Access EPL' selected. The 'Select Profile' dropdown is empty. The 'Close' and 'Next' buttons are at the bottom right.

2. In the **Technology** drop-down list, select **Optical**.

The page updates to display the optical service types.



**Provisioning Wizard** [X]

Please select a Technology, then the Service Type.

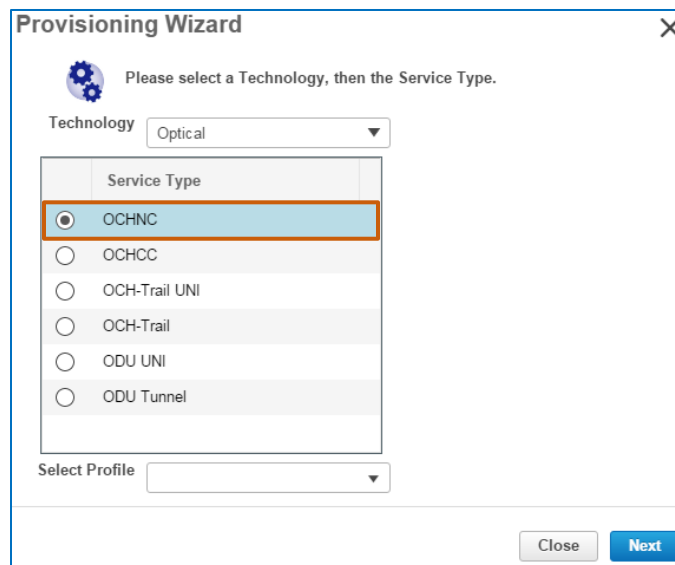
Technology: Optical

Service Type
<input checked="" type="radio"/> OCHNC
<input type="radio"/> OCHCC
<input type="radio"/> OCH-Trail UNI
<input type="radio"/> OCH-Trail
<input type="radio"/> ODU UNI
<input type="radio"/> ODU Tunnel

Select Profile: [Blank]

Close Next

3. In the **Service Type** list, select the circuit that you are provisioning.



**Provisioning Wizard** [X]

Please select a Technology, then the Service Type.

Technology: Optical

Service Type
<input checked="" type="radio"/> OCHNC
<input type="radio"/> OCHCC
<input type="radio"/> OCH-Trail UNI
<input type="radio"/> OCH-Trail
<input type="radio"/> ODU UNI
<input type="radio"/> ODU Tunnel

Select Profile: [Blank]

Close Next



**Note:** When you provision circuits automatically, the system configures the applicable settings, which vary based on the technology and circuit type that you are provisioning.

Provisioners can configure these settings, as needed, during complex provisioning.

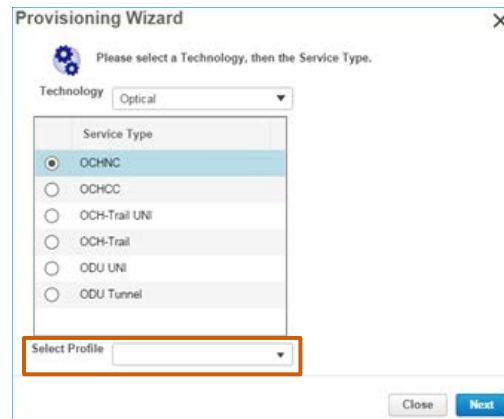
4. In the **Select Profile** drop-down list, accept the default selection, which is blank.



**Note:** When provisioning tasks include common sets of configurations that users provision on a regular basis, they can define those parameters in profiles to automate and expedite complex provisioning tasks.

Then, users can apply an applicable profile based on the circuit that they need to provision by using **Select Profile**.

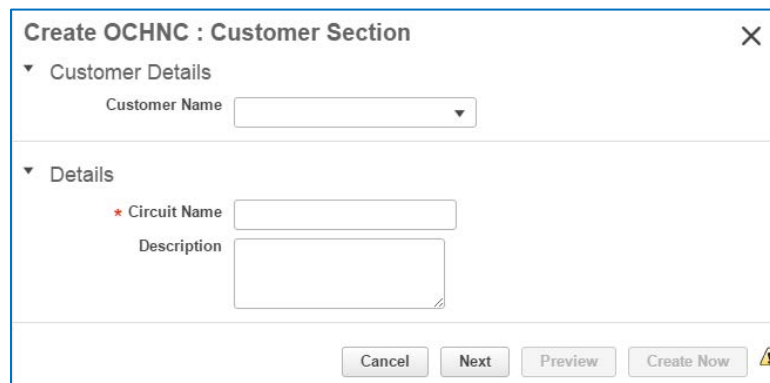
In automated provisioning, you do not select a profile.



The Provisioning Wizard dialog box is shown. It has a title bar with a close button (X). Inside, there's a gear icon and the text "Please select a Technology, then the Service Type." Below this, there's a "Technology" dropdown menu with "Optical" selected. Underneath, there's a "Service Type" section with a list of radio buttons: OCHNC (selected), OCHCC, OCH-Trail UNI, OCH-Trail, ODU UNI, and ODU Tunnel. At the bottom, there's a "Select Profile" dropdown menu, which is highlighted with an orange rectangle. There are "Close" and "Next" buttons at the bottom right.

5. To continue, click **Next**.

The **Customer Section** page opens.



The "Create OCHNC : Customer Section" dialog box is shown. It has a title bar with a close button (X). Inside, there's a "Customer Details" section with a "Customer Name" dropdown menu. Below that, there's a "Details" section with a "Circuit Name" text field (marked with a red asterisk) and a "Description" text area. At the bottom, there are four buttons: "Cancel", "Next", "Preview", and "Create Now" (with a warning icon).

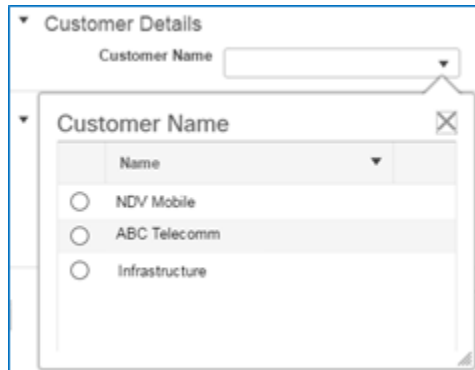


**Important Note:** Beginning on the **Customer Section** page, the wizard provides a **Cancel** button.

Use caution when canceling the provisioning process. When you cancel, the wizard automatically returns to the initial page with its default settings and discards any information that you have added.

The system does not prompt or alert you that it will not retain your changes.

6. On the **Customer Section** page, in the **Customer Name** drop-down list, select the name of the customer who will use the service, when applicable.

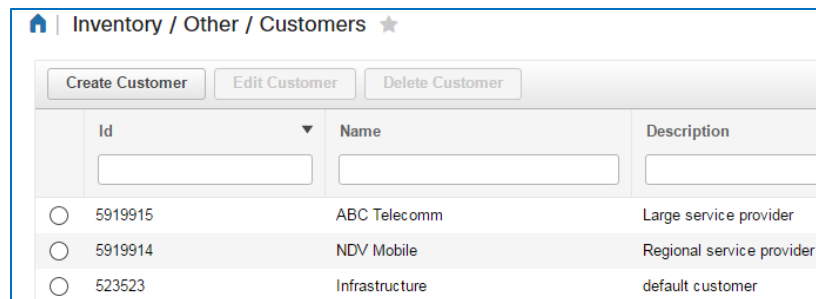


The screenshot shows a 'Customer Details' form. At the top, there is a 'Customer Name' drop-down menu. Below it, a modal window titled 'Customer Name' is open, displaying a list of three options: 'NDV Mobile', 'ABC Telecomm', and 'Infrastructure'. Each option is preceded by a radio button.



**Note:** System users can add customers in EPN Manager, and then associate them with network services during provisioning.

This association supports identifying service users during monitoring and troubleshooting activities.



The screenshot shows the 'Inventory / Other / Customers' page. At the top, there are three buttons: 'Create Customer', 'Edit Customer', and 'Delete Customer'. Below these buttons is a table with three columns: 'Id', 'Name', and 'Description'. The table contains three rows of customer data.

Id	Name	Description
5919915	ABC Telecomm	Large service provider
5919914	NDV Mobile	Regional service provider
523523	Infrastructure	default customer

7. In the **Details** section, type a name for the circuit, and optionally, type additional information about the circuit based on operational or business requirements.

Details

★ Circuit Name

Description



**Important Note:** When you type the circuit name, which is a required field, the **Preview** and **Create Now** buttons become available.

To provision the circuit successfully, you need to click **Next** to continue the process because you have not yet configured the devices and interfaces that will support the circuit.



**Note:** When you add a description, it appears in the **Circuit/VC 360° View** pop-up window details.

Circuit/VC 360° View

View

Actions

Details

Multi-Trace

OCH\_NC\_1

Discovery State

Full

Serviceability State

Up

Type

OCHNC

Protected

False

Last Change

—

Created

5/12/16, 10:06 AM Eastern Daylight Time

Customer

NDV Mobile

Provisioning State

Create Succeeded

Active Route

Working

Circuit-VC Details - OCH\_NC\_1

Summary

CTPs

Discovery State

Full

Provisioning State

Create succeeded

Serviceability State

Up

Circuit Type

OCHNC

Restoration

false

Admin State

Up

Layer

OCH

Restoration Priority

N/A

Operational State

Up

Protection

None

Optical Validation

None

Restoration Status

N/A

Customer

NDV Mobile

Restoration Optical Validation

N/A

WSN Optical Value

N/A

Frequency (GHz)

N/A

Revert Mode

N/A

Active Route

Working

Is Regeneration Allowed

false

Soak Time (HH-MM-SS)

N/A

Description

North Region Site 1 to Site 2

WSN Label

N/A

Acceptance Threshold

N/A

8. To continue, click **Next**.

Create OCHNC : Customer Section

Customer Details

Customer Name

NDV Mobile

Details

★ Circuit Name

OCH\_NC\_1

Description

North Region Site 1 to Site 2

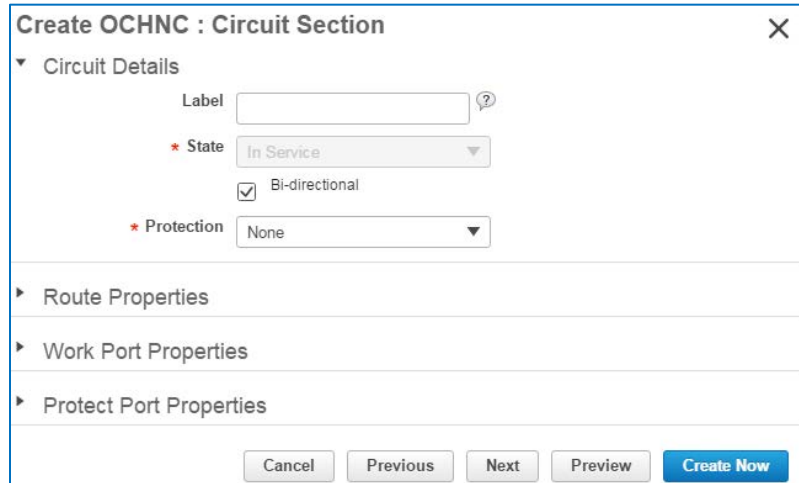
Cancel

Next

Preview

Create Now

The **Circuit Section** page opens.



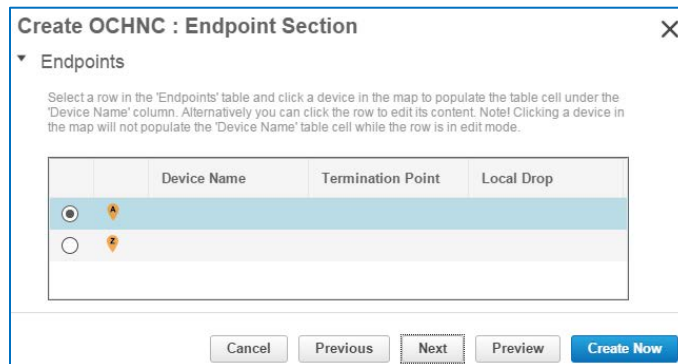
9. On the **Circuit Section** page, accept all of the system default settings.



**Note:** In complex provisioning scenarios, optical provisioners can configure circuit, route, and port properties on this page.  
For more information, [refer to the \*\*Configuring Circuit Properties\*\* topic.](#)

10. To continue, click **Next**.

The **Endpoint Section** page opens and the system selects the alpha (**A**) endpoint row by default.

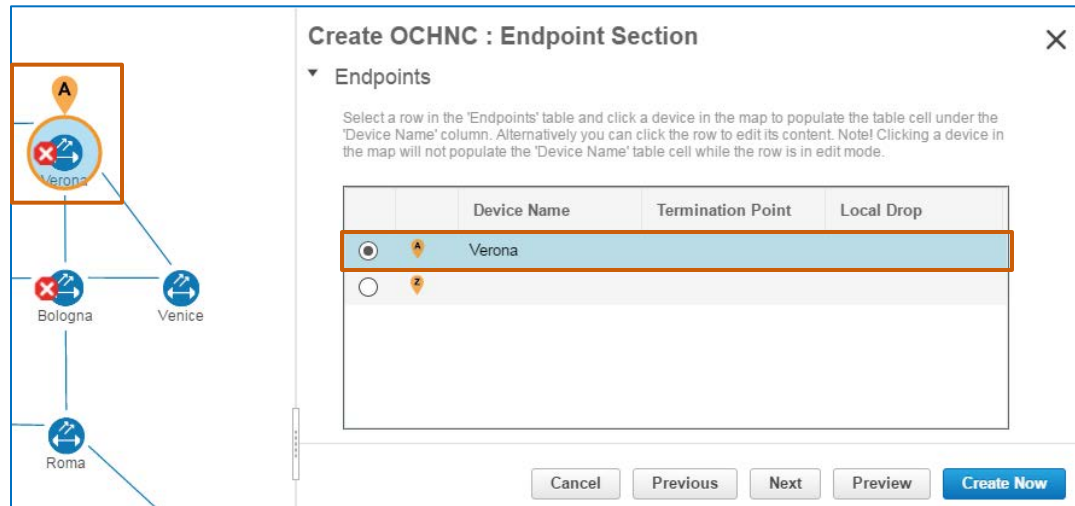



**Tip:** If you open the **Endpoint Section** page and the endpoint rows do not appear, click **Cancel**.  
The wizard returns you to the initial page with its default settings.  
Re-enter the data up to the point of opening the **Endpoint Section** page.  
The endpoints rows will be available editing.

11. To select the **A** endpoint, on the map, click the icon of the device with the port that you need to configure.



The system applies the **A** icon to the device icon and, in the **A** endpoint row, populates the **Device Name** field with the device name.



**Create OCHNC : Endpoint Section**

▼ Endpoints

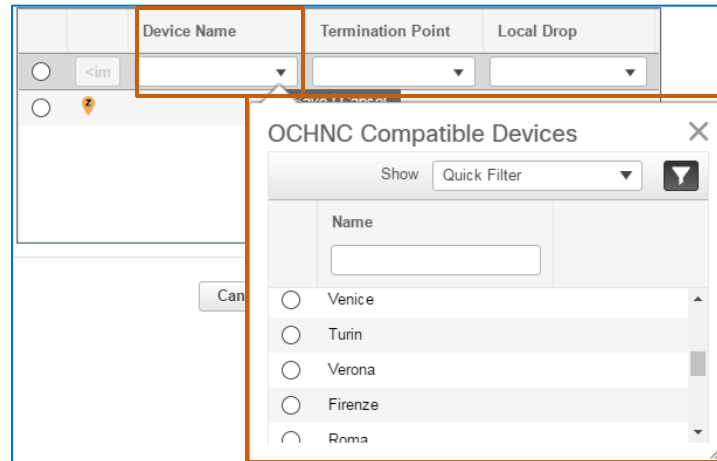
Select a row in the 'Endpoints' table and click a device in the map to populate the table cell under the 'Device Name' column. Alternatively you can click the row to edit its content. Note! Clicking a device in the map will not populate the 'Device Name' table cell while the row is in edit mode.

	Device Name	Termination Point	Local Drop
<input checked="" type="radio"/> A	Verona		
<input type="radio"/> Z			

Cancel Previous Next Preview **Create Now**



**Tip:** You also can click the **Device Name** field in an endpoint row to open a list of compatible devices from which you can select an endpoint.



	Device Name	Termination Point	Local Drop
<input type="radio"/> <im			
<input type="radio"/> Z			

OCHNC Compatible Devices

Show Quick Filter

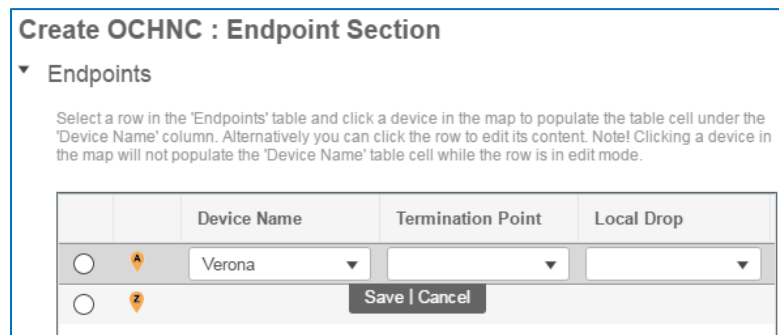
Name

☐ Venice  
☐ Turin  
☒ Verona  
☐ Firenze  
☐ Roma

Save | Cancel

- To select the **A** endpoint device ports to use for communication, click the **A** endpoint row.

The row becomes available for editing and the system populates the **Termination Point** drop-down list with all of the device's ports that are available for provisioning.



**Create OCHNC : Endpoint Section**

▼ Endpoints

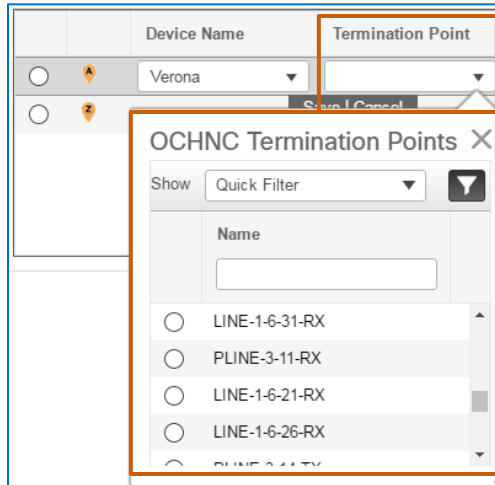
Select a row in the 'Endpoints' table and click a device in the map to populate the table cell under the 'Device Name' column. Alternatively you can click the row to edit its content. Note! Clicking a device in the map will not populate the 'Device Name' table cell while the row is in edit mode.

	Device Name	Termination Point	Local Drop
<input checked="" type="radio"/> A	Verona		
<input type="radio"/> Z			

Save | Cancel

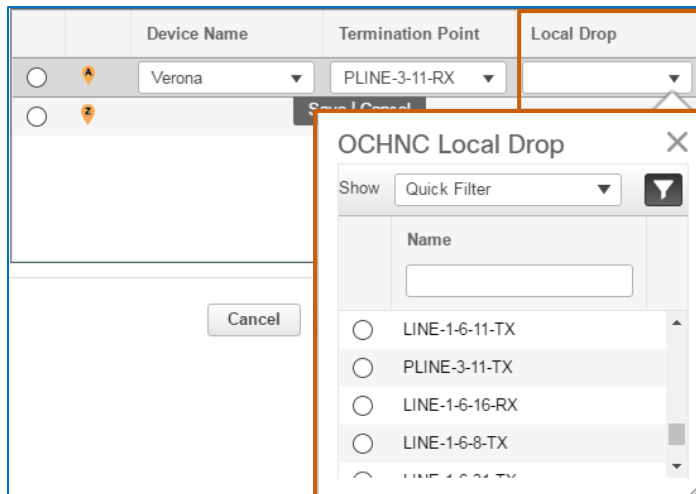
13. To configure the communication direction between the **A** and **Z** endpoints, on the **A** endpoint device:

- a. In the **Termination Point** drop-down list, select the device receiving (RX) port, which indicates the port that introduces the signal into the system and transmits data to the termination endpoint (TX) port on the **Z** endpoint.




**Important Note:** When populating the **Termination Point** drop-down list, the system filters the list to display the ports that are applicable to the devices that you select, and that are available for provisioning.

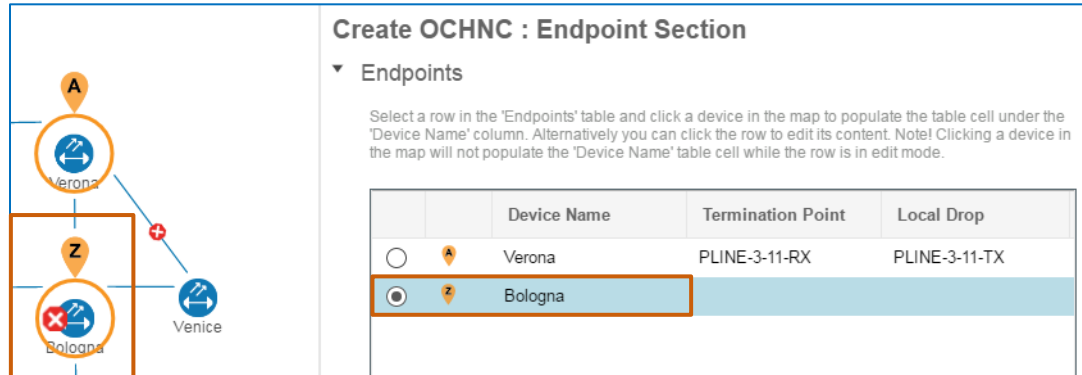
- b. In the **Local Drop** drop-down list, select the device port, which indicates the transmitting (TX) port to which the **Z** endpoint local drop (RX) port transmits data.



- c. Below the row, click **Save**. The system saves your changes.

14. To select the **Z** endpoint, click the **Z** row option button, and then, on the map, click the icon of the device with the port that you need to configure.

The system applies the **Z** icon to the device icon and, in the **Z** endpoint row, populates the **Device Name** field with the device name.



**Create OCHNC : Endpoint Section**

▼ Endpoints

Select a row in the 'Endpoints' table and click a device in the map to populate the table cell under the 'Device Name' column. Alternatively you can click the row to edit its content. Note! Clicking a device in the map will not populate the 'Device Name' table cell while the row is in edit mode.

	Device Name	Termination Point	Local Drop
<input type="radio"/>	Verona	PLINE-3-11-RX	PLINE-3-11-TX
<input checked="" type="radio"/>	Bologna		

15. To select the **Z** device ports to use for communication, click the **Z** endpoint row.

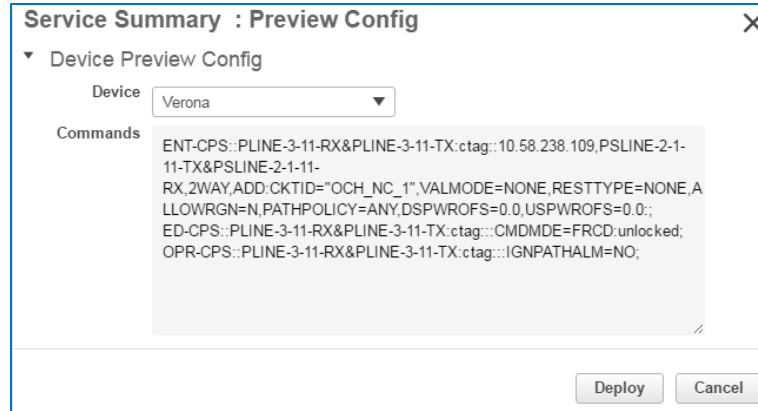
The row becomes available for editing and the system populates the **Termination Point** drop-down list with all of the device's ports.

16. To configure the communication direction between the **Z** and **A** endpoints, on the **Z** endpoint device,:
  - a. In the **Termination Point** drop-down list, select the device transmitting (TX) port, which indicates the port that receives the data from the termination endpoint (RX) port on the **A** endpoint.
  - b. In the **Local Drop** drop-down list, select the device port, which indicates the receiving (RX) port that introduces the signal into the system and transmits data to the local drop (TX) port on the **A** endpoint.
  - c. Below the row, click **Save**. The system saves your changes.
17. To evaluate the TL1 output that the system will send based on the settings, click **Preview**.



**Tip:** Cisco recommends that you preview the TL1 output before deploying it to help ensure that provisioning will occur as expected.

In the wizard, the **Service Summary: Preview Config** page opens. The **Device** field indicates the **A** endpoint and the **Commands** field displays the TL1 output that the system will send to the **A** endpoint device.



The dialog box titled "Service Summary : Preview Config" shows a "Device Preview Config" section with a "Device" dropdown set to "Verona". The "Commands" field contains the following TL1 output:

```
ENT-CPS::PLINE-3-11-RX&PLINE-3-11-TX:ctag::10.58.238.109,PSLINE-2-1-11-TX&PSLINE-2-1-11-RX,2WAY,ADD:CKTID="OCH_NC_1",VALMODE=NONE,RESTTYPE=NONE,ALLOWRGN=N,PATHPOLICY=ANY,DSPWROFS=0.0,USPWROFS=0.0;;ED-CPS::PLINE-3-11-RX&PLINE-3-11-TX:ctag::CMDMDE=FRCD:unlocked;OPR-CPS::PLINE-3-11-RX&PLINE-3-11-TX:ctag::IGNPATHALM=NO;
```

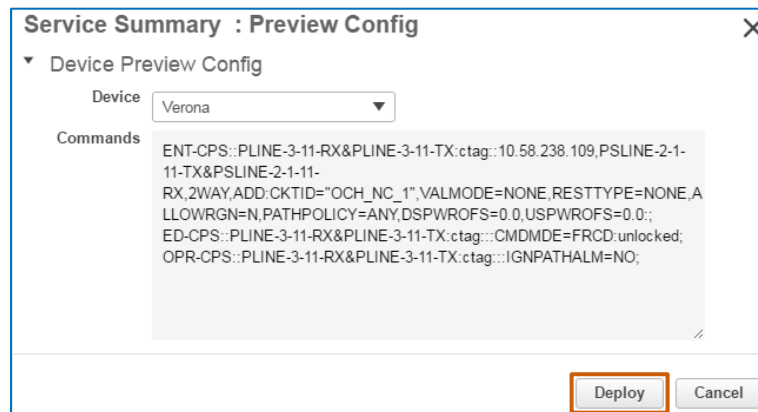
At the bottom right, there are "Deploy" and "Cancel" buttons.



**Note:** When provisioning OCH services on NCS 2000 devices, you see only one device in the preview because OCH services are GMPLS-signaled from one end only.

In this case, EPNM instructs the first device on how to provision the service, and then the control plane on that device handles provisioning the service end-to-end.

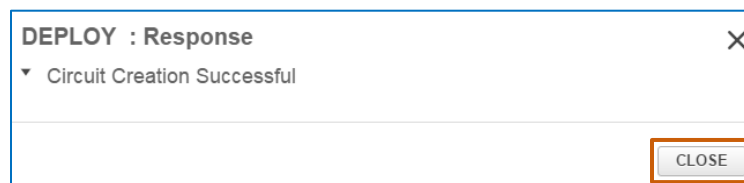
18. To start the auto-provisioning process, in the **Service Summary: Preview Config** dialog box, click **Deploy**.



This is the same dialog box as above, but the "Deploy" button is highlighted with an orange rectangle.

The system starts the provisioning action. When the system has deployed the TL1 output, a system message opens in the wizard, indicating deployment results.

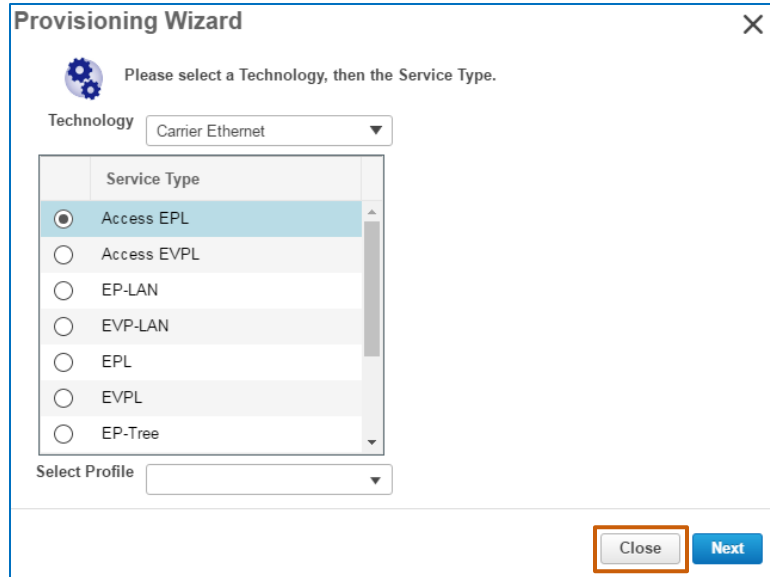
19. To continue, on the **Deploy: Response** page, click **Close**.




The dialog box titled "DEPLOY : Response" shows a "Circuit Creation Successful" message. At the bottom right, there is a "CLOSE" button highlighted with an orange rectangle.


The message closes, and the system returns to the **Provisioning Wizard** default start page.

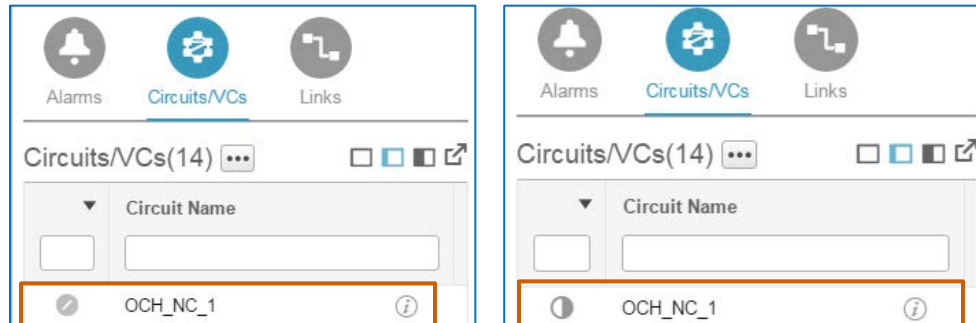
20. In the **Provisioning Wizard**, click **Close**.




The **Provisioning Wizard** closes.

In the **Circuit/VCs** list, the system lists the circuit with a gray **Missing** icon , which indicates that the system has not yet added or discovered the circuit.

As circuit provisioning progresses, the icon transitions to a gray **Partially Discovered** icon  icon.



When the circuit is online and EPN Manager has discovered it, the icon transitions to a green arrow  icon. At this point, the process is complete and the circuit is available on the network.



**Note:** The provisioning process for an auto-provisioning task takes approximately 5 minutes to complete.

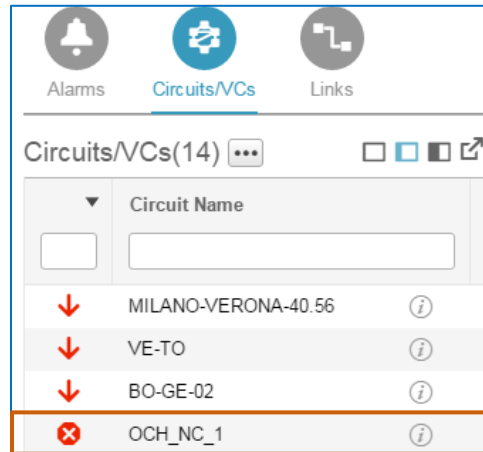
In more complex provisioning scenarios, the system can take significantly more time. For example, the timeline will be longer when provisioning a circuit with complex working and protection route settings combined with a series of working and protected route constraints.

In this case, the OCH NC circuit is up and at least one device is reporting a critical alarm.



**Note:** When circuits are up and indicating alarms, the system displays an indicator for the highest severity alarm that at least one of the devices is reporting.

This feature can prompt you to take action, as needed, to clear any issues that might affect the service that you provisioned.



**Note:** This job aid introduces you to use several methods of validating and evaluating a circuit.

Future demonstrations and related job aids will address evaluating and resolving alarm situations.

To validate or review the provisioned circuit in more detail:

- ❖ [You can use the methods available for validating and evaluating it.](#)



**Tip:** To see the types of default data that the system is applying during auto-provisioning, [you can review the optical provisioning settings for complex orders.](#)

## Optical Provisioning Settings for Complex Orders

When fulfillment requests require complex configuration, optical provisioners can configure provisioning settings.



**Important Note:** Optical provisioners require expert knowledge of optical networking technologies and devices to configure provisioning settings most effectively and efficiently.

This knowledge also helps avoid incorrectly provisioned circuits or provisioning failures.



**Note:** The system settings that optical provisioners can configure vary based on the technology and service type that they are provisioning. The settings that this job aid addresses are available when provisioning OCH network connection circuits.



**Tip:** You can accept the default settings that are applicable, configuring only those settings that the circuit requires.

### To prepare for complex provisioning:

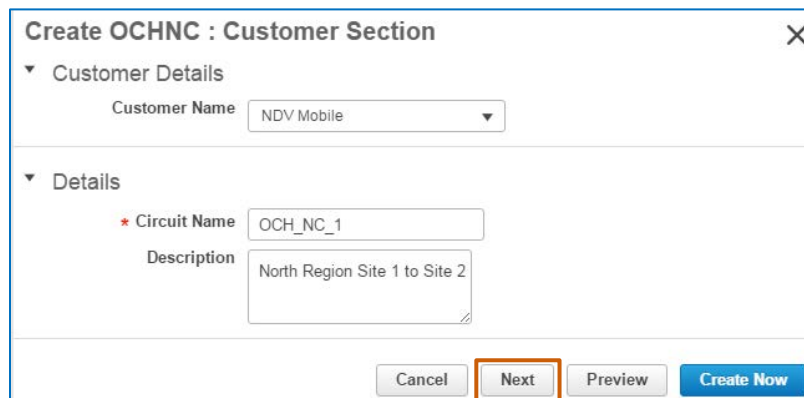
- ❖ Identify the devices and associated ports that will support each circuit endpoint.



**Tip:** When identifying devices and ports, it is optimal to understand their relationships in the network, which can help ensure that the circuit behaves as expected when it comes online.

### To provision an OCH NC circuit and configure specific settings:

1. [Follow auto-provisioning process steps 1 through 8](#), and then go to step 2.
2. To configure the circuit properties, click **Next**.



The wizard opens the **Circuit Section** page.



**Note:** For more information on the types of circuit settings that optical provisioners can configure, [refer to the Configuring Circuit Properties topic](#).

3. To configure the device endpoints, click **Next**, and then [follow auto-provisioning process steps 10 through 16](#).

4. To configure route constraints, which specify the working and protection routes that the circuit can use, on the **Endpoint Section** page, click **Next**.

The **Constraints Section** page opens.

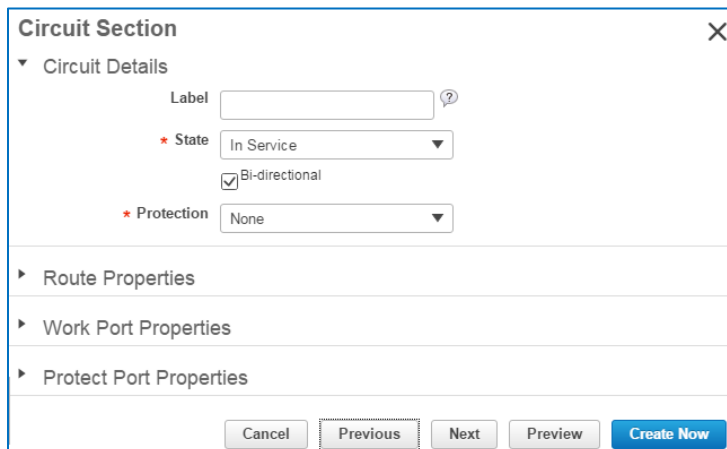


**Note:** For more information on configuring circuit routes, [refer to the \*\*Configuring Circuit Route Constraints\*\* topic](#).

5. To start the provisioning process, [follow auto-provisioning process steps 17 through 20](#).
6. [The system provisions the circuit following the auto-provisioning process](#).
7. To validate or review the provisioned circuit in more detail, [you can use the methods available for validating and evaluating it](#).

## Configuring Circuit Properties

After adding the customer and circuit names, the **Circuit Section** page opens with the **Circuit Details** open by default.



The screenshot shows the 'Circuit Section' form with a close button (X) in the top right corner. The form is divided into several sections: 'Circuit Details' (expanded), 'Route Properties', 'Work Port Properties', and 'Protect Port Properties'. The 'Circuit Details' section contains the following fields: 'Label' (text input), 'State' (dropdown menu with 'In Service' selected), 'Bi-directional' (checkbox, checked), and 'Protection' (dropdown menu with 'None' selected). At the bottom of the form, there are five buttons: 'Cancel', 'Previous', 'Next', 'Preview', and 'Create Now'.



**Note:** This topic summarizes the circuit settings that are available for configuration.

For field level definitions, [refer to the \*\*Circuit Section Reference\*\* for the \*\*OCH Circuit Types\*\* topic of the \*\*Cisco Evolved Programmable Network Manager 2.0 User and Administrator Guide\*\*](#).



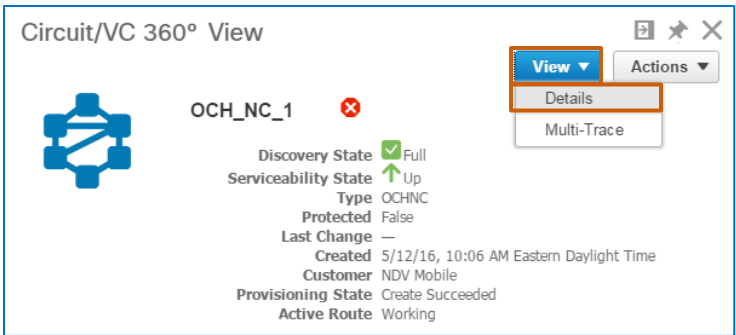
### Circuit Details

In the **Circuit Details** section, optical provisioners can:

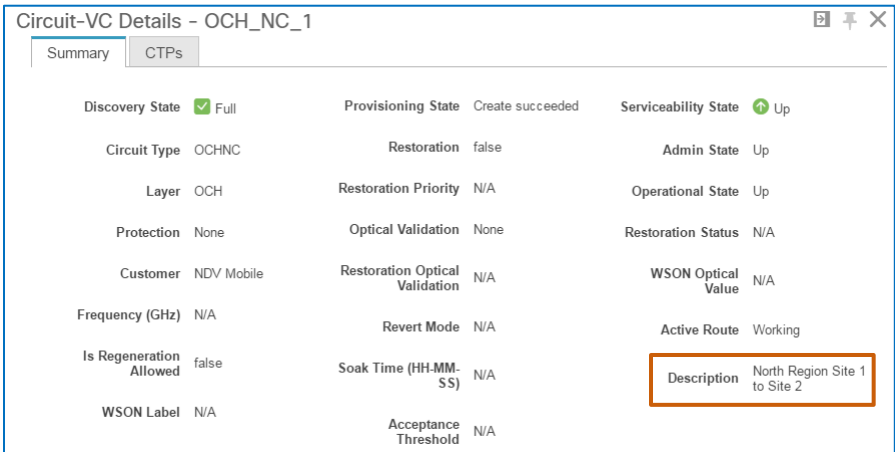
- ❖ Add a unique attribute to distinguish circuit use or other information



**Note:** When you add label information, it appears in the Description field, which you access by opening the **Circuit/VC 3600 View** pop-up window, and then selecting **Details** in the **View** drop-down menu.



The pop-up window refreshes to display circuit details.



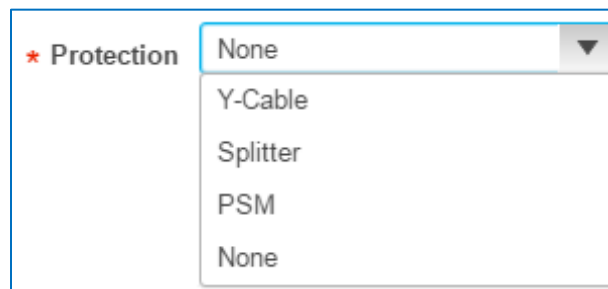
- ❖ Configure whether the state of the circuit is online or offline when provisioning is complete.

Continued on next page...

- ❖ Configure whether the system applies an applicable method of keeping a circuit online in the event of failure of the primary, or working, route, referred to as protection.



The type of protection route that you can configure varies based on the type of optical circuit that you are provisioning and the version of EPN Manager that is running.



Protection types can include:

- ◆ Y-Cable
- ◆ Splitter
- ◆ Protection Switching Module (PSM)

## Route Properties

In the **Route Properties** section, optical provisioners can:

- ❖ Configure a minimum, standardized threshold of quality to the circuit's working route.
- ❖ Configure whether, in the event that the primary circuit route does not meet the quality threshold, the system can attempt to provision alternate route that does meet the quality threshold.
- ❖ When you allow restoration, configure a minimum, standardized threshold of quality to the circuit's alternate route.



**Important Note:** When you configure a threshold, the system must be able to find a route that meets the minimum quality standard that you set or provisioning will fail.

Route Properties

Validation

None

Acceptance Threshold

Green

☐ Ignore Path Alarms
 ☐ Allow Regeneration
 ☐ Restoration

Priority

High

Restoration Validation

None

Restoration Acceptance Threshold

Green

Revert

☒ None
 ☐ Manual
 ☐ Automatic

Soak Time

0

00

00

## Work Port Properties

In the **Work Port Properties** section, optical provisioners can:

- ❖ Configure the bandwidth and frequency of the ports of the endpoint devices that comprise the circuit's working route.

Work Port Properties

☒ Auto Provisioning

C Band

Wavelength/Frequency

☐ Preferred
 ☒ Required

## Protect Port Properties

In the **Protect Port Properties** section, optical provisioners can:

- ❖ When configuring a protected route, configure the bandwidth and frequency of the ports of the endpoint devices that comprise the circuit's protected, or alternate, route.

▼

Protect Port Properties

☐ Copy from Work Port
   
☒ Auto Provisioning

C Band

Wavelength/Frequency

☐ Preferred
 ☒ Required

## Configuring Circuit Route Constraints

After adding the circuit endpoints, click **Next**. The **Constraints** page opens.

In the **Constraints** section, optical provisioners can:

- ❖ Configure specific routes for the circuit to follow by indicating:
  - ◆ The devices that you want to include in or exclude from the route.
  - ◆ Whether the route constraints apply to the working route, a protected route, or both.

Create OCHNC : Constraints Section

×

▼ Constraints

Click a device node or a link in the map to add it to the 'Constraints' table. Alternatively you can click the '+' button in the table toolbar to add a new row to the table and edit its content. Note! Clicking a device or a link in the map will not populate 'Node/Link Name' table cell while the row is in edit mode.

	Node/Link Name	Include/Exclude	Route
No data available			

Cancel

Previous

Preview

Create Now

Create OCHNC : Constraints Section

×

▼ Constraints

Click a device node or a link in the map to add it to the 'Constraints' table. Alternatively you can click the '+' button in the table toolbar to add a new row to the table and edit its content. Note! Clicking a device or a link in the map will not populate 'Node/Link Name' table cell while the row is in edit mode.

	Node/Link Name	Include/Exclude	Route
<input checked="" type="radio"/>			

Save | Cancel

Cancel

Previous

Preview

Create Now

## Validating and Evaluating Provisioned Circuits

Based on the level of detail that you want to review, EPN Manager presents circuit data, statistics, and performance information by using several methods.

### Reviewing Maps

---

Topological and geographical maps provide a visual representation of circuit relationships among devices in the network.

To learn more about reviewing information by using maps, [refer to the Navigating Cisco EPN Manager 1.2 job aid](#).

### Reviewing Circuit Details

---

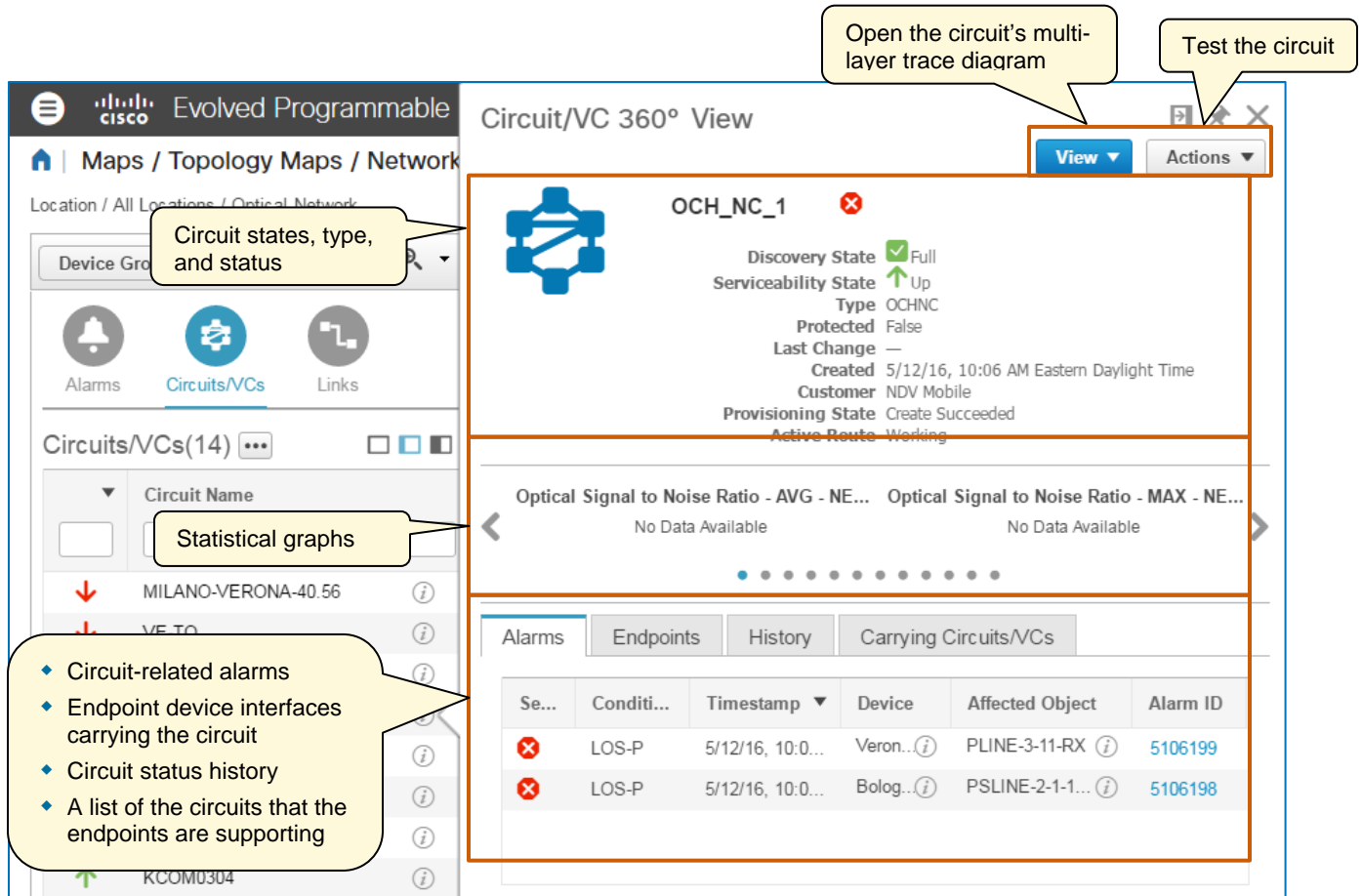
#### The Circuit/VC 360° View

The **Circuit/VC 360° View** pop-up window provides detailed information about the circuit.

It reports the circuit's status, statistics, and current alarms, if alarms are occurring. It also presents key relationships and details about the circuit endpoints.

**To open the view:**

- ❖ In the **Circuit/VCs** list, click the circuit's information button.



**Circuit/VC 360° View**

**OCH\_NC\_1**

Discovery State: Full  
Serviceability State: Up  
Type: OCHNC  
Protected: False  
Last Change: —  
Created: 5/12/16, 10:06 AM Eastern Daylight Time  
Customer: NDV Mobile  
Provisioning State: Create Succeeded  
Active Route: Working

Optical Signal to Noise Ratio - AVG - NE... No Data Available  
Optical Signal to Noise Ratio - MAX - NE... No Data Available

Alarms

Se...	Condi...	Timestamp	Device	Affected Object	Alarm ID
✗	LOS-P	5/12/16, 10:0...	Veron...	PLINE-3-11-RX	5106199
✗	LOS-P	5/12/16, 10:0...	Bolog...	PSLINE-2-1-1...	5106198

**Callouts:**

- Circuit states, type, and status
- Statistical graphs
- Open the circuit's multi-layer trace diagram
- Test the circuit

**Alarms List:**

- ❖ Circuit-related alarms
- ❖ Endpoint device interfaces carrying the circuit
- ❖ Circuit status history
- ❖ A list of the circuits that the endpoints are supporting



**Note:** When reviewing the information in the pop-up window, keep in mind that the system begins reporting statistical data and alarms based on the system monitoring policies and reporting parameters that administrators or users configure.

Monitoring policies define such parameters as device polling frequency, the types of data to report, and reporting thresholds. This means that you might not see statistics, alarms, or other data immediately after device provisioning.

## The Circuit Overlay

The circuit overlay displays the working route that the OCH network connection uses to carry traffic. During auto-provisioning, the system configures the circuit to support bi-directional traffic by default.

The overlay also indicates the device endpoints that support the circuit, including the initiating, or **A**, and the terminating, or **Z**, endpoint. When the traffic is bi-directional, the endpoints do not indicate traffic flow.

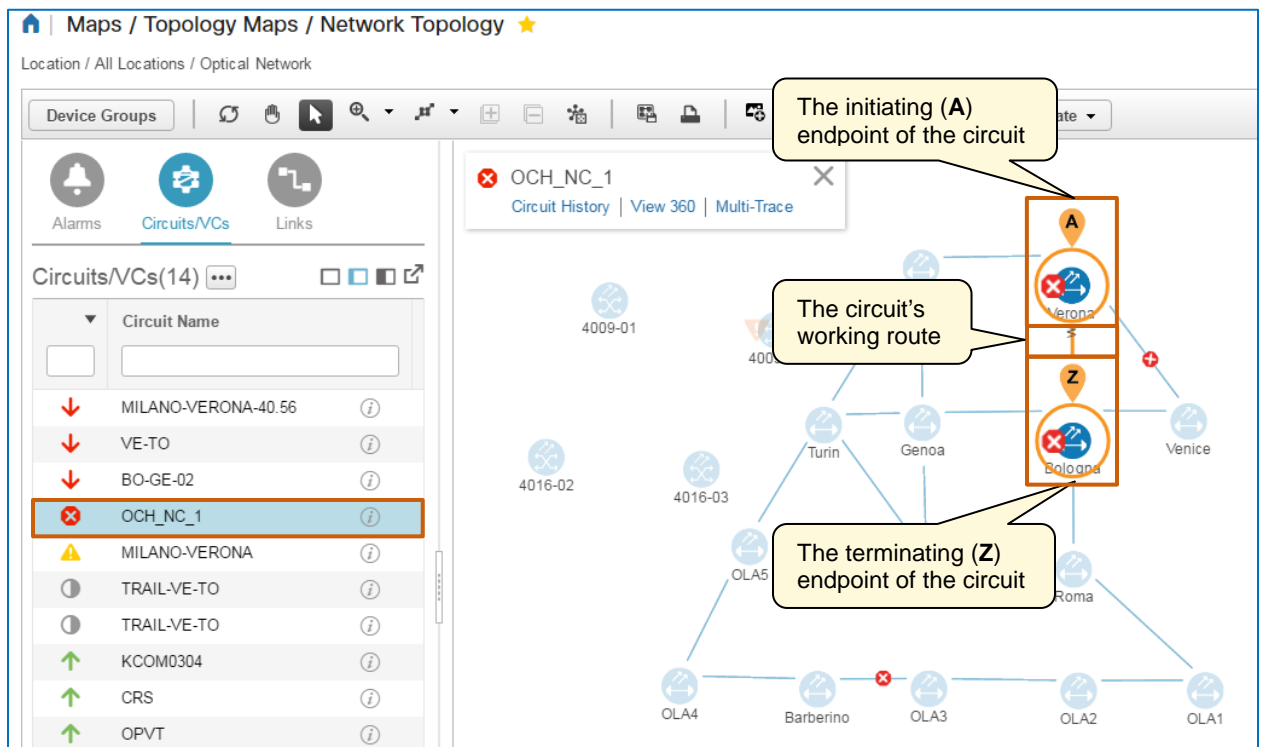


**Note:** When the circuit is uni-directional, traffic flows from the circuit's **A** endpoint to its **Z** endpoint.

Reviewing the circuit overlay after provisioning helps you to ensure that, at a device level, provisioning has occurred as expected.

### To review a circuit's overlay:

- ❖ In the **Circuit/VCs** list, select the circuit row. The overlay appears indicating the devices and associated route or routes.



## The Circuit Multi-Trace Diagram

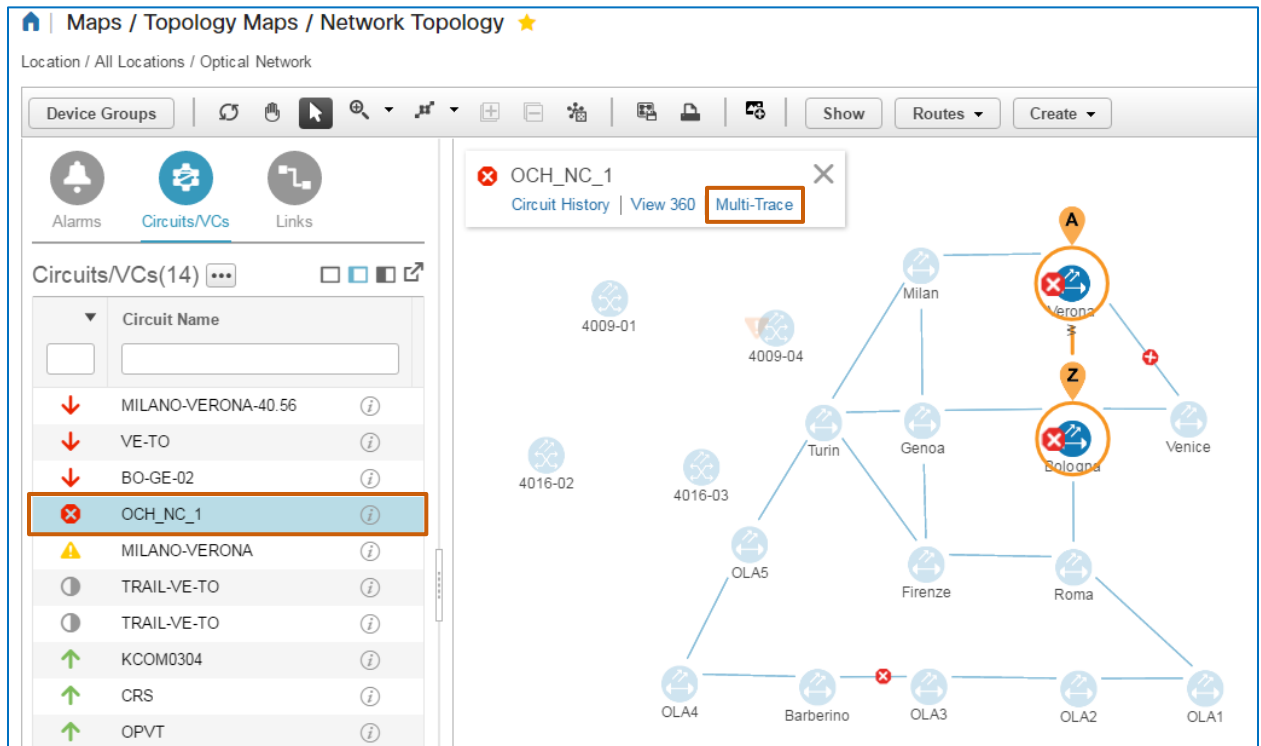
As you continue validating that the OCH network connection is provisioned as intended, you can review the circuit's multi-trace diagram. The diagram provides a detailed view of the optical technology layers that are supporting the circuit's route.



**Tip:** The **Multi-Trace** diagram is helpful when evaluating issues or alarms that the system is reporting on the circuit, also.

### To open the multi-trace:

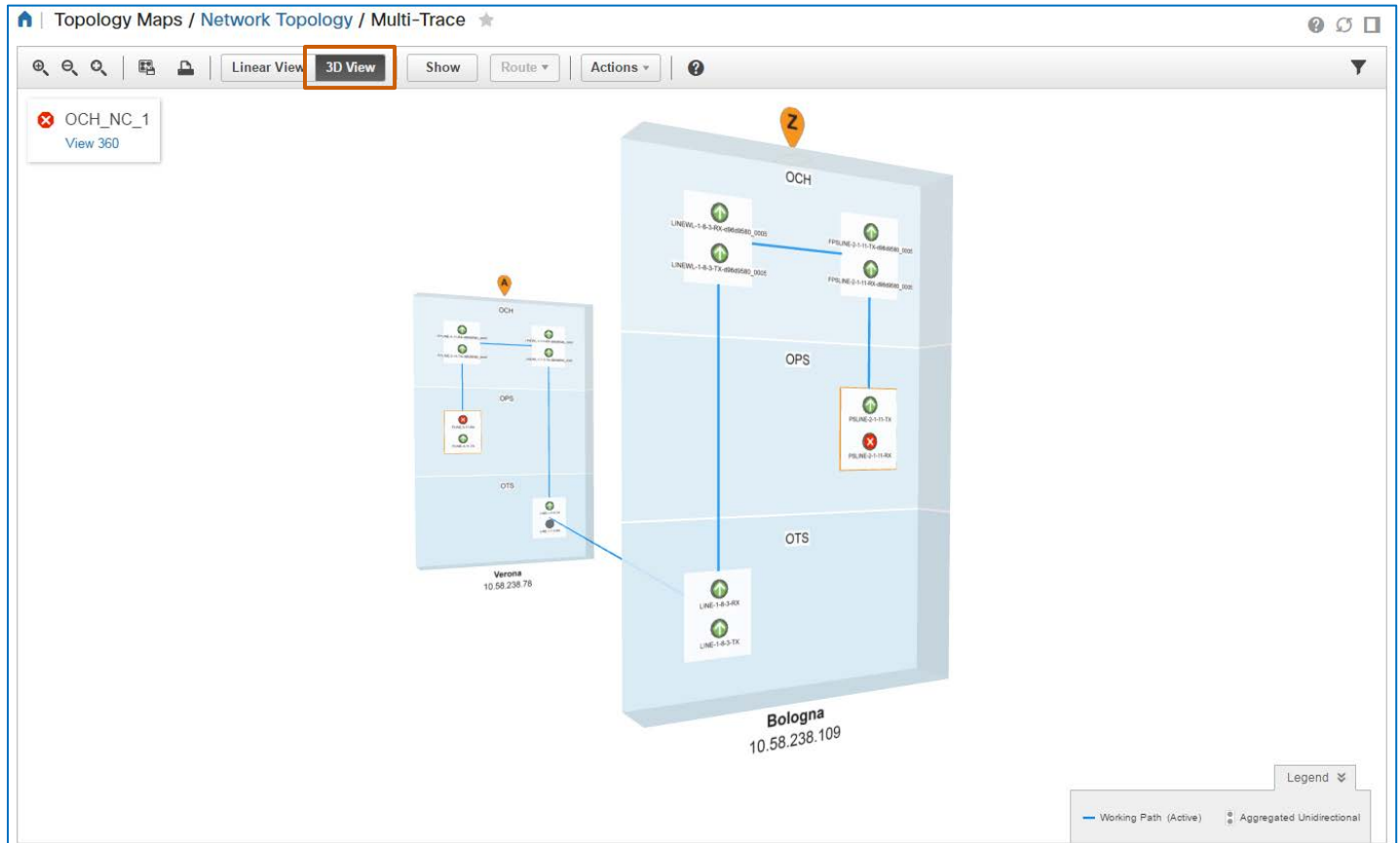
- ❖ In the **Circuit/VCs** list, select the circuit row, and then click **Multi-Trace**.



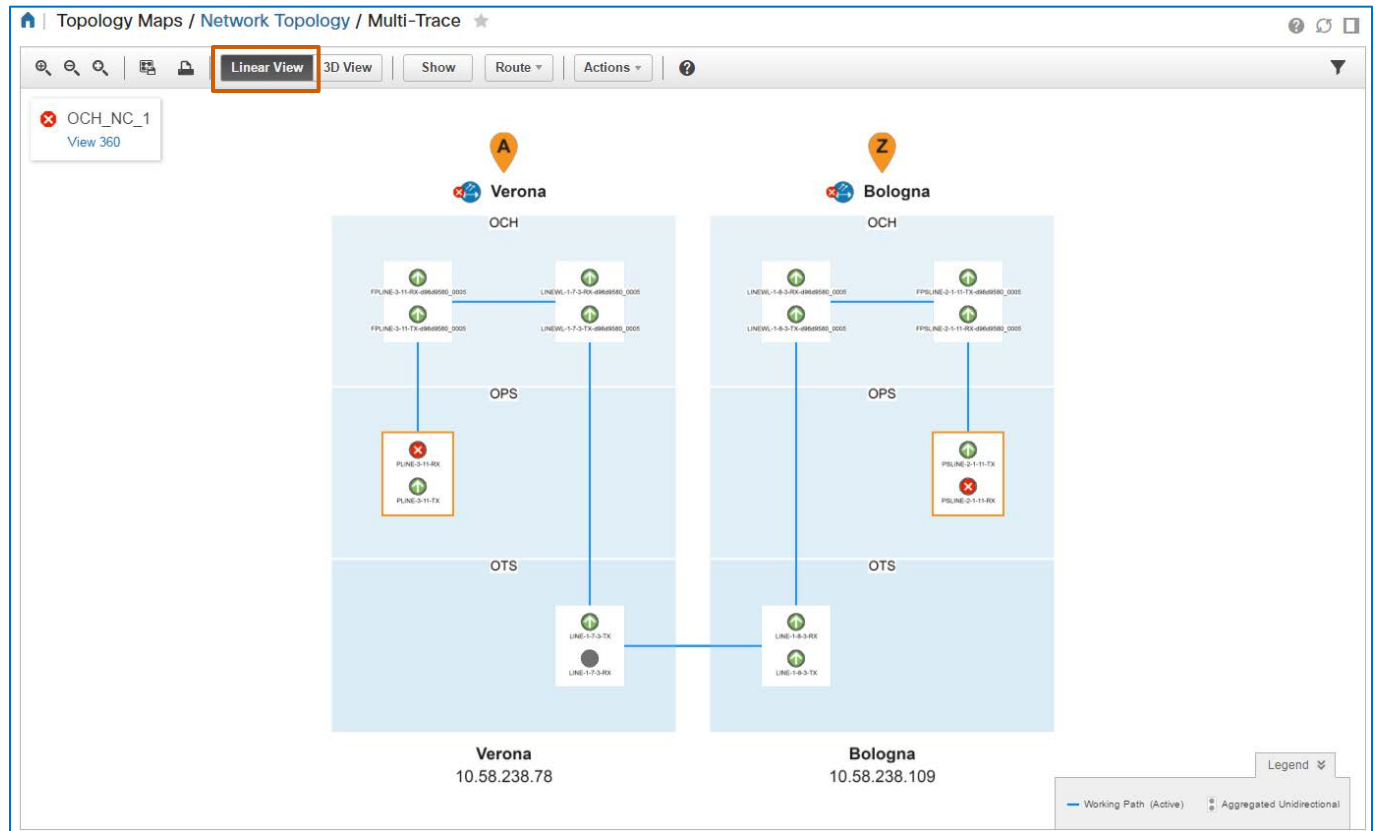


The **Multi-Trace** page opens. The trace illustrates the circuit connectivity from the **A** endpoint device to the **Z** endpoint device through the applicable intermediate points on the optical technology layers.

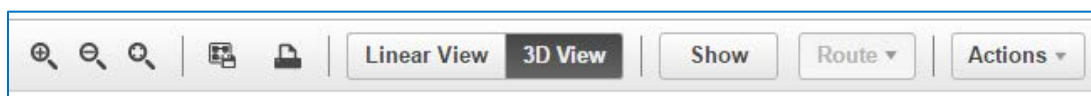
You can apply a three-dimensional view...



...or linear view to the diagram.



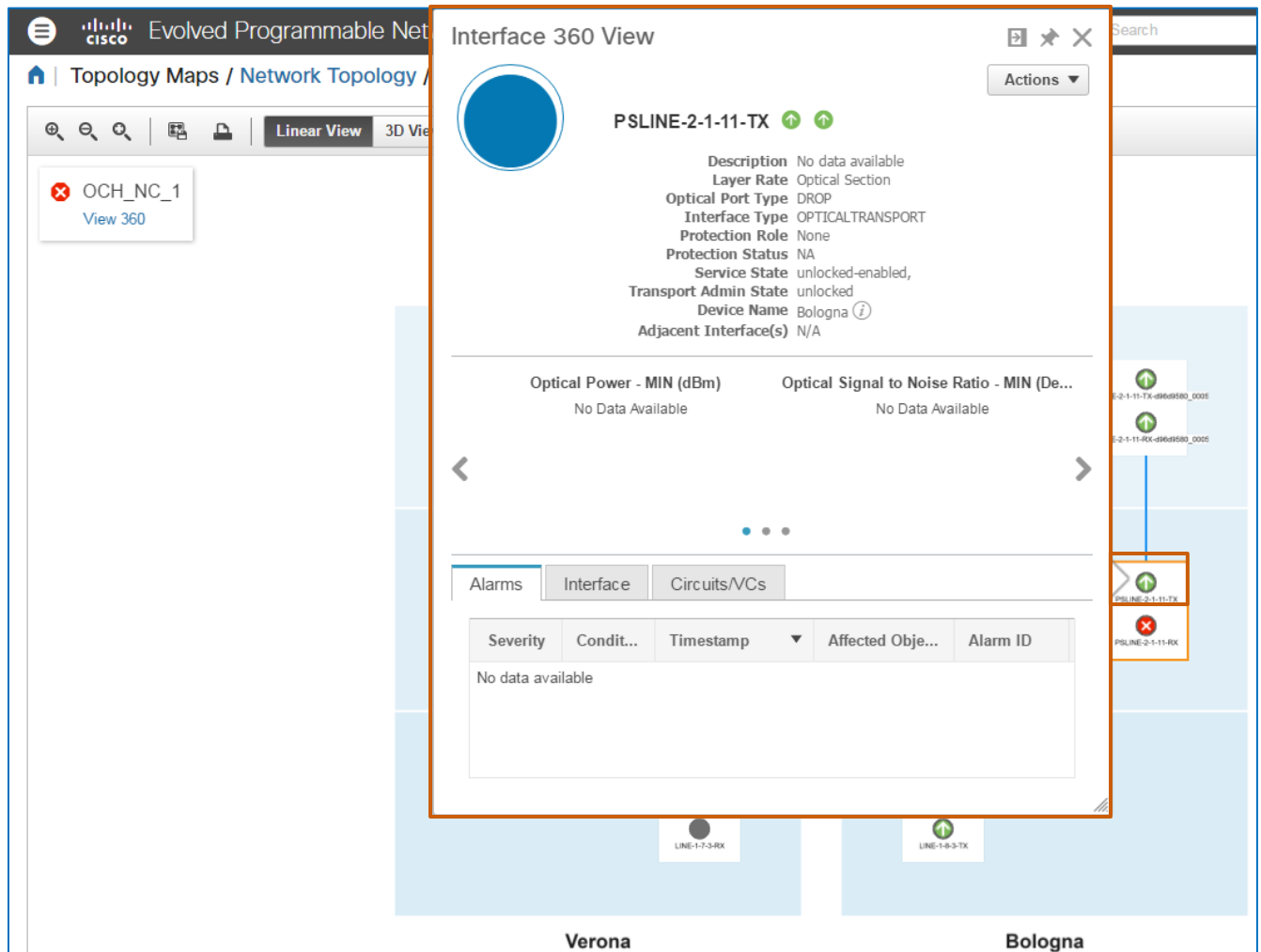
The trace provides tools to manage the diagram layout and the data that appears, and to review circuit details or take actions, such as circuit testing.



You can manage the circuit components at an interface level by opening the **Interface 360 View** pop-up window.

**To open the view:**

- ❖ Click the interface button.



The screenshot displays the Cisco Evolved Programmable Network (EPN) interface. A pop-up window titled 'Interface 360 View' is open, showing details for the 'PSLINE-2-1-11-TX' interface. The interface is highlighted with an orange border. In the background, a network topology map shows two locations: Verona and Bologna. A button labeled 'OCH\_NC\_1 View 360' is visible on the left side of the topology map.

**Interface 360 View Details:**

- PSLINE-2-1-11-TX** (Status: Up)
- Description:** No data available
- Layer Rate:** Optical Section
- Optical Port Type:** DROP
- Interface Type:** OPTICALTRANSPORT
- Protection Role:** None
- Protection Status:** NA
- Service State:** unlocked-enabled,
- Transport Admin State:** unlocked
- Device Name:** Bologna ⓘ
- Adjacent Interface(s):** N/A

**Optical Power - MIN (dBm):** No Data Available

**Optical Signal to Noise Ratio - MIN (De...):** No Data Available

**Alarms:** Interface (Selected)

Severity	Condit...	Timestamp	Affected Obje...	Alarm ID
No data available				

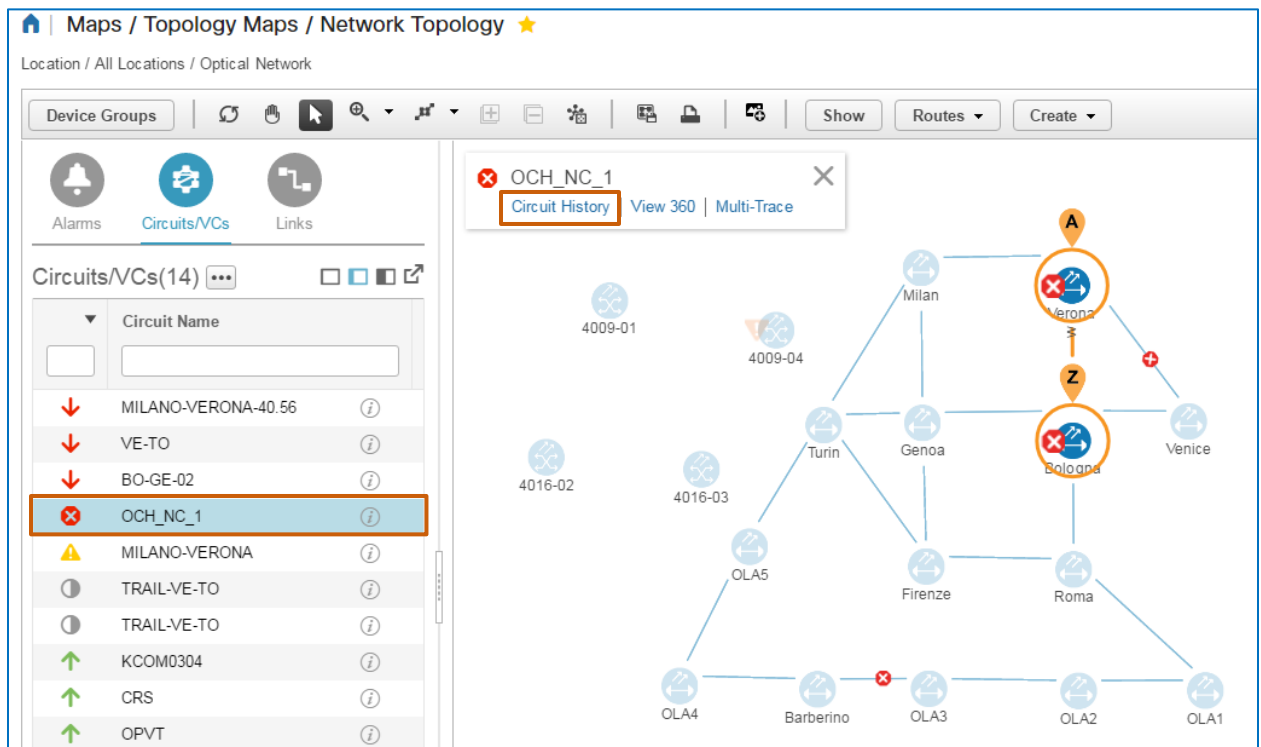
## The Circuit History

When provisioning is complete, the system begins building the circuit history, which captures all of the device or system changes that affect the circuit.

When you initially provision a circuit, you can refer to the history to validate the system has discovered the circuit and determine whether any other changes have occurred immediately after provisioning that affect it.

### To open the circuit history:

- ❖ In the **Circuit/VCs** list, select the circuit row, and then click **Circuit History**.



The screenshot displays the Cisco Network Topology interface. On the left, the 'Circuits/VCs' list is shown with 14 entries. The entry 'OCH\_NC\_1' is highlighted with a red border and a red 'X' icon. A tooltip for 'OCH\_NC\_1' is visible, showing 'Circuit History' (highlighted with a red box), 'View 360', and 'Multi-Trace'. The main area shows a network topology map with various nodes and links. The nodes include Milan, Verona, Bologna, Venice, Turin, Genoa, Firenze, Roma, OLA5, OLA4, Barberino, OLA3, OLA2, and OLA1. The links are represented by blue lines connecting the nodes. The interface also includes a top navigation bar with 'Maps / Topology Maps / Network Topology' and a search bar.

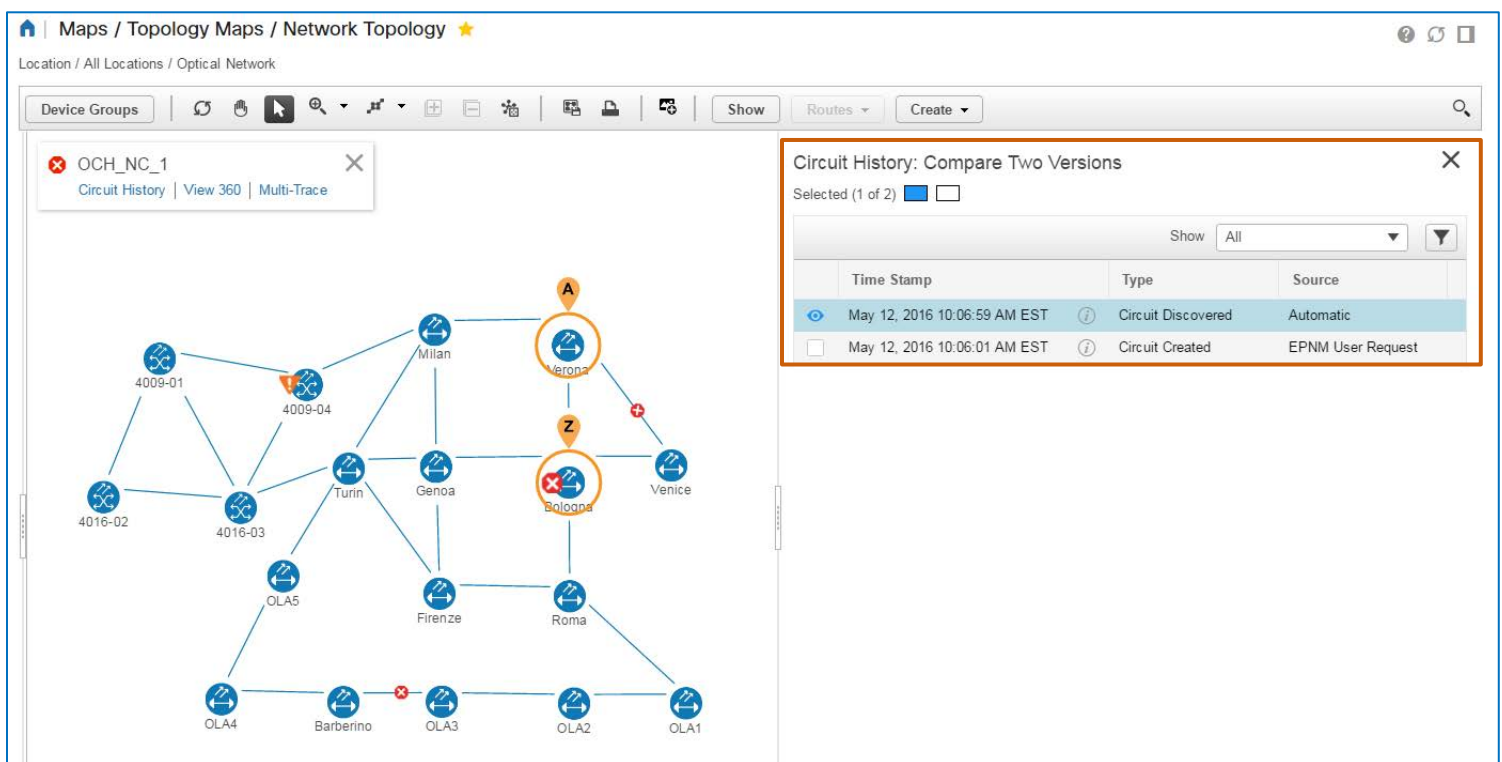
The **Circuit History** opens on the right side of the map and lists the network activity that affects the circuit.



**Note:** In new (greenfield) deployments, the history of a newly provisioned circuit reports two actions:

- ❖ The first entry reports that the commands that you configured in EPN Manager have been deployed to the network, which then follows those commands to execute the provisioning process.
- ❖ When provisioning is complete, the circuit history reports that EPN Manager has discovered the provisioned circuit, which means it is available for use.

In previously existing (brownfield) deployments, the circuit history reports only whether EPN Manager has discovered the circuit.



The screenshot shows the Cisco EPN Manager interface. On the left, a network topology map displays various nodes (routers/switches) and their connections. Nodes are labeled with IDs like 4009-01, 4009-04, 4016-02, 4016-03, OLA5, OLA4, Barberino, OLA3, OLA2, OLA1, Milan, Genoa, Turin, Firenze, Roma, Bologna, Verona, and Venice. Some nodes have status icons (green for active, red for error). On the right, the 'Circuit History: Compare Two Versions' panel is open for circuit 'OCH\_NC\_1'. It shows a table of actions:

Time Stamp	Type	Source
May 12, 2016 10:06:59 AM EST	Circuit Discovered	Automatic
May 12, 2016 10:06:01 AM EST	Circuit Created	EPNM User Request



**Tip:** Information in the circuit history can be helpful when you are evaluating issues or alarms that the system is reporting on the circuit.

You can review actions that the system or system users have taken that might be affecting the circuit's behavior or connectivity. For example, changes might occur that cause the circuit to switch from the working route to the protected route based on the route configuration.

# Video Demonstration

## *Watching Demonstrations*

---

### To watch a demonstration:

- ❖ Click a link, which opens an MP4 file.

Based on your system and configuration, you might need to start the video manually.



**Notes:** Video download and streaming times can vary.  
Demonstrations do not include narration.

## Fulfilling Orders for Optical Services

### Watch the Demonstration



To review the process for provisioning an OCH NC circuit, [watch the Fulfilling Orders for Optical Services video](#).

Approximate runtime: 11:00

# Links

## To Product Information

[Visit the Cisco Web site to learn more about EPN Manager.](#)

[Visit the Cisco Web site to review or download technical documentation.](#)

## To Training

[Visit the Cisco Web site to access other EPN Manager learning opportunities.](#)

[Visit the Cisco Web site to access learning opportunities for other Cisco products.](#)

## To Contact Us

[Send us a message with questions or comments about this job aid.](#)



**Note:** Please send messages that address the content of this job aid or other training questions only.

Please follow your regular business process to request technical support or address technical or application-related questions.