Node Functional View

This chapter describes the Node Functional View (NFV) used in Cisco Optical Site Manager and its related tasks.

Table 1: Feature History

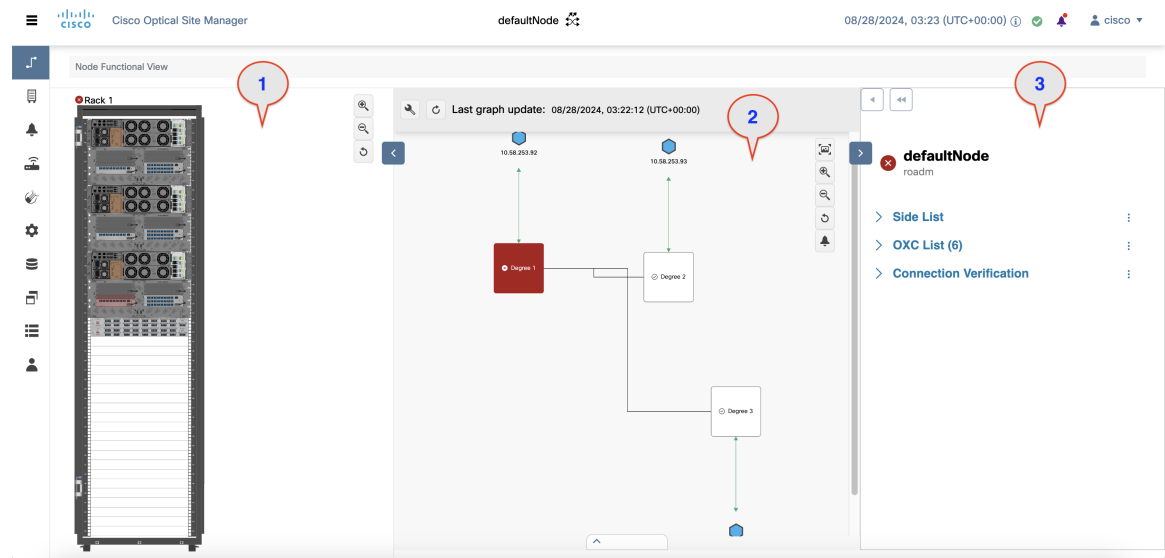| Feature Name	Release Information	Description
Detailed View in NFV for Transponder and Muxponder Card on Third-party OLS Networks	Cisco IOS XR Release 24.2.1	The Node Functional View (NFV) has been enhanced to provide a detailed view of transponder and muxponder cards on NCS1014 deployed within networks utilizing third-party Optical Line Systems (OLS). This detailed view provides a graphical representation of the connections between the trunk and client ports on the transponder and muxponder cards, thereby simplifying the visualization of the network's connection layout.
Detailed View in NFV for Transponder and Muxponder Cards on OLS Networks	Cisco IOS XR Release 24.1.1	You can now access a detailed graphical representation of the connections between the trunk and client ports of the transponder and muxponder cards on Optical Line System (OLS) NCS 1010 networks. This is available in the Map View of Node Functional View (NFV). This view is based on the card mode configured on the cards. When you access the detailed view, the right-panel of the Node Functional View displays the card mode details and a list of ports and their settings.

Understanding Node Functional View

The Node Functional View (NFV) provides a visual representation of a network rack, including the node and its associated components, such as cards and chassis. You can also add or manage chassis and passive units, switch between different views, and explore detailed maps of physical connections.

Additionally, NFV enables interaction between the Map and Rack views, allowing you to highlight and zoom in on specific components and their connections, such as optical cross-connections and port details.

Figure 1: Node Functional View

This table describes the three views available in the NFV:

Number	View	Description
1	Rack view	Displays a visual representation of a rack, including the node and its cards. **How to Access:** Click the **Collapse Shoulder** button to expand and collapse this view. In this view, you can: • Add Chassis or Passive Unit • Open, Delete or View Chassis Details • Open, Delete or View Card Details

Number	View	Description
2	Map view	Displays a visual map of the components of the node (sides, cards, and so on), connected by patch cords according to physical connections. In this view, you can: • **Switch Between Contexts and Views** You can switch between node view, side view, card view, circuit view, port view, and patch cord view. Based on the chosen context, the relevant details are displayed in the Detailed view of the screen. • **Map View Interaction with Rack View:** Open a node or a branch in the map view, the cards associated with them are highlighted in the Rack view. Similarly, when you open a card in the map view, the card is zoomed in and the corresponding rack is highlighted and zoomed in the Rack view. • **View Connections:** You can view the connection between the trunk and client ports on a card as well as the Internal Patch Cords (IPC) connecting the devices and line cards. The connections are based on the card modes configured on a card.

Number	View	Description
3	Detail view	Displays all relevant information about nodes, sides, cards, circuits, ports, or patch cords. In this view, you can view: • Optical Degrees • Optical Cross Connections • Verify connections • Card mode details • Ports list • Port settings and details **How to Access:**Click the **Collapse Shoulder** button to expand and collapse this view.

Action Icons in NFV

Icon	Description
	Resets the zoomed view to normal view.
Refresh	Refreshes the Map view with current information.
	Expands or collapses the Rack or Detailed view.
	Displays or hides the alarms icon in the Map and Detailed view. 1. Click this button. 2. Select or deselect the alarm icons in the drop-down list to display or hide the alarms icon in the Map and Detailed view.
User Settings	Sets the user preferences. For more details, see Set User Preferences, on page 19.

Icon	Description
Zoom In	Zooms in the Rack or Map view.
Zoom Out	Zooms out the Rack or Map view.
Zoom Out	Navigates to the default view in the Map view.
Zoom Out	Navigates to the previous page in the Map View.
Zoom Out	Expands or collapses the Alarms section.
Zoom Out	Magnifies the selected area of the Map view, providing a closer and more detailed view of that specific section.

View Details of Node

Use this task to view the details of a node in the Node Functional View. This includes a list of the nodes, active circuits, and the connections between the line cards and passive modules.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2   Click **Collapse Shoulder** to expand the right-panel.
The right-panel displays the details of the node.

Table 2: Node Details

Field	Description
Side List	Displays a list of the nodes along with its details, such as span loss value, the IP address of the device it is connected to, and its degree.
OXC List	Displays a list of active circuits passing through a particular card. For more details, see View Active Circuit List, on page 20.
Connection Verification	Displays a list of the connections between the line cards and all passive modules. For more details, see Connection Verification, on page 17.

View Details of OLS Node

Use this task to view the details of a node in NFV.

Note   In OLA database, all the cards must be placed in the same degree and only one degree must be present in the node.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2   Click **Show/Hide Shoulder** to open the right shoulder.

Step 3   View the **Name**, **Topology**, and **Status** fields in the right shoulder.

The **Status** field shows the most severe problem on the node.

Step 4   View the **Side List** pane that has two tabs - **Info on side** and **Display Neighbors**.

The **Info on side** tab displays the following information:

- Current status

- Span loss for both the sides

- (Optional) OTDR, OSC, and PPC information is displayed when available

The **Display Neighbors** tab displays the list of optional neighbors of the components of the node. The following information is displayed for each side:

- Name of the side

- Neighbor node

- At Degree

Step 5   View the **Circuit List** tab that displays the list of all the circuits present in the side.

View Optical Channel Monitoring Data

Log into Cisco Optical Site Manager

Use this task to view the Optical Channel Monitoring (OCM) for the Rx and Tx directions.

Procedure

Step 1   Click **Node Functional View** in the left panel.

Step 2   Right-click an optical degree in the Map view and click **Open**.

Step 3   Expand the panel at the bottom of the page.

Step 4   Click the **OCM** tab.

Step 5   Select **RX** or **TX** to view the OCM data in the receiving or transmitting directions, respectively.

Step 6   Click **Spectrum Occupancy Chart** button to view the spectrum occupancy chart.

Optical Time Domain Reflectometer

Cisco Optical Site Manager enables you to assess fiber quality during system installation (prior to activating traffic) using the Optical Time Domain Reflectometer (OTDR) feature.

Using OTDR on the NCS 1010 device has several benefits.

- Real-time loss and back reflection measurements for the fiber pair connected to the TX and RX ports.

- Monitoring of the fiber during live system operation.

- Inspection of the fiber following cable cut and repair events.
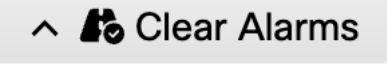
OTDR Graph Navigation and Controls

The table provides an overview of the icons available on the OTDR graph, along with a description of each operation they perform.

Optical Time Domain Reflectometer

Figure 2:

Table 3: OTDR Graph Navigation and Controls

Operation	Icon	Description
Zoom In	—	To zoom into the graph, click the **Shift** button and drag a rectangle that contains just the region you want to zoom into.
Zoom Out	—	Scroll down to zoom out of the graph.
Reset zoom	⌖	Resets the graph to its original zoom and position.
Download Graph Image	📷	Download the graph as an image.
Download SOR File	↧	Download SOR file that contains the fiber trace details such as the distance, reflectance, loss, and fiber attenuation measurements.
Save Scan as Baseline	💾	Save the current OTDR scan results as a baseline.
Clear Alarms	⌃ 🔍 Clear Alarms	Clear the reflections or losses alarms.
Automatic OTDR Scan	🔧	Enable or disable automatic OTDR scan after a fiber cut or Raman Turn Up.

Enable Automatic OTDR Scan

In automatic mode, the OTDR automatically initiates a scan after events such as span faults, span restoration, device power cycles, or line card cold reloads. This automated process swiftly identifies the type of fiber failure and pinpoints the fault location.

Use this task to enable or disable the automatic mode configuration for OTDR.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1 Click **Node Functional View** in the left panel.

Step 2 Right-click an optical degree in the Map view and click **Open**.

Step 3 Expand the panel at the bottom of the page.

Step 4   Click the **OTDR** tab.

Step 5   Scroll to the bottom of the panel and click the **Global OTDR Settings** icon.
Global OTDR Configurations dialog box is displayed.

Step 6   In the **Automatic OTDR Scans Settings** section, perform the following steps:

    a) Select the **System Startup, Fiber Cut & Repair** check box to enable the automatic start of the OTDR scan after a fiber cur or repair.

    b) Select the **Raman Turn Up** check box to enable the automatic start of the OTDR scan after the Raman turn-up process is completed.

Step 7   Click **Apply**.

Run a Manual OTDR Scan

You can manually run an OTDR scan during fiber optic installation, troubleshooting, and maintenance to verify link quality, pinpoint faults, and ensure proper network performance after repairs or modifications.

Use this task to manually run OTDR scan.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** in the left panel.

Step 2   Right-click an optical degree in the Map view and click **Open**.

Step 3   Expand the panel at the bottom of the page.

Step 4   Click the **OTDR** tab.

Step 5   Scroll to the bottom of the panel.

Step 6   Select RX or TX to run the OTDR scan in the RX or TX directions, respectively.

Step 7   Click the **Direction** button to set the OTDR scan sensitivity and threshold values.

Table 4: OTDR Scan Sensitivity and Threshold

Use this option	to
Loss Sensitivity	enable the OTDR scan to detect small signal losses (attenuation) along the fiber. Higher loss sensitivity helps the OTDR identify minor attenuation caused by factors like bends or splices.
Reflection Sensitivity	enable the OTDR scan to detect reflected signals from events such as connector interfaces, splices, or breaks. High reflection sensitivity is crucial for accurately locating and analyzing reflective faults in the fiber.

Use this option	to
Absolute Threshold	ensure that the OTDR scan can reliably detect and measure the lowest signal strength, allowing the OTDR to provide accurate and meaningful data essential for identifying weak signals or long-distance faults.
Unprovision	delete the OTDR scan results in the selected direction.

Step 8 Click **Start Scan** button to start OTDR scan.
The OTDR-SCAN-IN-PROGRESS-RX alarm is raised and displayed ion the **Alarms** tab of the **Fault Monitoring** menu.

Step 9 Click **Stop Scan** button to terminate the OTDR scan.

An informational message appears indicating that the OTDR scan has been terminated.

The scan results are displayed in the graph.

View Details of Side

Use this task to view the details of the side in NFV.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1 Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2 Right-click a side in the map view and choose **View Details** to view the details of the selected side along with the right shoulder.

Step 3 View the following information that is displayed in the right shoulder. Optional means that the information is displayed when available.

- Name of the side

- Overall alarm status as a colored label and an icon

- (Optional) Span loss

- (Optional) ORL of OTDR

- (Optional) Fiber End of OTDR

- (Optional) OSC power

- (Optional) IP address of the node of its optional neighbor. To open the SVO web UI of the neighbor node in a new browser tab, click the IP address of the neighbor node.

- Degree of its optional neighbor

- **Card List** tab - Displays the list of all the cards present in the side. The shelf number and slot number are displayed with the card name. The trunk port number is also displayed for TXP cards.

  To sort the list of cards, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

- **Circuit List** tab - Displays the list of all the circuits present in the side.

  To sort the list of circuits, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

View Details of Side for OLS Node

Use this task to view the details of the side for a node in NFV.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2   Right-click a side in the map view and choose **View Details** to view the details of the selected side along with the right shoulder.

Or

Click the arrow near the side name that is displayed inside the right shoulder.

Step 3   View Side 1 and Side 2 merged information that is displayed in the right shoulder. Optional means that the information is displayed when available.

- Overall alarm status as a colored label and an icon

- (Optional) Span loss

- (Optional) ORL of OTDR

- (Optional) Fiber End of OTDR

- (Optional) OSC power

- (Optional) IP address of the node of its optional neighbor. To open the SVO web UI of the neighbor node in a new browser tab, click the IP address of the neighbor node.

- Degree of its optional neighbor

- **Card List** tab - Displays the list of all the cards present in both sides. The shelf number and slot number are displayed with the card name. The trunk port number is also displayed for TXP cards.

  To sort the list of cards, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

- **Circuit List** tab - Displays the list of all the circuits present in the side.

  To sort the list of circuits, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

View Details of Card

Use this task to view the details of the card in NFV.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2   Right-click a side in the map view and choose **Open**.

Step 3   Right-click a card in the map view and choose **View Details**.

Step 4   View the following information that is displayed in the right shoulder:

- Name of the card

- Overall alarm status as a colored label and an icon

- **Port List** tab - Displays the list of all the ports with their aggregate power.

  To sort the list of ports, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

- **Circuit List** tab: Displays the list of all the circuits present in the card.

  To sort the list of circuits, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

View Details of Port

Use this task to view the details of the port in NFV.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1 Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2 Right-click a side in the map view and choose **Open**.

Step 3 Right-click a card in the map view and choose **Open**.

Step 4 Click the port name in the map view.

Step 5 View the following information that is displayed in the right shoulder:

- Name of the port

- Overall alarm status as a colored label and an icon

- **Agg. Powers** tab - Displays the list of all the links with their aggregate power.

  The aggregate power displays the current power in case of a single port. The aggregate power displays a list of all the different power levels in case of an MPO port or logical group.

  To sort the list of links, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Setpoint**, or **Low Setpoint**.

- **Circuit List** tab: Displays the list of all the circuits present in the port.

  To sort the list of circuits, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

View Details of Patch Cord

Use this task to view the details of a patch cord.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1 Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2   Click the patch cord in the map view.
The right panel displays the name and type of the patch cord.

Table 5: Node Details

Field	Description
Name	Displays a list of the nodes along with its details, such as span loss value, the IP address of the device it is connected to, and its degree.
Connections	Displays the ports that the patch cord connects with their cards and the aggregate power.
Connection Verification	Displays a list of the connections between the line cards and all passive modules. For more details, see Connection Verification, on page 17.

Step 3   To sort the list of patch cords, click the vertical ellipsis icon and choose **A-Z**, **Z-A**, **High Severity**, or **Low Severity**.

View Details of Circuit

Use this task to view the details of the circuit in NFV.

Circuits are created in EPNM and displayed as read-only in the **Optical Cross Connections** tab.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2   Click **Show/Hide Shoulder** to open the right shoulder.

Step 3   Click **>** against the circuit in the right shoulder to view the sides that are involved in the circuit in graphical view.

Step 4   View the following information that is displayed in the right shoulder:

• **Circuit Info** pane - Displays information on **Admin State**, **Frequency**, **From Degree**, and **To Degree**.

- **Path (Forward path)** pane - Click **:** next to the Path (Forward Path) pane and choose **Forward path**, **Backwards path**, or **Both paths** to specify the order of display of internal links. The pane name changes correspondingly.

Connection Verification

Table 6: Feature History

Feature Name	Release Information	Description
Connection Verification for NCS 1010	Cisco IOS XR Release 24.3.1	You can now verify the connections between OLT-C line cards and passive modules of NCS 1010 devices from the **Connection Verification** list located in the right-panel of the **Node Functional View**. You can use Connection Verification to quickly identify and troubleshoot connectivity issues.

Cisco Optical Site Manager allows you to verify connections between the OLT-C line card and the passive modules a NCS 1010 device, helping to prevent miscabling during node installation. This process involves generating a specific probe signal from the dedicated Connection Verification Tunable Laser (CV-TL) located at COM-RX-2, and then detecting the probe signal on:

- the same OLT-C line card.

- the passive modules (Mux/Demux panel or breakout panel) connected to the OLT-C line card.

- a different OLT-C line card or passive module belonging to the same near end (NE) node.

- an optical interface (router ports or transponder) connected to the line card.

Figure 3: Connection Verification
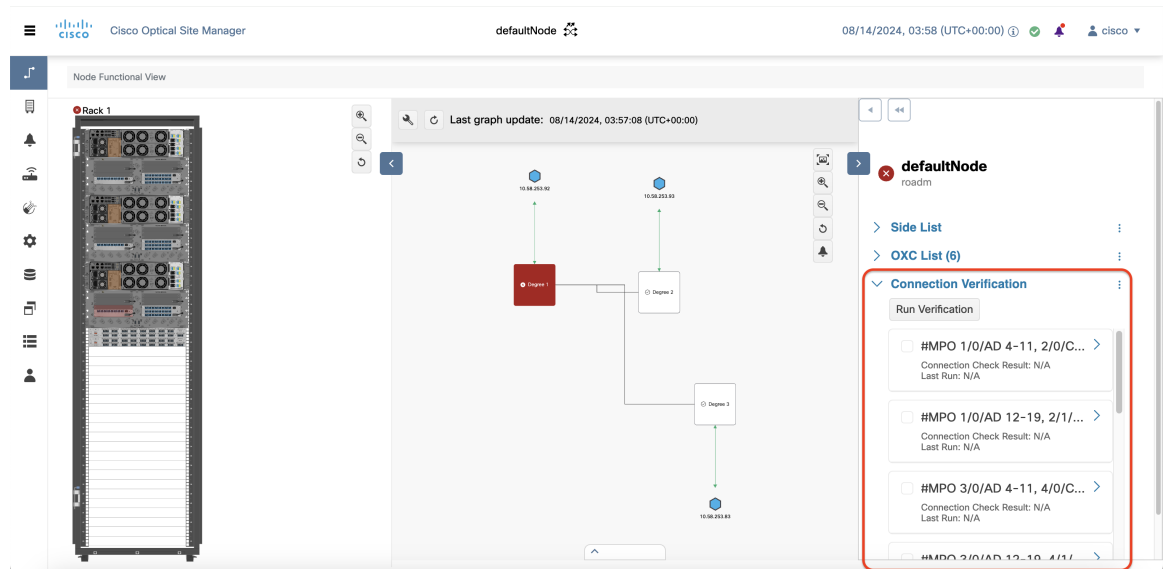
Verify Connections

Use this task to verify connections between the line cards and passive modules.

Before you begin

- Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** in the left panel.

Step 2   Click the **Expand shoulder** icon to expand the right panel.

Step 3   Scroll to the **Connection Verification** section and click to expand it.
A list of available connections is displayed.

Step 4   Select the check boxes corresponding to the connections you want to verify.

Step 5   Click **Run Verification**.
Connection verification is initiated for the selected connections and an information message is displayed.

Step 6   Click **OK**.

The **Connection Check Result** field displays the status of the connection verification.

The different status includes:

Table 7: Connection Verification status

Status	Description
Connected	Cable or patchcord is connected.
Disconnected	Cable or patchcord is disconnected.
Connection-Not-Verified	Cable or patchcord is not tested for connection verification.

Set User Preferences

Use this task to set the user preferences in Node Functional View. The user preferences are stored in the local storage of the browser and are retained for that browser.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1   Click **Node Functional View** from the left panel.

The Node Functional View page appears.

Step 2   Click the **Settings** icon.

The **Preferences** dialog box appears.

Step 3   In the **General** tab, perform these steps:
  a) Select a date format from the **Date format** drop-down list.
  b) Select the channel from the **Configuration channel** drop-down list.
  c) Select a unit for length from the **Length measurement unit** drop-down list.

Step 4   In the **Right shoulder** tab, perform the following steps:
  a) Choose **A-Z**, **Z-A**, **Low Severity**, or **High Severity** from the **Shoulder element order** drop-down list to sort the components in the right shoulder based on name and alarm severity.
  b) From the **Circuit path sorting** drop-down list, choose **Forward path**, **Backward path**, or **Both paths** to set the link path between source and destination.
  c) Select the **Always display details** check box to automatically display the right shoulder upon opening NFV.

Step 5   In the **Graph** tab, perform the following steps:
  a) Enter a degree space in the **Degrees space from the center** field.
  b) Enter a value in the **Layers spacing** field to set the horizontal distance between the components in the map view.
  c) Enter a value in the **Column spacing** field to set the vertical distance between the components in the map view.
  d) Enter the zoom scale value in the **Zoom scaling factor** field.

Refresh the browser to apply this value.

Step 6 In the **Rack** tab, perform these steps:

a) Enter a value in the **Rack opacity factor** field to highlight the cards of interest in physical view. The other cards are covered by overlay with transparency depending on the value provided.

The range is from 0 to 1.

b) Enter the value in the **Left shoulder width (px)** field to set the width of the left shoulder.

The range is from 400 to 600.

c) Check the **Show only visible cards on the rack** check box to display only the visible cards in the rack view.

Step 7 In the **Backdrop** tab, select **backdrop** or **visualization** from the Bottom shoulder visualization drop-down list.

Step 8 Click **Apply** to apply the user settings.

Step 9 Click **Reset** to reset the user settings to default values.

View Active Circuit List

Use this task to view the total number of circuits passing through a degree and a selected card.

Before you begin

Log into Cisco Optical Site Manager

Procedure

Step 1 Click **Node Functional View** in the left panel.

The Node Functional View page appears.

Step 2 Right-click a **Degree** and click **Open**.

The **OXC List** in the right panel displays the the total number of connections passing through the degree.

Step 3 Right-click a card and click **Open**.

The **Connections** list in the right panel displays the the total number of connections passing through the degree.