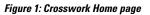


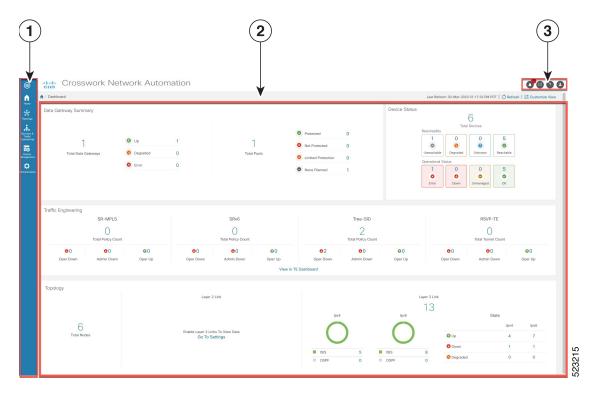
Setup and Monitor Your Network

- Get a Quick View in the Dashboard, on page 1
- View Devices and Links on the Topology Map, on page 2
- Customize Map Display Settings, on page 14
- Save Topology Views for Easy Access, on page 19

Get a Quick View in the Dashboard

The Home page displays a customizable collection of dashlets which provide an at-a-glance operational summary of the network being managed, including reachability and operational status of devices. The Dashboard is made up of a series of dashlets, and each dashlet represents different types of data belonging to the same category.





Callout No.	Description
1	Main Menu: The main menu allows you to navigate to installed Cisco Crosswork applications and device management and administrative tasks. Menu options may look slightly different depending on which Cisco Crosswork applications are installed.
2	Dashlets : Information varies depending on which Cisco Crosswork applications are installed.
	• To drill down for more information within a dashlet, click on a value. A window appears displaying only the filtered data you clicked on.
	• To add or change the layout of dashlets, click Customize View . Move the dashlets to your desired layout and click Save .
	• You can duplicate or remove TE dashlets using the trash or pencil icons within the top-right corner of the dashlet.
3	Settings icons:
	• The Alerts icon notifies you of any current error conditions related to the system operations which require attention, and provides a link to detailed information about those conditions.
	• The Events icon notifies you of new events related to system operation, and also provides access to the history of all system events.
	The About icon displays the current version of the Cisco Crosswork product.
	The User Account icon lets you view your username, change your password, and log out.

View Devices and Links on the Topology Map

To view your devices on the topology map, they must be onboarded. For more information refer to the *Cisco Crosswork Network Controller Administration Guide*. To view the network topology map, from the main menu choose **Topology**.



Note

If you are viewing the HTML version of this guide, click on the image to view it in full-size.

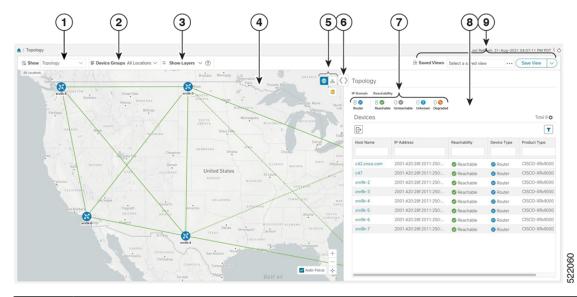


Figure 2: Cisco Crosswork UI and Topology Map

Callout No.	Description
1	Topology Map View : From the Show drop-down list, click the option that displays the data that you would like to see on the map.
	If Topology is selected, devices and links in the network are displayed.
	If Traffic Engineering is selected, TE tunnel information is displayed. For more information on the Traffic Engineering topology map, see View SR-MPLS and SRv6 Policies on the Topology Map and View RSVP-TE Tunnels on the Topology Map.
2	Device Groups : From the drop-down list, click the group of devices you want displayed on the map. All other device groups will be hidden.
3	Show Hide : From the drop-down list, click the network layers you want displayed on the map. All devices and links that belong to the selected layers are then displayed. By default, all layers are displayed.

Callout No.	Description				
4	Topology Map : The network topology can be displayed on a logical map or a geographical map, where the devices and links are shown in their geographic context. From the map, you can drill down to get detailed information about devices and links.				
	Devices:				
	• To view a device configuration summary, hover the mouse pointer over the device icon. A pop up window displaying the host name, state, node ID, and device type appears.				
	• To view device details, click on the device icon.				
	• If devices are in close physical proximity, the geographical map shows them as a cluster.				
	The number in a blue circle (\circ) indicates the number of devices in the cluster. Displaying devices in this manner helps prevent overlap and clutter on the map.				
	Links:				
	• A solid line indicates a <i>single link</i> between two devices. If there is more than one link between two devices, or between a device and a cluster of devices, the line is shown dashed instead. A dashed line indicates an <i>aggregated</i> link that represents more than one link, or the use of multiple protocols (for example, IPv4 and IPv6) on the same physical link.				
	• A and Z indicates headend and endpoint, respectively.				
	• To view link information details, click on the link.				
	Note Although aggregated, dual stack links show as one single line.				
5	E: The logical map shows devices and their links, positioned according to an automatic layout algorithm, ignoring their geographical location. You can change the layout algorithm.				
	: The geographical map shows single devices, device clusters, links, and tunnels, superimposed on a map of the world. Each device location on the map reflects the device's GPS coordinates (longitude and latitude) as defined in the device inventory.				
	The Display Preferences window allows you to change display settings for devices, links, utilization, Flexible Algorithms, and TE tunnel metrics.				
	\bigcirc : The global search allows you to search the topology using device names, location or the device civic location.				
	E: Export to KML allows you to export the geo localised objects using a KML format. KML is an XML base file format used to display information in a geographic context, such as Google Earth.				
6	Expand/Collapse/Hide Side Panel : Expand or collapse the contents of the side panel. Close the side panel to get a larger view of the topology map.				

Callout No.	Description				
7	The Mini Dashboard provides a summary of the IP Domain and device reachability status. If filters are applied, the Mini Dashboard is updated to reflect what is displayed in the Devices table.				
	NoteIf the Alarm Status feature is enabled, you will also see Alarm information he To view the Alarm Status, you must install Element Management Functions (of the Crosswork Network Controller Essentials package) and configure host information for Syslog and SNMP traps on the devices you want to view alar 	part ms ation			
8	The content of this window changes depending on what applications you have installed, we Show is set to for the Topology Map and if you have selected to view more information of device, link, SR-MPLS policy, SRv6 policy, or RSVP-TE tunnel				
9	Saved Custom Map Views : Lets you create a named custom view using the settings and I for your current map, settings of the tables saved in the saved views, or display a custom you have created previously. It also saves any filters applied to the Devices and Traffic Engine tables.	view			

View Device Details

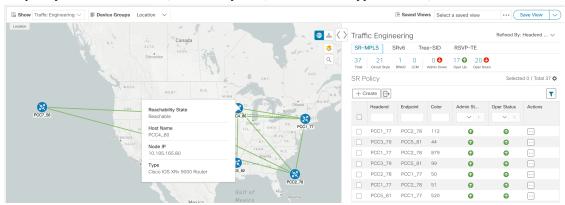
This example shows how you can view device using the topology map.



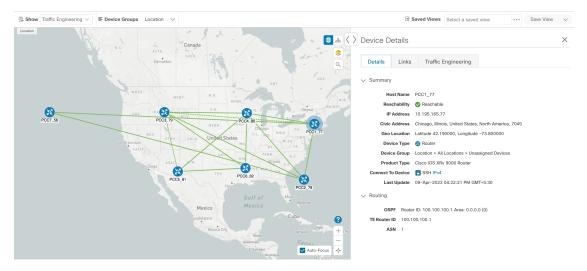
Note

If you are viewing the HTML version of this guide, click on the images to view them in full-size.

- **Step 1** From the main menu choose **Topology** or **Traffic Engineering > Traffic Engineering**.
- **Step 2** To quickly view the host name, reachability state, IP address and type of device, hover the mouse over the device icon.



- **Step 3** To view more device details, click on the device icon.
 - a) The following examples show the Device details from the Topology map.



NoteIf the Alarm Status feature is enabled, you will also see Alarm information here. To view the Alarm
Status, you must install Element Management Functions (part of the Crosswork Network Controller
Essentials package) and configure host information for Syslog and SNMP traps on the devices you want
to view alarms for. For more information, see the Cisco Crosswork Network Controller Installation
Guide and the Cisco Crosswork Network Controller Administration Guide. The Alarm Status feature is
available for select licensing packages.

In a multiple IGP setup, you can also view all the IGP, IS-IS, and OSPF processes in the Routing details. See the following examples:

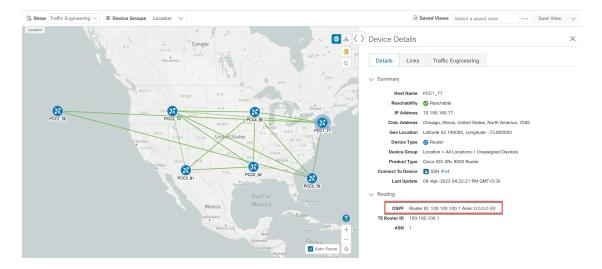


Figure 3: Multiple IGP: OSPF Processes

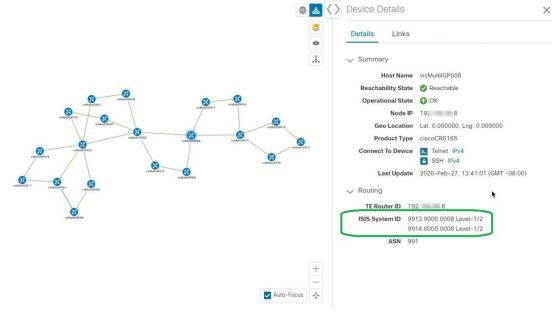
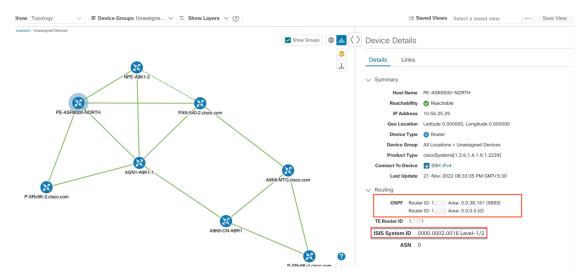
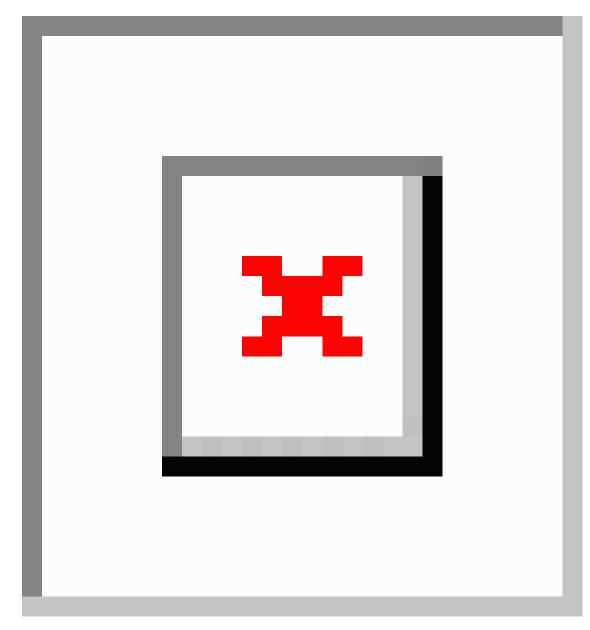


Figure 5: Multiple IGP: OSPF and ISIS Processes

Figure 4: Multiple IGP: ISIS Processes

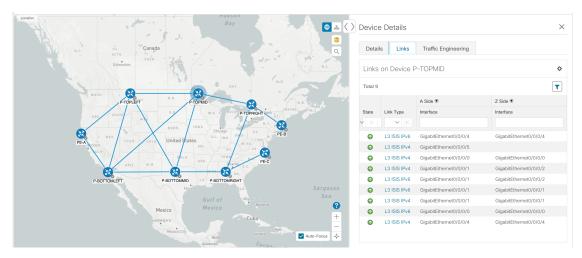


b) The following example shows additional Traffic Engineering Device details (SR-MPLS, SRv6, RSVP-TE, and Flexible Algorithm tabs) from the Traffic Engineering map. In this particular example, SRv6 Locators are listed for two domains.



Step 4 To view links on the device, click the **Links** tab and expand the right panel to see all the link details.

L



Step 5 To view interface utilization, expand A side or Z side.

The utilization shown on IPv4 and IPv6 links represents the aggregate traffic on the interface, not specific to each address family. Sub-interfaces will not show a utilization since they do not have a bandwidth like a physical interface. Traffic measurements will still be collected and displayed.

A Side				
Interfac_A Side	Utilization ?			
GigabitEthernet0/0/0/5	0% (0Bps/1Gbps)			
GigabitEthernet0/0/0/6	0% (0Bps/1Gbps)			
GigabitEthernet0/0/0/2	0% (0Bps/1Gbps)			
GigabitEthernet0/0/0/3.1				
GigabitEthernet0/0/0/2	0% (0Bps/1Gbps)			
GigabitEthernet0/0/0/5	0% (0Bps/1Gbps)			
GigabitEthernet0/0/0/1	0% (0Bps/1Gbps)			

View Link Details

This example describes how you can view the following information:

- Link details (name, state, type, and endpoint interface information)
- Members of an aggregate link
- IPv4 unnumbered interfaces information (when available) is now displayed as either an index or a combination of the TE Router ID and the index in device, link, and topology details.
- Link Aggregation Group (LAG) details

Step 1 From the main menu choose **Topology** or **Traffic Engineering** > **Traffic Engineering**.

Step 2 View link details.

Click a link on the topology map.

_ink Deta	ils	Ĩ		
Summary				
Name	GigabitEthernet0/0/0/2-Giga	bitEthernet0/0/0/2		
State	🕜 Up	🕞 Up		
Link Type	3 ISIS IPv4			
ISIS Level	2			
Last Update	13-Apr-2023 09:19:44 PM P	DT		
	A Side	Z Side		
Node	cw-xrv78	cw-xrv83		
TE Router ID	3.3.3.78	3.3.3.83		
IPv6 Router II	bb:bb:bb:3:3::78	bb:bb:3:3::83		
IF Name	GigabitEthernet0/0/0/2	GigabitEthernet0/0/0/2		
IF Description	GigabitEthernet0/0/0/2	GigabitEthernet0/0/0/2		
IF Alias	*** connect to xrv83 ***	*** connect to xrv78 ***		
Туре	ETHERNETCSMACD	ETHERNETCSMACD		
Local IF ID	3.3.3.78 (10)	3.3.3.83 (8)		
Utilization	0% (0Bps/1Gbps)	0% (0Bps/1Gbps)		
Packet Drops	0%	0%		
IGP Metric	10	10		
Delay Metric	10	10		
TE Metric	10	10		
Admin Group	s 5			

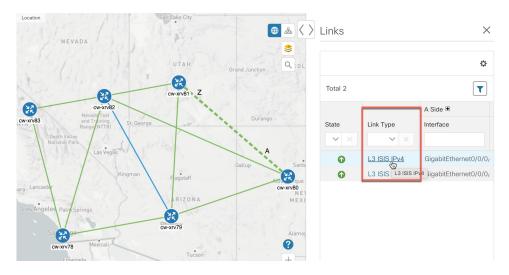
Step 3 View aggregate link details.

Click on a dashed line. A dashed line indicates an aggregated link that represents more than one link.

Note Dual stack links (although aggregate) are shown as one single line.

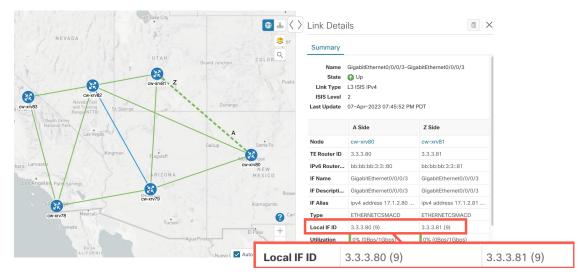
a) Under the Link Type column, click the link entry to see the link's details.

L



Step 4 View IPv4 unnumbered interface information (if available).

IPv4 unnumbered interfaces information is displayed as either an index or a combination of the TE Router ID and the index.



Step 5 View LAG details

To view different bundle members and member details in a Link Aggregation Group (LAG), confirm that LAG discovery is enabled (**Administration > Settings > System Settings** tab **> Discovery > LAG** checkbox):

Note It takes a few minutes for LAG collection to complete after LAG discovery is enabled.

a) Click on a LAG link. For example:

Links					×
					¢
Total 2					T
State	Link Type	A Si	Z Si	A Si	Z Si
O	L2 LAG	Bundl	Bundl	0% (0% (
0	L2 CDP	Gigabi	Gigabi	0% (0% (

b) Click the **Members** tab. In this example, only one link is displayed.

Link De	etails				
Summa	ary Members	5			
					¢
Total 1					
State	Link Type	A Si	Z Si	A Si	Z Si
O	L2 LAG MEM	Gigabi	Gigabi	0% (0% (

c) Click the LAG member link.

Summary		
Name GigabitEthernet0/0/0/3-GigabitEthernet0/0/0/3		
State	🕑 Up	
Link Type	.2 LAG MEMBER	
Last Update 25-Mar-2021 05:29:32 AM GMT+2		
	A Side	Z Side
Node	A Side P-BOTTOMRIGHT-L2	Z Side
Node TE Router ID IF Name	P-BOTTOMRIGHT-L2	P-BOTTOMLEFT-L2
TE Router ID	P-BOTTOMRIGHT-L2 101.101.101.4	P-BOTTOMLEFT-L2 101.101.101.3
TE Router ID IF Name	P-BOTTOMRIGHT-L2 101.101.101.4 GigabitEthernet0/0/0/3	P-BOTTOMLEFT-L2 101.101.101.3 GigabitEthernet0/0/0/3

Link States and Discovery Methods

Discovery	Link State
via SR-PCE	SR-PCE set it to UP or DOWN based on the link operational state
via SNMP MIB: CDP, LLDP and LAG	The link state is based on the two link endpoints operational states (via IF MIB).
	• Link state is UP when initially discovered.
	• When one of the endpoint interfaces is operationally down, then the link state is set to DOWN.
	• When both endpoint interfaces are operationally up, then the link state is set to UP.
	via SR-PCE via SNMP MIB: CDP, LLDP and

Table 1: Link Types, Discovery and States

Table 2: Link State Definitions

Link State	Description
UP	Link is present in SR-PCE topology in both directions.
DEGRADED	Link is reported in SR-PCE topology in only one direction.
DOWN	Link is reported down in both directions.

Protocols Used for Topology Services

The following table lists the protocols and methods used for obtaining information.

Protocol/Method	Provides	Use Cases
IGP/ BGP-LS (via SR-PCE)	Real time topology (Nodes, links, link metrics, and so on.)	L3 topology visualization
PCEP(via SR-PCE)	Real time LSP status and CRUD of SR-PCE initiated LSPs	 SR/SRv6, RSVP-TE LSP visualization SR-PCE initiated LSP Create/Update/Delete

Protocol/Method	Provides	Use Cases
SNMP(SNMPv2-MIB, IP-MIB, IF-MIB, LLDP-MIB, (CISCO CDB-MIB)(via CDG)	System info, Interface Table (interface and SR-TE/RSVP-TE traffic Utilization) IP Address Table, L2 adjacency information	 Device management and details and Crosswork Optimization Engine model building: L2/L3 Topology Interface name, Admin/Oper Status Interface and SR policy and RSVP-TE tunnel utilization Crosswork Optimization Engine model simulation: IGP/LSP path simulation Bandwidth use cases (for feature packs)
CLI (via CDG) -'show mpls	TE Router ID and so on.	To match the DLM node with the same TE Router ID that is learned from the SR-PCE

Customize Map Display Settings

You can configure visual settings on the topology map based on your needs and preferences. You can do the following:

- Customize the Display of Links and Devices, on page 14
- Configure How Device Groups Are Displayed for Traffic Engineering

Customize the Display of Links and Devices

To set device and link map display preferences, choose **Topology** and click \geq on the topology map.

- Click **Links** to show aggregated links and how links should be colored so that you can easily see their state and utilization status. By default, aggregated links will be differentiated from single links on the map and links will be colored based on link utilization thresholds. Administrators can change the utilization thresholds and their corresponding colors.
- Click **Devices** to show the device state and how the devices should be labeled. By default, the device state is shown on the map and the host name is used to label devices.

Use Device Groups to Filter Your Topology View

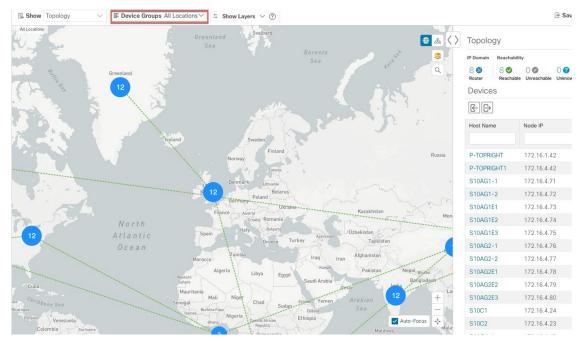
To help you identify, find, and group devices for a variety of purposes, you can create device groups. The device group window (**Device Management** > **Groups**) displays all devices and the device groups to which they belong. By default, all devices initially appear in the **Unassigned Devices** group.

To demonstrate the grouping and filtering functions, we have built an environment with devices distributed globally. You can sub-group the devices based on regions. For this example, we have a sub-group called **US West**.

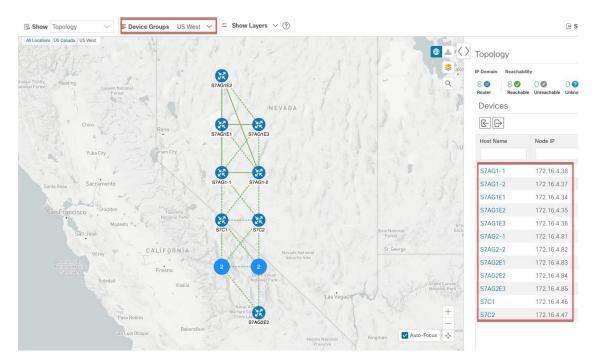
Step 1 View devices on the geographical map:

a) From the main menu, choose **Topology**.

Note Devices without a geo-location appear in the **Devices** table only. To display these devices on the map, provide their geographical coordinates in the **Geo Location** column.

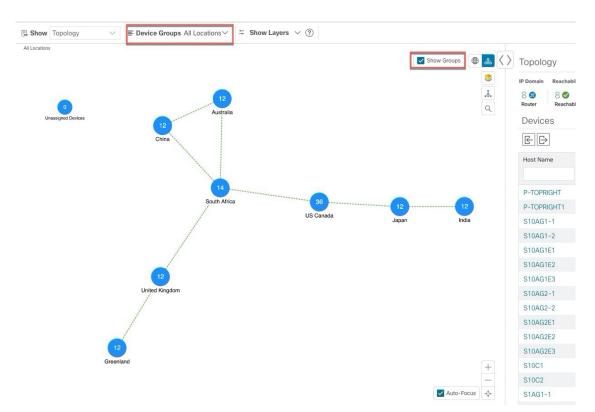


b) From the **Device Group** drop-down list, select a group (US West). Only the devices in that group and related links are displayed on the geographical map. The Devices table has also been filtered to list only those devices in the group.

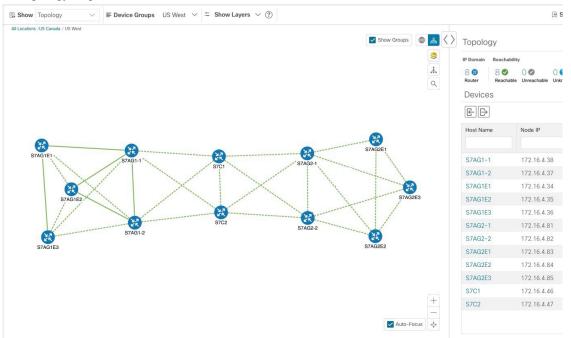


Step 2 View devices on the logical map:

- a) From the main menu, choose **Topology**.
- b) Click .
- c) From the **Device Group** drop-down list, select **All Locations** and check **Show Groups** if it is not already checked. You can see all device groups in this view. Device groups can be seen in this way only within the logical map.



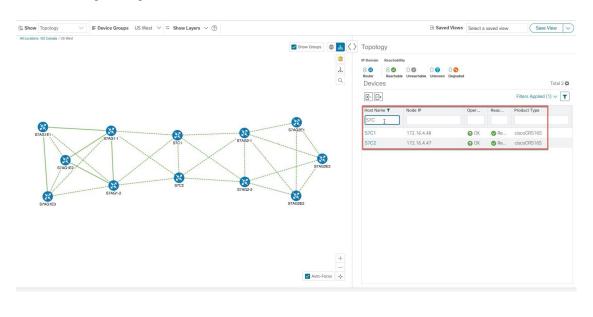
d) From the **Device Group** drop-down list, select a group (US West). Devices that belong to this group are shown in the topology map and the **Devices** table.



e) Filter devices in the Device table by entering the partial host name or IP address in the text box (for example, S7C is entered in the Host Name text box for the current configuration). The Device table displays only devices that match

the filtering criteria. However, filtering the Device table does not filter the devices visually on the topology map. To visually filter devices on the geographical or logical maps is to use device groups.

Note You can also double click on the device in the list to recenter the selected device on the geographical or logical maps.



Create and Modify Device Groups

You can create device groups and devices to the groups either manually (as described in this section) or automatically, as described in Enable Dynamic Device Grouping, on page 19. A device can belong to only one device group.

- **Step 1** From the main menu choose **Device Management** > **Groups**.
- **Step 2** To add a new sub-group, click next to **All Locations**. A new sub-group is added under **All Locations**.
- **Step 3** To add a device to a group, from the right-pane, under **Unassigned Devices**, select a device.
- **Step 4** From the **Move to Group** drop-down, select the appropriate group and click **Move**.

/ Device Management / Groups			O O Last Refresh: 15-Mar-2023 06:04:46 PM IS
Device Groups Q	Unassigned Devices		Selected 0 / Total 107 🅸
E D			T
✓ Location	Device IP	Host Name	Product Type
V All Locations			
Unassig Add a Sub-Group	1.1.1.16		
Manage Location Dynamic Groups	1.1.1.93		
	1.1.1.67		
	1.1.1.36		
	1.1.1.43		
	. 1.1.1.70		
	1.1.1.45		

Step 5 To delete from a group, click **Remove from Group**. If you delete a group, all devices that belong to that group are moved to the Unassigned Devices group. Also, deleting a group deletes all the sub-groups under it.

Step 6 Click Save.

Enable Dynamic Device Grouping

You can create a rule to dynamically create device groups and automatically add unassigned devices to these groups using a Regular Expression (regex) on the device hostname. Any newly added or discovered devices that match the rule will be placed in the appropriate group.

Dynamic rules do not apply to devices that already belong to groups. You must move them to Unassigned Devices if you want them to be considered by the rule.

Before you begin

While you can follow examples given in the Dynamic Groups dialog, it is helpful to be familiar with Regular Expressions.

- **Step 1** From the main menu choose **Device Management** > **Groups**.
- **Step 2** Click mext to **All Locations > Manage Location Dynamic Groups**.
- Step 3 Click Show more details and examples to help you fill out the required Host Name and Group Name fields.
- **Step 4** If there are any existing devices in the Unassigned Devices group, click **Test Rule** to view a sampling of what type of group names will be created.
- **Step 5** Turn the **Enable Rule** toggle ON to enable the rule. After the rule is enabled, the system checks for unassigned devices every minute and will assign them to the appropriate group based on the rule.
- Step 6 Click Save.
- **Step 7** Groups that are created this way initially appear under Unassigned Groups (created when a rule is enabled for the first time). Move newly created groups to the desired group hierarchy.
- **Step 8** To move newly created Unassigned groups to the correct group, do the following:
 - a) Click in next to All Locations and click Add a Sub-Group.
 - b) Enter the New Group details and click Create.
 - c) Click on the unassigned devices from the left pane.
 - d) From the right pane, select the devices you want to move and click **Move to Group** to move to an appropriate group.

Save Topology Views for Easy Access

When you rearrange the devices and links on a map, your changes are not normally saved. To easily access a useful map layout, you can save it as a named custom view and quickly retrieve it, without having to rearrange the map each time. This is especially useful when managing large networks with many devices.

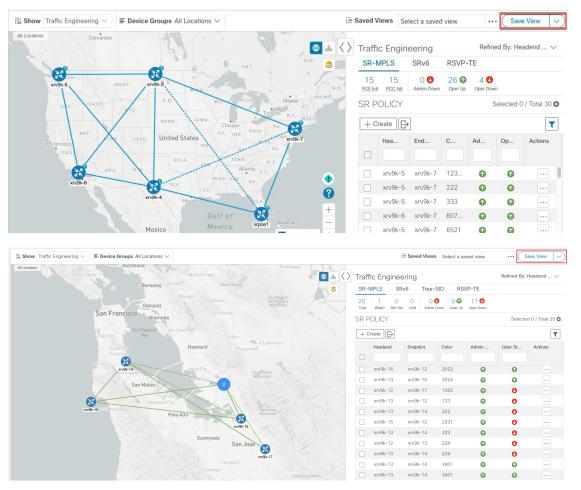
When you save a custom view, the following settings will be saved:

- · Whether it is a geographical or logical map.
- Device positions in the logical map layout.

- Device and link display settings
- Any filters used in the Device and Traffic Engineering tables

All custom views can be seen by all users. However, only users with the admin role or users that created the custom view can modify the view.

- **Step 1** Customize the current map view until it contains just the information you want and the layout meets your needs.
- **Step 2** When you have the view the way you want it, click **Save View**.



Step 3 Enter a unique name for the new custom view and click **Save**. You can later modify the view (click **Select a saved view**) and choose to edit the topology, rename, or delete the view.