



Resource Reservation Protocol (RSVP)

This section describes the RSVP-TE tunnel features that Crosswork Optimization Engine supports. For a list of known limitations and important notes, see the [Cisco Crosswork Optimization Engine Release Notes](#).

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View RSVP-TE Tunnels on the Topology Map

To get to the Traffic Engineering topology map for RSVP-TE visualization, choose **Traffic Engineering** > **Traffic Engineering** > **RSVP-TE** tab.

Figure 1: Traffic Engineering UI - RSVP-TE Tunnels

The figure illustrates the process of viewing RSVP-TE tunnels in the Traffic Engineering UI. It is divided into two main sections: a topology map on the left and a UI screenshot on the right.



Topology Map (Left): Shows a network of nodes (xrv9k-12 to xrv9k-17) connected by lines. Callouts 1-4 point to specific nodes and connections.

UI Screenshot (Right): Shows the Traffic Engineering UI with the RSVP-TE Tunnels tab selected. Callouts 5-9 point to various UI elements:

- 5: Filter tabs (SR-MPLS, SRv6, Tree-SID, RSVP-TE)
- 6: Summary statistics (19, 10, 0, 11, 18)
- 7: Filter dropdown (Refined By: Headend or L...)
- 8: Filter dropdown (Refined By: Headend or L...)
- 9: Table of RSVP-TE Tunnels

Tunnel ID	Headend	Endpoint	Admin Sta...	Oper Status	Actions
<input checked="" type="checkbox"/>	3345	xrv9k-15	xrv9k-17	✓	...
<input checked="" type="checkbox"/>	6000	xrv9k-16	xrv9k-14	✓	...
<input checked="" type="checkbox"/>	10111	xrv9k-14	xrv9k-16	✓	...
<input checked="" type="checkbox"/>	10112	xrv9k-15	xrv9k-17	✓	...
<input type="checkbox"/>	10122	xrv9k-13	xrv9k-15	✓	...
<input type="checkbox"/>	113	xrv9k-14	xrv9k-13	✓	...
<input checked="" type="checkbox"/>	105	xrv9k-14	xrv9k-13	✓	...
<input checked="" type="checkbox"/>	117	xrv9k-14	xrv9k-13	✓	...
<input checked="" type="checkbox"/>	115	xrv9k-14	xrv9k-13	✓	...
<input checked="" type="checkbox"/>	101	xrv9k-14	xrv9k-13	✓	...


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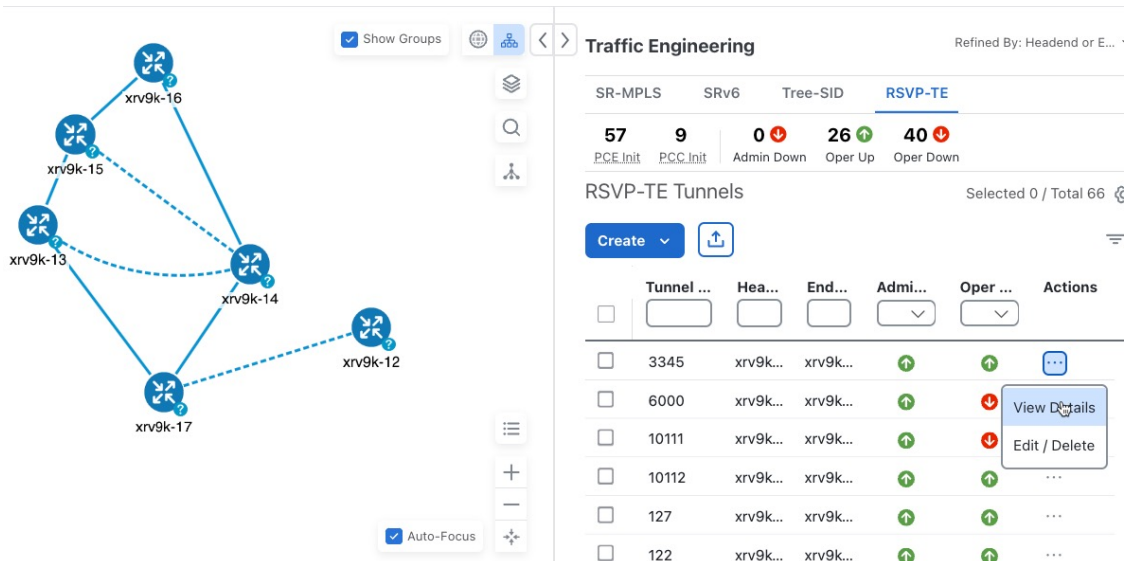
Callout No.	Description
1	Click Show Participating Only to display links that only belong to the selected RSVP-TE tunnels. All other links and devices disappear.
2	<p>A device with a solid orange outline () indicates that it is a strict hop. A dashed orange outline indicates that a loose hop was discovered.</p> <p>Note RSVP-TE tunnels cannot be configured with loose hops when provisioning in the UI.</p>
3	<p>When RSVP-TE tunnels are selected in the RSVP-TE Tunnel table, they show as colored directional lines on the map indicating source and destination.</p> <ul style="list-style-type: none"> Record Route Object (RRO) paths are shown as straight lines. Explicit Route Object (ERO) paths are shown as curved lines. <p>Note If both RRO and ERO paths are available, the RRO path is displayed by default.</p> <ul style="list-style-type: none"> An adjacency segment ID (SID) is shown as a green dot on a link along the path () <p>If both A and Z are displayed in a device cluster, at least one node in the cluster is a source and another is a destination. The A+ denotes that there is more than one RSVP-TE tunnel that originates from a node. The Z+ denotes that the node is a destination for more than one RSVP-TE tunnel.</p>
4	<p>SR-MPLS and SRv6 Policy Origin and Destination: If both A and Z are displayed in a device cluster, at least one node in the cluster is a source and another is a destination. The A+ denotes that there is more than one SR-TE policy that originates from a node. The Z+ denotes that the node is a destination for more than one SR policy.</p>
5	<p>The content of this window depends on what has been selected or filtered. In this example, the RSVP-TE tab is selected and the RSVP-TE Tunnels table is displayed. Depending on what is selected on the topology map, or whether you are in the process of viewing and managing RSVP-TE tunnels, you can do the following:</p> <ul style="list-style-type: none"> Create Dynamic RSVP-TE Tunnels Based on Optimization Intent, on page 5 Create Explicit RSVP-TE Tunnels, on page 4 Modify RSVP-TE Tunnels, on page 6 View RSVP-TE Tunnel Details, on page 3
6	Click the RSVP-TE tab.
7	The Mini Dashboard provides a summary of the operational RSVP-TE tunnel status and the number of PCC and PCE initiated tunnels that are <i>currently</i> listed in the RSVP-TE tables. If filters are applied, the Mini Dashboard is updated to reflect what is displayed in the RSVP-TE table.

Callout No.	Description
8	<p>This option allows you to choose how the group filter (when in use) should be applied on the table data. For example, if Headend only was selected, then it would only display policies where the headend device of the policy is in the selected group. This filter allows you to see specific configurations and is useful when you have a large network.</p> <p>Filter options:</p> <ul style="list-style-type: none"> • Headend or Endpoint—Show policies with either the headend or endpoint device in the selected group. • Headend and Endpoint—Show policies if both the headend and endpoint are in the group. • Headend only—Show policies if the headend device of the policy is in the selected group. • Endpoint only—Show policies if endpoint device of the policy is in the selected group.
9	Exports <i>all</i> data into a CSV file. You cannot export selected or filtered data.

View RSVP-TE Tunnel Details

View RSVP-TE tunnel details such as binding label, delegated PCE, metric type, ERO/RRO, delay, and so on.

Step 1 From the **Actions** column, click  > **View Details** for one of the RSVP-TE tunnels.



The screenshot displays the 'Traffic Engineering' section of a network management tool. On the left is a network diagram with nodes labeled xrv9k-12 through xrv9k-17. On the right, a table lists RSVP-TE tunnels. The table has columns: Tunnel ID, Headend, End, Admin, Oper, and Actions. The tunnel with ID 6000 is selected, and its 'Actions' column contains a 'View Details' button that is highlighted by a mouse cursor. Other tunnels listed include 3345, 10111, 10112, 127, and 122. Above the table, there are summary statistics for SR-MPLS, SRv6, Tree-SID, and RSVP-TE, along with a 'Create' button and a 'Selected 0 / Total 66' indicator.

Tunnel ID	Headend	End	Admin	Oper	Actions
3345	xrv9k...	xrv9k...	↑	↑	...
6000	xrv9k...	xrv9k...	↑	↓	View Details
10111	xrv9k...	xrv9k...	↑	↓	Edit / Delete
10112	xrv9k...	xrv9k...	↑	↑	...
127	xrv9k...	xrv9k...	↑	↑	...
122	xrv9k...	xrv9k...	↑	↑	...

Step 2 View RSVP-TE tunnel details. From the browser, you can copy the URL and share with others.

- Note**
- For end-to-end delays on RSVP-TE tunnels, inter-domain RSVP-TE tunnels must all be explicit (every interface along that path is specified as an adjacency hop).
 - If applicable, the Delay value is calculated for all policies every 10 minutes. Hover your mouse over the "i" icon (next to the Delay value) to view the last time the value was updated.

> RSVP-TE Tunnel Details
⋮ | ✕

Headend A xrv9k-6 (192.168.0.6)
Endpoint B xrv9k-7 (192.168.0.7)
Tunnel ID 33000

✓ Summary

Description	-
Path Name	60701-rsvp
LSP ID	6
Path Type	Unknown
Admin State	↑ Up
Oper State	↑ Up
Utilization	0 Mbps
Delay	109 i
Signaled Bandwidth	0 Mbps
Setup / Hold Priority	7 / 7
Metric Type	IGP
Fast Re-route (FRR)	Disable
Binding Label	24012
Accumulated Metric	20
Disjoint Group ID:	-
Association Source:	-
Type:	-
PCE Initiated	true
Delegated PCE	2001:420:28f:2011:250:56ff:fe85:a025
Non-delegated PCEs	-
Affinity Exclude-Any:	-
Include-Any:	-
Include-All:	-
PCE Computed Time	27-Oct-2021 12:33:03 PM PDT
Last Update	27-Oct-2021 12:39:58 PM PDT


Last Updated ✕
 27-Oct-2021 06:41:22 PM PDT

Explicit Route Object (ERO)

Hop	Node	IP	Interface Name	Type
0	xrv9k-3	10.0.0.29	GigabitEthernet0/0/0/4	Strict
1	xrv9k-7	10.0.0.42	GigabitEthernet0/0/0/1	Strict

Create Explicit RSVP-TE Tunnels

This task creates RSVP-TE tunnels using an explicit (fixed) path consisting of a list of prefix or adjacency Segment IDs (SID list), each representing a node or link along on the path.


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- Step 1** From the main menu, choose **Traffic Engineering > Traffic Engineering**.
- Step 2** From the right window, click **RSVP-TE**.
- Step 3** Under **RSVP-TE Tunnels**, click + **Create**.
- Step 4** Enter the required RSVP-TE Tunnel values. Hover the mouse pointer over  to view a description of each field.
- Tip** If you have set up device groups, you can select the device group from the **Device Groups** drop-down menu. Then navigate and zoom in on the topology map to click the device for headend or endpoint selection.
- Step 5** Under Tunnel Path, click **Explicit Path** and enter a path name.
- Step 6** Add segments that will be part of the RSVP-TE path.
- Step 7** Click **Preview**. The path is highlighted on the map.
- Step 8** If you want to commit the tunnel path, click **Provision**.
- Step 9** Validate the RSVP-TE tunnel creation:
- Confirm that the new RSVP-TE tunnel appears in the RSVP-TE Tunnels table. You can also click the check box next to the policy to see it highlighted in the map.
Note The newly provisioned RSVP-TE tunnel may take some time, depending on the network size and performance, to appear in the **RSVP-TE Tunnels** table. The **RSVP-TE Tunnels** table is refreshed every 30 seconds.
 - View and confirm the new RSVP-TE tunnel details. From the **RSVP-TE** table, click *** (in the same row as the RSVP-TE tunnel), and select **View**.
- Note** On a scaled setup with high node, policy, or interface counts, a timeout may occur during policy deployment. Please contact a Cisco representative to fine tune the timers involved.
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Create Dynamic RSVP-TE Tunnels Based on Optimization Intent

This task creates an RSVP-TE tunnel with a dynamic path. SR-PCE computes a path for the tunnel that is based on metrics and path constraints (affinity or disjointness) defined by you. You can select from three available metrics to minimize in path computation: IGP, TE, or delay. SR-PCE will also automatically re-optimize the path as necessary based on topology changes.



Tip If you plan to use affinities, collect affinity information from your devices and then map them in Cisco Crosswork before creating a dynamic RSVP-TE tunnel. For more information, see [Configure TE Link Affinities](#).

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- Step 1** From the main menu, choose **Traffic Engineering > Traffic Engineering**.
- Step 2** From the right window, click **RSVP-TE**.
- Step 3** Under **RSVP-TE Tunnels**, click + **Create**.
- Step 4** Enter the required RSVP-TE Tunnel values. Hover the mouse pointer over  to view a description of each field.

Tip If you have set up device groups, you can select the device group from the **Device Groups** drop-down menu. Then navigate and zoom in on the topology map to click the device for headend or endpoint selection.

Step 5 Under **Tunnel Path**, click **Dynamic Path** and enter the Path Name.

Step 6 Under **Optimization Objective**, select the metric you want to minimize.

Step 7 Define any applicable constraints and disjointness.

Note Affinity constraints and disjointness cannot be configured on the same RSVP-TE tunnel. Also, there cannot be more than two RSVP-TE tunnels in the same disjoint group or subgroup. If there are existing RSVP-TE tunnels belonging to a disjoint group that you define here, all RSVP-TE tunnels that belong to that same disjoint group are shown during Preview.


Step 8 Click **Preview**. The path is highlighted on the map.

Step 9 If you want to commit the tunnel path, click **Provision**.

Step 10 Validate the RSVP-TE tunnel creation:

a. Confirm that the new RSVP-TE tunnel appears in the RSVP-TE Tunnels table. You can also click the check box next to the policy to see it highlighted in the map.

Note The newly provisioned RSVP-TE tunnel may take some time, depending on the network size and performance, to appear in the **RSVP-TE Tunnels** table. The **RSVP-TE Tunnels** table is refreshed every 30 seconds.

b. View and confirm the new RSVP-TE tunnel details. From the **RSVP-TE** table, click  and select **View**.

Note On a scaled setup with high node, policy, or interface counts, a timeout may occur during policy deployment. Please contact a Cisco representative to fine tune the timers involved.

Modify RSVP-TE Tunnels

To view, modify, or delete an RSVP-TE tunnel, do the following:

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

Step 2 From the **Traffic Engineering** window select the **RSVP-TE** tab.

Step 3 Locate the RSVP-TE tunnel you are interested in and click .

Step 4 Choose **View** or **Edit/Delete**.

Note

- You can only modify or delete RSVP-TE tunnels that have been created with the UI or API.
- After updating the RSVP-TE tunnel details, you can preview the changes on the map before saving it.