



Resource Reservation Protocol (RSVP)

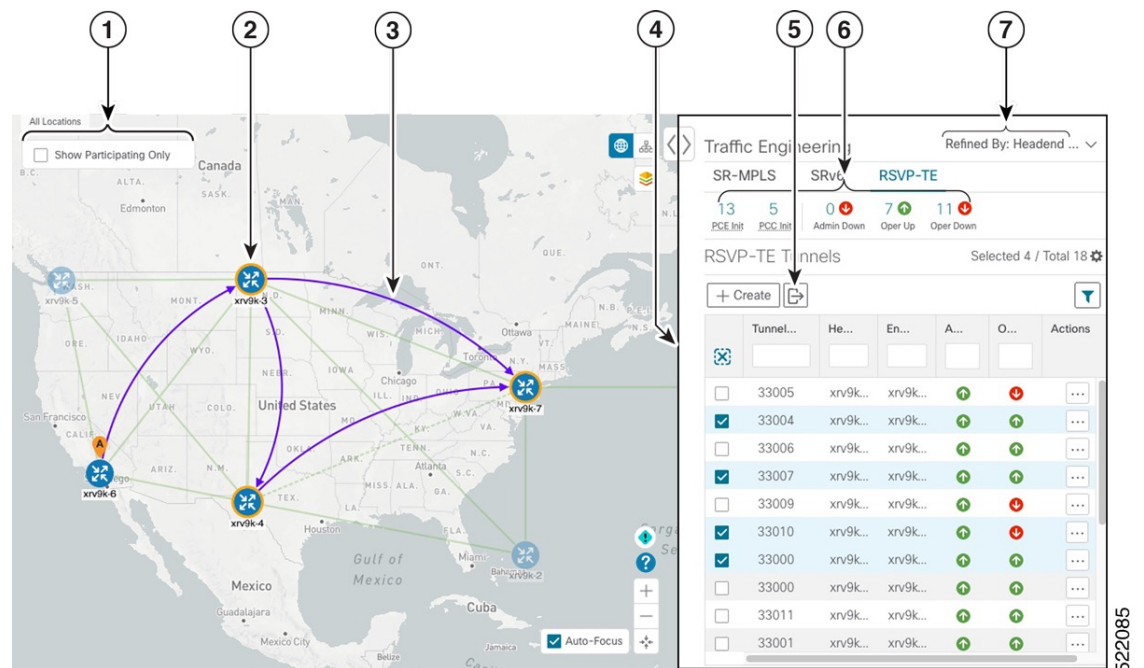
This section describes the RSVP-TE tunnel features that Crosswork Optimization Engine supports. For a list of known limitations and important notes, see the [Cisco Crosswork Optimization Engine Release Notes](#).



- [View RSVP-TE Tunnels on the Topology Map, on page 1](#)
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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



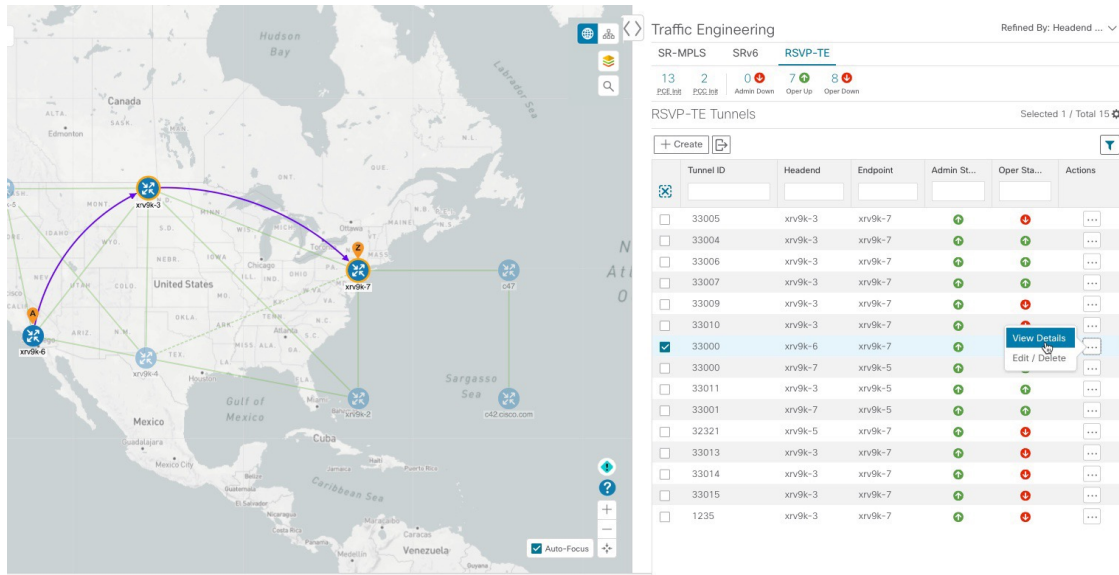
Callout No.	Description
1	Click Show Participating Only to display links that only belong to the selected RSVP-TE tunnels. All other links and devices disappear.
2	<p>A device with a solid orange outline () indicates that it is a strict hop. A dashed orange outline indicates that a loose hop was discovered.</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 purple 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>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
5	Exports <i>all</i> data into a CSV file. You cannot export selected or filtered data.
6	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
7	<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.

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.



Traffic Engineering

SR-MPLS SRv6 **RSVP-TE**

13 2 0 7 8
ESL: 13 2 0 Admin Down Open Up Oper Down

RSVP-TE Tunnels Selected 1 / Total 16

Tunnel ID	Headend	Endpoint	Admin St...	Oper Sta...	Actions
<input type="checkbox"/> 33005	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 33004	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 33006	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 33007	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 33009	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 33010	xrv9k-3	xrv9k-7	●	●	...
<input checked="" type="checkbox"/> 33000	xrv9k-6	xrv9k-7	●	●	View Details Edit / Delete
<input type="checkbox"/> 33000	xrv9k-7	xrv9k-5	●	●	...
<input type="checkbox"/> 33011	xrv9k-3	xrv9k-5	●	●	...
<input type="checkbox"/> 33001	xrv9k-7	xrv9k-5	●	●	...
<input type="checkbox"/> 32321	xrv9k-5	xrv9k-7	●	●	...
<input type="checkbox"/> 33013	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 33014	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 33015	xrv9k-3	xrv9k-7	●	●	...
<input type="checkbox"/> 1235	xrv9k-3	xrv9k-7	●	●	...

Step 2 View RSVP-TE tunnel details.

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).
- 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
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Headend A xrv9k-6 (192.168.0.6)

Endpoint Z 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 ↻
- 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.

- 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** If you are using Crosswork Optimization Engine within Crosswork Network Controller, select either **PCE Initor** or **PCC Init**.

- Step 5** 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 6** Under Policy Path, click **Explicit Path** and enter a path name.
- Step 7** Add segments that will be part of the RSVP-TE path.
- 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 *** (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.

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](#).

- 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.