



# MPLS Traffic Engineering over Bridge Domain Interfaces

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The MPLS Traffic Engineering (TE) over Bridge Domain Interfaces (BDI) feature enables MPLS traffic engineering over Bridge Domain Interfaces.

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## Prerequisites for Configuring MPLS TE over BDI

You must have:

- Enabled MPLS TE on all relevant routers and interfaces
- Configured MPLS TE tunnels

Your network must support the following Cisco IOS features:

- IP Cisco Express Forwarding
- Multiprotocol Label Switching (MPLS)

Your network must support at least one of the following protocols:

- Intermediate System to Intermediate System (ISIS)
- Open Shortest Path First (OSPF)

## Restrictions for MPLS TE over BDI

- MPLS TE - Verbatim Path Support
- Explicit Path Node exclusion
- P2MP TE Tunnels
- Auto-tunnel one-hops and backups

- Auto bandwidth
- Inter area or AS TE
- Auto route destinations
- FRR link ornode protection

## Information About MPLS Traffic Engineering over BDI

### Features of MPLS Traffic Engineering over BDI

The MPLS Traffic Engineering over BDI feature enables MPLS TE tunnels over BDI.

### Supported Features

Your network must support the following:

- MPLS TE tunnels
- Policy Routing onto MPLS TE Tunnels
- MPLS TE - Forwarding Adjacency
- MPLS TE – RSVP Hello State Timer
- MPLS TE - LSP Attributes
- MPLS TE - IP Explicit Address Exclusion
- MPLS TE - Configurable Path Calculation Metric for Tunnels
- MPLS TE - Verbatim Path Support
- Pseudo-wire mapping onto TE tunnels.

## How to Configure MPLS Traffic Engineering over BDI

This section assumes that you want to configure MPLS TE over BDI.

### Configuring MPLS TE over BDI

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface bdi30**
4. **mpls traffic-eng tunnels**
5. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Router# configure terminal	Enters interface configuration mode.
Step 3	<b>interface bdi30</b> <b>Example:</b> Router(config)# interface bdi30	Specifies the bridge domain interface and enters interface configuration mode.
Step 4	<b>mpls traffic-eng tunnels</b> <b>Example:</b> Router(config-if)# mpls traffic-eng tunnels	Enables an MPLS TE tunnel to use an established tunnel for the bridge domain interface.
Step 5	<b>end</b> <b>Example:</b> Router(config-if)# end	Returns to privileged EXEC mode.

## Configuring the RSVP Bandwidth

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type slot / subslot / port*
4. **ip rsvp bandwidth** [*interface-kbps* [*single-flow-kbps*[**bc1** *kbps* | **sub-pool** *kbps*]]] **percent** [*percent-bandwidth* [*single-flow-kbps*]]
5. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b>  Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>interface type slot / subslot / port</b> <b>Example:</b>  Router(config)# interface gigabitEthernet 0/0/0	Configures the interface type and enters interface configuration mode.
<b>Step 4</b>	<b>ip rsvp bandwidth [interface-kbps [single-flow-kbps[bc1 kbps   sub-pool kbps]]   percent percent-bandwidth [single-flow-kbps]]</b> <b>Example:</b>  Router(config-if)# ip rsvp bandwidth 7500 7500	Enables RSVP on an interface. <ul style="list-style-type: none"> <li>• The optional <i>interface-kbps</i> and <i>single-flow-kbps</i> arguments specify the amount of bandwidth that can be allocated by RSVP flows or to a single flow, respectively. Values are from 1 to 10000000.</li> <li>• The optional <b>sub-pool</b> and <i>kbps</i> keyword and argument specify subpool traffic and the amount of bandwidth that can be allocated by RSVP flows. Values are from 1 to 10000000.</li> </ul> <p><b>Note</b> Repeat this command for each interface on which you want to enable RSVP.</p>
<b>Step 5</b>	<b>end</b> <b>Example:</b>  Router(config-if)# end	(Optional) Returns to privileged EXEC mode.

## Verifying That MPLS TE over BDI Is Operational

To verify that MPLS TE over BDI can function, perform the following task.

### SUMMARY STEPS

1. enable
2. show mpls traffic-eng tunnels brief
3. show mpls traffic-eng tunnels summary
4. show mpls traffic-eng tunnels tunnel1

### DETAILED STEPS

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- Step 1**    **enable**  
Enables privileged EXEC mode.

**Step 2 show mpls traffic-eng tunnels brief**

Use this command to monitor and verify the state of the tunnels.

**Step 3 show mpls traffic-eng tunnels summary**

Use this command to monitor and verify the state of the tunnels.

**Step 4 show mpls traffic-eng tunnels tunnel1**

Use this command to verify that tunnels are up and using BDI.

**Troubleshooting Tips**

This section describes how you can use the `show mpls traffic-eng tunnels tunnel5` to check for issues.

```
Router# show mpls traffic-eng tunnels tunnel5

Name: router_t5                               (Tunnel5) Destination: 3.3.3.3
Status:
  Admin: up           Oper: up           Path: valid           Signalling: connected
  path option 1, type dynamic (Basis for Setup, path weight 2)

Config Parameters:
  Bandwidth: 0          kbps (Global) Priority: 5 5  Affinity: 0x0/0xFFFF
  Metric Type: TE (default)
  AutoRoute: disabled LockDown: disabled Loadshare: 0 [0] bw-based
  auto-bw: disabled

Active Path Option Parameters:
  State: dynamic path option 1 is active
  BandwidthOverride: disabled LockDown: disabled Verbatim: disabled

InLabel  : -
OutLabel  : BDI31, 21
Next Hop  : 12.0.0.2
RSVP Signalling Info:
  Src 1.1.1.1, Dst 3.3.3.3, Tun_Id 5, Tun_Instance 1
RSVP Path Info:
  My Address: 12.0.0.1
  Explicit Route: 12.0.0.2 14.0.0.2 14.0.0.1 3.3.3.3
  Record Route: NONE
  Tspec: ave rate=0 kbits, burst=1000 bytes, peak rate=0 kbits
RSVP Resv Info:
  Record Route: NONE
  Fspec: ave rate=0 kbits, burst=1000 bytes, peak rate=0 kbits
Shortest Unconstrained Path Info:
  Path Weight: 2 (TE)
  Explicit Route: 12.0.0.1 12.0.0.2 14.0.0.2 14.0.0.1
                  3.3.3.3

History:
Tunnel:
  Time since created: 1 minutes, 38 seconds
  Time since path change: 1 minutes, 36 seconds
  Number of LSP IDs (Tun_Instances) used: 1
  Current LSP: [ID: 1]
  Uptime: 1 minutes, 36 seconds
```

# Configuration Example for MPLS Traffic Engineering over BDI

The following example enables the BDI on the router:

```
Router(config)#interface bdi30
Router(config-if)#mpls traffic-eng tunnels
```

## Configuring Interface Tunnel Example

The following example configures an interface tunnel

```
interface Tunnel1
ip unnumbered Loopback0
tunnel source Loopback0
tunnel mode mpls traffic-eng
tunnel destination 4.4.4.4
tunnel mpls traffic-eng path-option 1 dynamic
```

## Configuring RSVP Bandwidth Example

The following example configures RSVP bandwidth

**ip rsvp bandwidth** [ *interface-kbps*] [*single-flow-kbps*]

```
Router(config-if)# ip rsvp bandwidth 500 500
```