



MPLS Traffic Engineering over Bridge Domain Interfaces

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

	Command or Action	Purpose
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface type slot / subslot / port Example: Router(config)# interface gigabitEthernet 0/0/0	Configures the interface type and enters interface configuration mode.
Step 4	ip rsvp bandwidth [interface-kbps [single-flow-kbps[bc1 kbps sub-pool kbps]] percent percent-bandwidth [single-flow-kbps]] Example: Router(config-if)# ip rsvp bandwidth 7500 7500	Enables RSVP on an interface. <ul style="list-style-type: none"> • 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. • The optional sub-pool 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. <p>Note Repeat this command for each interface on which you want to enable RSVP.</p>
Step 5	end Example: 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
```