



# MPLS Traffic Engineering—RSVP Hello State Timer

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**First Published: August 2, 2004**

**Last Updated: June 29, 2007**

The MPLS Traffic Engineering—RSVP Hello State Timer feature detects when a neighbor is down and triggers faster state timeout thereby freeing resources such as bandwidth to be reused by other label-switched paths (LSPs).

## History for the MPLS Traffic Engineering—RSVP Hello State Timer Feature

Release	Modification
12.0(29)S	This feature was introduced.
12.2(33)SRA	This feature was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This feature was integrated into Cisco IOS Release 12.2(33)SXH.

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Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

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- [Command Reference, page 13](#)
- [ip rsvp signalling hello dscp, page 14](#)

## Prerequisites for MPLS Traffic Engineering—RSVP Hello State Timer

- Configure Resource Reservation Protocol (RSVP) on routers.
- Enable Multiprotocol Label Switching (MPLS).
- Configure traffic engineering (TE) on routers.
- Enable hellos for state timeout.

## Restrictions for MPLS Traffic Engineering—RSVP Hello State Timer

- Hellos for state timeout are dependent on graceful restart, if it is configured; however, graceful restart is independent of hellos for state timeout.
- Unnumbered interfaces are not supported.
- Hellos for state timeout are configured on a per-interface basis.

## Information About MPLS Traffic Engineering—RSVP Hello State Timer

To configure MPLS TE—RSVP Hello State Timer, you should understand the following concepts:

- [Hellos for State Timeout, page 2](#)
- [Benefits of MPLS Traffic Engineering—RSVP Hello State Timer, page 4](#)

## Hellos for State Timeout

When RSVP signals a TE LSP and there is a failure somewhere along the path, the failure can remain undetected for as long as two minutes. During this time, bandwidth is held by the non-functioning LSP on the nodes downstream from the point of failure along the path with the state intact. If this bandwidth is needed by headend tunnels to signal or resignal LSPs, tunnels may fail to come up for several minutes thereby negatively affecting convergence time.

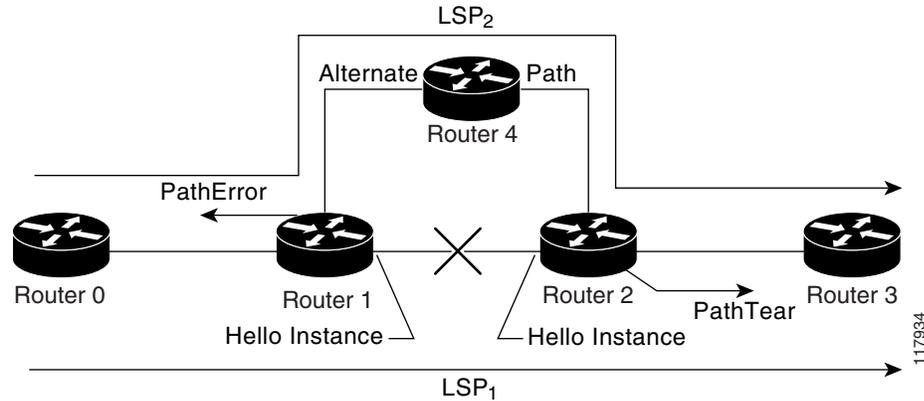
Hellos enable RSVP nodes to detect when a neighboring node is not reachable. After a certain number of intervals, hellos notice that a neighbor is not responding and delete its state. This action frees the node's resources to be reused by other LSPs.

Hellos must be configured both globally on the router and on the specific interface to be operational.

## NonFast-Reroutable TE LSP

As shown in Figure 1, a nonfast-reroutable TE LSP exists from Router 1 to Router 3 via Router 2.

**Figure 1** NonFast-Reroutable TE LSP



Assume that the link between Router 1 and Router 2 fails. This type of problem can be detected by various means including interface failure, Interior Gateway Protocol (IGP) (Open Shortest Path First (OSPF) or Intermediate System-to-Intermediate System (IS-IS)), and RSVP hellos. However, sometimes interface failure cannot be detected; for example, when Router 1 and Router 2 are interconnected through a Layer 2 switch. The IGP may be slow detecting the failure. Or there may be no IGP running between Router 1 and Router 2; for example, between two Autonomous System Boundary routers (ASBRs) interconnecting two autonomous systems.

If hellos were running between Router 1 and Router 2, they would notice that communication was lost and time out the state immediately.

Router 2 sends a delayed PathTear message to Router 3 so that the state can be deleted on all nodes thereby speeding up the convergence time.



### Note

The PathTear message is delayed one second because on some platforms data is being forwarded even after the control plane is down.

Router 1 sends a destructive PathError message upstream to Router 0 with error code ROUTING\_PROBLEM and error value NO\_ROUTE.

LSP1 goes from Router 0 to Router 1 to Router 2 to Router 3; LSP 2 goes from Router 0 to Router 1 to Router 4 to Router 2 to Router 3.

## Hello Instance

A hello instance implements RSVP hellos for a given router interface address and a remote IP address. A hello instance is expensive because of the large number of hello requests that are sent and the strains they put on the router resources. Therefore, you should create a hello instance only when it is needed to time out state and delete the hello instance when it is no longer necessary.

## Benefits of MPLS Traffic Engineering—RSVP Hello State Timer

### Faster Network Convergence

RSVP hellos can be used to detect when a neighboring node is down. The hello state timer then triggers a state timeout. As a result, network convergence time is reduced, and nodes can forward traffic on alternate paths or assist in stateful switchover (SSO) operation.

## How to Configure MPLS Traffic Engineering—RSVP Hello State Timer

This section contains the following procedures:



### Note

The following commands also enable Fast Reroute; however, this section focuses on the RSVP hello state timer.

- [Enabling the Hello State Timer Globally, page 4](#) (required)
- [Enabling the Hello State Timer on an Interface, page 5](#) (required)
- [Setting a DSCP Value on an Interface, page 6](#) (optional)
- [Setting a Hello Request Interval on an Interface, page 7](#) (optional)
- [Setting a Missed Refresh Limit on an Interface, page 8](#) (optional)
- [Verifying Hello for State Timer Configuration, page 9](#) (optional)

## Enabling the Hello State Timer Globally

Perform this task to enable the RSVP hello state timer globally.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip rsvp signalling hello**
4. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>ip rsvp signalling hello</b>  <b>Example:</b> Router(config)# ip rsvp signalling hello	Enables hellos for state timeout globally on a router.
Step 4	<b>end</b>  <b>Example:</b> Router(config)# end	Exits to privileged EXEC mode.

## Enabling the Hello State Timer on an Interface

Perform this task to enable the hello state timer on an interface.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip rsvp signalling hello**
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 global configuration mode.
Step 3	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# interface Ethernet 0/0	Enters interface configuration mode. <ul style="list-style-type: none"><li>• The <i>type number</i> argument identifies the interface to be configured.</li></ul>
Step 4	<b>ip rsvp signalling hello</b>  <b>Example:</b> Router(config-if)# ip rsvp signalling hello	Enables hellos for state timeout on an interface.
Step 5	<b>end</b>  <b>Example:</b> Router(config-if)# end	Exits to privileged EXEC mode.

## Setting a DSCP Value on an Interface

Perform this task to set a DSCP value on an interface.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip rsvp signalling hello reroute dscp** *num*
5. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# interface Ethernet 0/0	Enters interface configuration mode.  • The <i>type number</i> argument identifies the interface to be configured.
Step 4	<b>ip rsvp signalling hello reroute dscp</b> <i>num</i>  <b>Example:</b> Router(config-if)# ip rsvp signalling hello reroute dscp 30	Sets a DSCP value on an interface of a router with hellos for state timeout enabled.  <b>Note</b> If you issue the <b>ip rsvp signalling hello dscp</b> <i>num</i> command without a keyword, Fast Reroute is selected by default.
Step 5	<b>end</b>  <b>Example:</b> Router(config-if)# end	Exits to privileged EXEC mode.

## Setting a Hello Request Interval on an Interface

Perform this task to set a hello request interval on an interface.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip rsvp signalling hello reroute refresh interval** *interval-value*
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 global configuration mode.
Step 3	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# interface Ethernet 0/0	Enters interface configuration mode. <ul style="list-style-type: none"><li>The <i>type number</i> argument identifies the interface to be configured.</li></ul>
Step 4	<b>ip rsvp signalling hello reroute refresh interval</b> <i>interval-value</i>  <b>Example:</b> Router(config-if)# ip rsvp signalling hello reroute refresh interval 5000	Sets a hello request interval on an interface of a router with hellos for state timer enabled. <b>Note</b> If you issue the <b>ip rsvp signalling hello refresh interval</b> command without a keyword, Fast Reroute is selected by default.
Step 5	<b>end</b>  <b>Example:</b> Router(config-if)# end	Exits to privileged EXEC mode.

## Setting a Missed Refresh Limit on an Interface

Perform this task to set a missed refresh limit on an interface.

## SUMMARY STEPS

- enable**
- configure terminal**
- interface** *type number*
- ip rsvp signalling hello reroute refresh misses** *msg-count*
- 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 global configuration mode.
Step 3	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# interface Ethernet 0/0	Enters interface configuration mode. <ul style="list-style-type: none"><li>The <i>type number</i> argument identifies the interface to be configured.</li></ul>
Step 4	<b>ip rsdp signalling hello reroute refresh misses</b> <i>msg-count</i>  <b>Example:</b> Router(config-if)# ip rsdp signalling hello reroute refresh misses 5	Configures the number of consecutive hello messages that are lost before hello declares the neighbor down. <b>Note</b> If you issue the <b>ip rsdp signalling hello refresh misses</b> command without a keyword, Fast Reroute is selected by default.
Step 5	<b>end</b>  <b>Example:</b> Router(config-if)# end	Exits to privileged EXEC mode.

## Verifying Hello for State Timer Configuration

Perform this task to verify the hello for state timer configuration.

## SUMMARY STEPS

- enable
- show ip rsdp hello

## DETAILED STEPS

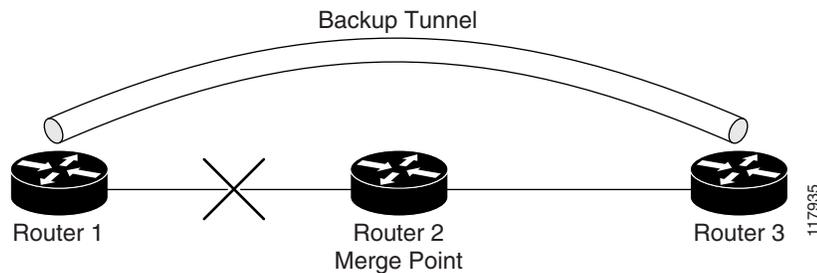
	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	(Optional) Enables privileged EXEC mode. <ul style="list-style-type: none"><li>Enter your password if prompted.</li></ul>
Step 2	<b>show ip rsdp hello</b>  <b>Example:</b> Router# show ip rsdp hello	Displays the status of RSVP TE hellos and statistics including hello state timer (reroute).

## Sample Configurations for Troubleshooting

### Fast-Reroutable TE LSP with Backup Tunnel

As shown in [Figure 2](#), a fast reroutable TE LSP with a backup tunnel exists from Router 1 to Router 2 to Router 3.

**Figure 2** *Fast Reroutable TE LSP with Backup Tunnel*



This TE LSP has a backup tunnel from Router 1 to Router 3 protecting the fast reroutable TE LSP against a failure in the Router 1-Router 2 link and node Router 2. However, assume that a failure occurs in the link connecting Router 1 to Router 2.

If hellos were running between Router 1 and Router 2, they would notice that the link is down, but would not time out the state. Router 2 notices the failure, but cannot time out the TE LSP because Router 2 may be a merge point or another downstream node may be a merge point. Router 1 notices the failure and switches to the backup LSP; however, Router 1 cannot time out the state either.



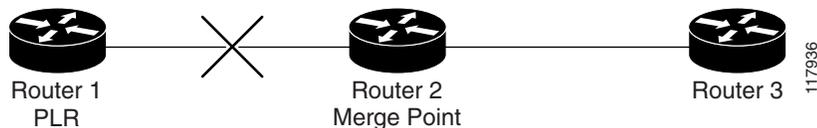
**Note**

A hello instance is not created in the preceding scenario because the neighbor is down and the hello instance cannot take action.

### Fast-Reroutable TE LSP Without Backup Tunnel

As shown in [Figure 3](#), a fast-reroutable TE LSP without a backup tunnel exists from Router 1, the point of local repair (PLR), to Router 2 to Router 3.

**Figure 3** *Fast Reroutable TE LSP Without Backup Tunnel*



Assume that a failure occurs in the link connecting Router 1 to Router 3. Router 1 can time out the state for the TE LSP because Router 1 knows there is no backup tunnel. However, Router 2 cannot time out the state because Router 2 does not know whether a backup tunnel exists. Also, Router 2 may be a merge point, and therefore, cannot time out the state.



**Note**

A hello instance is not created in the preceding scenario because the neighbor is down and the hello instance cannot take action.

## Hello Instance

- On a fast-reroutable TE LSP with no backup tunnel, create a hello instance with the neighbor downstream (next hop (NHOP)).
- On a non-fast-reroutable TE LSP, create a hello instance with the neighbor downstream (NHOP) and the neighbor upstream (previous hop (PHOP)). This is in addition to the existing hellos for Fast Reroute.



### Note

If both Fast Reroute and hellos for state timeout hello instances are needed on the same link, only one hello instance is created. It will have the Fast Reroute configuration including interval, missed refreshes, and DSCP. When a neighbor is down, Fast Reroute and the hello state timer take action.

# Configuration Examples for MPLS Traffic Engineering—RSVP Hello State Timer

This section provides a configuration example for the MPLS TE—RSVP Hello State Timer feature:

- [MPLS Traffic Engineering—RSVP Hello State Timer: Example, page 11](#)

## MPLS Traffic Engineering—RSVP Hello State Timer: Example

In the following example, the hello state timer is enabled globally and on an interface; and related parameters, including a DSCP value, a refresh interval, and a missed refresh limit are set on an interface.

```
Router# configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)# ip rsvp signalling hello

Router(config)# interface Ethernet 0/0

Router(config-if)# ip rsvp signalling hello

Router(config-if)# ip rsvp signalling hello reroute dscp 30

Router(config-if)# ip rsvp signalling hello reroute refresh interval 5000

Router(config-if)# ip rsvp signalling hello reroute refresh misses 5

Router(config-if)# end
```

The following example verifies the status of the hello state timer (reroute):

```
Router# show ip rsvp hello

Hello:
  Fast-Reroute/Reroute:Enabled
  Statistics:Enabled
  Graceful Restart:Enabled (help-neighbor only)
```

## Additional References

The following sections provide references related to the MPLS Traffic Engineering—RSVP Hello State Timer feature.

## Related Documents

Related Topic	Document Title
RSVP commands: complete command syntax, command mode, defaults, usage guidelines, and examples	<a href="#">Cisco IOS Quality of Service Solutions Command Reference</a> , Release 12.2SX <a href="#">Cisco IOS Quality of Service Solutions Command Reference</a> , Release 12.2SR
QoS features including signaling, classification, and congestion management	<a href="#">Cisco IOS Quality of Service Solutions Configuration Guide</a> , Release 12.4
Stateful Switchover	<a href="#">Stateful Switchover</a> feature module
MPLS Label Distribution Protocol	<a href="#">MPLS Label Distribution Protocol (LDP)</a> feature module
Cisco nonstop forwarding	<a href="#">Cisco Nonstop Forwarding</a> feature module
Information on backup tunnels, link and node failures, RSVP hellos	<a href="#">MPLS Traffic Engineering (TE)—Link and Node Protection, with RSVP Hellos Support</a> feature module
Information on stateful switchover, Cisco nonstop forwarding, graceful restart	<a href="#">NSF/SSO - MPLS LDP and LDP Graceful Restart</a> feature module

## Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

## MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

## RFCs

RFC	Title
RFC 3209	<a href="#">RSVP-TE: Extensions to RSVP for LSP Tunnels</a>

## Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p><a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a></p>

## Command Reference

This section documents only commands that are new or modified.

- [ip rsvp signalling hello dscp](#)
- [ip rsvp signalling hello refresh interval](#)
- [ip rsvp signalling hello refresh misses](#)
- [ip rsvp signalling hello reroute dscp](#)
- [ip rsvp signalling hello reroute refresh interval](#)
- [ip rsvp signalling hello reroute refresh misses](#)
- [show ip rsvp hello](#)

## ip rsvp signalling hello dscp

To set the differentiated services code point (DSCP) value that is in the IP header of a Resource Reservation Protocol (RSVP) traffic engineering (TE) hello message sent from an interface, use the **ip rsvp signalling hello dscp** command in interface configuration mode. To set the DSCP to its default value, use the **no** form of this command.

```
ip rsvp signalling hello [fast-reroute] dscp num
```

```
no ip rsvp signalling hello [fast-reroute] dscp
```

### Syntax Description

<b>fast-reroute</b>	(Optional) Initiates Fast Reroute capability.
<i>num</i>	DSCP value. Valid values are from 0 to 63.

### Defaults

The default DSCP value is 48.

### Command Modes

Interface configuration

### Command History

Release	Modification
12.0(22)S	This command was introduced.
12.0(29)S	The optional <b>fast-reroute</b> keyword was added.
12.2(18)SXD1	This command was integrated into Cisco IOS Release 12.2(18)SXD1.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

### Usage Guidelines

If a link is congested, you should set the DSCP to a value higher than 0 to reduce the likelihood that hello messages get dropped.

You configure the DSCP per interface, not per flow.

The DSCP applies to the RSVP hellos created on a specific interface. You can configure each interface independently for DSCP.

If you issue the **ip rsvp signalling hello dscp** command without the optional **fast-reroute** keyword, the command applies to Fast Reroute hellos. This command is provided for backward compatibility; however, we recommend that you use the **ip rsvp signalling hello fast-reroute dscp** command.

### Examples

In the following example, hello messages sent from this interface have a DSCP value of 30 and Fast Reroute capability is enabled by specifying the **fast-reroute** keyword:

```
Router(config-if)# ip rsvp signalling hello fast-reroute dscp 30
```

In the following example, hello messages sent from this interface have a DSCP value of 30 and Fast Reroute capability is enabled by default:

```
Router(config-if)# ip rsvp signalling hello dscp 30
```

#### Related Commands

Command	Description
<b>ip rsvp signalling hello (interface)</b>	Enables hellos on an interface where you need Fast Reroute protection.
<b>ip rsvp signalling hello refresh interval</b>	Sets the hello refresh interval in hello messages.
<b>ip rsvp signalling hello reroute refresh misses</b>	Sets the missed refresh limit in hello messages.

## ip rsvp signalling hello refresh interval

To configure the Resource Reservation Protocol (RSVP) traffic engineering (TE) hello refresh interval, use the **ip rsvp signalling hello refresh interval** command in interface configuration mode. To set the refresh interval to its default value, use the **no** form of the command.

**ip rsvp signalling hello** [**fast-reroute**] **refresh interval** *interval-value*

**no ip rsvp signalling hello** [**fast-reroute**] **refresh interval**

### Syntax Description

<b>fast-reroute</b>	(Optional) Initiates Fast Reroute capability.
<i>interval-value</i>	Frequency, in milliseconds, at which a node sends hello messages to a neighbor. Valid values are from 1000 to 30000 (1 to 30 seconds).

### Defaults

10000 milliseconds (10 seconds)

### Command Modes

Interface configuration

### Command History

Release	Modification
12.0(22)S	This command was introduced.
12.0(29)S	The optional <b>fast-reroute</b> keyword was added.
12.2(18)SXD1	This command was integrated into Cisco IOS Release 12.2(18)SXD1.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

### Usage Guidelines

You can configure the hello request interval on a per-interface basis. A node periodically generates a hello message containing a Hello Request object for each neighbor whose status is being tracked. The frequency of those hello messages is determined by the hello interval.

If you issue the **ip rsvp signalling hello refresh interval** command without the optional **fast-reroute** keyword, the command applies to Fast Reroute hellos. This command is provided for backward compatibility; however, we recommend that you use the **ip rsvp signalling hello fast-reroute refresh interval** command.

### Examples

In the following example, hello requests are sent to a neighbor every 5000 milliseconds and Fast Reroute capability is enabled by specifying the **fast-reroute** keyword:

```
Router(config-if)# ip rsvp signalling hello fast-reroute refresh interval 5000
```

In the following example, hello requests are sent to a neighbor every 5000 milliseconds and Fast Reroute capability is enabled by default:

```
Router(config-if)# ip rsvp signalling hello refresh interval 5000
```

Related Commands	Command	Description
	<b>ip rsvp signalling hello dscp</b>	Sets the DSCP value in hello messages.
	<b>ip rsvp signalling hello graceful-restart fresh interval</b>	Sets the refresh interval in graceful restart hello messages.
	<b>ip rsvp signalling hello reroute refresh misses</b>	Sets the missed refresh limit in hello messages.

## ip rsvp signalling hello refresh misses

To specify how many Resource Reservation Protocol (RSVP) traffic engineering (TE) hello acknowledgments a node can miss in a row before the node considers communication with its neighbor is down, use the **ip rsvp signalling hello refresh misses** command in interface configuration mode. To return the missed refresh limit to its default value, use the **no** form of the command.

**ip rsvp signalling hello** [**fast-reroute**] **refresh misses** *msg-count*

**no ip rsvp signalling hello** [**fast-reroute**] **refresh misses**

Syntax Description	fast-reroute	(Optional) Initiates Fast Reroute capability.
	<i>msg-count</i>	The number of sequential hello acknowledgments that a node can miss before RSVP considers the state expired and tears it down. Valid values are from 4 to 10.

**Defaults** The default for the *msg-count* argument is 4.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.0(22)S	This command was introduced.
	12.0(29)S	The optional <b>fast-reroute</b> keyword was added.
	12.2(18)SXD1	This command was integrated into Cisco IOS Release 12.2(18)SXD1.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

**Usage Guidelines** A hello comprises a hello message, a Hello Request object, and a Hello ACK object. Each request is answered by an acknowledgment. If a link is very congested or a router has a very heavy load, set this number to a value higher than the default value to ensure that hello does not falsely declare that a neighbor is down.

If you issue the **ip rsvp signalling hello refresh misses** command without the optional **fast-reroute** keyword, the command applies to Fast Reroute hellos and Fast Reroute capability is enabled by default. This command is provided for backward compatibility; however, we recommend that you use the **ip rsvp signalling hello fast-reroute refresh misses** command.

**Examples** In the following example, if the node does not receive five hello acknowledgments in a row, the node declares that its neighbor is down and Fast Reroute is enabled by specifying the **fast-reroute** keyword:

```
Router(config-if)# ip rsvp signalling hello fast-reroute refresh misses 5
```

In the following example, if the node does not receive five hello acknowledgments in a row, the node declares that its neighbor is down and Fast Reroute is enabled by default:

```
Router(config-if)# ip rsvp signalling hello refresh misses 5
```

**Related Commands**

Command	Description
<b>ip rsvp signalling hello dscp</b>	Sets the DSCP value in hello messages.
<b>ip rsvp signalling hello</b>	Sets the refresh interval in hello messages.

## ip rsvp signalling hello reroute dscp

To set the differentiated services code point (DSCP) value that is in the IP header of a Resource Reservation Protocol (RSVP) traffic engineering (TE) reroute hello (for state timeout) message sent from an interface, use the **ip rsvp signalling hello reroute dscp** command in interface configuration mode. To set the DSCP to its default value, use the **no** form of this command.

**ip rsvp signalling hello reroute dscp** *num*

**no ip rsvp signalling hello reroute dscp**

### Syntax Description

*num* DSCP value. Valid values are from 0 to 63.

### Defaults

The default DSCP value is 48.

### Command Modes

Interface configuration

### Command History

Release	Modification
12.0(29)S	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

### Usage Guidelines

If a link is congested, you should set the DSCP to a value higher than 0 to reduce the likelihood that hello messages get dropped.

You configure the DSCP per interface, not per flow.

The DSCP applies to the RSVP hellos created on a specific interface. You can configure each interface independently for DSCP.

### Examples

In the following example, hello messages sent from this interface have a DSCP value of 30:

```
Router(config-if)# ip rsvp signalling hello reroute dscp 30
```

### Related Commands

Command	Description
<b>ip rsvp signalling hello reroute refresh interval</b>	Sets the hello request interval in reroute hello messages.
<b>ip rsvp signalling hello reroute refresh misses</b>	Sets the missed refresh limit in reroute hello messages.

# ip rsvp signalling hello reroute refresh interval

To configure the Resource Reservation Protocol (RSVP) Traffic Engineering (TE) reroute hello (for state timeout) refresh interval, use the **ip rsvp signalling hello reroute refresh interval** command in interface configuration mode. To set the refresh interval to its default value, use the **no** form of the command.

**ip rsvp signalling hello reroute refresh interval** *interval-value*

**no ip rsvp signalling hello reroute refresh interval**

<b>Syntax Description</b>	<i>interval-value</i>	Frequency, in milliseconds, at which a node sends hello messages to a neighbor. Valid values are from 1000 to 30000 (1 to 30 seconds).
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<b>Defaults</b>	10000 milliseconds (10 seconds)
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<b>Command Modes</b>	Interface configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(29)S	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.	
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.	

<b>Usage Guidelines</b>	You can configure the hello request interval on a per-interface basis. A node periodically generates a hello message containing a Hello Request object for each neighbor whose status is being tracked. The frequency of those hello messages is determined by the hello interval. For some routers, if you set the interval to a value less than the default value, CPU usage may be high.
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<b>Examples</b>	In the following example, hello requests are sent to a neighbor every 5000 milliseconds and Fast Reroute capability is enabled by specifying the <b>fast-reroute</b> keyword:
-----------------	---

```
Router(config-if)# ip rsvp signalling hello fast-reroute refresh interval 5000
```

In the following example, hello requests are sent to a neighbor every 5000 milliseconds and Fast Reroute capability is enabled by default:

```
Router(config-if)# ip rsvp signalling hello refresh interval 5000
```

## ■ ip rsvp signalling hello reroute refresh interval

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>ip rsvp signalling hello reroute refresh interval</b>	Sets the DSCP value in reroute hello messages.
<b>ip rsvp signalling hello reroute refresh misses</b>	Sets the missed refresh limit in reroute hello messages.

## ip rsvp signalling hello reroute refresh misses

To specify how many Resource Reservation Protocol (RSVP) traffic engineering (TE) reroute hello (for state timeout) acknowledgments (ACKs) a node can miss in a row before the node considers communication with its neighbor is down, use the **ip rsvp signalling hello reroute refresh misses** command in interface configuration mode. To return the missed refresh limit to its default value, use the **no** form of the command.

**ip rsvp signalling hello reroute refresh misses** *msg-count*

**no ip rsvp signalling hello reroute refresh misses**

<b>Syntax Description</b>	<i>msg-count</i>	The number of sequential hello acknowledgments (ACKs) that a node can miss before RSVP considers the state expired and tears it down. Valid values are from 4 to 10.
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**Defaults** The default is 4.

**Command Modes** Interface configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(29)S	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

**Usage Guidelines** A hello comprises a hello message, a Hello Request object, and a Hello ACK object. Each request is answered by an acknowledgment. If a link is very congested or a router has a very heavy load, set this number to a value higher than the default value to ensure that hello does not falsely declare that a neighbor is down.

**Examples** In the following example, if the node does not receive five hello acknowledgments in a row, the node declares that its neighbor is down:

```
Router(config-if)# ip rsvp signalling hello reroute refresh misses 5
```

Related Commands	Command	Description
	<b>ip rsvp signalling hello reroute dscp</b>	Sets the DSCP value in reroute hello messages.
	<b>ip rsvp signalling hello reroute refresh interval</b>	Sets the refresh interval in reroute hello messages.

# show ip rsvp hello

To display hello status and statistics for Fast Reroute, reroute (hello state timer), and graceful restart, use the **show ip rsvp hello** command in user EXEC or privileged EXEC mode.

## show ip rsvp hello

**Syntax Description** This command has no arguments or keywords.

**Command Modes** User EXEC  
Privileged EXEC

Command History	Release	Modification
	12.0(22)S	This command was introduced.
	12.0(29)S	The command output was modified to include graceful restart, reroute (hello state timer), and Fast Reroute information.
	12.2(18)SXD1	This command was integrated into Cisco IOS Release 12.2(18)SXD1.
	12.2(33)SRA	The command output was modified to show whether graceful restart is configured and full mode was added.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

**Examples** The following is sample output from the **show ip rsvp hello** command:

```
Router# show ip rsvp hello

Hello:
  Fast-Reroute/Reroute: Enabled
    Statistics: Disabled
  GracefulRestart: Enabled, mode: full
```

[Table 1](#) describes the significant fields shown in the display. The fields describe the processes for which hello is enabled or disabled.

**Table 1** show ip rsvp hello Field Descriptions

Field	Description
Fast-Reroute/Reroute	Status of fast reroute/reroute. Values are as follows: <ul style="list-style-type: none"> <li>Enabled—Fast reroute and reroute (hello for state timer) are activated (enabled).</li> <li>Disabled—Fast reroute and reroute (hello for state timer) are not activated (disabled).</li> </ul>
Statistics	Status of hello statistics. Valid values are as follows: <ul style="list-style-type: none"> <li>Enabled—Statistics are configured. Hello packets are time-stamped when they arrive in the hello input queue for the purpose of recording the time required until they are processed.</li> <li>Disabled—Hello statistics are not configured.</li> <li>Shutdown—Hello statistics are configured but not operational. The input queue is too long (that is, more than 10,000 packets are queued).</li> </ul>
GracefulRestart	Restart capability: <ul style="list-style-type: none"> <li>Enabled—Restart capability is activated for a router (full mode) or its neighbor (help-neighbor).</li> <li>Disabled—Restart capability is not activated.</li> </ul>

**Related Commands**

Command	Description
<b>ip rsvp signalling hello (configuration)</b>	Enables hello globally on the router.
<b>ip rsvp signalling hello statistics</b>	Enables hello statistics on the router.
<b>show ip rsvp hello statistics</b>	Displays how long hello packets have been in the hello input queue.

# Glossary

**AS**—autonomous system. A collection of networks that share the same routing protocol and that are under the same system administration.

**ASBR**—autonomous system boundary router. A router that connects and exchanges information between two or more autonomous systems.

**backup tunnel**—An MPLS traffic engineering tunnel used to protect other (primary) tunnel traffic when a link or node failure occurs.

**DSCP**—differentiated services code point. Six bits in the IP header, as defined by the IETF. These bits determine the class of service provided to the IP packet.

**Fast Reroute**—A mechanism for protecting MPLS traffic engineering (TE) LSPs from link and node failure by locally repairing the LSPs at the point of failure, allowing data to continue to flow on them while their headend routers attempt to establish end-to-end LSPs to replace them. FRR locally repairs the protected LSPs by rerouting them over backup tunnels that bypass failed links or nodes.

**graceful restart**—A process for helping a neighboring route processor restart after a node failure has occurred.

**headend**—The router that originates and maintains a given LSP. This is the first router in the LSP's path.

**IGP**—Interior Gateway Protocol. Internet protocol used to exchange routing information within an autonomous system. Examples of common Internet IGPs include IGRP, OSPF, and RIP.

**IS-IS**—Intermediate System-to-Intermediate System. OSI link-state hierarchical routing protocol whereby Intermediate System (IS) routers exchange routing information based on a single metric to determine network topology.

**instance**—A mechanism that implements the RSVP hello extensions for a given router interface address and remote IP address. Active hello instances periodically send Hello Request messages, expecting Hello ACK messages in response. If the expected ACK message is not received, the active hello instance declares that the neighbor (remote IP address) is unreachable (that is, it is lost). This can cause LSPs crossing this neighbor to be fast rerouted.

**label**—A short, fixed-length data identifier that tells switching nodes how to forward data (packets or cells).

**LDP**—Label Distribution Protocol. The protocol that supports MPLS hop-by-hop forwarding by distributing bindings between labels and network prefixes. The Cisco proprietary version of this protocol is the Tag Distribution Protocol (TDP).

**LSP**—label-switched path. A configured connection between two routers, in which MPLS is used to carry packets. A path created by the concatenation of one or more label-switched hops, allowing a packet to be forwarded by swapping labels from an MPLS node to another MPLS node.

**merge point**—The backup tunnel's tail.

**MPLS**—Multiprotocol Label Switching. A method for forwarding packets (frames) through a network. MPLS enables routers at the edge of a network to apply labels to packets (frames). ATM switches or existing routers in the network core can switch packets according to the labels.

**OSPF**—Open Shortest Path First. A link-state routing protocol used for routing.

**PLR**—point of local repair. The headend of the backup tunnel.

**RSVP**—Resource Reservation Protocol. A protocol that supports the reservation of resources across an IP network. Applications running on IP end systems can use RSVP to indicate to other nodes the nature (bandwidth, jitter, maximum burst, and so on) of the packet streams they want to receive.

**state**—Information that a router must maintain about each LSP. The information is used for rerouting tunnels.

**tailend**—The router upon which an LSP is terminated. This is the last router in the LSP's path.

**TE**—traffic engineering. The techniques and processes used to cause routed traffic to travel through the network on a path other than the one that would have been chosen if standard routing methods had been used.

**topology**—The physical arrangement of network nodes and media within an enterprise networking structure.

**tunnel**—Secure communications path between two peers, such as two routers.

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