

Chapter 12

Summary of RSVP Configuration Statements

This chapter provides a reference for each of the Resource Reservation Protocol (RSVP) configuration statements. The statements are organized alphabetically.

aggregate

Syntax	(aggregate no-aggregate);
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit logical-routers <i>logical-router-name</i> protocols rsvp peer-interface <i>peer-interface-name</i>], [edit protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp peer-interface <i>peer-interface-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	<p>Control the use of RSVP aggregate messages on an interface or peer interface:</p> <ul style="list-style-type: none">■ aggregate—Use RSVP aggregate messages.■ no-aggregate—Do not use RSVP aggregate messages. <p>Aggregate messages can pack multiple RSVP messages into a single transmission, thereby reducing network overhead and enhancing efficiency. The number of supportable sessions and processing overhead are significantly improved when aggregation is enabled.</p> <p>Not all routers connected to a subnet need to support aggregation simultaneously. Each RSVP router negotiates its intention to use aggregate messages on a per-neighbor basis. Only when both routers agree are aggregate messages sent.</p>
Default	Aggregation is disabled.
Usage Guidelines	See “Configuring RSVP Refresh Reduction” on page 296.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

authentication-key

Syntax	authentication-key <i>key</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit logical-routers <i>logical-router-name</i> protocols rsvp peer-interface <i>peer-interface-name</i>], [edit protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp peer-interface <i>peer-interface-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	<p>Authentication key (password). Neighboring routers use the password to verify the authenticity of packets sent from this interface or peer interface.</p> <p>RSVP uses HMAC-MD5 authentication, which is defined in RFC 2104, <i>HMAC: Keyed-Hashing for Message Authentication</i>.</p> <p>All routers that are connected to the same IP subnet must use the same authentication scheme and password.</p>
Options	<p>key—Authentication password. It can be 1 through 16 contiguous digits or letters. Separate decimal digits with periods. Separate hexadecimal digits with periods and precede the string with 0x. If you include spaces in the password, enclose the entire password in quotation marks (" ").</p>
Usage Guidelines	See “Configuring RSVP Authentication” on page 299.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

bandwidth

Syntax	bandwidth <i>bps</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>], [edit protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	For certain logical interfaces (such as Asynchronous Transfer Mode [ATM], Permanent Virtual Circuit [PVC], or Frame Relay), you cannot determine the correct bandwidth from the hardware. This statement allows you to specify the actual available bandwidth. This statement also allows you to specify the bandwidth for a bypass label switched path (LSP). If you have configured multiple bypasses, this statement is mandatory and is applied to all of the bypass LSPs.
Default	The hardware raw bandwidth is used.
Options	<i>bps</i> —Bandwidth in bits per second. You can specify this as an integer value. If you do so, count your zeros carefully, or you can use the abbreviations k (for a thousand), m (for a million), or g (for a billion [also called a thousand million]). Range: Any positive integer Default: 0 (no bandwidth is reserved)
Usage Guidelines	See “Configuring the Bandwidth for Bypass LSPs” on page 305, “Configuring Node Protection or Link Protection” on page 301, and “Configuring Bypass LSPs” on page 304.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

bypass

```
bypass bypass-name {
  bandwidth bps;
  hop-limit number;
  no-cspf;
  path address <strict | loose>;
  priority setup-priority reservation-priority;
  to address;
}
```

Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp interface <i>interface-name</i> link-protection]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Allows you to configure specific bandwidth and path constraints for a bypass LSP. It is possible to individually configure multiple bypass LSPs. If you do not configure the bypass LSPs individually, they all share the same path and bandwidth constraints. If you specify the bandwidth , hop-limit , and path statements for the bypass LSP, these values take precedence over the values configured at the [edit protocols rsvp interface <i>interface-name</i> link-protection] hierarchy level. The other attributes (subscription , no-node-protection , and optimize-timer) are inherited from the general constraints.
Options	to —(Required) Specify the address for the interface of the immediate next-hop node (for link protection) or the next-next-hop node (for node-link protection). The address specified determines whether this is a link protection bypass or a node-link protection bypass. On multiaccess networks (for example, a LAN), this address is also used to specify which next-hop node is being protected. The remaining statements are explained separately.
Usage Guidelines	See “Configuring Bypass LSPs” on page 304.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

class-of-service

Syntax	<code>class-of-service <i>cos-value</i>;</code>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	<p>Class-of-service (CoS) value given to all packets in the bypass LSP. You can specify a single CoS value for all the bypass LSPs traversing an interface. You can also configure CoS values for specific bypass LSPs traversing an interface.</p> <p>The CoS value might affect the scheduling or queuing algorithm of traffic traveling along an LSP.</p>
Options	<p><i>cos-value</i>—CoS value. A higher value typically corresponds to a higher level of service.</p> <p>Range—0 through 7</p> <p>Default—If you do not specify a CoS value, the IP precedence bits from the packet's IP header are used as the packet's CoS value.</p>
Usage Guidelines	See “Configuring the Class of Service for Bypass LSPs” on page 305.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

disable

Syntax	disable;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp], [edit logical-routers <i>logical-router-name</i> protocols rsvp graceful-restart], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit logical-routers <i>logical-router-name</i> protocols rsvp peer-interface <i>peer-interface-name</i>], [edit protocols rsvp], [edit protocols rsvp graceful-restart], [edit protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp peer-interface <i>peer-interface-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Explicitly disable RSVP or RSVP graceful restart. Explicitly disable link protection on the specified interface.
Default	RSVP is enabled on interfaces and peer interfaces configured with the RSVP interface statement. RSVP graceful restart is enabled on the router. Link protection is disabled.
Usage Guidelines	See “Minimum RSVP Configuration” on page 293, “Configuring RSVP Graceful Restart” on page 309, and “Configuring Node Protection or Link Protection” on page 301.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

fast-reroute

Syntax	fast-reroute { optimize-timer <i>seconds</i> ; }
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp], [edit protocols rsvp]
Release Information	Statement added in JUNOS Release 7.5.
Description	Configure the optimize timer for fast reroute. The optimize timer triggers a periodic optimization process that recomputes the fast reroute detour LSPs to use network resources more efficiently.
Options	optimize-timer <i>seconds</i> —Specify the number of seconds between optimizations. Range: 0 through 65,535 seconds Default: 0 (disabled)
Usage Guidelines	See “Configuring the Optimization Interval for Fast Reroute Paths” on page 84.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

graceful-deletion-timeout

Syntax	graceful-deletion-timeout <i>seconds</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp], [edit protocols rsvp]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Specify the time, in seconds, before completing graceful deletion of signaling.
Options	<i>seconds</i> —Time before completing graceful deletion of signaling. Range: 1 through 300 seconds Default: 30 seconds
Usage Guidelines	See “Configuring the Graceful Deletion Timeout Interval” on page 475.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

graceful-restart

Syntax	<pre>graceful-restart { disable; helper-disable; maximum-helper-recovery-time seconds; maximum-helper-restart-time seconds; }</pre>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-options], [edit protocols rsvp], [edit routing-options]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Enable graceful restart on the router. You must configure the graceful-restart statement at the [edit routing-options] hierarchy level to enable graceful restart on the router.
Options	<p>disable—Disable graceful restart on the router or for RSVP.</p> <p>helper-disable—Disable RSVP graceful restart helper mode (this option is only available at the [edit protocols rsvp] hierarchy level). Default: Helper mode is enabled by default.</p> <p>maximum-helper-recovery-time—The maximum length of time the router stores the state of neighboring routers when they undergo a graceful restart. The value applies to all neighboring routers, so it should be based on the time that the slowest RSVP neighbor requires for restart. Default: 180 seconds Range: 1 through 3600 seconds</p> <p>maximum-helper-restart-time—The maximum length of time the router waits between when it discovers that a neighboring router has gone down and when it declares the neighbor down. This value is applied to all neighboring routers, so it should be based on the time that the slowest RSVP neighbor requires for restart. Default: 20 seconds Range: 1 through 1800 seconds</p>
Usage Guidelines	See “Configuring RSVP Graceful Restart” on page 309.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

hello-interval

Syntax	hello-interval <i>seconds</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit logical-routers <i>logical-router-name</i> protocols rsvp peer-interface <i>peer-interface-name</i>], [edit protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp peer-interface <i>peer-interface-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Enable the sending of hello packets on the interface. If you configure a nonzero hello interval and (2 x keep-multiplier + 1) consecutive hello exchanges with a neighbor are lost, the neighbor and all sessions to and from that neighbor are declared down.
Options	<i>seconds</i> —Length of time between hello packets. A value of 0 disables the sending of hello packets on the interface. Range: 1 through 60 seconds Default: 9 seconds
Usage Guidelines	See “Configuring the RSVP Hello Interval” on page 299.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

hop-limit

	hop-limit <i>number</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Specify the maximum number of hops a bypass can traverse. By default, each bypass can traverse a maximum of 255 hops, including the ingress and egress routers.
Option	<i>number</i> —Maximum number of hops a bypass can traverse. Range: 2 through 255 hops Default: 255 hops
Usage Guidelines	See “Configuring the Hop Limit for Bypass LSPs” on page 306.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

interface

Syntax interface *interface-name* {
 disable;
 (aggregate | no-aggregate);
 authentication-key *key*;
 bandwidth *bps*;
 hello-interval *seconds*;
 link-protection {
 disable;
 bandwidth *bps*;
 bypass *bypass-name* {
 bandwidth *bps* {
 ct0 *bps*;
 ct1 *bps*;
 ct2 *bps*;
 ct3 *bps*;
 }
 hop-limit *number*;
 path *address* <strict | loose>;
 to *address*;
 }
 class-of-service *cos-value*;
 hop-limit *number*;
 max-bypasses *number*;
 no-node-protection;
 optimize-timer *number*;
 path *address* <strict | loose>;
 subscription *percentage*;
 }
 (reliable | no-reliable);
 subscription *percentage* {
 ct0 *percentage*;
 ct1 *percentage*;
 ct2 *percentage*;
 ct3 *percentage*;
 }
 update-threshold *threshold*;
 }

Hierarchy Level [edit logical-routers *logical-router-name* protocols rsvp],
 [edit protocols rsvp]

Release Information Statement introduced before JUNOS Release 7.4.

Description Enable RSVP on one or more router interfaces.

Default RSVP is disabled on all interfaces.

Options *interface-name*—Name of an interface. To configure all interfaces, specify **all**. For details about specifying interfaces, see the *JUNOS Network Interfaces Configuration Guide*.

The remaining statements are explained separately.

Usage Guidelines See “Minimum RSVP Configuration” on page 293.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

keep-multiplier

Syntax keep-multiplier *number*;

Hierarchy Level [edit logical-routers *logical-router-name* protocols rsvp],
[edit protocols rsvp]

Release Information Statement introduced before JUNOS Release 7.4.

Description Set the keep multiplier value.

Options *number*—Multiplier value.
Range: 1 through 255
Default: 3

Usage Guidelines See “Configuring RSVP Timers” on page 312.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

link-protection

See the following sections:

- link-protection (MPLS) on page 331
- link-protection (RSVP) on page 332

link-protection (MPLS)

Syntax link-protection;

Hierarchy Level [edit logical-routers *logical-router-name* protocols mpls label-switched-path *lsp-name*],
[edit protocols mpls label-switched-path *lsp-name*]

Release Information Statement introduced before JUNOS Release 7.4.

Description Enable link protection on the specified LSP. To fully enable link protection, you also need to configure the link-protection statement at the [edit protocols rsvp interface *interface-name*] hierarchy level.

Default Link protection is disabled.

Usage Guidelines See “Configuring Node Protection or Link Protection” on page 301.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

link-protection (RSVP)

```

Syntax link-protection {
    disable;
    bandwidth bps;
    bypass bypass-name {
        bandwidth bps {
            ct0 bps;
            ct1 bps;
            ct2 bps;
            ct3 bps;
        }
        hop-limit number;
        no-cspf;
        path address <strict | loose>;
        to address;
    }
    class-of-service cos-value;
    hop-limit number;
    max-bypasses number;
    no-cspf;
    no-node-protection;
    optimize-timer seconds;
    path address <strict | loose>;
    subscription percentage {
        ct0 percentage;
        ct1 percentage;
        ct2 percentage;
        ct3 percentage;
    }
}

```

Hierarchy Level [edit logical-routers *logical-router-name* protocols rsvp interface *interface-name*],
[edit protocols rsvp interface *interface-name*]

Release Information Statement introduced before JUNOS Release 7.4.

Description Enable link protection on the specified interface. Using link protection, you can configure a network to reroute traffic quickly around broken links. To fully enable link protection, you also need to configure the `link-protection` statement at the [edit protocols mpls label-switched-path *lsp-name*] hierarchy level. You can configure single or multiple bypasses for protected interface.

Options `no-node-protection`—Disables node-link protection on the RSVP interface. Link protection remains active. When this option is configured, the router can only initiate a next-hop bypass, not a next-next-hop bypass.

The remaining statements are explained separately.

Default Link protection is disabled.

Usage Guidelines See “Configuring Node Protection or Link Protection” on page 301.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

load-balance

Syntax	load-balance { bandwidth; }
Release Information	Statement introduced in JUNOS Release 7.4.
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp], [edit protocols rsvp]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Load-balance traffic between RSVP LSPs.
Option	bandwidth—Load-balance traffic between RSVP LSPs based on the bandwidth configured for each LSP.
Usage Guidelines	See “Configuring RSVP LSP Load Balancing” on page 311.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

max-bypasses

Syntax	max-bypasses <i>number</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp interface <i>interface-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Specify the maximum number of bypasses permitted for protecting this interface. When this option is configured, multiple bypasses for link protection are enabled. Call admission control (CAC) is also enabled. The limit on bypasses configured applies to both automatically and manually configured bypasses. By default, this option is disabled and only one bypass is enabled for each interface. If you configure max-bypasses , you must also configure the bandwidth option.
Usage Guidelines	See “Configuring the Maximum Number of Bypass LSPs” on page 306.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

no-adjacency-down-notification

Syntax	no-adjacency-down-notification;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols isis interface <i>interface-name</i>], [edit protocols isis interface <i>interface-name</i>]
Release Information	Statement introduced in JUNOS Release 8.0.
Description	Disables adjacency down notification for Intermediate System-to-Intermediate System (IS-IS) to allow for migration from IS-IS to Open Shortest Path First (OSPF) without disruption of the RSVP neighbors and associated RSVP-signaled LSPs.
Usage Guidelines	See “Disabling Adjacency Down and Neighbor Down Notification in IS-IS and OSPF” on page 315.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

no-aggregate

See aggregate on page 321.

no-cspf

Syntax	no-cspf;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>]
Release Information	Statement introduced in JUNOS Release 7.5.
Description	Disable CSPF computation on all bypass LSPs or on a specific bypass LSP. You need to disable CSPF for link protection to function properly on interarea paths.
Default	CSPF is enabled.
Usage Guidelines	See “Disabling CSPF for Bypass LSPs” on page 307.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

no-neighbor-down-notification

Syntax	no-neighbor-down-notification;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols ospf area <i>area-id</i> interface <i>interface-name</i>], [edit protocols ospf area <i>area-id</i> interface <i>interface-name</i>]
Release Information	Statement introduced in JUNOS Release 8.0.
Description	Disables neighbor down notification for OSPF to allow for migration from OSPF to IS-IS without disruption of the RSVP neighbors and associated RSVP-signaled LSPs.
Usage Guidelines	See “Disabling Adjacency Down and Neighbor Down Notification in IS-IS and OSPF” on page 315.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

no-reliable

See reliable on page 341.

node-link-protection

Syntax	node-link-protection;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols mpls label-switched-path <i>lsp-path-name</i>], [edit protocols mpls label-switched-path <i>lsp-path-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Enable node and link protection on the specified LSP. To fully enable node and link protection, you also need to configure the <code>link-protection</code> statement at the [edit protocols rsvp interface <i>interface-name</i>] hierarchy level.
Default	Node and link protection is disabled.
Usage Guidelines	See “Configuring Node Protection or Link Protection” on page 301.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

optimize-timer

Syntax	optimize-timer <i>seconds</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols mpls label-switched-path <i>lsp-path-name</i>], [edit protocols mpls label-switched-path <i>lsp-path-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Configure the optimize timer, a periodic optimization process that reshuffles data LSPs among bypasses to achieve the most efficient use of network resources. The optimization process attempts to either minimize the number of bypasses currently in use, minimize the total amount of bandwidth reserved for all bypasses, or both.
Options	<i>seconds</i> —Specify the number of seconds between optimizations. Range: 0 through 65,535 seconds Default: 0 (disabled)
Usage Guidelines	See “Configuring the Optimization Interval for Bypass LSPs” on page 307.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

path

Syntax	<code>path address <strict loose>;</code>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Configure an explicit path (a sequence of strict or loose routes) to control where and how a bypass LSP is established. If multiple bypasses are configured, they all will use the same explicit path.
Default	No path is configured. CSPF automatically calculates the path the bypass LSP takes.
Options	<p><i>address</i>—IP address of each transit router in the LSP. You must specify the address or hostname of each transit router, although you do not need to list each transit router if its type is loose. As an option, you can include the ingress and egress routers in the path. Specify the addresses in order, starting with the ingress router (optional) or the first transit router, and continuing sequentially along the path until reaching the egress router (optional) or the router immediately before the egress router.</p> <p>Default: If you do not specify any routers explicitly, no routing limitations are imposed on the bypass LSP.</p> <p>loose—The next address in the path statement is loose. The LSP can traverse other routers before reaching this router. Default: strict</p> <p>strict—The LSP must go to the next address specified in the path statement without traversing other nodes. This is the default.</p>
Usage Guidelines	See “Configuring an Explicit Path for Bypass LSPs” on page 308.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

peer-interface

Syntax	<pre>peer-interface <i>peer-interface-name</i> { disable; (aggregate no-aggregate); authentication-key <i>key</i>; hello-interval <i>seconds</i>; (reliable no-reliable); }</pre>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp], [edit protocols rsvp]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Configure the name of the LMP peer device. The remaining statements are explained separately.
Usage Guidelines	See “Configuring Peer Interfaces in RSVP and OSPF” on page 467.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

preemption

Syntax	preemption { (aggressive disabled normal); soft-preemption { cleanup-timer <i>seconds</i> ; } }
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp], [edit protocols rsvp]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Control RSVP session preemption.
Options	<p>aggressive—Preempt RSVP sessions whenever bandwidth is insufficient to handle all sessions. A session is preempted whenever bandwidth is lowered or a new higher-priority session is established.</p> <p>disabled—Do not preempt RSVP sessions.</p> <p>normal—Preempt RSVP sessions to accommodate new higher-priority sessions when bandwidth is insufficient to handle all sessions.</p> <p>The remaining statements are explained separately.</p>
Default	normal
Usage Guidelines	See “Preempting RSVP Sessions” on page 313.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

priority

Syntax	<code>priority setup-priority reservation-priority;</code>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection bypass <i>bypass-name</i>],
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Configure the setup priority and reservation priority for a bypass LSP. If insufficient link bandwidth is available during session establishment, the setup priority is compared with other setup priorities for established sessions on the link to determine whether some of them should be preempted to accommodate the new session. The session with the lower-hold priority is preempted.
Options	<p><i>reservation-priority</i>—Reservation priority, used to keep a reservation after it has been set up. A smaller number has a higher priority. The priority must be greater than or equal to the setup priority to prevent preemption loops. Range: 0 through 7, where 0 is the highest and 7 is the lowest priority. Default: 0 (Once the session is set up, no other session can preempt it.)</p> <p><i>setup-priority</i>—Setup priority. Range: 0 through 7, where 0 is the highest and 7 is the lowest priority. Default: 7 (The session cannot preempt any existing sessions.)</p>
Usage Guidelines	See “Configuring Priority and Preemption for Bypass LSPs” on page 309 and “Configuring Priority and Preemption” on page 108.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

refresh-time

Syntax	<code>refresh-time seconds;</code>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp], [edit protocols rsvp]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Set the refresh time.
Options	<p><i>seconds</i>—Refresh time. Range: 1 through 65,535 Default: 30 seconds</p>
Usage Guidelines	See “Configuring RSVP Timers” on page 312.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

reliable

Syntax	(reliable no-reliable);
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit logical-routers <i>logical-router-name</i> protocols rsvp peer-interface <i>peer-interface-name</i>], [edit protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp peer-interface <i>peer-interface-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Enable reliable message delivery on the interface.
Usage Guidelines	See “Configuring RSVP Refresh Reduction” on page 296.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

rsvp

Syntax	rsvp { ... }
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols], [edit protocols]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Enable RSVP routing on the router. You must include the rsvp statement in the configuration to enable RSVP on the router. See “Minimum RSVP Configuration” on page 293.
Default	RSVP is disabled on the router.
Usage Guidelines	See “Minimum RSVP Configuration” on page 293.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

soft-preemption

Syntax	soft-preemption { cleanup-timer <i>seconds</i> ; }
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp preemption], [edit protocols rsvp preemption]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Soft preemption attempts to establish a new path for a preempted LSP before tearing it down.
Options	cleanup-timer—A value of 0 disables soft preemption. Range: 0 through 180 seconds Default: 30 seconds
Usage Guidelines	See “Configuring MPLS Soft Preemption” on page 92.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

subscription

Syntax	<pre>subscription <i>percentage</i> { ct0 <i>percentage</i>; ct1 <i>percentage</i>; ct2 <i>percentage</i>; ct3 <i>percentage</i>; }</pre>
Hierarchy Level	<p>[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i> link-protection], [edit protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp interface <i>interface-name</i> link-protection]</p>
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Configures the amount of bandwidth subscribed to a class type (when you have enabled Differentiated Services), or bypass LSP (when you have enabled link protection). The subscription is the percentage of the link bandwidth that can be used for the RSVP reservation process.
Options	<p><i>ctnumber percentage</i>—Percent of the class-type bandwidth that RSVP allows to be used for reservations. If you specify a value greater than 100, you are oversubscribing the class type. You can specify bandwidth subscriptions for class types 0 through 3. This option is not available for bypass LSPs. Range: 0 through 65,000 Default: 100 percent</p> <p><i>percentage</i>—Percent of the class-type or bypass LSP bandwidth that RSVP allows to be used for reservations. If you specify a value greater than 100, you are oversubscribing the class type or bypass LSP. Range: 0 through 65,000 Default: 100 percent</p>
Usage Guidelines	See “Configuring the Bandwidth Subscription Percentage for LSPs” on page 150 and “Configuring the Amount of Bandwidth Subscribed for Bypass LSPs” on page 308.
Required Privilege Level	<p>routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.</p>

traceoptions

Syntax traceoptions {
 file *filename* <replace> <size *size*> <files *number*> <no-stamp>
 <world-readable | no-world-readable>;
 flag *flag* <flag-modifier> <disable>;
 }

Hierarchy Level [edit logical-routers *logical-router-name* protocols rsvp],
 [edit protocols rsvp]

Release Information Statement introduced before JUNOS Release 7.4.

Description RSVP protocol-level trace options.

Default The default RSVP protocol-level trace options are those inherited from the routing protocols **traceoptions** statement included at the [edit routing-options] hierarchy level.

Options **disable**—(Optional) Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as **all**.

filename—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory **/var/log**. We recommend that you place RSVP tracing output in the file **rsvp-log**.

files number—(Optional) Maximum number of trace files. When a trace file named **trace-file** reaches its maximum size, it is renamed **trace-file.0**, then **trace-file.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you also must specify a maximum file size with the **size** option.

Range: 2 through 1000

Default: 2 files

flag—Tracing operation to perform. To specify more than one tracing operation, include multiple *flag* statements.

RSVP Tracing Flags

- *all*—All tracing operations
- *error*—All detected error conditions
- *event*—RSVP-related events
- *Imp*—RSVP-LMP interactions
- *packets*—All RSVP packets
- *path*—All path messages
- *pathtear*—PathTear messages
- *resv*—Resv messages
- *resvtear*—ResvTear messages
- *route*—Routing information
- *state*—Session state transitions

flag-modifier—(Optional) Modifier for the tracing flag. You can specify one or more of these modifiers:

- *detail*—Provide detailed trace information
- *receive*—Packets being received
- *send*—Packets being transmitted

no-stamp—(Optional) Do not place timestamp information at the beginning of each line in the trace file.

Default: If you omit this option, timestamp information is placed at the beginning of each line of the tracing output.

no-world-readable—(Optional) Enable only certain users to read the log file.

replace—(Optional) Replace an existing trace file if there is one.

Default: If you do not include this option, tracing output is appended to an existing trace file.

size size—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named *trace-file* reaches this size, it is renamed *trace-file.0*. When the *trace-file* again reaches its maximum size, *trace-file.0* is renamed *trace-file.1* and *trace-file* is renamed *trace-file.0*. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *xk* to specify KB, *xm* to specify MB, or *xg* to specify GB
Range: 10 KB through the maximum file size supported on your system
Default: 1 MB

world-readable—(Optional) Enable any user to read the log file.

Usage Guidelines See “Tracing RSVP Protocol Traffic” on page 317.

Required Privilege Level routing and trace—To view this statement in the configuration.
 routing-control and trace-control—To add this statement to the configuration.

tunnel-services

Syntax tunnel-services {
 devices *device-names*;
 }

Hierarchy Level [edit protocols rsvp]

Release Information Statement introduced in JUNOS Release 8.1.

Description Enables ultimate-hop popping on point-to-multipoint LSPs. The JUNOS software selects one of the available virtual tunnel (VT) interfaces to de-encapsulate the egress traffic. By default, the selection process is performed automatically.

Default Ultimate-hop popping is disabled.

Options devices *device-names*—Specifies which VT interfaces are used to handle the RSVP traffic.
Range: 0 to 8 devices

Usage Guidelines See “Enabling Ultimate-Hop Popping on Point-to-Multipoint LSPs” on page 316.

Required Privilege Level routing—To view this statement in the configuration.
 routing-control—To add this statement to the configuration.

update-threshold

Syntax	update-threshold <i>threshold</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols rsvp interface <i>interface-name</i>], [edit protocols rsvp interface <i>interface-name</i>]
Release Information	Statement introduced before JUNOS Release 7.4.
Description	Adjust the threshold at which a change in bandwidth triggers an interior gateway protocol (IGP) update. Range: 1 through 20 percent Default: 10 percent
Usage Guidelines	See “Configuring the RSVP Update Threshold on an Interface” on page 300.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

