RSVP Infrastructure Commands on Cisco IOS XR Software

This chapter describes the commands that you will use to configure and use Resource Reservation Protocol (RSVP). RSVP is a signaling protocol used to set up, maintain, and control end-to-end quality-of-service (QoS) reservations over IP. RSVP is specified in Internet Engineering Task Force (IETF) RFC 2205 (ftp://ftp.isi.edu/in-notes/rfc2205.txt).

The protocol has been extended to signal Multiprotocol Label Switching traffic engineering (MPLS-TE) tunnels, as specified in the IETF RFC 3209, *RSVP-TE: Extensions to RSVP for LSP Tunnels* and Optical UNI tunnels, as specified in the Optical Internetworking Forum (OIF) document OIF2000.125.7, *User Network Interface (UNI) 1.0, Signalling Specification*. The RSVP implementation also supports fault handling as specified in IETF RFC 3473, *Generalized Multiprotocol Label Switching* (GMPLS) Signaling RSVP-TE extensions.

RFC2747, *RSVP Cryptographic Authentication* is also supported.

For detailed information about MPLS concepts, configuration tasks, and examples, refer to the *Cisco IOS XR MPLS Configuration Guide*.

authentication (RSVP)

To enter RSVP authentication submode, use the **authentication** command in global configuration mode, RSVP interface configuration mode, or RSVP neighbor configuration mode. To remove authentication parameters in the applicable submode, use the **no** form of this command.

> **authentication**

> **no authentication**

Syntax Description   This command has no arguments or keywords.

Defaults   The default value is no authentication, which means that the feature is disabled.

Command Modes   Global configuration

RSVP interface configuration

RSVP neighbor configuration

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **authentication** command to enter RSVP authentication configuration mode.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to enter RSVP authentication configuration mode from global configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp authentication
RP/0/RP0/CPU0:router(config-rsvp-auth)#
```

The following example shows how to activate the RSVP on an interface and enter RSVP authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/2/1/0
RP/0/RP0/CPU0:router(config-rsvp-if)# authentication
RP/0/RP0/CPU0:router(config-rsvp-if-auth)#
```

The following example shows how to configure the RSVP neighbor with IP address 1.1.1.1 and enter neighbor authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp neighbor 1.1.1.1
RP/0/RP0/CPU0:router(config-rsvp-nbor)# authentication
RP/0/RP0/CPU0:router(config-rsvp-nbor-auth)#
```

Related Commands	Command	Description
	key-source key-chain (RSVP)	Specifies the source of the key information to authenticate RSVP signaling messages.
	life-time (RSVP)	Controls how long RSVP maintains idle security associations with trusted neighbors.
	window-size (RSVP)	Specifies the tolerance to accept out-of-sequence messages.

bandwidth (RSVP)

To configure RSVP bandwidth on an interface using prestandard DS-TE mode, use the **bandwidth** command in RSVP interface configuration mode. To reset the RSVP bandwidth on that interface to its default value, use the **no** form of this command.

> **bandwidth** [*total reservable bandwidth*] [**bc0** *bandwidth*] [**global-pool** *bandwidth*] [**sub-pool** *reservable-bw*]

> **no bandwidth** [*total reservable bandwidth*] [**bc0** *bandwidth*] [**global-pool** *bandwidth*] [**sub-pool** *reservable-bw*]

Syntax Description

total reservable bandwidth	(Optional) Total reservable bandwidth (in kbps) that RSVP accepts for reservations on this interface. Range is 0 to 4294967295 Kbps.
bc0 *bandwidth*	Total reservable bandwidth in the bc0 pool (in Kbps, Mbps or Gbps). The default is Kbps. Range is 0 to 4294967295.
global-pool *bandwidth*	(Optional) Total reservable bandwidth in the global-pool. Range is 0 to 4294967295 Kbps.
sub-pool *reservable-bw*	(Optional) Total reservable bandwidth in the subpool (in Kbps, Mbps, or Gbps). Range is 0 to 4294967295.

Defaults *sub-pool-bw*: 0

Note If the command is entered without the optional arguments, the total bandwidth is set to 75 percent of the intrinsic bandwidth of the interface. (If the interface has zero intrinsic bandwidth, none are reserved.)

Command Modes RSVP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	The **sub-pool** keyword was added.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

RSVP is enabled either using the **rsvp interface** command or when MPLS is configured on the interface. In addition, there are other instances in which RSVP is enabled automatically; for example, when an RSVP message is received on an interface that is not configured under RSVP or MPLS (such as out-of-band signaling for an Optical User Network Interface application).

If RSVP reservation messages are received on an interface different from the one through which the corresponding Path message was sent out, the interfaces are adjusted such that all resource reservations, such as bandwidth, are done on the outgoing interface of the Path message.

Prestandard DS-TE uses the Cisco proprietary mechanisms for RSVP signaling and IGP advertisements. This DS-TE mode does not interoperate with third-party vendor equipment. Note that prestandard DS-TE is enabled only after configuring the sub-pool bandwidth values on MPLS-enabled interfaces.

Note You can also configure RSVP bandwidth on an interface using IETF DS-TE mode. This mode supports multiple bandwidth constraint models, including the Russian Doll Model (RDM) and the Maximum Allocation Model (MAM) both with two bandwidth pools.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples   The following example shows how to limit the total of all RSVP reservations on POS interface 0/3/0/0 to 5000 Kbps:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp)# bandwidth 5000
```

Related Commands	Command	Description
	bandwidth mam (RSVP)	Configures RSVP bandwidth on an interface using the Maximum Allocation Model (MAM) bandwidth constraints model.
	bandwidth rdm (RSVP)	Configures RSVP bandwidth on an interface using the Russian Doll Model (RDM) bandwidth constraints model.

bandwidth mam (RSVP)

To configure RSVP bandwidth on an interface using the Maximum Allocation Model (MAM) bandwidth constraints model, use the **bandwidth mam** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

bandwidth mam {*total reservable bandwidth* | **max-reservable-bw** *maximum-reservable-bw*} **bc0** *reservable bandwidth*

no bandwidth mam {*total reservable bandwidth* | **max-reservable-bw** *maximum-reservable-bw*} **bc0** *reservable bandwidth*

Syntax Description		
total reservable bandwidth	Total reservable bandwidth (in kbps) that RSVP accepts for reservations on this interface. Range is 0 to 4294967295 Kbps.	
max-reservable-bw *maximum-reservable-bw*	Maximum reservable bandwidth (in kbps) that RSVP accepts for reservations on this interface. Range is 0 to 4294967295 Kbps.	
bc0 *reservable bandwidth*	Total reservable bandwidth in the bc0 pool (in Kbps, Mbps or Gbps).	

Defaults   If the command is entered without the optional arguments, the RSVP total bandwidth is set to 75 percent of the intrinsic bandwidth of the interface. If the interface has no (0) intrinsic bandwidth, then no bandwidth is reserved for RSVP.

Command Modes   RSVP interface configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Both the MAM and RDM models can be configured on a single interface to allow switching between each model.

Note   Non-stop forwarding (NSF) is not guaranteed when the bandwidth constraint model is changed.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples

The following example shows how to limit the total of all RSVP reservations on POS interface 0/3/0/0 to 7500 kbps:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp-if)# bandwidth mam 7500
```

Related Commands

Command	Description
bandwidth (RSVP)	Configures RSVP bandwidth on an interface using prestandard DS-TE mode.
bandwidth rdm (RSVP)	Configures RSVP bandwidth on an interface using the Russian Doll Model (RDM) bandwidth constraints model.

bandwidth rdm (RSVP)

To configure RSVP bandwidth on an interface using the Russian Doll Model (RDM) bandwidth constraints model, use the **bandwidth rdm** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

> **bandwidth rdm** {*total-reservable-bw* | **bc0** | **global-pool**} {**sub-pool** | **bc1** *reservable-bw*}

> **no bandwidth rdm** {*total-reservable-bw* | **bc0** | **global-pool**} {**sub-pool** | **bc1** *reservable-bw*}

Syntax Description

total-reservable-bw	Total reservable bandwidth (in Kbps, Mbps or Gbps). The default value is expressed in Kbps.
bc0	Reserves bandwidth in the bc0 pool.
global-pool	Reserves bandwidth in the global pool.
sub-pool	Reserves bandwidth in the sub-pool.
bc1	Reservable bandwidth in the bc1 pool.
reservable-bw	Reservable bandwidth in the sub- and bc1 pools (in Kbps, Mbps or Gbps). The default value is expressed in Kbps.

Defaults

sub-pool-bw: 0

global-pool and **bc0**: default value expressed in Kbps

✎ **Note**   If the command is entered without the optional arguments, the RSVP total bandwidth is set to 75 percent of the intrinsic bandwidth of the interface. If the interface has no (0) intrinsic bandwidth, then no bandwidth is reserved for RSVP.

Command Modes   RSVP interface configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Both the MAM and RDM bandwidth constraint models support up two bandwidth pools.

Cisco IOS XR software provides global configuration when switching between bandwidth constraint models. Both models are configured on a single interface to allow switching between models.

Note   Non-stop forwarding (NSF) is not guaranteed when the bandwidth constraint model is changed.

The **global pool** and **sub-pool** keywords are included in this command for backward compatibility with prestandard DS-TE. The **global pool** keyword is equivalent to the **bc0** keyword. The **sub-pool** keyword is equivalent to the **bc1** keyword.

RDM is the default bandwidth constraint model used in both pre-standard and IETF mode.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following example shows how to limit the total of all RSVP reservations on POS interface 0/3/0/0 to 7500 kbps, and allows each single flow to reserve no more than 1000 kbps:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp-if)# bandwidth rdm 7500 1000
```

Related Commands

Command	Description
bandwidth (RSVP)	Configures RSVP bandwidth on an interface using prestandard DS-TE mode.
bandwidth mam (RSVP)	Configures RSVP bandwidth on an interface using the Maximum Allocation Model (MAM) bandwidth constraints model.

clear rsvp authentication

To eliminate RSVP security association (SA) before the lifetime expires, use the **clear rsvp authentication** command in EXEC mode.

clear rsvp authentication [*type interface-id*] [**destination** *IP address*] [**source** *IP address*]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface. **Note** Use the show interfaces command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
destination *IP address*	(Optional) Eliminates the RSVP security associations (SA) before their lifetimes expire. All SAs with this destination IP address are cleared.
source *IP address*	(Optional) Eliminates the RSVP security associations (SA) before their lifetimes expire. All SAs with this source IP address are cleared.

Command Modes EXEC

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **clear rsvp authentication** command for the following reasons:

- To eliminate security associations before their lifetimes expire
- To free up memory
- To resolve a problem with a security association being in an indeterminate state

You can delete all RSVP security associations if you do not enter an optional filter (interface, source, or destination IP address).

If you delete a security association, it is recreated as needed.

Task ID	Task ID	Operations
	mpls-te	execute
	ouni	execute

Examples

The following example shows how to clear each SA:

```
RP/0/RP0/CPU0:router# clear rsvp authentication
```

The following example shows how to clear each SA with the destination address 1.1.1.1:

```
RP/0/RP0/CPU0:router# clear rsvp authentication destination 1.1.1.1
```

The following example shows how to clear each SA with the source address 2.2.2.2:

```
RP/0/RP0/CPU0:router# clear rsvp authentication source 2.2.2.2
```

The following example shows how to clear each SA with the POS interface 0/2/1/0:

```
RP/0/RP0/CPU0:router# clear rsvp authentication POS 0/2/1/0
```

The following example shows how to clear each SA on the POS interface 0/2/1/0, destination address 1.1.1.1, and source address 2.2.2.2:

```
RP/0/RP0/CPU0:router# clear rsvp authentication POS 0/2/1/0 destination 1.1.1.1 source
2.2.2.2
```

Related Commands

Command	Description
life-time (RSVP)	Controls how long RSVP maintains idle security associations with other trusted RSVP neighbors.

clear rsvp counters authentication

To eliminate RSVP counters for each security association (SA), use the **clear rsvp counters authentication** command in EXEC mode.

> **clear rsvp counters authentication** [*type interface-id*] [**destination** *IP address*] [**source** *IP address*]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface. **Note** Use the show interfaces command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
destination *IP address*	(Optional) Eliminates authentication-related statistics for each security association (SA) with this destination IP address.
source *IP address*	(Optional) Eliminates authentication-related statistics for each security association (SA) with this source IP address.

Command Modes   EXEC

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	execute
ouni	execute

Examples   The following example shows how to clear authentication counters for each SA:

```
RP/0/RP0/CPU0:router# clear rsvp counters authentication
```

The following example shows how to clear authentication counters for each SA with the destination address 1.1.1.1:

```
RP/0/RP0/CPU0:router# clear rsvp counters authentication destination 1.1.1.1
```

The following example shows how to clear authentication counters for each SA with the source address 2.2.2.2:

```
RP/0/RP0/CPU0:router# clear rsvp counters authentication source 2.2.2.2
```

The following example shows how to clear authentication counters for each SA with the POS interface 0/2/1/0:

```
RP/0/RP0/CPU0:router# clear rsvp counters authentication POS 0/2/1/0
```

The following example shows how to clear authentication counters for each SA on the POS interface 0/2/1/0, destination address 1.1.1.1, and source address 2.2.2.2:

```
RP/0/RP0/CPU0:router# clear rsvp counters authentication POS 0/2/1/0 destination 1.1.1.1
source 2.2.2.2
```

clear rsvp counters all

To clear (set to zero) all RSVP message and event counters that are being maintained by the router, use the **clear rsvp counters all** command in EXEC mode.

clear rsvp counters all *type interface-id*

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Modes EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following example shows how to clear all message and event counters:

```
RP/0/RP0/CPU0:router# clear rsvp counters all
```

	Command	Description
Related Commands	**clear rsvp counters events**	Clears all RSVP event counters that are being maintained by the router.
	clear rsvp counters messages	Clears all RSVP message counters that are being maintained by the router.
	show rsvp counters	Shows all RSVP message/event counters that are being maintained by the router.

clear rsvp counters chkpt

To clear RSVP checkpoint counters, use the **clear rsvp counters chkpt** command in EXEC mode.

clear rsvp counters chkpt

Syntax Description   This command has no arguments or keywords.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to clear all message and event counters:

```
RP/0/RP0/CPU0:router# clear rsvp counters chkpt
```

Related Commands

Command	Description
clear rsvp counters events	Clears all RSVP event counters that are being maintained by the router.
clear rsvp counters messages	Clears all RSVP message counters that are being maintained by the router.
show rsvp counters	Shows all RSVP message/event counters that are being maintained by the router.

clear rsvp counters events

To clear (set to zero) all RSVP event counters that are being maintained by the router, use the **clear rsvp counters events** command in EXEC mode.

clear rsvp counters events [*type interface-id*]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Modes

EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **clear rsvp counters events** command to set all RSVP event counters to zero.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following example shows how to clear all event counters:

```
RP/0/RP0/CPU0:router# clear rsvp counters events
```

Related Commands	Command	Description
	clear rsvp counters messages	Clears all RSVP message counters that are being maintained by the router.
	show rsvp counters	Shows RSVP event counters that are being maintained by the router when the *events* option is specified.

clear rsvp counters messages

To clear (set to zero) all RSVP message counters that are being maintained by the router, use the **clear rsvp counters messages** command in EXEC mode.

clear rsvp counters messages [*type interface-id*]

Syntax Description	*type*	Interface type. For more information, use the question mark (**?**) online help function.
	interface-id	Identifies a physical interface or a virtual interface.
		Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Modes EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **clear rsvp counters messages** command to set all RSVP message counters to zero.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples The following example shows how to set all RSVP message counters for POS interface 0/3/0/2 to zero:

```
RP/0/RP0/CPU0:router# clear rsvp counters messages pos0/3/0/2
```

Cisco IOS XR MPLS Command Reference ■

Related Commands	Command	Description
	show rsvp counters	Displays the number of RSVP messages sent and received.

clear rsvp counters oor

To clear internal RSVP counters on out of resources (OOR) events, use the **clear rsvp counters oor** command in EXEC mode.

clear rsvp counters oor [*type interface-id*]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Modes   EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **clear rsvp counters oor** command to set RSVP OOR counters to zero.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example show how to clear all RSVP message counters for POS interface 0/3/0/2 to zero:

```
RP/0/RP0/CPU0:router# clear rsvp counters oor pos0/3/0/2
```

■ **clear rsvp counters oor**

Related Commands	**Command**	**Description**
	show rsvp counters oor	Displays the internal RSVP counters on OOR events.

clear rsvp counters prefix filtering

To clear internal prefix-filtering related RSVP counters, use the **clear rsvp counters prefix-filtering** command in EXEC mode.

clear rsvp counters prefix-filtering {**interface** [*type interface-id*] | **access-list** [*aclname*]}

Syntax Description

interface	Clears RSVP prefix-filtering counters for all interfaces.
type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.
access-list	(Optional) Clears RSVP prefix-filtering counters for access control list.
aclname	Name of the access list.

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the clear rsvp **counters prefix-filtering** command to set RSVP prefix-filtering related RSVP counters to zero.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

■ **clear rsvp counters prefix filtering**

Examples   The following example shows how to set all RSVP message counters for POS interface 0/3/0/2 to zero:

RP/0/RP0/CPU0:router# **clear rsvp counters prefix-filtering interface pos0/3/0/2**

The following example shows how to set all RSVP prefix-filtering counters for access-list banks to zero:

RP/0/RP0/CPU0:router# **clear rsvp counters prefix-filtering access-list banks**

Related Commands

Command	Description
show rsvp counters prefix filtering	Displays the internal prefix-filtering related RSVP counters.

key-source key-chain (RSVP)

To specify the source of the key information to authenticate RSVP messages, use the **key-source key-chain** command in the appropriate RSVP authentication configuration mode. To remove the key source from the appropriate RSVP authentication configuration mode, use the **no** form of this command.

key-source key-chain *key-chain-name*

no key-source key-chain *key-chain-name*

Syntax Description

key-chain-name	Specifies the name of the keychain. The maximum number of characters is 32.

Defaults

The default value is none, which means that the key source is not specified.

Command Modes

RSVP authentication configuration

RSVP interface authentication configuration

RSVP neighbor authentication configuration

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Note
- RSVP authentication is enabled regardless of whether or not the specified keychain exists or has no available keys to use. If the specified keychain does not exist or there are no available keys in the keychain, RSVP authentication processing fails.

- The **key-source key-chain** command does not create a keychain but just specifies which keychain to use. You must configure a keychain first. For an example of how a key chain is configured, see the *Cisco IOS XR System Security Configuration Guide*.

- The **no key-source key-chain** command does not necessarily disable the authentication.

- RSVP authentication supports only keyed-hash message authentication code (HMAC)-type algorithms.

Note For inheritance procedures, see *Cisco IOS XR MPLS Configuration Guide*.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples The following example shows that the source of the key information is specified for the keychain mpls-keys in RSVP authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp authentication
RP/0/RP0/CPU0:router(config-rsvp-auth)# key-source key-chain mpls-keys
```

The following example shows that the source of the key information is specified for the keychain mpls-keys for a POS interface in RSVP authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp interface POS 0/2/1/0
RP/0/RP0/CPU0:router(config-rsvp-if)# authentication
RP/0/RP0/CPU0:router(config-rsvp-if-auth)# key-source key-chain mpls-keys
```

The following example shows that the source of the key information is specified for the keychain mpls-keys in RSVP neighbor authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp neighbor 1.1.1.1 authentication
RP/0/RP0/CPU0:router(config-rsvp-nbor-auth)# key-source key-chain mpls-keys
```

Related Commands

Command	Description
life-time (RSVP)	Controls how long RSVP maintains idle security associations with other trusted RSVP neighbors.
window-size (RSVP)	Specifies the tolerance to accept out-of-sequence messages.

life-time (RSVP)

To control how long RSVP maintains idle security associations with other trusted RSVP neighbors, use the **life-time** command in the appropriate RSVP authentication configuration mode. To disable the lifetime setting, use the **no** form of this command.

> **life-time** *seconds*

> **no life-time** *seconds*

Syntax Description	*seconds*	Length of time (in seconds) that RSVP maintains security associations with other trusted RSVP neighbors. Range is 30 to 86400.

Defaults	*seconds*: 1800 seconds (30 minutes)

Command Modes

RSVP authentication configuration

RSVP interface authentication configuration

RSVP neighbor authentication configuration

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

For inheritance procedures, see the *Cisco IOS XR MPLS Configuration Guide*.

Use the **life-time (RSVP)** command to indicate when to end idle security associations with RSVP trusted neighbors.

By setting a larger lifetime, the router remembers the state for a long period time, which provides better protection against a replay attack.

Use the **clear rsvp authentication** command to free security associations before their lifetimes expire.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to configure a lifetime of 2000 seconds for each SA in RSVP authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp authentication
RP/0/RP0/CPU0:router(config-rsvp-auth)# life-time 2000
```

The following example shows how to configure a lifetime of 2000 seconds for each SA in RSVP neighbor authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp neighbor 1.1.1.1 authentication
RP/0/RP0/CPU0:router(config-rsvp-nbor-auth)# life-time 2000
```

The following example shows how to configure a lifetime of 2000 seconds for each SA in RSVP interface authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp interface POS 0/2/1/0
RP/0/RP0/CPU0:router(config-rsvp-if)# authentication
RP/0/RP0/CPU0:router(config-rsvp-if-auth)# life-time 2000
```

Related Commands

Command	Description
clear rsvp authentication	Clears out RSVP security associations.
key-source key-chain (RSVP)	Specifies the source of the key information to authenticate RSVP signaling messages.
window-size (RSVP)	Specifies the tolerance to accept out-of-sequence messages.

rsvp interface

To configure RSVP on an interface, use the **rsvp interface** command in global configuration mode. To disable RSVP on that interface, use the **no** form of this command.

rsvp interface *type interface-id*}

no rsvp interface *type interface-id*

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.

Defaults

RSVP is enabled by default on an interface under the following conditions. (Enabling RSVP on an interface means that interface can be used by RSVP to send and receive RSVP messages).

- RSVP is configured on that interface using the rsvp interface command.
- MPLS is configured on that interface.
- Automatically enabled as in the case of out-of-band signaling for the Optical User Network Interface (O-UNI) application, where an RSVP message could be received on an interface which is not configured under RSVP or MPLS.

Command Modes

Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Cisco IOS XR MPLS Command Reference ■

When RSVP is enabled on an interface by any of the three methods mentioned in the above section, the default bandwidth is 0. Use the bandwidth command in RSVP interface configuration mode to configure the bandwidth on an interface.

If the interface bandwidth is 0, RSVP can be used only to signal flows that do not require bandwidth on this interface. In the case of O-UNI, 0 bandwidth is not an issue, because O-UNI does not use bandwidth as a resource.

The **rsvp interface** command enables the RSVP interface configuration submode.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples

The following example shows how to enable the RSVP interface configuration submode and to enable RSVP on this interface with 0 bandwidth:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
```

Related Commands

Command	Description
bandwidth (RSVP)	Configures RSVP bandwidth on an interface using prestandard DS-TE mode.
signalling dscp (RSVP)	Gives all RSVP packets sent out on a specific interface higher priority in the network by marking them with a particular differentiated services code point (DSCP).

rsvp neighbor

To specify an RSVP neighbor, use the **rsvp neighbor** command in global configuration mode. To deactivate authentication for a neighbor, use the **no** form of this command.

> **rsvp neighbor** *IP address* **authentication**

> **no rsvp neighbor** *IP address* **authentication**

Syntax Description

IP address	IP address of the neighbor. A single IP address of a specific neighbor; usually one of the neighbor's physical or logical (loopback) interfaces.
authentication	Configures RSVP authentication parameters.

Defaults

No default values or behaviors

Command Modes

Global configuration

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Note RSVP neighbor configuration mode can be used only if you want to configure authentication for a particular neighbor.

Use the **rsvp neighbor** command to enter RSVP neighbor authentication configuration mode.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to enter RSVP neighbor authentication configuration mode for IP address 1.1.1.1:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp neighbor 1.1.1.1 authentication
P/0/RP0/CPU0:router(config-rsvp-nbor-auth)#
```

Related Commands

Command	Description
key-source key-chain (RSVP)	Specifies the source of the key information to authenticate RSVP signaling messages.
life-time (RSVP)	Controls how long RSVP maintains idle security associations with other trusted RSVP neighbors.
window-size (RSVP)	Specifies the tolerance to accept out-of-sequence messages.

show rsvp authentication

To display the database for the security association that RSVP has established with other RSVP neighbors, use the **show rsvp authentication** command in EXEC mode.

> show rsvp authentication [*type interface-id*] [**destination** *IP address*] [**detail**] [**mode** {**receive** | **send**}] [**neighbor** *IP address*] [**source** *IP address*]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface. **Note** Use the show interfaces command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
destination *IP address*	Displays the database for the security association (SA) for the destination IP address. The *IP address* argument is the IP address of the destination address.
detail	Displays additional information about RSVP security SAs.
mode	Specifies the SA type. An SA is used to authenticate either incoming (receive) or outgoing (send) messages.
receive	Displays SAs for incoming messages.
send	Displays SAs for outgoing messages.
neighbor *IP address*	Displays the RSVP authentication information for the neighbor IP address. The *IP address* argument is the IP address of the neighbor. For the send SA, the neighbor address is the destination address. For receive, the neighbor address is the source address.
source *IP address*	Displays the database for the SA for the source IP address. The *IP address* argument is the IP address of the source address.

Command Modes   EXEC

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	read
ouni	read

Examples

The following sample output displays information for RSVP authentication:

```
RP/0/RP0/CPU0:router# show rsvp authentication

Codes: S - static, G - global, N - neighbor, I -interface, C - chain

Source Address  Dest Address    Interface   Mode Key-Source Key-ID Code
3.0.0.1         3.0.0.2         PO0/7/0/2   Send mpls-keys  1      SGC
3.0.0.2         3.0.0.1         PO0/7/0/2   Recv mpls-keys  1      SGC
```

Table 49 describes the significant fields shown in the display.

Table 49   show rsvp authentication Field Descriptions

Field	Description
Source Address	IP address of the sender. For Send mode, this is the local address (either the address of the Interface field or the local router ID). For Recv mode, this is the address of the RSVP neighbor.
Dest Address	IP address of the receiver. For Send mode, this is the address of the RSVP neighbor. For Recv mode, this is the local address (either the address of the Interface field or the local router ID).
Interface	Name of the interface over which the security association is being maintained.
Mode	Direction of the association for the following mode types: • Send—Authenticates messages that you forward. • Recv—Authenticates messages that you receive.
Key-Source	Key source identification string that is currently set to the configured keychain name.
Key-ID	The last successful key ID that is used for authentication and that maps to the keychain ID configuration. If the value is too large to fit into the column, it is truncated and a (..) suffix is appended. Use the detail mode to see the non-truncated key ID.
Code	Code field has the following terms: • Static—Key is static and configured. • Global—Key is global-based. • Neighbor—Key is neighbor-based. • Interface—Key is interface-based. • Chain—Key is part of a keychain.

The following sample output shows detailed information about a Send mode SA that is followed by a Receive mode SA:

```
RP/0/RP0/CPU0:router# show rsvp authentication detail

RSVP Authentication Information:
  Source Address:       3.0.0.1
  Destination Address:  3.0.0.2
  Neighbour Address:    3.0.0.2
  Interface:            POS0/7/0/2
  Direction:            Send
  LifeTime:             1800 (sec)
  LifeTime left:        1305 (sec)
  KeyType:              Static Global KeyChain
  Key Source:           foobar
  Key Status:           No error
  KeyID:                1
  Digest:               HMAC MD5 (16)
  Challenge:            Not supported
  TX Sequence:          5023969459702858020 (0x45b8b99b00000124)
  Messages successfully authenticated:    245
  Messages failed authentication:         0

Receive Errors:
    Incomplete security association:     0
    Missing INTEGRITY object:            0
    Incorrect digest:                    0
    Digest type mismatch:                0
    Duplicate sequence number:           0
    Out-of-range sequence number:        0
    Invalid message format:              0
```

Table 50 describes the significant fields shown in the display.

Table 50   *show rsvp authentication detail Field Descriptions*

Field	Description
Source Address	IP address of the sender. For Send mode, this is the local address (either the address of the Interface field or the local router ID). For Recv mode, this is the address of the RSVP neighbor.
Destination Address	IP address of the receiver. For Send mode, this is the address of the RSVP neighbor. For Recv mode, this is the local address (either the address of the Interface field or the local router ID).
Neighbor Address	IP address of the RSVP neighbor with which the security association is being maintained.
Interface	Name of the interface over which the security association is being maintained.
Direction	Direction of the association for the following mode types: • Send—Authenticates messages that you forward. • Recv—Authenticates messages that you receive.
LifeTime	Configured expiration timer value.
LifeTime left	Number of seconds until the expiration timer expires.

Table 50   show rsvp authentication detail Field Descriptions (continued)

Field	Description
KeyType	Lists the keys that are used: • Static—Key is static and configured. • Global—Key is global-based. • Neighbor—Key is neighbor-based. • Interface—Key is interface-based. • Chain—Key is part of a keychain.
Key-Source	Key source identification string that is currently set to the configured keychain name.
Key Status	The last status is reported from the key source.
Key-ID	The last successful key ID that is used for authentication and that maps to the keychain ID configuration. If the value is too large to fit into the column, it is truncated and a (..) suffix is appended. (Use the detail mode to see the non-truncated key ID.)
Digest	Digest algorithm that is used. The algorithms are either HMAC-MD5 or HMAC-SHA1.
Challenge	The current challenge status (always Not supported) is reported.
Tx Sequence	Last sequence number that was sent.
RX Sequence	Last accepted sequence number that was received.
Messages successfully authenticated	The number of messages authenticated by using this SA.
Messages failed authentication	The number of messages that failed authentication using this SA.
Sequence Window Size	Maximum configured RX sequence number window.
Sequence Window Count	Currently used size of the RX sequence number window.
Sequence Window	The list of the last Sequence Window Count sequence numbers that were accepted.
Incomplete security association	Number of messages that are dropped due to a key failure.
Incorrect digest	Number of messages that are dropped due to an incorrect digest.
Digest type mismatch	Number of messages that are dropped due to an incorrect digest length, which implies an algorithm mismatch.
Duplicate sequence number	Number of messages that are dropped due to a duplicate sequence number.
Out-of-range sequence number	Number of messages that are dropped due to a sequence number range (window-size) checking.
Invalid message format	Number of messages that are dropped due to formatting errors, such as incorrect objects.

show rsvp counters

To display internal RSVP counters, use the **show rsvp counters** command in EXEC mode.

show rsvp counters [**messages** *type interface-id*] [**events | database**]

Syntax Description

messages	(Optional) Displays a historical count of the number of messages RSVP has received and sent on each interface along with a summation.
type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.
events	(Optional) Displays the number of states expired for lack of refresh and a count of received NACKs.
database	(Optional) Displays counters on RSVP database, including number of paths, session, and so on.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
	The **database** keyword was added on both the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

In message counters, bundle messages are counted as single bundle messages. The component messages are not counted separately.

Cisco IOS XR MPLS Command Reference

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following is sample output from the **show rsvp counters messages** command for POS0/3/0/0:

```
RP/0/RP0/CPU0:router# show rsvp counters messages POS 0/3/0/0

    POS0/3/0/0          Recv   Xmit                        Recv   Xmit
        Path              24      1   Resv                   0      0
        PathError          0      0   ResvError              0      0
        PathTear           5      1   ResvTear               0      0
        ResvConfirm        0      0   Ack                   34      0
        Bundle             0          Hello                  0      0
        SRefresh       10118      0   OutOfOrder             0
        Retransmit                0   Rate Limited                  0
```

Table 51 describes the significant fields shown in the display.

Table 51   show rsvp counters messages Field Descriptions

Field	Description
Path	Number of Path messages sent downstream or received from an upstream node.
PathError	Number of Path Error messages received from a downstream neighbor or sent to an upstream neighbor.
PathTear	Number of Path Tear messages sent downstream, or messages received, from upstream neighbors.
ResvConfirm	Number of ResvConfirm messages received from an upstream neighbor or sent to a downstream neighbor.
Bundle	Number of bundle messages containing RSVP messages sent and received by the neighbor.
SRefresh	Number of summary refresh messages sent to and received by a neighbor to refresh the path and reservation states.
Retransmit	Number of messages retransmitted to ensure reliable messaging (related to refresh reduction).
Resv	Number of reservation messages received from a downstream neighbor or sent to an upstream neighbor to reserve resources.
ResvError	Number of reservation error messages received from a upstream neighbor or sent to a downstream neighbor.
ResvTear	Number of reservation tear messages received from a downstream neighbor or sent to an upstream neighbor to tear down RSVP flows.
Ack	Number of acknowledgement messages sent and received by a neighbor acknowledging receipt of a message.
Hello	Number of hello messages sent to and received by a neighbor.
OutOfOrder	Number of messages received that are out of order.
Rate Limited	Number of RSVP packets affected by rate limiting.

The following is sample output from the **show rsvp counters events** command:

```
RP/0/RP0/CPU0:router# show rsvp counters events

Ethernet0/0/0/0                         tunnel1
 Expired Path states          0          Expired Path states          0
 Expired Resv states          0          Expired Resv states          0
 NACKs received               0          NACKs received               0
POS0/3/0/1                               POS0/3/0/2
 Expired Path states          0          Expired Path states          0
 Expired Resv states          0          Expired Resv states          0
 NACKs received               0          NACKs received               0
POS0/3/0/3                               All RSVP Interfaces
 Expired Path states          0          Expired Path states          0
 Expired Resv states          0          Expired Resv states          0
 NACKs received               0          NACKs received               0
```

Table 52 describes the significant fields shown in the display.

Table 52   show rsvp counters events Field Descriptions

Field	Description
Expired Path states	Number of Path states expired for lack of refresh.
Expired Reserve states	Number of Resv states expired for lack of refresh.
NACKS received	Number of NACKS received.

The following is sample output from the **show rsvp counters database** command:

```
RP/0/RP0/CPU0:router# show rsvp counters database

Sessions: 0
Locally created and incoming paths: 0
Outgoing paths: 0
Locally created and incoming Reservations: 0
Outgoing Reservations: 0
Interfaces: 4
```

Table 53 describes the significant fields shown in the display.

Table 53   show rsvp counters database Field Descriptions

Field	Description
Sessions	RSVP sessions.
Locally created and incoming paths	Path states created by a: • local application on the node, or • Path message received from the network
Outgoing paths	Outgoing path states.
Locally created and incoming Reservations	Reservations created by a: • Local application on the node, or • Path message received from the network
Outgoing Reservations	Outgoing reservation (request) states.
Interfaces	Known RSVP interfaces.

show rsvp counters oor

To display internal RSVP counters on out of resources (OOR) events, use the **show rsvp counters oor** command in EXEC mode.

show rsvp counters oor [*type interface-id* **| summary]**

Syntax Description	*type*	Interface type. For more information, use the question mark (**?**) online help function.
	interface-id	Identifies a physical interface or a virtual interface.
		Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.
	summary	(Optional) Displays a summary of OOR events.

Command Modes   EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1 and the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples   The following is sample output from the **show rsvp counters oor** command:

```
RP/0/RP0/CPU0:router# show rsvp counters oor

POS 0/3/0/0          Rejected
    Path                  24
POS 0/3/0/2          Rejected
    Path                  31
All RSVP Interfaces  Rejected
    Path                  55
```

Table 54 describes the significant fields shown in the display.

Table 54   ***show rsvp counters oor Field Descriptions***

Field	Description
Path	Number of Path messages received on the interface that were rejected due to oor conditions.

show rsvp counters prefix filtering

To display internal prefix-filtering related RSVP counters, use the **show rsvp counters prefix-filtering** command in EXEC mode.

> **show rsvp counters prefix-filtering** {**interface** [*type interface-id* | **summary**]} {**access-list** [*aclname*]}

Syntax Description

interface	Displays RSVP prefix-filtering counters for all interfaces.
type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.
summary	(Optional) Displays a summary of RSVP prefix-filtering counters on all interfaces.
access-list	(Optional) Displays RSVP prefix-filtering counters for the access control list.
aclname	Name of the access control list.

Command Modes   EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Note   Counters do not increment if you have not configured an access control list for prefix-filtering.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following is sample output from the **show rsvp counters prefix filtering** command:

```
RP/0/RP0/CPU0:router# show rsvp counters prefix-filtering interface

Routed      Fwd       Local       Drop       Def-Drop     Def-Proc     Total
Path        4                                                          4
PathTear    0                                                          0
ResvConfirm 0                                                          0
Total       4                                                          4

POS0/5/0/1  Fwd       Local       Drop       Def-Drop     Def-Proc     Total
Path                  1           0          219          2            222
PathTear             0           0          31           0            31
ResvConfirm          0           0          0            0            0
Total                1           0          219          2            253

POS0/5/0/2  Fwd       Local       Drop       Def-Drop     Def-Proc     Total
Path                  0           0          0            1            1
PathTear             0           0          0            0            0
ResvConfirm          0           0          0            0            0
Total                0           0          0            1            1

ALL RSVP
Interfaces  Fwd       Local       Drop       Def-Drop     Def-Proc     Total
Path        4         1           0          219          3            227
PathTear    0         0           0          31           0            31
ResvConfirm 0         0           0          0            0            0
Total       4         1           0          250          3            258
```

The following is sample output from the **show rsvp counters prefix filtering interface** *type interface-id* command:

```
RP/0/RP0/CPU0:router# show rsvp counters prefix-filtering interface POS 0/5/0/1

POS0/5/0/1  Fwd       Local       Drop       Def-Drop     Def-Proc     Total
Path                  1           0          219          2            222
PathTear             0           0          31           0            31
ResvConfirm          0           0          0            0            0
Total                1           0          250          2            253
```

The following is sample output from the **show rsvp counters prefix filtering summary** command:

```
RP/0/RP0/CPU0:router# show rsvp counters prefix-filtering interface summary

ALL RSVP
Interfaces  Fwd       Local       Drop       Def-Drop     Def-Proc     Total
Path        4         1           0          219          3            227
PathTear    0         0           0          31           0            31
ResvConfirm 0         0           0          0            0            0
Total       4         1           0          250          3            258

RP/0/RP0/CPU0:router# show rsvp counters prefix-filtering access-list

ACL: banks          Forward       Local       Drop       Total
Path                0             0           0          0
PathTear            0             0           0          0
```

```
ResvConfirm                0              0              0              0
Total                      0              0              0              0
RP/0/RP0/CPU0:router# show rsvp counters prefix-filtering access-list banks

ACL: banks          Forward        Local          Drop           Total
Path                       0              0              0              0
PathTear                   0              0              0              0
ResvConfirm                0              0              0              0
Total                      0              0              0              0
```

Table 55 describes the significant fields shown in the display.

Table 55   show rsvp counters prefix filtering interface and summary Field Descriptions

Field	Description
Fwd	Number of messages forwarded to the next router. **Note** Because RSVP does not know what interface the messages will be forwarded, the messages are counted against the *routed* interface only.
Local	Number of messages not forwarded (because locally destined).
Drop	Number of messages dropped.
Def-Drop	Number of messages dropped when an access control list match returns an implicit deny. (Results when RSVP is configured to drop implicit deny messages.)
Def-Proc	Number of messages processed by RSVP when an access control list match returns an implicit deny.
Path	Number of Path messages.
PathTear	Number of Path Tear messages.
ResvConfirm	Number of ResvConfirm messages.

show rsvp fast-reroute

To display RSVP Fast-Reroute (FRR) information, use the **show rsvp counters fast-reroute** command in EXEC mode.

> **show rsvp fast-reroute** [**destination** *A.B.C.D.* | **dst-port** *destination port* | **source** *A.B.C.D.* | **src-port** *source port* | **summary**]

Syntax Description

destination *A.B.C.D.*	(Optional) IP address of the destination network.
dst-port *destination port*	(Optional) Port address of the destination router.
source *A.B.C.D.*	(Optional) IP address of the source network.
src-port *source port*	(Optional) Port number of the source router.
summary	(Optional) Displays summarized information about the FRR database.

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples The following is sample output from the **show rsvp fast-reroute** command:

```
RP/0/RP0/CPU0:router# show rsvp fast-reroute

Type        Destination      TunID       Source        PSBs       RSBs
--------    ---------------  ----------  ------------  ---------  -------
LSP4        70.70.70.70         1        50.50.50.50   Ready       Ready
```

Table 56 describes the significant fields shown in the display.

Table 56   show rsvp fast-reroute Field Descriptions

Field	Description
Type	Type of session.
Destination	Destination address of session.
TunID	Tunnel ID number.
Source	Source address of session.
PSBs	PSB FRR[1] state.
RSBs	RSB FRR state.

1. Fast reroute

The following is sample output from the **show rsvp fast-reroute summary** command:

```
RP/0/RP0/CPU0:router# show rsvp fast-reroute summary

States          Total          Ready          Act-Wait          Active
PSBs              1              1               0                 0
RSBs              1              1               0                 0
```

Table 57 describes the significant fields shown in the display.

Table 57   show rsvp fast-reroute summary Field Descriptions

Field	Description
States	FRR[1] state.
Total	Total number of path and reservation states.
Ready	Number of states in FRR ready state. No FRR processing has been done on these states.
Act-Wait	Number of states in "Active Wait" FRR state. • For PSBs, this indicates that after FRR the path message has not yet been sent. • For RSBs, this indicates that after FRR, the reservation message has not yet been received.
Active	Number of states in "Active" FRR state. • For PSBs, this indicates that after FRR the path message has been sent. • For RSBs, this indicates that after FRR, the reservation message has been received.

1. Fast reroute

show rsvp graceful-restart

To display the local graceful-restart information for RSVP, use the **show rsvp graceful-restart** command in EXEC mode.

> **show rsvp graceful-restart** [**neighbors** *A.B.C.D.* | **detail**]

Syntax Description

neighbors	(Optional) Displays single-line status for each neighbor. If this keyword is not specified, only a multiline table entry is displayed showing local graceful-restart information.
A.B.C.D.	(Optional) Address of the neighbor you are displaying. Displays a specific neighbor with that destination address only. If this keyword is not specified, all neighbors are displayed.
detail	(Optional) Displays multiline status for each neighbor. If this keyword is not specified, only a single-line table entry is displayed.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Graceful-restart neighbors are displayed in ascending order of neighbor IP address.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following is sample output from the **show rsvp graceful-restart** command:

```
RP/0/RP0/CPU0:router# show rsvp graceful-restart

Graceful restart: enabled  Number of global neighbors: 1
Local MPLS router id: 192.168.55.55
Restart time: 60 seconds  Recovery time: 120 seconds
Recovery timer: Not running
Hello interval: 5000 milliseconds Maximum Hello miss-count: 4
```

Table 58 describes the significant fields shown in the display.

Table 58   *show rsvp graceful-restart Field Descriptions*

Field	Description
Graceful restart	Indicates whether graceful restart is configured locally.
Number of global neighbors	Number of neighbors identified by a unique router ID.
Local router id	Local router ID used for the MPLS or OUNI applications.
Restart time	Amount of time after a loss in hello messages within which RSVP hello session is reestablished. This setting is manually configurable.
Recovery time	Local recovery time advertised to neighbors. This is dynamically computed based on the number of LSPs established and is the time used by neighbors to refresh states in the event of a failure.
Recovery timer	A countdown timer which, upon expiry, causes un-refreshed data forwarding states to be deleted (usually beginning with a value that is equivalent to the sum of the restart and recovery times).
Hello interval	Interval at which hello messages are sent to neighbors.
Maximum hello miss-count	Number of hellos from a neighbor that can be missed before declaring hellos down.

The following is sample output from the **show rsvp graceful-restart neighbors** command, which displays information about graceful restart neighbors in the router:

```
RP/0/RP0/CPU0:router# show rsvp graceful-restart neighbors

Neighbor        App  State Recovery     Reason               Since  LostCnt
--------------- ----- ------ -------- ------------ -------------------- --------
192.168.77.77 MPLS    UP   DONE         N/A 19/12/2002 17:02:25        0
```

Table 59 describes the significant fields shown in the display.

Table 59   *show rsvp graceful-restart neighbors Field Descriptions*

Field	Description
Neighbor	Router ID of a global neighbor.
App	Application type of a global neighbor (MPLS or OUNI).
State	*S*tate of the hello session to a global neighbor (up, down, INIT).
Recovery	The state at which the local node is recovering a global neighbor.

Table 59   show rsvp graceful-restart neighbors Field Descriptions (continued)

Field	Description
Reason	The last reason for which communication has been lost for a global neighbor. If none has occurred, this field is marked as N/A.
Since	The time at which the current hello state for a global neighbor has been established.
LostCnt	Number of times hello communication has been lost with a global neighbor.

The following is sample output from the **show rsvp graceful-restart neighbors detail** command, which displays detailed information about all graceful restart neighbors:

```
RP/0/RP0/CPU0:router# show rsvp graceful-restart neighbors detail

Neighbor: 192.168.77.77 Source: 192.168.55.55 (MPLS)
  Hello instance for application MPLS
    Hello State: UP       (for 00:20:52)
    Number of times communications with neighbor lost: 0
    Reason: N/A
  Recovery State: DONE
  Number of Interface neighbors: 1
    address: 192.168.55.0
  Restart time: 120 seconds  Recovery time: 120 seconds
  Restart timer: Not running
  Recovery timer: Not running
  Hello interval: 5000 milliseconds  Maximum allowed missed Hello messages: 4
```

Table 60 describes the significant fields shown in the display.

Table 60   show rsvp graceful-restart neighbors detail Field Descriptions

Field	Description
Neighbor	Router ID of a global neighbor.
Source	Local router ID and application type.
Hello State	State of the hello instance for the global neighbor (up, down, or init) and duration of the current state.
Number of times communications with neighbor lost	Number of times hello communication has been lost with a global neighbor.
Reason	Last reason indicating why communication was lost for a global neighbor. If none has occurred, this field is marked as N/A.
Recovery State	State at which the local node is recovering a global neighbor.
Number of Interface neighbors	Number of interfaces belonging to a global neighbor.
Address	IP address of the interface neighbor.
Recovery time	Remote recovery time for a global neighbor.
Hello interval	Interval at which hello messages are sent by the remote global neighbor.
Maximum allowed missed Hello messages	Number of hellos that can be missed by the remote global neighbor before declaring hellos down.

show rsvp hello instance

To display the RSVP hello instances, use the **show rsvp hello instance** command in EXEC mode.

show rsvp hello instance [*Hostname or A.B.C.D.* | **detail**]

Syntax Description

Hostname or A.B.C.D.	(Optional) Address of the neighbor you are displaying. If this argument is not specified, all neighbors are displayed.
detail	(Optional) Displays multiline status for each hello instance. If this keyword is not specified, only a single-line table entry is displayed.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Hello instances are displayed in ascending order of neighbor IP address.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following is sample output from the **show rsvp hello instance** command, which displays brief information about all hello instances in the router:

```
RP/0/RP0/CPU0:router# show rsvp hello instance

Neighbor         Type    State    Interface    LostCnt
---------------  ------  -------- ------------ --------
192.168.77.77    ACTIVE  UP       None         0
```

Table 61 describes the significant fields shown in the display.

Table 61   *show rsvp hello instance Field Descriptions*

Field	Description
Neighbor	Router ID of a global neighbor hosting the hello instance.
Type	Hello instance type (active or passive). active type indicates that a node is sending hello requests and passive indicates that a node is sending hello acknowledgements.
State	State of the hello session to a global neighbor (up, down, or init).
Interface	Interface for interface bound hello's used for FRR[1]. Hello instances bound to a global neighbor show Interface as None. Hello's used for FRR are currently not supported.
LostCnt	Number of times hello communication has been lost with a global neighbor.

1. Fast reroute

The following is sample output from the **show rsvp hello instance** command, which displays detailed information about all hello instances in the router:

```
RP/0/RP0/CPU0:router# show rsvp hello instance detail

Neighbor: 192.168.77.77 Source: 192.168.55.55 (MPLS)
  State: UP        (for 00:07:14)
  Type: ACTIVE    (sending requests)
  I/F: None
  Hello interval (msec) (used when ACTIVE)
  Configured: 5000
  Src_instance 0x484b01, Dst_instance 0x4d4247
  Counters:
  Communication with neighbor lost:
    Num of times: 0    Reasons:
      Missed acks:           0
      New Src_Inst received:  0
      New Dst_Inst received:  0
      I/f went down:          0
      Neighbor disabled Hello: 0
  Msgs Received:   93
    Sent:        92
    Suppressed: 87
```

Table 62 describes the significant fields shown in the display.

Table 62   *show rsvp hello instance detail Field Descriptions*

Field	Description
Neighbor	Router ID of a global neighbor.
Source	Local router ID and application type.
State	State of the hello instance for the global neighbor (up, down or init) and duration of the current state.

Table 62   show rsvp hello instance detail Field Descriptions (continued)

Field	Description
Type	Hello instance type (active or passive). active type indicates that a node is sending hello requests and passive indicates that a node is sending hello acks.
I/F	Interface for interface bound hello's. Hello instances for Graceful restart show interface as None.

show rsvp hello instance interface-based

To display the RSVP hello instances on a specific interface, use the **show rsvp hello instance interface-based** command in EXEC mode.

show rsvp hello instance interface-based [*A.B.C.D.* | **detail**]

Syntax Description

A.B.C.D.	(Optional) Address of the neighboring interface. you are displaying. If this argument is not specified, all neighbors are displayed.
detail	(Optional) Displays detailed information for the specified interface.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Hello instances are displayed in ascending order of neighbor IP address.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following is sample output from the **show rsvp hello instance interface-based** command, which displays detailed information about hello instances on a specific interface:

```
RP/0/RP0/CPU0:router# show rsvp hello instance interface-based 10.10.10.10

Neighbor         Type    State    Interface    LostCnt
---------------- ------  -------- ------------ --------
10.10.10.10      ACTIVE  UP       None         0
```

Table 63 describes the significant fields shown in the display.

Table 63   *show rsvp hello instance Field Descriptions*

Field	Description
Neighbor	Router ID of a global neighbor hosting the hello instance.
Type	Hello instance type (active or passive). active type indicates that a node is sending hello requests and passive indicates that a node is sending hello acknowledgements.
State	State of the hello session to a global neighbor (up, down, or init).
Interface	Interface for interface bound hello's used for FRR[1]. Hello instances bound to a global neighbor show Interface as None. Hello's used for FRR are currently not supported.
LostCnt	Number of times hello communication has been lost with a global neighbor.

1. Fast reroute

show rsvp interface

To display information about all interfaces with RSVP enabled, use the **show rsvp interface** command in EXEC mode.

>**show rsvp interface** *type interface-id* [**detail**]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-id	Identifies a physical interface or a virtual interface.
	Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.
detail	(Optional) Displays multiline status for each interface. If this keyword is not specified, only a single-line table entry is displayed.

Command Modes EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show rsvp interface** command to display various configuration settings such as the list of neighbors and their refresh reduction capabilities.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following is sample output from the **show rsvp interface** command, which displays brief
information about RSVP-configured interfaces running in prestandard DS-TE mode:

```
RP/0/RP0/CPU0:router# show rsvp interface

    Interface   MaxBW    MaxFlow  Allocated       MaxSub
    ----------  -------- -------- --------------  -------
    tu2000      0        0        0 (   0%)        0
    PO0/3/0/0   1000M    1000M    200K(  0%)       0
```

This following is sample output from the **show rsvp interfaces detail** command running in standard
DS-TE mode:

```
RP/0/RP0/CPU0:router# show rsvp interface detail

INTERFACE: tunnel-te10 (ifh=0x1000480).
 BW (bits/sec): Max=0. MaxFlow=0.
                Allocated=0 (0%).
                BC0=0. BC1=0.

INTERFACE: POS0/3/0/0 (ifh=0x4000300).
 BW (bits/sec): Max=0. MaxFlow=0.
                Allocated=0 (0%).
                BC0=0. BC1=0.

INTERFACE: POS0/3/0/3 (ifh=0x4000C00).
 BW (bits/sec): Max=0. MaxFlow=0.
                Allocated=0 (0%).
                BC0=0. BC1=0.
```

Table 64 describes the significant fields shown in the display.

Table 64   show rsvp interface detail Field Descriptions

Field	Description
Bandwidth	Configured values on the interface and currently allocated bandwidth.
Ack hold	Milliseconds before RSVP responds with an acknowledgement.
Neighbor-IP	Address of peer that RSVP is exchanging messages on that interface.
Nbor-msglds	Messages IDs received from the neighbor (corresponding to the number of LSPs with reliable messaging).
States-out	States (including paths or reservations) sent on this interface to the neighbor.
Refresh Reduction	Neighbor's Refresh Reduction capability.
Expiry	This is the time a nbor entry in the interfaces database expires if there is no activity on this interface with the corresponding neighbor.

Related Commands

Commands	Description
show rsvp counters	Displays internal RSVP counters.

show rsvp neighbor

To display information about RSVP neighbors, use the **show rsvp neighbor** command in EXEC mode.

> **show rsvp neighbor** [**detail**]

Syntax Description	**detail**	(Optional) Displays detailed information about RSVP neighbors.

Command Modes EXEC

Command History	Release	Modification
	Release 3.3.0	This command was introduced on the Cisco CRS-1.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show rsvp interface** command to display various configuration settings such as the list of neighbors and their refresh reduction capabilities.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples The following is sample output from the **show rsvp neighbor** command using the **detail** keyword:

```
RP/0/RP0/CPU0:router# show rsvp neighbor detail

Global Neighbor: 40.40.40.40
Interface Neighbor: 1.1.1.1
Interface: POS0/0/0/0
Refresh Reduction: "Enabled" or "Disabled".
Remote epoch: 0xXXXXXXXX
Out of order messages: 0
Retransmitted messages: 0
Interface Neighbor: 2.2.2.2
Interface: POS0/1/0/0
Refresh Reduction: "Enabled" or "Disabled".
Remote epoch: 0xXXXXXXXX
Out of order messages: 0
Retransmitted messages: 0
```

show rsvp request

To list all the requests that RSVP knows about on a router, use the **show rsvp request** command in EXEC mode.

> **show rsvp request** [**detail**] [**destination** *A.B.C.D.* | **dst-port** *port-num* | **source** *A.B.C.D.* | **src-port** *port-num*]

Syntax Description		
detail	(Optional) Displays multiline status for each path. If this keyword is not specified, only a single-line table entry is displayed.
destination *A.B.C.D.*	(Optional) Displays destination address information.
dst-port *port-num*	(Optional) Displays destination port and tunnel information.
source *A.B.C.D.*	(Optional) Displays source address information.
src-port *port-num*	(Optional) Displays port and LSP ID information.

Command Modes   EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

This command displays information about upstream reservations only; that is, reservations being sent to upstream hops. Information about downstream reservations (that is, incoming or locally created reservations) is available using the **show rsvp reservation** command.

Reservations are displayed in ascending order of destination IP address, destination port, source IP address, and source port.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples

The following is sample output from the **show rsvp request** command:

```
RP/0/RP0/CPU0:router# show rsvp request

        Dest Addr DPort      Source Addr SPort Pro   OutputIF Sty Serv Rate Burst
---------------- ----- --------------- ----- --- ---------- --- ---- ---- -----
   192.168.40.40 2001     192.168.67.68     2   0 PO0/7/0/1  SE LOAD    0    1K
```

The following is sample output from the **show rsvp request detail** command, which displays detailed information about all requests in the router. Requests are reservation states for the reservation messages sent upstream:

```
RP/0/RP0/CPU0:router# show rsvp request detail

REQ:  IPv4-LSP Session addr: 192.168.40.40. TunID: 2001. LSPId: 2.
 Source addr: 192.168.67.68. ExtID: 192.168.67.68.
 Output interface: POS0/7/0/1. Next hop: 192.168.67.68 (lih: 0x19700001).
 Flags: Local Receiver.
 Style: Shared-Explicit. Service: Controlled-Load.
 Rate: 0 bits/sec. Burst: 1K bytes. Peak: 0 bits/sec.
 MTU min: 0, max: 500 bytes.
 Policy:  Forwarding. Policy source(s): MPLS/TE.
 Number of supporting PSBs: 1
 Destination Add DPort      Source Add SPort Pro    Input IF Rate Burst Prot
  192.168.40.40  2001     192.168.67.68 2   0     PO0/7/0/1    0   1K     Off
 Number of supporting RSBs: 1
 Destination Add DPort      Source Add SPort Pro    Input IF Sty Serv Rate Burst
   192.168.40.40  2001     65.66.67.68     2   0    None  SE LOAD     0    1K
```

Table 65 describes the significant fields shown in the display.

Table 65   ***show rsvp request detail Field Descriptions***

Field	Description
Number of supporting PSBs	Number of senders for this session (typically, 1).
Number of supporting RSBs	Number of reservations per session (typically, 1).
Policy	Admission control status.
Policy source	Entity performing the admission control (MPLS-TE or COPS).

Related Commands

Commands	Description
show rsvp reservation	Displays internal RSVP reservation counters.

show rsvp reservation

To list all reservations that RSVP knows about on a router, use the **show rsvp reservation** command in EXEC mode.

> **show rsvp reservation** [**detail**] [**destination** *A.B.C.D.* | **dst-port** *port-num* | **source** *A.B.C.D.* | *src-port port-num*]

Syntax Description

detail	(Optional) Displays multiline status for each reservation. If the **detail** keyword is not specified, only a single-line table entry is displayed.
destination *A.B.C.D.*	(Optional) Displays destination address information.
dst-port *port-num*	(Optional) Displays destination port and tunnel ID information.
source *A.B.C.D.*	(Optional) Displays source address information.
src-port *port-num*	(Optional) Displays source port and LSP ID information.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The **show rsvp reservation** command displays information about downstream reservations only (that is, reservations received on this device or created by application program interface (API) calls). Upstream reservations or requests are displayed using the **show rsvp request** command.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following is sample output from the **show rsvp reservation** command:

```
CRP/0/RP0/CPU0:router# show rsvp reservation

        Dest Addr DPort       Source Addr SPort Pro   Input IF Sty Serv Rate Burst
--------------- ----- --------------- ----- --- ---------- --- ---- ---- -----
    192.168.40.40  2001  192.168.67.68     2   0       None SE LOAD    0   1K
    192.168.67.68  2000    10.40.40.40    15   0  PO0/7/0/1 SE LOAD    0   1K
```

The following example displays detailed information about all reservations in the router:

```
RP/0/RP0/CPU0:router# show rsvp reservation detail

RESV: IPv4-LSP Session addr: 192.168.40.40. TunID: 2001. LSPId: 2.
 Source addr: 192.168.67.68. ExtID: 192.168.67.68.
 Input adjusted interface: None. Input physical interface: None.
 Next hop: 0.0.0.0 (lih: 0x0).
 Style: Shared-Explicit. Service: Controlled-Load.
 Rate: 0 bits/sec. Burst: 1K bytes. Peak: 0 bits/sec.
 MTU min: 40, max: 500 bytes.
 Flags: Local Receiver.
 State expires in 0.000 sec.
 Policy:  Accepted. Policy source(s): MPLS/TE.
 Header info: RSVP TTL=255. IP TTL=255. Flags: 0x0. TOS=0xff.
 Resource:
  Labels: Local downstream: 3.

RESV: IPv4-LSP Session addr: 192.168.67.68. TunID: 2000. LSPId: 15.
 Source addr: 192.168.40.40. ExtID: 10.10.40.40.
 Input adjusted interface: PO0/7/0/1. Input physical interface: PO0/7/0/1.
 Next hop: 10.66.67.68 (lih: 0x8DE00002).
 Style: Shared-Explicit. Service: Controlled-Load.
 Rate: 0 bits/sec. Burst: 1K bytes. Peak: 0 bits/sec.
 MTU min: 0, max: 500 bytes.
 Flags: None.
 State expires in 361.184 sec.
 Policy:  Accepted. Policy source(s): MPLS/TE.
 Header info: RSVP TTL=254. IP TTL=254. Flags: 0x1. TOS=0xff.
 Resource:
  Labels: Outgoing downstream: 3.
```

Table 66 describes the significant fields shown in the display.

Table 66   *show rsvp reservation detail Field Descriptions*

Field	Description
Input adjusted interface	Interface to reflect the path's outgoing interface.
Input physical interface	Interface where the reservation was received.
Next hop	Address of the downstream node that sent the reservation to this node.
Lih	Logical interface handle sent in the hop object of path returned to us in the reservation to figure out what interface the path was sent on.
Flags	Indicates path state, including as Local Repair, Local Sender (LSP[1] ingress node), and others.
Policy	Admission control status.
Policy source	Entity performing the admission control on the LSP.
Header info	RSVP header information as described in RFC 2205.

1. Link-state packet

Cisco IOS XR MPLS Command Reference

Related Commands	Command	Description
	show rsvp request	Lists all the requests that RSVP knows about on a router.

show rsvp sender

To list all path states that RSVP knows about on this router, use the **show rsvp sender** command in EXEC mode.

> **show rsvp sender** [**detail**] [**destination** *A.B.C.D.* | **dst-port** *port-num* | **source** *A.B.C.D.* | **src-port** *port-num*]

Syntax Description

detail	(Optional) Displays multiline status for each path. If the **detail** keyword is not specified, only a single-line table entry is displayed.
destination *A.B.C.D.*	(Optional) Displays destination address information.
dst-port *port-num*	(Optional) Displays destination port and tunnel ID information.
source *A.B.C.D.*	(Optional) Displays source address information.
src-port *port-num*	(Optional) Displays source port and LSP ID information.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The **show rsvp sender** command displays information about path states.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following is sample output from the **show rsvp sender** command:

```
RP/0/RP0/CPU0:router# show rsvp sender

      Dest Addr DPort      Source Addr SPort Pro    Input IF Rate Burst Prot
--------------- ----- --------------- ----- --- ----------- ---- ----- ----
   10.40.40.40  2001     10.66.67.68    2    0   PO0/7/0/1   0   1K   Off
   10.66.67.68  2000     10.40.40.40   15    0        None   0   1K   Off
```

Table 67 describes the significant fields shown in the display.

Table 67   show rsvp sender Field Descriptions

Field	Description
DProt	Destination port number and tunnel-id.
Dest Address	Destination and session address of LSP[1].
SPort	Source port and LSP ID.
Source Addr	Address of the ingress node of the LSP.
Input IF	Interface on which the Path message was received.

1. Link-state packet

The following example displays detailed information about all paths in the system:

```
RP/0/RP0/CPU0:router# show rsvp sender detail

PATH: IPv4-LSP Session addr: 65.66.67.68. TunID: 1. LSPId: 25.
 Source addr: 40.40.40.40. ExtID: 40.40.40.40.
 Prot: Off. Backup tunnel: None.
 Setup Priority: 7, Reservation Priority: 0
 Rate: 0 bits/sec. Burst: 1K bytes. Peak: 0 bits/sec.
 Min unit: 40 bytes, Max unit: 500 bytes
 Flags: Bidirectional.
 State expires in 370.154 sec.
 Policy:  Accepted. Policy source(s): Default.
 Header info: RSVP TTL=254. IP TTL=254. Flags: 0x1. TOS=0xc0.
 Input interface: PO0/3/0/0. Previous hop: 40.40.40.40 (lih: 0x40600001).
 Resource:
  Labels: Outgoing upstream: 3.
 Class-Type: None.
 Explicit Route (Incoming):
     Strict, 65.66.67.68(interface-id 5)
     Strict, 65.66.67.68/32
```

Table 68 describes the significant fields shown in the display.

Table 68   show rsvp sender detail Field Descriptions

Field	Description
Prot	Specifies if the LSP is configured as a protected tunnel.
Backup tunnel	Name of the backup tunnel assigned to protect this LSP[1].
Flags	Path state, including as local repair, local sender (LSP ingress node), and others.
Policy	Admission control status for Path message in the incoming direction.
Policy source	Entity doing the admission control, such as COPS or MPLS-TE[2].

Table 68   *show rsvp sender detail Field Descriptions (continued)*

Field	Description
Header info	RSVP header information as described in RFC 2205.
Input interface	Interface on which the path was received. At ingress mode, it is None.
Previous hop	Address of the upstream peer who sent us the Path message. May be the interface address or node-id depending on LSP (packet or optical).
Lih	Logical interface handle received in the hop object of the path.
Output interface	Interface on which the path was forwarded to the downstream neighbor
Policy	Admission control status for the path in the outgoing direction.
Explicit route	Explicit route specified in the explicit-route object of the Path message.

1. Link-state packet

2. MPLS-Traffic Engineering

show rsvp session

To list all sessions that RSVP knows about on this router, use the **show rsvp session** command in EXEC mode.

show rsvp session [**detail**] [**destination** *A.B.C.D.* | **dst-port** *port-num* | **tunnel-name** *tunnel-name*]

Syntax Description

detail	(Optional) Displays multiline status for each path. If the **detail** keyword is not specified, only a single-line table entry is displayed.
destination *A.B.C.D.*	(Optional) Displays destination address information.
dst-port *port-num*	(Optional) Displays destination port and tunnel ID information.
tunnel-name *tunnel-name*	(Optional) Displays status for the session matching the specified tunnel-name.

Command Modes   EXEC

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Sessions are displayed in ascending order of destination IP address, destination port, and source IP address.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following is sample output from the **show rsvp session** command:

```
RP/0/RP0/CPU0:router# show rsvp session

Type    Session Addr   Port  Proto/ExtTunID  PSBs  RSBs  Reqs
----  --------------- ----- --------------- ----- ----- -----
LSP4    10.40.40.40   2001    10.66.67.68    1     1     1
LSP4    10.66.67.68   2000    10.40.40.40    1     1     0
```

Table 69 describes the significant fields shown in the display.

Table 69   show rsvp session Field Descriptions

Field	Description
Type	Type of data flow (Traffic-Engineering LSP (LSP4), OUNI, or IPV4 session).
Session Addr	Destination address of the data packets and also tail of the LSP.
Port	Destination port or tunnel ID in case of TE and OUNI tunnels.
Proto/ExtTunID	Source address of TE and OUNI tunnels or protocol as in the case of IPV4 sessions.
PSBs	Number of path state blocks for this session.
RSBs	Number of reservation state blocks pertaining to incoming or local reservations for this session.
Reqs	Number of requests. State data structure representing reservations sent up-stream.

The following is sample output for the **show rsvp session detail** command:

```
RP/0/RP0/CPU0:router# show rsvp session detail

SESSION: IPv4-LSP Addr: 65.66.67.68, TunID: 1, ExtID: 40.40.40.40
 PSBs: 1, RSBs: 1, Requests: 0
 LSPId: 1
 Tunnel Name: newhead_t1
  RSVP Path Info:
   InLabel: No intf, No label
   Incoming Address: Unknown
   Explicit Route:
     Strict, 65.66.67.68(interface-id 5)
     Strict, 65.66.67.68/32
   Record Route: None
   Tspec: avg rate=0, burst=1K, peak rate=0
  RSVP Resv Info:
   OutLabel: POS0/7/0/1, 5
   FRR OutLabel: No intf, No label
   Record Route:
     Node-id 65.66.67.68, interface index 5
   Fspec: avg rate=0, burst=1K, peak rate=0
```

Table 70 describes the significant fields shown in the display.

Table 70   *show rsvp session detail Field Descriptions*

Field	Description
TunID	Tunnel identifier and the destination port of the LSP[1].
ExtID	Ingress node address of LSP.
Tunnel Instance	Source port of the LSP (with the ExtId forming the source parameters).
Tunnel Name	Name of the tunnel and LSP.
InLabel	Incoming interface and label info for the LSP in the upstream direction. At the egress node, using penultimate hop popping at the egress node, (implicit-null) appears as *No Label*.
Incoming Address	Address of the ingress interface.
Explicit Route	Explicit route specified in the explicit-route object of the Path message.
Record Route	Record route object in either the path or reservation message.
Tspec	Traffic parameters.
OutLabel	Outgoing interface and label sent downstream.
FRR OutLabel	For FRR[2], displays the backup tunnel and Merge-point label.
Fspec	Flow spec parameters for specified QoS.

1. Link-state packet

2. Fast reroute

signalling dscp (RSVP)

To give all RSVP signaling packets sent out on a specific interface higher priority in the network by marking them with a particular Differentiated Service Code Point (DSCP), use the **signalling dscp** command in RSVP interface configuration submode. To return to the default behavior, use the **no** form of this command.

signalling dscp *dscp*

no signalling *dscp*

Syntax Description

dscp	Specifies a DSCP priority number. Range is 0 to 63.

Defaults

No default behavior or values

Command Modes

RSVP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

DSCP marking improves signaling setup and teardown times.

Ordinarily, when a router receives Path messages for a particular state marked with a DSCP value, it sends out Path messages for that state marked with the same DSCP value. This command overrides that DSCP persistence and ensures that all messages sent out a particular interface are marked with a specified DSCP.

Though this command controls RSVP signaling packets, it has no effect on ordinary IP or MPLS data packets traveling along the path created or reserved by this RSVP session.

DSCP persistence operates on a per-state basis, but this command operates on a per-interface basis. So, if some incoming message (for example, multicast Path) with DSCP 10 causes two outgoing messages on interfaces A and B, ordinarily both are sent with DSCP 10. If **signalling dscp 5** is configured for RSVP on interface A, the Path messages being sent out interface A is marked with DSCP 5, but the Path messages being sent out interface B are marked with DSCP 10.

There is a difference between the **signalling dscp 0** and **no signalling dscp** commands. The first command instructs RSVP to explicitly set to 0 the DSCP on all packets sent out this interface. The second command removes any override on the packets being sent out this interface, and allows the DSCP of received packets that created this state to persist on packets forwarded out this interface.

The RFC specifies a standard mapping from the eight IP precedence values to eight values in the 64-value DSCP space. You can use those special DSCP values to specify IP precedence bits only.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples

The following example shows how to mark all RSVP packets going out on POS interface 0/1/0/1 as DSCP 20:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/1/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling dscp 20
```

The following example shows how to disable DSCP marking of signaling packets going out POS interface 0/1/0/1:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/1/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# interface pos 0/1/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling dscp
```

signalling graceful-restart

To enable or disable RSVP signaling graceful restart, use the **signalling graceful-restart** command in RSVP configuration mode. To return to the default behavior, use the **no** form of this command.

> **signalling graceful-restart**

> **no signalling graceful-restart**

Syntax Description   This command has no arguments or keywords.

Defaults   RSVP signaling graceful restart is disabled.

Command Modes   RSVP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The **signalling graceful-restart** command provides a mechanism that helps minimize the negative effects on MPLS and Optical User Network Interface (O-UNI) traffic for the following types of faults. This is an implementation of the fault handling section of the IETF standard RFC 3473:

- Control-channel-failure—Disruption of communication channels between 2 nodes when the communication channels are separated from the data channels.

- Node-failure—The control plane of a node fails, but the node preserves its data forwarding states.

The **signalling graceful-restart** command instigates the exchange of RSVP hello messages between the router and its neighbor nodes. After the hello messages are established with a given neighbor, RSVP can detect these types of faults when they occur.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following example shows how to enable RSVP signalling graceful restart:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# signalling graceful-restart
```

Related Commands

Command	Description
signalling graceful-restart restart-time	Configures the restart time that is advertised in the Restart Cap object in hello messages.

signalling graceful-restart restart-time

To configure the restart time that is advertised in the Restart Cap object in hello messages, use the **signalling graceful-restart restart-time** command in RSVP configuration mode. To return to the default behavior, use the **no** form of this command.

signalling graceful-restart restart-time *time*

no signalling graceful-restart restart-time

Syntax Description	*time* Time after a control-plane restart that RSVP can start exchanging hello messages. Range is 60 to 3600 seconds. Default is 120 seconds.

Defaults   *restart-time*: 120 seconds

Command Modes   RSVP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If no hello messages are received from a neighbor within a certain number of hello intervals, a node assumes that communication with the neighbor has been lost. The node waits the amount of time advertised by the last restart time communicated by the neighbor, before invoking procedures for recovery from communication loss.

The configured restart time is important in case of recovery from failure. The configured value should accurately reflect the amount of time within which, after a control-plane restart, RSVP can start exchanging hello messages.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples

The following example shows how to set the restart time:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# signalling graceful-restart restart-time 200
```

The following example shows how to reset the restart time to the default of 120 seconds:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# no signalling graceful-restart restart-time
```

Related Commands

Command	Description
signalling graceful-restart	Enables or disables graceful restart.

signalling hello graceful-restart interface-based

To enable RSVP to accept interface-based hello requests from the neighbor on an interface and send a Hello Ack to it, use the **rsvp hello graceful-restart interface-based** command in RSVP configuration mode. To return to the default behavior, use the **no** form of this command.

signalling hello graceful-restart interface-based

no signalling hello graceful-restart interface-based

Syntax Description   This command has no arguments or keywords.

Defaults   .No default behavior or values

Command Modes   RSVP interface configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to enable interface-based graceful restart:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 66
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling hello graceful-restart interface based
```

signalling hello graceful-restart refresh interval

To configure the interval at which RSVP graceful-restart hello messages are sent to each neighbor, use the **signalling hello graceful-restart refresh interval** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

signalling hello graceful-restart refresh interval *refresh-interval*

no signalling hello graceful-restart refresh interval

Syntax Description	*refresh-interval* Interval at which RSVP graceful-restart hello messages are sent to each neighbor. Range is 3000 to 30000 milliseconds.

Defaults   *refresh interval*: 5000 milliseconds

Command Modes   Global configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The **signalling hello graceful-restart refresh interval** command determines how often hello messages are sent to each neighbor. If the interval is made short, the hello messages are sent more frequently. Although a short interval may help detect failures quickly, it also results in increased network traffic. Optimizations in the RSVP hello mechanism exist to reduce the number of hello messages traveling over the network.

When an RSVP hello message is received, the receiving node acknowledges the hello and restarts its hello timer to the neighbor. By doing this, a hello is transmitted to the neighbor only if a hello is not received before the hello refresh interval has expired.

If two neighboring nodes do not have the same hello interval, the node with the larger hello interval has to acknowledge its neighbor's (more frequent) hellos. For instance, if node A has a hello interval of 5 seconds, and node B has a hello interval of 10 seconds, node B still has to send hello messages every 5 seconds.

The hello backoff mechanism is an optimization that is tailored to minimize the number of hello messages from a neighbor that either does not have graceful restart enabled, or that fails to come back up during the restart interval. The restart interval is provided by the neighbor in the restart cap object.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following example sets the hello graceful-restart refresh interval to 4000 msecs:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# signalling hello graceful-restart refresh interval 4000
```

Related Commands

Command	Description
signalling hello graceful-restart refresh misses	Configures the number of consecutive missed RSVP hello messages before a neighbor is declared down or unreachable.

signalling hello graceful-restart refresh misses

To configure the number of consecutive missed RSVP hello messages before a neighbor is declared down or unreachable, use the **signalling hello graceful-restart refresh misses** command in RSVP configuration mode. To return to the default behavior, use the **no** form of this command.

signalling hello graceful-restart refresh misses *refresh-misses*

no signalling hello graceful-restart refresh misses

Syntax Description	*refresh-misses*	The number of misses for hello messages before a neighbor is declared down or unreachable. Range is 1 to 10. Default is 3.

Defaults   *refresh-misses*: 3

Command Modes   RSVP configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If no hello messages (request or ACK) are received from a neighbor within the configured number of refresh misses, the node assumes that communication with the neighbor has been lost.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to set hello graceful-restart refresh misses to 4:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# signalling hello graceful-restart refresh misses 4
```

Related Commands

Command	Description
signalling hello graceful-restart refresh interval	Configures the interval at which RSVP graceful restart hello messages are sent per neighbor.

signalling prefix-filtering access-list

To specify the extended access control list to use for prefix filtering of RSVP Router Alert messages, use the **signalling prefix-filtering access-list** command in RSVP configuration mode. To return to the default behavior, use the **no** form of this command.

> **signalling prefix-filtering access-list** *access list name*

> **no signalling prefix-filtering access-list** *access list name*

Syntax Description	*access list name*	The extended access-list name as a string (maximum 32 characters).

Defaults No default behavior or values

Command Modes RSVP configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Note The extended access control list containing the source and destination prefixes used for packet filtering is configured separately.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to configure the access control list name banks for prefix-filtering of RSVP Router Alert messages:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# signalling prefix-filtering access-list banks
```

The following example shows how to disable RSVP prefix-filtering of RSVP Router Alert messages:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# no signalling prefix-filtering access-list banks
```

Related Commands

Command	Description
signalling prefix-filtering default-deny-action	Configures RSVP to drop messages when an access control list match yields an implicit deny.

signalling prefix-filtering default-deny-action

To configure RSVP to drop RSVP Router Alert messages when an access control list match returns an implicit deny, use the **signalling prefix-filtering default-deny-action** command in RSVP configuration mode. To return to the default behavior, use the **no** form of this command.

> **signalling prefix-filtering default-deny-action drop**

> **no signalling prefix-filtering default-deny-action drop**

Syntax Description

drop	When an access list match returns default deny, RSVP router alert messages are dropped.

Defaults   Performs normal RSVP processing of Path, Path Tear, and ResvConfirm message packets.

Command Modes   RSVP configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to configure RSVP Router Alert messages when an access control list match returns an implicit deny:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp
RP/0/RP0/CPU0:router(config-rsvp)# signalling prefix-filtering default-deny-action drop
```

Related Commands	Command	Description
	signalling prefix-filtering access-list	Configures extended access control lists for prefix-filtering of an RSVP Router Alert messages.

signalling rate-limit

To limit the rate of RSVP signaling messages being sent out a particular interface, use the **signalling rate-limit** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

> **signalling rate-limit** [**rate** *messages*] [**interval** *interval-length*]

> **no signalling rate-limit** [**rate** *messages*] [**interval** *interval-length*]

Syntax Description		
	rate *messages*	(Optional) Number of messages sent per scheduling interval. Range is 1 to 500 messages.
	interval *interval-length*	(Optional) Interval length between scheduling intervals (specified in milliseconds). Range is 250 to 2000 milliseconds.

Defaults

messages: 100

interval-length: 1 second

Command Modes   RSVP interface configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the rate-limiting feature with caution. Limiting the rate of RSVP signaling has the advantage of avoiding an overload of the next hop router's input queue, because such overloads would cause the next hop router to drop RSVP messages. However, reliable messaging and rapid retransmit usually enable the router to recover very rapidly from message drops; so rate limiting might not be necessary.

If the rate is set too low, it causes slower convergence times. This command limits all RSVP messages except acknowledgments (ACK) and SRefresh messages. The command does not let you make a router generate messages faster than its inherent limit. (That limit differs among router models.)

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples

The following example shows how to enable rate-limiting:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# rsvp interface POS0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling rate-limit
```

The following example shows how to limit the rate to 50 messages per second:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling rate-limit rate 50
```

The following example shows how to set a limit at 40 messages for every 250 milliseconds:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling rate-limit rate 40 interval 250
```

The following example shows how to restore the rate to the default of 100 messages per second:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling rate-limit rate
```

The following example shows how to disable rate-limiting:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/3/0/0
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling rate-limit
```

Related Commands

Command	Description
signalling refresh reduction bundle-max-size	Specifies the maximum bundle size of maximum size of single RSVP bundle message.

signalling refresh interval

To change the frequency with which a router updates the network about the RSVP state of a particular interface, use the **signalling refresh interval** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

signalling refresh interval *seconds*

no signalling refresh interval

Syntax Description	*seconds*	Number of seconds the router waits to update the network about the RSVP state of an interface (specified in seconds). Range is 10 to 180 seconds. Default is 45 seconds.

Defaults   *seconds:* 45

Command Modes   RSVP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

RSVP relies on a soft-state mechanism to maintain state consistency in the face of network losses. That mechanism is based on continuous refresh messages to keep a state current. Each RSVP router is responsible for sending periodic refresh messages to its neighbors.

The router attempts to randomize network traffic and reduce metronomic burstiness by jittering the actual interval between refreshes by as much as 50 percent. As a result, refreshes may not be sent at exactly the interval specified. However, the average rate of refreshes are within the specified refresh interval.

Lengthening the interval reduces the refresh load of RSVP on the network but causes downstream nodes to hold state longer. This reduces the responsiveness of the network to failure scenarios. Shortening the interval improves network responsiveness but expands the messaging load on the network.

The reliable messaging extension, implemented through the **signalling refresh reduction reliable** command, may cause new or changed messages to be temporarily refreshed at a more rapid rate than specified, in order to improve network responsiveness.

The use of reliable messaging with rapid retransmit substantially improves network responsiveness in case of transient message loss; if the refresh interval is changed when using the reliable messaging feature, it is more useful to lengthen the interval than to shorten it.

The summary refresh extension, implemented through the **signalling refresh reduction summary** command, provides a lower-cost mechanism to refresh RSVP state. The router uses the same refresh interval between successive refreshes of a single state when using summary refresh and when using ordinary message-based refresh.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following example shows how to specify a refresh interval of 30 seconds:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh interval 30
```

The following example shows how to restore the refresh interval to the default value of 45 seconds:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling refresh interval
```

Related Commands

Command	Description
signalling refresh missed	Specifies the number of successive missed refresh messages before RSVP deems the state expired and tears it down.
signalling refresh reduction reliable	Customizes acknowledgment message size and hold interval, and the RSVP message retransmit interval.
signalling refresh reduction summary	Enables and configures the maximum size of the SRefresh message.

signalling refresh missed

To specify the number of successive refresh messages that can be missed before the RSVP deems a state to be expired (resulting in the state to be torn down), use the **signalling refresh missed** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

signalling refresh missed *number*

no signalling refresh missed

Syntax Description

number	Number of successive missed refresh messages. Range is 1 to 8. Default is 4.

Defaults

number: 4

Command Modes

RSVP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Decreasing the missed-message number improves RSVP responsiveness to major failures like router failure or link faults, but decreases the resilience of RSVP resulting in packet drops or temporary network congestion. The latter condition makes RSVP too sensitive.

Increasing the missed-message number increases the resilience of RSVP to such transient packet loss, but decreases the RSVP responsiveness to more intransient network failures such as router failure or link fault.

The default value of 4 provides a balance of resilience and responsiveness factors.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples   The following example shows how to specify a missed refresh limit of six (6) messages:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh missed 6
```

The following example shows how to return the missed refresh limit to the default value of four (4):

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling refresh missed
```

Related Commands

Command	Description
signalling refresh interval	Changes the frequency with which a router updates the network about the RSVP state of an interface.
signalling refresh reduction reliable	Customizes acknowledgment message size and hold interval, and the RSVP message retransmit interval.
signalling refresh reduction summary	Enables and configures the maximum size of the SRefresh message.

signalling refresh reduction bundle-max-size

To configure the maximum size of a single RSVP bundle message, use the **signalling refresh reduction bundle-max-size** command in RSVP interface configuration mode.

signalling refresh reduction bundle-max-size *size*

Syntax Description	*size* Maximum size of a single RSVP bundle message. Range is 512 to 65000 bytes.

Defaults *size*: **4096 bytes**

Command Modes RSVP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples The following example shows how to set the maximum bundle size of a single RSVP bundle message to 4000:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh reduction bundle-max-size 4000
```

Related Commands	Command	Description
	show rsvp interface	Displays information about all interfaces with RSVP enabled.

signalling refresh reduction disable

To disable RSVP refresh reduction on an interface, use the **signalling refresh reduction disable** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

> **signalling refresh reduction disable**
>
> **no signalling refresh reduction disable**

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values

Command Modes   RSVP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The following features of the IETF refresh reduction standard RFC 2961 are enabled with this command:

- Setting the refresh-reduction-capable bit in message headers
- Message-ID usage
- Reliable messaging with rapid retransmit, acknowledgment (ACK), and NACK messages
- Summary refresh extension

Because refresh reduction relies on cooperation of the neighbor, the neighbor must also support the standard. If the router detects that a neighbor is not supporting the refresh reduction standard (either through observing the refresh-reduction-enabled bit in messages received from the next hop, or by sending a Message-ID object to the next hop and receiving an error), refresh reduction is not used on this link. That information is obtained through use of the **show rsvp interface detail** command.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples   The following example shows how to disable RSVP refresh reduction on an interface:

```
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh reduction disable
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
```

The following example shows how to enable RSVP refresh reduction on the interface:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling refresh reduction disable
```

Related Commands

Command	Description
show rsvp interface	Displays information about all interfaces with RSVP enabled.
signalling refresh interval	Changes the frequency with which a router updates the network about the RSVP state of an interface.
signalling refresh reduction reliable	Customizes acknowledgment message size and hold interval, and the RSVP message retransmit interval.
signalling refresh reduction summary	Enables and configures the maximum size of the signalling refresh message.

signalling refresh reduction reliable

To configure the parameters of reliable messaging, use the **signalling refresh reduction reliable** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

signalling refresh reduction reliable [**ack-max-size** *bytes* | **ack-hold-time** *milliseconds* | **retransmit-time** *milliseconds* | **summary-refresh**]

no signalling refresh reduction reliable [**ack-max-size** *bytes* | **ack-hold-time** *milliseconds* | **retransmit-time** *milliseconds* | **summary-refresh**]

Syntax Description

ack-max-size	(Optional) Maximum size of the RSVP component within a single acknowledgment message.
bytes	(Optional) Number of bytes that define the maximum size of an RSVP component. Range is 20 to 65000 bytes.
ack-hold-time	(Optional) Maximum amount of time a router holds an acknowledgment before sending it, in an attempt to bundle several acknowledgments into a single acknowledgment message.
milliseconds	(Optional) Number of milliseconds that define the acknowledgment hold time. Range is 100 to 5000 milliseconds.
retransmit-time	(Optional) Amount of time the router initially waits for an acknowledgment message before resending the RSVP message.
milliseconds	(Optional) Number of milliseconds that define the retransmit time. Range is 100 to 10000 milliseconds.
summary-refresh	(Optional) Enables the use of reliable transmission for RSVP summary refresh messages.

Defaults

ack-max-size *bytes*: 4096

ack-hold-time *milliseconds*: 400 (0.4 seconds)

retransmit-time *milliseconds*: 900 (0.9 seconds)

Command Modes   RSVP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.

Release	Modification
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

For reliable messaging to work properly, configure the retransmit time on the send router (A) and acknowledgment hold time on the peer router (B). (Vice versa for messages in reverse direction.)

The retransmit time must be greater than the acknowledgment hold time, so that the acknowledgment message has time to get back to the sender before the message retransmits. We recommend that the retransmit-time interval be at least twice the acknowledgment hold-time interval. If the retransmit-time value is smaller than the acknowledgment hold-time value, then router A retransmits the message even though router B may have received the message and is waiting for an acknowledgment hold time to time out to send the acknowledgment. This causes unnecessary network traffic.

Reducing the value of **ack-max-size** causes more acknowledgment messages to be issued, with fewer acknowledgments contained within each acknowledgment message. However, reducing the acknowledgment-max-size does not speed up the rate at which acknowledgment messages are issued, because their frequency is still controlled by the time values (acknowledgment hold time and retransmit time).

To use reliable messaging for summary refresh messages, use the **rsvp interface** *interface-name* **signalling refresh reduction summary** command.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples

The following example shows how to set the maximum acknowledgment message size to 4096 bytes on POS interface 0/4/0/1:

```
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/4/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh reduction reliable ack-max-size
4096
```

The following example shows how to return the maximum acknowledgment message size to the default of 1000 bytes on POS interface 0/4/0/1:

```
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/4/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# no rsvp signalling refresh reduction reliable
```

The following example shows how to set the acknowledgment hold time to 1 second:

```
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/4/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh reduction reliable
ack-hold-time 1000
```

The following example shows how to return the acknowledgment hold time to the default of 0.4 second:

```
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/4/0/1
```

Cisco IOS XR MPLS Command Reference

```
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling refresh reduction reliable
ack-hold-time
```

The following example shows how to set the retransmit timer to 2 seconds:

```
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/4/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh reduction reliable
retransmit-time 2000
```
The following example shows how to return the retransmit timer to the default of 0.9 seconds:

```
RP/0/RP0/CPU0:router(config)# rsvp interface pos 0/4/0/1
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling refresh reduction reliable
```

The following example shows how to enable the use of reliable transmission for RSVP summary refresh messages:

```
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh reduction reliable
summary-refresh
```

The following example shows how to disable the use of reliable transmission for RSVP summary refresh messages:

```
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling refresh reduction reliable
summary-refresh
```

Related Commands	Command	Description
	signalling refresh reduction disable	Disables RSVP refresh reduction on an interface.

signalling refresh reduction summary

To configure RSVP summary refresh message size on an interface, use the **signalling refresh reduction summary** command in RSVP interface configuration mode. To return to the default behavior, use the **no** form of this command.

signalling refresh reduction summary [max-size *bytes*]

no signalling refresh reduction summary [max-size *bytes*]

Syntax Description

max-size *bytes*	(Optional) Specifies the maximum size in bytes of a single RSVP summary refresh message. Range is 20 to 65000 bytes.

Defaults   *bytes*: 4096

Command Modes   RSVP interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	This command was supported on the Cisco XR 12000 Series Router.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines   To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **signalling refresh reduction summary** command to specify the maximum size of the summary refresh messages sent. Message size is verified using the **show rsvp interface detail** command.

Task ID

Task ID	Operations
mpls-te	read, write
ouni	read, write

Examples   The following example shows how to change the summary message maximum size on an interface:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# signalling refresh reduction summary max-size 6000
```

The following example shows how to return the summary message maximum size to the default value on an interface:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# config rsvp interface tunnel-te 2
RP/0/RP0/CPU0:router(config-rsvp-if)# no signalling refresh reduction summary max-size
6000
```

Related Commands

Command	Description
show rsvp interface	Displays information about all interfaces with RSVP enabled.
signalling refresh interval	Changes the frequency with which a router updates the network about the RSVP state of an interface.

window-size (RSVP)

To specify the maximum number of RSVP authenticated messages that can be received out of sequence, use the **window-size** command in RSVP authentication configuration mode, RSVP interface authentication configuration mode, or RSVP neighbor authentication configuration mode. To disable the window size, use the **no** form of this command.

> **window-size** {*N*}
>
> **no window-size**

Syntax Description

N	Size of the window to restrict out-of-sequence messages. Range is 1 to 64. Default is 1. All out-of-sequence messages are dropped.

Defaults

N: 1

Command Modes

RSVP authentication configuration

RSVP interface authentication configuration

RSVP neighbor authentication configuration

Command History

Release	Modification
Release 3.4.1	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **window-size** command to specify the maximum number of authenticated messages that are received out of sequence. All RSVP authenticated messages include a sequence number that is used to prevent replays of RSVP messages.

With a default window size of one message, RSVP rejects any out-of-order or out-of-sequence authenticated messages, because they are assumed to be replay attacks. However, sometimes bursts of RSVP messages become reordered between RSVP neighbors. If this occurs on a regular basis, and you can verify that the node sending the burst of messages is trusted, you can use the window-size option to adjust the burst size such that RSVP does not discard such reordered bursts. RSVP checks for duplicate messages within these bursts.

Task ID	Task ID	Operations
	mpls-te	read, write
	ouni	read, write

Examples

The following example shows how to configure the size of the window to 33 in RSVP neighbor authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp neighbor 1.1.1.1 authentication
RP/0/RP0/CPU0:router(config-rsvp-nbor-auth)# window-size 33
```

The following example shows how to configure the size of the window to 33 in RSVP authentication configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp authentication
RP/0/RP0/CPU0:router(config-rsvp-auth)# window-size 33
```

The following example shows how to configure the size of the window to 33 in RSVP interface authentication configuration mode by using the **rsvp interface** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# rsvp interface POS 0/2/1/0
RP/0/RP0/CPU0:router(config-rsvp-if)# authentication
RP/0/RP0/CPU0:router(config-rsvp-if-auth)# window-size 33
```

Related Commands

Command	Description
key-source key-chain (RSVP)	Specifies the source of the key information to authenticate RSVP signaling messages.
life-time (RSVP)	Controls how long RSVP maintains idle security associations with other trusted RSVP neighbors.