Configuring RSVP Support for LLQ

This chapter describes the tasks for configuring the RSVP Support for Low Latency Queueing (LLQ) feature.

For complete conceptual information, see the chapter "Signalling Overview" in this book.

For a complete description of the RSVP Support for LLQ commands in this chapter, see the *Cisco IOS Quality of Service Solutions Command Reference*. To locate documentation of other commands that appear in this chapter, use the command reference master index or search online.

To identify the hardware platform or software image information associated with a feature, use the Feature Navigator on Cisco.com to search for information about the feature or refer to the software release notes for a specific release.

RSVP Support for LLQ Configuration Task List

To configure RSVP support for LLQ, perform the tasks described in the following sections. The tasks in the first two sections are required; the tasks in the remaining sections are optional.

- Configuring Flow Classification, page 2 (Required)
- Enabling RSVP and WFQ, page 2 (Required)
- Configuring a Burst Factor, page 2 (Optional)
- Configuring a Path, page 2 (Optional)
- Configuring a Reservation, page 3 (Optional)
- Verifying RSVP Support for LLQ Configuration (Optional)
- Monitoring and Maintaining RSVP Support for LLQ, page 4 (Optional)

See the end of this chapter for the section "Example: RSVP Support for LLQ Configuration."

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Configuring Flow Classification

To configure flow classification, use the following command in global configuration mode:

Command	Purpose
`Router#(config)# ip rsvp pq-profile`	Specifies the criteria for determining which flows go into the priority queue.

Enabling RSVP and WFQ

To enable RSVP and weighted fair queueing (WFQ), use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	`Router(config)# interface s2/0`	Enables an interface; for example, serial interface 2/0.
Step 2	`Router(config-if)# ip rsvp bandwidth`	Enables RSVP on an interface.
Step 3	`Router(config-if)# fair-queue`	Enables WFQ on an interface with priority queueing (PQ) support.

Configuring a Burst Factor

To configure a burst factor, use the following command in interface configuration mode:

Command	Purpose
`Router(config-if)# ip rsvp burst policing`	Specifies a burst factor on a per-interface basis.

Configuring a Path

To configure a path, use the following command in global configuration mode:

Command	Purpose
`Router(config)# ip rsvp sender`	Specifies the RSVP path parameters, including the destination and source addresses, the protocol, the destination and source ports, the previous hop address, the average bit rate, and the burst size.

Configuring a Reservation

To configure a reservation, use the following command in global configuration mode:

Command	Purpose
`Router(config)# ip rsvp reservation`	Specifies the RSVP reservation parameters, including the destination and source addresses, the protocol, the destination and source ports, the next hop address, the input interface, the service type, the average bit rate, and the burst size.

Verifying RSVP Support for LLQ Configuration

To verify RSVP support for LLQ configuration, perform the following steps:

Step 1 Enter the **show ip rsvp installed** command to display information about interfaces and their admitted reservations. A sample output is shown.

This output shows that Ethernet interface 2/1 has four reservations and serial interface 3/0 has none.

```
Router# show ip rsvp installed

RSVP:Ethernet2/1
BPS     To              From            Protoc DPort  Sport  Weight Conversation
44K     145.20.0.202    145.10.0.201    UDP    1000   1000   0      264
44K     145.20.0.202    145.10.0.201    UDP    1001   1001   13     266
98K     145.20.0.202    145.10.0.201    UDP    1002   1002   6      265
1K      145.20.0.202    145.10.0.201    UDP    10     10     0      264
RSVP:Serial3/0 has no installed reservations
Router#
```

Note In the sample output, weight 0 is assigned to voice-like flows, which proceed to the priority queue.

Step 2 Enter the **show ip rsvp installed detail** command to display additional information about interfaces and their current reservations. A sample output is shown.

```
Router# show ip rsvp installed detail

RSVP:Ethernet2/1 has the following installed reservations
RSVP Reservation. Destination is 145.20.0.202, Source is 145.10.0.201,
  Protocol is UDP, Destination port is 1000, Source port is 1000
  Reserved bandwidth:44K bits/sec, Maximum burst:1K bytes, Peak rate:44K bits/sec
  Resource provider for this flow:
    WFQ on hw idb Se3/0: PRIORITY queue 264.  Weight:0, BW 44 kbps
  Conversation supports 1 reservations
  Data given reserved service:316 packets (15800 bytes)
  Data given best-effort service:0 packets (0 bytes)
  Reserved traffic classified for 104 seconds
  Long-term average bitrate (bits/sec):1212 reserved, 0M best-effort
RSVP Reservation. Destination is 145.20.0.202, Source is 145.10.0.201,
  Protocol is UDP, Destination port is 1001, Source port is 1001
  Reserved bandwidth:44K bits/sec, Maximum burst:3K bytes, Peak rate:44K bits/sec
  Resource provider for this flow:
```

```
    WFQ on hw idb Se3/0: RESERVED queue 266.  Weight:13, BW 44 kbps
  Conversation supports 1 reservations
  Data given reserved service:9 packets (450 bytes)
  Data given best-effort service:0 packets (0 bytes)
  Reserved traffic classified for 107 seconds
  Long-term average bitrate (bits/sec):33 reserved, 0M best-effort
RSVP Reservation. Destination is 145.20.0.202, Source is 145.10.0.201,
  Protocol is UDP, Destination port is 1002, Source port is 1002
Router#
```

Note In the sample output, the first flow gets the priority queue (weight = 0) while the second flow does not.

Monitoring and Maintaining RSVP Support for LLQ

To monitor and maintain the RSVP Support for LLQ feature, use the following commands in EXEC mode, as needed:

Command	Purpose
`Router# show ip rsvp installed`	Displays information about interfaces and their admitted reservations.
`Router# show ip rsvp installed detail`	Displays additional information about interfaces and their admitted reservations.
`Router# show queue interface-type interface-number`	Displays queueing configuration and statistics for a particular interface.

Example: RSVP Support for LLQ Configuration

This section provides a configuration example for the RSVP Support for LLQ feature.

For information about configuring RSVP support for LLQ, see the section "RSVP Support for LLQ Configuration Task List" in this module.

In the following example, PQ parameters, including flow rate and burst factor, are defined:

```
Router(config)# ip rsvp pq-profile ?

  <1-1048576>  Max Flow Rate (bytes/second)
  voice-like   Voice-like flows
  <cr>

Router(config)# ip rsvp pq-profile 11000 1500 ?

  <100-4000>         Max Peak to Average Ratio (in %)
  ignore-peak-value  Ignore the flow's p/r ratio
  <cr>

Router(config)# ip rsvp pq-profile 11000 1500 ignore-peak-value
Router(config)# end
```

```
Router# sh run | include pq-profile
ip rsvp pq-profile 11000 1500 ignore-peak-value
```

In the following example, RSVP is enabled:

```
Router# configure terminal

Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# interface loopback 40
Router(config-if)# ip rsvp bandwidth ?
  <1-10000000>  Reservable Bandwidth(KBPS)
  <cr>

Router(config-if)# ip rsvp bandwidth 300 ?
  <1-10000000>  Largest Reservable Flow(KBPS)
  <cr>

Router(config-if)# ip rsvp bandwidth 300 30 ?
  <cr>
Router(config-if)# ip rsvp bandwidth 300 30
Router(config-if)# end
```

In the following example, WFQ is enabled:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# interface e0/1
Router(config-if)# fair-queue
Router(config-if)# fair-queue 64
```

In the following example, a burst factor is configured:

```
Router(config)# interface e3/0
Router(config-if)# ip rsvp burst policing 200
```

In the following example, a path is defined:

```
Router(config)# ip rsvp sender 145.20.20.202 145.10.10.201 udp 10 20
145.10.10.201 loopback 10  80 10
```

In the following example, a reservation is defined:

```
Router(config)# ip rsvp reservation 145.20.20.202 145.10.10.201 udp
10 20 145.20.20.202 lo20 ff load 80 10
```