Chapter 4

Verifying RSVP Signal Processing

This chapter describes how to determine that the Resource Reservation Protocol (RSVP) path messages are sent and received. (See Table 8.)

Table 8: Checklist for Verifying RSVP Signal Processing

Verifying RSVP Signal Processing Tasks	Command or Action
Checking That RSVP Path Messages Are Sent and Received on page 70	show rsvp statistics
Examining the History Log on page 72	show mpls lsp extensive
Determining the Current RSVP Neighbor State on page 73	show rsvp neighbor
Enabling RSVP Traceoptions on page 74	[edit] edit protocols rsvp traceoptions set file *filename*.log set flag packets show commit run show log rsvp.log deactivate traceoptions show commit

Checking That RSVP Path Messages Are Sent and Received

Purpose The presence or absence of various RSVP messages can help determine if there is a problem with Multiprotocol Label Switching (MPLS) in your network. For example, if path messages occur in the output without Resv messages, it might indicate that label-switched paths (LSPs) are not being created.

Action To check that RSVP Path messages are sent and received, enter the following JUNOS command-line interface (CLI) operational mode command:

```
user@host>show rsvp statistics
```

Sample Output

```
user@R1> show rsvp statistics
  PacketType              Total                 Last 5 seconds
                    Sent      Received        Sent      Received
  Path            114523         80185           1             0
  PathErr              5            10           0             0
  PathTear            12             6           0             0
  Resv FF          80515        111476           0             0
  Resv WF              0             0           0             0
  Resv SE              0             0           0             0
  ResvErr              0             0           0             0
  ResvTear             0             5           0             0
  ResvConf             0             0           0             0
  Ack                  0             0           0             0
  SRefresh             0             0           0             0
  Hello           915851        915881           0             0
  EndtoEnd RSVP        0             0           0             0

  Errors                          Total           Last 5 seconds
  Rcv pkt bad length                0                       0
  Rcv pkt unknown type              0                       0
  Rcv pkt bad version               0                       0
  Rcv pkt auth fail                 0                       0
  Rcv pkt bad checksum              0                       0
  Rcv pkt bad format                0                       0
  Memory allocation fail            0                       0
  No path information               0                       0
  Resv style conflict               0                       0
  Port conflict                     0                       0
  Resv no interface                 0                       0
  PathErr to client                15                       0
  ResvErr to client                 0                       0
  Path timeout                      0                       0
  Resv timeout                      0                       0
  Message out-of-order              0                       0
  Unknown ack msg                   0                       0
  Recv nack                         0                       0
  Recv duplicated msg-id            0                       0
  No TE-link to recv Hop            0                       0
```

What It Means The sample output shows RSVP messages sent and received. The total number of RSVP Path messages is 11,4532 sent and 80,185 received. Within the last 5 seconds, no messages have been sent or received.

A total of 5 PathErr messages were sent and 10 received. When path errors occur (usually because of parameter problems in a path message), the router sends a unicast PathErr message to the sender that issued the path message. In this case, R1 sent at least 10 path messages with an error, as indicated by the 10 PathErr messages that R1 has received. The downstream router sent R1 five path messages with an error, as indicated by the five PathErr messages that R1 has sent. PathErr messages transmit in the opposite direction to path messages.

A total of 12 PathTear messages were sent and 6 received, none in the last 5 seconds. In contrast to PathErr messages, PathTear messages travel in the same direction as path messages. Since path messages are both sent and received, PathTear messages are also sent and received. However, if only path messages are sent, then only the PathTear messages that are sent appear in the output.

A total of 80,515 reservation (Resv) messages with the fixed filter (FF) reservation style were sent and 111,476 received, none in the last 5 seconds. An FF reservation style indicates that within each session, each receiver establishes its own reservation with each upstream sender, and that all selected senders are listed. No messages for the wildcard filter (WF) or shared explicit (SE) reservation styles are sent or received. For more information on RSVP reservation styles, see the *JUNOS MPLS Applications Configuration Guide*.

Other RSVP message types are not sent or received. For information on the ResvErr, ResvTear, and Resvconf message types, see the *JUNOS MPLS Applications Configuration Guide*.

Ack and summary refresh (SRefresh) messages do not appear in the output. Ack and summary refresh messages are defined in RFC 2961 and are part of the RSVP extensions. Ack messages are used to reduce the amount of RSVP control traffic in the network.

A total of 915,851 hello messages were sent and 915,881 received, with none transmitted or received in the last 5 seconds. The RSVP hello interval is 9 seconds. If more than one hello message is sent or received in the last 5 seconds, it implies that more than one interface supports RSVP.

EndtoEnd RSVP messages are legacy RSVP messages that are not used for RSVP traffic engineering. These counters increment only when RSVP forwards legacy RSVP messages issued by a virtual private network (VPN) customer for transit across the backbone to the other site(s) in the VPN. They are called end-to-end messages because they are intended for the opposite side of the network and only have meaning at the two ends of the provider network.

The Errors section of the output shows statistics about RSVP packets with errors. A total of 15 PathErr to client packets were sent to the Routing Engine. The total combines the sent and received PathErr packets. For more information about error statistics and packets, see the *JUNOS System Basics and Services Command Reference.*

Examining the History Log

Purpose The history log for the show mpls lsp extensive command contains information that is useful in determining a possible reason for any errors in MPLS functioning in your network.

Action To examine the history log, enter the following JUNOS CLI operational mode command:

```
user@host> show mpls lsp extensive
```

Sample Output

```
user@R6> show mpls lsp extensive
Ingress LSP: 1 sessions

10.0.0.1
From: 10.0.0.6, State: Up, ActiveRoute: 1, LSPname: R6-to-R1
  ActivePath:  (primary)
  LoadBalance: Random
  Encoding type: Packet, Switching type: Packet, GPID: IPv4
 *Primary                    State: Up
    Computed ERO (S [L] denotes strict [loose] hops): (CSPF metric: 20)
 10.1.56.1 S 10.1.15.1 S
    Received RRO (ProtectionFlag 1=Available 2=InUse 4=B/W 8=Node
10=SoftPreempt):
          10.1.56.1 10.1.15.1
    6 Aug 17 12:19:04 Selected as active path
    5 Aug 17 12:19:03 Record Route:  10.1.56.1 10.1.15.1
    4 Aug 17 12:19:03 Up
    3 Aug 17 12:19:03 Originate Call
    2 Aug 17 12:19:03 CSPF: computation result accepted
    1 Aug 17 12:18:34 CSPF failed: no route toward 10.0.0.1
  Created: Tue Aug 17 12:18:33 2004
Total 1 displayed, Up 1, Down 0
[...Output truncated...]
```

What It Means Lines 1through 6 contain the six most recent entries to the history log. Each line is time stamped. The most recent entries have the largest log history number and are at the top of the log, indicating that line 6 is the most recent entry in the history log.

The history log was started on August 17, and displays the following sequence of activities: a call failed because the address could not be reached (line 1); 31 seconds later, probably because the addressing problem was resolved, the call was signaled (line 2); the call was completed (line 3); the LSP came up with a route (lines 4 and 5); and the LSP was selected as active (line 6).

For more details about the messages that can appear in the history log, see *JUNOS MPLS Operations Guide: Log Files.*

Determining the Current RSVP Neighbor State

Purpose Display a list of RSVP neighbors that were learned dynamically when exchanging RSVP packets. Once a neighbor is learned, it is never removed from the list of RSVP neighbors.

Action To determine the current RSVP neighbor state, enter the following JUNOS CLI operational mode command:

```
user@host> show rsvp neighbor
```

Sample Output

```
user@R6> show rsvp neighbor
RSVP neighbor: 2 learned
Address   Idle Up/Dn LastChange   HelloInt  HelloTx/Rx     MsgRcvd
10.1.36.1    5  1/0  1w5d 6:30:50    9      116734/116734   23558
10.1.56.1   10  1/0  2w2d 23:44:15   9      161600/161600   23570
```

What It Means The sample output shows that R6 has learned about two different RSVP neighbors. Each neighbor has one line of output that includes the neighbor RSVP address, the length of time the interface was idle, the current interface up/down counter, the time of the last interface state change, the current RSVP hello interval, the total number of RSVP hello messages transmitted and received, and the total number of RSVP messages received on the interface.

The show rsvp neighbor command only indicates a neighbor after a session is established. Once an interface is displayed in this command output, it always appears, even if the RSVP neighbor state is down.

The RSVP neighbor 10.1.36.1 was idle for 5 seconds, came up once and has not gone down, indicating that the interface is currently in an Up state. As long as the up counter is one greater than the down counter, the RSVP interface is up. If the up/down counters are equal, the interface is down.

The last state change occurred 6 hours and 30 minutes ago. The current hello interval is 9 seconds. A total of 116,734 hello messages were transmitted and received on this interface, and a total of 23,558 RSVP Path/Resv messages were processed.

The RSVP neighbor 10.1.56.1 was idle for 10 seconds, came up once and has not gone down, indicating that the interface is currently in an Up state. The last state change occurred 23 hours and 44 minutes ago. The current Hello interval is 9 seconds. A total of 161,600 hello messages were transmitted and received on this interface, and a total of 23,570 RSVP Path/Resv messages were processed.

Enabling RSVP Traceoptions

Purpose Global routing protocol tracing operations track all general routing operations and record them in a log file. Any global tracing operations that you configure are inherited by the individual routing protocols. To modify the global tracing operations for an individual protocol, enable tracing when configuring that protocol.

The error descriptions logged by the remote operations daemon can often provide more detailed information to help you solve the problem faster.

Action To enable traceoptions for RSVP packets in your network, follow these steps:

1. In configuration mode, go to the following hierarchy level:

   ```
   [edit]
   user@host# edit protocols rsvp traceoptions
   ```

2. Configure the RSVP log file:

   ```
   [edit protocols rsvp traceoptions]
   user@host# set file filename.log
   ```

3. Configure the tracing operations:

   ```
   [edit protocols rsvp traceoptions]
   user@host# set flag packets
   ```

4. Verify and commit the configuration:

   ```
   user@host# show
   user@host# commit
   ```

5. View the contents of the log file:

   ```
   user@host# run show log rsvp.log
   ```

6. Stop monitoring the rsvp log file:

   ```
   [edit protocols rsvp]
   user@host# deactivate traceoptions
   ```

7. Verify and commit the new configuration:

   ```
   user@host# show
   user@host# commit
   ```

Sample Output

```
user@R1> edit
Entering configuration mode

[edit]
user@R1# edit protocols rsvp traceoptions

[edit protocols rsvp traceoptions]
user@R1# set file rsvp.log

[edit protocols rsvp traceoptions]
user@R1# set flag packets

[edit protocols rsvp traceoptions]
user@R1# show
file rsvp.log;
flag packets;

[edit protocols rsvp traceoptions]
user@R1# commit
commit complete

[edit protocols rsvp traceoptions]
user@R1# run show log rsvp.log
Aug 26 10:05:54 trace_on: Tracing to "/var/log/rsvp.log" started
Aug 26 10:05:54 RSVP send Hello New 10.1.13.1->10.1.13.2 Len=32 so-0/0/2.0
Aug 26 10:05:55 RSVP recv Resv 10.1.13.2->10.1.13.1 Len=128 so-0/0/2.0
Aug 26 10:05:55 RSVP send Hello New 10.1.12.1->10.1.12.2 Len=32 so-0/0/0.0
Aug 26 10:05:55 RSVP send Hello New 10.1.15.1->10.1.15.2 Len=32 so-0/0/1.0
Aug 26 10:05:55 RSVP recv Hello New 10.1.12.2->10.1.12.1 Len=32 so-0/0/0.0
Aug 26 10:05:55 RSVP recv Hello New 10.1.15.2->10.1.15.1 Len=32 so-0/0/1.0
Aug 26 10:05:57 RSVP recv Path 10.0.0.6->10.0.0.1 Len=208 so-0/0/1.0
Aug 26 10:05:57 RSVP send Resv 10.1.15.1->10.1.15.2 Len=120 so-0/0/1.0
---(more)---[abort]

[edit protocols rsvp traceoptions]
user@R1# up

[edit protocols rsvp]
user@R1# deactivate traceoptions

[edit protocols rsvp]
user@R1# show
inactive: traceoptions {
    file rsvp.log;
    flag packets;
}
interface so-0/0/0.0;
interface so-0/0/1.0;
interface so-0/0/2.0;
interface fxp0.0 {
    disable;
}

[edit protocols rsvp]
user@R1# commit
commit complete
```

What It Means The sample output shows the configuration of RSVP traceoptions, the output for the log file, and the deactivation of the traceoptions configuration.

To specify more than one tracing operation, include multiple flag statements in the configuration, at the following hierarchy level:

```
[edit protocols rsvp traceoptions]
user@R1# set flag flag
```

Table 9: RSVP Tracing Flags

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

For more information on configuring traceoptions, see the *JUNOS MPLS Applications Configuration Guide* and the *JUNOS Routing Protocols Configuration Guide*.