



RSVP Support for RTP Header Compression Phase 1

Last Updated: January 15, 2013

The Resource Reservation Protocol (RSVP) Support for Real-Time Transport Protocol (RTP) Header Compression, Phase 1 feature provides a method for decreasing a flow's reserved bandwidth requirements so that a physical link can accommodate more voice calls.

Feature Specifications for RSVP Support for RTP Header Compression, Phase 1

Feature History

Release	Modification
12.2(15)T	This feature was introduced.

Supported Platforms

For platforms supported in Cisco IOS Release 12.2(15)T, consult Cisco Feature Navigator.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

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

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

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

Prerequisites for RSVP Support for RTP Header Compression Phase 1

- Ensure that Real-Time Transport Protocol (RTP) or User Data Protocol (UDP) header compression is configured in the network.
- Ensure that RSVP is configured on two or more routers within the network before you can use this feature.

Restrictions for RSVP Support for RTP Header Compression Phase 1

- Routers do not generate compression hints, as described in RFC 3006, in this release.
- Signalled compression hints are not supported.
- Admission control with compression is limited to reservations with one sender per session.

Information About RSVP Support for RTP Header Compression Phase 1

- [Feature Design of RSVP Support for RTP Header Compression Phase 1, page 2](#)
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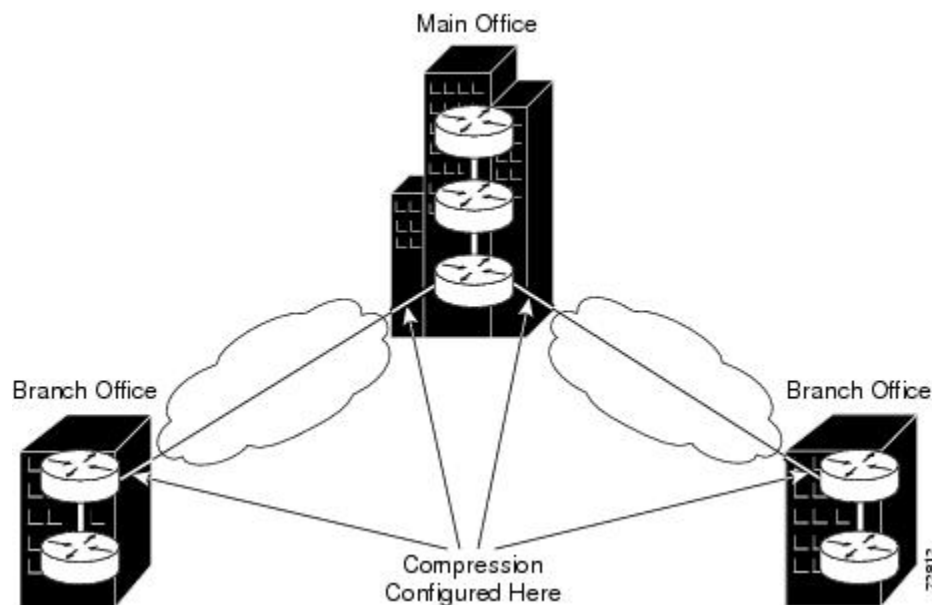
Feature Design of RSVP Support for RTP Header Compression Phase 1

Network administrators use RSVP with Voice over IP (VoIP) to provide quality of service (QoS) for voice traffic in a network. Because VoIP is a real-time application, network administrators often configure compression within the network to decrease bandwidth requirements. Typically, compression is configured on slow serial lines (see the figure below), where the savings from reduced bandwidth requirements outweigh the additional costs associated with the compression and decompression processes.

**Note**

RTP header compression is supported by Cisco routers.

Figure 1 *Configuring Compression*



Originating applications know if their traffic is considered compressible, but not whether the network can actually compress the data. Additionally, compression may be enabled on some links along the call's path, but not on others. Consequently, the originating applications must advertise their traffic's uncompressed bandwidth requirements, and receiving applications must request reservation of the full amount of bandwidth. This causes routers whose RSVP implementations do not take compression into consideration to admit the same number of flows on a link running compression as on one that is not.

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Predicting Compression within Admission Control

Network administrators, especially those whose networks have very low speed links, may want RSVP to use their links as fully as possible. Such links typically have minimum acceptable outgoing committed information rate (minCIR) values between 19 and 30 kbps. Without accounting for compression, RSVP can admit (at most) one G.723 voice call onto the link, despite the link's capacity for two compressed calls. Under these circumstances, network administrators may be willing to sacrifice a QoS guarantee for the last call, if the flow is less compressible than predicted, in exchange for the ability to admit it.

In order to account for compression during admission control, routers use signalled Tspec information, as well as their awareness of the compression schemes running on the flow's outbound interfaces, to make local decisions as to how much bandwidth should actually be reserved for a flow. By reserving fewer resources than signalled by the receiver, RSVP can allow links to be more fully used.

Benefits of RSVP Support for RTP Header Compression Phase 1

Additional Calls Accommodated on the Same Link

The RSVP Support for RTP Header Compression, Phase 1 feature performs admission control based on compressed bandwidth so that additional voice calls can be accommodated on the same physical link.

How to Configure RSVP Support for RTP Header Compression Phase 1

- [Configuring RSVP Admission-Control Compression, page 4](#)
- [Verifying RSVP Support for RTP Header Compression Phase 1 Configuration, page 5](#)

Configuring RSVP Admission-Control Compression



Note

RSVP predicted compression is enabled by default.

Perform this task to configure RSVP admission-control compression.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *[type number]*
4. **ip rsvp admission-control compression predict** *[method {rtp | udp} [bytes-saved N]]*
5. **end**

DETAILED STEPS

Command or Action	Purpose
Step 1 enable Example: <pre>Router> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2 configure terminal Example: <pre>Router# configure terminal</pre>	Enters global configuration mode.

	Command or Action	Purpose
Step 3	<p><code>interface [type number]</code></p> <p>Example:</p> <pre>Router(config-if)# interface Serial3/0</pre>	<p>Enters interface configuration mode.</p> <ul style="list-style-type: none"> The <i>type number</i> argument identifies the interface to be configured.
Step 4	<p>ip rsvp admission-control compression predict [method {rtp udp} [bytes-saved N]]</p> <p>Example:</p> <pre>Router(config-if)# ip rsvp admission-control compression predict method udp bytes-saved 16</pre>	<p>Configures RSVP admission-control compression prediction.</p> <ul style="list-style-type: none"> The optional method keyword allows you to select Real-Time Transport Protocol (rtp) or User Data Protocol (udp) for your compression scheme. The optional bytes-saved N keyword allows you to configure the predicted number of bytes saved per packet when RSVP predicts that compression will occur using the specified method.
Step 5	<p><code>end</code></p> <p>Example:</p> <pre>Router(config-if)# end</pre>	<p>Exits to privileged EXEC mode.</p>

Verifying RSVP Support for RTP Header Compression Phase 1 Configuration

Perform this task to verify that the RSVP Support for RTP Header Compression, Phase 1 feature is functioning.

SUMMARY STEPS

1. enable
2. show ip rsvp installed [detail]
3. show ip rsvp interface [interface-type interface-number] [detail]

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p><code>enable</code></p> <p>Example:</p> <pre>Router> enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> Enter your password if prompted.

Command or Action	Purpose
Step 2 <code>show ip rsvp installed [detail]</code> Example: Router# <code>show ip rsvp installed detail</code>	Displays information about interfaces and their admitted reservations and the resources needed for a traffic control state block (TCSB) after taking compression into account. <ul style="list-style-type: none"> The optional detail keyword displays the reservation's traffic parameters, downstream hop, compression, and resources used by RSVP to ensure QoS for this reservation.
Step 3 <code>show ip rsvp interface [interface-type interface-number] [detail]</code> Example: Router# <code>show ip rsvp interface detail</code>	Displays information about interfaces on which RSVP is enabled, including the current allocation budget and maximum available bandwidth and the RSVP bandwidth limit counter, taking compression into account. <ul style="list-style-type: none"> The optional detail keyword displays RSVP parameters associated with an interface including bandwidth, admission control, and compression methods.

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- [Troubleshooting Tips, page 7](#)

Examples

- [Sample Output for the show ip rsvp installed detail Command, page 6](#)
- [Sample Output for the show ip rsvp interface detail Command, page 6](#)

Sample Output for the show ip rsvp installed detail Command

In this example, the `show ip rsvp installed detail` command displays information, including the predicted compression method, its reserved context ID, and the observed bytes saved per packet average, for the admitted flowspec.

```
Router# show ip rsvp installed detail
RSVP: Ethernet2/1 has no installed reservations
RSVP: Serial3/0 has the following installed reservations
RSVP Reservation. Destination is 10.1.1.2. Source is 10.1.1.1,
Protocol is UDP, Destination port is 18054, Source port is 19156
Compression: (method rtp, context ID = 1, 37.98 bytes-saved/pkt avg)
Admitted flowspec:
  Reserved bandwidth: 65600 bits/sec, Maximum burst: 328 bytes, Peak rate: 80K bits/sec
  Min Policed Unit: 164 bytes, Max Pkt Size: 164 bytes
Admitted flowspec (as required if compression were not applied):
  Reserved bandwidth: 80K bits/sec, Maximum burst: 400 bytes, Peak rate: 80K bits/sec
  Min Policed Unit: 200 bytes, Max Pkt Size: 200 bytes
Resource provider for this flow:
  WFQ on FR PVC dlc1 101 on Se3/0: PRIORITY queue 24. Weight: 0, BW 66 kbps
Conversation supports 1 reservations [0x1000405]
Data given reserved service: 3963 packets (642085 bytes)
Data given best-effort service: 0 packets (0 bytes)
Reserved traffic classified for 80 seconds
Long-term average bitrate (bits/sec): 64901 reserved, 0 best-effort
Policy: INSTALL. Policy source(s): Default
```

Sample Output for the show ip rsvp interface detail Command

In this example, the show ip rsvp interface detail command displays the current interfaces and their configured compression parameters.

```
Router# show ip rsvp interface detail
Et2/1:
  Bandwidth:
    Curr allocated: 0 bits/sec
    Max. allowed (total): 1158K bits/sec
    Max. allowed (per flow): 128K bits/sec
    Max. allowed for LSP tunnels using sub-pools: 0 bits/sec
    Set aside by policy (total): 0 bits/sec
  Admission Control:
    Header Compression methods supported:
      rtp (36 bytes-saved), udp (20 bytes-saved)
  Neighbors:
    Using IP encap: 0. Using UDP encap: 0
  Signalling:
    Refresh reduction: disabled
    Authentication: disabled

Se3/0:
  Bandwidth:
    Curr allocated: 0 bits/sec
    Max. allowed (total): 1158K bits/sec
    Max. allowed (per flow): 128K bits/sec
    Max. allowed for LSP tunnels using sub-pools: 0 bits/sec
    Set aside by policy (total): 0 bits/sec
  Admission Control:
    Header Compression methods supported:
      rtp (36 bytes-saved), udp (20 bytes-saved)
  Neighbors:
    Using IP encap: 1. Using UDP encap: 0
  Signalling:
    Refresh reduction: disabled
    Authentication: disabled
```

Troubleshooting Tips

The observed bytes-saved per packet value should not be less than the configured or default value. Otherwise, the flow may be experiencing degraded QoS. To avoid any QoS degradation for future flows, configure a lower bytes-saved per packet value.

Flows may achieve less compressibility than the default RSVP assumes for many reasons, including packets arriving out of order or having different differentiated services code point (DSCP) or precedence values, for example, due to policing upstream within the network.

If compression is enabled on a flow's interface, but the compression prediction was unsuccessful, the reason appears in the output instead of the reserved compression ID and the observed bytes-saved per packet.

Configuration Examples for RSVP Support for RTP Header Compression Phase 1

- [Example RSVP Support for RTP Header Compression Phase 1, page 8](#)

Example RSVP Support for RTP Header Compression Phase 1

The following sample configuration shows the compression prediction enabled for flows using UDP and disabled for flows using RTP:

```
Router# configure terminal

Router(config)# interface Serial3/0
Router(config-if)# ip rsvp admission-control compression predict method udp bytes-saved 16
Router(config-if)# no
ip rsvp admission-control compression predict method rtp
```

Use the **show run** command to display all the RSVP configured parameters:

```
Router# show run

2d18h: %SYS-5-CONFIG_I: Configured from console by console

Router# show run int se3/0
Building configuration...

Current configuration : 339 bytes
!
interface Serial3/0
 ip address 10.2.1.1 255.255.0.0
 fair-queue 64 256 8
 serial restart_delay 0
 clock rate 128000
 ip rtp header-compression
 ip rsvp bandwidth
 no ip rsvp admission-control compression predict method rtp
 ip rsvp admission-control compression predict method udp bytes-saved 16
end
```

Additional References

For additional information related to RSVP Support for RTP Header Compression, Phase 1, refer to the following references:

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
QoS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco IOS Quality of Service Solutions Command Reference</i>
Signalling	"Signalling Overview" module
RSVP	"Configuring RSVP" module
Header compression concepts and topics	"Header Compression" module

Standards

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

MIBs

MIB ¹	MIBs Link
<ul style="list-style-type: none"> RFC 2206, RSVP Management Information Base using SMIV2 	<p>To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL:</p> <p>http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml</p>

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:

<http://tools.cisco.com/ITDIT/MIBS/servlet/index>

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

<http://www.cisco.com/register>

RFCs

RFCs ²	Title
RFC 2205	Resource Reservation Protocol (RSVP)
RFC 2508	Compressing IP/UDP/RTP Headers for Low-Speed Serial Links
RFC 3006	Integrated Services in the Presence of Compressible Flows

¹ Not all supported MIBs are listed.

² Not all supported RFCs are listed.

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for RSVP Support for RTP Header Compression

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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

Table 1 *Feature Information for RSVP Support for RTP Header Compression*

Feature Name	Releases	Feature Information
RSVP Support for RTP Header Compression	Cisco IOS XE Release 3.8S	In Cisco IOS XE Release 3.8S, support was added for the Cisco ASR 903 Router.

Glossary

admission control --The process in which a Resource Reservation Protocol (RSVP) reservation is accepted or rejected based on end-to-end available network resources.

bandwidth --The difference between the highest and lowest frequencies available for network signals. The term also is used to describe the rated throughput capacity of a given network medium or protocol.

compression --The running of a data set through an algorithm that reduces the space required to store or the bandwidth required to transmit the data set.

DSCP --differentiated services code point. The six most significant bits of the 1-byte IP type of service (ToS) field. The per-hop behavior represented by a particular DSCP value is configurable. DSCP values range between 0 and 63.

flow --A stream of data traveling between two endpoints across a network (for example, from one LAN station to another). Multiple flows can be transmitted on a single circuit.

flowspec --In IPv6, the traffic parameters of a stream of IP packets between two applications.

G.723 --A compression technique that can be used for compressing speech or audio signal components at a very low bit rate as part of the H.324 family of standards. This codec has two bit rates associated with it: 5.3 and 6.3 kbps. The higher bit rate is based on ML-MLQ technology and provides a somewhat higher quality of sound. The lower bit rate is based on code excited linear prediction (CELP) compression and provides system designers with additional flexibility. Described in the ITU-T standard in its G-series recommendations.

minCIR --The minimum acceptable incoming or outgoing committed information rate (CIR) for a Frame Relay virtual circuit.

packet --A logical grouping of information that includes a header containing control information and (usually) user data. Packets most often refer to network layer units of data.

QoS --quality of service. A measure of performance for a transmission system that reflects its transmission quality and service availability.

router --A network layer device that uses one or more metrics to determine the optimal path along which network traffic should be forwarded. Routers forward packets from one network to another based on network layer information.

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

RTP --Real-Time Transport Protocol. A protocol that is designed to provide end-to-end network transport functions for applications transmitting real-time data, such as audio, video, or simulation data, over multicast or unicast network services. RTP provides such services as payload type identification, sequence numbering, timestamping, and delivery monitoring to real-time applications.

TCSB --traffic control state block. A Resource Reservation Protocol (RSVP) state that associates reservations with their reserved resources required for admission control.

Tspec --Traffic specification. The traffic characteristics of a data stream from a sender or receiver (included in a Path message).

UDP--User Datagram Protocol. A connectionless transport layer protocol in the TCP/IP protocol stack. UDP is a simple protocol that exchanges datagrams without acknowledgments or guaranteed delivery, requiring that error processing and retransmission be handled by other protocols. UDP is defined in RFC 768.

VoIP --Voice over IP. The ability to carry normal telephony-style voice over an IP-based Internet maintaining telephone-like functionality, reliability, and voice quality.

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