RSVP Application ID Support

The RSVP Application ID Support feature introduces application-specific reservations, which enhance the granularity for local policy match criteria so that you can manage quality of service (QoS) on the basis of application type.

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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 Application ID Support

You must configure Resource Reservation Protocol (RSVP) on one or more interfaces on at least two neighboring routers that share a link within the network.
Restrictions for RSVP Application ID Support

• RSVP policies apply only to PATH, RESV, PATHERROR, and RESVERROR messages.
• Merging of global and interface-based local policies is not supported; therefore, you cannot match on multiple policies.

Information About RSVP Application ID Support

Feature Overview of RSVP Application ID Support

How RSVP Functions

Multiple applications such as voice and video need RSVP support. RSVP admits requests until the bandwidth limit is reached. RSVP does not differentiate between the requests and is not aware of the type of application for which the bandwidth is requested.

As a result, RSVP can exhaust the allowed bandwidth by admitting requests that represent just one type of application, causing all subsequent requests to be rejected because of unavailable bandwidth. For example, a few video calls could prevent all or most of the voice calls from being admitted because the video calls require a large amount of bandwidth and not enough bandwidth remains to accommodate the voice calls. With this limitation, you would probably not deploy RSVP for multiple applications especially if voice happens to be one of the applications for which RSVP is required.

The solution is to allow configuration of separate bandwidth limits for individual applications or classes of traffic. Limiting bandwidth per application requires configuring a bandwidth limit per application and having each reservation flag the application to which the reservation belongs so that it can be admitted against the appropriate bandwidth limit.

Application and Sub Application Identity Policy Element for Use with RSVP (Internet Engineering Task Force (IETF) RFC 2872) allows for creation of separate bandwidth reservation pools. For example, an RSVP reservation pool can be created for voice traffic, and a separate RSVP reservation pool can be created for video traffic. This prevents video traffic from overwhelming voice traffic.

Note

Before the introduction of the RSVP Application ID Support feature, provision was made to create Access Control Lists (ACLs) that matched on the differentiated services code points (DSCPs) of the IP header in an RSVP message. However, multiple applications could use the same DSCP; therefore, you could not uniquely identify applications in order to define separate policies for them.

Sample Solution

The figure below shows a sample solution in which application ID support is used. In this example, bandwidth is allocated between the voice and video sessions that are being created by Cisco Unified Communications...
Manager (CUCM). Video requires much more bandwidth than voice, and if you do not separate the reservations, the video traffic could overwhelm the voice traffic.

CUCM uses the RSVP Application ID Support feature. In this example, when CUCM makes the RSVP reservation, CUCM can specify whether the reservation should be made against a video RSVP bandwidth pool or a voice RSVP bandwidth pool. If not enough bandwidth remains in the requested pool, even though there is enough bandwidth in the total RSVP allocation, RSVP signals CUCM that there is a problem with the reservation. The figure below shows some of the signaling and data traffic that is sent during the session setup.

IMAGE MISSING; embedded not referenced

In this scenario, the IP phones and IP video devices do not directly support RSVP. In order to allow RSVP to reserve the bandwidth for these devices, the RSVP agent component in the Cisco IOS router creates the reservation. While setting up the voice or video session, CUCM communicates with the RSVP agent and sends the parameters to reserve the necessary bandwidth.

When you want to make a voice or video call, the device signals CUCM. CUCM signals the RSVP agent, specifying the RSVP application ID that corresponds to the type of call, which is voice or video in this example. The RSVP agents establish the RSVP reservation across the network and communicate to CUCM that the reservation has been made. CUCM then completes the session establishment, and the Real-Time Transport Protocol (RTP) traffic streams flow between the phones (or video devices). If the RSVP agents are unable to create the bandwidth reservations for the requested application ID, they communicate that information back to CUCM, which signals this information back to you.

Global and per-Interface RSVP Policies

You can configure RSVP policies globally and on a per-interface basis. You can also configure multiple global policies and multiple policies per interface.

Global RSVP policies restrict how much RSVP bandwidth a router uses regardless of the number of interfaces. You should configure a global policy if your router has CPU restrictions, one interface, or multiple interfaces that do not require different bandwidth limits.

Per-interface RSVP policies allow you to configure separate bandwidth pools with varying limits so that no one application, such as video, can consume all the RSVP bandwidth on a specified interface at the expense of other applications, such as voice, which would be dropped. You should configure a per-interface policy when you need greater control of the available bandwidth.

How RSVP Policies Are Applied

RSVP searches for policies whenever an RSVP message is processed. The policy informs RSVP if any special handling is required for that message.

If your network configuration has global and per-interface RSVP policies, the per-interface policies are applied first; that is, the RSVP looks for policy-match criteria in the order in which the policies were configured. RSVP searches for policy-match criteria in the following order:

- Nondefault interface policies
- Default interface policy
- Nondefault global policies
- Global default policy
If RSVP finds no policy-match criteria, it accepts all incoming messages. To change this decision from accept to reject, use the `ip rsvp policy default-reject` command.

### Preemption

Preemption happens when one reservation receives priority over another because there is insufficient bandwidth in an RSVP pool. There are two types of RSVP bandwidth pools: local policy pools and interface pools. Local policies can be global or interface-specific. RSVP performs admission control against these pools when a RESV message arrives.

If an incoming reservation request matches an RSVP local policy that has an RSVP bandwidth limit (as configured with the `maximum bandwidth group` submode command) and that limit has been reached, RSVP tries to preempt other lower-priority reservations admitted by that policy. When there are too few of these lower-priority reservations, RSVP rejects the incoming reservation request. Then RSVP looks at the interface bandwidth pool that you configured by using the `ip rsvp bandwidth` command. If that bandwidth limit has been reached, RSVP tries to preempt other lower-priority reservations on that interface to accommodate the new reservation request. At this point, RSVP does not consider which local policies admitted the reservations. When not enough bandwidth on that interface pool can be preempted, RSVP rejects the new reservation even though the new reservation was able to obtain bandwidth from the local policy pool.

Preemption can also happen when you manually reconfigure an RSVP bandwidth pool of any type to a lower value such that the existing reservations using that pool no longer fit in the pool.

### How Preemption Priorities Are Assigned and Signaled

If a received RSVP PATH or RESV message contains preemption priorities (signaled with an IETF RFC 3181 preemption priority policy element inside an IETF RFC 2750 POLICY_DATA object) and the priorities are higher than those contained in the matching local policy (if any), the offending message is rejected and a PATHERROR or RESVERROR message is sent in response. If the priorities are approved by the local policy, they are stored with the RSVP state in the device and forwarded to its neighbors.

If a received RSVP PATH or RESV message does not contain preemption priorities (as previously described) and you issued a global `ip rsvp policy preempt` command, and the message matches a local policy that contains a `preempt-priority` command, a POLICY_DATA object with a preemption priority element that contains the local policy’s priorities is added to the message as part of the policy decision. These priorities are then stored with the RSVP state in the device and forwarded to neighbors.

### Controlling Preemption

The `ip rsvp policy preempt` command controls whether a router preempts any reservations when required. When you issue this command, a RESV message that subsequently arrives on an interface can preempt the bandwidth of one or more reservations on that interface if the assigned setup priority of the new reservation is higher than the assigned hold priorities of the installed reservations.

### Benefits of RSVP Application ID Support

The RSVP Application ID Support feature provides the following benefits:

- Allows RSVP to identify applications uniquely and to separate bandwidth pools to be created for different applications so that one application cannot consume all the available bandwidth, thereby forcing others to be dropped.
• Integrates with the RSVP agent and CUCM to provide a solution for call admission control (CAC) and QoS for VoIP and video conferencing applications in networks with multtiered, meshed topologies using signaling protocols such as Signaling Connection Control Part (SCCP) to ensure that a single application does not overwhelm the available reserved bandwidth.

• Functions with any endpoint that complies with RFC 2872 or RFC 2205.

How to Configure RSVP Application ID Support

You can configure application IDs and local policies to use with RSVP-aware software programs such as CUCM or to use with non-RSVP-aware applications such as static PATH and RESV messages.

Configuring RSVP Application ID for RSVP-Aware Software Programs

Configuring an RSVP Application ID

SUMMARY STEPS

1. enable
2. configure terminal
3. ip rsvp policy identity alias policy-locator locator
4. Repeat Step 3 as needed to configure additional application IDs.
5. end

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>enable</td>
<td>• Enter your password if prompted.</td>
</tr>
<tr>
<td>Example:</td>
<td>Router&gt; enable</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>configure terminal</td>
<td>Router# configure terminal</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Defines RSVP application IDs to use as match criteria for local policies.</td>
</tr>
<tr>
<td>ip rsvp policy identity alias policy-locator locator</td>
<td>• Enter a value for the alias argument, which is a string used within the router to reference the identity in RSVP configuration commands and show displays. The string can have as many as 64 printable characters (in the range 0x20 to 0x7E).</td>
</tr>
</tbody>
</table>
### Configuring RSVP Application ID for RSVP-Aware Software Programs

#### Purpose

- If you use the " " or ? characters as part of the alias or locator string itself, you must type the CTRL-V key sequence before entering the embedded " " or ? character. The alias is never transmitted to other routers.

  - Enter a value for the locator argument, which is a string that is signaled in RSVP messages and contains application IDs usually in X.500 Distinguished Name (DN) format. This can also be a regular expression.

#### Step 4

Repeat Step 3 as needed to configure additional application IDs.

**Note**: Defines additional application IDs.

#### Step 5

**end**

**Example:**

```
Router(config)# end
```

**Purpose**: Exits global configuration mode and returns to privileged EXEC mode.

### What to Do Next

Configure a local policy globally, or on an interface, or both.

### Configuring a Local Policy Globally

#### SUMMARY STEPS

1. enable
2. configure terminal
3. ip rsvp policy local [acl acl1[acl2...acl8]] | dscp-ip value1[value2...value8] default | identity alias1 [alias2...alias4] | origin-as as1[as2...as8]
4. Repeat Step 3 as needed to configure additional local policies.
5. Enter the submode commands as required.
6. end

#### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router&gt; enable</td>
<td>- Enter your password if prompted.</td>
</tr>
</tbody>
</table>
### Command or Action

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>ip rsvp policy local [acl acl1[acl2...acl8]</td>
<td>dscp-ip value1[value2...value8]</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router(config)# ip rsvp policy local identity rsvp-voice</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>Repeat Step 3 as needed to configure additional local policies.</td>
<td>(Optional) Configures additional local policies.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Enter the submode commands as required.</td>
<td>(Optional) Defines the properties of the local policy that you are creating.</td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This is an optional step. An empty policy rejects everything, which may be desired in some cases.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• See the ip rsvp policy local command for detailed information on submode commands.</td>
<td></td>
</tr>
<tr>
<td>Step 6</td>
<td>end</td>
<td>Exits local policy configuration mode and returns to privileged EXEC mode.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router(config-rsvp-policy-local)# end</td>
<td></td>
</tr>
</tbody>
</table>
## Configuring a Local Policy on an Interface

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `interface type slot / subslot / port`
4. Repeat Step 3 as needed to configure a local policy on additional interfaces.
5. `ip rsvp bandwidth [interface-kbps [single-flow-kbps [bc1 kbps | sub-pool kbps]] | percent percent-bandwidth [single-flow-kbps]]`
6. Repeat Step 5 as needed to configure bandwidth for additional interfaces.
7. `ip rsvp policy local [acl acl1[acl2...acl8] | dscp-ip value1[value2...value8] | default | identity alias1 [alias2...alias4] | origin-as as1[as2...as8]]`
8. Repeat Step 7 as needed to configure additional local policies.
9. Enter the submode commands as required.
10. `end`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1** enable | Enables privileged EXEC mode.  
| **Example:** | • Enter your password if prompted. |
| Router> enable | |
| **Step 2** configure terminal | Enters global configuration mode. |
| **Example:** | Router# configure terminal |
| **Step 3** interface type slot / subslot / port | Configures the interface type and number and enters interface configuration mode. |
| **Example:** | Router(config)# interface gigabitEthernet 0/0/0 |
| **Step 4** Repeat Step 3 as needed to configure a local policy on additional interfaces. | (Optional) Configures additional interfaces. |
| **Step 5** ip rsvp bandwidth [interface-kbps | Enables RSVP on an interface.  
| [single-flow-kbps [bc1 kbps | single-flow-kbps]] | • The optional interface-kbps and single-flow-kbps arguments specify the amount of bandwidth that can be |
### Configuring RSVP Application ID for Non-RSVP-Aware Software Programs

#### Configuring an Application ID

Refer to the **Configuring an RSVP Application ID**, on page 5.

#### Configuring a Static RSVP Sender with an Application ID

Perform this task to configure a static RSVP sender with an application ID to make the router proxy an RSVP PATH message containing an application ID on behalf of an RSVP-unaware sender application.
### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `ip rsvp sende r-host session-ip-address sender-ip-address {ip-protocol | tcp | udp} session-dest-port sender-source-port bandwidth burst-size [identity alias]`
4. `end`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td><code>enable</code></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td><code>Router&gt; enable</code></td>
<td>Enter your password if prompted.</td>
</tr>
<tr>
<td>Step 2</td>
<td><code>configure terminal</code></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td><code>Router# configure terminal</code></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>`ip rsvp sende r-host session-ip-address sender-ip-address {ip-protocol</td>
<td>tcp</td>
</tr>
<tr>
<td>Example:</td>
<td><code>Router(config)# ip rsvp sender-host 10.0.0.7 10.0.0.1 udp 1 1 10 1 identity rsvp-voice</code></td>
<td>The optional <code>identity alias</code> keyword and argument combination specifies an application ID alias. The string can have as many as 64 printable characters (in the range 0x20 to 0x7E).</td>
</tr>
<tr>
<td>Note</td>
<td>If you use the &quot; &quot; or ? character as part of the alias string itself, you must type the CTRL-V key sequence before entering the embedded &quot; &quot; or ? character. The alias is never transmitted to other routers.</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td><code>end</code></td>
<td>Exits global configuration mode and returns to privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td><code>Router(config)# end</code></td>
<td></td>
</tr>
</tbody>
</table>

#### Configuring a Static RSVP Receiver with an Application ID

Perform this task to configure a static RSVP receiver with an application ID to make the router proxy an RSVP RESV message containing an application ID on behalf of an RSVP-unaware receiver application.
You can also configure a static listener to use with an application ID. If an incoming PATH message contains an application ID and/or a preemption priority value, the listener includes them in the RESV message sent in reply. See the Feature Information for RSVP Application ID Support, on page 20 for more information.

Note
Use the `ip rsvp reservation-host` command if the router is the destination, or the `ip rsvp reservation` command to have the router proxy on behalf of a downstream host.

SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. Do one of the following:
   - `ip rsvp reservation-host` `session-ip-address` `sender-ip-address` `{ip-protocol tcp | udp}`
     `session-dest-port` `sender-source-port` `{ff | se | wf}` `{load | rate}` `bandwidth burst-size[identity alias]`
   - `ip rsvp reservation` `session-ip-address` `sender-ip-address` `{ip-protocol tcp | udp}`
     `session-dest-port` `sender-source-port` `next-hop-ip-address` `next-hop-interface` `{ff | se | wf}` `{load | rate}` `bandwidth burst-size[identity alias]`
4. `end`

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td>• Enter your password if prompted.</td>
</tr>
<tr>
<td><code>Router&gt; enable</code></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td><code>Router# configure terminal</code></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> Do one of the following:</td>
<td>Enables a router to simulate a host generating RSVP RESV messages.</td>
</tr>
</tbody>
</table>
| • `ip rsvp reservation-host` `session-ip-address` `sender-ip-address` `{ip-protocol tcp | udp}`
  `session-dest-port` `sender-source-port` `{ff | se | wf}` `{load | rate}` `bandwidth burst-size[identity alias]` | • The optional `identity alias` keyword and argument combination specifies an application ID alias. The string can have as many as 64 printable characters (in the range 0x20 to 0x7E). |
Verifying the RSVP Application ID Support Configuration

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ip rsvp reservation session-ip-address</td>
<td></td>
</tr>
<tr>
<td>sender-ip-address {ip-protocol</td>
<td>tcp</td>
</tr>
<tr>
<td>next-hop-ip-address next-hop-interface {ff</td>
<td>se</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# ip rsvp reservation-host 10.1.1.1</td>
<td></td>
</tr>
<tr>
<td>10.30.1.4 udp 20 30 se load 100 60 identity rsvp-voice</td>
<td></td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# ip rsvp reservation 10.1.1.1</td>
<td></td>
</tr>
<tr>
<td>0.0.0.0 udp 20 0 172.16.4.1 Ethernet1 wf rate 350 65 identity xyz</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>end</td>
</tr>
<tr>
<td>Example:</td>
<td>Exits global configuration mode and returns to privileged EXEC mode.</td>
</tr>
<tr>
<td>Router(config)# end</td>
<td></td>
</tr>
</tbody>
</table>

Verifying the RSVP Application ID Support Configuration

Note You can use the following commands in user EXEC or privileged EXEC mode, in any order.
### SUMMARY STEPS

1. **enable**
2. **show ip rsvp host** `{receivers|senders}{[hostname | group-address]}
3. **show ip rsvp policy identity** `[regular-expression]`
4. **show ip rsvp policy local** `[detail]` `[interface type slot / subslot / port]` `[acl acl-number]` `[dscp-ip value]` `[default]` `[identity alias | origin-as as]`
5. **show ip rsvp reservation** `[detail]` `[filter destination address]` `[dst-port port-number]` `[source address]` `[src-port port-number]`
6. **show ip rsvp sender** `[detail]` `[filter destination address]` `[dst-port port-number]` `[source address]` `[src-port port-number]`
7. **end**

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1** | **enable** | (Optional) Enables privileged EXEC mode.  
  **Example:**  
  Router> enable |
| **Step 2** | **show ip rsvp host** `{receivers|senders}{hostname | group-address}` | Displays specific information for an RSVP host.  
  **Example:**  
  Router# show ip rsvp host senders |
| **Step 3** | **show ip rsvp policy identity** `[regular-expression]` | Displays selected RSVP identities in a router configuration.  
  **Example:**  
  Router# show ip rsvp policy identity voice100 |
| **Step 4** | **show ip rsvp policy local** `[detail]` `[interface type slot / subslot / port]` `[acl acl-number]` `[dscp-ip value]` `[default]` `[identity alias | origin-as as]` | Displays the local policies currently configured.  
  **Example:**  
  Router# show ip rsvp policy local identity voice100 |
| **Step 5** | **show ip rsvp reservation** `[detail]` `[filter destination address]` `[dst-port port-number]` `[source address]` `[src-port port-number]` | Displays RSVP-related receiver information currently in the database. |
### Configuration Examples for RSVP Application ID Support

#### Example Configuring RSVP Application ID Support

The configurations for four-router network shown in the figure below are in the following sections:

*Figure 1: Sample Network with Application Identities and Local Policies*

![Sample Network Diagram](image)

**Configuring a Proxy Receiver on R4**

The following example configures R4 with a proxy receiver to create an RESV message to match the PATH message for the destination 10.0.0.7:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# ip rsvp listener 10.0.0.7 any any reply
Device(config)# end
```
Configuring an Application ID and a Global Local Policy on R3

The following example configures R3 with an application ID called video and a global local policy in which all RSVP messages are being accepted and forwarded:

```
Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# ip rsvp policy identity video policy-locator video
Device(config)# ip rsvp policy local identity video
Device(config-rsvp-policy-local)# forward all
Device(config-rsvp-policy-local)# end
```

Configuring an Application ID and Separate Bandwidth Pools on R2 for per-Interface Local Policies

The following example configures R2 with an application ID called video, which is a wildcard regular expression to match any application ID that contains the substring video:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# ip rsvp policy identity video policy-locator .*Video.*
Router(config-rsvp-id)# end
```

The following example configures R2 with a local policy on ingress Gigabit Ethernet interface 0/0/0:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface gigabitEthernet 0/0/0
Router(config-if)# ip address 10.0.0.2 255.0.0.0
Router(config-if)# no cdp enable
Router(config-if)# ip rsvp bandwidth 200
Router(config-if)# ip rsvp policy local identity video
Router(config-rsvp-policy-local)# maximum senders 10
Router(config-rsvp-policy-local)# maximum bandwidth group 100
Router(config-rsvp-policy-local)# maximum bandwidth single 10
Router(config-rsvp-policy-local)# forward all
Router(config-rsvp-policy-local)# end
```

The following example configures R2 with a local policy on egress Gigabit Ethernet interface 3/0/0:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface gigabitEthernet 3/0/0
Router(config-if)# ip address 10.0.0.3 255.0.0.0
Router(config-if)# no cdp enable
Router(config-if)# ip rsvp bandwidth 200
Router(config-if)# ip rsvp policy local identity video
Router(config-rsvp-policy-local)# maximum senders 10
Router(config-rsvp-policy-local)# maximum bandwidth group 100
Router(config-rsvp-policy-local)# maximum bandwidth single 10
Router(config-rsvp-policy-local)# forward all
Router(config-rsvp-policy-local)# end
```

PATH messages arrive on ingress Gigabit Ethernet interface 0/0/0 and RESV messages arrive on egress Gigabit Ethernet interface 3/0/0.
Configuring an Application ID and a Static Reservation from R1 to R4

The following example configures R1 with an application ID called video and initiates a host generating a PATH message with that application ID:

Device# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Device(config)# ip rsvp policy identity video policy-locator "GUID=www.cisco.com, APP=Video, VER=1.0"
Device(config)# ip rsvp sender-host 10.0.0.7 10.0.0.1 udp 1 1 10 10 identity video
Device(config)# end

Example Verifying RSVP Application ID Support

Verifying the Application ID and the Global Local Policy on R3

The following example verifies that a global local policy has been configured on R3 with an application ID called Video:

Router# show ip rsvp policy local detail
Global:
  Policy for ID(s): Video
    Preemption Scope: Unrestricted.
    Local Override: Disabled.
    Fast ReRoute: Accept.
    Handle: 23000404.
    Accept Forward
    Path: Yes Yes
    Resv: Yes Yes
    PathError: Yes Yes
    ResvError: Yes Yes
    Setup Priority Hold Priority
    TE: N/A N/A
    Non-TE: N/A N/A
    Current Limit
    Senders: 1 N/A
    Receivers: 1 N/A
    Conversations: 1 N/A
    Group bandwidth (bps): 10K N/A
    Per-flow b/w (bps): N/A N/A

Generic policy settings:
  Default policy: Accept all
  Preemption: Disabled

Verifying the Application ID and the per-Interface Local Policies on R2

The following example verifies that an application ID called Video has been created on R2:

Router# show ip rsvp policy identity
Alias: Video
  Type: Application ID
  Locator: .*Video.*
The following example verifies that per-interface local policies have been created on Gigabit Ethernet interface 0/0/0 and Gigabit Ethernet interface 3/0/0 on R2:

Router# show ip rsvp policy local detail

```
gigabitEthernet 0/0/0:
Policy for ID(s): Video
Preemption Scope: Unrestricted.
Local Override: Disabled.
Fast ReRoute: Accept.
Handle: 26000404.

Accept Forward
Path: Yes Yes
Resv: Yes Yes
PathError: Yes Yes
ResvError: Yes Yes
Setup Priority Hold Priority
TE: N/A N/A
Non-TE: N/A N/A
Current Limit
Senders: 1 10
Receivers: 0 N/A
Conversations: 0 N/A
Group bandwidth (bps): 0 100K
Per-flow b/w (bps): N/A 10K
```

gigabitEthernet 3/0/0:
Policy for ID(s): Video
Preemption Scope: Unrestricted.
Local Override: Disabled.
Fast ReRoute: Accept.
Handle: 5A00040A.

Accept Forward
Path: Yes Yes
Resv: Yes Yes
PathError: Yes Yes
ResvError: Yes Yes
Setup Priority Hold Priority
TE: N/A N/A
Non-TE: N/A N/A
Current Limit
Senders: 0 10
Receivers: 1 N/A
Conversations: 1 N/A
Group bandwidth (bps): 10K 100K
Per-flow b/w (bps): N/A 10K

Generic policy settings:
Default policy: Accept all
Preemption: Disabled

Notice in the display that the ingress interface has only its senders counter incremented because the PATH message is checked there. However, the egress interface has its receivers, conversations, and group bandwidth counters incremented because the reservation is checked on the incoming interface, which is the egress interface on R2.

---

### Verifying the Application ID and the Reservation on R1

The following example verifies that a PATH message containing the application ID called Video has been created on R1:

Router# show ip rsvp sender detail

```
PATH Session address: 10.0.0.7, port: 1. Protocol: UDP
Sender address: 10.0.0.1, port: 1
Inbound from: 10.0.0.1 on interface:
```

---
Traffic params - Rate: 10K bits/sec, Max. burst: 10K bytes
  Min Policed Unit: 0 bytes, Max Pkt Size 4294967295 bytes
Path ID handle: 02000402.
Incoming policy: Accepted. Policy source(s): Default
Application ID: 'GUID=www.cisco.com, APP=Video, VER=1.0'
Status: Proxied
Output on gigabitEthernet 0/0/0. Policy status: Forwarding. Handle: 01000403
  Policy source(s): Default

Note: You can use the `debug ip rsvp dump path` and the `debug ip rsvp dump resv` commands to get more information about a sender and the application ID that it is using.

The following example verifies that a reservation with the application ID called Video has been created on R1:

Router# show ip rsvp reservation detail

RSVP Reservation. Destination is 10.0.0.7, Source is 10.0.0.1,
  Protocol is UDP, Destination port is 1, Source port is 1
  Next Hop is 10.0.0.2, Interface is gigabitEthernet 0/0/0
  Reservation Style is Fixed-Filter, QoS Service is Guaranteed-Rate
  Resv ID handle: 01000405.
  Created: 10:07:35 EST Thu Jan 12 2006
  Average Bitrate is 10K bits/sec, Maximum Burst is 10K bytes
  Min Policed Unit: 0 bytes, Max Pkt Size: 0 bytes
  Status:
    Policy: Forwarding. Policy source(s): Default
    Application ID: 'GUID=www.cisco.com, APP=Video, VER=1.0'

Additional References

The following sections provide references related to the RSVP Application ID Support feature.

Related Documents

<table>
<thead>
<tr>
<th>Related Topic</th>
<th>Document Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS commands</td>
<td>Cisco IOS Master Commands List, All Releases</td>
</tr>
<tr>
<td>QoS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples</td>
<td>Cisco IOS Quality of Service Solutions Command Reference</td>
</tr>
<tr>
<td>QoS configuration tasks related to RSVP</td>
<td>&quot;Configuring RSVP&quot; module</td>
</tr>
<tr>
<td>Cisco United Communications Manager (CallManager) and related features</td>
<td>&quot;Overview of Cisco Unified Communications Manager and Cisco IOS Interoperability&quot; module</td>
</tr>
<tr>
<td>Regular expressions</td>
<td>&quot;Using the Cisco IOS Command-Line Interface&quot; module</td>
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### Standards

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<tr>
<th>Standard</th>
<th>Title</th>
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<tr>
<td>No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.</td>
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### MIBs

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<th>MIB</th>
<th>MIBs Link</th>
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<tr>
<td>No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.</td>
<td>To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></td>
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</table>

### RFCs

<table>
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<tr>
<th>RFC</th>
<th>Title</th>
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<tbody>
<tr>
<td>RFC 2205</td>
<td>Resource ReSerVation Protocol (RSVP)</td>
</tr>
<tr>
<td>RFC 2872</td>
<td>Application and Sub Application Identity Policy Element for Use with RSVP</td>
</tr>
<tr>
<td>RFC 3181</td>
<td>Signaled Preemption Priority Policy Element</td>
</tr>
<tr>
<td>RFC 3182</td>
<td>Identity Representation for RSVP</td>
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### Technical Assistance

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<tbody>
<tr>
<td>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.</td>
<td><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></td>
</tr>
</tbody>
</table>
Feature Information for RSVP Application ID Support

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 Application ID Support

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
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<tbody>
<tr>
<td>RSVP Application ID Support</td>
<td>Cisco IOS XE Release 2.6</td>
<td>The RSVP Application ID Support feature introduces application-specific reservations, which enhance the granularity for local policy-match criteria so that you can manage QoS on the basis of application type.</td>
</tr>
<tr>
<td></td>
<td>Cisco IOS XE Release 3.8S</td>
<td></td>
</tr>
</tbody>
</table>

The following commands were introduced or modified: ip rsvp listener, ip rsvp policy identity, ip rsvp policy local, ip rsvp reservation, ip rsvp reservation-host, ip rsvp sender, ip rsvp sender-host, maximum(local policy), show ip rsvp host, show ip rsvp policy identity, show ip rsvp policy local.

In Cisco IOS XE Release 3.8S, support was added for the Cisco ASR 903 Router.

Glossary

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

**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 that they want to receive.

**RSVP Agent** --Implements a Resource Reservation Protocol (RSVP) agent on Cisco IOS voice gateways that support Unified CM.
Unified Communications Manager (CM)--The software-based, call-processing component of the Cisco IP telephony solution. The software extends enterprise telephony features and functions to packet telephony network devices such as IP phones, media processing devices, voice-over-IP (VoIP) gateways, and multimedia applications.