



VoIP Call Admission Control Using RSVP

Document Update Alert

This document was originally produced for Cisco IOS Release 12.1(5)T. This feature has been updated in subsequent releases, and more recent documentation is available.

If you are using Cisco IOS Release 12.3 or higher, refer to the following documentation in the *Quality of Service for Voice* guide, Cisco IOS Voice Configuration Library, Release 12.3:

- [VoIP Call Admission Control](#)

If you are using Cisco IOS Release 12.2 or higher, refer to the following documentation in the Configuring Quality of Service for Voice chapter of the *Cisco IOS Voice, Video, and Fax Configuration Guide, Release 12.2*:

- [VoIP Call Admission Control](#)

Feature History

Release	Modification
12.1(3)XI	This feature was introduced.
12.1(5)T	This feature was integrated into Cisco IOS Release 12.1(5)T.
12.2(2)XB1	This feature was implemented on the Cisco AS5850.
12.2(11)T	This feature was integrated into Cisco IOS Release 12.2(11)T.

This feature module describes enhancements to call admission control using Resource Reservation Protocol (RSVP) in Cisco H.323 Voice over IP (VoIP) networks. This feature synchronizes RSVP procedures with H.323 Version 2 (Fast Connect) setup procedures to ensure that the required Quality of Service (QoS) for a call is maintained across the IP network.

This document includes the following sections:

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Feature Overview

RSVP is the IP service that allows applications to request end-to-end QoS guarantees from the network. Cisco VoIP applications use RSVP for call admission control, limiting the accepted voice load on the IP network to guarantee the QoS levels of calls. The VoIP Call Admission Control using RSVP feature synchronizes RSVP signaling with H.323 Version 2 signaling to ensure that the bandwidth reservation is established in both directions before a call moves to the alerting phase (ringing). This ensures that the called party phone rings only after the resources for the call have been reserved. Using RSVP-based admission control, VoIP applications can reserve network bandwidth and react appropriately if bandwidth reservation fails.

Prior to Cisco IOS Release 12.1(3)XI and 12.1(5)T, VoIP gateways used H.323 Version 1 (Slow Connect) procedures when initiating calls requiring bandwidth reservation. This feature, which is enabled by default, allows gateways to use H.323 Version 2 (Fast Connect) for all calls, including those requiring RSVP. To enable backward compatibility, commands are available to force the originating gateway to initiate calls using Slow Connect procedures if the terminating gateway is running Cisco IOS Release 12.1(1)T or later. You can configure Slow Connect globally for all VoIP calls by using the **h323 call start** voice-service command, or configure Slow Connect per the individual VoIP dial-peer by using the **call start** voice-class command.

A timer can be set by using the **call RSVP-sync resv-timer** command to limit the number of seconds that the terminating gateway waits for bandwidth reservation setup before proceeding with the call setup or releasing the call, depending on the configured QoS level in the dial peers.



Note

To enable RSVP, the **ip RSVP bandwidth** command must be configured on the specific interface. If RSVP is not enabled, a 10 sec post-dial delay occurs before the gateway forwards the call.

Synchronized RSVP is attempted for an IP call when the requested (desired) QoS for the associated dial peer is set to controlled-load or guaranteed-delay, as long as RSVP has been enabled for the interface by using the **ip RSVP bandwidth** command. If the requested QoS level is set to the default of best-effort, or RSVP is not enabled, bandwidth reservation is not attempted.

If RSVP reservation is attempted but fails, the acceptable QoS for the dial peer determines the outcome of the call. When the acceptable QoS is configured for best effort, the call setup proceeds but without any bandwidth reservation in place. When the acceptable QoS on either gateway is configured for other than best effort, and the RSVP reservation fails, the call is released. The requested QoS and acceptable QoS are configured through Cisco IOS software by using the **req-qos** and **acc-qos** dial-peer configuration commands, respectively.

Table 1 summarizes the results of nine call setup scenarios using Fast Connect, based on the QoS levels configured in the VoIP dial peers at the originating and terminating gateways. This table does not include cases where the requested QoS is best-effort and the acceptable QoS is other than best effort because those configurations are considered invalid.

Table 1 Call Results Based on Configured QoS Levels

Originating Gateway			Terminating Gateway		Results
Requested QoS	Acceptable QoS	Requested QoS	Acceptable QoS		
1	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	Call proceeds only if both RSVP reservations succeed.
2	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	best-effort	Call proceeds only if both RSVP reservations succeed.
3	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	best-effort	best-effort	Call is released.
4	controlled-load or guaranteed-delay	best-effort	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	Call proceeds only if both RSVP reservations succeed.
5	controlled-load or guaranteed-delay	best-effort	controlled-load or guaranteed-delay	best-effort	Call proceeds regardless of RSVP results. If RSVP reservation fails, call receives best-effort service.
6	controlled-load or guaranteed-delay	best-effort	best-effort	best-effort	Call proceeds with best-effort service.
7	best-effort	best-effort	controlled-load or guaranteed-delay	controlled-load or guaranteed-delay	Call is released.
8	best-effort	best-effort	controlled-load or guaranteed-delay	best-effort	Call proceeds with best-effort service.
9	best-effort	best-effort	best-effort	best-effort	Call proceeds with best-effort service.

**Note**

Table 1 is valid only for calls using Fast Connect procedures. Slow Connect procedures do not consider the acceptable QoS configuration at the originating and terminating gateways when determining the outcome of a call if RSVP fails.

For detailed descriptions and instructions on configuring the requested and acceptable QoS levels, see the *Cisco IOS Multiservice Applications Command Reference*, Cisco IOS Release 12.1.

Benefits

- VoIP gateways default to H.323 Version 2 (Fast Connect) for all calls.
- Called-party phone rings only after bandwidth reservation is confirmed.
- QoS for voice calls is guaranteed across the IP network.

Restrictions

- To support RSVP-based QoS with H.323 version 2 (Fast Connect), the originating and terminating gateways must be running Cisco IOS Release 12.1(3)XI or 12.1(5)T, or later.
- To support RSVP-based QoS with H.323 version 1 (Slow Connect), Cisco H.323 version 2 gateways must be running Cisco IOS Release 12.1(1)T or later.

- RSVP with multicast is not supported.

Related Features and Technologies

RSVP-based resource admission control is related to the existing RSVP feature, which is documented in the *Cisco IOS Quality of Service Solutions Configuration Guide*, Cisco IOS Release 12.1.

Related Documents

- *Cisco AS5300 Software Configuration Guide*
- *Cisco AS5800 Operations, Administration, Maintenance, and Provisioning Guide*
- *Cisco AS5300 Universal Access Server Software Configuration Guide*
- *Cisco H.323 Version 2 Phase 2*
- *Cisco IOS IP and IP Routing Configuration Guide*, Cisco IOS Release 12.1.
- *Cisco IOS Multiservice Applications Command Reference*, Cisco IOS Release 12.1.
- *Cisco IOS Multiservice Applications Configuration Guide*, Cisco IOS Release 12.1
- *Cisco IOS Quality of Service Solutions Command Reference*, Cisco IOS Release 12.1
- *Cisco IOS Quality of Service Solutions Configuration Guide*, Cisco IOS Release 12.1
- *Configuring H.323 VoIP Gateway for Cisco Access Platforms*
- *Enhancement to Cisco H.323 to Support RSVP Slow Connect*
- *Software Configuration Guide for Cisco 3600 and Cisco 2600 Series Routers*

Supported Platforms

- Cisco 1700 series
- Cisco 2600 series
- Cisco 3600 series
- Cisco 7200 series
- Cisco 7500 series
- Cisco AS5300
- Cisco AS5800
- Cisco AS5850
- Cisco MC3810

The VoIP Call Admission Control Using RSVP feature runs on all platforms that support Cisco IOS Release 12.1(3)XI or 12.1(5)T, and H.323-based VoIP.

Determining Platform Support Through Cisco Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this feature, access Cisco Feature Navigator. Cisco Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Cisco Feature Navigator is a web-based tool that enables you to determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

To access Cisco Feature Navigator, 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 at <http://www.cisco.com/register>.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

<http://www.cisco.com/go/fn>

Availability of Cisco IOS Software Images

Platform support for particular Cisco IOS software releases is dependent on the availability of the software images for those platforms. Software images for some platforms may be deferred, delayed, or changed without prior notice. For updated information about platform support and availability of software images for each Cisco IOS software release, refer to the online release notes or, if supported, Cisco Feature Navigator.

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

- CISCO-CAC-RSVP-MIB

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:

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

RFCs

No new or modified RFCs are supported by this feature.

Prerequisites

- Establish a working IP network. For information about configuring IP, see the *Cisco IOS IP and IP Routing Configuration Guide*, Cisco IOS Release 12.1.
- Configure your VoIP gateway for H.323. To support RSVP-based QoS with H.323 version 2 (Fast Connect), the originating and terminating gateways must be running Cisco IOS Release 12.1(3)XI or 12.1(5)T, or later. For information about configuring the gateway, see the *Software Configuration Guide for Cisco 3600 and Cisco 2600 Series Routers* or *Configuring H.323 VoIP Gateway for Cisco Access Platforms*.
- Enable RSVP on the appropriate interfaces on your gateways by using the **ip rsvp bandwidth** interface configuration command. You must also enable fair queueing on these interfaces by using the **fair-queue** interface configuration command. For information about enabling RSVP and fair queueing, see the *Cisco IOS Quality of Service Solutions Command Reference*, Cisco IOS Release 12.1.

- Set the QoS levels in your dial peers by using the **req-qos** and **acc-qos** dial-peer configuration commands. For information about configuring QoS levels, see the *Cisco IOS Multiservice Applications Command Reference*, Cisco IOS Release 12.1.

**Note**

An inbound POTS dial peer is not required if the originating and terminating gateways have outbound VoIP dial peers configured to reach the calling number at the far-end and if the VoIP dial peers use the same QoS parameters. Configure an inbound POTS dial peer if the corresponding outbound VoIP dial peers at the originating and terminating gateways do not have matching QoS configurations, or if calls can be established in only one direction (for example, calls can be made from gateway A to gateway B, but not from gateway B to gateway A).

Configuration Tasks

The following sections describe optional configuration tasks for the VoIP Call Admission Control Using RSVP feature. The tasks in the first section are for configuring synchronization:

- Configuring Synchronization and the Reservation Timer (Optional)

Use the following tasks only if you require backward compatibility with Version 2 (Slow Connect) gateways running a release earlier than Cisco IOS Release 12.1(3)XI or 12.1(5)T (must be Cisco IOS Release 12.1(1)T or later):

- Configuring Slow Connect for VoIP Globally (Optional)
- Configuring Slow Connect for a Specific Dial Peer (Optional)

Configuring Synchronization and the Reservation Timer

Synchronization between RSVP and the H.323 voice signaling protocol is enabled by default; no configuration tasks are required to enable this feature. To reenble the feature if the **no call rsvp sync** command was used to disable it, perform the following steps in global configuration mode:


	Command	Purpose
Step 1	Router(config)# call rsvp sync	Enables synchronization between RSVP and the H.323 voice signaling protocol.
Step 2	Router(config)# call rsvp-sync resv-timer <i>seconds</i>	Sets the timer for reservation requests. The default is 10 seconds.

**Note**

To enable RSVP, the **ip rsvp bandwidth** command must be configured on the specific interface. If RSVP is not enabled, a 10 sec post-dial delay occurs before the gateway forwards the call.

Configuring Slow Connect for VoIP Globally

To make an H.323 gateway backward compatible with a destination gateway that is running Cisco IOS Release 12.1(1)T or later (up to Cisco IOS Release 12.1(3)XI), perform the following steps beginning in global configuration mode. This procedure is optional and selects Slow Connect globally for all VoIP services.

	Command	Purpose
Step 1	Router(config)# voice service voip	Enters voice-service configuration mode for VoIP services.
Step 2	Router(conf-voi-serv)# h323 call start slow	Forces the H.323 gateway to use Slow Connect procedures.
		 <p>Note To restore the default of Fast Connect, use the h323 call start fast command.</p>




Note

The previous procedure selects Slow Connect globally for all VoIP calls. To change the type of connect procedures for calls associated with a specific dial peer, use the following procedure, “Configuring Slow Connect for a Specific Dial Peer”.

Configuring Slow Connect for a Specific Dial Peer

To make an H.323 gateway backward compatible with a destination gateway that is running Cisco IOS Release 12.1(1)T or later (up to Cisco IOS Release 12.1(3)XI), perform the following steps beginning in global configuration mode. This procedure is optional and selects Slow Connect for a specific VoIP dial peer.

	Command	Purpose
Step 1	Router(config)# voice class h323 tag	Enters voice-class configuration mode and creates a voice class for H.323 attributes.
Step 2	Router(config-class)# call start slow or Router(config-class)# call start system	Forces the H.323 gateway to use Slow Connect procedures. The default is system , which causes the H.323 gateway to use the connect procedure that is configured by using the h323 call start voice-service configuration command (see “Configuring Slow Connect for VoIP Globally”).
		 <p>Note To select Fast Connect for the specific dial peer, use the call start fast command.</p>
Step 3	Router(config-class)# exit	Exits voice-class configuration mode and returns to global configuration mode.

	Command	Purpose
Step 4	Router(config)# dial-peer voice <i>number</i> voip	Enters dial-peer configuration mode for the VoIP dial peer.
Step 5	Router(config-dial-peer)# voice-class h323 <i>tag</i>	Assigns the voice class attributes to the dial peer, including the H.323 connect procedure that was selected in Step 2.

Verifying Configuration

To verify that RSVP-based call admission control is configured correctly, enter the **show running-config** privileged EXEC command to display the command settings for the router, as shown in the “Configuration Examples” section.

Monitoring and Maintaining RSVP Call Admission Control

To display the configuration parameters for RSVP synchronization and to display statistics for calls that initiate RSVP, use the following privileged EXEC commands.

Command	Purpose
show call rsvp-sync conf	Displays the RSVP synchronization configuration.
show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.

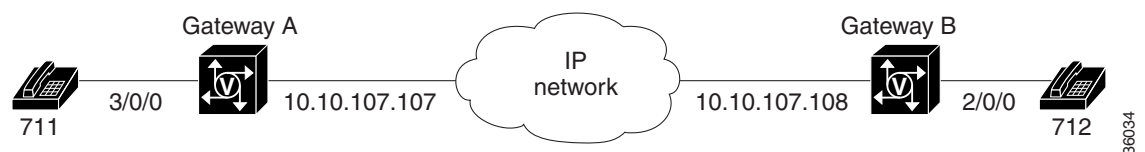
Configuration Examples

The following examples display the screen output using the **show running-config** command:

- RSVP Synchronization Examples
- H.323 Slow Connect by Voice Service Example
- H.323 Slow Connect by Dial Peer Example

RSVP Synchronization Examples

The following examples show that calls can be made in either direction between gateway A and gateway B, which are connected to POTS phones, with phone numbers 711 and 712 respectively. The requested QoS indicates that RSVP setup must complete before the destination phone rings. The acceptable QoS indicates that the call is released if the RSVP setup fails or does not complete within the allotted time.



Gateway A	Gateway B
<pre> call rsvp-sync call rsvp-sync resv-timer 15 ! interface Ethernet0/0 ip address 10.10.107.107 10.255.255.255 fair-queue 64 256 31 ip rsvp bandwidth 1000 1000 ! voice-port 3/0/0 ! dial-peer voice 712 voip destination-pattern 712 session target ipv4:10.10.107.108 req-qos controlled-load acc-qos controlled-load ! dial-peer voice 711 pots destination-pattern 711 port 3/0/0 </pre>	<pre> call rsvp-sync call rsvp-sync resv-timer 15 ! interface Ethernet0/0 ip address 10.10.107.108 10.255.255.255 fair-queue 64 256 31 ip rsvp bandwidth 1000 1000 ! voice-port 2/0/0 ! dial-peer voice 711 voip destination-pattern 711 session target ipv4:10.10.107.107 req-qos controlled-load acc-qos controlled-load ! dial-peer voice 712 pots destination-pattern 712 port 2/0/0 </pre>

H.323 Slow Connect by Voice Service Example

The following example shows that Slow Connect is configured globally for all VoIP calls because the **h323 call start slow** command is used in the voice service configuration:

```

!
dial-peer voice 712 voip
 destination-pattern 712
 session target ipv4:10.10.107.108
 req-qos controlled-load
 acc-qos controlled-load
!
voice service voip
→ h323 call start slow
!

```

The following example shows the same basic configuration but demonstrates that when the **call start system** command is used in the voice class configuration, the gateway defaults to the connect procedure that is configured in the voice service; otherwise the dial peer configuration takes precedence (see the H.323 Slow Connect by Dial Peer Example).

```

!
dial-peer voice 712 voip
 voice-class h323 2
 destination-pattern 712
 session target ipv4:10.10.107.108
 req-qos controlled-load
 acc-qos controlled-load
!
voice class h323 2
→ call start system
!
voice service voip
→ h323 call start slow
!

```

H.323 Slow Connect by Dial Peer Example

The following example shows that calls from VoIP dial peer 712 use Slow Connect procedures because the **call start slow** command is configured in the voice class assigned to the dial peer:

```
!
dial-peer voice 712 voip
→ voice-class h323 2
  destination-pattern 712
  session target ipv4:10.10.107.108
  req-qos controlled-load
  acc-qos controlled-load
!
voice class h323 2
→ call start slow
!
voice service voip
  h323 call start fast
!
```



Note The **h323 call start fast** voice-service command is ignored because the voice class configuration takes precedence, unless the **call start system** voice-class command is used (see the H.323 Slow Connect by Voice Service Example).

Command Reference

This section documents new commands. All other commands used with this feature are documented in the Cisco IOS Release 12.1 command reference publications.

- **call rsvp-sync**
- **call rsvp-sync resv-timer**
- **call start**
- **h323 call start**
- **show call rsvp-sync conf**
- **show call rsvp-sync stats**

call rsvp-sync

To enable synchronization between Resource Reservation Protocol (RSVP) signaling and the voice signaling protocol, use the **call rsvp-sync** global configuration command. To disable synchronization, use the **no** form of this command.

call rsvp-sync

no call rsvp-sync

Syntax Description This command has no keywords or arguments.

Defaults Synchronization is enabled between RSVP and the voice signaling protocol (for example, H.323).

Command Modes Global configuration

Command History	Release	Modification
	12.1(3)XI	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(2)XB1	This command was implemented on the Cisco AS5850.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines The **call rsvp-sync** command is enabled by default. To enable RSVP, the **ip rsvp bandwidth** command must be configured on the related interface.

Examples The following example enables synchronization between RSVP and the voice signaling protocol:

```
call rsvp-sync
```

Related Commands	Command	Description
	call rsvp-sync resv-timer	Sets the timer for reservation requests.
	call start	Forces an H.323 Version 2 gateway to use Fast Connect or Slow Connect procedures for a specific VoIP dial peer.
	debug call rsvp-sync events	Displays the events that occur during RSVP synchronization.
	h323 call start	Forces an H.323 Version 2 gateway to use Fast Connect or Slow Connect procedures for all VoIP services.
	ip rsvp bandwidth	Enables the use of RSVP on an interface.
	show call rsvp-sync conf	Displays the RSVP synchronization configuration.
	show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.

call rsvp-sync resv-timer

To set the timer on the terminating VoIP gateway for completing RSVP reservation setups, use the **call rsvp-sync resv-timer** global configuration command. To restore the default value, use the **no** form of this command.

call rsvp-sync resv-timer *seconds*

no call rsvp-sync resv-timer

Syntax Description	<i>seconds</i>	Number of seconds in which the reservation setup must be completed, in both directions. Value range is 1 to 60 seconds. Default is 10.
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Defaults	10 seconds
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Command Modes	Global configuration
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Command History	Release	Modification
	12.1(3)XI	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(2)XB1	This command was implemented on the Cisco AS5850.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines	The reservation timer is started on the terminating gateway when the session protocol receives an indication of the incoming call. This timer is not set on the originating gateway because the resource reservation is confirmed at the terminating gateway. If the reservation timer expires before the RSVP setup is complete, the outcome of the call depends on the acceptable QoS level configured in the dial peer; the call either proceeds without any bandwidth reservation or it is released. The timer must be set long enough to allow calls to complete but short enough to free up resources. The optimum number of seconds depends on the number of hops between the participating gateways and the delay characteristics of the network.
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Examples	The following example sets the reservation timer to 30 seconds:
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```
call rsvp-sync resv-timer 30
```

Related Commands	Command	Description
	call rsvp-sync	Enables synchronization of RSVP and the H.323 voice signaling protocol.
	debug call rsvp-sync events	Displays the events that occur during RSVP synchronization.

Command	Description
ip rsvp bandwidth	Enables the use of RSVP on an interface.
show call rsvp-sync conf	Displays the RSVP synchronization configuration.
show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.

call start

To force the H.323 Version 2 gateway to use Fast Connect or Slow Connect procedures for a dial peer, use the **call start** voice-class configuration command. To restore the default condition, use the **no** form of this command.

```
call start {fast | slow | system}
```

```
no call start
```

Syntax	Description
fast	Gateway uses H.323 Version 2 (Fast Connect) procedures.
slow	Gateway uses H.323 Version 1 (Slow Connect) procedures.
system	Gateway defaults to the voice service configuration that is defined using the h323 call start command in voice-service configuration mode.

Defaults system

Command Modes Voice-class configuration

Command History	Release	Modification
	12.1(3)XI	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(2)XB1	This command was implemented on the Cisco AS5850.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines In Cisco IOS Release 12.1(3)XI and later, H.323 VoIP gateways by default use H.323 Version 2 (Fast Connect) for all calls including those initiating RSVP. Previously, gateways used only Slow Connect procedures for RSVP calls. To enable Cisco IOS Release 12.1(3)XI gateways to be backward compatible with earlier releases of Cisco IOS Release 12.1 T, the **call start** command allows the originating gateway to initiate calls using Slow Connect.

This **call start** command is configured as part of the voice class assigned to an individual VoIP dial peer. It takes precedence over the **h323 call start** voice-service configuration command, which applies globally to all VoIP calls, unless the **system** keyword is selected. If the **system** keyword is used for the **call start** voice-class command, the gateway defaults to the voice-service configuration.

Examples The following example selects Slow Connect for voice class 1000:

```
voice class h323 1000
  call start slow
!
dial-peer voice 210 voip
  voice-class h323 1000
```

Related Commands	Command	Description
	acc-qos	Selects the acceptable quality of service for a dial peer.
	call rsvp-sync	Enables synchronization between RSVP and the H.323 voice signaling protocol.
	call rsvp-sync resv-timer	Sets the timer for RSVP reservation setup.
	debug call rsvp-sync events	Displays the events that occur during RSVP synchronization.
	h323 call start	Selects whether the H.323 gateway uses Fast Connect or Slow Connect procedures for all VoIP services.
	req-qos	Selects the desired quality of service to use in reaching a dial peer.
	show call rsvp-sync conf	Displays the RSVP synchronization configuration.
	show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.
	voice class h323	Enters voice-class configuration mode and creates a voice class for H.323 attributes.
	voice-class h323	Assigns a voice class to the dial peer.

h323 call start

To force the H.323 Version 2 gateway to use Fast Connect or Slow Connect procedures for all H.323 calls, use the **h323 call start** voice-service configuration command. To restore the default condition, use the **no** form of this command.

```
h323 call start {fast | slow}
```

```
no h323 call start
```

Syntax	Description
fast	Gateway uses H.323 Version 2 (Fast Connect) procedures.
slow	Gateway uses H.323 Version 1 (Slow Connect) procedures.

Defaults fast

Command Modes Voice-service configuration

Command History	Release	Modification
	12.1(3)XI	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(2)XB1	This command was implemented on the Cisco AS5850.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines In Cisco IOS Release 12.1(3)XI and later, H.323 VoIP gateways by default use H.323 Version 2 (Fast Connect) for all calls including those initiating RSVP. Previously, gateways used only Slow Connect procedures for RSVP calls. To enable Cisco IOS Release 12.1(3)XI gateways to be backward compatible with earlier releases of Cisco IOS Release 12.1 T, the **h323 call start** command forces the originating gateway to initiate calls using Slow Connect.

This **h323 call start** command is configured as part of the global voice-service configuration for VoIP services. It does not take effect unless the **call start system** voice-class configuration command is configured in the VoIP dial peer.

Examples The following example selects Slow Connect procedures for the gateway:

```
voice service voip
  h323 call start slow
```

Related Commands	Command	Description
	call rsvp-sync	Enables synchronization between RSVP and the H.323 voice signaling protocol.
	call rsvp-sync resv-timer	Sets the timer for RSVP reservation setup.
	call start	Selects whether the H.323 gateway uses Fast Connect or Slow Connect procedures for the specific VoIP dial peer.
	debug call rsvp-sync events	Displays the events that occur during RSVP synchronization.
	show call rsvp-sync conf	Displays the RSVP synchronization configuration.
	show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.
	voice service	Enters voice-service configuration mode and specifies the voice encapsulation type.

show call rsvp-sync conf

To display the configuration settings for RSVP synchronization, use the **show call rsvp-sync conf** privileged EXEC command.

show call rsvp-sync conf

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Privileged EXEC

Command History	Release	Modification
	12.1(3)XI1	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(2)XB1	This command was implemented on the Cisco AS5850.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Examples The following example shows sample output from the **show call rsvp-sync conf** command:

```
Router# show call rsvp-sync conf
```

```
VoIP QoS: RSVP/Voice Signaling Synchronization config:
```

```
Overture Synchronization is ON
Reservation Timer is set to 10 seconds
```

Table 2 describes the fields shown in the display.

Table 2 *show call rsvp-sync conf* Field Descriptions

Field	Description
Overture Synchronization is ON	Indicates whether RSVP synchronization is enabled.
Reservation Timer is set to xx seconds	Number of seconds for which the RSVP reservation timer is configured.

Related Commands	Command	Description
	call rsvp-sync	Enables synchronization between RSVP and the H.323 voice signaling protocol.
	call rsvp-sync resv-timer	Sets the timer for RSVP reservation setup.
	debug call rsvp-sync events	Displays the events that occur during RSVP synchronization.
	show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.

show call rsvp-sync stats

To display statistics for calls that attempted RSVP reservation, use the **show call rsvp-sync stats** privileged EXEC command.

show call rsvp-sync stats

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Privileged EXEC

Command History	Release	Modification
	12.1(3)XI1	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(2)XB1	This command was implemented on the Cisco AS5850.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Examples The following example shows sample output from the **show call rsvp-sync stats** command:

```
Router# show call rsvp-sync stats

VoIP QoS:Statistics Information:
Number of calls for which QoS was initiated      : 18478
Number of calls for which QoS was torn down     : 18478
Number of calls for which Reservation Success was notified : 0
Total Number of PATH Errors encountered : 0
Total Number of RESV Errors encountered : 0
Total Number of Reservation Timeouts encountered : 0
```

Table 3 describes the fields shown in the display.

Table 3 *show call rsvp-sync stats* Field Descriptions

Field	Description
Number of calls for which QoS was initiated	Number of calls for which RSVP setup was attempted.
Number of calls for which QoS was torn down	Number of calls for which an established RSVP reservation was released.
Number of calls for which Reservation Success was notified	Number of calls for which an RSVP reservation was successfully established.
Total Number of PATH Errors encountered	Number of path errors that occurred.

Table 3 *show call rsvp-sync stats Field Descriptions*

Field	Description
Total Number of RESV Errors encountered	Number of reservation errors that occurred.
Total Number of Reservation Timeouts encountered	Number of calls in which the reservation setup did not complete before the reservation timer expired.

Related Commands

Command	Description
call rsvp-sync	Enables synchronization between RSVP and the H.323 voice signaling protocol.
call rsvp-sync resv-timer	Sets the timer for RSVP reservation setup.
debug call rsvp-sync events	Displays the events that occur during RSVP synchronization.
show call rsvp-sync conf	Displays the RSVP synchronization configuration.

Debug Commands

This section documents new **debug** commands. All other debug commands used with this feature are documented in the Cisco IOS Release 12.1 command reference publications.

- **debug call rsvp-sync events**
- **debug call rsvp-sync func-trace**

debug call rsvp-sync events

To display events that occur during RSVP setup, use the **debug call rsvp-sync events** privileged EXEC command. To restore the default condition, use the **no** form of this command.

debug call rsvp-sync events

no debug call rsvp-sync events

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command History	Release	Modification
	12.1(3)XI1	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(2)XB1	This command was implemented on the Cisco AS5850.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines It is highly recommended that you log the output from the **debug call rsvp-sync events** command to a buffer, rather than sending the output to the console; otherwise, the size of the output could severely impact the performance of the gateway.

Examples The following example shows a portion of sample output for a call initiating RSVP when using the **debug call rsvp-sync events** command:

```
00:03:25: Parameters: localip: 10.19.101.117 :localport: 16660
00:03:25: Parameters: remoteip: 10.19.101.116 :remoteport: 17568
00:03:25: QoS Primitive Event for Call id 0x1 : QoS Listen
00:03:25: Lookup to be done on hashkey 0x1 in hash table 0x61FC2498
00:03:25: Hashed entry 0x1 in call table 0x61FC2498
00:03:25: Entry Not found
00:03:25: Parameters: localip: 10.19.101.117
00:03:25: remoteip: 10.19.101.116
00:03:25: QoSpcb : 0x61FC34D8
00:03:25: Response Status : 0
Starting timer for call with CallId 0x1 for 10000 secs
00:03:25: Handling QoS Primitive QoS Listen
```

■ debug call rsvp-sync events

```

00:03:25: Establishing RSVP RESV state : rsvp_request_reservation()
00:03:25: For streams from 10.19.101.116:17568 to 10.19.101.117:16660
00:03:25: RSVP Confirmation required
00:03:25: QoS Primitive Event for Call id 0x1 : QoS Resv
00:03:25: Lookup to be done on hashkey 0x1 in hash table 0x61FC2498
00:03:25: Hashed entry 0x1 in call table 0x61FC2498
00:03:25: Initiating RVSP PATH messages to be Sent : reg_invoke_rsvp_advertise_sender()
00:03:25: Advertizing for streams to 10.19.101.116:17568 from 10.19.101.117:16660
00:03:25: RESV notification event received is : 2
00:03:25: Received RESVCONFIRM
00:03:25: RESV CONFIRM message received from 10.19.101.116 for RESV setup from
10.19.101.117
00:03:25: RESV event received is : 0
00:03:25: RESV message received from 10.19.101.116:17568 for streams from
10.19.101.117:16660
00:03:25: RESERVATIONS ESTABLISHED : CallId: 1Stop timer and notify Session Protocol of
Success (ie. if notification requested)
00:03:25: Invoking spQoSresvCallback with Success

```

Related Commands

Command	Description
call rsvp-sync	Enables synchronization between RSVP and the H.323 voice signaling protocol.
call rsvp-sync resv-timer	Sets the timer for RSVP reservation setup.
debug call rsvp-sync func-trace	Displays messages about the software functions called by RSVP synchronization.
show call rsvp-sync conf	Displays the RSVP synchronization configuration.
show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.

debug call rsvp-sync func-trace

To display messages about software functions called by RSVP, use the **debug call rsvp-sync func-trace** privileged EXEC command. To restore the default condition, use the **no** form of this command.

debug call rsvp-sync func-trace

no debug call rsvp-sync func-trace

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values

Command History

Release	Modification
12.1(3)XI1	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(2)XB1	This command was implemented on the Cisco AS5850.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines

It is highly recommended that you log the output from the **debug call rsvp-sync func-trace** command to a buffer, rather than sending the output to the console; otherwise, the size of the output could severely impact the performance of the gateway.

Examples

The following example shows a portion of sample output for a call initiating RSVP when using the **debug call rsvp-sync func-trace** command in conjunction with the **debug call rsvp-sync events** command:

```
00:03:41: Entering Function QoS_Listen
00:03:41: Parameters:localip:10.10.101.116 :localport:17568
00:03:41:remoteip:10.10.101.117 :remoteport:0
00:03:41: Entering Function qos_dequeue_event
00:03:41: Entering Function process_queue_event
00:03:41: QoS Primitive Event for Call id 0x2 :QoS Listen
00:03:41: Entering Function get_pcb
00:03:41: Entering Function hash_tbl_lookup
00:03:41:Lookup to be done on hashkey 0x2 in hash table 0x61FAECD8
00:03:41: Entering Function hash_func
00:03:41:Hashed entry 0x2 in call table 0x61FAECD8
```

■ **debug call rsvp-sync func-trace**

```

00:03:41:Entry Not found
00:03:41: Entering Function qos_dequeue_pcb
00:03:41: Entering Function qos_initialize_pcb
00:03:41: Parameters:localip:10.10.101.116
00:03:41:remoteip:10.10.101.117
00:03:41: QoSpcb :0x61FAFD18
00:03:41: Response Status :0
00:03:41: Entering Function hash_tbl_insert_entry
00:03:41: Entering Function hash_func
00:03:41: Handling QoS Primitive QoS Listen
00:03:41: Entering Function qos_dequeue_hash_port_entry
00:03:41: Entering Function qos_port_tbl_insert_entry
00:03:41: Entering Function hash_func
00:03:41: Doing RSVP Listen :rsvp_add_ip_listen_api()

```

Related Commands

Command	Description
call rsvp-sync	Enables synchronization between RSVP and the H.323 voice signaling protocol.
call rsvp-sync resv-timer	Sets the timer for RSVP reservation setup.
debug call rsvp-sync events	Displays the events that occur during RSVP synchronization.
show call rsvp-sync conf	Displays the RSVP synchronization configuration.
show call rsvp-sync stats	Displays statistics for calls that attempted RSVP reservation.

Glossary

acceptable QoS—Minimum level of QoS that is required for a call, or the call is released.

Call Admission Control—Procedures that determine whether to admit a VoIP call based on the available bandwidth in the IP network. There must be sufficient bandwidth to support the new VoIP call with the required QoS, while also maintaining the required QoS of already established VoIP calls.

desired QoS—Requested level of QoS that is preferred for a call. The desired QoS is typically equal to or higher than the acceptable QoS for the call.

Fast Connect—Allows H.323 endpoints to establish media channels without waiting for a separate H.245 connection to be opened. This streamlines the number of messages that are exchanged and the amount of processing that must be done before endpoint connections can be established.

gateway—An H.323 endpoint on the LAN that provides real-time, two-way communication between H.323 terminals on the LAN, other ITU-T terminals in the WAN, or to another H.323 gateway. A gateway allows H.323 terminals to communicate with non-H.323 terminals by converting protocols. A gateway is the point where a circuit-switched call is encoded and repackaged into IP packets.

H.323—An International Telecommunication Union (ITU-T) standard that describes packet-based video, audio, and data conferencing. H.323 is an umbrella standard that describes the architecture of the conferencing system and refers to a set of other standards (H.245, H.225.0, and Q.931) to describe its actual protocol.

QoS—Quality of Service. The performance of a transmission across a network. To ensure that receivers get the quality they expect, for example a video image that is smooth rather than choppy, various strategies have been developed that enable routers to give preference to one set of packets over others that arrive at the routers at the same moment. These strategies are known as Quality of Service features.

RSVP—Resource reSerVation Protocol. An IETF protocol used for signalling requests (setting up reservations) for Internet services by a customer, before that customer is permitted to transmit data over that portion of the network.

VoIP—Voice over IP. The ability to carry normal telephone-style voice over an IP-based Internet with POTS-like functionality, reliability, and voice quality. VoIP is a blanket term, that generally refers to the Cisco standards-based (for example H.323) approach to IP voice traffic.

VoIP dial peer—Dial peer connected by a packet network; in the case of Voice over IP, this is an IP network. VoIP peers point to specific VoIP devices.

