



# Advanced Voice Busyout

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## Feature History

Release	Modification
12.1(3)T	This feature was introduced.
12.2(2)XA	Commands were modified and introduced on the Cisco AS5300, AS5350, and AS5400.
12.2(2)XA3	The keyword <b>shut-if</b> was added to the <b>voice-class busyout</b> command.
12.2(4)T	Support for this feature was introduced on the Cisco 7200 series routers. The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

This feature module describes advanced voice busyout functions in Cisco IOS Release 12.2(4)T. It includes the following sections:

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- Supported Platforms, page 3
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## Feature Overview

The local voice busyout feature provides a way to busy out a voice port or DS-0 group (time slot) if a state change is detected in a monitored network interface (or interfaces). When a monitored interface changes to a specified state—to out-of-service or in-service—the voice port presents a seized/busyout condition to the attached PBX or other customer premises equipment (CPE). The PBX or other CPE can then attempt to select an alternate route.

## Advanced Voice Busyout (AVBO)

### Cisco 2600 Series, Cisco 3600 Series, Cisco 7200 Series and Cisco MC3810

Advanced Voice Busyout adds the following functionality to the local voice busyout feature:

- For Voice over IP (VoIP), monitoring of links to remote, IP-addressable interfaces by use of service assurance agent (SAA)
- Configuration by voice class to simplify and speed up the configuration of voice busyout on multiple voice ports

Using the Advanced Voice Busyout feature you can perform the following tasks:

- Configure individual voice ports to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface detects loss of IP connectivity by crossing a specified delay or loss threshold.
- Define voice classes with specified busyout conditions, and assign a particular voice class to any number of voice ports.
- SAA probe monitoring of remote interfaces is intended for use with VoIP networks, although it can also be used with Voice over Frame Relay (VoFR) and Voice over ATM (VoATM) networks.

### Cisco AS5300, Cisco AS5350, and Cisco AS5400

Advanced Voice Busyout adds the following functionality:

- Monitoring of links to remote, IP-addressable interfaces by use of SAA
- Configuration by voice class to simplify and speed up the configuration of voice busyout on DS-0/PRI groups.

The Advanced Voice Busyout feature allows you to perform the following tasks:

- Configure individual DS-0/PRI groups under individual T1/E1 controllers to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface detects loss of IP connectivity by crossing a specified delay or loss threshold
- Define voice classes with specified busyout conditions, and assign a specific voice class to DS-0/PRI groups.

SAA probe monitoring of remote interfaces is intended for use with VoIP networks, although it can also be used with Voice over Frame Relay (VoFR) and Voice over ATM (VoATM) networks.



#### Note

The 12.2(4)T release does not support the Cisco AS5300, Cisco AS5350 or Cisco AS5400.

## Soft/Hard Busy

This feature allows an Internet service provider (ISP) to manually busyout certain channels/channel-groups or trunk groups.

The existing **ds0 busyout** command has been enhanced to support the soft/hard manual busyout feature. The existing **isdn service** command can be used to manually soft-busy PRI groups. These commands are usable on individual DS-0s.



#### Note

This feature does not support commands which can busyout a trunk group.

## Benefits

The AVBO feature provides the following benefits:

- Reduces the number of configuration steps when multiple voice ports are configured for the same busyout triggering conditions
- Adds additional busyout triggering conditions.
- Increases the flexibility of the call fallback feature.
- Soft busyout enables ISPs to manually busy out certain channels and/or channel groups, or trunk groups.

## Restrictions

The following restrictions and limitations apply to the AVBO feature:

- A maximum of 128 network interfaces can be monitored for a voice port.
- The maximum number of simultaneous SAA probes is controlled by the SAA sub-system design and its configuration.
- Busyout based on monitoring of a remote, IP-addressable interface is not activated by the following conditions:
  - Non availability of DSP resources
  - Non availability of bandwidth
- Call fallback must be enabled for the **busyout monitor probe** command to function.
- The SAA responder function must be enabled on the router at the remote IP address targeted by the SAA probe.
- This feature is not supported on the BRI voice module (BVM).

## Related Features and Technologies

- Local Voice Busyout
- Service Assurance Agent
- PSTN Fallback Feature

## Related Documents

- *Cisco IOS Voice, Video, and Fax Configuration Guide*, Cisco IOS Release 12.2
- *Cisco IOS Voice, Video, and Fax Command Reference*, Cisco IOS Release 12.2

## Supported Platforms

This feature is supported on the following Cisco platforms:

- Cisco 2600 series

- Cisco 3600 series
- Cisco 7200 series
- Cisco MC3810
- Cisco AS5300
- Cisco AS5350
- Cisco AS5400

**Note**

The 12.2(4)T release does not support the Cisco AS5300, Cisco AS5350 or Cisco AS5400.

Table 1 lists the hardware platforms that support this feature, and the releases in which the feature was first supported. If the First T train Release column is blank, the feature is not yet available in a Cisco IOS T release on that platform.

**Table 1** Release and Platform Support for this Feature

Platform	First Limited Cisco IOS Lifetime Release		First Cisco IOS T Release	Release Date
	Release	Release Date		
Cisco 2600 Series			12.1(3)T	07/24/00
Cisco 3600 Series			12.1(3)T	07/24/00
Cisco MC3810			12.1(3)T	07/24/00
Cisco 7200 Series			12.2(4)T	10/15/01
Cisco AS5300, AS5350, and AS5400	12.2(2)XA	07/02/01		

#### Determining Platform Support Through 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 Feature Navigator. Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image.

To access 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](mailto: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>.

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

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

## Supported Standards, MIBs, and RFCs

### Standards

ITU-T G.113 *General Characteristics of International Telephone Connections and International Telephone Circuits*

### MIBs

No new or modified MIBs are supported by this feature.

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

The Cisco AS5350 and Cisco AS5400 do not support the MICA modem card, Microcom modem card, or VoIP feature card. Voice and modem functions are provided by the Universal Port Dial Feature card running SPE firmware. See the *Cisco AS5350 Universal Gateway Card Installation Guide* and the *Cisco AS5400 Universal Gateway Card Installation Guide* for more information. All references to the Cisco AS5300 in this document apply to the Cisco AS5350 and Cisco AS5400 platforms with the following exceptions:

- Use the Universal Port Dial feature card instead of the MICA or Microcom modem cards.
- Use SPE firmware instead of portware version 6.7.7.
- Use Cisco IOS Release 12.2(4)T or later.

### Other Prerequisites

You should complete the following configuration tasks before configuring the AVBO feature:

- Voice over IP configuration, including the configuration of POTS and network dial peers
- Voice port configuration

If the SAA probe function is to be implemented, you must configure the following:

- A VoIP network
- Call fallback on the local router
- The SAA responder on the target (far-end) router

# Configuration Tasks

See the following sections for the configuration tasks for the AVBO feature. Each task in the list is identified as either optional or required:

## **Cisco 2600 Series, Cisco 3600 Series, Cisco 7200 Series, and Cisco MC3810**

Complete the following task to configure a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold:

- Configuring a Voice Port to Monitor the Link to a Remote Interface (required)

Complete the following tasks to configure a hard or soft busyout:

- Configuring a Hard or Soft Busyout (optional)

Complete the following task to define a voice class with specified busyout conditions, and assign a particular voice class to any number of voice ports:

- Configuring a Voice Class for Local Voice Busyout (required)

Complete the following task to assign a voice class to a voice port:

- Assigning a Voice Class to a Voice Port (required)

## **Cisco AS5300, Cisco AS5350, Cisco AS5400**

The following procedure configures DS-0/PRI groups under a T1/E1 controller for AVBO. When properly configured, the DS-0/PRI groups specified busyout if the SAA probe targeted towards a remote interface does not return or returns with delay/jitter values above those specified in the configuration criteria.

- Configuring a Voice Class on the Cisco AS5300, Cisco AS5350, and Cisco AS5400 (required)
- Assigning a Voice Class to a DS-0/PRI Groups (required)

## **All Platforms**

- Verifying the AVBO Configuration (optional)

## Configuring a Voice Port to Monitor the Link to a Remote Interface

You can configure voice ports individually for busyout, or you can apply a voice class that includes all of the busyout parameters (see the “Configuring a Voice Class for Local Voice Busyout” and the “Assigning a Voice Class to a Voice Port”).

**Note**


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If you have already assigned a busyout voice class to a voice port, you cannot configure busyout using this procedure; the command will be rejected.

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To configure a voice port to go into the busyout state when the SAA probe signal returned from a remote interface crosses a predetermined threshold, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	<p>For Cisco 2600 and 3600 series analog voice ports:  Router(config)# <b>voice-port</b> <i>slot/subunit/port</i></p> <p>For Cisco 2600, 3600, and 7200 series digital voice ports:  Router(config)# <b>voice-port</b> <i>slot/port:ds0-group</i></p> <p>For Cisco MC3810 analog voice ports:  Router(config)# <b>voice-port</b> <i>slot/port</i></p> <p>For Cisco MC3810 digital voice ports:  Router(config)# <b>voice-port</b> <i>slot:ds0-group</i></p>	<p>Identifies the voice port you want to configure and enters voice-port configuration mode.</p> <ul style="list-style-type: none"> <li>• <i>slot</i>—specifies controller slot number</li> <li>• <i>subunit</i>—specifies a voice interface card (VIC) in which the voice port is located. Valid entries are 0 and 1.</li> <li>• <i>port</i>—specifies controller port number</li> <li>• <i>ds0-group</i>—specifies controller DS-0 group number</li> </ul>

	Command	Purpose
Step 2	<pre>Router(config-voiceport)# busyout monitor probe ip-address [codec codec-type] [icpif number   loss loss-value delay milliseconds]</pre>	<p>Configures the voice port to use an SAA probe to monitor the link to the remote interface identified by an IP address. To configure the voice port to monitor multiple remote interfaces, reenter the command for each additional interface to be monitored.</p> <p><i>ip-address</i>—The IP address of a target interface for the SAA probe signal.</p> <p><b>codec</b>—(Optional) Configures the profile of the SAA probe signal to mimic the packet size and interval of a specific codec type.</p> <p><i>codec-type</i>—(Optional) The codec type for the SAA probe signal.</p> <p>Available options are:</p> <ul style="list-style-type: none"> <li>• <b>g711a</b>—G.711 alaw</li> <li>• <b>g711u</b>—G.711 ulaw (the default)</li> <li>• <b>g729</b>—G.729</li> <li>• <b>g729a</b>—G.729</li> </ul> <p><b>icpif</b>—(Optional) Configures the busyout monitor probe to use a Calculated Planning Impairment Factor (ICPIF) loss/delay busyout threshold, in accordance with ITU-T G.113. The ICPIF numbers represent predefined combinations of loss and delay.</p> <p><i>number</i>—(Optional) The ICPIF threshold for initiating a busyout. The range is 0 to 30. Lower numbers equal lower loss and delay thresholds.</p> <p>If you do not enter threshold values, the threshold values for packet delay from the <b>pstn fallback</b> command are used.</p> <p><b>loss</b>—(Optional) Configures the percent of packets lost threshold for initiating a busyout.</p> <p><i>percent</i>—(Optional) The loss value in percent for initiating a busyout. The range is 1 to 100.</p> <p><b>delay</b>—(Optional) Configures the average packet delay threshold for initiating a busyout.</p> <p><i>milliseconds</i>—(Optional) The delay threshold in milliseconds for initiating a busyout. The range is 1 to 2147483647.</p> <hr/> <p> <b>Note</b> You must also configure PSTN fallback on this router and the SAA responder on the target router.</p> <hr/> <p>If you configure a voice port to monitor multiple links, busyout occurs only when <i>all</i> of the monitored links go below the threshold.</p>

	Command	Purpose
Step 3	Router(config-voiceport)# <b>exit</b>	Exits from voice port configuration mode.

## Configuring a Hard or Soft Busyout

To configure a DS-0 time slot on a T1 or E1 controller for a hard or soft busyout state, complete the following steps beginning in global configuration mode.


	Command	Purpose
Step 1	Router(config)# <b>controller</b> { <b>t1</b>   <b>e1</b> } <i>slot/port</i>	Identifies the controller you want to configure and enters controller configuration mode.
Step 2	Router(config-controller)# <b>ds0 busyout</b> <i>ds0-timeslot</i> [ <b>soft</b>   <b>hard</b> ]	Places one or more DS-0 time slots into the busyout state. <ul style="list-style-type: none"> <li>• <i>ds0-timeslot</i>—List of time slots to busyout. Valid range is 1 to 24.</li> <li>• <b>soft</b>—Enables soft busyout. (DS-0 busyout begins when no active calls exist).</li> <li>• <b>hard</b>—Enables hard busyout. (DS-0 busyout begins immediately).</li> </ul>

## Configuring a Voice Class for Local Voice Busyout

A busyout voice class can provide monitoring of local ports and links to remote IP addresses. Busyout occurs when all the monitored local ports are out of service or when all of the monitored links go below the threshold.

To define a voice class with specified busyout conditions, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>voice class busyout tag</b>	Creates a voice class for defining busyout conditions. The range for the <i>tag</i> number is 1 to 10000. The <i>tag</i> number must be unique on the router.
Step 2	Router(config-class)# <b>busyout monitor serial interface-number [in-service]</b>	<p>(Optional) Specifies a local serial interface to be monitored by the voice port(s). To configure the voice port(s) to monitor multiple interfaces, re-enter the command for each additional interface to be monitored.</p> <p>The default is to busyout the voice port(s) when the monitored interface goes out of service. Enter the keyword <b>in-service</b> to configure the voice port(s) for busyout when the monitored interface goes into service.</p> <p>If a voice port is configured to monitor multiple interfaces for out-of-service states, busyout occurs only when <i>all</i> of the interfaces go out of service. If a voice port is configured to monitor multiple interfaces for the in-service state, busyout occurs when <i>any one</i> interface goes into service.</p>
Step 3	Router(config-class)# <b>busyout monitor ethernet interface-number} [in-service]</b>	<p>(Optional) Specifies a local Ethernet interface to be monitored by the voice port(s). To configure the voice port(s) to monitor multiple interfaces, reenter the command for each additional interface to be monitored.</p> <p>The default is to busyout the voice port(s) when the monitored interface goes out of service. Enter the keyword <b>in-service</b> to configure the voice port(s) for busyout when the monitored interface goes into service.</p> <p>If a voice port is configured to monitor multiple interfaces for out-of-service states, busyout occurs only when <i>all</i> of the interfaces go out of service. If a voice port is configured to monitor multiple interfaces for the in-service state, busyout occurs when <i>any one</i> interface goes into service.</p>



Command	Purpose
<b>Step 4</b> Router(config-class)# <b>busyout monitor probe</b> <i>ip-address</i> [ <b>codec</b> <i>codec-type</i> ] [ <b>icpif</b> <i>number</i>   <b>loss</b> <i>loss-value</i> <b>delay</b> <i>milliseconds</i> ]	<p>(Optional) Configures the voice port to use an SAA probe to monitor the link to the remote interface identified by an IP address.</p> <p>Optionally specifies a codec profile for the SAA probe signal.</p> <p>Optionally specifies a calculated planning impairment factor (ICPIF) loss/delay threshold, or specify loss and delay thresholds individually. Packet loss and delay determine the threshold for initiating the busyout state.</p> <p>If you do not enter threshold values, the threshold values for packet delay from the <b>pstn fallback</b> command are used.</p> <p> <b>Note</b> You must also configure PSTN fallback on this router and the SAA responder on the target router.</p>
<b>Step 5</b> Router(config-class)# <b>exit</b>	Exits from voice-class configuration mode.
<b>Step 6</b> Router(config)# <b>voice class busyout</b> <i>tag</i>	Creates a voice class for defining busyout conditions. <ul style="list-style-type: none"> <li>• <i>tag</i>—A number in the range of 1 to 10,000. The <i>tag</i> number must be unique on the router.</li> </ul>
<b>Step 7</b> Router(config-class)# <b>busyout monitor</b> <i>interface</i> <i>slot/port</i> [ <b>in-service</b> ]	<p>(Optional) Specifies a local interface to be monitored by the voice port(s). To configure the voice port(s) to monitor multiple interfaces, reenter the command for each additional interface to be monitored.</p> <p>The default is to busyout the voice port(s) when the monitored interface goes out of service.</p> <ul style="list-style-type: none"> <li>• <b>in-service</b>—(Optional) Configures the voice port(s) for busyout when the monitored interface comes into service.</li> </ul> <p>If you configure a voice port to monitor multiple interfaces for out-of-service states, busyout occurs only when all of the monitored serial and Ethernet interfaces go out of service. If you configure a voice port to monitor multiple interfaces for the in-service state, busyout occurs when any one monitored serial or Ethernet interface comes into service.</p>

Command	Purpose
<b>Step 8</b> Router(config-class)# <b>busyout monitor probe</b> <i>ip-address</i> [ <b>codec</b> <i>codec-type</i> ] [ <b>icpif</b> <i>number</i>   <b>loss percent</b> <b>delay</b> <i>milliseconds</i> ]	<p>(Optional) Configures the voice port to use an SAA probe to monitor the link to the remote interface identified by an IP address. To configure the voice port to monitor multiple remote interfaces, reenter the command for each additional interface to be monitored.</p> <ul style="list-style-type: none"> <li>• <i>ip-address</i>—The IP address of a target interface for the RPR probe signal.</li> <li>• <b>codec</b> <i>codec-type</i>—(Optional) Specifies a codec profile for the SAA probe signal.</li> </ul> <p>Available options are:</p> <ul style="list-style-type: none"> <li>- g711a—G.711 alaw (64,000 bps)</li> <li>- g711u—G.711 ulaw (the default)</li> <li>- g729—G.729</li> <li>- g729a—G.729</li> </ul> <li>• <b>icpif</b> <i>number</i>—(Optional) Specifies a calculated planning impairment factor (ICPIF) loss/delay busyout threshold. The range is 0 to 30. Lower numbers are equivalent to lower loss and delay thresholds.</li> <p>If you do not enter threshold values, the threshold values for packet delay from the <b>pstn fallback</b> command are used.</p> <ul style="list-style-type: none"> <li>• <b>loss percent</b>—(Optional) Configures the percent of packets lost threshold for initiating a busyout. The range is 1 to 100.</li> <li>• <b>delay milliseconds</b>—(Optional) Configures the average packet delay threshold for initiating a busyout. The range is 1 to 2,147,483,647 milliseconds.</li> </ul> <p>If you do not enter threshold values, the threshold values for packet delay from the <b>pstn fallback</b> command are used.</p> <p><b>Note</b> You must also configure call fallback on this router and the SAA responder on the target router.</p> <p>If you configure a voice port to monitor multiple links, busyout occurs only when <i>all</i> of the monitored links go below the threshold.</p>
<b>Step 9</b> Router(config-class)# <b>exit</b>	Exit from the voice-class configuration mode.

After you have created the voice class for busyout function, assign it to all of the voice ports that have these busyout requirements. See “Assigning a Voice Class to a Voice Port” section on page 13.

## Assigning a Voice Class to a Voice Port


To assign a particular voice class to a voice port, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	<p>For Cisco 2600 and Cisco 3600 series analog voice ports:</p> <pre>Router(config)# <b>voice-port</b> slot/subunit/port</pre> <p>For Cisco 2600, Cisco 3600, and Cisco 7200 series digital voice ports:</p> <pre>Router(config)# <b>voice-port</b> slot/port:ds0-group</pre> <p>For Cisco MC3810 series analog voice ports:</p> <pre>Router(config)# <b>voice-port</b> slot/port</pre> <p>For Cisco MC3810 digital voice ports:</p> <pre>Router(config)# <b>voice-port</b> slot:ds0-group</pre>	<p>Identifies the voice port you want to configure and enter voice-port configuration mode.</p> <ul style="list-style-type: none"> <li>• <i>slot</i>—specifies controller slot number</li> <li>• <i>subunit</i>—specifies a voice interface card (VIC) in which the voice port is located. Valid entries are 0 and 1.</li> <li>• <i>port</i>—specifies controller port number</li> <li>• <i>ds0-group</i>—specifies controller DS-0 group number</li> </ul>
Step 2	<pre>Router(config-voiceport)# <b>voice class busyout</b> tag</pre>	<p>Assigns a busyout voice class to this voice port.</p> <p><i>tag</i>—A unique identification number assigned to one voice class. The range is 1 to 10,000. The <i>tag</i> number must be unique to the router.</p> <p>You will very likely assign the same busyout voice class to multiple voice ports.</p> <p> <b>Note</b> You can assign only one busyout voice class to a voice port. If a second busyout voice class is assigned to a voice port, the second voice class replaces the one previously assigned</p> <p> <b>Note</b> If you assign a busyout voice class to a voice port, you may not assign separate busyout commands directly to the voice port, such as <b>busyout monitor serial</b>, <b>busyout monitor ethernet</b>, or <b>busyout monitor probe</b>. The commands will be rejected.</p>
Step 3	<pre>Router(config-voiceport)# <b>exit</b></pre>	Exits from voice-port configuration mode.

Repeat the above procedure for each voice port to be configured for busyout.

## Configuring a Voice Class on the Cisco AS5300, Cisco AS5350, and Cisco AS5400



To define a voice class with specified busyout conditions, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>voice class busyout tag</b>	Creates a voice class for defining busyout conditions and enters voice-class configuration mode. The range for the <i>tag</i> number is 1 to 10,000. The <i>tag</i> number must be unique to the router.
Step 2	Router(config-class)# <b>busyout monitor</b> <b>probe ip-address [codec codec-type]</b> <b>[icpif number   loss loss-value</b> <b>delay milliseconds]</b>	Configures the voice port to use an SAA probe to monitor the link to the remote interface identified by an IP address.  Optionally specifies a codec profile for the SAA probe signal.  Optionally specifies a calculated planning impairment factor (ICPIF) loss/delay threshold, or specify loss and delay thresholds individually. Packet loss and delay determine the threshold for initiating the busyout state.  If you do not enter threshold values, the threshold values for packet delay from the <b>pstn fallback</b> command are used.   <b>Note</b> You must also configure PSTN fallback on this router and the SAA responder on the target router.
Step 3	Router(config-class)# <b>exit</b>	Exits from voice-class configuration mode.

After you have created the voice class for busyout function, assign it to the DS-0/PRI groups that have these busyout requirements, using the procedure that follows.

## Assigning a Voice Class to a DS-0/PRI Groups

To assign a specific voice class to a DS-0/PRI groups, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>controller</b> {T1   E1} <i>controller-tag</i>	Identifies the controller where the DS-0/PRI group is located.
Step 2	Router(config-controller)# <b>voice-class busyout</b> <i>voice-class-tag</i> { <b>ds0-group</b> <i>group-number</i>   <b>pri-group</b> [ <i>shut-if</i> ]}	Assigns voice class to the DS-0/PRI group.   <b>Note</b> You should assign the same busyout voice class to multiple DS-0/PRI groups.   <b>Note</b> You can assign only one busyout voice class to a group. If a second busyout voice class is assigned to a DS-0/PRI group, the second voice class replaces the one previously assigned.
Step 3	Router(config-controller)# <b>exit</b>	Exits from controller configuration mode.

Repeat the above procedure for each DS-0 group to be configured for busyout. There is only one PRI group.

## Verifying the AVBO Configuration

Complete the following tasks to verify that a voice port is correctly configured to monitor the link to a remote interface:

- Step 1** Shut down the remote interface associated with the configured IP address. This should cause the voice port to busy out.
- Step 2** Enter the **show voice busyout** command to display information about the busyout state.

The following is a sample display from the **show voice busyout** command for voice ports on a Cisco 7200:

```
Router# show voice busyout
Voice port busyout will be triggered by the
following network interfaces states
 3/0:0 busyout monitor FastEthernet0/0
 3/1:0 probe 209.165.202.128 codec g711u icpif 25
 3/2:0 probe 209.165.202.128 codec g711u icpif 25
 3/3:0 probe 209.165.202.128 codec g711u icpif 25
The following voice ports are in busyout state

1/1:1 is in busyout state caused by
      probe 209.165.202.128 codec g711u icpif 2
1/2:2 is in busyout state caused by
      probe 209.165.202.128 codec g711u icpif 2
1/1:3 is in busyout state caused by
      probe 209.165.202.128 codec g711u icpif 2
```

Complete the following tasks to verify that a voice port is correctly configured for busyout monitoring:

**Step 1** Shut down or bring up the monitored interface or interfaces, as required. This should cause the voice port to busy out. Monitored interfaces can be any of the following depending on your busyout configuration.

- Local interfaces—for **busyout monitor interface**  
If the voice port is configured to monitor multiple local interfaces for *out-of-service* states, busyout occurs only when *all* of the monitored interfaces go out of service. If a voice port is configured to monitor multiple local interfaces for the *in-service* state, busyout occurs when *any one* monitored interface comes into service.
- Remote interface—for **busyout monitor probe**  
The voice port monitors a remote IP address for out-of-service states only.

**Note**

Be sure that call fallback is configured on the local router and SAA responder is configured on the target router.

**Step 2** Enter the **show voice busyout** command to display information about the busyout state.

The following is a sample display from the **show voice busyout** command for voice ports on a Cisco 7200:

```
Router# show voice busyout
Voice port busyout will be triggered by the
following network interfaces states
3/0:0 busyout monitor FastEthernet0/0
1/6:0 probe 209.165.202.128 codec g711u icpif 25
The following voice ports are in busyout state
```

You can use the **show voice busyout all** command to display information about the busyout state.

The following is a sample display from the **show voice busyout all** command for DS-0 and PRI groups on a Cisco AS5300, Cisco AS5350 or Cisco AS5400 only:

```
Router# show voice busyout all
1 Current busyout for ds0-group and pri-group by voice-class busyout:
  T1(or E1) 0:DS0 Group 0:1 is in busyout state by voice-class busyout 1
2 Resource triggered busyout (for more info, check show call threshold status)
  The busyout isn't active right now
3 Manual configured busyout for CAS
  T1 0 manual busyout CAS time slots are:1, 2, 3, 4,
  T1 1 manual busyout CAS time slots are:
  T1 2 manual busyout CAS time slots are:
  T1 3 manual busyout CAS time slots are:
```

# Configuration Examples

This section provides the following examples:

- Configuring a Soft Busyout Example
- Configuring a Hard Busyout Example
- Configuring a Voice Port to Monitor the Link to a Remote Interface Examples
- Configuring a Voice Class for Local Voice Busyout Examples

## Configuring a Soft Busyout Example

The following example forces DS-0 time slots 1 through 12 on controller T1 0/1 on a Cisco 7200 series router into a soft busyout state:

```
Router(config)# controller t1 0/1
Router(config-controller)# ds0 busyout 1-12 soft
Router(config-controller)# exit
```

## Configuring a Hard Busyout Example

The following example forces DS-0 time slot 3 on controller E1 on a Cisco 7200 series router into a soft busyout state:

```
Router(config)# controller e1 3/1
Router(config-controller)# ds0 busyout 2 hard
Router(config-controller)# exit
```

## Configuring a Voice Port to Monitor the Link to a Remote Interface Examples

The following example configures voice port 3/0:0 on a Cisco 7200 router to use an SAA probe with the default (G.711 ulaw) profile to probe the link to the remote interface with IP address 192.168.0.0, and to busyout the voice port if the link has packet loss and delay that exceeds the threshold values configured by the **pstn fallback** command:

```
Router(config)# voice-port 3/0:0
Router(config-voiceport)# busyout monitor probe 198.168.0.0
Router(config-voiceport)# exit
```

The following example configures voice port 3/0:0 on a Cisco 7200 to use an SAA probe with a G.711 ulaw profile to probe the link to the remote interface with IP address 198.169.101.0, and to busyout the voice port if the link has a packet loss of more than 50 percent and a packet delay of more than 25 milliseconds:

```
Router(config)# voice-port 3/0:0
Router(config-voiceport)# busyout monitor probe 198.169.101.0 codec g711a loss 50 delay 25
Router(config-voiceport)# exit
```

## Configuring a Voice Class for Local Voice Busyout Examples

### Cisco 2600 Series, Cisco 3600 Series, Cisco 7200 Series and MC3810

The following example configures busyout voice class 30, which initiates voice-port busyout whenever serial ports 0 and 1 both go out of service, and it applies voice class 30 to voice port 1/3:

```
Router(config)# voice class busyout 30
Router(config-class)# busyout monitor serial 0
Router(config-class)# busyout monitor serial 1
Router(config-class)# exit
Router(config)# voice-port 1/3
Router(config-voiceport)# voice-class 30
```

The following example configures busyout voice class 35, which initiates voice-port busyout whenever either serial port 0 or 1 is in service, and it applies voice class 35 to voice port 1/3:

```
Router(config)# voice class busyout 35
Router(config-class)# busyout monitor serial 0 in-service
Router(config-class)# busyout monitor serial 1 in-service
Router(config-class)# exit
Router(config)# voice-port 1/3
Router(config-voiceport)# voice class 35
```

The following example configures busyout voice class 40, which initiates voice-port busyout whenever an SAA probe sent to both of the two specified remote interfaces results in a link with an ICPiF delay/loss average of more than 15, and it applies voice class 40 to voice port 1/4:

```
Router(config)# voice class busyout 40
Router(config-class)# busyout monitor probe 209.165.202.128 icpif 15
Router(config-class)# busyout monitor probe 209.165.202.129 icpif 15
Router(config-class)# exit
Router(config)# voice-port 1/4
Router(config-voiceport)# voice class 40
```

The following example configures analog voice port 1/1 on a Cisco MC3810 to use an SAA probe with a G.711 ulaw profile to probe the link to the remote interface with IP address 209.165.202.128, and to busyout the voice port if the link has a packet loss of more than 50 percent and a packet delay of more than 25 milliseconds:

```
Router(config)# voice-port 1/1
Router(config-voiceport)# busyout monitor probe 209.165.202.128 codec g711u loss 50 delay 25
```

The following example configures voice port 1/0/1 on a Cisco 3600 series router to use an SAA probe with the default (G.711 alaw) profile to probe the link to the remote interface with IP address 209.165.202.128, and to busyout the voice port if the link has packet loss and delay that exceed the threshold values configured by the **pstn fallback** command:

```
Router(config)# voice-port 1/0/1
Router(config-voiceport)# busyout monitor probe 209.165.202.128
```

The following example configures busyout voice class 60, which configures multiple parameters for voice-port busyout, and it applies voice class 60 to voice ports 1:0.0 and 1:0.1 on a Cisco 3600 series router. The voice ports busyout under any one the following conditions:

- Serial ports 0/0 and 0/1 are both OOS
- Serial port 1/0 or 1/0 is in service
- The link loss exceeds 50 percent or the link delay exceeds 1 second on the links to both remote interfaces (IP addresses 209.165.202.128 and 209.165.202.129)

```

Router(config)# voice class busyout 60
Router(config-class)# busyout monitor serial 0/0
Router(config-class)# busyout monitor serial 0/1
Router(config-class)# busyout monitor serial 1/0 in-service
Router(config-class)# busyout monitor serial 1/1 in-service
Router(config-class)# busyout monitor probe 209.165.202.128 loss 50 delay 1000
Router(config-class)# busyout monitor probe 209.165.202.129 loss 50 delay 1000
Router(config-class)# exit
Router(config)# voice-port 1:0.0
Router(config-voiceport)# voice class 60
Router(config-voiceport)# exit
Router(config)# voice-port 1:0.1
Router(config-voiceport)# voice class 60
Router(config-voiceport)# exit

```

### Cisco AS5300, Cisco AS5350 and Cisco AS5400

The following example configures a voice class with a tag number of 5. If this class is assigned to a DS-0 or PRI group, the group will busyout if the SAA probes sent to the interfaces 209.165.202.128/129 have an ICPHF delay/loss average of more than 15:

```

Router(config)# voice class busyout 5
Router(config-class)# busyout monitor probe 209.165.202.128 icpif 15
Router(config-class)# busyout monitor probe 209.165.202.129 icpif 15
Router(config-class)# exit

```

The following example configures a voice class with a tag number of 6. If this class is assigned to a DS-0 or PRI group, the group will busyout if the SAA probes sent to interface 209.165.202.128 have a packet loss of more than 50 percent and a packet delay of more than 25 milliseconds:

```

Router(config)# voice class busyout 6
Router(config-class)# busyout monitor probe 209.165.202.128 codec g711u loss 50
delay 25
Router(config-class)# exit

```

The following example assigns a voice class of 5 to a DS-0 group (with tag number 17) already configured on a T1 controller:

```

Router(config)# controller T1 1
Router(config-controller)# voice-class busyout 5 ds0-group 17
Router(config-controller)# exit

```

The following example assigns a voice class of 6 to a PRI group already configured on an E1 controller:

```

Router(config)# controller E1 2
Router(config-controller)# voice-class busyout 6 pri-group
Router(config-controller)# exit

```

# Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

## New Commands

- **clear interface**
- **isdn service b\_channel**

## Modified Commands

- **busyout monitor**
- **busyout monitor probe**
- **busyout monitor serial**
- **ds0 busyout**
- **isdn service dsl**
- **show voice busyout (all)**
- **voice class busyout**
- **voice-class busyout**

# clear interface

To effect a hard busy on DS-0s or the whole PRI interface after entering either of the **isdn service** commands, use the **clear interface** command in global configuration mode.

**clear interface** *interface\_name*

**no clear interface** *interface\_name*

Syntax Description	<i>interface_name</i>	Name of the interface to be cleared.
--------------------	-----------------------	--------------------------------------

Defaults	Disabled
----------	----------

Command Modes	Global configuration
---------------	----------------------

Command History	Release	Modification
	12.2(2)XA	This command was introduced on the Cisco AS5300, Cisco AS5350, and Cisco AS5400.
	12.2(4)T	The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

**Examples** The following example clears the serial interface at slot 0 port 23:

```
Router(config)# clear interface serial0:23
```

Related Commands	Command	Description
	<b>isdn service b_channel</b>	Takes an individual B channel or an entire PRI interface out of service or set it to a different channel service state that is passed in to the switch. No ISDN NFAS.
	<b>isdn service dsl</b>	Takes an individual B channel or an entire PRI interface out of service or set it to a different channel service state that is passed in to the switch. Supports ISDN NFAS.

## isdn service b\_channel

To take an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch, use the **isdn service** command in interface configuration mode.

**isdn service b\_channel** *channel\_range* **state** *state\_value*

**no isdn service b\_channel** *channel\_range* **state** *state\_value*

Syntax Description		
<b>b_channel</b> <i>channel_range</i>	B channel or range of B channels to be set with the passed-in state value. The <i>channel_range</i> is from 0 to 31. Use 0 for the entire interface.	
<b>state</b> <i>state_value</i>	Desired channel service state to be set on the channels. The following channel service state values are supported:	<ul style="list-style-type: none"> <li>• 0—In service</li> <li>• 1—Maintenance</li> <li>• 2—Out of service</li> </ul>

**Defaults** Disabled

**Command Modes** Interface configuration

Command History	Release	Modification
	12.2(2)XA	This command was introduced on the Cisco AS5300, Cisco AS5350, and Cisco AS5400.
	12.2(4)T	The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

**Usage Guidelines** This feature requires a configured B channel or PRI interface before the **isdn service b\_channel** command can be entered.

Putting the B channel or PRI interface into the “Out of service” state effects a soft-busy.

Use the **b\_channel 0** phrase to set the entire PRI interface to the specified state value.

Use the **show isdn service** command to display the service states that were set by the **isdn service** command.

The digital subscriber line (DSL) is not affected by this command. The ISDN Non-Facility Associated Signaling (NFAS) feature can not be configured with this command. Refer to the **isdn service dsl** command for DSL service options.

---

**Examples**

The following example sets the entire PRI interface to the maintenance state:

```
Router(config-if)# isdn service b_channel 0 state 1
```

The following example puts B channel 11 out of service:

```
Router(config-if)# isdn service b_channel 11 state 2
```

---

**Related Commands**

Command	Description
isdn service dsl	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.
show isdn service	Displays the state and the service status of each ISDN channel.
show isdn status	Displays the information about memory, Layer 2 and Layer 3 timers, and the status of PRI channels.

# busyout monitor

To place a voice port into the busyout monitor state, enter the **busyout monitor** command in voice-port configuration mode. To remove the busyout monitor state from the voice port, use the **no** form of this command.

**busyout monitor** {**serial** *interface-number* | **ethernet** *interface-number* | **fastethernet** *interface-number*} [**in-service**]

**no busyout monitor** {**serial** *interface-number* | **ethernet** *interface-number* | **fastethernet** *interface-number*} [**in-service**]

## Syntax Description

<b>serial</b>	Specifies monitoring of a serial interface. More than one interface can be entered for a voice port.
<b>ethernet</b>	Specifies monitoring of an Ethernet interface. More than one interface can be entered for a voice port.
<b>fastethernet</b>	Specifies monitoring of a FastEthernet interface. More than one interface can be entered for a voice port.
<i>interface-number</i>	Identifies an interface to be monitored for the voice port busyout function.  Interface choices include serial port, serial port subinterface, Ethernet port, FastEthernet port and ATM interface.
<b>in-service</b>	(Optional) Configures the voice port to be busied out when any monitored interface comes into service (its state changes to up). If the keyword is not entered, the voice port is busied out when all monitored interfaces go out of service (their state changes to down).

## Defaults

The voice port does not monitor any interfaces.

## Command Modes

Voice-port configuration

## Command History

Release	Modification
12.0(3)T	This command was introduced on the Cisco MC3810.
12.0(5)XE	This command was implemented on the Cisco 7200 series routers.
12.0(5)XK	This command was implemented on the Cisco 2600 and 3600 series routers.
12.0(7)T	The Cisco 2600 and 3600 series router implementation was integrated into Cisco IOS Release 12.0(7)T.
12.0(7)XK	The ability to monitor an Ethernet port was introduced and the <b>in-service</b> keyword was added. The serial keyword was first supported on the Cisco 2600 and 3600 series routers.

Release	Modification
12.1(1)T	The implementation of this command on the Cisco 7200 series routers was integrated into Cisco IOS Release 12.1(1)T.
12.1(2)T	The <b>serial</b> and <b>ethernet</b> keywords were added, the <b>in-service</b> keyword was integrated into Cisco IOS Release 12.1(2)T, and the <i>interface number</i> argument was changed to go with the serial and Ethernet keywords.
12.1(3)T	The keyword <b>interface</b> was removed.
12.2(2)XA	This command was introduced on the Cisco AS5300, Cisco AS5350, and Cisco AS5400 and the keyword <b>fastethernet</b> was added.
12.2(4)T	This command was first supported on the Cisco 7200 series. The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

### Usage Guidelines

When you place a voice port in the busyout monitor state, the voice port monitors the specified interface and enters the busyout state when the interface is down.

This down state forces the rerouting of calls.

The command monitors only the up or down status of an interface—not end-to-end TCP/IP connectivity.

When an interface is operational, a busied-out voice port returns to its normal state.

This feature can monitor LAN, WAN, and virtual interfaces as well as subinterfaces.

The Cisco 2600 and 3600 series routers and the MC3810 multiservice concentrator support ATM interfaces. To monitor an ATM interface, enter ATM and the interface number.

A voice port can monitor multiple interfaces at the same time. To configure a voice port to monitor multiple interfaces, reenter the busyout monitor command for each additional interface to be monitored.

If you specify more than one monitored interface for a voice port, all the monitored interfaces must be down to trigger busyout on the voice port.

You can combine in-service and out-of-service monitoring on a voice port. The following rule describes the actions if monitored interfaces change state.

A voice port is busied out if either of the following occurs:

- Any interface monitored for coming into service comes up.
- All interfaces monitored for going out of service go down.

### Examples

The following example configures voice port 2/1:1 on a Cisco 7200 router to busyout if Ethernet ports 0/0:0 and 1/0:1 both go out of service:

```
Router(config)# voice-port 2/1:1
Router(config-voiceport)# busyout monitor ethernet 0/0:0
Router(config-voiceport)# busyout monitor ethernet 1/0:1
Router(config-voiceport)# exit
```

The following example configures voice port 2/1:1 on a Cisco 7200 router to busyout if Ethernet ports 0/0:0 and 1/0:1 both go out of service:

```
Router(config)# voice-port 2/1:1
Router(config-voiceport)# busyout monitor fastethernet 0/0:0
Router(config-voiceport)# busyout monitor fastethernet 1/0:1
Router(config-voiceport)# exit
```

The following example configures digital voice 0/1:1 on a Cisco 7200 router to busyout if Ethernet ports 0/0 and 1/0 both go out of service:

```
Router(config)# voice-port 0/1:1
Router(config-voiceport)# busyout monitor ethernet 0/1:1
Router(config-voiceport)# busyout monitor serial 0/1:2
Router(config-voiceport)# exit
```

The following example configures digital voice port 0/0:1 on a Cisco 7200 to busyout if Ethernet port 0/1:2 comes into service.

```
Router(config)# voice-port 0/0:1
Router(config-voiceport)# busyout monitor ethernet 0/1:2 in-service
Router(config-voiceport)# exit
```

The following example configures voice port 2/1 on a Cisco 3600 series router to busyout if Ethernet ports 0/0 and 1/0 both go out of service:

```
Router(config)# voice-port 2/1
Router(config-voiceport)# busyout monitor ethernet 0/0
Router(config-voiceport)# busyout monitor ethernet 1/0
Router(config-voiceport)# exit
```

The following example configures voice port 2/1 on a Cisco 3600 series router to busyout if Ethernet ports 0/0 and 1/0 both go out of service:

```
Router(config)# voice-port 2/1
Router(config-voiceport)# busyout monitor fastethernet 0/0
Router(config-voiceport)# busyout monitor fastethernet 1/0
Router(config-voiceport)# exit
```

The following example configures digital voice port 0:6 on a Cisco MC3810 to busyout if both Ethernet port 0 and serial port 0 go out of service:

```
Router(config)# voice-port 0:6
Router(config-voiceport)# busyout monitor ethernet 0
Router(config-voiceport)# busyout monitor serial 0
Router(config-voiceport)#
```

The following example configures digital voice port 0:1 on a Cisco MC3810 to busyout if Ethernet port 0 goes into of service:

```
Router(config)# voice-port 0:1
Router(config-voiceport)# busyout monitor ethernet 0 in-service
Router(config-voiceport)#
```

The following example configures a voice class with a tag number of 5 on a Cisco AS5300. If this class is assigned to a DS-0 or PRI group, the group will busyout if the SAA probes sent to the interfaces 209.165.202.128/129 have an ICPIF delay/loss average of more than 15.

```
Router(config)# voice class busyout 5
Router(config-voice-class)# busyout monitor probe 209.165.202.128 icpif 15
Router(config-voice-class)# busyout monitor probe 209.165.202.129 icpif 15
Router(config-voice-class)# exit
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>busyout forced</b>	Forces a voice port into the busyout state.
<b>ds0 busyout</b>	Configures a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold.
<b>busyout monitor probe</b>	Configures a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold.
<b>busyout seize</b>	Changes the busyout seize procedure for a voice port.
<b>show voice busyout</b>	Displays information about the voice busyout state.

## busyout monitor probe

To configure a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold, use the **busyout monitor probe** command in voice-port configuration mode. Use the **no** form of this command to configure a voice port not to monitor SAA probe signals.

**busyout monitor probe** *ip-address* [**codec** *codec-type* | **icpif** *number* | **loss percent** **delay** *milliseconds*]

**no busyout monitor probe** *ip-address*

Syntax Description	
<i>ip-address</i>	The IP address of a target interface for the SAA probe signal.
<b>codec</b>	(Optional) Configures the profile of the SAA probe signal to mimic the packet size and interval of a specific codec type.
<i>codec-type</i>	(Optional) The codec type for the SAA probe signal. Available options are: <ul style="list-style-type: none"> <li>• <b>g711a</b>—G.711 alaw</li> <li>• <b>g711u</b>—G.711 ulaw (the default)</li> <li>• <b>g729</b>—G.729</li> <li>• <b>g729a</b>—G.729</li> </ul>
<b>icpif</b>	(Optional) Configures the busyout monitor probe to use a Calculated Planning Impairment Factor (ICPIF) loss/delay busyout threshold, in accordance with ITU-T G.113. The ICPIF numbers represent predefined combinations of loss and delay.
<i>number</i>	(Optional) The ICPIF threshold for initiating a busyout. The range is 0 to 30. Lower numbers equal lower loss and delay thresholds.
<b>loss</b>	(Optional) Configures the percent of packets lost threshold for initiating a busyout.
<i>percent</i>	(Optional) The loss value in percent for initiating a busyout. The range is 1 to 100.
<b>delay</b>	(Optional) Configures the average packet delay threshold for initiating a busyout.
<i>milliseconds</i>	(Optional) The delay threshold in milliseconds for initiating a busyout. The range is 1 to 2147483647.

### Defaults

If this command is not entered, the voice port does not monitor SAA probe signals.

If this command is entered with no optional keywords or arguments, the default codec type is G.711 alaw and the default loss and delay thresholds are the threshold values configured with the **pstn fallback** command.

### Command Modes

**Cisco 2600 Series, Cisco 3600 Series, Cisco 7200 Series and Cisco MC3810**

Voice-port configuration

**Cisco AS5300**

Voice-class configuration

Command History	Release	Modification
	12.1(3)T	This command was introduced on the Cisco 2600, Cisco 3600 and Cisco MC3810.
	12.2(2)XA	This command was introduced on the Cisco AS5300, Cisco AS5350, and Cisco AS5400.
	12.2(4)T	This command was first supported on the Cisco 7200 series. The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

**Usage Guidelines**

A voice port can monitor multiple interfaces at the same time. To configure a voice port or DS-0/PRI group to monitor multiple interfaces, reenter the command for each additional interface to be monitored.

This command is effective only if the call fallback function is enabled on this router and the SAA responder is enabled on the target router.

The SAA probe is transmitted periodically with a period determined by the PSTN fallback function.

Refer to the *PSTN Fallback* feature module for Cisco IOS Release 12.2(4)T for details of the PSTN fallback function and ICPIF values.

Lower thresholds of ICPIF, loss, and delay result in earlier busyout when the link deteriorates, thereby raising the voice minimum quality level. Higher thresholds prevent busyout until loss and delay are greater, allowing transmission of lower-quality voice.

**Caution**

If thresholds are set too low, the link can alternate between in-service and out-of-service states, causing repeated interruptions of traffic.

**Examples**

The following example configures analog voice port 1/1 on a Cisco MC3810 to use an SAA probe with a G.711alaw profile to probe the link to two remote interfaces with IP addresses, and to busyout the voice port both links have a loss exceeding 25 percent or a packet delay of more than 1.5 seconds:

```
Router(config)# voice-port 1/1
Router(config-voiceport)# busyout monitor probe 209.165.202.128 codec g711a loss 25 delay 1500
Router(config-voiceport)# busyout monitor probe 209.165.202.129 codec g711a loss 25 delay 1500
```

The following example configures a voice class on a Cisco AS5300 with a tag number of 5. If this class is assigned to a DS-0 or PRI group, the group will busyout if the SAA probes sent to the interfaces 209.165.202.128/129 have an ICPIF delay/loss average of more than 15:

```
Router(config)# voice class busyout 5
Router(config-class)# busyout monitor probe 209.165.202.128 icpif 15
Router(config-class)# busyout monitor probe 209.165.202.129 icpif 15
Router(config-class)# exit
```

The following example configures a voice class on a Cisco AS5300 with a tag number of 6. If this class is assigned to a DS-0 or PRI group, the group will busyout if the SAA probes sent to interface 209.165.202.128 have a packet loss of more than 50 percent and a packet delay of more than 25 milliseconds:

```
Router(config)# voice class busyout 6
Router(config-class)# busyout monitor probe 209.165.202.128 codec g711u loss 50
delay 25
Router(config-class)# exit
```

#### Related Commands


Command	Description
<b>busyout monitor ethernet</b>	Configures a voice port to monitor a local Ethernet interface for events that would trigger a voice-port busyout.
<b>busyout monitor serial</b>	Configures a voice port to monitor a serial interface for events that would trigger a voice-port busyout.
<b>pstn fallback</b>	Forces a voice port into the busyout state.
<b>show voice busyout</b>	Displays information about the voice busyout state.
<b>voice class busyout</b>	Creates a voice class for local voice busyout functions.

# busyout monitor serial

On the Cisco 2600 Series, Cisco 3600 Series, Cisco 7200 Series, and MC3810 only, to configure a voice port to monitor a serial interface for events that would trigger a voice-port busyout, use the **busyout monitor serial** command in voice-port configuration mode. To configure a voice port not to monitor a serial interface for such events, use the **no** form of this command

**busyout monitor serial** *interface-number* [**in-service**]

**no busyout monitor serial** *interface-number*

Syntax Description	
<b>serial</b>	Specifies monitoring of a serial interface.
	 <b>Note</b> More than one interface can be entered for a voice port.
<i>interface-number</i>	Identifies an interface to be monitored for the voice-port busyout function.  Interface choices can include both serial ports and serial port subinterfaces.
<b>in-service</b>	(Optional) Configures the voice port to be busied out when <i>any one</i> monitored interface goes into service (state changes to up). If the keyword is not entered, the voice port is busied out when <i>all</i> monitored interfaces go out of service (state changes to down).

**Defaults** The voice port does not monitor any interfaces.

**Command Modes** Voice-port configuration.

Command History	Release	Modification
	12.0(3)T	This command was introduced on the Cisco MC3810.
	12.0(7)XK	This command was first supported on the Cisco 2600 and Cisco 3600 series.
	12.1(3)T	The keyword <b>interface</b> was removed.
	12.2(2)XA	This command was introduced.
	12.2(4)T	This command was first supported on the Cisco 7200 series. The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

**Usage Guidelines**

A voice port can monitor multiple interfaces at the same time. To configure a voice port to monitor multiple interfaces, reenter the command for each additional interface to be monitored.

You can combine in-service and out-of-service monitoring on a voice port. The following rule describes the actions if monitored interfaces change state:

A voice port is busyout if:

- Any interface monitored for coming into service comes up
- All interfaces monitored for going out of service go down

**Examples**

The following example configures analog voice port 1/1 on a Cisco MC3810 to busyout if serial ports 1 and 0:0 both go out of service:

```
Router(config)# voice-port 1/1
Router(config-voiceport)# busyout monitor serial 0:0
Router(config-voiceport)# busyout monitor serial 1
Router(config-voiceport)#
```

The following example configures analog voice port 1/2 on a Cisco MC3810 to busyout if serial port 0 or 1 goes into service:

```
Router(config)# voice-port 1/2
Router(config-voiceport)# busyout monitor serial 0 in-service
Router(config-voiceport)# busyout monitor serial 1 in-service
Router(config-voiceport)#
```

The following example configures digital voice port 1/2:2 on a Cisco 3600 series router to busyout if serial ports 0/0, 0/1, 1/0 and 1/1 all go out of service:

```
Router(config)# voice-port 1/2:2
Router(config-voiceport)# busyout monitor serial 0/0
Router(config-voiceport)# busyout monitor serial 0/1
Router(config-voiceport)# busyout monitor serial 1/0
Router(config-voiceport)# busyout monitor serial 1/1
Router(config-voiceport)#
```

The following example configures digital voice port 0:6 on a Cisco MC3810 to busyout if both Ethernet port 0 and serial port 0 go out of service:

```
Router(config)# voice-port 0:6
Router(config-voiceport)# busyout monitor ethernet 0
Router(config-voiceport)# busyout monitor serial 0
Router(config-voiceport)#
```

The following example configures analog voice port 1/1:0 on a Cisco 7200 to busyout if serial ports 1/0:0 and 0/1:1 both go out of service:

```
Router(config)# voice-port 1/1:0
Router(config-voiceport)# busyout monitor serial 1/0:0
Router(config-voiceport)# busyout monitor serial 0/1:1
```

The following example configures voice port 1/2:2 on a Cisco 7200 to busyout if serial port 0/1:0 or 1/1:1 comes into service:

```
Router(config)# voice-port 1/2:2
Router(config-voiceport)# busyout monitor serial 0/1:0 in-service
Router(config-voiceport)# busyout monitor serial 1/1:1 in-service
```

The following example configures digital voice port 1/2:2 on a Cisco 7200 router to busyout if serial ports 0/1:1, 0/1:1, 1/1:1 and 1/1:1 all go out of service:

```
Router(config)# voice-port 1/2:2
```

```

Router(config-voiceport)# busyout monitor serial 0/1:1
Router(config-voiceport)# busyout monitor serial 0/1:1
Router(config-voiceport)# busyout monitor serial 1/1:1
Router(config-voiceport)# busyout monitor serial 1/1:1

```

The following example configures digital voice port 0/1:6 on a Cisco 7200 router to busyout if both Ethernet port 0/0:1 and serial port 0/1:1 go out of service:

```

Router(config)# voice-port 0/1:6
Router(config-voiceport)# busyout monitor ethernet 0/0:1
Router(config-voiceport)# busyout monitor serial 0/1:1

```

#### Related Commands

Command	Description
<b>busyout forced</b>	Forces a voice port into the busyout state.
<b>busyout monitor ethernet</b>	Configures a voice port to monitor a local Ethernet interface for events that would trigger a voice-port busyout.
<b>busyout monitor probe</b>	Configures a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold.
<b>ds0 busyout</b>	Configures a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold.
<b>busyout seize</b>	Changes the busyout seize procedure for a voice port.
<b>show voice busyout</b>	Displays information about the voice busyout state.

## ds0 busyout

To force a DS-0 time slot on a controller into the busyout state, use the **ds0 busyout** command in controller configuration mode. Use the **no** form of this command to remove the DS-0 time slot from the busyout state.

**ds0 busyout** *ds0-timeslot* [**soft** | **hard**]

**no ds0 busyout** *ds0-timeslot*

### Syntax Description

<i>ds0-timeslot</i>	DS-0 time slot to be forced into the busyout state. The range is 1 to 24 time slots in any combination.
<b>soft</b>	(Optional) Enables soft busyout.
<b>hard</b>	(Optional) Enables hard busyout.

### Defaults

DS-0 time slots are not in busyout state.

### Command Modes

Controller configuration

### Command History

Release	Modification
12.1(3)T	This command was introduced.
12.2(2)XA	The <b>soft</b> and <b>hard</b> keywords were added and the command was introduced on the Cisco AS5300, Cisco AS5350 and Cisco AS5400.
12.2(4)T	This command was first supported on the Cisco 7200 series. The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

### Usage Guidelines

This command affects only DS-0 time slots that are configured into a DS-0 group and function as part of a digital voice port. If multiple DS-0 groups are configured on a controller, you can busy out any combination of DS-0 time slots, as long as each DS-0 time slot to be busied out is part of a DS-0 group.

If a DS-0 time slot is in the busyout state, only the **no ds0 busyout** command can restore the DS-0 time slot to service.

To avoid conflicting CLI commands, do not use the **ds0 busyout** command and the **busyout forced** command on the same controller.

All the channels which are manually busied out are NOT automatically unbusied. The manual unbusyout command is needed to unbusy these channels.

**Examples**

The following example forces DS-0 time slot 6 on controller T1 0 into the hard busyout state:

```
Router(config)# controller t1 0
Router(config-controller)# ds0 busyout 6 hard
```

The following example forces DS-0 time slots 1, 3, 4, 5, 6, and 24 on controller E1 1 into the soft (default) busyout state:

```
Router(config)# controller e1 1
Router(config-controller)# ds0 busyout 1,3-6,24
```

The following example forces DS-0 time slot 6 on controller T1 0/1:1 into the hard busyout state:

```
Router(config)# controller t1 0/1:1
Router(config-controller)# ds0 busyout 6 hard
```

The following example forces DS-0 time slots 1, 3, 4, 5, 6, and 24 on controller E1 1/1:0 into the soft (default) busyout state:

```
Router(config)# controller e1 1/1:0
Router(config-controller)# ds0 busyout 1,3-6,24
```

**Related Commands**

Command	Description
<b>show running configuration</b>	Use this command to determine which DS-0 time slots have been forced into the busyout state.

## isdn service dsl

To take an individual B channel or an entire PRI interface out of service or set it to a different channel service state that is passed in to the switch, use the **isdn service** command in interface configuration mode.

```
isdn service dsl dsl_value b_channel channel_range state state_value
```

```
no isdn service dsl dsl_value b_channel channel_range state state_value
```

### Syntax Description

<b>dsl</b> <i>dsl_value</i>	The digital subscriber line and line number. The <i>dsl_value</i> range is from 0 to 7.
<b>b_channel</b> <i>channel_range</i>	B channel or range of B channels to be set with the passed-in state value. The <i>channel_range</i> is 0 to 31. Use 0 for the entire interface.
<b>state</b> <i>state_value</i>	Desired channel service state to be set on the channels. The following channel service state values are supported: <ul style="list-style-type: none"> <li>• 0—In service</li> <li>• 1—Maintenance</li> <li>• 2—Out of service</li> </ul>

### Defaults

Disabled

### Command Modes

Interface configuration

### Command History

Release	Modification
11.3	This command was first introduced.
12.2(2)XA	This command was introduced on the Cisco AS5300, Cisco AS5350, and Cisco AS5400.
12.2(4)T	The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

### Usage Guidelines

This feature requires a configured B channel or PRI interface before the **isdn service** command can be entered.

This command is used to configure the ISDN Non-Facility Associated Signaling (NFAS) feature on Cisco routers.

Putting the B channel or PRI interface into the “Out of service” state effects a soft-busy.

Use the **b\_channel 0** phrase to set the entire PRI interface to the specified state value.

Use the **show isdn status** command to display the digital subscriber line (DSL) value. Use the **show isdn service** command to display the service states that were set by the **isdn service** command.

---

**Examples**

The following example sets the entire PRI interface to maintenance state; the digital signal line (DSL) value was displayed and then used in the command:

```
Router(config-if)# isdn service dsl 3 b_channel 0 state 1
```

The following example puts B channel 11 out of service; the DSL value was displayed and then used in the command:

```
Router(config-if)# isdn service dsl 3 b_channel 11 state 2
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>isdn service b_channel</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch,
<b>show isdn service</b>	Displays the state and the service status of each ISDN channel.
<b>show isdn status</b>	Displays the information about memory, Layer 2 and Layer 3 timers, and the status of PRI channels.

## show voice busyout (all)

To display voice busyout stats, use the **show voice busyout** EXEC command. On the Cisco AS5300, Cisco AS5350, and Cisco AS5400 only, to display all three types of voice busyout stats (AVBO, resource-based busyout, and manual busyout on DS-0), use the **show voice busyout all** EXEC command.

**show voice busyout**

**show voice busyout all**

<b>Syntax Description</b>	<b>all</b>	All three types of busyout.
<b>Defaults</b>	None	
<b>Command Modes</b>	EXEC	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(3)T	This command was introduced on the Cisco MC3810.
	12.0(7)XK	This command supported on the Cisco 2600 and Cisco 3600 series.
	12.1(2)T	This command was integrated into the Cisco IOS 12.1(2)T release.
	12.2(2)XA	The <b>all</b> keyword was added to support the Cisco AS5300, Cisco AS5350 and Cisco AS5400.
12.2(4)T	This command was first supported on the Cisco 7200 series. The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.	

### Usage Guidelines

The **show voice busyout all** command is only available for the Cisco AS5300, Cisco AS5350, and Cisco AS5400. The command displays all three types of busyout (advanced voice busyout, resource-based busyout, and manual busyout on DS-0).

**Examples**

The following is a sample display from the **show voice busyout** command on a Cisco 3640 router:

```
Router# show voice busyout
Voice port busyout will be triggered by the
following network interfaces states
1/0:0 probe 11.0.0.2 codec g711ulaw
1/0:1 probe 11.0.0.2 codec g711ulaw
1/0:2 probe 11.0.0.2 codec g711ulaw
1/0:3 probe 11.0.0.2 codec g711ulaw
1/0:4 probe 11.0.0.2 codec g711ulaw
1/0:5 probe 11.0.0.2 codec g711ulaw
1/0:6 probe 11.0.0.2 codec g711ulaw
1/0:7 probe 11.0.0.2 codec g711ulaw
1/0:8 probe 11.0.0.2 codec g711ulaw
1/0:9 probe 11.0.0.2 codec g711ulaw
1/0:10 probe 11.0.0.2 codec g711ulaw
1/0:11 probe 11.0.0.2 codec g711ulaw
1/0:12 probe 11.0.0.2 codec g711ulaw
1/0:13 probe 11.0.0.2 codec g711ulaw
1/0:14 probe 11.0.0.2 codec g711ulaw
1/0:15 probe 11.0.0.2 codec g711ulaw
1/0:16 probe 11.0.0.2 codec g711ulaw
1/0:17 probe 11.0.0.2 codec g711ulaw
1/0:18 probe 11.0.0.2 codec g711ulaw
1/0:19 probe 11.0.0.2 codec g711ulaw
1/0:20 probe 11.0.0.2 codec g711ulaw
1/0:21 probe 11.0.0.2 codec g711ulaw
1/0:22 probe 11.0.0.2 codec g711ulaw
1/0:23 probe 11.0.0.2 codec g711ulaw
1/1:0 probe 11.0.0.2 codec g711ulaw
1/1:1 probe 11.0.0.2 codec g711ulaw
1/1:2 probe 11.0.0.2 codec g711ulaw
1/1:3 probe 11.0.0.2 codec g711ulaw
1/1:4 probe 11.0.0.2 codec g711ulaw
1/1:5 probe 11.0.0.2 codec g711ulaw
1/1:6 probe 11.0.0.2 codec g711ulaw
1/1:7 probe 11.0.0.2 codec g711ulaw
1/1:8 probe 11.0.0.2 codec g711ulaw
1/1:9 probe 11.0.0.2 codec g711ulaw
1/1:10 probe 11.0.0.2 codec g711ulaw
1/1:11 probe 11.0.0.2 codec g711ulaw
1/1:12 probe 11.0.0.2 codec g711ulaw
1/1:13 probe 11.0.0.2 codec g711ulaw
1/1:14 probe 11.0.0.2 codec g711ulaw
1/1:15 probe 11.0.0.2 codec g711ulaw
1/1:16 probe 11.0.0.2 codec g711ulaw
1/1:17 probe 11.0.0.2 codec g711ulaw
1/1:18 probe 11.0.0.2 codec g711ulaw
1/1:19 probe 11.0.0.2 codec g711ulaw
1/1:20 probe 11.0.0.2 codec g711ulaw
1/1:21 probe 11.0.0.2 codec g711ulaw
1/1:22 probe 11.0.0.2 codec g711ulaw
1/1:23 probe 11.0.0.2 codec g711ulaw
```

The following is a sample display from the **show voice busyout all** command for DS-0 and PRI groups on a Cisco AS5300:

```
Router# show voice busyout all
1 Current busyout for ds0-group and pri-group by voice-class busyout:
  T1(or E1) 0:DS0 Group 0:1 is in busyout state by voice-class busyout 1
2 Resource triggered busyout (for more info, check show call threshold status)
  The busyout isn't active right now
3 Manual configured busyout for CAS
  T1 0 manual busyout CAS time slots are:1, 2, 3, 4,
  T1 1 manual busyout CAS time slots are:
  T1 2 manual busyout CAS time slots are:
  T1 3 manual busyout CAS time slots are:
```

Related Commands	Command	Description
	voice class busyout	Creates a voice class for local voice busyout functions.
	voice-class busyout	Assigns a voice class to a DS-0/PRI group.

# voice class busyout

To create a voice class for local voice busyout functions, use the **voice class busyout** command in global configuration mode. Enter the **no** form of this command to delete the voice class.

**voice class busyout** *tag*

**no voice class busyout** *tag*

<b>Syntax Description</b>	<i>tag</i>	A unique identification number assigned to one voice class. The range is 1 to 10,000. The <i>tag</i> number must be unique to the router.
---------------------------	------------	---

<b>Defaults</b>	No voice class is configured for busyout functions.
-----------------	---

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(3)T	This command was introduced.
	12.2(2)XA	This command was introduced on the Cisco AS5300, Cisco AS5350, and Cisco AS5400.
	12.2(4)T	This command was first supported on the Cisco 7200 series. The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

<b>Usage Guidelines</b>	<p>You can apply a busyout voice class to multiple voice ports.</p> <p>You can assign only one busyout voice class to a voice port. If a second busyout voice class is assigned to a voice port, the second voice class replaces the one previously assigned.</p> <p>If you assign a busyout voice class to a voice port, you may not assign separate busyout commands directly to the voice port, such as <b>busyout monitor serial</b>, <b>busyout monitor ethernet</b>, or <b>busyout monitor probe</b>.</p>
-------------------------	---

**Examples**

The following example configures busyout voice class 20, in which the connections to two remote interfaces are monitored by an SAA probe with a G.711ulaw profile, and voice ports are busyied out whenever both links have a packet loss exceeding 10 percent and packet delay time exceeding 2 seconds:

```
Router(config)# voice class busyout 20
Router(config-class)# busyout monitor probe 209.165.202.128 g711u loss 10
delay 2000
Router(config-class)# busyout monitor probe 209.165.202.129 g711u loss 10
delay 2000
Router(config-class)#
```

The following example configures busyout voice class 30, in which voice ports are busyied out when serial ports 0/0, 1/0, 2/0, and 3/0 go out of service.

```
Router(config)# voice class busyout 30
Router(config-class)# busyout monitor serial 0/0
Router(config-class)# busyout monitor serial 1/0
Router(config-class)# busyout monitor serial 2/0
Router(config-class)# busyout monitor serial 3/0
Router(config-class)#
```

**Cisco AS5300, Cisco AS5350, and Cisco AS5400**

The following example configures a voice class with a tag number of 5. If this class is assigned to a DS-0 or PRI group, the group will busyout if the SAA probes sent to the interfaces 209.165.202.128/129 have an ICPIF delay/loss average of more than 15:

```
Router(config)# voice class busyout 5
Router(config-class)# busyout monitor probe 209.165.202.128 icpif 15
Router(config-class)# busyout monitor probe 209.165.202.129 icpif 15
Router(config-class)# exit
```

The following example configures a voice class with a tag number of 6. If this class is assigned to a DS-0 or PRI group, the group will busyout if the SAA probes sent to interface 209.165.202.128 have a packet loss of more than 50 percent and a packet delay of more than 25 milliseconds:

```
Router(config)# voice class busyout 6
Router(config-class)# busyout monitor probe 209.165.202.128 codec g711u loss 50
delay 25
Router(config-class)# exit
```

**Related Commands**

Command	Description
<b>busyout monitor ethernet</b>	Configures a voice port to monitor a local Ethernet interface for events that would trigger a voice-port busyout.
<b>busyout monitor probe</b>	Configures a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold.
<b>busyout monitor serial</b>	Configures a voice port to monitor a serial interface for events that would trigger a voice-port busyout.
<b>show voice busyout (all)</b>	Displays information about the voice busyout state.

# voice-class busyout

On the Cisco AS5300, Cisco AS5350 and Cisco AS5400 only, to assign a voice class to a DS-0/PRI group, use the **voice-class busyout** command in controller configuration mode. Enter the **no** form of this command to delete the voice class.

```
voice-class busyout voice-class-tag { ds0-group group-number | pri-group [shut-if] }
```

```
no voice-class busyout voice-class-tag
```

## Syntax Description

<i>voice-class-tag</i>	A unique identification number assigned to one voice class. The range is 1 to 10,000.
<b>ds0-group</b> <i>group-number</i>	DS-0 group number assigned a voice class.
<b>pri-group</b>	PRI group assigned a voice class. There is only one PRI group.
<b>shut-if</b>	Enables AVBO to take down the D channel (shuts the ISDN interface) instead of taking down B channels by sending service messages to the remote switch.

## Defaults

No voice class is configured for busyout functions.

## Command Modes

Controller configuration.

## Command History

Release	Modification
12.2(2)XA	This command was introduced on the Cisco AS5300, Cisco AS5350 and Cisco AS5400 <i>only</i> .
12.2(2)XA3	The keyword <b>shut-if</b> was added.
12.2(4)T	The new and modified commands introduced in Cisco IOS Release 12.2(2)XA were integrated into Cisco IOS Release 12.2(4)T. Support for the Cisco AS5300, Cisco AS5350, and Cisco AS5400 is not included in this release.

## Usage Guidelines

You can assign only one busyout voice class to a group. If a second busyout voice class is assigned to a DS-0/PRI group, the second voice class replaces the one previously assigned.

You should assign the same busyout voice class to multiple DS-0 groups.

The following example assigns a voice class of 5 to a DS-0 group (with tag number 17) already configured on a T1 controller:

```
Router(config)# controller T1 1
Router(config-controller)# voice-class busyout 5 ds0-group 17
Router(config-controller)# exit
```

The following example assigns a voice class of 6 to a PRI group already configured on an E1 controller:

```
Router(config)# controller E1 2
Router(config-controller)# voice-class busyout 6 pri-group
Router(config-controller)# exit
```

#### Related Commands

Command	Description
<b>busyout monitor ethernet</b>	Configures a voice port to monitor a local Ethernet interface for events that would trigger a voice-port busyout.
<b>busyout monitor serial</b>	Configures a voice port to monitor a serial interface for events that would trigger a voice-port busyout.
<b>busyout monitor probe</b>	Configures a voice port to enter the busyout state if an SAA probe signal returned from a remote, IP-addressable interface crosses a specified delay or loss threshold.
<b>show voice busyout</b>	Displays information about the voice busyout state.

# Glossary

**AVBO**—Advanced Voice Busy Out.

**CLI**—Command line interface.

**Codec**—Coder-Decoder. An integrated circuit device that typically uses pulse code modulation to transform analog signals into a digital bit stream and digital signals back into analog signals. In Voice over IP, Voice over Frame Relay, and Voice over ATM, a DSP software algorithm used to compress/decompress speech or audio signals.

**DLCI**—data-link connection identifier.

**Dial peer**—An addressable call endpoint that contains configuration information including voice protocol, a CODEC type, and a telephone number associated with the call endpoint. There are five kinds of dial peers: POTS, VoIP, VoFR, VoATM, and VoHDL.

**DS-0**—digital signal level 0. Framing specification used in transmitting digital signals over a single channel at 64-kbps on a T1 facility.

**DSP**—Digital Signaling Processor.

**DTMF**—dual tone multifrequency. Uses two simultaneous voice-band tones for dial such as touch tone.

**DTMF relay**—Enables the generation of FRF.11 Annex A frames for a VoFR dial peer. The DSP generates Annex A frames instead of passing a DTMF tone through the network as a voice sample.

**Dynamic switched call**—A telephone call dynamically established across a packet data network based on a dialed telephone number. In the case of VoFR, a Cisco proprietary session protocol similar to Q.931 is used to achieve call switching and negotiation between calling endpoints. The proprietary session protocol runs over FRF.11-compliant subchannels.

**E&M**—Stands for receive and transmit (or Ear and Mouth). E&M is a trunking arrangement generally used for two-way switch-to-switch or switch-to-network connections. Cisco's analog E&M interface is an RJ-48 connector that allows connections to PBX trunk lines (tie lines). E&M is also available on E1 and T1 digital interfaces.

**E1**—European equivalent of T1. 32-64kbps channels include 1-channel for framing and 1-channel for D-channel information at a 2.048 Mhz clock rate.

**FRF**—Frame Relay Forum. An association of corporate members consisting of vendors, carriers, users, and consultants committed to implementing Frame Relay in accordance with national and international standards. See <http://www.frforum.com>.

**FXO**—Foreign Exchange Office. An FXO interface connects to the Public Switched Telephone Network's (PSTN) central office and is the interface offered on a standard telephone. Cisco's FXO interface is an RJ-11 connector that allows an analog connection to be directed to the PSTN's central office or to a station interface on a PBX.

**FXS**—Foreign Exchange Station. An FXS interface connects directly to a standard telephone and supplies ring, voltage, and dial tone. Cisco's FXS interface is an RJ-11 connector that allows connections to basic telephone service equipment, keysets, and PBXs.

**ICPIF**—Calculated Planning Impairment Factor. Calculated and used as per the ITU G.113 specification.

**LLQ**—low latency queuing. LLQ brings strict priority queuing to Class-Based Weighted Fair Queuing (CBWFQ). Strict priority queuing allows delay-sensitive data such as voice to be dequeued and sent first (before packets in other queues are dequeued), giving delay-sensitive data preferential treatment over other traffic.

**LVBO**—Local Voice Busy Out.

**MD5**—Message Digest 5. Algorithm used for message authentication in SNMP v.2. MD5 verifies the integrity of the communication, authenticates the origin, and checks for timeliness.

**MEL CAS**—Mercury Exchange Limited (MEL) Channel Associated Signaling. A voice signaling protocol used primarily in the United Kingdom.

**OOS**—Out of Service state of the call or trunk.

**PBX**—Private Branch Exchange. A privately owned central switching office.

**Permanent calls**—Permanent calls are private line calls used for fixed point-to-point calls, connections between PBXs (E&M to E&M), or for remote telephone extensions (FXO to FXS).

**POTS**—Plain old telephone service. Basic telephone service supplying standard single line telephones, telephone lines, and access to the PSTN.

**POTS dial peer**—Dial peer connected by a traditional telephony network. POTS peers point to a particular voice port on a voice network device.

**PRI**—Primary Rate Interface. ISDN interface to primary rate access. Primary rate access consists of a single 64-Kbps D channel plus 23 (T1) or 30 (E1) B channels for voice or data.

**PSTN**—Public Switched Telephone Network. PSTN refers to the local telephone company.

**RAI**—Resource Availability Indicator.

**RTP**—Routing Table Protocol.

**SAA**—Service Assurance Agent. Formerly known as Response Time Reporter (RTR). Works alongside TCP to carry streaming data over the network. RTP uses packet headers that contain sequencing information, time stamps required to time the output (for example, display of frames) and synchronize different data streams (for example, audio and video), and information on the packet's "payload" (for example, MPEG versus H.261 encoding). This payload descriptor allows RTP to support multiple compression types.

**Switched calls**—Switched calls are normal telephone calls when a user picks up a phone, hears a dial tone and enters the destination phone number to reach the other phone. Switched calls can also be private line auto-ringdown (PLAR) calls, or tie-line calls for fixed point-to-point connections.

**T1**—Digital WAN carrier facility. T1 transmits DS-1-formatted data at 1.544 Mbps through the telephone-switching network by using AMI or B8ZS coding.

**TCP**—Transmission Control Protocol. Connection-oriented transport layer protocol that provides reliable full-duplex data transmission.

**Trunk**—Service that allows quasi-transparent connections between two PBXs, a PBX and a local extension, or some other combination of telephony interfaces with signaling passed transparently through the packet data network.

**Voice over Frame Relay**—Voice over Frame Relay enables a router to carry voice traffic (for example, telephone calls and faxes over a Frame Relay network. When sending voice traffic over Frame Relay, the voice traffic is segmented and encapsulated for transit across the Frame Relay network by using FRF.12 encapsulation.

**Voice over IP**—Voice over IP enables a router to carry voice traffic, for example, telephone calls and faxes) over an IP network. In Voice over IP, the DSP segments the voice signal into frames, which are then coupled in groups of two and stored in voice packets that are transported by using IP in compliance with ITU-T specification H.323.



**Note**

For a list of other internetworking terms, see *Internetworking Terms and Acronyms*, available on the Documentation CD-ROM and Cisco.com at the following URL:  
<http://www.cisco.com/univercd/cc/td/doc/cisintwk/ita/index.htm>.