



FXO Disconnect Supervision

This feature module describes the FXO Disconnect Supervision feature for analog FXO voice ports. This feature applies to analog FXO voice ports with loop start signaling connected to PSTNs, PBXs, or key systems.

FXO Disconnect Supervision was introduced in Cisco IOS Release 12.1(5)XM on the Cisco 2600 and Cisco 3600 series routers and Cisco MC3810 series concentrators.

This document includes the following sections:

- Feature Overview, page 1
- Supported Platforms, page 2
- Supported Standards, MIBs, and RFCs, page 2
- Prerequisites, page 3
- Configuration Tasks, page 3
- Configuration Examples, page 11
- Command Reference, page 13
- Glossary, page 36

Feature Overview

The FXO Disconnect Supervision feature enables analog FXO ports to monitor call progress tones returned from a PBX or from the PSTN. This feature supports both incoming and outgoing calls.

You can configure voice ports to detect either the standard call progress tones that are preconfigured for certain countries, or you can configure custom call progress tone detection. Tone detection is performed by the digital signal processor (DSP) and causes a DSP event to be reported to the host software.

Disconnect supervision can be configured to detect disconnect tones sent by the PBX or PSTN, or to detect any tone received (for example, busy tone or dial-tone). When an incoming call ends, the DSP detects the associated tone, and the analog FXO voice port goes on-hook. This prevents the voice port from remaining off-hook when no call is in progress.

You can configure disconnect tones to be detected either continuously during calls or only during call setup (before calls are answered). Detection of any tone operates only during call set-up. If you configure detection of any tone, you must also enable echo cancellation to prevent disconnection due to detection of the router's own ringback tone.

Benefits

Disconnect supervision allows interoperability with PSTN and PBX systems regardless of their ability to transmit supervisory tones. These functions prevent billing errors that could otherwise result from failure to detect noncompletion or termination of long-distance calls.

Restrictions

The FXO Disconnect Supervision feature is applicable only to analog FXO ports with loop-start signaling.

FXO disconnect supervision is not supported on local hairpinned calls between analog voice ports (FXS and FXO) on Cisco MC3810 series concentrators, because the DSP is bypassed. If hairpinning is turned off with the **no voice local-bypass** global configuration command, FXO disconnect supervision is supported.

There is no timer function to initiate a disconnection in cases of calls in which there are no detectable supervisory tones.

Battery reversal is not supported in this feature.

The Cisco MC3810 series concentrators must be equipped with high-performance compression modules (HCMs) to support tone detection. Standard voice compression modules (VCMs) do not support the FXO Disconnect Supervision feature.

Related Documents

- *Cisco IOS Multiservice Applications Configuration Guide*, Cisco IOS Release 12.1
- *Cisco IOS Multiservice Applications Command Reference*, Cisco IOS Release 12.1
- *Software Configuration Guide For Cisco 3600 Series and Cisco 2600 Series Routers*
- *Cisco MC3810 Multiservice Concentrator Configuration Guide*

Supported Platforms

- Cisco 2600 series
- Cisco 3600 series
- Cisco MC3810 series

Supported Standards, MIBs, and RFCs

To obtain lists of MIBs supported by platform and Cisco IOS release and to download MIB modules, go to the Cisco MIB web site on Cisco Connection Online (CCO) at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

Prerequisites

The FXO Disconnect Supervision feature described in this document requires Cisco IOS Release 12.1(5)XM or later.

Configuration Tasks

You can configure a voice port to detect standard call progress tones for a particular region or country, or you can configure custom tone detection parameters. Use the standard tone detection procedure if the **cptone** command provides a set of call progress tones matching your requirements. Use the custom tone detection capability when the **cptone** command does not provide a preconfigured set of call progress tones for your region or country.

To configure detection of standard call progress tones, complete the following tasks:

- Configuring Voice Ports to Detect Standard Call Progress Tones
- Verifying Configuration of Call Progress Tone Detection

To configure detection of custom call progress tones, complete the following tasks:

- Configuring Voice Ports to Detect Custom Call Progress Tones
- Verifying Configuration of Call Progress Tone Detection

To configure a voice port to disconnect when any tone is detected, complete the following task:

- Configuring Voice Ports to Detect Any Tone

Configuring Voice Ports to Detect Standard Call Progress Tones

To enable detection of standard call progress tones for a country or locale, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	For Cisco 2600 and 3600 series analog voice ports: <code>Router(config)# voice-port slot/subunit/port</code> For Cisco MC3810 series analog voice ports: <code>Router(config)# voice-port slot/port</code>	Identifies the voice port you want to configure and enters voice-port configuration mode.
Step 2	<code>Router(config-voiceport)# supervisory disconnect dualtone {mid-call pre-connect}</code>	Enables disconnect supervision. Specify pre-connect for tone detection only during call set-up. Specify mid-call for tone detection during the entire call duration.
Step 3	<code>Router(config-voiceport)# cptone locale</code>	Configures the voice port to detect the standard call progress tones for the country or region named by the entry for <i>locale</i> . For <i>locale</i> entries, see the <i>Cisco IOS Multiservice Applications Command Reference</i> for your Cisco IOS release.
Step 4	<code>Router(config-voiceport)# exit</code>	Exits from voice-port configuration mode.

Configuring Voice Ports to Detect Custom Call Progress Tones

To enable detection of custom call progress tones, create a voice class to define the call progress tones. These call progress tones have default tolerance limits; to change the tolerance limits, create another voice class to define non-default tolerance limits for the tone detection parameters. Finally, associate the call-progress-tone voice class, and the tolerance-limit voice class if required, with the applicable analog FXO voice ports.



Note

Use this procedure only if there is no set of standard call progress tones for your application. Standard call progress tones are defined by the **cptone** command.

Creating a Class of Custom Call Progress Tones

To configure a voice port to detect incoming call progress tones, you need to know the parameters of the tones expected from the PBX or PSTN. This procedure creates a set, or class, of specified tones, that can be associated with voice ports. The parameters of the tones need to be precisely specified to prevent unwanted actions due to detection of non-supervisory tones or noise.

A call progress tone can consist of a single frequency or a combination of two frequencies, and it can have a cadence with up to four *on* times and four *off* times.



Caution

If a voice port is configured to detect non-dual tones, unwanted disconnects can result from detection of random tone frequencies—the phenomenon of “talkoff.”

To create a voice class that defines the specific tone or tones to be detected, complete the following steps, as required, beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# voice class custom-cptone <i>cptone-name</i>	Defines a class of custom call progress tones to be detected. You can create multiple voice classes to define different sets of custom call progress tones, and you can associate any one of these voice classes to any FXO voice port. Identify each voice class with a unique name. Choose a <i>cptone-name</i> to match your application.
Step 2	Router(cfg-cptone)# dualtone busy	Enters dualtone configuration mode for busy tone.
Step 3	Router(cfg-cp-dualtone)# cadence { <i>cycle-1-on-time</i> <i>cycle-1-off-time</i> [<i>cycle-2-on-time</i> <i>cycle-2-off-time</i>] [<i>cycle-3-on-time</i> <i>cycle-3-off-time</i>] [<i>cycle-4-on-time</i> <i>cycle-4-off-time</i>] continuous }	(If required) Specifies the cadence in ms for the busy tone. The range is 0 to 1000 ms. The default is continuous.
Step 4	Router(cfg-cp-dualtone)# frequency <i>frequency-1</i> [<i>frequency-2</i>]	(If required) Specifies the frequencies (or frequency) in Hz for the busy tone. The range is 300 to 3600 Hz. The default is 300 Hz.

	Command	Purpose
Step 5	Router(cfg-cp-dualtone)# dualtone ringback	(If required) Enters dualtone configuration mode for ringback tone.
Step 6	Router(cfg-cp-dualtone)# cadence { <i>cycle-1-on-time</i> <i>cycle-1-off-time</i> [<i>cycle-2-on-time</i> <i>cycle-2-off-time</i>] [<i>cycle-3-on-time</i> <i>cycle-3-off-time</i>] [<i>cycle-4-on-time</i> <i>cycle-4-off-time</i>] continuous }	(If required) Specifies the cadence in ms for the ringback tone. The range is 0 to 1000 ms. The default is continuous.
Step 7	Router(cfg-cp-dualtone)# frequency <i>frequency-1</i> [<i>frequency-2</i>]	(If required) Specifies the frequencies (or frequency) in Hz for the ringback tone. The range is 300 to 3600 Hz. The default is 300 Hz.
Step 8	Router(cfg-cp-dualtone)# dualtone reorder	(If required) Enters dualtone configuration mode for reorder tone.
Step 9	Router(cfg-cp-dualtone)# cadence { <i>cycle-1-on-time</i> <i>cycle-1-off-time</i> [<i>cycle-2-on-time</i> <i>cycle-2-off-time</i>] [<i>cycle-3-on-time</i> <i>cycle-3-off-time</i>] [<i>cycle-4-on-time</i> <i>cycle-4-off-time</i>] continuous }	(If required) Specifies the cadence in ms for the reorder tone. The range is 0 to 1000 ms. The default is continuous.
Step 10	Router(cfg-cp-dualtone)# frequency <i>frequency-1</i> [<i>frequency-2</i>]	(If required) Specifies the frequencies (or frequency) in Hz for the reorder tone. The range is 300 to 3600 Hz. The default is 300 Hz.
Step 11	Router(cfg-cp-dualtone)# dualtone out-of-service	(If required) Enters dualtone configuration mode for out-of-service tone.
Step 12	Router(cfg-cp-dualtone)# cadence { <i>cycle-1-on-time</i> <i>cycle-1-off-time</i> [<i>cycle-2-on-time</i> <i>cycle-2-off-time</i>] [<i>cycle-3-on-time</i> <i>cycle-3-off-time</i>] [<i>cycle-4-on-time</i> <i>cycle-4-off-time</i>] continuous }	(If required) Specifies the cadence in ms for the out-of-service tone. The range is 0 to 1000 ms. The default is continuous.
Step 13	Router(cfg-cp-dualtone)# frequency <i>frequency-1</i> [<i>frequency-2</i>]	(If required) Specifies the frequencies (or frequency) in Hz for the out-of-service tone. The range is 300 to 3600 Hz. The default is 300 Hz.
Step 14	Router(cfg-cp-dualtone)# dualtone number-unobtainable	(If required) Enters dualtone configuration mode for number-unobtainable.
Step 15	Router(cfg-cp-dualtone)# cadence { <i>cycle-1-on-time</i> <i>cycle-1-off-time</i> [<i>cycle-2-on-time</i> <i>cycle-2-off-time</i>] [<i>cycle-3-on-time</i> <i>cycle-3-off-time</i>] [<i>cycle-4-on-time</i> <i>cycle-4-off-time</i>] continuous }	(If required) Specifies the cadence in ms for the number-unobtainable tone. The range is 0 to 1000 ms. The default is continuous.
Step 16	Router(cfg-cp-dualtone)# frequency <i>frequency-1</i> [<i>frequency-2</i>]	(If required) Specifies the frequencies (or frequency) in Hz for the number-unobtainable tone. The range is 300 to 3600 Hz. The default is 300 Hz.

	Command	Purpose
Step 17	Router(cfg-cp-dualtone)# dualtone disconnect	(If required) Enters dualtone configuration mode for disconnect tone.
Step 18	Router(cfg-cp-dualtone)# cadence { <i>cycle-1-on-time</i> <i>cycle-1-off-time</i> [<i>cycle-2-on-time</i> <i>cycle-2-off-time</i>] [<i>cycle-3-on-time</i> <i>cycle-3-off-time</i>] [<i>cycle-4-on-time</i> <i>cycle-4-off-time</i>] continuous }	(If required) Specifies the cadence in ms for the disconnect tone. The range is 0 to 1000 ms. The default is continuous.
Step 19	Router(cfg-cp-dualtone)# frequency <i>frequency-1</i> [<i>frequency-2</i>]	(If required) Specifies the frequencies (or frequency) in Hz for the disconnect tone. The range is 300 to 3600 Hz. The default is 300 Hz.
Step 20	Router(cfg-cp-dualtone)# exit	Exits from dualtone configuration mode.
Step 21	Router(cfg-cptone)# exit	Exits from cp-tone configuration mode.

Creating a Class of Tone-Detection Tolerance Limits

To create a voice class that defines a set of non-default tolerance limits for the frequency, power, and cadence of the tones to be detected, complete the following steps, as required, beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# voice class dualtone-detect-params <i>tag</i>	Creates a voice class that defines a set of tolerance limits for the frequency, power, and cadence of the tones to be detected. You can create multiple voice classes to define different tolerance limits, and you can associate any one of these voice classes to any FXO voice port. Identify each voice class by a unique tag.
Step 2	Router(cfg-dual-detect)# freq-max-deviation <i>frequency</i>	(If required) The maximum allowed frequency deviation in Hz for call progress tones. The range is 10 to 125. The default is 10.
Step 3	Router(cfg-dual-detect)# freq-max-power <i>dBm0</i>	(If required) The upper limit of the tone power that will be detected, in dBm0. The range is 0 to 20 (0 dBm0 to 20 dBm0). The default is 10 (10 dBm0).
Step 4	Router(cfg-dual-detect)# freq-min-power <i>dBm0</i>	(If required) The lower limit of the tone power that will be detected; your <i>dBm0</i> entry represents minus dBm0. The range is 10 to 35 (–10 dBm0 to –35 dBm0). The default is 30 (–30 dBm0).
Step 5	Router(cfg-dual-detect)# freq-power-twist <i>dBm0</i>	(If required) The maximum power difference allowed between the two frequencies of a tone. The range is 0 to 15. The default is 6.

	Command	Purpose
Step 6	Router(cfg-dual-detect)# freq-max-delay <i>time</i>	(If required) The maximum number of 10-ms time intervals by which the two frequencies in a tone may differ from each other and be detected. The range is 10 to 100 (100 ms to 1 s). The default is 20 (200 ms).
Step 7	Router(cfg-dual-detect)# cadence-variation <i>time</i>	(If required) The maximum time that the tone onset can vary from the specified onset time and still be detected, in 10-ms increments. The range is 0 to 200 (0 ms to 2 s). The default is 100 (1 s).
Step 8	Router(cfg-dual-detect)# exit	Exits from voice-class configuration mode.

Assigning Custom Call Progress Tones to an FXO Voice Port

To configure an analog FXO voice port to detect a specific set, or class, of call-progress tones, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	For Cisco 2600 and 3600 series analog voice ports: Router(config)# voice-port <i>slot/subunit/port</i> For Cisco MC3810 series analog voice ports: Router(config)# voice-port <i>slot/port</i>	Identifies the voice port you want to configure and enters voice-port configuration mode.
Step 2	Router(config-voiceport)# supervisory disconnect dualtone { mid-call pre-connect }	Enables disconnect supervision. Specify pre-connect for tone detection only during call set-up. Specify mid-call for tone detection during the entire call duration.
Step 3	Router(config-voiceport)# supervisory custom-cptone <i>cptone-name</i>	Configures a voice port to detect the call-progress tones that were defined by the voice class custom-cptone command. The <i>cptone-name</i> specifies a voice class created in the “Creating a Class of Custom Call Progress Tones” section.
Step 4	Router(config-voiceport)# exit	Exits from voice-port configuration mode.


Assigning a Class of Tone-Detection Tolerance Limits to an FXO Voice Port

To specify a set of tolerance limits for the frequency, power, and cadence of the tones to be detected by a voice port, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	For Cisco 2600 and 3600 series analog voice ports: Router(config)# voice-port <i>slot/subunit/port</i> For Cisco MC3810 series analog voice ports: Router(config)# voice-port <i>slot/port</i>	Identifies the voice port you want to configure and enters voice-port configuration mode.
Step 2	Router(config-voiceport)# supervisory disconnect dualtone { mid-call pre-connect }	Enables disconnect supervision on the voice port. Specify pre-connect for tone detection only during call set-up. Specify mid-call for tone detection during the entire call duration.
Step 3	Router(config-voiceport)# supervisory dualtone-detect-params <i>tag</i>	Associates a set, or class, of tolerance limits for the frequency, power, and cadence of the tones to be detected. The class of tolerance limits was created by the voice class dualtone-detect-params command. The <i>tag</i> specifies a voice class created in the “Creating a Class of Tone-Detection Tolerance Limits” section.
Step 4	Router(config-voiceport)# timeouts wait-release <i>seconds</i>	(Optional) Configures a non-default duration in seconds that a voice port waits before dropping a call, after disconnect tones are detected.
Step 5	Router(config-voiceport)# exit	Exits from voice-port configuration mode.

Configuring Voice Ports to Detect Any Tone

To configure an analog FXO voice port to go on-hook when any tone is received from a PBX or PSTN before the call is answered, complete the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	For Cisco 2600 and 3600 series analog voice ports: Router(config)# voice-port slot/subunit/port For Cisco MC3810 series analog voice ports: Router(config)# voice-port slot/port	Identifies the voice port you want to configure and enters voice-port configuration mode.
Step 2	Router(config-voiceport)# supervisory disconnect anytone	Enables disconnect supervision pre-connect (during call set-up), and specifies disconnection on receipt of any tone. Examples of tones that trigger a disconnect include busy tone, fast busy tone, and dial tone.  Note You must enable echo cancellation to prevent disconnections caused by the router's own ringback tone.
Step 3	Router(config-voiceport)# exit	Exits from voice-port configuration mode.

Verifying Configuration of Call Progress Tone Detection

Enter the **show running-config** command to verify that call progress tone detection has been properly configured on a voice port.

The following example shows part of the output from the **show running-config** command on a Cisco 3600 series router, in which the following configurations are demonstrated:

- Two voice classes for tone detection tolerance limits (voice class dualtone-detect-params 1 and voice class dualtone-detect-params 2)
- Two voice classes for custom tone detection (us-custom and oz-custom)
- One voice class of each type is associated with voice port 1/1/0: voice class dualtone-detect-params 1 and voice class us-custom

```
Router# show running-config
Building configuration...
.
.
.
voice class dualtone-detect-params 1
  freq-max-power 0
  freq-min-power 35
  freq-power-twist 15
  freq-max-delay 40
  cadence-variation 8
!
voice class dualtone-detect-params 2
  freq-max-power 6
  freq-min-power 25
```

```

freq-power-twist 15
freq-max-delay 16
cadence-variation 8
!
!
voice class custom-cptone us-custom
dualtone busy
  frequency 480 620
  cadence 500 500
dualtone ringback
  frequency 440 480
  cadence 2000 4000
dualtone reorder
  frequency 480 620
  cadence 250 250
dualtone out-of-service
  frequency 950
  cadence 330 330
dualtone number-unobtainable
  frequency 480 620
  cadence 250 250
dualtone disconnect
  frequency 600
  cadence 330 330
!
!
voice class custom-cptone oz-custom
dualtone ringback
  frequency 440 480
  cadence 2000 4000
dualtone number-unobtainable
  frequency 480 620
  cadence 250 250
.
.
.
voice-port 1/1/0
  timeouts wait-release 3
  supervisory disconnect dualtone pre-connect
  supervisory custom-cptone us-custom
  supervisory dualtone-detect-params 1
  no battery-reversal
.
.
.

```

Troubleshooting Tips

The FXO Disconnect Supervision feature does not function correctly if incorrect disconnect cause codes are configured.

- The values configured for custom call progress tones could be incorrect. Refer to the “Creating a Class of Custom Call Progress Tones” section on page 4.
- Overlapping detection frequencies might have been incorrectly specified in the voice class created by the **voice class dualtone-detect-params** command. For example if **freq-max-deviation** is configured to be 20 Hz, and the **busy** and **reorder** frequencies are 350 and 370 respectively, the voice port will not be able to detect the **reorder** tone, resulting in an incorrect disconnect cause code.



Note If the frequencies and cadences (including error deviations as defined in the **voice class dualtone-detect-params** command) are the same for multiple call-progress tones, the order of detection is as follows: **busy**, **reorder**, **number-unobtainable**, **out-of-service**, **disconnect**.

Configuration Examples

The following examples illustrate basic FXO disconnect supervision configurations:

- Enabling and Defining Disconnect Supervision with Standard Tone Detection on FXO Voice Ports
- Creating a Voice Class to Specify Custom FXO Disconnect Supervision Parameters
- Creating a Voice Class to Specify Custom Tone Detection Tolerance Limits
- Enabling and Defining Disconnect Supervision with Custom Tone Detection on FXO Voice Ports
- Configuring a Voice Port to Disconnect with Any Detected Tone

Enabling and Defining Disconnect Supervision with Standard Tone Detection on FXO Voice Ports

The following example enables call progress tone detection on FXO voice ports 1/1, 1/2, and 1/3 on a Cisco MC3810, using the standard call progress tone parameters for the USA:

```
Router(config)# voice-port 1/1
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# cptone us
Router(config-voiceport)# exit
Router(config)# voice-port 1/2
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# cptone us
Router(config-voiceport)# exit
Router(config)# voice-port 1/3
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# cptone us
Router(config-voiceport)# exit
Router(config)#
```

Creating a Voice Class to Specify Custom FXO Disconnect Supervision Parameters

The following example configures a voice class with the name “country-x” and specifies a set of custom call progress tone detection parameters:

```
Router(config)# voice class custom-cptone country-x
Router(cfg-cptone)# dualtone ringback
Router(cfg-cp-dualtone)# cadence 3000 4000
Router(cfg-cp-dualtone)# frequency 420 460
Router(cfg-cptone)# dualtone busy
Router(cfg-cp-dualtone)# cadence 250 250
Router(cfg-cp-dualtone)# frequency 500 600
Router(cfg-cptone)# dualtone reorder
Router(cfg-cp-dualtone)# cadence 200 200
Router(cfg-cp-dualtone)# frequency 500 600
Router(cfg-cptone)# dualtone out-of-service
Router(cfg-cp-dualtone)# cadence 360 360
Router(cfg-cp-dualtone)# frequency 800
Router(cfg-cptone)# dualtone number-unobtainable
Router(cfg-cp-dualtone)# cadence 200 200
Router(cfg-cp-dualtone)# frequency 500 600
Router(cfg-cptone)# dualtone disconnect
```

```

Router(cfg-cp-dualtone)# cadence 360 360
Router(cfg-cp-dualtone)# frequency 650
Router(cfg-cp-dualtone)# exit
Router(cfg-cptone)# exit
Router(config)#

```

Creating a Voice Class to Specify Custom Tone Detection Tolerance Limits

The following example configures a voice class with a tag identification of 100, that defines a set of non-default tolerance limits for the frequency, power, and cadence of the tones to be detected:

```

Router(config)# voice class dualtone-detect-params 100
Router(cfg-dual-detect)# freq-max-deviation 15
Router(cfg-dual-detect)# freq-max-power 12
Router(cfg-dual-detect)# freq-min-power 25
Router(cfg-dual-detect)# freq-power-twist 10
Router(cfg-dual-detect)# freq-max-delay 100
Router(cfg-dual-detect)# cadence-variation 125
Router(cfg-dual-detect)# exit
Router(config)# exit

```

Enabling and Defining Disconnect Supervision with Custom Tone Detection on FXO Voice Ports

The following example enables call progress tone detection on FXO voice ports 1/1, 1/2, and 1/3 on a Cisco MC3810, defines the tones to be detected, and specifies non-default tone detection tolerances:

```

Router(config)# voice-port 1/1
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# supervisory custom-cptone country-x
Router(config-voiceport)# supervisory dualtone-detect-params 100
Router(config-voiceport)# timeouts wait-release 15
Router(config-voiceport)# exit
Router(config)# voice-port 1/2
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# supervisory custom-cptone country-x
Router(config-voiceport)# supervisory dualtone-detect-params 100
Router(config-voiceport)# timeouts wait-release 15
Router(config-voiceport)# exit
Router(config)# voice-port 1/3
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# supervisory custom-cptone country-x
Router(config-voiceport)# supervisory dualtone-detect-params 100
Router(config-voiceport)# timeouts wait-release 15
Router(config-voiceport)# exit

```

The following example enables call progress tone detection on FXO voice ports 1/1/0, 1/1/1, and 1/2/0 on a Cisco 3600 series router, defines the tones to be detected, and specifies default tone detection tolerances:

```

Router(config)# voice-port 1/1/0
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# supervisory custom-cptone country-x
Router(config-voiceport)# no supervisory dualtone-detect-params

Router(config-voiceport)# exit
Router(config)# voice-port 1/1/1
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# supervisory custom-cptone country-x
Router(config-voiceport)# no supervisory dualtone-detect-params

Router(config-voiceport)# exit
Router(config)# voice-port 1/2/0
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# supervisory custom-cptone country-x

```

```
Router(config-voiceport)# no supervisory dualtone-detect-params  
Router(config-voiceport)# exit
```

The following example disables call progress tone detection on FXO voice port 1/1 on a Cisco MC3810:

```
Router(config)# voice-port 1/1  
Router(config-voiceport)# no supervisory disconnect dualtone pre-connect  
Router(config-voiceport)# exit
```

Configuring a Voice Port to Disconnect with Any Detected Tone

This example configures voice port 1/1 to go on-hook upon receipt of any tone from a PBX or PSTN if the caller goes on-hook before the call is answered:

```
Router(config)# voice port 1/1  
Router(config-voiceport)# echo-cancel enable  
Router(config-voiceport)# connection plar 12  
Router(config-voiceport)# supervisory disconnect anytime  
Router(config-voiceport)# exit
```

Command Reference

This section documents new or modified commands. Modified commands are indicated by an asterisk (*). All other commands used on these platforms are documented in the Cisco IOS Release 12.1 command reference publications.

- **cadence**
- **cadence-variation**
- **cptone***
- **dualtone**
- **freq-max-delay**
- **freq-max-deviation**
- **freq-max-power**
- **freq-min-power**
- **freq-power-twist**
- **frequency**
- **supervisory custom-cptone**
- **supervisory disconnect dualtone***
- **supervisory dualtone-detect-params**
- **voice class custom-cptone**
- **voice class dualtone-detect-params**

cadence

To define the tone and silence durations for a call progress tone, use the **cadence** dualtone configuration command. To restore the default cadence, use the **no** form of this command.

cadence { *cycle-1-on-time cycle-1-off-time* [*cycle-2-on-time cycle-2-off-time*] [*cycle-3-on-time cycle-3-off-time*] [*cycle-4-on-time cycle-4-off-time*] } | **continuous**

no cadence

Syntax Description

<i>cycle-1-on-time</i>	The tone duration for the first cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
<i>cycle-1-off-time</i>	The silence duration for the first cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
<i>cycle-2-on-time</i>	The tone duration for the second cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
<i>cycle-2-off-time</i>	The silence duration for the second cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
<i>cycle-3-on-time</i>	The tone duration for the third cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
<i>cycle-3-off-time</i>	The silence duration for the third cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
<i>cycle-4-on-time</i>	The tone duration for the fourth cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
<i>cycle-4-off-time</i>	The silence duration for the fourth cycle of the cadence pattern. The range is 0 to 1000 (0 ms to 100 s). The default is 0.
continuous	A continuous call progress tone is detected.

Defaults

A single continuous tone of 300 Hz is detected.

Command Modes

Dualtone configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command specifies the cadence for a class of custom call progress tones.

You need to define each cadence that you want a voice port to detect. Reenter the command for each additional cadence to be detected.

Examples

The following example defines a cadence for a busy tone in the custom tone voice class with the name **country-x**.

```
Router(config)# voice class custom-cptone country-x
Router(cfg-cptone)# dualtone busy
Router(cfg-cp-dualtone)# cadence 500 500
Router(cfg-cp-dualtone)# exit
Router(cfg-cptone)#
```

Related Commands

Command	Description
voice class custom-cptone	Creates a voice class for defining custom call progress tones.
voice class dualtone-detect-params	Modifies the boundaries and limits for custom call progress tones defined by the voice class custom-cptone command.
supervisory custom-cptone	Associates a class of custom call progress tones with a voice port.

cadence-variation

To specify the maximum allowed variation in the call progress tone cadence, use the **cadence-variation** voice-class configuration command. To restore the default value, use the **no** form of this command.

cadence-variation *time*

no cadence-variation

Syntax Description

<i>time</i>	The maximum time that the tone onset can vary from the specified cadence onset time and still be detected, in 10-ms increments. The range is 0 to 200 (0 ms to 2 s). The default is 100 (1 s).
-------------	---

Defaults

The onset times of the tones in the cadence may vary from the specified times by 1 second.

Command Modes

Voice-class configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command creates a detection limit for one parameter within a voice class. You can apply the detection limit to any voice port.

Cadence minimum *on* times and maximum *off* times are configured automatically.

Examples

The following example specifies 80 ms (eight 10-ms time intervals) as the maximum allowable cadence variation in voice class 70:

```
Router(config)# voice class dualtone-detect-params 70
Router(cfg-dual-detect)# cadence-variation 8
Router(config)#
```

Related Commands

Command	Description
supervisory dualtone-detect-params	Assigns the boundary and detection tolerance parameters defined by the voice class dualtone-detect-params command to a voice port.
dualtone	Defines the tone and cadence for a custom call progress tone.
supervisory disconnect dualtone	Enables disconnect supervision on a voice port.

cptone

To specify a country-standard call progress tone on an analog voice port, use the **cptone** voice-port command. Use the **no** form of this command to disable the selected tone.

cptone *locale*

no cptone *locale*

Syntax Description

<i>locale</i>	Names the country-specific call progress tone to be detected on a voice port. Valid entries are listed in Table 1 for: <ul style="list-style-type: none"> • Cisco 2600 series • Cisco 3600 series • Cisco MC3810 with Cisco IOS Release 12.0(4)T and later <p>The 2-letter codes listed in Table 1 comply with the ISO 3166 country name standards.</p> <p>Valid entries for the Cisco MC3810 with Cisco IOS releases prior to 12.0(4)T are: argentina, australia, austria, belgium, brazil, canada, china, colombia, czechrepublic, denmark, finland, france, germany, greatbritain, greece, hongkong, hungary, iceland, india, indonesia, ireland, israel, italy, japan, korea, luxembourg, malaysia, mexico, netherlands, newzealand, norway, peru, philippines, poland, portugal, russia, singapore, slovakia, slovenia, southafrica, spain, sweden, switzerland, taiwan, thailand, turkey, unitedstates, venezuela.</p>
---------------	--

Table 1 Valid Command Entries for *locale*

Country	<i>cptone</i> Command Entry
Argentina	ar
Australia	au
Austria	at
Belgium	be
Brazil	br
Canada	ca
China	cn
Colombia	co
Czech Republic	cz
Denmark	dk
Egypt	eg
Finland	fi

Table 1 Valid Command Entries for locale (continued)

Country	cptune Command Entry
France	fr
Germany	de
Ghana	gh
Great Britain	gb
Greece	gr
Hong Kong	hk
Hungary	hu
Iceland	is
India	in
Indonesia	id
Ireland	ie
Israel	il
Italy	it
Japan	jp
Jordan	jo
Kenya	ke
Korea Republic	kr
Lebanon	lb
Luxembourg	lu
Malaysia	my
Mexico	mx
Nepal	np
Netherlands	nl
New Zealand	nz
Nigeria	ng
Norway	no
Pakistan	pk
Panama	pa
Peru	pe
Philippines	ph
Poland	pl

Table 1 Valid Command Entries for locale (continued)

Country	<i>cptone</i> Command Entry
Portugal	pt
Russian Federation	ru
Saudi Arabia	sa
Singapore	sg
Slovakia	sk
Slovenia	si
South Africa	za
Spain	es
Sweden	se
Switzerland	ch
Taiwan	tw
Thailand	th
Turkey	tr
Great Britain	gb
United States	us
Venezuela	ve
Zimbabwe	zw

Defaults

The call progress tone for **northamerica** is enabled on the Cisco MC3810 with Cisco IOS releases prior to 12.0(4)T and for ISDN PRI. The call progress tone for **us** is enabled on the Cisco MC3810 with Cisco IOS Releases 12.0(4)T and later, on the Cisco 2600 and 3600 series, and for E1 R2 signaling.

Command Modes

Voice-port configuration

Command History

Release	Modification
11.3(1)T	This command was introduced.
11.3(1)MA	The full keyword names for the countries were first supported on the Cisco MC3810.
12.0(4)T	Support was added for the ISO 3166 two-letter country codes on the Cisco MC3810.
12.1(5)XM	Support was added for eg, gh, jo, ke, lb, np, ng, pk, pa, sa, and zw.

Usage Guidelines

This command defines the detection of call progress tones generated at the local interface. It does not affect any information passed to the remote end of a connection, and it does not define the detection of tones generated at the remote end of a connection.

If your device is configured to support E1 R2 signalling, the E1 R2 signalling type (whether ITU, ITU variant, or local variant as defined by the **cas-custom** command) needs to match the appropriate PCM encoding type as defined by the **cptone** command. For countries for which a **cptone** value has not yet been defined, you can try the following:

- If the country uses a-Law E1 R2 signalling, use the **gb** value for the **cptone** command.
- If the country uses u-Law E1 R2 signalling, use the **us** value for the **cptone** command.
- You can specify custom call progress tones with the **voice class custom-cptone** command.

Examples

The following example configures United States standard call progress tones on voice port 1/0/0 on a Cisco 3600 series router, beginning in global configuration mode:

```
Router(config)# voice-port 1/0/0
Router(config-voiceport)# cptone us
```

The following example configures Singapore standard call progress tones on a Cisco MC3810, beginning in global configuration mode:

```
Router(config)# voice-port 1/1
Router(config-voiceport)# cptone sg
```

The following example configures Japanese standard call progress tones:

```
Router(config)# voice-port 0:D
Router(config-voiceport)# cptone jp
```

The following example configures Brazilian standard call progress tones on a Cisco AS5300:

```
Router(config)# voice-port 1:0
Router(config-voiceport)# cptone br
Router(config-voiceport)# description Brasil Tone
```

Related Commands

Command	Description
voice class custom-cptone	Creates a voice class for defining custom call progress tones.

dualtone

To enter the dualtone configuration mode for specifying a custom call progress tone, use the **dualtone** **cp-tone** configuration command.

dualtone { **ringback** | **busy** | **reorder** | **out-of-service** | **number-unobtainable** | **disconnect** }

Syntax Description

ringback	Enters dualtone configuration mode for specifying a ringback tone.
busy	Enters dualtone configuration mode for specifying a busy tone.
reorder	Enters dualtone configuration mode for specifying a reorder tone.
out-of-service	Enters dualtone configuration mode for specifying an out-of-service tone.
number-unobtainable	Enters dualtone configuration mode for specifying a number-unavailable tone.
disconnect	Enters dualtone configuration mode for specifying a disconnect tone.

Defaults

No default behavior or values.

Command Modes

cp-tone configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

Use the **dualtone** command to switch to the dualtone configuration mode from the cp-tone configuration mode. Use the **exit** command to exit the dualtone configuration mode and return to the cp-tone configuration mode.

Examples

The following example enters the dualtone configuration mode for specifying a busy tone in the custom tone voice class with the name **country-x**.

```
Router(config)# voice class custom-cptone country-x
Router(cfg-cptone)# dualtone busy
Router(cfg-cp-dualtone)#
```

Related Commands

Command	Description
voice class custom-cptone	Creates a voice class for defining custom call progress tones.

freq-max-delay

To specify the maximum onset-time difference for the two frequencies in a call progress tone, use the **freq-max-delay** voice-class configuration command. To restore the default value, use the **no** form of this command.

freq-max-delay *time*

no freq-max-delay

Syntax Description

<i>time</i>	The maximum number of 10-ms time intervals by which the start times of the two frequencies in a tone may differ from each other and be detected. The range is 10 to 100 (100 ms to 1 s). The default is 20 (200 ms).
-------------	---

Defaults

The onset times of the two frequencies may vary by 200 ms.

Command Modes

Voice-class configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command creates a detection limit for one parameter within a voice class that you can apply to any voice port.

Examples

The following example specifies 160 ms (sixteen 10-ms time intervals) as the maximum time difference allowed between the onset times of the two tone frequencies in voice class 70:

```
Router(config)# voice class dualtone-detect-params 70
Router(cfg-dual-detect)# freq-max-delay 16
Router(config)#
```

Related Commands

Command	Description
supervisory dualtone-detect-params	Assigns the boundary and detection tolerance parameters defined by the voice class dualtone-detect-params command to a voice port.
dualtone	Defines the tone and cadence for a custom call progress tone.
supervisory disconnect dualtone	Enables disconnect supervision on a voice port.

freq-max-deviation

To specify the maximum cycles per second that the tone frequencies may deviate from the configured frequencies and be detected, use the **freq-max-deviation** voice-class configuration command. To restore the default value, use the **no** form of this command.

freq-max-deviation *frequency*

no freq-max-deviation

Syntax Description	<i>frequency</i>	The maximum cycles per second that the tone frequencies may deviate from the configured frequencies, in Hz, and be detected. The value applies to both frequencies of a dual tone. The range is 10 to 125. The default is 10
---------------------------	------------------	---

Defaults	10 Hz.
-----------------	--------

Command Modes	Voice-class configuration
----------------------	---------------------------

Command History	Release	Modification
	12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines	<p>This command creates a detection limit for one parameter within a voice class that you can apply to any voice port.</p> <p>Be sure that the frequency deviation is less than the smallest frequency difference between any two call-progress tones, to prevent overlapping of detectable frequencies. If detectable frequencies overlap, one of the call-progress tones will not be detected.</p>
-------------------------	--

Examples	The following example configures a maximum frequency deviation of 20 Hz in voice class 70:
-----------------	--

```
Router(config)# voice class dualtone-detect-params 70
Router(cfg-dual-detect)# freq-max-deviation 20
Router(cfg-dual-detect)#
```

Related Commands	Command	Description
	supervisory dualtone-detect-params	Assigns the boundary and detection tolerance parameters defined by the voice class dualtone-detect-params command to a voice port.
	dualtone	Defines the tone and cadence for a custom call progress tone.
	supervisory disconnect dualtone	Enables disconnect supervision on a voice port.

freq-max-power

To specify the upper limit of the tone power that will be detected, use the **freq-max-power** voice-class configuration command. To restore the default value, use the **no** form of this command.

freq-max-power *dBmO*

no freq-max-power

Syntax Description

<i>dBmO</i>	The upper limit of the tone power that will be detected, in dBmO. The range is 0 to 20. The default is 10.
-------------	---

Defaults

10 dBm0.

Command Modes

Voice-class configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command creates a detection limit for one parameter within a voice class that you can apply to any voice port.

Examples

The following example specifies 6 dBm0 as the maximum tone power that will be detected in voice class 70:

```
Router(config)# voice class dualtone-detect-params 70
Router(cfg-dual-detect)# freq-max-power 6
Router(cfg-dual-detect)#
```

Related Commands

Command	Description
supervisory dualtone-detect-params	Assigns the boundary and detection tolerance parameters defined by the voice class dualtone-detect-params command to a voice port.
dualtone	Defines the tone and cadence for a custom call progress tone.
supervisory disconnect dualtone	Enables disconnect supervision on a voice port.

freq-min-power

To specify the lower limit of the tone power that will be detected, use the **freq-min-power** voice-class configuration command. To restore the default value, use the **no** form of this command.

freq-min-power *dBmO*

no freq-min-power

Syntax Description	<i>dBmO</i>	The lower limit of the tone power that will be detected, in minus dBmO. The range is 10 to 35 (–10 dBm0 to –35 dBm0). The default is 30 (–30 dBm0).
---------------------------	-------------	---

Defaults	30 (–30 dBm0)
-----------------	---------------

Command Modes	Voice-class configuration
----------------------	---------------------------

Command History	Release	Modification
	12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines	This command creates a detection limit for one parameter within a voice class that you can apply to any voice port.
-------------------------	---

Examples	The following example specifies –25 dBm0 as the minimum tone power that will be detected in voice class 70:
-----------------	---

```
Router(config)# voice class dualtone-detect-params 70
Router(cfg-dual-detect)# freq-min-power 25
Router(cfg-dual-detect)#
```

Related Commands	Command	Description
	supervisory dualtone-detect-params	Assigns the boundary and detection tolerance parameters defined by the voice class dualtone-detect-params command to a voice port.
	dualtone	Defines the tone and cadence for a custom call progress tone.
	supervisory disconnect dualtone	Enables disconnect supervision on a voice port.

freq-power-twist

To specify the maximum power difference allowed between the two frequencies of a call progress tone, use the **freq-power-twist** voice-class configuration command. To restore the default value, use the **no** form of this command.

freq-power-twist *dBmO*

no freq-power-twist

Syntax Description

<i>dBmO</i>	The maximum power difference allowed between the two frequencies of a call progress tone. The range is 0 to 15. The default is 6.
-------------	--

Defaults

6 dBm0

Command Modes

Voice-class configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command creates a detection limit for one parameter within a voice class that you can apply to any voice port.

Examples

The following example specifies 15 dBm0 as the maximum power difference allowed between the two tone frequencies in voice class 70:

```
Router(config)# voice class dualtone-detect-params 70
Router(cfg-dual-detect)# freq-power-twist 15
Router(config)#
```

Related Commands

Command	Description
supervisory dualtone-detect-params	Assigns the boundary and detection tolerance parameters defined by the voice class dualtone-detect-params command to a voice port.
dualtone	Defines the tone and cadence for a custom call progress tone.
supervisory disconnect dualtone	Enables disconnect supervision on a voice port.

frequency

To define the frequency components for a call progress tone, use the **frequency** dualtone configuration command. To restore the default frequency components, use the **no** form of this command.

frequency *frequency-1* [*frequency-2*]

no frequency

Syntax Description

<i>frequency-1</i>	One frequency component of the tone to be detected, in Hz. The range is 300 to 3600. The default is 300 Hz.
<i>frequency-2</i>	A second frequency component of the tone to be detected, in Hz. The range is 300 to 3600 or you can specify 0. The default is that no second frequency component is detected.

Defaults

A single continuous tone of 300 Hz is detected.

Command Modes

Dualtone configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command specifies the frequency component for a class of custom call progress tones.

You need to define frequency that you want a voice port to detect. Reenter the command for each additional frequency to be detected.

Examples

The following example defines a frequency for the busy tone in the custom tone voice class with the name **country-x**.

```
Router(config)# voice class custom-cptone country-x
Router(cfg-cptone)# dualtone busy
Router(cfg-cp-dualtone)# frequency 480 620
Router(cfg-cp-dualtone)#
```

Related Commands

Command	Description
voice class custom-cptone	Creates a voice class for defining custom call progress tones.
voice class dualtone-detect-params	Modifies the boundaries and limits for custom call progress tones defined by the voice class custom-cptone command.
supervisory custom-cptone	Associates a class of custom call progress tones with a voice port.

supervisory custom-cptone

To associate a class of custom call-progress tones with a voice port, use the **supervisory custom-cptone** voice-port command. Use the **no** form of this command to restore the default call-progress tones on a voice port.

supervisory custom-cptone *cptone-name*

no supervisory custom-cptone *cptone-name*

Syntax Description

<i>cptone-name</i>	The descriptive identifier of the class of custom call progress tones to be detected by a voice port. This name must match the <i>cptone-name</i> of a class of tones defined by the voice class custom-cptone command.
--------------------	---

Defaults

The United States standard call progress tones are associated with a voice port.

Command Modes

Voice-port configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command associates a class of custom call-progress tones, defined by the **voice class custom-cptone** command, with a voice port.

You can associate the same custom call-progress tones to multiple voice ports.

You can associate only one class of custom call-progress tones with a voice port. If you associate a second class of custom call-progress tones with a voice port, the second class of custom tones replaces the one previously assigned.

This feature is applicable to analog FXO voice ports with loop-start signaling.

Examples

The following example associates the call-progress tone with the name **country-x** with voice ports 1/4 and 1/5:

```
Router(config)# voice-port 1/4
Router(config-voice-class)# supervisory custom-cptone country-x
Router(config-voiceport)# exit
Router(config)# voice-port 1/5
Router(config-voice-class)# supervisory custom-cptone country-x
Router(config-voice-class)# exit
```

Related Commands	Command	Description
	dualtone	Defines a call progress tone to be detected.
	supervisory disconnect dualtone	Enables disconnect supervision on an FXO voice port.

supervisory disconnect dualtone

To enable disconnect supervision on an FXO voice port, use the **supervisory disconnect dualtone** voice-port configuration command. Use the **no** form of this command to disable disconnect supervision on a voice port.

```
supervisory disconnect dualtone {mid-call | pre-connect}
```

```
no supervisory disconnect dualtone {mid-call | pre-connect}
```

Syntax Description

mid-call	Configures disconnect supervision to operate throughout the duration of the call.
pre-connect	Configures disconnect supervision to operate during call set-up, and to stop when the called telephone goes off-hook.

Defaults

Disconnect supervision is not enabled on voice ports.

Command Modes

Voice-port configuration

Command History

Release	Modification
12.1(3)T	This command was introduced on the Cisco 2600 series, Cisco 3600 series, and Cisco MC3810 series as supervisory disconnect dualtone voice-class .
12.1(5)XM	The syntax was changed to remove voice-class .

Usage Guidelines

This command configures an FXO voice port to go on-hook when the router detects a disconnect tone from a PBX or from the PSTN.

The voice port detects the call progress tones that are associated with the voice port by the **supervisory custom-cptone** command. If you do not enter the **supervisory custom-cptone** command, the voice port detects the call progress tones defined by the **cptone** command.

This feature is applicable to analog FXO voice ports with loop-start signaling.

Examples

The following example specifies tone detection during the entire call duration:

```
Router(config)# voice-port 1/5
Router(config-voiceport)# supervisory disconnect dualtone mid-call
Router(config-voiceport)# exit
```

The following example specifies tone detection only during call set-up:

```
Router(config)# voice-port 0/1/1
Router(config-voiceport)# supervisory disconnect dualtone pre-connect
Router(config-voiceport)# exit
```

Related Commands	Command	Description
	supervisory custom-cptone	Associates a class of custom call progress tones with a voice port.
	timeouts wait-release	Configures the duration in seconds that a voice port waits before dropping a call, after disconnect tones are detected.
	voice class dualtone-detect-params	Modifies the frequency, power, and cadence tolerances of call progress tones.

supervisory dualtone-detect-params

To associate a class of modified tone detection tolerance limits with a voice port, use the **supervisory dualtone-detect-params** voice-port configuration command. Use the **no** form of this command to restore the default tone detection tolerance limits to a voice port.

supervisory dualtone-detect-params *tag*

no supervisory dualtone-detect-params

Syntax Description

<i>tag</i>	The tag number of the set of modified tone detection tolerance limits to be associated with this voice port. The tag number must match the tag number of a voice class configured by the voice class dualtone-detect-params global configuration command. The range is 1 to 10000. There is no default.
------------	---

Defaults

The default tone detection tolerance limits are associated with voice ports.

Command Modes

Voice-port configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines

This command associates a specific set of modified tone detection tolerance limits, defined by the **voice class dualtone-detect-params** command, to a voice port.

You can associate the same class of modified tone detection tolerance limits to multiple voice ports.

You can associate only one class of modified tone detection tolerance limits to a voice port. If you associate a second class of modified tone detection tolerance limits with a voice port, the second class replaces the one previously assigned.

This feature is applicable to analog FXO voice ports with loop-start signaling.

Examples

The following example associates the class of modified tone detection tolerance limits with the tag 70 with voice ports 1/5 and 1/6.

```
Router(config)# voice-port 1/5
Router(config-voiceport)# supervisory dualtone-detect-params 70
Router(config-voiceport)# exit
Router(config)# voice-port 1/6
Router(config-voiceport)# supervisory dualtone-detect-params 70
Router(config-voiceport)# exit
```

The following example restores the default tone detection parameters to voice port 1/5.

```
Router(config)# voice-port 1/5  
Router(config-voiceport)# no supervisory dualtone-detect-params  
Router(config-voiceport)# exit
```

Related Commands

Command	Description
voice class dualtone-detect-params	Creates a voice class for call progress tone detection tolerance parameters.
supervisory disconnect dualtone	Enables disconnect supervision on an FXO voice port.

voice class custom-cptone

To create a voice class for defining custom call progress tones to be detected, use the **voice class custom-cptone** global configuration command. To delete the voice class, use the **no** form of this command.

voice class custom-cptone *cptone-name*

no voice class custom-cptone *cptone-name*

Syntax Description

<i>cptone-name</i>	A descriptive identifier for this class of custom call progress tones.
--------------------	--

Defaults

No voice class of custom call progress tones is created.

Command Modes

Global configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced on the Cisco 2600, 3600 and MC3810 series.

Usage Guidelines

Use this command to define a voice class and enter voice class configuration mode. The *cptone-name* tag is used to associate this set of custom call progress tones with voice ports.

Examples

The following example creates a voice class named **country-x**.

```
Router(config)# voice class custom-cptone country-x
Router(cfg-cptone)#
```

Related Commands

Command	Description
dualtone	Defines the tone and cadence for a custom call progress tone.
voice class dualtone-detect-params	Modifies the boundaries and limits for call progress tones.
supervisory custom-cptone	Associates a class of custom call progress tones with a voice port.

voice class dualtone-detect-params

To create a voice class for defining a set of tolerance limits for the frequency, power, and cadence parameters of the tones to be detected, use the **voice class dualtone-detect-params** global configuration command. To delete a voice class, use the **no** form of this command.

```
voice class dualtone-detect-params tag
```

```
no voice class dualtone-detect-params tag
```

Syntax Description	<i>tag</i>	A unique tag identification number assigned to this voice class. The range is 1 to 10000.
---------------------------	------------	---

Defaults No voice class is configured for defining tone-detection tolerance limits.

Command Modes Global configuration

Command History	Release	Modification
	12.1(5)XM	This command was introduced on the Cisco 2600, Cisco 3600, and Cisco MC3810 series.

Usage Guidelines Use this command to create a voice class in which you can define maximum and minimum call progress tone tolerance parameters that you can apply to any voice port. These parameters further define the call progress tones defined by the **voice class custom-cptone** command. Use the **supervisory dualtone-detect-params** command to apply these tolerance parameters to a voice port.

Examples The following example creates **cfg-dual-detect** voice class 70, in which you can specify modified boundaries and limits for call progress tone detection.

```
Router(config)# voice class dualtone-detect-params 70
Router(cfg-dual-detect)# freq-max-deviation 25
Router(cfg-dual-detect)# freq-max-power -5
Router(cfg-dual-detect)# freq-min-power -20
Router(cfg-dual-detect)# freq-power-twist 10
Router(cfg-dual-detect)# freq-max-delay 50
Router(cfg-dual-detect)# cadence-variation 80
Router(cfg-dual-detect)# exit
Router(config)#
```

Related Commands	Command	Description
	supervisory dualtone-detect-params	Assigns the boundary and detection tolerance parameters defined by the voice class dualtone-detect-params command to a voice port.

Glossary

ABCD signaling—Four-bit telephony line signaling coding in which each letter of “ABCD” represents one of the four bits. This is often associated with CAS or Robbed-Bit signaling on a T1 or E1 telephony trunk.

AIS—Alarm Indication Signal.

AVBO—Advanced Voice Busy Out.

Cisco trunk (private line) call—A Cisco trunk (private line) call is established by the forced connection of a dynamic switched call. A Cisco trunk call is established during configuration of the trunk and stays up for the duration of the configuration. Optionally, it provides a pass-through connection path to pass signaling information between the two telephony interfaces at either end of the connection.

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.

CPTone—Call progress tone. Tones sent from a PBX or from the PSTN to support answer supervision and disconnect supervision by voice ports.

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 VoHDLC.

DSP—Digital Signaling Processor.

DTMF—Dual tone multi frequency. 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—Refers to 2-wire or 4-wire interfaces with separate signaling paths (from “Ear and Mouth,” also “recEive and transMit”). E&M is a trunking arrangement generally used for two-way switch-to-switch or switch-to-network connections. The Cisco 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. The clock rate is 2.048 Mhz.

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>.

FRF.11—Frame Relay Forum implementation agreement for Voice over Frame Relay (v1.0 May 1997). This specification defines multiplexed data, voice, fax, DTMF digit-relay, and CAS/Robbed-bit signaling frame formats, but does not include call setup, routing, or administration facilities. See <http://www.frforum.com>.

FRF.11 Annex C—See FRF.12.

FRF11-trunk—A point-to-point permanent voice connection (private line) conforming to the FRF.11 specification.

FRF.12—The FRF.12 Implementation Agreement (also known as FRF.11 Annex C) was developed to allow long data frames to be fragmented into small pieces and interleaved with real-time frames. In this way, real-time voice and non real-time data frames can be carried together on low speed links without causing excessive delay to the real-time traffic.

FXO—Foreign Exchange Office. An FXO interface connects to the Public Switched Telephone Network (PSTN) central office and is the interface offered on a standard telephone. The Cisco FXO interface is an RJ-11 connector that allows an analog connection to be directed to the PSTN 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. The Cisco FXS interface is an RJ-11 connector that allows connections to basic telephone service equipment, keysets, and PBXs.

ICPIF—Calculated Planning Impairment Factor.

LVBO—Local Voice Busy Out.

MEL CAS—Mercury Exchange Limited (MEL) Channel Associated Signaling (CAS). 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.

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

RTR—Response Time Reporter.

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.

Tandem switching—The dynamic switching of voice calls between VoFR, VoATM, or VoHDL PVCs and subchannels; also called tandeming. Tandem switching is often encountered in multi-hop VoFR call connection paths.

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.

VoFR—Voice over Frame Relay.

VoFR dial peer—Dial peer connected by a Frame Relay network. VoFR peers point to specific VoFR devices.

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.

VoIP—Voice over IP through Ethernet.