



# Configuring Feature Mode

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This module describes how to enable the Skinny Client Control Protocol (SCCP) feature mode call-control mode for analog foreign exchange service (FXS) ports on Cisco voice gateways, including Cisco VG224 Analog Phone Gateways and Cisco Integrated Services Routers (ISRs), and under the control of Cisco Unified Communications Manager or Cisco Unified Communications Manager Express (Cisco Unified CME).

## **Finding Feature Information in This Module**

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the “[Feature Information for Feature Mode for SCCP FXS Ports in Cisco IOS Feature](#)” section on page 104.

## **Finding Support Information for Platforms and Cisco IOS Software Images**

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

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# Prerequisites for Configuring Feature Mode for SCCP FXS Ports in Cisco IOS

## Cisco IOS Gateway

- Cisco IOS Release 12.4(6)XE or a later release.
- The Cisco voice gateway is set up and configured for operation. For information, see the appropriate Cisco configuration documentation.
- The analog FXS voice ports are set up and configured for operation. For information, see the [Cisco IOS Voice Port Configuration Guide](#).
- SCCP and the SCCP telephony control (STC) application is enabled on the Cisco voice gateway. For configuration information, see the [“Configuring FXS Ports for Basic Calls” section on page 17](#).

## Analog Endpoints in Cisco Unified Communications Manager

- Cisco Unified Communications Manager 4.2 or a later version.
- Phones are added and configured in Cisco Unified Communications Manager. See the “Directory Number Configuration” chapter under “Call Routing Configuration” and the “Gateway Configuration” chapter under “Device Configuration” in the appropriate [Cisco Unified Communications Manager Administration Guide](#).

## Analog Endpoints in Cisco Unified CME

- Cisco Unified CME 4.0 or a later version.
- Ephone configurations and feature parameters for analog endpoints are configured in Cisco Unified CME. For information, see the [Cisco Unified CME Administration Guide](#).
- To use call transfer on analog endpoints in Cisco Unified CME, set the **transfer-system** command to full-consult on the Cisco router. For configuration information, see the [“Configuring Call Transfer and Forwarding” module in the Cisco Unified CME Administration Guide](#).

The following example shows how to configure full consultation as the call transfer method:

```
Router(config)# telephony-service
Router(config-telephony)# transfer-system full-consult
```

- For the Drop Last Party feature in Cisco Unified CME 4.0:
  - Cisco IOS Release 12.4(9)T or a later release.
  - The **keep-conference drop-last** command is enabled on Cisco router. For configuration information, see the [“Configuring Conferencing” module in the Cisco Unified CME Administration Guide](#).

# Restrictions for Feature Mode for SCCP FXS Ports in Cisco IOS

## Analog Endpoints in Cisco Unified CME

- Autoconfiguration using TFTP download of extensible markup language (XML) dial-peer configuration files from Cisco Unified Communications Manager is not supported
- This feature is not supported on a VIC2-2BRI-NT/TE.

# Information About Feature Mode for SCCP FXS Ports in Cisco IOS

To configure the Feature Mode for SCCP FXS Ports in Cisco IOS feature, you should understand the following concepts:

- [Summary of Supported Features in Feature Mode, page 95](#)
- [Feature Mode for SCCP FXS Ports in Cisco IOS, page 96](#)

## Summary of Supported Features in Feature Mode

**Table 1** contains a list of SCCP supplementary features that are supported in feature mode on analog phones connected to FXS ports, along with descriptions and information about how to configure support for each feature in your Cisco call-control system.



**Note**

For information about individual commands in Cisco Unified CME, see the [Cisco Unified CME Command Reference](#).

**Table 1**      **Feature Mode: Supported Supplementary Features**

Feature	How Phone User Accesses Feature	Configuration on Call-Control System
<b>Call Transfer</b> Connects call to a third party that the phone user dials.	User in basic call mode presses hookflash to get the first dial tone, then dials an extension number to connect to a second call. When the second call is established, user presses hookflash to get feature tone and then dials #2 to transfer the call; the user hears silence after the call is transferred.	<b>Cisco Unified Communications Manager</b> For feature information, see the “Making and Receiving Multiple Calls Per Directory Number” section of the “Understanding Directory Numbers” chapter under “Dial Plan Architecture” in the <a href="#">Cisco Unified Communications Manager System Guide</a> . <b>Cisco Unified CME</b> To configure, see “ <a href="#">Configuring Call Transfer and Forwarding</a> ” in the <a href="#">Cisco Unified CME Administration Guide</a> .
<b>Conference Call</b> Initiates a three-party conference.	User in basic call mode presses hookflash to get the first dial tone, then dials an extension number to connect to a second call. When the second call is established, user presses hookflash to get feature tone and then dials #3 to initiate a three-party conference.	<b>Cisco Unified Communications Manager</b> For feature information, see the “Initiating an Ad Hoc Conference Bridge” section of the “Conference Bridges” chapter under “Media Resources” in the <a href="#">Cisco Unified Communications Manager System Guide</a> . <b>Cisco Unified CME</b> To configure, see “ <a href="#">Configuring Conferencing</a> ” in the <a href="#">Cisco Unified CME Administration Guide</a> .

**Table 1**      **Feature Mode: Supported Supplementary Features (continued)**

Feature	How Phone User Accesses Feature	Configuration on Call-Control System
<b>Drop Last Conferee</b>	<p><b>Cisco Unified Communications Manager</b></p> <p>The next hookflash after a three-party conference call is established drops the last conferee.</p> <p><b>Cisco Unified CME</b></p> <p>During a three-party conference, user presses hookflash to get feature tone and then dials #4 to drop the last active party. The conference becomes a basic call to the second call party.</p>	No additional configuration is required on the Cisco call-control system.
<b>Hang Up Last Call</b>	<p>During a three-party conference, user presses hookflash to get feature tone and then dials #1 to drop the last active call party. The conference becomes a basic call.</p>	<p><b>Cisco Unified Communications Manager</b></p> <p>No additional configuration is required on the Cisco call-control system.</p> <p><b>Cisco Unified CME</b></p> <p>The <b>keep-conference drop-last</b> command is enabled on Cisco router. For configuration information, see the “<a href="#">Configuring Conferencing</a>” module in the <i>Cisco Unified CME Administration Guide</i>.</p>
<b>Toggle Between Calls</b>	<p>User in basic call mode presses hookflash to get the first dial tone, then dials an extension number to connect to a second call. During the second call, user presses a hookflash to get feature tone and then dials #5 to toggle back to the previous call party.</p>	No additional configuration is required on the Cisco call-control system.

## Feature Mode for SCCP FXS Ports in Cisco IOS

In Cisco IOS Release 12.4(6)XE and later releases, Feature Mode for SCCP FXS Ports in Cisco IOS provides enhanced call-control mode capability on analog ports on Cisco voice gateways. Before Cisco IOS Release 12.4(6)XE, the SCCP analog gateway supported only standard mode feature activation, the default telephony mode which provides standard Bellcore features.

When feature mode is enabled on a Cisco voice gateway, calls through the analog FXS ports are controlled by Cisco Unified Communications Manager or by Cisco Unified CME, with basic call support in SRST mode. The SCCP telephony control (STC) application on the Cisco voice gateway functions as a proxy to translate call-control messages between the Cisco call-control system and the voice gateway.

In feature mode, the user enters a specific combination of digits called feature access codes (FACs) consisting of a prefix plus a feature code, for example #1. The prefix for FACs in feature mode is a number sign (#). In standard mode, the user uses a hookflash to activate supplementary features like call transfer and call conference.

Feature mode is limited to outgoing calls only. All feature mode functions are performed after the second call is established. A user in basic call mode performs a hookflash to get the first dial tone, then dials an extension number to connect to a second call. When the second call is established, the user performs a hookflash to get a feature tone, a special dial tone used to indicate feature mode, then dials the FAC.

[Table 2](#) lists FACs used to access telephony features in feature mode only.

**Table 2** *FACs Used to Access Telephony Features in Feature Mode*

Feature	FAC
Drop last active call	#1
Call transfer	#2
Call conference	#3
Drop last conferee	#4
Toggle between two calls	#5



**Note**

For a list of FACs and feature speed dials (FSDs) that are available in both feature mode and standard mode, see the [“Summary of SCCP Supplementary Features for FXS ports”](#) section on page 58.

For configuration information for feature mode, see the [“How to Configure Feature Mode for SCCP FXS Ports in Cisco IOS”](#) section on page 98.

## Flexible FACs in Feature Mode

Before Cisco IOS Release 15.0(1)M, FACs in feature mode were limited to two characters (# and 1 to 5) and could not be modified.

In Cisco IOS Release 15.0(1)M and later releases, you can configure FACs for accessing features that are supported in feature mode to create four-character (0-9, #, \*) strings that can be dialed on the keypad after the user hears the feature tone. The default FACs for telephony features in feature mode continue to be supported. For default FACs in feature mode, see [Table 2](#).

If you attempt to set a FAC to a value that is already configured for another FAC in feature mode, you receive a warning message. If you configure a duplicate FAC, the system implements the first feature it matches in the order of precedence as determined by the value for each FAC.

If you attempt to set a FAC to a value that precludes or is precluded by another FAC in feature mode, you receive a warning message. For example, if you attempt to set a FAC of 123 and 12 is already configured for another feature, such as Call Transfer, the following message appears:

```
123 is precluded by call transfer(12)
```

Or if you attempt to configure 1 and 12 is already configured for another feature, such as Call Transfer, the following message appears:

```
1 precludes call transfer(12)
```

These messages will not prevent you from configuring the feature code.

For configuration information, see the [“Configuring Flexible FACs in Feature Mode”](#) section on page 99.

## Feature Mode Error Handling

If the user does nothing after feature tone is heard, the interdigit timeout expires and a fast busy tone is played. The user must press hookflash again to toggle back to the previous state. User input other than a hookflash is not accepted during a fast busy tone.

If the user dials an incorrect combination of digits, the fast busy tone is played. The user must perform a hookflash to toggle back to the previous state.

If the user hangs up after feature tone is heard, then power-ring-back on the phone is played. If the user goes off hook, the user is connected to the first call.

If the user performs any of the following actions, the call is transferred:

- Hangs up after feature tone is heard and before the interdigit timeout expires.
- Hangs up after feature tone is heard and after the interdigit timeout expires and the fast busy tone is heard.
- Hangs up after the feature tone is heard and after an incomplete digit is pressed and no fast busy tone is heard.
- Hangs up after the feature tone is heard and after an incorrect digit combination is pressed and a fast busy tone is heard.

# How to Configure Feature Mode for SCCP FXS Ports in Cisco IOS

This section contains the following tasks:

- [Configuring Feature Mode, page 98](#) (required)
- [Troubleshooting the Feature Mode for SCCP FXS Ports Configuration, page 99](#) (optional)
- [Configuring Flexible FACs in Feature Mode, page 99](#) (optional)

## Configuring Feature Mode

To configure feature mode for SCCP analog phones on a Cisco voice gateway and enable SCCP analog phones to invoke features using standard FACs after hookflash, perform the following steps.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **stcapp call-control mode feature**
4. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>stcapp call-control mode feature</b>  <b>Example:</b> Router(config)# stcapp call-control mode feature	Enables feature call control mode.
Step 4	<b>exit</b>  <b>Example:</b> Router(config-stcapp-fmcode)# exit	Exits global configuration mode.

## Troubleshooting the Feature Mode for SCCP FXS Ports Configuration

Use the following commands to verify and troubleshoot call control modes and display debugging information for feature mode calls:

- **show stcapp feature codes**—Displays feature access codes.
- **debug voip application stcapp all**—Displays debugging messages for STC application-controlled phones configured in feature mode.
- **debug voip application stcapp port**—Displays debugging information for the components of the STCAPP for a specified port
- **debug vpm signal**—Displays information for signaling events for feature and standard mode calls, including PBX signaling.

For information about these commands, see the [Cisco IOS Voice Command Reference](#) or the [Cisco IOS Debug Command Reference, Release 12.4T](#), and [Cisco IOS Configuration Fundamentals Command Reference, Release 12.4](#).

## Configuring Flexible FACs in Feature Mode

To define a feature access codes (FACs) to invoke features supported in feature mode, perform the following steps.

### Prerequisites

- Cisco IOS Release 15.0(1)M or a later release.

## Restrictions

- If you configure the same value for more than one feature code in feature mode, the system implements the first feature it matches in the order of precedence.
- If you configure a FAC to a value that precludes or is precluded by another FAC in feature mode, the system implements the feature with the shortest FAC first. The precluded FAC cannot be implemented.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **stcapp call-control mode feature**
4. **conference** *keypad-character*
5. **hangup-last-active-call** *keypad-character*
6. **drop-last-conferee** *keypad-character*
7. **toggle-between-two-calls** *keypad-character*
8. **transfer** *keypad-character*
9. **end**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>stcapp call-control mode feature</b>  <b>Example:</b> Router(config-stcapp-fmcode)# stcapp call-control mode feature	Enables feature call control mode and enters STC application feature-call-control configuration mode.
Step 4	<b>conference</b> <i>keypad-character</i>  <b>Example:</b> Router(config-stcapp-fmcode)# conference *	(Optional) Sets the code to use for initiating a three-party conference. <ul style="list-style-type: none"> <li>• <i>keypad-character</i>—String that can be dialed on a phone keypad. The length of <i>keypad-character</i> must be 1 to 4 characters (0-9, #, *). Default is #3.</li> </ul>

	Command or Action	Purpose
Step 5	<p><b>drop-last-conferee</b> <i>keypad-character</i></p> <p><b>Example:</b>  Router(config-stcapp-fmcode)#  drop-last-conferee 44</p>	<p>(Optional) Sets the code to use for dropping last active call during a three-party conference.</p> <ul style="list-style-type: none"> <li><i>keypad-character</i>—String that can be dialed on a phone keypad. The length of <i>keypad-character</i> must be 1 to 4 characters (0-9, #, *). Default is #4.</li> <li>The <b>keep-conference drop-last</b> command must be enabled on Cisco router.</li> </ul>
Step 6	<p><b>hangup-last-active-call</b> <i>keypad-character</i></p> <p><b>Example:</b>  Router(config-stcapp-fmcode)#  hangup-last-active-call 11</p>	<p>(Optional) Sets the code to use for dropping last active call during a three-party conference.</p> <ul style="list-style-type: none"> <li>For phones controlled by Cisco Unified CME. This command does not affect user experience on phones controlled by Cisco Unified Communications Manager.</li> <li><i>keypad-character</i>—String that can be dialed on a phone keypad. The length of <i>keypad-character</i> must be 1 to 4 characters (0-9, #, *). Default is #1.</li> </ul>
Step 7	<p><b>toggle-between-two-calls</b> <i>keypad-character</i></p> <p><b>Example:</b>  Router(config-stcapp-fmcode)#  toggle-between-two-calls 55</p>	<p>(Optional) Sets the code to use for toggling between two active calls.</p> <ul style="list-style-type: none"> <li><i>keypad-character</i>—String that can be dialed on a phone keypad. The length of <i>keypad-character</i> must be 1 to 4 characters (0-9, #, *). Default is #5.</li> </ul>
Step 8	<p><b>transfer</b> <i>keypad-character</i></p> <p><b>Example:</b>  Router(config-stcapp-fmcode)# transfer ##</p>	<p>(Optional) Sets the code to use for connecting a call to a third party that the phone user dials.</p> <ul style="list-style-type: none"> <li><i>keypad-character</i>—String that can be dialed on a phone keypad. The length of <i>keypad-character</i> must be 1 to 4 characters (0-9, #, *). Default is #2.</li> </ul>
Step 9	<p><b>end</b></p> <p><b>Example:</b>  Router(config-stcapp-fmcode)# end</p>	<p>Exits STC application feature access-code configuration mode and returns to privileged EXEC mode.</p>

## Examples

The following example shows how to change the value of the feature code for supplementary features supported in feature mode from the defaults:

```
Router(config)# stcapp call-control mode feature
Router(config-stcapp-fmcode)# conference 33
Router(config-stcapp-fmcode)# drop-last-active-conferee 44
Router(config-stcapp-fmcode)# hangup-last-active-call 11
Router(config-stcapp-fmcode)# toggle-between-two-calls 55
Router(config-stcapp-fmcode)# transfer 22
Router(config-stcapp-fmcode)# exit
Router(config)#
```

# Configuration Examples for Feature Mode for SCCP FXS Ports in Cisco IOS

The following example shows feature call control mode enabled:

```
Router# show running-config
.
.
.
stcapp call-control mode feature
!
```

The following example shows standard call control mode enabled:

```
Router# show running-config
.
.
.
stcapp call-control mode standard
!
```

## Additional References

The following sections provide references related to the Feature Mode for SCCP FXS Ports in Cisco IOS feature.

## Related Documents

Related Topic	Document Title
Cisco Unified Communications Manager interoperability	<a href="#">Cisco Unified CallManager and Cisco IOS Interoperability Guide</a>
Cisco Unified Communications Manager	<a href="#">Cisco Unified Communications Manager System Guide</a>
Cisco Unified Communications Express	<a href="#">Cisco Unified CME Administrator Guide</a>
Cisco IOS debugging	<a href="#">Cisco IOS Debug Command Reference</a>
Cisco IOS voice commands	<a href="#">Cisco IOS Voice Command Reference</a>
Cisco IOS voice configuration guides	<a href="#">Cisco IOS Voice Configuration</a>

## Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p><a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a></p>

# Feature Information for Feature Mode for SCCP FXS Ports in Cisco IOS Feature

Table 3 lists the features in this module and provides links to specific configuration information. Only features that were introduced or modified in Cisco IOS Release 12.4(6)XE or a later release appear in the table.

For information on a feature in this technology that is not documented here, see the “[Supplementary Services Features Roadmap](#)” section on page 1.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



## Note

Table 3 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

**Table 3** Feature Information for Feature Mode for SCCP FXS Ports in Cisco IOS Feature

Feature Name	Releases	Feature Information
Feature Mode for SCCP FXS Ports in Cisco IOS	12.4(6)XE 12.4(11)T	<p>Enables feature mode call control on analog FXS ports on Cisco voice gateways and under the control of Cisco Unified Communications Manager or Cisco Unified CME.</p> <p>The following sections provide information about this feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Information About Feature Mode for SCCP FXS Ports in Cisco IOS, page 95</a></li> <li>• <a href="#">How to Configure Feature Mode for SCCP FXS Ports in Cisco IOS, page 98</a></li> </ul> <p>The following commands were introduced or modified by this feature: <b>debug voip application stcapp all</b>; <b>debug voip application stcapp port</b>; <b>show stcapp feature codes</b>; <b>stcapp call-control mode</b></p>

**Table 3** *Feature Information for Feature Mode for SCCP FXS Ports in Cisco IOS Feature (continued)*

<b>Feature Name</b>	<b>Releases</b>	<b>Feature Information</b>
Flexible FACs in Feature Mode	15.0(1)M	<p>Enables configurable feature access codes (FACs) for accessing supplementary features that are supported in feature mode.</p> <p>The following sections contain information about this feature:</p> <ul style="list-style-type: none"><li>• <a href="#">Flexible FACs in Feature Mode, page 97</a></li><li>• <a href="#">Configuring Flexible FACs in Feature Mode, page 99</a></li></ul> <p>The following commands were introduced or modified by this feature: <b>conference</b>; <b>drop-last-conferee</b>; <b>hangup-last-active-call</b>; <b>toggle-between-two-calls</b>; <b>transfer</b></p>

