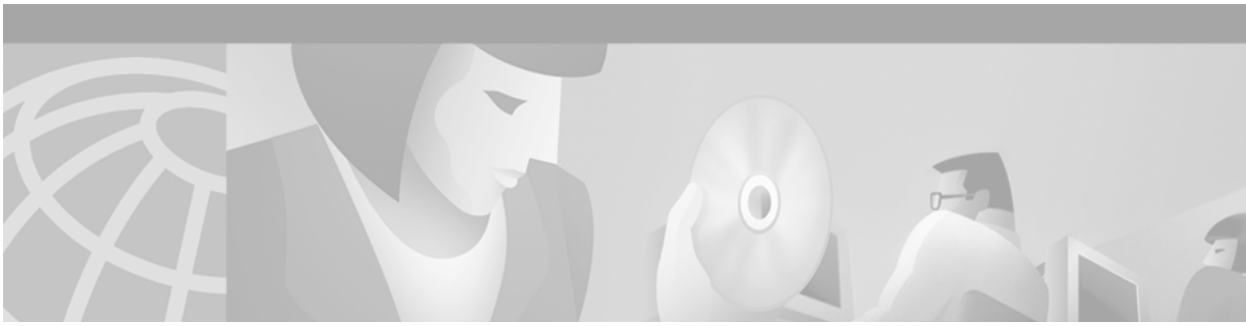


Voice over IP Q.SIG Network Transparency

Feature History

Release	Modification
12.0(7)T	This feature was introduced
12.1(5)XM2	Support was added for the Cisco AS5350 and Cisco AS5400 universal gateways.

This feature module describes the Voice over IP Q.SIG network transparency feature for the Cisco AS5300 and Cisco AS5400. It includes information on the benefits of the new feature, supported platforms, and related documents.

This document includes the following sections:

Feature Overview

Integration of Q.SIG with the Cisco AS5300 universal access server enables Cisco voice switching services to connect private branch exchanges (PBXs), key systems (KTs), and central office switches (COs) that communicate by using the Q.SIG protocol.

The Q.SIG protocol is a variant of ISDN D-channel voice signaling. It is based on the ISDN Q.921 and Q.931 standards and is becoming a worldwide standard for PBX interconnection. By using Q.SIG signaling, the Cisco AS5300 can route incoming voice calls from a private integrated services network exchange (PINX) across a wide-area network (WAN) to a peer Cisco AS5300, which can then transport the signaling and voice packets to a second PINX.

Note In Cisco IOS Release 12.0(7)T, the Cisco AS5300 supports ISDN PRI only when a Q.SIG connection to the PINX is configured on the T1/E1 controller.

Q.SIG on the AS5300 allows the user to place Q.SIG calls into and receive Q.SIG calls from Cisco Voice-over-IP (VoIP) networks. The Cisco packet network appears to PBXs as a large, distributed transit PBX that can establish calls to any destination served by a Cisco voice node. The switched voice connections are established and torn down in response to Q.SIG control messages that come over an ISDN PRI D channel. The Q.SIG message is passed transparently across the IP network and the message appears to the attached PINXs as a transit network. The PINXs are responsible for processing and provisioning the attached services.

Benefits

Q.SIG voice signaling on the Cisco AS5300 provides the following benefits:

- Enables the Cisco AS5300 to connect with digital PBXs that use the Q.SIG form of common channel signaling.
- Provides access to multiple remote PBXs with a single connection to a Cisco AS5300.
- Provides transparent support for supplementary PBX services, so that proprietary PBX features are not lost when connecting PBXs to Cisco AS5300 networks.
- Provides Q.SIG support based on widely used ISDN Q.931 standards. Cisco's Q.SIG implementation follows the following ETSI implementation standards:
  - ECMA 143: *Private Telecommunication Network (PTN) Inter-exchange Signaling Protocol Circuit Mode Basic Services*. (This specification covers Q.SIG basic call services.)
  - ECMA 142: *Specification, Functional Model and Information flows for Control Aspects of Circuit Mode Basic Services in Private Telecommunication Networks*.
  - ECMA 141: *Private Telecommunications Networks Inter-exchange Signaling Data Link Layer Protocol*.
  - ECMA 165: *Generic Functional Protocol for the Support of Supplementary Services*.
- Compatibility with H.323 for IP call setup and transport of Q.SIG messaging
- Support for calls that do not require a bearer channel for voice transport
- Support for bandwidth-on-demand, utilizing network resources only when a connection is desired

Restrictions

The following restrictions and limitations apply to the Cisco AS5300 Q.SIG implementation:

- Q.SIG functionality on the AS5300 requires Cisco IOS Release 12.0(7)T and VCWare version 4.04.
- Q.SIG data calls are not supported. All calls with bearer capability indicating a nonvoice type (such as video telephony) are rejected.
- The incoming POTS dial peer must have direct inward dial configured to prevent generation of a secondary dialtone to ensure end-to-end Q.SIG feature transparency.

Related Documents

- *ISDN PRI Q.SIG Voice Signaling*
- *Configuring the Cisco AS5300 for Voice Service Provider Features*
- *Configuring H.323 VoIP Gateway for Cisco Access Platforms*
- *Configuring H.323 VoIP Gatekeeper for Cisco Access Platforms*

Supported Platforms

- Cisco AS5300
- Cisco AS5350
- Cisco AS5400

Supported MIBs and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported by this feature.

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.

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.
- Run Cisco IOS Release 12.1(5)XM2 software for VoIP functionality.

Other Prerequisites

The following configuration tasks should be completed before configuring this feature:

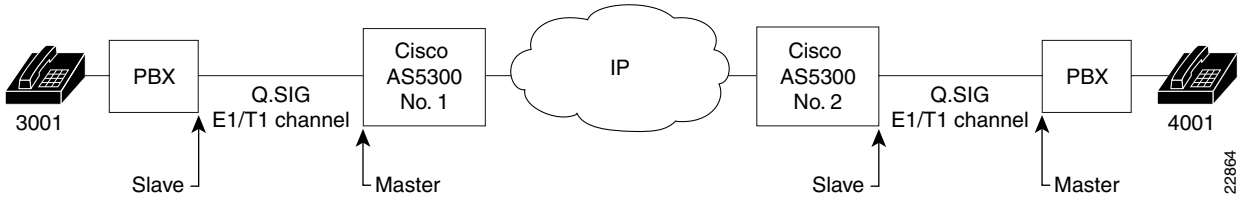
- Configure the Cisco AS5300 voice ports.

- Install VCWare version 4.04.
- Configure Voice-over-IP, including configuring local and voice-network dial peers.

Configuration Tasks

Figure 1 shows an example of a Q.SIG signaling configuration. In this example, the Cisco AS5300 acts as either a master to a slave PBX or as a slave to a master PBX.

Figure 1 Q.SIG Signaling Configuration



Configuring VoIP Q.SIG Software on the Cisco AS5300

To configure Q.SIG signaling support on the Cisco AS5300, complete the following steps, beginning in global configuration mode:

Note When configuring a voice port, use the following configuration designations:
For the Cisco AS5300 access server, port designation is *port*.
For the Cisco AS5350 and Cisco AS5400 universal gateways, port designation is *slot/port*.
For the Cisco AS5800 access server, port designation is *shelf/slot/port*.

	Command	Purpose
Step 1	`Router(config)# isdn switch-type primary-qsig`	Configures the ISDN switch-type to support Q.SIG signaling. **Note** You can configure the ISDN switch type using either this global command or the same command in interface configuration mode, depending on your configuration. (See Step 5.) If you configure the global **isdn-switch-type** command for Q.SIG support, you do not need to configure the interface **isdn-switch-type** command for Q.SIG. **Note** If the PBX in your configuration is an NEC PBX, and you are using Fusion Call Control Signaling (FCCS), proceed to the "Fusion Call Control Signaling (NEC Fusion)" section on page 7.
Step 2	`Router(config)# controller {T1 | E1}`*`controller number`*	Enters interface configuration mode.
Step 3	`Router(config-controller)# pri-group { timeslots 1-24 }`	Configures the PRI group for either T1 or E1 to carry voice traffic. For T1, available timeslots are from 1 to 23, and for E1, available timeslots are from 1 to 31. You can configure the PRI group to include all available timeslots, or you can configure a select group of timeslots for the PRI group. For example, if only timeslots 1 to 10 are in the PRI group, enter **pri-group timeslot 1-10**. If the PRI group includes all channels available for T1 (channels 1 to 24), enter **pri-group timeslot 1-24**. If the PRI group includes all channels available for E1 (channels 1 to 31), enter **pri-group timeslot 1-31**.
Step 4	`Router(config-controller)# exit`	Exits controller configuration mode.
Step 5	`Router(config)# interface serial 1:`*`x`*	Enters interface configuration mode for the ISDN PRI interface. For T1, enter **serial 1:23**. For E1, enter **serial 1:15**.

	Command	Purpose
Step 6	`Router(config-if)# isdn switch-type primary-qsig`	If you did not configure the global ISDN switch type for Q.SIG support in Step 1, configure the interface ISDN switch type to support Q.SIG signaling. The conditions that apply to this command in global configuration mode also apply to this command in interface configuration mode. **Note** This interface command overrides the global **isdn switch-type** command setting for this interface.
Step 7	`Router(config-if)# isdn protocol-emulate { user | network }`	Configures the ISDN interface to serve as either the primary Q.SIG slave or the primary Q.SIG master. For this command, **user** specifies slave and **network** specifies master. If the PINX is the primary Q.SIG master, configure the Cisco AS5300 to serve as the primary Q.SIG slave. If the PINX is the primary Q.SIG slave, configure the Cisco AS5300 to serve as the primary Q.SIG master. For more information about the different options available with this command, see "ISDN Switch Type Command Options" on page 7.
Step 8	`Router(config-if)# isdn overlap-receiving value`	Activates overlap signaling to send to the destination PBX. **Note** This command is not mandatory; you can leave the default as enbloc.
Step 9	`Router(config-if)# isdn incoming-voice modem`	Routes incoming voice calls to the modem and treat them as analog data.
Step 10	`Router(config-if)# isdn network-failure-cause [value]`	(Optional) Specifies the cause code to pass to the PBX when a call cannot be placed or completed because of internal network failures. Possible values are from 1 to 127. **Note** All cause codes except for Normal Call Clearing (16), User Busy (17), No User Responding (18) and No Answer from User (19) will be changed to the specified cause code.

	Command	Purpose
Step 11	`Router(config-if)# isdn bchan-number-order {ascending | descending}`	(Optional) Configures the ISDN Primary Rate Interface (PRI) interface to make the outgoing call selection in ascending or descending order. The default is descending order, in which the first call from the Cisco AS5300 uses channel 23 (T1) or channel 31 (E1). The second call then uses channel 22 (T1) or channel 30 (E1), and so on in descending order. If you select ascending order and the PRI group starts with 1, the first call uses channel 1, the second call uses channel 2, and so on in ascending order. If the PRI group starts with a different timeslot, the ascending order starts with the lowest timeslot.
Step 12	`Router(config-if)# exit`	Exits interface configuration mode.

ISDN Switch Type Command Options

As shown in the preceding section, you have a choice of configuring the **isdn-switch-type** command to support Q.SIG at either the global configuration level or the interface configuration level. For example, if you have a Q.SIG connection on one line as well as on the PRI port, you can configure the ISDN switch type in one of the following combinations:

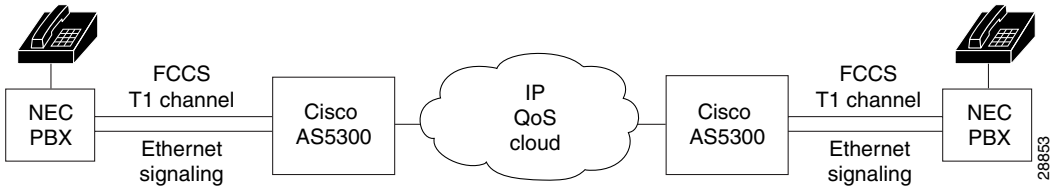
- Set the global **isdn-switch-type** command to support Q.SIG and set the interface **isdn-switch-type** command for **interface serial 0:23** to a PRI setting such as 5ess.
- Set the global **isdn-switch-type** command to support PRI 5ess and set the interface **isdn-switch-type** command for **interface serial 1:23** to support Q.SIG.
- Configure the global **isdn-switch-type** command to another setting (such as switch type VN3), set the interface **isdn-switch-type** command for **interface serial 0:23** to a PRI setting, and set the interface **isdn-switch-type** command for **interface serial 1:23** to support Q.SIG.

Fusion Call Control Signaling (NEC Fusion)

If you have an NEC PBX in your network and you are running Fusion Call Control Signaling (FCCS), you will need to configure this device appropriately. FCCS, also known as NEC Fusion, allows individual nodes anywhere within a network to operate as if they were part of a single integrated PBX system. The database storage, share, and access routine of NEC Fusion allow real-time access from any node to any other, allowing individual nodes to “learn” about the entire network configuration. This capability allows network-wide feature, functional, operational, and administration transparency.

Figure 2 shows an example of a Q.SIG signaling configuration using an NEC PBX.

Figure 2 Q.SIG Signaling Configuration with NEC PBX



To configure NEC Fusion signaling support on the Cisco AS5300, complete the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	`Router(config)# controller T1 controller number`	Enters controller configuration mode. NEC Fusion does not support fractional T1/E1; all 24 channels must be available. If they are not available, the configuration request will fail.
Step 2	`Router(config-controller)# pri-group nec-fusion { pbx-ip-address | pbx-ip-host-name } pbx-port number`	Configures the controller to communicate with an NEC PBX using NEC Fusion. The range for the PBX port is 49152 to 65535. If you don't specify a port number, the default value of 55000 will be used. If this value is already in use, the next greater value will be used.
Step 3	`Router(config-controller)# exit`	Exits controller configuration mode.

Verifying VoIP Q.SIG Software on the Cisco AS5300

After you complete the configuration for the AS5300, perform the following steps to verify that you configured Q.SIG properly:

Step 1 Enter the **show isdn status** command to view the ISDN layer information. This output shows that you have correctly designated the global ISDN switch type to be primary-Q.SIG.

```
Router# show isdn status

Global ISDN Switchtype = primary-qsig
ISDN Serial1:23 interface
        dsl 0, interface ISDN Switchtype = primary-qsig
         **** Slave side configuration ****
    Layer 1 Status:
        DEACTIVATED
    Layer 2 Status:
        TEI = 0, Ces = 1, SAPI = 0, State = TEI_ASSIGNED
    Layer 3 Status:
        0 Active Layer 3 Call(s)
    Activated dsl 0 CCBs = 0
    The Free Channel Mask: 0x7FFFFF
```

Configuration Example

The following configuration example configures interface serial 1:23 for Q.SIG PRI and to act as the Q.SIG slave. The example includes the other commands necessary for configuration (see Figure 1).

```
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname as5300A
!
ip subnet-zero
!
isdn switch-type primary-qsig
!
controller T1 0
 shutdown
!
controller T1 1
 framing esf
 clock source line primary
 linecode b8zs
 pri-group timeslots 1-24
!
controller T1 2
 shutdown
!
controller T1 3
 shutdown
!
!
voice-port 1:D
!
!
dial-peer voice 3001 pots
 destination-pattern 3001
 port 1:D
!
dial-peer voice 4001 pots
 incoming called-number 4001
 direct-inward dial
!
dial-peer voice 4002 voip
 destination-pattern 4001
 session target ipv4:1.14.82.14
!
!
interface Ethernet0
 ip address 1.14.82.13 255.255.0.0
 no ip directed-broadcast
!
interface 1:23
 no ip address
 no ip directed broadcast
 isdn switch-type primary-qsig
 isdn protocol-emulate user
 isdn incoming-voice modem
!
interface FastEthernet0
 no ip address
 no ip directed-broadcast
```

```
 shutdown
!
ip default-gateway 1.14.0.1
ip classless
!
line con 0
 transport input none
line aux 0
line vty 0 4
 login
!
end

==========================================================
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname as5300B
!
ip subnet-zero
!
isdn switch-type primary-qsig
!
!
controller T1 0
 shutdown
!
controller T1 1
 framing esf
 clock source line primary
 linecode b8zs
 pri-group timeslots 1-24
!
controller T1 2
 shutdown
!
controller T1 3
 shutdown
!
!
voice-port 1:D
!
!
dial-peer voice 3001 pots
 incoming called-number 3001
 direct-inward-dial
!
dial-peer voice 3002 voip
 destination-pattern 3001
 session target ipv4:1.14.82.13
!
dial-peer voice 4001 pots
 destination-pattern 4001
 port 1:D
!
interface Ethernet0
 ip address 1.14.82.14 255.255.0.0
 no ip directed-broadcast
!
interface Serial1:23
 no ip address
```

```
 no ip directed-broadcast
 isdn switch-type primary-qsig
 isdn protocol-emulate network
 isdn incoming-voice modem
!
interface FastEthernet0
 no ip address
 no ip directed-broadcast
 shutdown
!
ip default-gateway 1.14.0.1
ip classless
!
line con 0
 transport input none
line aux 0
line vty 0 4
 login
!
end
```

Command Reference

The following commands are used to configure the Q.SIG PRI signaling feature:

- **isdn protocol-emulate**
- **isdn switch type**
- **pri-group nec-fusion**
- **show cdapi**
- **show rawmsg**

isdn protocol-emulate

To configure the Cisco AS5300 PRI interface to serve as either the primary Q.SIG slave or the primary Q.SIG master, use the **isdn protocol-emulate** interface command. To disable Q.SIG signaling, use the **no** form of this command.

isdn protocol-emulate { user | network }

no isdn protocol-emulate { user | network }

Syntax Description

user	Slave.
network	Master.

Defaults

The switch type defaults to user.

Command Modes

Interface configuration mode.

Command History

Release	Modification
12.0(3)XG	This command first appeared
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Examples

The following example configures T1 interface 23 on the Cisco AS5300 to act as the Q.SIG master:

```
interface serial 1:23
isdn protocol-emulate network
```

Related Commands

Command	Description
isdn switch type	Configures the Cisco AS5300 PRI interface to support Q.SIG signaling.
pri-group nec-fusion	Configures your NEC PBX to use FCCS instead of Q.SIG signaling.
show cdapi	Displays information about the CDAPI.
show rawmsg	Displays information about any memory leaks.

isdn switch type

To configure the Cisco AS5300 PRI interface to support Q.SIG signaling, use the **isdn switch-type** global or interface command. To disable Q.SIG signaling, use the **no** form of this command.

isdn *switch-type* **primary-qsig**

no isdn *switch-type* **primary-qsig**

Syntax Description

switch-type	Service provider switch type. Specifies the Cisco AS5300 or the interface to support Q.SIG signaling.

Defaults

The switch type defaults to none, which disables the switch on the ISDN interface.

Command Modes

Global configuration mode or interface configuration mode.

Command History

Release	Modification
9.21	Introduced as a global command.
11.3 T	Introduced as an interface command.
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Usage Guidelines

You have the choice of configuring the **isdn-switch-type** command to support Q.SIG in either global configuration mode or interface configuration mode. When entered in global configuration mode, the setting applies to the entire Cisco AS5300. When entered in interface configuration mode, the setting applies only to the T1/E1 interface specified. The interface configuration mode setting overrides the global configuration setting.

For example, if you have a Q.SIG connection on one line as well as on the PRI port, you can configure the ISDN switch type in one of the following combinations:

- Set the global **isdn-switch-type** command to support Q.SIG and set the interface **isdn-switch-type** command for **interface serial 0:23** to a PRI setting such as 5ess.
- Set the global **isdn-switch-type** command to support PRI 5ess and set the interface **isdn-switch-type** command for **interface serial 1:23** to support Q.SIG.
- Configure the global **isdn-switch-type** command to another setting (such as switch type VN3), set the interface **isdn-switch-type** command for **interface serial 0:23** to a PRI setting, and set the interface **isdn-switch-type** command for **interface serial 1:23** to support Q.SIG.

Note The dial-peer **codec** command must be configured before any calls can be placed over the connection to the PINX. The default codec type is G729a.

Examples

The following example configures the Cisco AS5300 to support Q.SIG signaling:

```
isdn switch-type primary-qsig
```

The following example configures T1 interface 23 on the Cisco AS5300 to support Q.SIG signaling:

```
interface serial 1:23
isdn switch-type primary-qsig
```

Related Commands

Command	Description
isdn protocol-emulate	Configures the Cisco AS5300 PRI interface to serve as either the primary Q.SIG slave or the primary Q.SIG master.
pri-group nec-fusion	Configures your NEC PBX to use FCCS instead of Q.SIG signaling.
show cdapi	Displays information about the CDAPI.
show rawmsg	Displays information about any memory leaks.

pri-group nec-fusion

To configure your NEC PBX to support Fusion Call Control Signaling (FCCS), use the **pri-group nec-fusion** controller command. To disable FCCS, use the **no** form of this command.

pri-group nec-fusion { *pbx-ip-address* **|** *pbx-ip-host-name* **} pbx-port** *number*
no pri-group nec-fusion { *pbx-ip-address* **|** *pbx-ip-host-name* **} pbx-port** *number*

Syntax Description

pbx-ip-address	The IP address of the NEC PBX.
pbx-ip-host-name	The host name of the NEC PBX.
number	Choose a port number for the PBX. The range for the PBX port is 49152 to 65535. If you don't specify a port number, the default value of 55000 will be used. If this value is already in use, the next greater value will be used.

Defaults

55000

Command Modes

Controller configuration mode.

Command History

Release	Modification
12.0(7)T	This command first appeared
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Usage Guidelines

This command is used only if the PBX in your configuration is an NEC PBX, and if you are configuring it to run FCCS and not Q.SIG signaling.

Examples

The following example shows how to configure this NEC PBX to use FCCS:

```
pri-group nec-fusion 172.31.255.255 pbx-port 60000
```

Related Commands

Command	Description
isdn protocol-emulate	Configures the Cisco AS5300 PRI interface to serve as either the primary Q.SIG slave or the primary Q.SIG master.
isdn switch type	Configures the Cisco AS5300 PRI interface to support Q.SIG signaling.
show cdapi	Displays information about the CDAPI.
show rawmsg	Displays information about any memory leaks.

show cdapi

To display the Call Distributor Application Programming Interface (CDAPI), use the **show cdapi command**.

show cdapi

Syntax Description

cdapi	The internal API that provides an interface between signaling stacks and applications.

Command Modes

Privileged EXEC mode.

Command History

Release	Modification
12.0(7)T	This command first appeared
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Examples

The following is output for the **show cdapi** command:

```
Router# sh cdapi

Registered CDAPI Applications/Stacks
====================================
Application TSP CDAPI Application
        Application Type(s)  Voice Facility Signaling
        Application Level    Tunnel
        Application Mode     Enbloc
Signaling Stack ISDN
        Interface Se023
Signaling Stack ISDN
        Interface Se123
Active CDAPI Calls
==================
Interface Se023
        No active calls.
Interface Se123
        Call ID = 0x39, Call Type = VOICE, Application = TSP CDAPI Application
CDAPI Message Buffers
=====================
Used Msg Buffers 0, Free Msg Buffers 1600
Used Raw Buffers 1, Free Raw Buffers 799
Used Large-Raw Buffers 0, Free Large-Raw Buffers 80
scarlatti1#
```

Related Commands

Command	Description
isdn protocol-emulate	Configures the Cisco AS5300 PRI interface to serve as either the primary Q.SIG slave or the primary Q.SIG master.
isdn switch type	Configures the Cisco AS5300 PRI interface to support Q.SIG signaling.
pri-group nec-fusion	Configures your NEC PBX to use FCCS instead of Q.SIG signaling.
show rawmsg	Displays information about any memory leaks.

show rawmsg

To show the raw messages owned by the required component, use the **show rawmsg** interface command.

show rawmsg { all | tsp | vtsp | ccapi | h323 }

Syntax Description

all	All selections below.
tsp	Telephony Service Provider subsystem.
vtsp	Voice Telephony Service Provider subsystem.
ccapi	API (Application Programming Interface) used to coordinate interaction between application and call legs (telephony or IP).
h323	H.323 subsystem.

Command Modes

Privileged EXEC mode.

Command History

Release	Modification
12.0(7)T	This command first appeared
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Usage Guidelines

The number displayed for **show rawmsg all** should be zero, to indicate there are no memory leaks.

Examples

The following example shows how to display memory leaks from the telephony service provider:

```
show rawmsg tsp
```

Related Commands

Command	Description
isdn protocol-emulate	Configures the Cisco AS5300 PRI interface to serve as either the primary Q.SIG slave or the primary Q.SIG master.
isdn switch type	Configures the Cisco AS5300 PRI interface to support Q.SIG signaling.
pri-group nec-fusion	Configures your NEC PBX to use FCCS instead of Q.SIG signaling.
show cdapi	Displays information about the CDAPI.

Debug Commands

This section documents new debug commands for Q.SIG on the Cisco AS5300 access server. All other commands used with this feature are documented in the Cisco IOS Release 12.0 command references.

- **debug cdapi**
- **debug tsp**
- **debug voip rawmsg**

debug cdapi

The **debug cdapi** command is used to display information about the CDAPI (Call Distributor Application Programming Interface).

debug cdapi {**detail** | **events**}

no debug cdapi {**detail** | **events**}

Syntax Description

detail	Shows when applications register or unregister with CDAPI, when calls are added or deleted from the CDAPI routing table, and when CDAPI messages are created and freed. It is useful for determining if messages are being lost (or not freed) as well as the size of the raw messages passed between CDAPI and applications, so that you can check that the correct number of bytes is being passed.
events	Shows the events passing between CDAPI and an application or signaling stack. This debug is useful for determining if certain ISDN messages are not being received by an application or if calls are not being directed to an application.

Defaults

Debugging for the CDAPI is disabled.

Command History

Release	Modification
12.0(7)T	This command was introduced.
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Examples

The following example shows output for the **debug cdapi detail** command.

```
003511 ISDN Se123 RX <-  SETUP pd = 8  callref = 0x77C4
003511         Bearer Capability i = 0x9090A2
003511         Channel ID i = 0xA18381
003511         Facility i =
0x9FAA068001008201008B0100A1180202274A020100800F534341524C415454492D3530303733
003511         Progress Ind i = 0x8183 - Origination address is non-ISDN
003511         Calling Party Number i = 0xA1, '50073'
003511         Called Party Number i = 0xC1, '3450070'
003511 CDAPI cdapi_create_msg() CDAPI Pool Count 1599, Raw Length = 72
003511 CDAPI cdapi_create_msg() Copied raw message of length 72, Raw msg Pool Count 799,
Msg = 0x6146AB1C, Raw = 0x6146AB20
003511 CDAPI Se123 cdapi_add_entry_callRoutingTbl() -
003511       Added entry for call 0x23 for application TSP CDAPI Application
003511 CDAPI cdapi_free_msg() Raw Length = 72, freeRaw = 0, Raw Msg = 0x6146AB1C
003511 CDAPI cdapi_free_msg() CDAPI Pool Count 1600
003511 CDAPI cdapi_create_msg() CDAPI Pool Count 1599, Raw Length = 0
003511 CDAPI-ISDN Se123 cdapi_process_connect_resp() Received cause (0)
003511       from application for call 0x23
003511 CDAPI cdapi_free_msg() Raw Length = 0, freeRaw = 1, Raw Msg = 0x0
003511 CDAPI cdapi_free_msg() CDAPI Pool Count 1600
003511 CDAPI cdapi_create_raw_msg() Created raw message buffer, Length = 72, Pool count
798 Raw Msg = 0x6146AC54, Buff = 0x6146AC58
003511 CDAPI cdapi_free_raw_msg_buf() Buff = 0x6146AC58, Length = 72
003511 CDAPI cdapi_free_raw_msg() Raw Msg = 0x6146AC54, Length = 72
003511 CDAPI cdapi_free_raw_msg() Freed raw message buffer, Length = 72, Pool count 799
003511 CDAPI cdapi_create_msg() CDAPI Pool Count 1599, Raw Length = 0
003511 CDAPI-ISDN Se123 cdapi_process_info_req() - Called process_xxx_simple
003511       for call 0x23, bchan 0, call type VOICE
003511 CDAPI cdapi_free_msg() Raw Length = 0, freeRaw = 1, Raw Msg = 0x0
003511 CDAPI cdapi_free_msg() CDAPI Pool Count 1600
003511 ISDN Se123 TX ->  CALL_PROC pd = 8  callref = 0xF7C4
003511         Channel ID i = 0xA98381
```

The following example shows output for the **debug cdapi events** command.

```
003909 ISDN Se123 RX <-  SETUP pd = 8  callref = 0x06BB
003909         Bearer Capability i = 0x9090A2
003909         Channel ID i = 0xA18381
003909         Facility i =
0x9FAA068001008201008B0100A1180202274C020100800F534341524C415454492D3530303733
003909         Progress Ind i = 0x8183 - Origination address is non-ISDN
003909         Calling Party Number i = 0xA1, '50073'
003909         Called Party Number i = 0xC1, '3450070'
003909 CDAPI Se123 TX -> CDAPI_MSG_CONNECT_IND to TSP CDAPI Application call = 0x24
003909       From Appl/Stack = ISDN
003909       Call Type = VOICE
003909       B Channel = 0
003909       Cause     = 0
003909       Calling Party Number = 50073
003909       Called Party Number = 3450070
003909 CDAPI Se123 TX -> CDAPI_MSG_CONNECT_RESP to ISDN call = 0x24
003909       From Appl/Stack = TSP CDAPI Application
003909       Call Type = VOICE
003909       B Channel = 0
003909       Cause     = 0
003909 CDAPI-ISDN Se123 RX <- CDAPI_MSG_CONNECT_RESP from TSP CDAPI Application call =
0x24
003909       Call Type = VOICE
003909       B Channel = 0
003909       Cause     = 0
003909 CDAPI Se123 TX -> CDAPI_MSG_SUBTYPE_CALL_PROC_REQ to ISDN call = 0x24
003909       From Appl/Stack = TSP CDAPI Application
003909       Call Type = VOICE
003909       B Channel = 0
003909       Cause     = 0
003909 CDAPI-ISDN Se123 RX <- CDAPI_MSG_SUBTYPE_CALL_PROC_REQ from TSP CDAPI Application
call = 0x24
003909       Call Type = VOICE
003909       B Channel = 0
003909       Cause     = 0
003909 ISDN Se123 TX ->  CALL_PROC pd = 8  callref = 0x86BB
003909         Channel ID i = 0xA98381
```

Related Commands

Command	Description
debug cdapi	Displays information about the call distributor application programming interface
debug voip rawmsg	Displays the raw message owner, length, and pointer.

debug tsp

The **debug tsp** command is used to display information about the telephony service provider (TSP). Use the **no** form of this command to disable debugging output.

debug tsp {**all** | **call** | **error** | **port**}

no debug tsp {**all** | **call** | **error** | **port**}

Syntax Description

all	Enables all TSP debugging (except statistics).
call	Enables call debugging.
error	Enables error debugging.
port	Enables port debugging.

Defaults

Debugging for the TSP is disabled.

Command History

Release	Modification
12.0(7)T	This command was introduced.
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Examples

The following example shows output for the **debug tsp** ***all*** command.

```
01:04:12:CDAPI TSP RX ===> callId=(32  ), Msg=(CDAPI_MSG_CONNECT_IND,1 )
Sub=(CDAPI_MSG_SUBTYPE_NULL,0 )cdapi_tsp_connect_ind
01:04:12:TSP CDAPI:cdapi_free_msg returns 1
01:04:13:tsp_process_event:[0:D, 0.1 , 3] tsp_cdapi_setup_ack tsp_alert
01:04:13:tsp_process_event:[0:D, 0.1 , 5] tsp_alert_ind
01:04:13:tsp_process_event:[0:D, 0.1 , 10]
01:04:14:tsp_process_event:[0:D, 0.1 , 10]
01:04:17:CDAPI TSP RX ===> callId=(32  ), Msg=(CDAPI_MSG_DISCONNECT_IND,7 )
Sub=(CDAPI_MSG_SUBTYPE_NULL,0 )cdapi_tsp_disc_ind
01:04:17:TSP CDAPI:cdapi_free_msg returns 1
01:04:17:tsp_process_event:[0:D, 0.1 , 27] cdapi_tsp_release_indtsp_disconnet_tdm
01:04:17:tsp_process_event:[0:D, 0.4 , 7] cdapi_tsp_release_comp
```

Related Commands

Command	Description
debug tsp	Displays information about the telephony service provider.
debug voip rawmsg	Displays the raw message owner, length, and pointer.

debug voip rawmsg

The **debug voip rawmsg** command is used to display the raw message owner, length, and pointer. Use the **no** form of this command to disable debugging output.

debug voip rawmsg [**detail**]

no debug voip rawmsg [**detail**]

Syntax Description

detail	This will additionally print the contents of the raw message in hex.

Defaults

Debugging for the raw messages is disabled.

Command History

Release	Modification
12.0(7)T	This command was introduced.
12.1(5)XM2	The command was introduced for the Cisco AS5350 and CiscoAS5400.

Examples

The following example shows output for the **debug voip rawmsg** command.

```
as5300# debug voip rawmsg

00:57:40:Raw Message owner is 2, length is 69, ptr is 60FE4F5C, type is 0, protocol id is
0
00:57:40:Raw Message owner is 5, length is 69, ptr is 60FE4F5C, type is 0, protocol id is
0
0
```

The following example shows output for the **debug voip rawmsg detail** command.

```
as5300# debug voip rawmsg detail

00:57:40:Raw Message owner is 2, length is 69, ptr is 60FE4F5C, type is 0, protocol id is
0
00:57:40:Raw Message is :04 03 80 90 A2 18 03 A9 83 97 1C 27 9F AA 06 80 01 00 82 01 00
92 01 11 8B 01 00 A1 16 02 02 01 00 06 04 2B 0C 09 00 80 0A 4D 4F 4E 49 43 41 20 33 32 33
1E 02 81 83 6C 05 09 80 33 32 33 70 04 89 38 30 30 A1
00:57:40:Raw Message owner is 5, length is 69, ptr is 60FE4F5C, type is 0, protocol id is
0
00:57:40:Raw Message is :04 03 80 90 A2 18 03 A9 83 97 1C 27 9F AA 06 80 01 00 82 01 00
92 01 11 8B 01 00 A1 16 02 02 01 00 06 04 2B 0C 09 00 80 0A 4D 4F 4E 49 43 41 20 33 32 33
1E 02 81 83 6C 05 09 80 33 32 33 70 04 89 38 30 30 A1
```

Related Commands

Command	Description
debug cdapi	Displays information about the call distributor application programming interface
debug tsp	Displays information about the telephony service provider.

Glossary

APDU—Application protocol data unit. A sequence of data elements exchanged between peer application layer entities.

CAS—Channel associated signaling.

CCS—Common channel signaling. Signaling system used in telephone networks that separates signaling information from user data. A specified channel is exclusively designated to carry signaling information for all other channels in the system.

E1—Wide-area digital transmission scheme used predominantly in Europe that carries data at a rate of 2.048 Mbps. E1 lines can be leased for private use from common carriers.

Enbloc—Mode where all call establishment information is sent in the setup message (opposite of overlap mode, where additional messages are needed to establish the call).

GFP—General Functional Procedures. Standard defined by ECMA-165.

H.323—Extension of ITU-T standard H.320 that enables videoconferencing over LANs and other packet-switched networks, as well as video over the Internet.

ISDN—Integrated Services Digital Network. Communication protocol offered by telephone companies that permits telephone networks to carry data, voice, and other source traffic.

Overlap—Mode where call control is waiting for possible additional call information from the preceding PINX, since it received acknowledgment that the subsequent PINX may receive additional call information.

PBX—Private branch exchange. Digital or analog telephone switchboard located on the subscriber premises and used to connect private and public telephone networks.

PINX—Private integrated services network exchange.

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

Q.SIG—Q Signaling. An inter-PBX signaling protocol for networking PBX supplementary services in a multi- or uni-vendor environment.

T1—Digital WAN carrier facility. T1 transmits DS-1-formatted data at 1.544 Mbps through the telephone-switching network using AMI or B8ZS coding. Compare with E1.

Transit PINX—A PINX that participates in the provision of a call-independent signaling connection but does not originate or terminate that connection.

VFC—Voice-over-IP feature card.

WAN—Wide-area network. Data communications network that serves users across a broad geographic area and often uses transmission devices provided by common carriers.