



Cisco AS5300 Gateway-PBX Interoperability: Alcatel 4400 with E1 QSIG Signaling

This document describes the interoperability and configuration of a Cisco AS5300 voice gateway with an Alcatel 4400 PBX using E1 QSIG signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

PBX Model	Alcatel 4400
PBX Release	Version R3.2
Telephony Signaling	E1 QSIG
Voice Gateway	Cisco AS5300
Gateway Release	Cisco IOS™ 12.2(1)
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Alcatel PBX Configuration
- Cisco AS5300 Gateway Configuration

Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

Connectivity Diagrams

Figure 1: Test Configuration

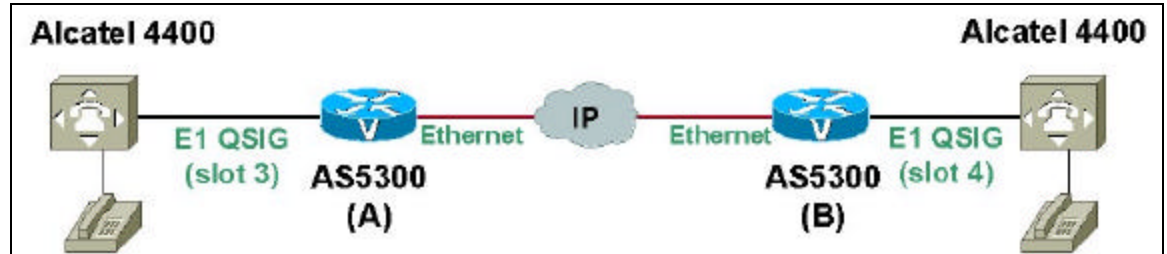


Figure 1 represents the configuration used for testing: an Alcatel 4400 PBX connected to a Cisco AS5300 voice gateway via an E1 QSIG connection.

Set Up Notes

- The Cisco AS5300 gateway with ISDN switch type setting of **primary-qsig** supports both protocol sides by using the “isdn protocol-emulate network/user” command.
- The Alcatel 4400 supports both “USER” (slave) and “NETWORK” (master) protocol sides.
- The following options are of particular interest:
 - Trunk **interface type** must be set to **PRA2**.
 - Network/User options are set in the Board/Digital Access Options menu. **Network mode** must be set to **Yes** for (Master/Network) or **No** - (Slave/User).
 - **Access Type** must be set to **T2**.
 - Q931 variant is used to determine Protocol type. ABC-F is Alcatel proprietary.
- Calling/Called Number is not shown on Alcatel phone display (one line display phone show Name only) due to limitation on one line display phone.

Alcatel PBX Configuration

Version Information

```

\compidea\Node

      Node Number (reserved)  1
      Software Version        R3.2
      Version name            c1.712
      Patch No.               5
      Notes
      Object Identity
      Node Number (reserved)  1
      Ethernet Notes
      Netmask
      Local CPU
      Name                    x000000_tun
      IP Address              172.30.253.253
      Twin Cpu
      Name
      IP Address
      Main Cpu
      Name                    xm000000
      IP Address              10.253.253.3
      StandBy Cpu
      Name
      IP Address
      SL Notes
      IP/X25 Tunnel Notes
      Netmask                 255.255.0.0
      Local Node
      Name                    x000000_tun
      IP Address              172.30.253.253
  
```

Alcatel PBX Sample Configuration

See the following sections for sample configuration information:

- Trunks Cards
- Digital Access Options
- Trunk Group
- Trunk Detail

Trunk Cards

Interface type must be set to PRA2.

```

\compidea\Shelf::0\Board::4

      Board Address          4
      Interface Type        PRA2
      Usage State           Busy
      Operational State     Enabled
      Main/Standby State    Main (Master)
      Number Of Sets Being Connect.  1
      CRC4                  YES
      Country Protocol Type Default
      Incidents Teleservice YES
      ISDN Board Layer 2 Parameters
  
```

Retransmission Timer	100
TEI Identity Check Timer	100
Polling Timer	1000
Nb_Of_Retransmission	3
Max Frame Size (Bytes)	260
Window Size In Frames SAPI S T0	1
Window Size In Frames SAPI P T0	3
Window Size In Frames SAPI S T2	7
Window Size In Frames SAPI P T2	7
Passive board	NO
SS7 signalling	NO

Digital Access Options

Network mode must be set to **Yes** for (Master/Network) or **No** - (Slave/User).
Access Type must be set to **T2**.

\compidea\Shelf::0\Board::4\Digital Access::0

T0/T2 Access No.	0
Access Type	T2
Synchronisation Priority	255
Network Mode	NO
Max Nb Of Used B Channels	30
Max_Nb_Of_Compressed_B_Channels	0
TieLine Mode	NO
With Alarm	NO
Reserved1	NO
Reserved2	NO
Network Date Time Update	NO
CRC4	YES

Trunk Group

Q931 variant is used to determine Protocol type. ABC-F is Alcatel proprietary.

\compidea\Trunk Groups::0

Trunk Group Id	0
Trunk Group Type	T2
Trunk Group Name	PRA2-QSIG
Node number	1
Transcom Trunk Group	False
Auto.reserv.by Attendant	False
Overflow trunk group No.	-1
Tone on seizure	True
Private Trunk Group	False
Q931 signal variant	ABC-F
Number Compatible With	1
Channel selection type	Quantum
Remote Network	15
Shared Trunk Group	False
auto.DTMF dialing on outgoing call	NO
T2 Specificity	None
Public Network Category	0
DDI transcoding	False
Special Services	Nothing
Can support UUS in SETUP	True

Trunk Detail

```
\compidea\Trunk Groups::1\Trunk Group::1

Instance (reserved)                1
Trunk Group Type                    T2
Public Network Ref.
Dialling end to end                NO
DTMF end to end signal.            NO
Trunk group used in DISA            NO
DISA Secret Code
VG for non-existent No.             YES
Routing To Executive                NO
Trunk Category Id                  18
Nb of digits unused (ISDN)         4
B Channel Choice                    NO
Channels Reserved By Attend.        0
Dissuasion For ACD                 NO
DTO joining                         NO
Enquiry Call On B Channel           NO
Automated Attendant                NO
Calling party Rights category       0
Entity Number                       0
TS Overflow                         YES
Number To Be Added
Supervised by Routing               NO
VPN Cost Limit for Incom.Calls      0
Immediat Trk Listening For VPNCall  YES
VPN TS %                            50
Csta Monitored                     NO
Max.% of trunks out CCD             0
Charge Calling And ADN Creation     NO
Ratio analog.to ISDN tax
LogicalChannel                      1__15 & 17__31
TS Distribution on Accesses         YES
Use Split Acces                     NO
Heterogeneous Remote Network        NO
Barring mode                        Not barred
ARS class of service                31
Quality profile for voice on IP      Profile #1
IP compression type                 Default
Use of volume in system              YES
```

Cisco AS5300 Gateway Configuration

The following is the configuration of the Cisco AS5300 voice gateway connected to the Alcatel 4400 PBX E1 QSIG interface.

Cisco AS5300 (A) Voice Gateway Version Information

```
AS5300_A#sh ver
Cisco Internetwork Operating System Software
IOS (tm) 5300 Software (C5300-JS-M), Version 12.2(1a), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 25-May-01 22:32 by pwade
Image text-base: 0x60008958, data-base: 0x611DA000

ROM: System Bootstrap, Version 12.0(2)XD1, EARLY DEPLOYMENT RELEASE SOFTWARE (fc1)
BOOTFLASH: 5300 Software (C5300-BOOT-M), Version 12.0(4)T1, RELEASE SOFTWARE (fc1)

AS5300_A uptime is 20 hours, 25 minutes
System returned to ROM by reload at 00:10:38 UTC Sat Jan 1 2000
System image file is "flash:c5300-js-mz.122-1a.bin"
```

```
cisco AS5300 (R4K) processor (revision A.32) with 131072K/16384K bytes of memory
.
Processor board ID 13241546
R4700 CPU at 150Mhz, Implementation 33, Rev 1.0, 512KB L2 Cache
Channelized E1, Version 1.0.
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
Primary Rate ISDN software, Version 1.1.
Backplane revision 2
Manufacture Cookie Info:
  EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x30,
  Board Hardware Version 3.1, Item Number 800-2544-03,
  Board Revision D0, Serial Number 13241546,
  PLD/ISP Version 0.0, Manufacture Date 17-May-2000.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
35 Serial network interface(s)
4 Channelized E1/PRI port(s)
60 Voice resource(s)
128K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)
8192K bytes of processor board Boot flash (Read/Write)

Configuration register is 0x2102
```

Cisco AS5300 (A) Voice Gateway Sample Configuration

```
AS5300_A#sh conf
Using 2214 out of 124920 bytes
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname AS5300_A
!
logging rate-limit console 10 except errors
enable secret 5 $1$/.SG$h05ycqcEN3shrrgYfUUo91
enable password cisco
!
!
!
resource-pool disable
!
call rsvp-sync
ip subnet-zero
no ip finger
no ip domain-lookup
!
no ip dhcp-client network-discovery
isdn switch-type primary-qsig
!
!
!
!
!
fax interface-type vfc
mta receive maximum-recipients 0
!
!
controller E1 0
  clock source line primary
```

```
    pri-group timeslots 1-31
!
controller E1 1
  shutdown
!
controller E1 2
  shutdown
  clock source line secondary 2
!
controller E1 3
  shutdown
  clock source line secondary 3
!
!
interface Ethernet0
  ip address 10.1.1.203 255.255.255.0
  no cdp enable
!
interface Serial0
  no ip address
  shutdown
  no fair-queue
  clockrate 2015232
!
interface Serial1
  no ip address
  shutdown
  no fair-queue
  clockrate 2015232
  no cdp enable
!
interface Serial2
  no ip address
  shutdown
  no fair-queue
  clockrate 2015232
  no cdp enable
!
interface Serial3
  no ip address
  shutdown
  no fair-queue
  clockrate 2015232
  no cdp enable
!
interface Serial0:15
  no ip address
  no logging event link-status
  isdn switch-type primary-qsig
  isdn overlap-receiving
  isdn incoming-voice modem
  isdn T203 30000
  isdn T310 60000
  isdn bchan-number-order ascending
  no cdp enable
!
interface FastEthernet0
  ip address 1.1.1.1 255.255.255.0
  duplex auto
  speed auto
  no cdp enable
!
router rip
  network 1.0.0.0
!
ip kerberos source-interface any
ip classless
no ip http server
```

```
!  
dialer-list 1 protocol ip permit  
dialer-list 1 protocol ipx permit  
!  
!  
!  
voice-port 0:D  
!  
dial-peer voice 2 voip  
  destination-pattern 3000  
  progress_ind setup enable 1  
  session target ipv4:1.1.1.2  
!  
dial-peer voice 1 pots  
  destination-pattern 3001  
  direct-inward-dial  
  port 0:D  
  prefix 3001  
!  
dial-peer voice 3 pots  
  destination-pattern 3002  
  direct-inward-dial  
  port 0:D  
  prefix 3002  
!  
dial-peer voice 4 voip  
  destination-pattern 3003  
  session target ipv4:1.1.1.2  
!  
!  
line con 0  
  exec-timeout 0 0  
  logging synchronous  
  transport input none  
line aux 0  
line vty 0 4  
  password cisco  
  login  
!  
scheduler interval 1000  
end  
  
AS5300_A#
```

Cisco AS5300 (B) Voice Gateway Version Information

```
AS5300_B#sh ver  
Cisco Internetwork Operating System Software  
IOS (tm) 5300 Software (C5300-JS-M), Version 12.2(1a), RELEASE SOFTWARE (fc1)  
Copyright (c) 1986-2001 by cisco Systems, Inc.  
Compiled Fri 25-May-01 22:32 by pwade  
Image text-base: 0x60008958, data-base: 0x611DA000  
  
ROM: System Bootstrap, Version 12.0(2)XD1, EARLY DEPLOYMENT RELEASE SOFTWARE (fc  
1)  
BOOTFLASH: 5300 Software (C5300-BOOT-M), Version 12.0(4)T1, RELEASE SOFTWARE (f  
c1)  
  
AS5300_B uptime is 20 hours, 29 minutes  
System returned to ROM by reload at 00:18:59 UTC Sat Jan 1 2000  
System image file is "flash:c5300-js-mz.122-1a.bin"  
  
cisco AS5300 (R4K) processor (revision A.32) with 131072K/16384K bytes of memory  
.  
Processor board ID 20238282  
R4700 CPU at 150Mhz, Implementation 33, Rev 1.0, 512KB L2 Cache  
Channelized E1, Version 1.0.
```


Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
Primary Rate ISDN software, Version 1.1.
Backplane revision 2
Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x30,
 Board Hardware Version 3.1, Item Number 800-2544-03,
 Board Revision D0, Serial Number 20238282,
 PLD/ISP Version 0.0, Manufacture Date 12-May-2000.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
35 Serial network interface(s)
4 Channelized E1/PRI port(s)
60 Voice resource(s)
128K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)
8192K bytes of processor board Boot flash (Read/Write)

Configuration register is 0x2102

Cisco AS5300 (B) Voice Gateway Sample Configuration

```
AS5300_B#sh conf
Using 2238 out of 124920 bytes
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname AS5300_B
!
logging rate-limit console 10 except errors
enable secret 5 $1$iJdG$J.bdACJeFouly4AEW.QQU.
enable password cisco
!
!
!
resource-pool disable
!
call rsvp-sync
ip subnet-zero
no ip finger
no ip domain-lookup
!
no ip dhcp-client network-discovery
isdn switch-type primary-qsig
!
!
!
!
!
fax interface-type vfc
mta receive maximum-recipients 0
!
!
controller E1 0
  clock source line primary
  pri-group timeslots 1-31
!
controller E1 1
  shutdown
  clock source line secondary 1
!
```

```
controller E1 2
 shutdown
  clock source line secondary 2
!
controller E1 3
 shutdown
  clock source line secondary 3
!
!
interface Ethernet0
 ip address 10.1.1.204 255.255.255.0
 no cdp enable
!
interface Serial0
 no ip address
 shutdown
 no fair-queue
 clockrate 2015232
!
interface Serial1
 no ip address
 shutdown
 no fair-queue
 clockrate 2015232
 no cdp enable
!
interface Serial2
 no ip address
 shutdown
 no fair-queue
 clockrate 2015232
 no cdp enable
!
interface Serial3
 no ip address
 shutdown
 no fair-queue
 clockrate 2015232
 no cdp enable
!
interface Serial0:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn overlap-receiving
 isdn protocol-emulate network
 isdn incoming-voice modem
 no isdn T309-enable
 isdn T203 30000
 isdn T310 60000
 isdn bchan-number-order ascending
 no cdp enable
!
interface FastEthernet0
 ip address 1.1.1.2 255.255.255.0
 duplex auto
 speed auto
 no cdp enable
!
ip kerberos source-interface any
ip classless
no ip http server
!
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
!
!
```

```
voice-port 0:D
!
dial-peer voice 2 voip
 destination-pattern 3001
 session target ipv4:1.1.1.1
!
dial-peer voice 1 pots
 destination-pattern 3000
 direct-inward-dial
 port 0:D
 prefix 3000
!
dial-peer voice 3 voip
 destination-pattern 3002
 session target ipv4:1.1.1.1
!
dial-peer voice 4 pots
 destination-pattern 3003
 direct-inward-dial
 port 0:D
 prefix 3003
!
!
line con 0
 exec-timeout 0 0
 logging synchronous
 transport input none
line aux 0
line vty 0 4
 password cisco
 login
!
scheduler interval 1000
end
```

Caveats

- Overlap Sending feature is not turned-on on Alcatel PBX, therefore not tested.
- Calling/Called Number is not shown on Alcatel phone display (one line display phone show Name only) due to limitation on one line display phone.