



Cisco AS5300 Gateway-PBX Interoperability: Siemens Hicom 330E with E1 QSIG Signaling

This document describes the interoperability and configuration of a Cisco AS5300 voice gateway with an Siemens Hicom 330E PBX using E1 QSIG signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

PBX Model	Siemens Hicom 330E
PBX Release	Version 3.1
Telephony Signaling	E1 QSIG
Voice Gateway	Cisco AS5300
Gateway Release	Cisco IOS™ 12.2(3)
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Siemens Hicom 330E 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: a Siemens Hicom 330E PBX connected to a Cisco AS5300 voice gateway via an E1 QSIG connection.

Set Up Notes

- The layer 1 configuration in the Siemens Hicom 330E PBX is assigned to the device type S2CONN via parameter “LWPAR” (Loadware Parameters). For Master side operation, the Hicom 330E was configured so that the LWPAR field under the <cha-tdesu> command is:

LWPAR = 4

The applicable fields under LWPAR = 4 <cha-lwpar> are as follows:

MASTER = Y

SMD = Y

For slave side operation:

LWPAR = 1

The applicable fields under LWPAR = 1 <cha-lwpar> are as follows:

MASTER = N

SMD = N

- Configuring the Siemens operation to be Master (or Network) side sets the Layers 2 and 3 protocol side setting to master as well. Therefore, the Cisco AS5300 gateway should be set to Slave protocol side by issuing the command: “isdn protocol-emulate user”.
- Similarly, if the Siemens operation is set for Slave (or user) side, Layers 2 and 3 protocol side are set for slave side. The Cisco AS5300 gateway is set to Master protocol side by issuing the command: “isdn protocol-emulate network”.
- 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 ECMA1 protocol setting was used on the Siemens Hicom 330E PBX.

Siemens Hicom 330E PBX Configuration

Version Information

Software Version 3.1.

Siemens Hicom 330E PBX Sample Configuration

See the following sections for sample configuration information:

- Trunk Configuration
- Route Configuration
- Board Configuration
- Station (Phone) Configuration

Trunk Configuration

Master Side

```
<dis-tdcsu
```

```
PEN1 = 1-1-73-0;
DIS-TDCSU:1-1-73-0;
H500: AMO TDCSU STARTED
```

```
+----- DIGITAL TRUNK (FORMAT=L) -----+
|          DEV = S2CONN          PEN = 1-01-073-0          |
+-----+-----+-----+
| COTNO   = 4          COPNO   = 4          DPLN     = 0          |
| ITR     = 0          COS     = 32         LCOSV    = 31         |
| LCOSD   = 31         CCT     = qsig      DESTNO   = 99         |
| PROTVAR = ECMA1     SEGMENT = 1         TCHARG   = N          |
| SUPPRESS = 0        DGTPR   =          CHIMAP   = N          |
| ISDNCC  =          ISDNAC  =          ISDNLC   =          |
| ISDNIP  =          ISDNNP  =          PNPLC    =          |
| PNPL2C  =          PNPL1C  =          PNPAC    =          |
| PNPL2P  =          PNPL1P  =          NNO      = 1   -1   -999 |
| TRACOUNT = 31       SATCOUNT = MANY    CARRIER = 1          |
| ALARMNO = 2         FIDX    = 1         FWDX     = 10         |
| ZONE    = EMPTY    COTX    = 4         TPROFNO  =          |
| DOMTYPE =          DOMAINNO =          UUSCCX   = 16         |
| CCHDL   =          UUSCCY   = 8         |
+-----+-----+-----+
| TGRP    = 37        SRCHMODE = CIR      BCNEG    = N          |
| BCGR    = 1         INS      = Y        LWPAR    = 4          |
| LWPP    = 0         LWLT    = 0        LWPS     = 0          |
| LWR1    = 0         LWR2    = 0         |
| BCHAN   = 1 && 30   |
+-----+-----+-----+
```

AMOUNT OF B-CHANNELS IN THIS DISPLAY-OUTPUT: 30

```
AMO-TDCSU-82          DIGITAL TRUNKS
```

```
DISPLAY COMPLETED;
```

Slave Side

<dis-tdcsu

PEN1 = 1-1-73-0;
 DIS-TDCSU:1-1-73-0;
 H500: AMO TDCSU STARTED

```

+----- DIGITAL TRUNK (FORMAT=L) -----+
|          DEV = S2CONN          PEN = 1-01-073-0          |
+-----+-----+-----+-----+-----+-----+
| COTNO   = 4          COPNO   = 4          DPLN     = 0          |
| ITR     = 0          COS     = 32         LCOSV    = 31         |
| LCOSD   = 31         CCT     = qsig      DESTNO   = 99         |
| PROTVAR = ECMA1     SEGMENT = 1          TCHARG   = N          |
| SUPPRESS = 0        DGTPR   =           CHIMAP   = N          |
| ISDNCC  =           ISDNAC  =           ISDNLC   =           |
| ISDNIP  =           ISDNNP  =           |
| PNPL2C  =           PNPL1C  =           PNPLC    =           |
| PNPL2P  =           PNPL1P  =           PNPAC    =           |
| TRACOUNT = 31       SATCOUNT = MANY     NNO      = 1   -1   -999 |
| ALARMNO  = 2        FIDX    = 1          CARRIER = 1          |
| ZONE     = EMPTY   COTX    = 4          FWDX     = 10         |
| DOMTYPE  =         DOMAINNO =           TPROFNO  =           |
| INIGHT   =         UUSCCX  = 16        UUSCCY   = 8          |
+-----+-----+-----+-----+-----+
| TGRP    = 37        SRCHMODE = CIR       BCNEG    = N          |
| BCGR    = 1         INS      = Y         LWPAR    = 1          |
| LWPP    = 0         LWLT    = 0         LWPS     = 0          |
| LWR1    = 0         LWR2    = 0         |
| BCHAN   = 1 && 30   |
+-----+-----+-----+-----+
    
```

AMOUNT OF B-CHANNELS IN THIS DISPLAY-OUTPUT: 30

AMO-TDCSU-82 DIGITAL TRUNKS

DISPLAY COMPLETED;

<dis-lwpar;

DIS-LWPAR;
 H500: AMO LWPAR STARTED

```

+-----+-----+-----+-----+-----+-----+
| LOADWARE PARAMETERS      CIRCUIT TYPE: DIUS2  SOURCE:DB  BLOCK:    1  |
+-----+-----+-----+-----+-----+-----+
| LNTYPE  = COPPER         VERSION  = S2          QUAL     = ON          |
| MASTER  = N              DCHAN1  = 16         DCHAN2   = 0          |
| PATTERN = D5H           QUAL1   = 10 SEC.   QUAL2    = 10 MIN.   |
| SMD     = N             PERMACT  = Y         FCBAB    = DFH       |
| CDG     = N             FIXEDTEI = 0         CNTRNR   = 255       |
| TEIVERIF = N           CRC4REP  = N          |
| DEV     = INDEP         |
| INFO    = 1:COPPER-DERIVE CLOCK FROM LINE(I421) |
+-----+-----+-----+-----+-----+
    
```

```

+-----+-----+-----+-----+-----+-----+
| LOADWARE PARAMETERS      CIRCUIT TYPE: DIUS2  SOURCE:DB  BLOCK:    4  |
+-----+-----+-----+-----+-----+-----+
| LNTYPE  = COPPER         VERSION  = S2          QUAL     = ON          |
+-----+-----+-----+-----+-----+
    
```

Cisco AS5300 Gateway-PBX Interoperability: Siemens Hicom 330E with E1 QSIG Signaling

```

MASTER = Y           DCHAN1 = 16           DCHAN2 = 0
PATTERN = D5H        QUAL1 = 10 SEC.        QUAL2 = 10 MIN.
SMD = Y             PERMACT = Y           FCBAB = DFH
CDG = Y             FIXEDTEI = 0          CNTRNR = 255
TEIVERIF = N        CRC4REP = N
DEV = INDEP
INFO = 4:COPPER-MASTER CLOCK(DPNSS A-END)
    
```

<dis-buend

```

TGRP = 37
FORMAT = 1;
DIS-BUEND:37,L;
H500: AMO BUEND STARTED
    
```

```

----- FORMAT = L -----
TGRP NUMBER : 37   TGRP NAME : qsig           MAXIMUM NO. : 30
SUBGROUP NO.: 10  DEVICE TYPE : S2CONN        TRACENO      : 0
RESERVED    : N   SEARCH MODE : CIRCULAR      ACD THRESHOLD : *
NUMBER OF ASSOCIATED ROUTES : 1             PRIORITY     : 1
THE FOLLOWING TRUNKS (LTG-LTU-SLOT-CCT) HAVE BEEN ALLOCATED:
    
```

1- 1- 73-0	B-CHL: 1	1- 1- 73-0	B-CHL: 2	1- 1- 73-0	B-CHL: 3
1- 1- 73-0	B-CHL: 4	1- 1- 73-0	B-CHL: 5	1- 1- 73-0	B-CHL: 6
1- 1- 73-0	B-CHL: 7	1- 1- 73-0	B-CHL: 8	1- 1- 73-0	B-CHL: 9
1- 1- 73-0	B-CHL: 10	1- 1- 73-0	B-CHL: 11	1- 1- 73-0	B-CHL: 12
1- 1- 73-0	B-CHL: 13	1- 1- 73-0	B-CHL: 14	1- 1- 73-0	B-CHL: 15
1- 1- 73-0	B-CHL: 16	1- 1- 73-0	B-CHL: 17	1- 1- 73-0	B-CHL: 18
1- 1- 73-0	B-CHL: 19	1- 1- 73-0	B-CHL: 20	1- 1- 73-0	B-CHL: 21
1- 1- 73-0	B-CHL: 22	1- 1- 73-0	B-CHL: 23	1- 1- 73-0	B-CHL: 24
1- 1- 73-0	B-CHL: 25	1- 1- 73-0	B-CHL: 26	1- 1- 73-0	B-CHL: 27
1- 1- 73-0	B-CHL: 28	1- 1- 73-0	B-CHL: 29	1- 1- 73-0	B-CHL: 30

AMO-BUEND-82 TRUNK GROUP

DISPLAY COMPLETED;

<dis-refta

```

TYPE = circuit
PEN = 1-1-73-0;
DIS-REFTA:CIRCUIT,1-1-73-0;
H500: AMO REFTA STARTED
    
```

```

----- REFERENCE CLOCK CIRCUITS -----
    
```

PEN	MODULE	DEVICE	PRI	ERROR	BLOCK	SUPP.	READY BUT ASYN.
1- 1- 73- 0	DIU-N2	S2CONN	11	11023	N	X	N

AMO-REFTA-82 REFERENCE CLOCK TABLE

DISPLAY COMPLETED;

Route Configuration

```

<dis-richt

MODE = all
DIS-RICHT:ALL;
H500: AMO RICHT STARTED

+--
+-----+
| LRTE = 37      NAME = TEST                      SRVC = ALL
| DNNO = 1 -1   -999
| ROUTOPT = NO   REROUT = YES  PLB = NO          FWDBL = NO
| MFV: CNV=FIX   DSP=WITHOUT TEXT=                PULS=PP300
| ROUTENO =     4 BUGS = LIN                      MAINGROUP = 4
| INFO =
+-----+
| TGRP = 37  LDAT      PRI                      SUBGROUP = 10
| TGRP = 38  LDAT      QSIG                     SUBGROUP = 9
+-----+
| LRTE = 39      NAME = BRISLAVE                  SRVC = ALL
| DNNO = 1 -1   -1
| ROUTOPT = NO   REROUT = YES  PLB = NO          FWDBL = NO
| MFV: CNV=WITHOUT DSP=WITHOUT TEXT=              PULS=
| ROUTENO =     7 BUGS = LIN                      MAINGROUP = 7
| INFO =
+-----+
| TGRP = 39                      BRI              SUBGROUP = 8
+-----+
| LRTE = 40      NAME = BRI TRUNK                  SRVC = ALL
| DNNO = 1 -1   -999  DESTNO = 99
| ROUTOPT = NO   REROUT = YES  PLB = NO          FWDBL = NO
| MFV: CNV=FIX   DSP=WITHOUT TEXT=                PULS=PP300
| ROUTENO =     3 BUGS = LIN                      MAINGROUP = 3
| INFO =
+-----+
| TGRP = 40  LDAT      BRI MASTER                SUBGROUP = 13
+-----+
+-----+

```

```

AMO-RICHT-82          TRUNK ROUTING

DISPLAY COMPLETED;

```

Board Configuration

```

<dis-bcsu

TYPE = tbl
LTG = 1
LTU = 1
SLOT = 73
DIS-BCSU:TBL,1,1,73;

H500: AMO BCSU STARTED

```

```

ADDRESS : LTG 1  LTU 1

```

```

-----+-----+-----+-----+-----+-----+-----+-----+
| ASSIGNED | MODULE | FCT|HWY| | INSERTED | | | | | MODULE | |

```

```

PEN | MODULE | TYPE | ID | BDL | MODULE | STATE | HW-INFO | STATUS |
-----+-----+-----+-----+-----+-----+-----+-----+-----+
73 | Q2196-X | DIU-N2 | 1 | A | Q2196-X | 1 | -04 - | READY |

```

AMO-BCSU -82 BOARD CONFIGURATION, SWITCHING UNIT

DISPLAY COMPLETED

Station (Phone) Configuration

```

<dis-sbcusu
STNO = 5000
TYPE = all
DIS-SBCSU:5000,TERMDATA;
H500: AMO SBCSU STARTED

```

```

----- USER DATA -----
STNO =5000 OPT =OPTI COS1 =7 DPLN =0 SPDI =Y
MAINO =5000 CONN =DIR COS2 =7 ITR =0 SPDC1 =0
PEN = 1- 1- 79- 1 LCOSV1 =31 COSX =0 SPDC2 =1
INS =Y STD =3 LCOSV2 =31 SERVID =0 CBKBMX=5
SECR =N LCOSD1 =31 DSSTNA =N RCBKB =N
SSTNO =N DIGNODIS=N LCOSD2 =31 DSSTNB =Y RCBKNA =N
TRACE =N HFREE = ASYNCT =500 PERMACT= CBKNAMB=Y
ALARMNO =0 HMUSIC =0 API =N TEXTSEL=ENGLISH
EXTBUS = REP =0 OPTICOM=N OPTISPA:0 DLAUT =
CALLOG =NONE IDCR =N OPTICA =0 OPTIS0A:0 DLMAN =
HEADSET =N OPTIDA =0 OPTIABA:0 PRIO =
HSKEY =NORMAL ATMADDR= VPI =
DFSVCAN= TFAGRP = PATTERN= VCI =
DVCFIG =OPTISET TSI =1 SOPTIDX= SPROT =
DOPTIDX= DPROT =
FOPTIDX= FPROT =
TOPTIDX= TPROT =
VOPTIDX= VPROT =

```

```

----- ACTIVATION IDENTIFIERS FOR FEATURES -----
FWDS :N FWDT :N FWDV :N FWDF :N FWDD :N
HTOS :N HTOT :N HTOV :N HTOF :N HTOD :N
DND :N VCP :Y CWT :N TCLOGIN:N

```

```

----- FEATURES AND GROUP MEMBERSHIPS -----
ESSTN :
PUGR : HUNTING GROUP : N
KEYSYS :N NIGHT OPTION : N ASSOCIATED STN : N
----- SUBSCRIBER ATTRIBUTES (AMO SDAT) -----
NONE

```

AMO-SBCSU-95 STATION AND S0-BUS CONFIGURATION OF SWITCHING UNIT

DISPLAY COMPLETED

Cisco AS5300 Gateway Configuration

The following is the configuration of the Cisco AS5300 voice gateway connected to the Siemens Hicom 330E PBX E1 QSIG interface.

Cisco AS5300 Voice Gateway Version Information

```
AS5300_A#sho ver
Cisco Internetwork Operating System Software
IOS (tm) 5300 Software (C5300-JS-M), Version 12.2(3), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Wed 18-Jul-01 11:24 by pwade
Image text-base: 0x600089B0, data-base: 0x6121E000

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

AS5300_A uptime is 3 days, 2 hours, 19 minutes
System returned to ROM by reload at 00:04:12 UTC Sat Jan 1 2000
System image file is "flash:c5300-js-mz.122-3.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 Voice Gateway Sample Configuration

```
AS5300_A#sho conf
Using 2037 out of 124920 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log uptime
no service password-encryption
!
hostname AS5300_A
!
enable secret 5 $1$/.SG$h05ycqcEN3shrrgYfUUo91
enable password cisco
!
!
!
resource-pool disable
!
call rsvp-sync
ip subnet-zero
```



```
no ip domain-lookup
!
isdn switch-type primary-qsig
!
!
!
!
!
fax interface-type modem
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 1.1.1.1 255.255.255.0
    no ip mroute-cache
    no cdp enable
!
interface Serial0
    no ip address
    no ip mroute-cache
    shutdown
    no fair-queue
    clockrate 2015232
!
interface Serial1
    no ip address
    no ip mroute-cache
    shutdown
    no fair-queue
    clockrate 2015232
    no cdp enable
!
interface Serial2
    no ip address
    no ip mroute-cache
    shutdown
    no fair-queue
    clockrate 2015232
    no cdp enable
!
interface Serial3
    no ip address
    no ip mroute-cache
    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 T321 0
isdn T203 30000
isdn T310 60000
isdn bchan-number-order ascending
no cdp enable
!
interface FastEthernet0
 ip address 10.1.1.214 255.255.255.0
 no ip mroute-cache
 duplex auto
 speed auto
 no cdp enable
!
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 3...
 progress_ind setup enable 1
 session target ipv4:1.1.1.2
!
dial-peer voice 1 pots
 application default
 destination-pattern 5...
 direct-inward-dial
 port 0:D
 prefix 5
!
!
line con 0
 exec-timeout 0 0
 logging synchronous
line aux 0
line vty 0 4
 password cisco
 login
!
scheduler interval 1000
end
```

Caveats

- Overlap Sending feature is not turned-on on the Siemens Hicom 330E, therefore not tested.