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

This document describes the interoperability and configuration of a Cisco AS5300 voice gateway with a 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	Software Version 3.1
Telephony Signaling	E1 QSIG
Voice Gateway	Cisco AS5300
Gateway Release	IOS™ Version 12.2.1
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:
- Set Up
- Siemens Hicom PBX Configuration
- Cisco AS5300 Gateway Configuration

Set Up

This section includes the following information:
- Connectivity Diagrams
- Set Up Notes

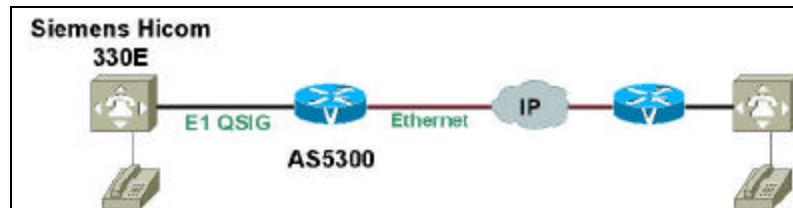## Connectivity Diagrams

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

- A Siemens Hicom 330E Switch-type/ Protocol side setting of "ECMA1 QSIG (ETSI 300172 2nd with Supplementary Services) / Master" was used for Network side, and "ECMA1 QSIG (ETSI 300172 2nd with Supplementary Services) / Slave" was used for User side.

- 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 Siemens Hicom 330E PBX supports both "USER" (slave) and "NETWORK" (master) protocol sides.

- Configuring the Siemens PBX Layer 1 operation to be Master (or Network) side sets the Layers 2 & 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 PBX Layer 1 operation is set for Slave (or user) side, layers 2 & 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 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-tdcsu> 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

Siemens Hicom PBX Configuration

Siemens Hicom PBX Sample Configuration

See the following sections for sample configuration information:

- Master Side Configuration
- Slave Side Configuration
- Route Configuration
- Board Configuration
- Station Phone Configuration
- Least Cost Routing Configuration
- Class of Service
- System Information

Master Side Configuration

```
<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   =                                                            |
   | CCHDL    =             UUSCCX   = 16          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 Configuration

```
        <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   =                                                            |
   | CCHDL    =             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         |
   | 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 = l;
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

   +--------------------------------------------------------------------+
   |           R E F E R E N C E   C L O C K   C I R C U I T S          |
   +-------------+--------+---------+------+--------+------+--------+-----+
   | 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-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;
```

Station Phone Configuration

```
<dis-sbcsu

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       CBKBMAX=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   =
                  DFSVCANA=       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
```

Least Cost Routing Configuration

```
<dis-ldat
 TYPE = ?
 TYPE              : DISPLAY TYPE CHARACTERISTIC  : OPTIONAL
POSSIBLE VALUES : LCR      ONLY LROUTES FOR LCR                NWLCR     ONLY
LROUTES WITH CLOSED NUMBERING BY LCR                ALL        ALL TYPE = lcr
 LROUTE = ;
 DIS-LDAT:LCR,; H500:  AMO LDAT  STARTED
+---------------------------------------------------------------------------+
| LROUTE = 1     LDPLN     NAME = CENTRAL OFFICE            SERVICE =  ALL  |
| TYPE = LCR                               DNNO OF ROUTE  = 1 -1  -999      |
| SERVICE INFO =                                                           |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|       |       |       |     |     | SCHEDULE | CARRIER    |BAND|         |
| LRTEL | LVAL  | TGRP  | ODR |LAUTH| ABCDEFGH |       ZONE |WDTH|  LATTR  |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|     1 |     1 |    30 |  1  |  1  | ******** | 1    EMPTY |  1 |    NONE |
+---------------------------------------------------------------------------+
| LROUTE = 31    LDPLN     NAME = E&M                       SERVICE =  VCE  |
| TYPE = LCR                               DNNO OF ROUTE  = 1 -1  -999      |
| SERVICE INFO =                                                           |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|       |       |       |     |     | SCHEDULE | CARRIER    |BAND|         |
| LRTEL | LVAL  | TGRP  | ODR |LAUTH| ABCDEFGH |       ZONE |WDTH|  LATTR  |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|     1 |     1 |    31 |  1  |  1  | ******** | 1    EMPTY |  1 |    NONE |
+---------------------------------------------------------------------------+
| LROUTE = 37    LDPLN     NAME = PRI TEST                  SERVICE =  ALL  |
| TYPE = LCR                               DNNO OF ROUTE  = 1 -1  -999      |
| SERVICE INFO =                                                           |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|       |       |       |     |     | SCHEDULE | CARRIER    |BAND|         |
| LRTEL | LVAL  | TGRP  | ODR |LAUTH| ABCDEFGH |       ZONE |WDTH|  LATTR  |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|     1 |     1 |    37 |  1  |  1  | ******** | 1    EMPTY |  1 |    NONE |
|     2 |     1 |    38 |  1  |  1  | ******** | 1    EMPTY |  1 |    NONE |
+---------------------------------------------------------------------------+
| LROUTE = 40    LDPLN     NAME = BRI TRUNK                 SERVICE =  ALL  |
| TYPE = LCR                     DNNO OF ROUTE  = 1 -1  -999               |
| SERVICE INFO =                                                           |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|       |       |       |     |     | SCHEDULE | CARRIER    |BAND|         |
| LRTEL | LVAL  | TGRP  | ODR |LAUTH| ABCDEFGH |       ZONE |WDTH|  LATTR  |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
|     1 |     1 |    40 |  1  |  1  | ******** | 1    EMPTY |  1 |    NONE |
+-------+-------+-------+-----+-----+----------+------------+----+---------+
AMO-LDAT -187      LCR-DIRECTIONS
DISPLAY COMPLETED;
```

Class of Service

```
<dis-cot


COTNO = 4;


DIS-COT:4;

H500:  AMO COT   STARTED


   COT:   4  INFO: 4:Q931 EXTERNAL
```

```
   DEVICE: INDEP        SOURCE: DB

   PARAMETER:

        PRIORITY FOR AC WILL BE DETERMINED FROM MESSAGE          PRI
        RECALL IF USER HANGS UP IN CONSULTATION CALL             RCL
        TRUNK CALL TRANSFER                                      XFER
        TRUNK SIGNALING ANSWER                                   ANS
        CHANGEOVER FROM HOLD TO RING TONE                        CHRT
        KNOCKING OVERRIDE POSSIBLE                               KNOR
        CALL EXTEND FOR BUSY, RING OR CALL STATE                 CEBC
        NETWORKWIDE AUTOMATIC CALLBACK ON BUSY                   CBBN
        NETWORKWIDE AUTOMATIC CALLBACK ON FREE                   CBFN
        DON'T RELEASE CALL TO BUSY HUNT GROUP                    BSHT
        SEND NO NODE NUMBER TO PARTNER                           LWNC
        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR                 NLCR
        TSC-SIGNALING FOR NETWORKWIDE FEATURES (MANDATORY)       TSCS
        INCOMING CDR BY ZONE OR FROM LINE                        ICZL
        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR (DATA)          NLRD
        AOC PER CALL (AUTOMATICAL OR ON REQUEST), MAND. CORNET-NQ  AOCC
        CONTROLLED TRUNK AND LINE SELECTION                      CTLS
        NO TONE                                                  NTON


AMO-COT  -95       CLASS OF TRUNK FOR CALL PROCESSING

DISPLAY COMPLETED;

  <dis-cop


COPNO = 4;


DIS-COP:4;

H500:  AMO COP   STARTED



   COP:   4  INFO: 4:Q931
   DEVICE: INDEP        SOURCE: DB
   PARAMETER:
        SPECIAL MODE                                            SFRM
        REGISTRATION OF LAYER 3 ADVISORIES                      L3AR


AMO-COP  -95       CLASS OF PARAMETER FOR DEVICE HANDLER

DISPLAY COMPLETED;
```

```
  <dis-cossu

TYPE = cos
COS = 32;
DIS-COSSU:COS,32;
H500:  AMO COSSU STARTED

    +------+----------+---------+---------+---------+----------+
    | COS  | VOICE    | FAX     | TTX     | VTX     | DTE      |
    +------+----------+---------+---------+---------+----------+
    |   32 |>32:TRUNKS                                        |
    |      |       TA | NOCO    | NOCO    | NOCO    |       TA |
    |      |   TNOTCR | NOTIE   | NOTIE   | NOTIE   |   TNOTCR |
    |      |          |         |         |         |    BASIC |
    |      |          |         |         |         |      MSN |
    |      |          |         |         |         |   CDRINT |
    |      |          |         |         |         |   MULTRA |
    |      |          |         |         |         |          |
    |      |          |         |         |         |          |
    +------+----------+---------+---------+---------+----------+

AMO-COSSU-82       CLASSES OF SERVICE, SWITCHING UNIT

DISPLAY COMPLETED;

  <dis-cossu

TYPE = lcos
LCOS = 31;
DIS-COSSU:LCOS,31;
H500:  AMO COSSU STARTED

   THE LCR CLASSMARKS ARE CONTAINED IN THE FOLLOWING LCOS:

    +----+---------------------------------------------------------------+
    |LCOS|           LCOSV               |           LCOSD               |
    |    |1234567890123456789012345678901|1234567890123456789012345678901|
    |    |>SERVICE INFORMATION                                           |
    +----+----+----|----+----|----+----|--+----+----|----+----|----+----|--+
    | 31 |                            XX|                            XX|
    +----+---------------------------------------------------------------+

AMO-COSSU-82       CLASSES OF SERVICE, SWITCHING UNIT

DISPLAY COMPLETED
```

System Information

```
<dis-dbc
 VERBOSE = ?
 VERBOSE         : LIST OF ACTIVE DB SUBSYSTEMS CHARACTERISTIC  : OPTIONAL
POSSIBLE VALUES : Y         YES                   N          NO VERBOSE = y
 DIS-DBC:Y; H500:  AMO DBC   STARTED
+-----------------------------------------------------------------------------+
| SYSTEM CLASSIFICATION  : SYSTEM 80         (H80  )                           |
| HARDWARE ASSEMBLY      : EXTENDED COMPACT CXE (CXE    )                      |
| DEVELOPMENT LINE       : EUROPE DEVELOPMENT  (H300)                          |
| OPERATING MODE         : SIMPLEX                                             |
| RESTART TYPE           : SYM                                                 |
| HW-ARCHITECTURE        : 330E                                               |
| HW-ARCHITECTURE TYPE   : 4                                                   |
|                                                                             |
| 'NO OF' HW VALUES                                                           |
|   LTG'S     :    1  LTU'S       :  4  LOG.LINES :  8000  MTS BD /GSN:   1    |
|   SIUP'S/LTU:    4  TMD24'S PER LTU:  4  PHYS.PORTS: 2688 HWY /MTS BD:  64   |
|   HDLC /DCL :    5  PBC /DCL : 1  PBC'S     :    17                          |
| LOG. SIU LINES         :   26                                                |
| LOG. CONF LINES        :   35                                                |
| LOG. DCL LINES         :   36                                                |
| DB DIMENSIONING-NAME   : 350EMSTD         CONF-TABLE VERSION:    1           |
```

```
| DB SUSY'S:                                                               |
| SWITCH NUMBER : L31900Q2999A00001                                       |
| DB                                                                      |
| SYSTEM_ID        : PKP091000                                            |
+-------------------------------------------------------------------------+
```

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_B#sh ver
Cisco Internetwork Operating System Software
IOS (tm) 5300 Software (C5300-JS-M), Version 12.2(0.5g), BETA TEST SOFTWARE
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Mon 09-Apr-01 16:29 by pwade
Image text-base: 0x60008958, data-base: 0x611D8000

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 6 days, 3 hours, 32 minutes
System returned to ROM by bus error at PC 0x60207E70, address 0x3C400010 at 20:0
7:26 UTC Sat Jan 8 2000
System image file is "flash:c5300-js-mz.122-0.5g"

cisco AS5300 (R4K) processor (revision A.32) with 131072K/16384K bytes of memory
.
Processor board ID 21215876
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 21215876,
 PLD/ISP Version 0.0,  Manufacture Date 12-Jul-2000.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
35 Serial network interface(s)
8 Channelized E1/PRI port(s)
30 Voice resource(s)
128K bytes of non-volatile configuration memory.
32768K 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_B#sh conf
Using 2178 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
!
!
!
resource-pool disable
!
call rsvp-sync
ip subnet-zero
no ip finger
!
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
 clock source line secondary 1
!
controller E1 2
 clock source line secondary 2
!
controller E1 3
 clock source line secondary 3
!
controller E1 4
 clock source line secondary 4
!
controller E1 5
 clock source line secondary 5
!
controller E1 6
 clock source line secondary 6
!
controller E1 7
 clock source line secondary 7
!
!
interface Ethernet0
 ip address 10.1.1.114 255.255.255.0
 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
```

```
!
interface Serial2
 no ip address
 no ip mroute-cache
 shutdown
 no fair-queue
 clockrate 2015232
!
interface Serial3
 no ip address
 no ip mroute-cache
 shutdown
 no fair-queue
 clockrate 2015232
!
interface Serial0:15
 no ip address
 isdn switch-type primary-qsig
 isdn incoming-voice modem
 isdn guard-timer 3000
 isdn bchan-number-order ascending
 isdn sending-complete
 no cdp enable
!
interface FastEthernet0
 ip address 100.100.100.1 255.255.255.0
 no ip mroute-cache
 duplex auto
 speed auto
!
ip kerberos source-interface any
ip classless
no ip http server
!
!
!
!
voice-port 0:D
!
dial-peer voice 1 pots
 destination-pattern 5...
 direct-inward-dial
 port 0:D
 prefix 5
!
dial-peer voice 2 voip
 destination-pattern 2...
 progress_ind setup enable 1
 session target ipv4:100.100.100.2
!
dial-peer voice 3 pots
 destination-pattern 408557....
 direct-inward-dial
 port 0:D
!
dial-peer voice 4 voip
 destination-pattern 408527....
 session target ipv4:100.100.100.2
!
!
line con 0
 transport input none
line aux 0
line vty 0 4
 login
!
end
```

```
AS5300_B#
```

Cisco AS5300 Voice Gateway Controller Information

```
AS5300_B#sh controllers e1
E1 0 is up.
  Applique type is Channelized E1 - balanced
  No alarms detected.
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.

  Framing is CRC4, Line Code is HDB3, Clock Source is Line Primary.
  Data in current interval (558 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
E1 1 is down.
  Applique type is Channelized E1 - balanced
  Far End Block Errors Detected
  Receiver has loss of signal.
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.

  Framing is CRC4, Line Code is HDB3, Clock Source is Line Secondary.
  Data in current interval (561 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     561 Slip Secs, 561 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 561 Unavail Secs
E1 2 is down.
  Applique type is Channelized E1 - balanced
  Far End Block Errors Detected
  Receiver has loss of signal.
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.

  Framing is CRC4, Line Code is HDB3, Clock Source is Line Secondary.
  Data in current interval (572 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     130 Slip Secs, 572 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 572 Unavail Secs
E1 3 is down.
  Applique type is Channelized E1 - balanced
  Far End Block Errors Detected
  Receiver has loss of signal.
```

```
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.

  Framing is CRC4, Line Code is HDB3, Clock Source is Line Secondary.
  Data in current interval (573 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     415 Slip Secs, 573 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 573 Unavail Secs
E1 4 is down.
  Applique type is Channelized E1 - balanced
  Far End Block Errors Detected
  Receiver has loss of signal.
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.

  Framing is CRC4, Line Code is HDB3, Clock Source is Line Secondary.
  Data in current interval (574 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     574 Slip Secs, 574 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 574 Unavail Secs
E1 5 is down.
  Applique type is Channelized E1 - balanced
  Far End Block Errors Detected
  Receiver has loss of signal.
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.

  Framing is CRC4, Line Code is HDB3, Clock Source is Line Secondary.
  Data in current interval (576 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     540 Slip Secs, 576 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 576 Unavail Secs
E1 6 is down.
  Applique type is Channelized E1 - balanced
  Far End Block Errors Detected
  Receiver has loss of signal.
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.
```

```
  Framing is CRC4, Line Code is HDB3, Clock Source is Line Secondary.
  Data in current interval (577 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     86 Slip Secs, 577 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 577 Unavail Secs
E1 7 is down.
  Applique type is Channelized E1 - balanced
  Far End Block Errors Detected
  Receiver has loss of signal.
  alarm-trigger is not set
  Version info of slot 0:  HW: 1, PLD Rev: 11
  Framer Version: 0x8

Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x49,
 Board Hardware Version 3.1, Item Number 800-3883-02,
 Board Revision B0, Serial Number 21685723,
 PLD/ISP Version 0.1,  Manufacture Date 22-Jul-2000.

  Framing is CRC4, Line Code is HDB3, Clock Source is Line Secondary.
  Data in current interval (579 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     387 Slip Secs, 579 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 579 Unavail Secs
AS5300_B#
```

Caveats

- When calling from the Siemens Hicom 330E to the Lucent PBX on the other side of the network, the Lucent PBX sends back a Progress Indicator message indicating inband information may be available. The "progress_ind setup enable 1" command is necessary under all voip dial-peers associated with the PBXs to open the voice path to ensure the caller hears a ringback tone.