Application Note

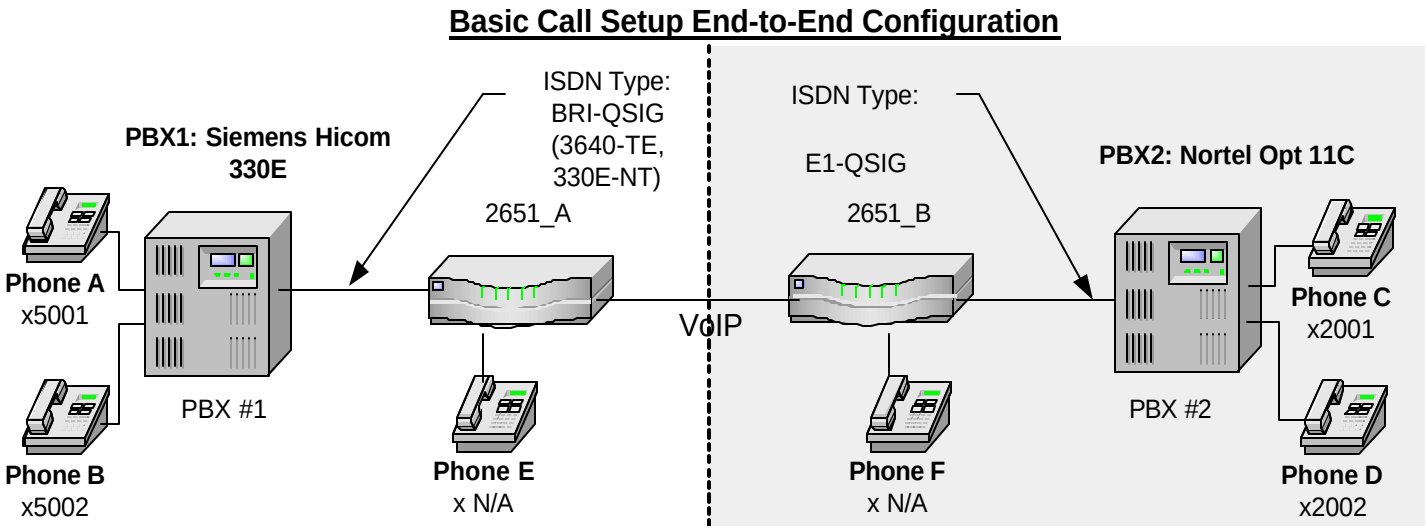
Cisco 2651 Gateway-PBX Interoperability: Siemens Hicom 330E PBX with BRI QSIG Interfaces to an MGCP Gateway

Introduction

- This note describes the connectivity for the Siemens Hicom 330E public branch exchange (PBX) using a Cisco 2651 gateway with basic rate interface (BRI) QSIQ interface to an media gateway control protocol (MGCP) gateway.
- The network topology diagram shows the set up for interoperability between Cisco 2651 gateway connected to the Siemens Hicom 330E PBX using basic rate interface (BRI) QSIG interfaces.
- The Cisco 2651 gateway is configured for back-to-back voice over Internet protocol (VoIP) operation.
- The Cisco 2651 gateway is connected and configured for connection to a Siemens Hicom 330E PBX.
- This note covers end-to-end interoperability between the Cisco 2651 gateway connected to the Siemens Hicom 330E PBX using ISDN primary rate interface (PRI) QSIG link.
- The table shows the PRI protocol settings supported by the Siemens Hicom 330E PBX and Cisco 2651gateway.

Siemens Hicom 330E Switch-type/ Protocol side setting	**Cisco 2651 ISDN switch-type emulation**
ECMA1 QSIG (ETSI 300172 2nd with Supplementary Services) / Master	isdn switch-type basic-qsig isdn layer1-emulate user (default) isdn protocol-emulate user (default)
ECMA1 QSIG (ETSI 300172 2nd with Supplementary Services) / Slave	isdn switch-type basic-qsig isdn layer1-emulate network isdn protocol-emulate network

Network Topology



The Siemens Hicom 330E PBX is connected using an ISDN BRI QSIG link to a Cisco 2651 gateway. The interoperability connectivity involves Layers 1, 2 and 3 on the ISDN QSIG link between the Cisco 2651 gateway and the Siemens Hicom 330E PBX. QSIG Supplementary Services features such as Call Forward, Conference and Transfer were also verified for proper operation.

Layer 1 (Physical Layer)

The layer 1 configuration in the Siemens Hicom 300E PBX is assigned to the device type S0CONN via parameter SMD (BRI). For Master side operation, the Siemens was configured so that the applicable fields under the <cha-tdcsu command are as follows:

```
Master = Y

SMD = Y

PRI = 0
```

For slave side operation:

```
Master = N

SMD = N

PRI = 11 (number other than 0)
```

To configure Layer 1 operation for the Cisco 2651 gateway BRI voice port as clock master (NT) or clock slave (TE), “isdn layer1-emulate user/network” is used. The default setting is user.

User/ Network Settings

The Cisco 2651 gateway with ISDN switch type setting of **primary-qsig** or **basic-qsig** supports both protocol sides by using the "isdn protocol-emulate network/user" command.

Configuring the Siemens PBX operation to be Master (or Network) side sets the Layers 2 & 3 protocol side setting to master. Therefore, the Cisco 2651 gateway should be set to Slave protocol side by issuing the command: "isdn protocol-emulate user".

Similarly, if the Siemens PBX operation is set for Slave (or user) side, layers 2 & 3 protocol side are set for slave side. The Cisco 2651 gateway is set to Master protocol side by issuing the command: "isdn protocol-emulate network".

Limitations

- To assure that Calling Name delivery and presentation is supported on the Siemens PBX, the Siemens was configured for ECMA1 type of supplementary services.
- ISDN command "isdn contiguous-bchan" may be needed in the Cisco 2651 gateway to support ESGF (ETSI QSIG) channel mapping standard, depending on the PBX settings.
- The Siemens automatically changed its RJ48C pin-outs accordingly when changed from "Master" side to "Slave" side. Therefore, a crossover cable to swap the transmit and receive pins was not necessary when the Cisco 2651 gateway was changed from a TE device to an NT device.

System Components

Hardware Requirements

- Cisco Hardware
  Cisco 2651 gateway
- PBX Hardware.
  Siemens Hicom 330E PBX

Software Requirements

- Cisco IOS Software Release 12.2(1)
- Siemens Hicom 330E PBX with Software version 3.1

Configuration

Configuring the Siemens Hicom 330E PBX

TRUNK CONFIGURATION:

For Master side configuration:

```
<dis-tdcsu

PEN1 = 1-1-85-2;

DIS-TDCSU:1-1-85-2;

H500:  AMO TDCSU STARTED

  +------------------------ DIGITAL TRUNK (FORMAT=L) -------------------------+

  |             DEV = S0CONN                   PEN =  1-01-085-2              |

  |-------------------------------------------------------------------------------|

  | COTNO    = 4             COPNO    = 4             DPLN     = 0             |

  | ITR      = 0             COS      = 3             LCOSV    = 31            |

  | LCOSD    = 31            CCT      =               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  = 0             FIDX     = 1             CARRIER  = 1             |

  | ZONE     = EMPTY         COTX     = 4             FWDX     = 1             |

  | DOMTYPE  =               DOMAINNO =               TPROFNO  =               |

  | INIGHT   =                                                                |

  | CCHDL    =               UUSCCX   = 16            UUSCCY   = 8             |

  |-------------------------------------------------------------------------------|

  | INS      = y             TGRP     = 40            SRCHMODE = CIR           |

  | MASTER   = y             SMD      = y             CNTRNR   = 0             |
```

```
| BCNEG    = N                                                                 |
+------------------------------------------------------------------------------+
```

```
AMOUNT OF B-CHANNELS IN THIS DISPLAY-OUTPUT: 2

AMO-TDCSU-95        DIGITAL TRUNKS

DISPLAY COMPLETED;
```

For Slave side configuration:

```
<dis-tdcsu

PEN1 = 1-1-85-2;

DIS-TDCSU:1-1-85-2;

H500:  AMO TDCSU STARTED

  +------------------------ DIGITAL TRUNK (FORMAT=L) --------------------------+
  |             DEV = S0CONN                   PEN =  1-01-085-2               |
  |----------------------------------------------------------------------------|
  | COTNO    = 4             COPNO    = 4             DPLN     = 0             |
  | ITR      = 0             COS      = 3             LCOSV    = 31            |
  | LCOSD    = 31            CCT      =               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  = 0             FIDX     = 1             CARRIER  = 1             |
  | ZONE     = EMPTY         COTX     = 4             FWDX     = 1             |
  | DOMTYPE  =               DOMAINNO =               TPROFNO  =               |
  | INIGHT   =                                                                 |
  | CCHDL    =               UUSCCX   = 16            UUSCCY   = 8             |
  |----------------------------------------------------------------------------|
  | INS      = N             TGRP     = 40            SRCHMODE = CIR           |
  | MASTER   = N             SMD      = N             CNTRNR   = 0             |
  | BCNEG    = N                                                               |
  +----------------------------------------------------------------------------+
```

```
  AMOUNT OF B-CHANNELS IN THIS DISPLAY-OUTPUT: 2
AMO-TDCSU-95        DIGITAL TRUNKS
DISPLAY COMPLETED;


<dis-buend
TGRP = 40
FORMAT = l
DIS-BUEND:40,L;
H500:  AMO BUEND STARTED
+------------------------------ FORMAT = L -----------------------------------+
|  TGRP NUMBER :    40   TGRP NAME   : BRI MASTER         MAXIMUM NO.   :    4 |
|  SUBGROUP NO.:    13   DEVICE TYPE : S0CONN             TRACENO       :    0 |
|  RESERVED    :     N   SEARCH MODE : CIRCULAR           ACD THRESHOLD :    * |
|  NUMBER OF ASSOCIATED ROUTES       :   1                PRIORITY      :    2 |
|  THE FOLLOWING TRUNKS (LTG-LTU-SLOT-CCT) HAVE BEEN ALLOCATED:                 |
+-------------------------------------------------------------------------------+
|   1- 1- 85-2   B-CHL:  1 |  1- 1- 85-2   B-CHL:  2 |  1- 1- 85-3   B-CHL:  1 |
|   1- 1- 85-3   B-CHL:  2 |                    :    |                    :    |
+-------------------------------------------------------------------------------+
AMO-BUEND-95        TRUNK GROUP
DISPLAY COMPLETED;
```

```
<dis-refta
TYPE = circuit
PEN = 1-1-85-2;
DIS-REFTA:CIRCUIT,1-1-85-2;
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- 85- 2 | STMD    | S0CONN   |   11 |  45032 |    N |        |  N  |
   +--------------+---------+----------+------+--------+------+--------+-----+
AMO-REFTA-95        REFERENCE CLOCK TABLE
DISPLAY COMPLETED;
```

ROUTE CONFIGURATION:

```
<dis-richt
 MODE = ?
 MODE            : ADDRESS-MODE OF THE ROUTE CHARACTERISTIC  : REQUIRED             CONDITIONAL
POSSIBLE VALUES : ALL        ALL
PM         PHONE MAIL                   INFO       SERVICE INFORMATIONS                  LRTE
LCR ROUTE NUMBER                  CD         CODE MODE = all
```

```
DIS-RICHT:ALL; H500:  AMO RICHT STARTED
+------------------------------------------------------------+
| LRTE = 1      NAME = CENTRAL OFFICE              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 =     6 BUGS = LIN                   MAINGROUP =    6 |
| INFO =                                                        |
+------------------------------------------------------------+
|TGRP =  30   LDAT      ANALOG TRUNKS         SUBGROUP =    3  |
+------------------------------------------------------------+
| LRTE = 31     NAME = E&M                         SRVC = VCE   |
| DNNO = 1 -1  -999  DESTNO =  99                               |
| ROUTOPT = NO     REROUT = YES   PLB = NO     FWDBL = NO       |
| MFV: CNV=FIX     DSP=WITHOUT TEXT=                 PULS=PP300 |
| ROUTENO =     5 BUGS = LIN                   MAINGROUP =    5 |
| INFO =                                                        |
+------------------------------------------------------------+
| TGRP =  31   LDAT      E&M WINK               SUBGROUP =    6  |
+------------------------------------------------------------+
| LRTE = 37     NAME = PRI 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-187       TRUNK ROUTING
DISPLAY COMPLETED;
```

BOARD CONFIGURATION:

```
<dis-bcsu
TYPE = tbl
LTG = 1
LTU = 1
SLOT = 85
DIS-BCSU:TBL,1,1,85;
```

```
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     |
-----+-----------+---------+---+---+-+------------+-----+--------+------------+
  85 | Q2163-X     STMD2      1  A | | Q2163-X    |  1  | -09 -  | READY      |
---------------+-----------+---------+---+---+-+------------+-----+--------+------------+
AMO-BCSU -95        BOARD CONFIGURATION, SWITCHING UNIT
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;
```

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                                                 |
+------------------------------------------------------------------------------+

  <dis-cossu
TYPE = cos
COS = 3
FORMAT = l;
DIS-COSSU:COS,3,L;
H500:  AMO COSSU STARTED

   +------+----------+---------+---------+---------+----------+
   | COS  |  VOICE   |   FAX   |   TTX   |   VTX   |    DTE   |
   +------+----------+---------+---------+---------+----------+
   |    3 |>3:STANDARD - FWDBSY                                |
   |      |      TA  |   NOCO  |   NOCO  |   NOCO  |      TA  |
   |      |   TSUID  |  NOTIE  |  NOTIE  |  NOTIE  |  TNOTCR  |
   |      |  TNOTCR  |         |         |         |   BASIC  |
   |      |  CDRINT  |         |         |         |     MSN  |
   |      |    CDRS  |         |         |         |  CDRINT  |
   |      |    CDRC  |         |         |         |  MULTRA  |
   |      |  COSXCD  |         |         |         |          |
   |      |     VCE  |         |         |         |          |
   |      |    DATA  |         |         |         |          |
```

```
   |      |  FWDNWK  |         |         |         |          |
   |      |     MSN  |         |         |         |          |
   |      |  FWDBSY  |         |         |         |          |
   |      |  FWDEXT  |         |         |         |          |
   |      |          |         |         |         |          |
   +------+----------+---------+---------+---------+----------+
AMO-COSSU-95        CLASSES OF SERVICE, SWITCHING UNIT
DISPLAY COMPLETED;


  <dis-cossu
TYPE = cos
COS = 7;
DIS-COSSU:COS,7;
H500:  AMO COSSU STARTED
   +------+----------+---------+---------+---------+----------+
   | COS  |  VOICE   |   FAX   |   TTX   |   VTX   |    DTE   |
   +------+----------+---------+---------+---------+----------+
   |    7 |>7:STANDARD/FWDNWK - NOANSA&FWDBSY                  |
   |      |      TA  |   NOCO  |   NOCO  |   NOCO  |      TA  |
   |      |   TSUID  |  NOTIE  |  NOTIE  |  NOTIE  |  TNOTCR  |
   |      |  TNOTCR  |         |         |         |   BASIC  |
   |      |  CDRINT  |         |         |         |     MSN  |
   |      |    CDRS  |         |         |         |  CDRINT  |
   |      |    CDRC  |         |         |         |  MULTRA  |
   |      |  COSXCD  |         |         |         |          |
   |      |     VCE  |         |         |         |          |
   |      |    DATA  |         |         |         |          |
   |      |  NOANSA  |         |         |         |          |
   |      |  FWDNWK  |         |         |         |          |
   |      |     MSN  |         |         |         |          |
   |      |  FWDBSY  |         |         |         |          |
```

```
   |      |  FWDECA  |         |         |         |          |
   |      |  FWDEXT  |         |         |         |          |
   |      |          |         |         |         |          |
   +------+----------+---------+---------+---------+----------+
AMO-COSSU-95        CLASSES OF SERVICE, SWITCHING UNIT
DISPLAY COMPLETED;
```

Configuring the Cisco 2651 Router

Cisco 2651_A Configuration

The following is the configuration of the 2651_A router directly connected to Siemens Hicom 330E PBX ISDN BRI interface.

```
2651_A#sho run
Building configuration...
Current configuration : 1251 bytes
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 2651_A
!
logging rate-limit console 10 except errors
!
memory-size iomem 20
ip subnet-zero
!
no ip finger
!
no ip dhcp-client network-discovery
isdn switch-type basic-qsig
```

```
call rsvp-sync
!
interface FastEthernet0/0
 ip address 100.100.100.1 255.255.255.0
 no ip mroute-cache
 speed auto
 half-duplex
!
interface FastEthernet0/1
 ip address 10.1.1.207 255.255.255.0
 duplex auto
 speed auto
!
interface BRI1/0
 no ip address
 no ip mroute-cache
 isdn switch-type basic-qsig
 isdn twait-disable
 isdn incoming-voice voice
 isdn T310 40000
 isdn skipsend-idverify
!
interface BRI1/1
 no ip address
 isdn switch-type basic-qsig
!
ip kerberos source-interface any
ip classless
no ip http server
!
voice-port 1/0/0
```

```
 compand-type a-law
!
voice-port 1/0/1
!
dial-peer cor custom
!
dial-peer voice 1 pots
 destination-pattern 5...
 direct-inward-dial
 port 1/0/0
 prefix 5
!
dial-peer voice 2 pots
!
dial-peer voice 4 voip
 destination-pattern 2...
 session target ipv4:100.100.100.2
!
line con 0
 transport input none
line aux 0
line vty 0 4
 login
line vty 5 15
login
!
end
```

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