Application Note

Siemens Hicom 330 E Rel 3.1 PBX with CallManager using 2621-E1 PRI-NET5 Gateway

This application note illustrates for connectivity of the Siemens Hicom 330 E Rel 3.1 PBX with Cisco CallManager using Cisco 2621-E1 PRI-NET5 Gateway.

Integration Description

Connectivity is achieved by using the ETSI standard PRI protocol. The Siemens Hicom 330 E can be configured as either NETWORK or USER side.

Cisco Systems Hardware and Software Requirements

- Hardware (Cisco 2621 Gateway): 2MFT E1 Port
- Software: CallManager Release 3.1

PBX Hardware and Software Requirements

- Hardware: DIU-N2
- Software: Version 3.1

Features Supported

Key Features Supported

Calling/Called Number

Key Features Not Supported

Calling/Called Name

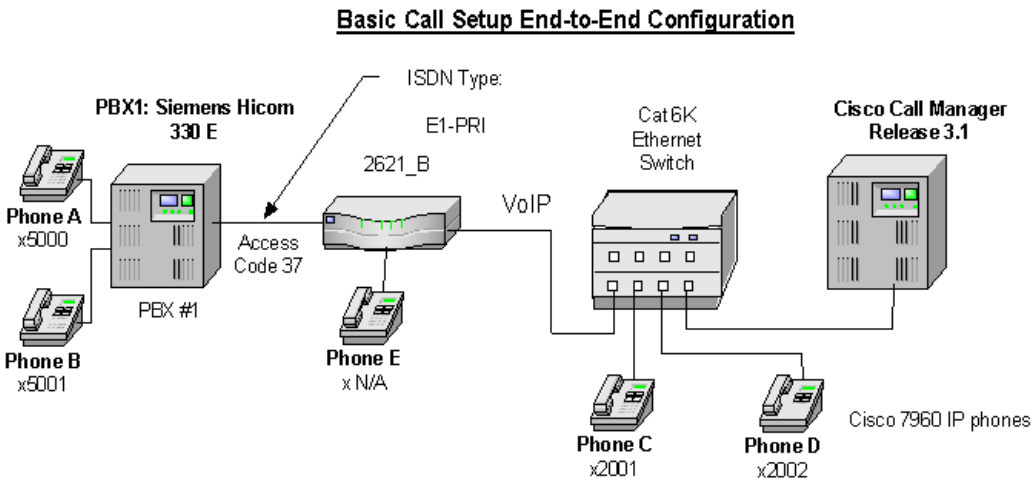
Limitations

Calling Name and Number feature

- Calling Name delivery and presentation features are not supported by the Siemens Hicom 330 E PBX.
- When calling from Cisco 7960 IP phone to Siemens digital phone, Calling/Called Number is displayed on both phones after the call is answered as expected.
- When calling from Siemens digital phone to Cisco 7960 IP phone, the IP phone displays Connected Number after the call is answered. The Siemens phone however does NOT get updated when the call is answered. It displays the numbers being dialed instead. (i.e. Access Code + extension number). It was verified using ISDN protocol analyzer that the CallManager was not sending "Connected Number" information in the connect message back to PBX.

Network Topology

Figure 1 Basic Setup



Configuration

Configuring the Siemens Hicom 330 E PBX

Use the following steps to configure the Siemens Hicom 330 E PBX.

Step 1. Add the new access code to Dialing Plans using WABE + LDPLN.

Step 2. Add the new trunk board using BCSU.

Step 3. Configure Class of Trunk using COT.

Step 4. Configure Class of Parameter for device handler using COP.

Step 5. Configure Class of Service using COSSU.

Step 6. Add the new trunk group access code using BUEND.

Step 7. Configure trunk using TDCSU.

Step 8. Configure Reference Clock using REFTA.

Step 9. Configure trunk Least Cost Routing using LDAT + RICHT.

Step 10. Configure LCR Out-dial Rules using LODR.

Siemens Hicom 330 E PBX Configuration Menus and Commands

Step 1. Add the new access code to Dialing Plans using WABE + LDPLN.

```
<dis-wabe

TYPE = gen

CD =

DPLN = 0;

DIS-WABE:GEN,,0;

H500:  AMO WABE  STARTED
```

```
-------------------------------------------------------------------------------
| DIGIT INTERPRETATION                  VALID FOR ALL DIAL PLANS              |
-------------------------------------------------------------------------------
|                 |    CALL PROGRESS STATE     |  DIGIT   | RESERVED/CONVERT |
|      CODE       |            1 11111 11112 22| ANALYSIS | DNI/ADD-INFO     |
|                 |0 12345 67890 12345 67890 12|  RESULT  | *=OWN NODE       |
-------------------------------------------------------------------------------
| 001    - 002    |* ..... ..... ..... ..... ..| NETRTE   |                  |
| 11              |. ..... ..... ..... ....* ..| MBKY     |                  |
| 3001            |. .**** ***** **... ..... ..| STN      | R                |
|                 |                            |          |DESTNO   0        |
|                 |                            |          |DNNO    1-  1-150*|
| 3007            |. ..... ..... ..... ....* ..| MBKY     |                  |
| 3007            |. .**** ***** **... ..... ..| STN      |                  |
|                 |                            |          |DESTNO   0        |
|                 |                            |          |DNNO    1-  1-150*|
| 4100   - 4500   |. .**** ***** **... ..... ..| STN      |                  |
|                 |                            |          |DESTNO  72        |
|                 |                            |          |DNNO    1-  1-702 |
-------------------------------------------------------------------------------
| DIGIT INTERPRETATION                  VALID FOR ALL DIAL PLANS              |
-------------------------------------------------------------------------------
|                 |    CALL PROGRESS STATE     |  DIGIT   | RESERVED/CONVERT |
|      CODE       |            1 11111 11112 22| ANALYSIS | DNI/ADD-INFO     |
|                 |0 12345 67890 12345 67890 12|  RESULT  | *=OWN NODE       |
-------------------------------------------------------------------------------
| 5000   - 5007   |. .**** ***** **... ..... ..| STN      |                  |
|                 |                            |          |DESTNO   0        |
|                 |                            |          |DNNO    1-  1-150*|
| 5008   - 5009   |. .**** ***** **... ..... ..| STN      |                  |
|                 |                            |          |DESTNO  99        |
|                 |                            |          |DNNO    1-  1- 99 |
| 5010            |. .**** *.*** **... ..... ..| ATNDIND  |                  |
| 800             |. ..... *...* **... ..... ..| ATNDDID  |                  |
| 854             |. .**** ***** **... ..... ..| NETW     | R                |
|                 |                            |          |DESTNO   2        |
|                 |                            |          |DNNO    0-  0-  0 |
| *66             |. ....* ..... ..... ..... ..| SIGNON   |                  |
-------------------------------------------------------------------------------
| DIGIT INTERPRETATION                  VALID FOR ALL DIAL PLANS              |
-------------------------------------------------------------------------------
```

CODE	CALL PROGRESS STATE 1 11111 11112 22 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE
*91	. ....* ....*	MBOFF	
#66	. ....*	SIGNOFF	
#91	. ....* ....*	MBON	
##22	. ...* ..	DAKY	
##24	. ...* ..	DSSKY	
##25	. ...* ..	FWDKY	
##26	. ...* ..	HTKY	
##27	. ...* ..	KNOVRKY	
##28	. ...* ..	MBKY	
##29	. ...* ..	MSGRKY	
##35	. ...* ..	TIMEKY	
##36	. ...* ..	VCKY	

DIGIT INTERPRETATION — VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE 1 11111 11112 22 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE
##37	. ...* ..	VCRKY	
##38	. ...* ..	CCKY	
##39	. ...* ..	CONFKY	
##41	. ...* ..	NAMEKY	
##42	. ...* ..	PARKKY	
##43	. ...* ..	REMKY	
##44	. ...* ..	STKY	
##45	. ...* ..	CBKKY	
##46	. ...* ..	CONSKY	
##47	. ...* ..	DNDKY	
##48	. ...* ..	EXHOLDKY	
##49	. ...* ..	HOLDKY	

DIGIT INTERPRETATION — VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE 1 11111 11112 22 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE
##50	. ...* ..	IUSEKY	
##51	. ...* ..	LNRKY	
##52	. ...* ..	PRIVKY	
##53	. ...* ..	RLSKY	
##54	. ...* ..	SNRKY	
##55	. ...* ..	TRNSKY	
##56	. ...* ..	RCTOFFKY	
##57	. ...* ..	TOGGLEKY	

DIGIT INTERPRETATION — DPLN 0

CODE	CALL PROGRESS STATE 1 11111 11112 22 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE

0	. ..... *....	ATNDDID	
0	. ....* ..*** **...	ATND	
150	. .**** ***** **...	OWNNODE	
31	. .**** ***** **...	TIE	
37 - 38	. .**** ***** **...	TIE	
40	. .**** ***** **...	TIE	
702	. .**** ***** **...	TIE	
9	. .**** ..*** **...	CO	
*0	. *.... ..*.. ....*	ACBK	
*10	. ....* ....* **...	CCMANS	R
*11	. ....* ....*	AFWDVCE	
*12	. ....* ....*	AFWDDTE	

DIGIT INTERPRETATION — DPLN 0

CODE	CALL PROGRESS STATE 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE
*13	. ....*	AFWDDWD	
*14	. .**** ***** **..*	AFWDREM	
			CFREMVAR CFU
			CFREMSE VOICE
*15	. *...* ..**.	APRIV	
*16	. ....*	PUGDIS	
*17	. *.... ..**. ....*	SPLIT	
*18	. *.... ..**.	TRACE	
*19	. ....* ....*	AREM	
*20	. ...**	NOPT	
*21	. ....* ....*	AFFWDVCE	
*22	. ....* ....*	AFFWDDTE	

DIGIT INTERPRETATION — DPLN 0

CODE	CALL PROGRESS STATE 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE
*23	. *...* ..**.	CALLPARK	
*24	. ....* ..**.	DISUON	
*3	. .**** ..**.	PUDIR	
*40	. ....* ....* **...	CCANS	R
*41	. ...*.. ..	CCDIS	
*43	. .**.* *...* **...	DTE	
*44	. .**** ***** **..*	FWDREM	
			CFREMVAR CFU
			CFREMSE VOICE
*45	. ...*.. ..	CCMEETME	
*46	. ***** *.*** **...	CCSCD	R
*47	. ...*.. ..	CCSURG	

DIGIT INTERPRETATION — DPLN 0

CODE	CALL PROGRESS STATE 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE

*48	. ...*.. ..	CCVCE	
*49	. ....*	ACOSX	
*50	. ....* ..**.	FWDIGNOR	
*51	. ....*	ADND	
*52	. ....*	AHTVCE	
*53	. ***** *.*** **...	CCMSURG	R
*54	. ....*	SPD	
*55	. *...* ..**.	BABYLSNG	
*56	. ***** *.*** **...	CCMS	R
*57	. ...*.. ..	CCS	
*58	. ***** *.*** **...	CCSN	R
*59	. ...*.. ..	CCSTN	

DIGIT INTERPRETATION — DPLN 0

CODE	CALL PROGRESS STATE 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE
*60	. *....	KNOVR	
*61	. .**** ..*** **...	SPDC1	
*62	. .**** ..*** **...	SPDC2	
*63	. .**.* ..**.	SPDI	
*64	. ....* ....*	SPDIPROG	
*69	. *.... ..**.	EOVR	
*7	. *...* ..**. ....*	LNR	
*81	. ....* ..**. ..... .*... ..	APIN1	
*82	. ....* ..**. ..... .*... ..	APIN2	
*83	. ....* ..**. ..... .*... ..	APIN3	
*84	. ....* ..**. ..... .*... ..	APIN4	
*85	. ....* ..**. ..... .*... ..	APIN5	

DIGIT INTERPRETATION — DPLN 0

CODE	CALL PROGRESS STATE 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE
*88	. ...** ....* *....	CTLS	
*89	. ..*.. *...* *....	TESTLN	
*9	. *....	CONF3	
**	. ....*	PU	
*#50	. *...* ..**. ....*	ACDLOGON	
*#51	. *...* ..**. ....*	ACDAV	
*#52	. *...* ..**. ....*	ACDWORK	
*#53	. *...* ..**. ....*	ACC	
*#54	. ....*	MONSLNT	
*#55	. ....*	MONTONE	
*#60	. *...* ..**.	ACDPGS	
*#61	. *...* ..**.	ACDPQS	

DIGIT INTERPRETATION — DPLN 0

CODE	CALL PROGRESS STATE 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO *=OWN NODE

```
-------------------------------------------------------------------------------
| *#62            |. ....* ..... ..... ..... ..| ACDEMMSG |                  |
| *#63            |. ....* ..... ..... ..... ..| ACDSHMSG |                  |
| *#71            |. *...* ..**. ..... ..... ..| CAFAV    |                  |
| *#72            |. *...* ..**. ..... ..... ..| CAFGRAV  |                  |
| *#74            |. *...* ..**. ..... ..... ..| CAFAFWD  |                  |
| #0              |. ....* ..... ..... ..... ..| DCBK     |                  |
| #11             |. ....* ..... ..... ..... ..| DFWDVCE  |                  |
| #12             |. ....* ..... ..... ..... ..| DFWDDTE  |                  |
| #14             |. .**** ***** **..* ..... ..| DFWDREM  |                  |
|                 |                            |          |CFREMVAR CFU      |
|                 |                            |          |CFREMSE  VOICE    |
| #15             |. *...* ..**. ..... ..... ..| DPRIV    |                  |
-------------------------------------------------------------------------------
| DIGIT INTERPRETATION                              DPLN 0                    |
-------------------------------------------------------------------------------
|                 |    CALL PROGRESS STATE     |  DIGIT   | RESERVED/CONVERT |
|      CODE       |            1 11111 11112 22| ANALYSIS | DNI/ADD-INFO     |
|                 |0 12345 67890 12345 67890 12|  RESULT  | *=OWN NODE       |
-------------------------------------------------------------------------------
| #19             |. ....* ..... ..... ..... ..| DREM     |                  |
| #21             |. ....* ..... ..... ..... ..| DFFWDVCE |                  |
| #22             |. ....* ..... ..... ..... ..| DFFWDDTE |                  |
| #24             |. ....* ..**. ..... ..... ..| DISUOFF  |                  |
| #49             |. ....* ..... ..... ..... ..| DCOSX    |                  |
| #51             |. ....* ..... ..... ..... ..| DDND     |                  |
| #52             |. ....* ..... ..... ..... ..| DHTVCE   |                  |
| #74             |. ....* ..... ..... ..... ..| DIGIDAT  |                  |
| #8              |. ....* ..**. ..... .*... ..| DPIN     |                  |
| #92             |. ....* ....* ..... ..... ..| MBOFF    |                  |
| #*50            |. *...* ..**. ..... ..... .*| ACDLOGOF |                  |
| #*51            |. *...* ..**. ..... ..... .*| ACDNAV   |                  |
-------------------------------------------------------------------------------
| DIGIT INTERPRETATION                              DPLN 0                    |
-------------------------------------------------------------------------------
|                 |    CALL PROGRESS STATE     |  DIGIT   | RESERVED/CONVERT |
|      CODE       |            1 11111 11112 22| ANALYSIS | DNI/ADD-INFO     |
|                 |0 12345 67890 12345 67890 12|  RESULT  | *=OWN NODE       |
-------------------------------------------------------------------------------
| #*60            |. *...* ..**. ..... ..... ..| ACDSGS   |                  |
| #*61            |. *...* ..**. ..... ..... ..| ACDSQS   |                  |
| #*70            |. *...* ..**. ..... ..... ..| CAFLOGOF |                  |
| #*71            |. *...* ..**. ..... ..... ..| CAFNAV   |                  |
| #*72            |. *...* ..**. ..... ..... ..| CAFGRNAV |                  |
| #*73            |. *...* ..**. ..... ..... ..| CAFGROFF |                  |
| #*74            |. *...* ..**. ..... ..... ..| CAFDFWD  |                  |
| ##1             |. ..... ..... ....* ..... ..| KYPROG   |                  |
| ##40            |. ..... ..... ..... ....* ..| NAKYLO   |                  |
| ##7             |. ....* ....* ..... ..... ..| MBON     |                  |
| ##8             |. ....* ....* ..... ..... ..| MBOFF    |                  |
-------------------------------------------------------------------------------
```

```
AMO-WABE -107       DIALLING PLANS, FEATURE ACCESS CODES

DISPLAY COMPLETED;

<dis-ldpln
```

```
TYPE = ldp

M40: APPLICABLE GROUP CONDITION: MAXIMUM OF 1 OUT OF 2 PARAMETERS

LDPNO = 47;

DIS-LDPLN:LDP,47;

H500:  AMO LDPLN STARTED
   +--------------+-----------------------------------------+
   |              |                                         |
   | LDPNO :   47 | LDP : 37-XXXX                           |
   |              | SPC : 22                                |
   +--------------+------+------+------++------+------+------+
   |              | DPLN | LRTE | LAUTH|| DPLN | LRTE | LAUTH|
   |              +------+------+------++------+------+------+
   |              |   0  |   37 |   1  ||   8  |      |      |
   |              |   1  |      |      ||   9  |      |      |
   |              |   2  |      |      ||  10  |      |      |
   |              |   3  |      |      ||  11  |      |      |
   |              |   4  |      |      ||  12  |      |      |
   |              |   5  |      |      ||  13  |      |      |
   |              |   6  |      |      ||  14  |      |      |
   |              |   7  |      |      ||  15  |      |      |
   +--------------+------+------+------++------+------+------+

AMO-LDPLN-107       ADMINISTRATION LCR DIALPLAN

DISPLAY COMPLETED;
```

Step 2. Add the new trunk board using BCSU.

```
<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 -107       BOARD CONFIGURATION, SWITCHING UNIT
DISPLAY COMPLETED;
```

Step 3. Configure Class of Trunk using COT.

```
<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
        INTERWORKING CALLBACK - NO ANSWER AND MAILBOX CALLBACK         IWCB
        AOC PER CALL (AUTOMATICAL OR ON REQUEST), MAND. CORNET-NQ      AOCC
        CONTROLLED TRUNK AND LINE SELECTION                            CTLS
        NO TONE                                                        NTON
AMO-COT  -107       CLASS OF TRUNK FOR CALL PROCESSING
DISPLAY COMPLETED;
```

Step 4. Configure Class of Parameter for device handler using COP.

```
<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  -107       CLASS OF PARAMETER FOR DEVICE HANDLER
DISPLAY COMPLETED;
```

Step 5. Configure Class of Service using COSSU.

```
<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                |
   |    |12345678901234567890123456789012|12345678901234567890123456789012|
   |    |>SERVICE INFORMATION                                               |
   +----+----+----|----+----|----+----|--+----+----|----+----|----+----|--+
   |  31|                             XX|                                XX|
   +----+-------------------------------------------------------------------+
AMO-COSSU-82        CLASSES OF SERVICE, SWITCHING UNIT
DISPLAY COMPLETED
```

Step 6. Add the new trunk group access code using BUEND.

```
<dis-buend

TGRP = 37

FORMAT = ;
DIS-BUEND:37,;
H500:  AMO BUEND STARTED

+------------------------------ FORMAT = L -----------------------------------+
|  TGRP NUMBER :    37   TGRP NAME   : PRI               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-BUE
ND-107       TRUNK GROUP
DISPLAY COMPLETED;
```

Step 7. Configure trunk using TDCSU.

For 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      = PRI           DESTNO   = 99           |
  | PROTVAR  = ETSI          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-107       DIGITAL TRUNKS
DISPLAY COMPLETED;

<dis-lwpar

INFOPAT = 4

FORMAT = l

DEV = ;

DIS-LWPAR:4,L,;
H500: AMO LWPAR STARTED
   +--------------------------------------------------------------------------+
   | 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)                         |
   +-------------------------------------------------------------------------+
AMO-LWPAR-70        LOADWARE PARAMETERS FOR NETWORKING MODULES
DISPLAY COMPLETED;
```

For 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      = PRI           DESTNO   = 99          |
  | PROTVAR  = ETSI          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-107       DIGITAL TRUNKS
DISPLAY COMPLETED;

DIS-LWPAR:1,L,;
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)                      |
   +-------------------------------------------------------------------+
AMO-LWPAR-104       LOADWARE PARAMETERS FOR NETWORKING MODULES
DISPLAY COMPLETED;
```

Step 8. Configure Reference Clock using REFTA.

For Master Side Configuration

```
<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   |  0   |  15485 |    N |      X |  N  |

+-------------+---------+----------+------+--------+------+--------+-----+AMO-REFTA-89
REFERENCE CLOCK TABLE
DISPLAY COMPLETED;
```

For Slave Side Configuration

```
<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  |  15485 |    N |      X |  N  |

+-------------+---------+----------+------+--------+------+--------+-----+AMO-REFTA-89
REFERENCE CLOCK TABLE
DISPLAY COMPLETED;
```

Step 9. Configure trunk Least Cost Routing using LDAT + RICHT.

LDAT

```
<dis-ldat

TYPE = lcr

LROUTE = 37;

DIS-LDAT:LCR,37;
H500:  AMO LDAT  STARTED
   +-------------------------------------------------------------------------+
   | 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 |
   +-------+-------+-------+-----+-----+----------+------------+----+---------+AMO-LDAT
-107       LCR-DIRECTIONS
DISPLAY COMPLETED;
```

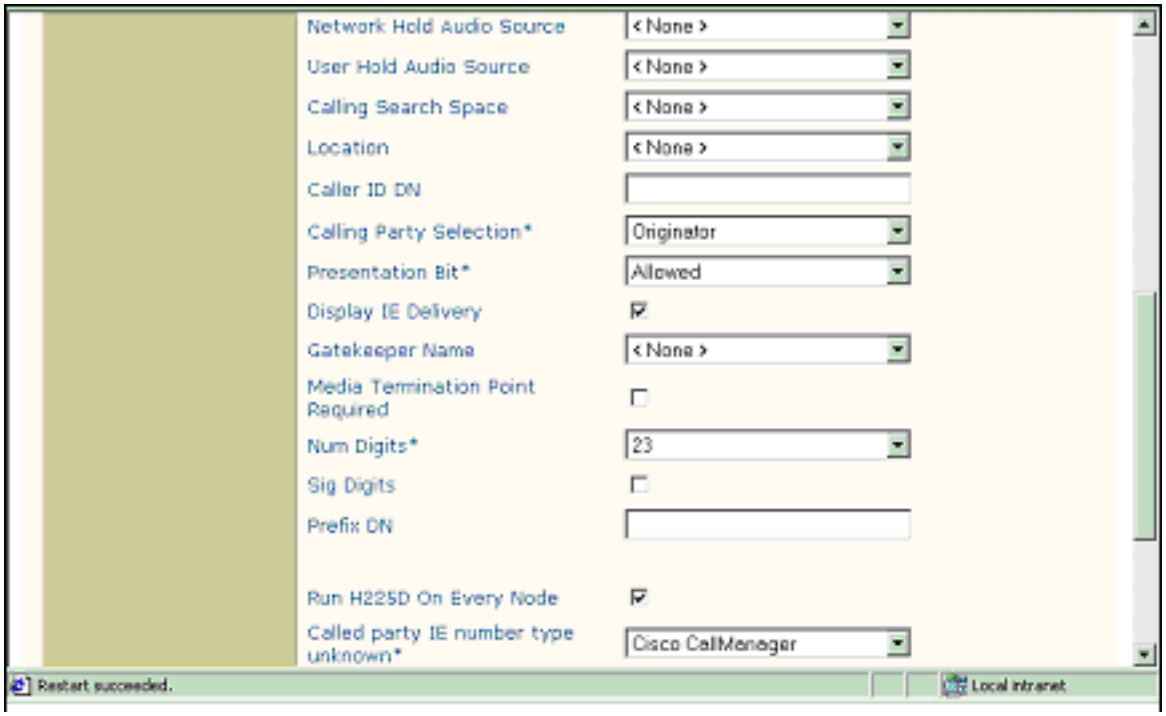
RICHT

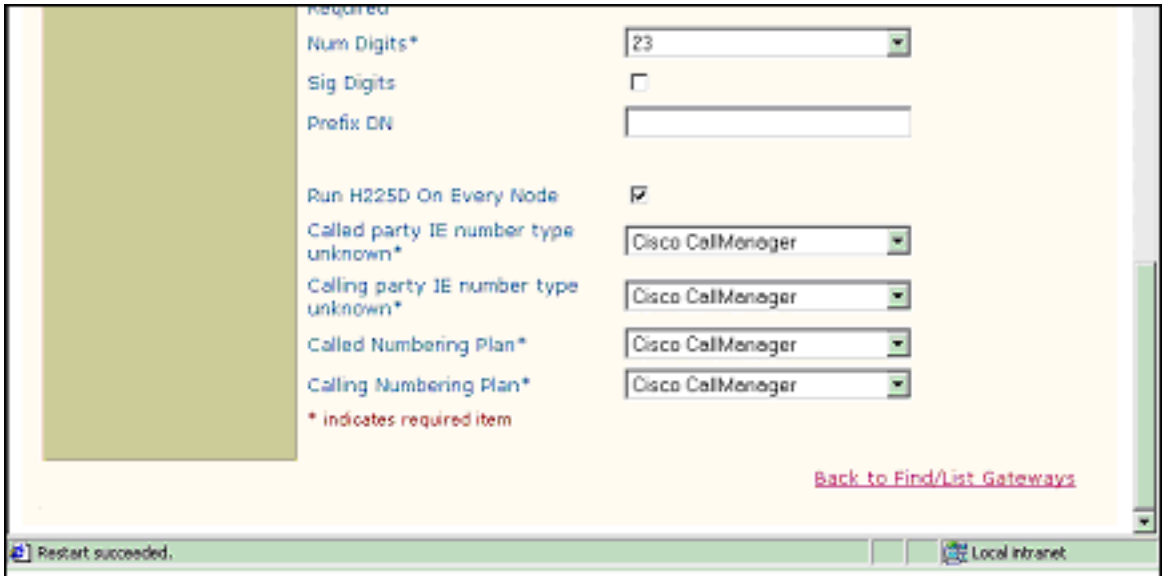
```
<dis-richt

MODE = lrte
LRTE = 37;
DIS-RICHT:LRTE,37;
H500:  AMO RICHT STARTED
+-----------------------------------------------------------------+
| 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  |
+-----------------------------------------------------------------+AMO-RICHT-107
TRUNK ROUTING
DISPLAY COMPLETED;
```

Step 10. Configure LCR Out-dial Rules using LODR.

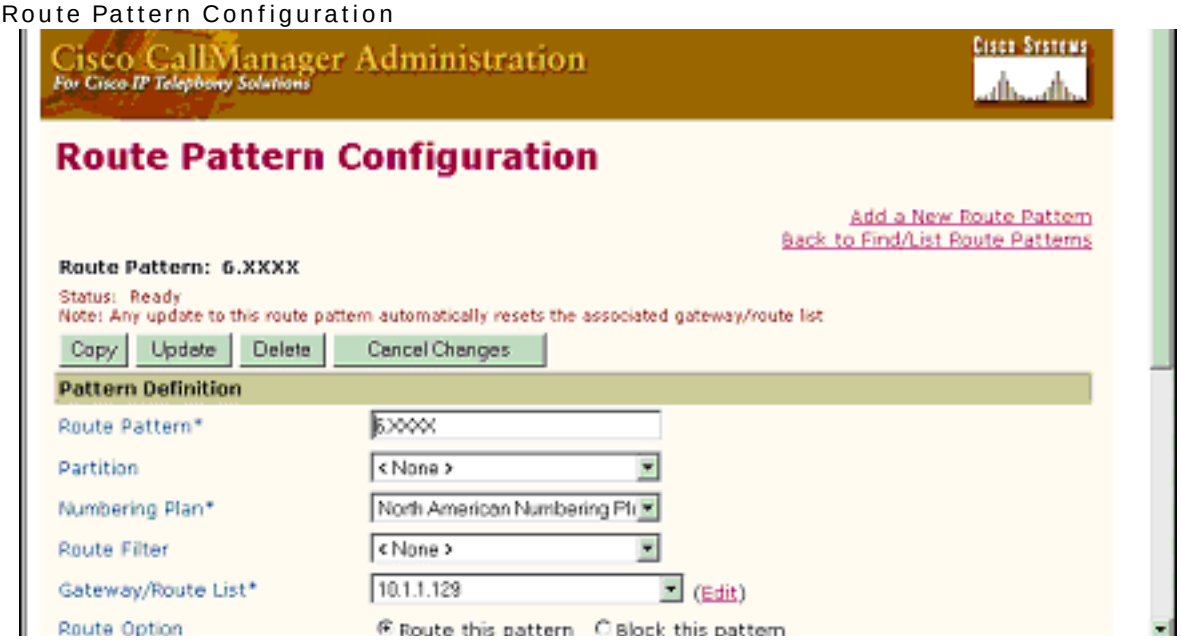
```
<dis-lodr
ODR = 1
INFOPAT = ;
DIS-LODR:1,;
H500:  AMO LODR  STARTED
   +-----------------------------------------------------+
   |  ODR     POSITION  CMD         PARAMETER            |
   +--------+-----------------------------------------+--+
   |    1   |      1    ECHO        2                    |
   |        |      2    END                              |
   +--------+-----------------------------------------+--+
   |INFO:PSTN                                            |
   +-----------------------------------------------------+
H03: THE NEXT FREE ODR IS 3AMO-LODR -107    ADMINISTRATION OF LCR OUTDIAL RULES
DISPLAY COMPLETED;
  <
```

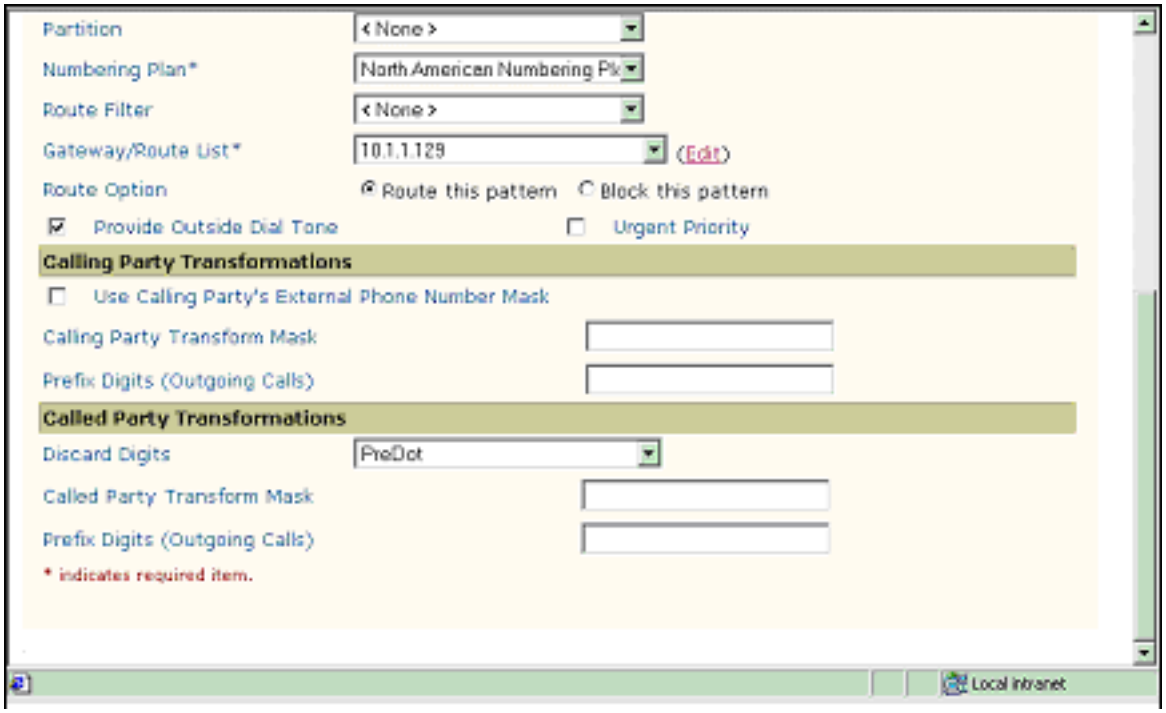
Figure 1
Configuring the H323 (Cisco 2621) Gateway





Route Pattern Configuration



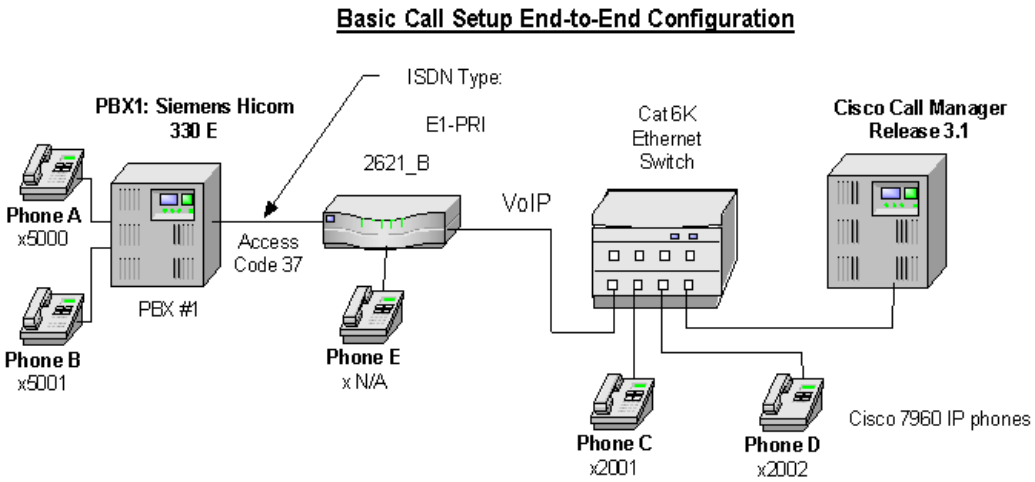


Test Results

As shown in the diagram below, a Siemens Hicom 330 E PBX was connected via an ISDN E1 PRI link to a Cisco

2621, which in turn, was connected to an Ethernet switch. The interoperability testing involved Layers 1, 2 and 3 on the ISDN PRI link between a Cisco 2621 and the PBX.

Test Configuration



Layer 1 (Physical Layer)

The Siemens configuration screen for the E1 trunk interface is reached with the following command:
`<cha-tdcsu`

Layers 2 & 3 (Q.921 and Q.931)

Layer 2 and 3 packet exchanges were monitored using an Acacia Clarinet protocol analyzer, bridged across the PRI link in high impedance mode.

Layer 2 Q.921 packets were monitored to ensure that each PBX/2621 software configuration properly exchanged SABME/UA packets to initialize the ISDN link, and then RR packets were exchanged every 30 seconds.

Layer 3 Q.931 packets were monitored to ensure that the appropriate call setup/teardown packets were exchanged for each configuration, and that the SETUP packets contained the mandatory Information Elements (IEs) with the necessary details, as well as optional IEs such as Calling Name and Number.

Telephone calls were made end-to-end in both directions through the Cisco 2621 Gateway, and a check was made to ensure that there was an audio path in both directions for each call.

User/Network Settings

The Cisco 2621 Gateway with ISDN protocol type setting of primary-net5 supports both protocol sides by selecting “Network/User” in the protocol side field when configuring the Gateway via CallManager.

The "Network/user" or Master/Slave choice for the Siemens Hicom 330 E PBX is made by deactivating the B channels/D-channel (<dea-dssu). A change command is then issued to the Reference clock (<cha-refta) to get to the Master/Slave selection (Pri=0 for Master, 11 for slave). Now the trunk is changed (<cha-tdcsu) to get to Device type prompt (Dev=s2conn), (Bcgrp=1), and loadware parameters (Lwpar=1 for Slave, 4 for Master). The D-channel, and B-channels are then reactivated (<act-dssu), after the settings are changed.

Table 1 PBX 1 - ETSI (Network) Cisco 2621 Gateway - primary-net5 (User)

Siemens Hicom 330 E Switch-type/ Protocol side setting	Cisco2621_B ISDN protocol-type/Protocol side setting
ETSI / Master	isdn switch-type—primary-net5 isdn protocol—emulate user

Table 2 Basic Calls: (Enbloc Sending)

Calls Made	Call Comp?	"Calling Number" Passed to Final Destination?	"Calling Name" Passed to Final Destination?	"Called Number" Passed to Orig. Side?	"Called Name" Passed to Orig. Side?	Notes
Phone A to Phone C	Yes	Yes	No	No [1]	No	[2]
Phone C to Phone A	Yes	Yes	No	Yes	No	

1. CallManager is not sending "Connected Number" information in the connect message back to PBX.
2. The Siemens PRI interface with ETSI setting does not support "Calling Name" presentation Feature.

Table 3 Call Transfers: (Supervised Local Transfers)

Calls Made	Call Comp?	Orig. "Calling Number" displayed on Final Dest. phone?	Orig. "Calling Name" displayed on Final Dest. phone?	"Called Number" display on Orig. phone updated after transfer?	"Called Name" display on Orig. phone updated after transfer?	Notes
Phone C to Phone A Xfr to Phone B	Yes	Yes	No	No	No	
Phone A to Phone C Xfr to Phone D	Yes	Yes	No	No	No	

Table 4 Call Conferencing (Local)

Calls Made	Call Comp?	"Calling Number" Passed to remaining conferee when the conferencing phone drops out?	"Calling Name" displayed on remaining conferee when the conferencing phone drops out?	"Connected Number" updated on Orig. Caller phone display when a conferee drops out?	"Connected Name" updated on Orig. Caller phone display when a conferee drops out?	Notes
Phone C to Phone A, Phone A conf Phone B	Yes	(A Drops out) Yes	(A Drops out) No	(A Drops out) No	(A Drops out) No	
Phone C to Phone A, Phone C conf Phone D	Yes	(C Drops out) No	(C Drops out) No	(D Drops out) No	(D Drops out) No	
Phone A to Phone C, Phone C conf Phone D	Yes	(C Drops out) No	(C Drops out) No	(C Drops out) No	(C Drops out) No	
Phone A to Phone C, Phone A conf Phone B	Yes	(A Drops out) No	(A Drops out) No	(B Drops out) No	(B Drops out) No	

Table 5 Call Forward (Local)

Calls Made	Call Comp?	Original "Calling Number" Passed to Final Dest.?	Original "Calling Name" Passed to Final Dest.?	Forwarding "Called Number" Pased to Final Dest.?	Forwarding "Called Name" Displayed on Final Dest.?	Final dest. "Connected Number" updated at orig. side?	Final dest. "ConnectedName" updated at orig. side?	Notes
Phone C to Phone A fwd to Phone B	Yes	Yes	No	No	No	No	No	
Phone A to Phone C fwd to Phone D	Yes	Yes	No	No	No	No	No	

Test Setup 2

Setup was as follows:

- PBX1 configured as ETSI, emulates User
- Cisco 2621 Gateway configured as PRI EURO, emulates Network

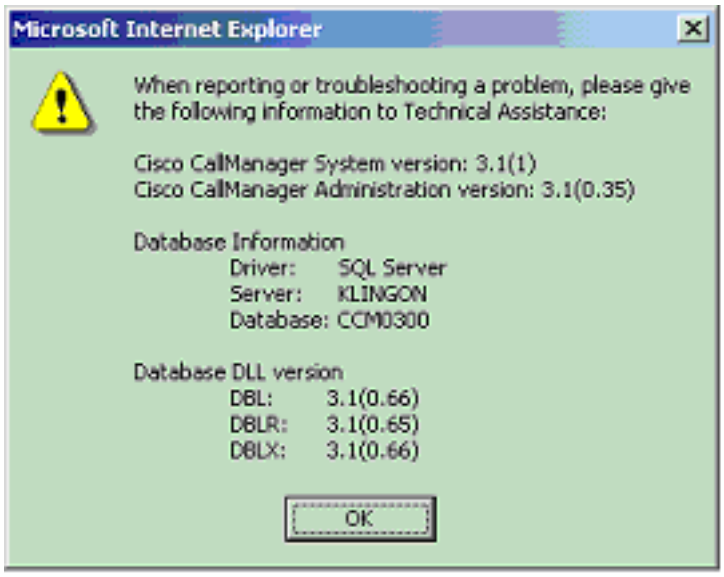
Table 6 Switch and Gateway Settings

Siemens Hicom 330 E Switch-type/ Protocol side setting	Cisco 6608-E1 ISDN protocol-type/ Protocol side setting
ETSI/Slave	PRI EURO / Network

The test results are the same as in previous section . Refer to Tables 2 through 6 for details.

Appendix A

Call Manager Software Release:



Siemens Hicom 330 E Software release

```
Software Release

--------------------------------------------------------------------------------
TERMINAL 1                     L O G O N                   01-10-15    11:36:52
-------------------------------------------------------------------------------- <dis-dbc

VERBOSE =
DIS-DBC:;
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                                          |
| LOCATION         : CUSTOMER                                                  |
| BAPPL            : 6ECXM48                                                   |
| DBAPPL           : 6ECXM48                                                   |
| SYSTEM_ID        : PKP091000                                                 |
+------------------------------------------------------------------------------+
AMO-DBC  -89        DATABASE CONFIGURATION
DISPLAY COMPLETED;



  DIS-VEGAS;
H500:  AMO VEGAS STARTED
     SYSTEM NO.        AMO   APS NO.           START           USER     STATUS
SWU: L31900Q2999A00001 REGEN P30252B4200B00103 14.11.00  14:33 DAVE A   FINISHED
ADS: L31900Q2999A00001 REGEN P30252B4200A00103 14.11.00  14:35 DAVE A   FINISHED
AMO-VEGAS-107       ADMIN. OF DATABASE GENERATION RUNS ON SUPPORT SYSTEM
DISPLAY COMPLETED;
  <
```

Cisco 2621 Router Configuration

```
2621_B#sh version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-JS-M), Version 12.2(3.5)T,  MAINTENANCE INTERIM S
OFTWARE
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 03-Aug-01 22:45 by ccai
Image text-base: 0x80008088, data-base: 0x81631DD8

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)

2621_B uptime is 16 hours, 6 minutes
System returned to ROM by power-on
System image file is "flash:c2600-js-mz.122-3.5.T"

cisco 2621 (MPC860) processor (revision 0x200) with 56320K/9216K bytes of memory
.
Processor board ID JAD051516TX (503811939)
M860 processor: part number 0, mask 49
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.
2 FastEthernet/IEEE 802.3 interface(s)
31 Serial network interface(s)
2 Channelized E1/PRI port(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102

2621_B#
```

```
2621_B#sh diag
Slot 0:
        C2621 2FE Mainboard Port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time unknown
        EEPROM contents at hardware discovery:
        Hardware Revision        : 2.0
        PCB Serial Number        : JAD051516TX (503811939)
        Part Number              : 73-3200-08
        RMA History              : 00
        RMA Number               : 0-0-0-0
        Board Revision           : A0
        Deviation Number         : 0-21249
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 00 A2 41 02 00 C1 17 4A 41 44 30 35 31
          0x10: 35 31 36 54 58 20 28 35 30 33 38 31 31 39 33 39
```

```
          0x20: 29 82 49 0C 80 08 04 00 81 00 00 00 00 42 41 30
          0x30: 80 00 00 53 01 FF FF FF FF FF FF FF FF FF FF FF
          0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

Slot 1:
        High Density Voice Port adapter
        Port adapter is analyzed
        Port adapter insertion time unknown
        EEPROM contents at hardware discovery:
        Hardware Revision        : 1.1
        Top Assy. Part Number    : 800-03567-01
        Board Revision           : F1
        Deviation Number         : 0-0
        Fab Version              : 02
        PCB Serial Number        : JAB05080LU9
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 00 CC 41 01 01 C0 46 03 20 00 0D EF 01
          0x10: 42 46 31 80 00 00 00 00 02 02 C1 8B 4A 41 42 30
          0x20: 35 30 38 30 4C 55 39 03 00 81 00 00 00 00 04 00
          0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

        VIC Slot 0:
        E1 (2 Port) Multi-Flex Trunk WAN Daughter Card
        Hardware revision 1.0           Board revision B0
        Serial number     18801733      Part number    800-04479-01
        Test history      0x0           RMA number     00-00-00
        Connector type    PCI
        EEPROM format version 1
        EEPROM contents (hex):
          0x20: 01 23 01 00 01 1E E4 45 50 11 7F 01 00 00 00 00
          0x30: 58 00 00 00 00 03 09 00 FF FF FF FF FF FF FF FF

        HDV firmware: Compiled Fri 23-Mar-01 00:20 by miriyala
        HDV memory size 524280 heap free 175065


2621_B#
```

```
2621_B#sh controllers e1 1/0
E1 1/0 is up.
  Applique type is Channelized E1 - balanced
  No alarms detected.
  alarm-trigger is not set
  Version info Firmware: 20010710, FPGA: 15
```

```
  Framing is CRC4, Line Code is HDB3, Clock Source is Line.
  Data in current interval (71 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
2621_B#
```

```
2621_B#sh configuration
Using 1813 out of 29688 bytes
!
version 12.2
no parser cache
service timestamps debug datetime msec localtime show-timezone
service timestamps log uptime
no service password-encryption
!
hostname 2621_B
!
no logging buffered
enable password cisco
!
!
!
memory-size iomem 15
voice-card 1
 dspfarm
!
ip subnet-zero
!
!
no ip domain-lookup
!
isdn switch-type primary-net5
!
!
voice class codec 1
 codec preference 1 g729r8
 codec preference 2 g711ulaw
 codec preference 3 g711alaw
!
!
!
!
!
!
!
controller E1 1/0
 pri-group timeslots 1-31
!
controller E1 1/1
!
!
!
!
interface FastEthernet0/0
```

```
 ip address 192.168.100.2 255.255.255.0
 no ip mroute-cache
 load-interval 30
 no keepalive
 speed auto
 half-duplex
!
interface FastEthernet0/1
 ip address 10.1.1.129 255.255.255.0
 no ip mroute-cache
 duplex auto
 speed auto
!
interface Serial1/0:15
 no ip address
 no logging event link-status
 isdn switch-type primary-net5
 isdn incoming-voice voice
 isdn T321 40000
 isdn T203 30000
 isdn T306 60000
 isdn T310 30000
 isdn bchan-number-order ascending
 no cdp enable
!
router rip
 network 1.0.0.0
 network 192.168.100.0
!
ip classless
no ip http server
ip pim bidir-enable
!
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
!
!
snmp-server packetsize 4096
snmp-server manager
tftp-server nvram
call rsvp-sync
!
voice-port 1/0:15
!
!
mgcp profile default
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
 destination-pattern 5...
 direct-inward-dial
 port 1/0:15
 prefix 5
!
```

```
dial-peer voice 3 voip
 destination-pattern 2...
 progress_ind setup enable 1
 voice-class codec 1
 session target ipv4:10.1.1.2
 dtmf-relay h245-alphanumeric
!
!
line con 0
 exec-timeout 0 0
line aux 0
 exec-timeout 0 0
line vty 0 4
 exec-timeout 0 0
 password cisco
 login
line vty 5 15
 exec-timeout 0 0
 login
!
scheduler allocate 3996 1000
!
end

2621_B#
```

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