

Siemens Hicom 330 E Rel 3.1 PBX with CallManager using 6608-E1 PRI EURO Gateway

This application note illustrates for connectivity of the Siemens Hicom 330 E Rel 3.1 PBX with Cisco CallManager using Cisco 6608-E1 PRI Euro 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 (Gateway): 6608 E1 Port
- Software: CallManager Release 3.1

PBX Hardware and Software Requirements

- Hardware: DTU-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

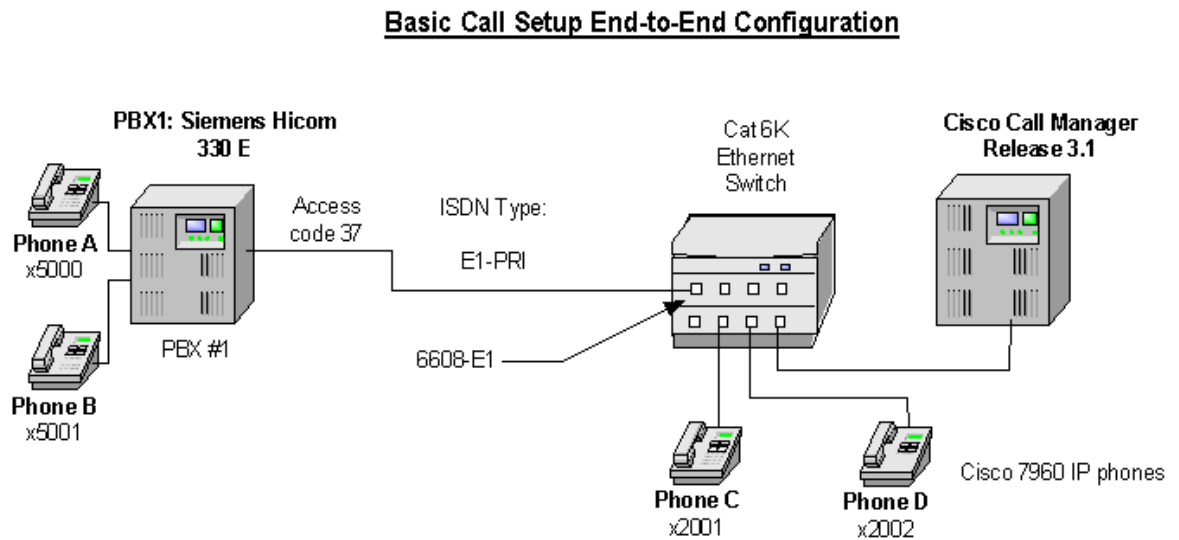
- Calling Name delivery and presentation features are not supported by the Siemens Hicom 330 E PBX.

- 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, IP phone displays Connected Number after the call is answered. 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			
CODE	CALL PROGRESS STATE	DIGIT	RESERVED/CONVERT		
	1 1111 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			
CODE	CALL PROGRESS STATE	DIGIT	RESERVED/CONVERT		
	1 1111 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	. . . . .	ATNDIDD		
854	. . . . .	NETW	R	
			DESTNO 2		
			DNNO 0- 0- 0		
*66	. . . . *	SIGNON		

DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS			
CODE	CALL PROGRESS STATE	DIGIT	RESERVED/CONVERT		
	1 1111 11112 22	ANALYSIS	DNI/ADD-INFO		



		0 12345 67890 12345 67890 12	RESULT	*=OWN NODE
*91	. . . . *	. . . . *	MBOFF	
#66	. . . . *	. . . . *	SIGNOFF	#91
. . . . *	. . . . *	. . . . *	MBON	
##22	. . . . *	. . . . *	DAKY	
##24	. . . . *	. . . . *	DSSKY	
##25	. . . . *	. . . . *	FWDKY	
##26	. . . . *	. . . . *	HTKY	
##27	. . . . *	. . . . *	KNOVRKY	
##28	. . . . *	. . . . *	MBKY	
##29	. . . . *	. . . . *	MSGPKY	
##35	. . . . *	. . . . *	TIMEKY	
##36	. . . . *	. . . . *	VCKY	
DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS		
CODE	CALL PROGRESS STATE		DIGIT	RESERVED/CONVERT
	1	11111 11112 22	ANALYSIS	DNI/ADD-INFO
	0	12345 67890 12345 67890 12	RESULT	*=OWN NODE
##37	. . . . *	. . . . *	VCRKY	
##38	. . . . *	. . . . *	CKKY	
##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		DIGIT	RESERVED/CONVERT
	1	11111 11112 22	ANALYSIS	DNI/ADD-INFO
	0	12345 67890 12345 67890 12	RESULT	*=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		DIGIT	RESERVED/CONVERT
	1	11111 11112 22	ANALYSIS	DNI/ADD-INFO
	0	12345 67890 12345 67890 12	RESULT	*=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	DIGIT ANALYSIS	RESERVED/CONVERT
	1 1111 11112 22		DNI/ADD-INFO
0 12345 67890 12345 67890 12		RESULT	*=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	DIGIT ANALYSIS	RESERVED/CONVERT
	1 1111 11112 22		DNI/ADD-INFO
0 12345 67890 12345 67890 12		RESULT	*=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	DIGIT ANALYSIS	RESERVED/CONVERT
	1 1111 11112 22		DNI/ADD-INFO
0 12345 67890 12345 67890 12		RESULT	*=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 1 11111 11112 22	DIGIT	RESERVED/CONVERT
		ANALYSIS	DNI/ADD-INFO
0 12345 67890 12345 67890 12		RESULT	*=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 1 11111 11112 22	DIGIT	RESERVED/CONVERT
		ANALYSIS	DNI/ADD-INFO
0 12345 67890 12345 67890 12		RESULT	*=OWN NODE

*88	. . . . ** . . . * *	CTLS	
*89	. . * . . * . . * *	TESTLN	
*9	. *	CONF3	
**	. . . . *	PU	*#50
*#51	. * . . . * . . **	ACDLOGON	
*#52	. * . . . * . . **	ACDAV	
*#53	. * . . . * . . **	ACDWORK	
*#54	. * . . . * . . **	ACC	
*#55	. * . . . * . . **	MONSLNT	
*#56	. * . . . * . . **	MONTONE	
*#60	. * . . . * . . **	ACDPGS	*#61
*#61	. * . . . * . . **	ACDPQS	

DIGIT INTERPRETATION DPLN 0

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

*#62 *	ACDEMMSG	
------	-----------	----------	--



*#63	. . . . *	ACDSHMSG	
*#71	. * . . . *	CAFAV	
*#72	. * . . . *	CAFGRV	*#74
. * . . . *	. . . . *	CAFAFWD	#0
.	DCBK	#11 *
.	DFWDVCE		
#12	. . . . *	DFWDDTE	
#14	. * . . . *	DFWDREM	CFREMVAR CFU
			CFREMSE VOICE
#15	. * . . . *	DPRIV	

DIGIT INTERPRETATION		DPLN 0	

CODE	CALL PROGRESS STATE	DIGIT	RESERVED/CONVERT
	1 1111 11112 22	ANALYSIS	DNI/ADD-INFO
0 12345 67890 12345 67890 12		RESULT	*=OWN NODE

#19	. . . . *	DREM	
#21	. . . . *	DFWVCE	#22
. . . . *	. . . . *	DFWDDTE	
#24	. . . . *	DISUOFF	
#49	. . . . *	DCOSX	
#51	. . . . *	DDND	
#52	. . . . *	DHTVCE	
#74	. . . . *	DIGIDAT	
#8	. . . . *	DPIN	
#92	. . . . *	MBOFF	
*#50	. * . . . *	ACDLOGOF	
*#51	. * . . . *	ACDNAV	

DIGIT INTERPRETATION		DPLN 0	

CODE	CALL PROGRESS STATE	DIGIT	RESERVED/CONVERT
	1 1111 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	. * . . . *	CAFGRGROFF	
*#74	. * . . . *	CAFDFWD	
##1	. . . . *	KYPROG	
##40	. . . . *	NAKYLO	
##7	. . . . *	MBOFF	
##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 AOC
        CONTROLLED TRUNK AND LINE SELECTION                     CTLS
        NO TONE                                                  NTONAMO-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

Table with 6 columns: COS, VOICE, FAX, TTX, VTX, DTE. Row 1: 32, >32:TRUNKS, TA, NOCO, NOCO, NOCO. Row 2: TNOTCR, NOTIE, NOTIE, NOTIE, TA, 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

Table with 2 columns: LCOSV, LCOSD. Row 1: 31, XX. Row 2: 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

```
-----+-----
|          |          |          |          |          |          |          |          |          |          |
| 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: 30AMO-TDCSU-107 DIGITAL TRUNKS
DISPLAY COMPLETED;

<dis-lwpar

INFOPAT = 4

FORMAT = 1

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  =           PNPLIC  =           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: 30AMO-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 | WPTH | LATTR |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | 1 | 37 | 1 | 1 | ***** | 1 | EMPTY | 1 | NONE |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

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

```

TRUNK ROUTING

DISPLAY COMPLETED;



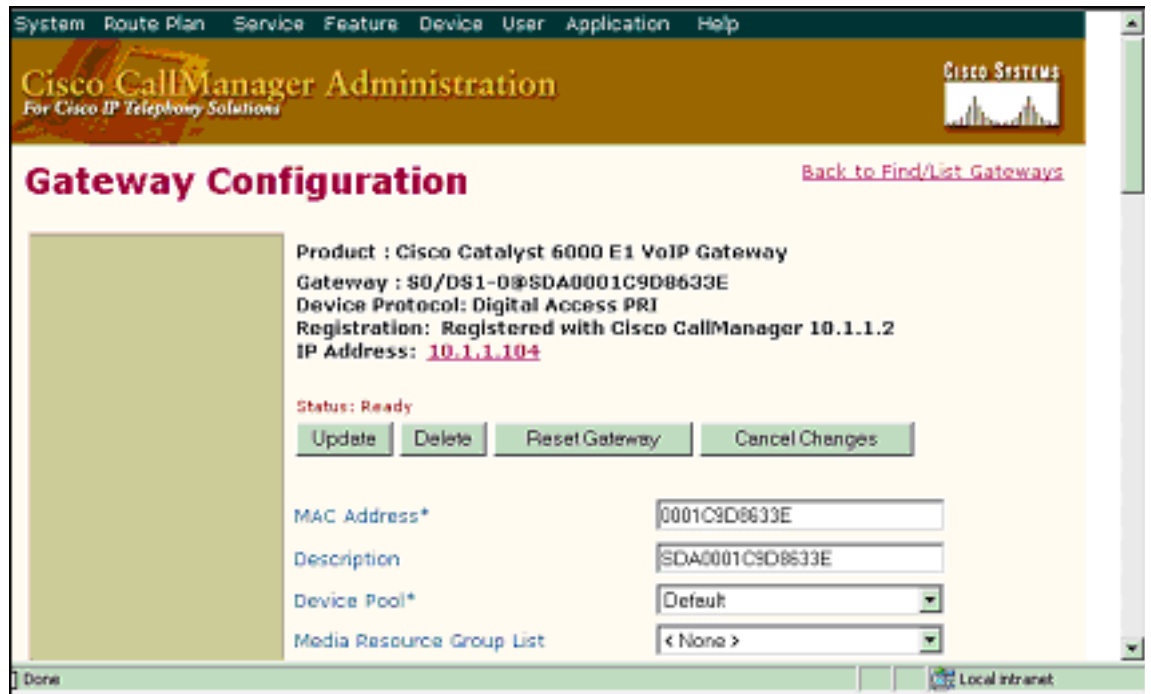
Step 10. Configure LCR Out-dial Rules using LODR.

```
<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;
<
```




Configuring the Cisco CallManager

Figure 1
Configuring the 6608-E1 Gateway



The screenshot shows the Cisco CallManager Administration web interface. The top navigation bar includes 'System', 'Route Plan', 'Service', 'Feature', 'Device', 'User', 'Application', and 'Help'. The main header displays 'Cisco CallManager Administration For Cisco IP Telephony Solutions' and the Cisco Systems logo. The page title is 'Gateway Configuration' with a link to 'Back to Find/List Gateways'. The configuration details for a Cisco Catalyst 6000 E1 VoIP Gateway are shown, including its MAC address, description, device pool, and media resource group list. The status is 'Ready' and there are buttons for 'Update', 'Delete', 'Reset Gateway', and 'Cancel Changes'.


Product :	Cisco Catalyst 6000 E1 VoIP Gateway
Gateway :	S0/DS1-0@SDA0001C9D8633E
Device Protocol:	Digital Access PRI
Registration:	Registered with Cisco CallManager 10.1.1.2
IP Address:	10.1.1.104
Status:	Ready
MAC Address*	0001C9D8633E
Description	SDA0001C9D8633E
Device Pool*	Default
Media Resource Group List	< None >



Network Hold Audio Source	< None >
User Hold Audio Source	< None >
Calling Search Space	< None >
Location	< None >
Load Information	
Channel Selection Order*	Top Down
PCM Type*	A-law
Protocol Side*	User
Caller ID DN	
Calling Party Selection*	Originator
Channel IE Type*	Use Number when 1B
Interface Identifier Present**	<input type="checkbox"/>
Interface Identifier Value**	0
Display IE Delivery	<input type="checkbox"/>
Redirecting Number IE Delivery	<input checked="" type="checkbox"/>
Delay for first restart (1/8 sec ticks)	32

Delay between restarts (1/8 sec ticks)	4
Num Digits*	23
Sig Digits	<input checked="" type="checkbox"/>
Prefix DN	
Presentation (01)*	Allowed
Called party IE number type unknown*	Cisco CallManager
Calling party IE number type unknown*	Cisco CallManager
Called Numbering Plan*	Cisco CallManager
Calling Numbering Plan*	Cisco CallManager
RTI Protocol Type*	PG-0/R0
Inhibit restarts at PRI initialization	<input checked="" type="checkbox"/>
Enable status poll	<input type="checkbox"/>
Number of digits to strip*	0
Country Code*	North America
Setup non-ISDN Progress Indicator IE Enable***	<input type="checkbox"/>



Product Specific Configuration 

Clock Reference*	Network
Framing*	CRC4
Audio Signal Adjustment into IP Network*	NoDbPadding
Audio Signal Adjustment from IP Network*	NoDbPadding
Zero Suppression*	HDB3

* indicates required item
** applicable to DMS-100 protocol only
*** may be required to force ringback from some PBXs

[Back to Find/List Gateways](#)

Local Intranet

Route Pattern Configuration

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

Route Pattern Configuration

[Add a New Route Pattern](#)
[Back to Find/List Route Patterns](#)

Route Pattern: 6.XXXX
Status: Ready
Note: Any update to this route pattern automatically resets the associated gateway/route list

Pattern Definition

Route Pattern*	6.XXXX
Partition	< None >
Numbering Plan*	North American Numbering Plan
Route Filter	< None >
Gateway/Route List*	10.1.1.129 (Edit)
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern

Local Intranet



Partition	< None >
Numbering Plan*	North American Numbering Plk
Route Filter	< None >
Gateway/Route List*	10.1.1.129 (Edit)
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern
<input checked="" type="checkbox"/> Provide Outside Dial Tone	<input type="checkbox"/> Urgent Priority
Calling Party Transformations	
<input type="checkbox"/> Use Calling Party's External Phone Number Mask	
Calling Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
Called Party Transformations	
Discard Digits	PreDot
Called Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
* indicates required item.	

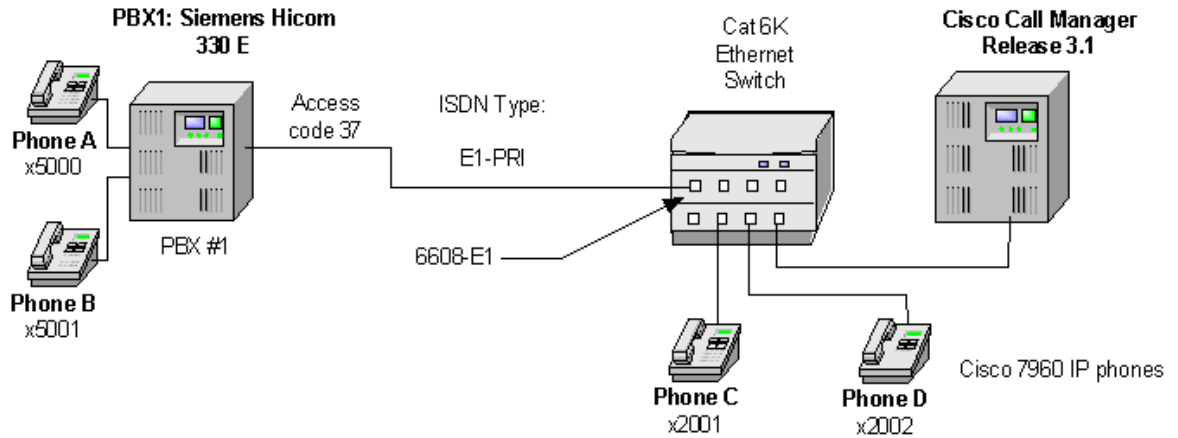
Test Results

As shown in the diagram below, a Siemens Hicom 330 E PBX was connected via an ISDN E1 PRI link to a Cisco 6608-E1 Gateway, 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 6608-E1 and the PBX.



Test Configuration

Basic Call Setup End-to-End Configuration



Layer 1 (Physical Layer)

The Siemens configuration screen for the E1 trunk interface is reached with the following command:

```
<cha-tdcslu
```

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/6608-E1 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 6608-E1 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 6608-E1 Gateway with ISDN protocol type setting of PRI-EURO 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 6608-E1 Gateway - PRI EURO (User)

Siemens Hicom 330 E Switch-type/ Protocol side setting	Cisco 6608-E1 ISDN protocol-type/Protocol side setting
ETSI / Master	PRI EURO / 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. " Connec ted Number" updated at orig. side?	Final dest. " Connec tedName" 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 6608-E1 Gateway configured as PRI EURO, emulates Network



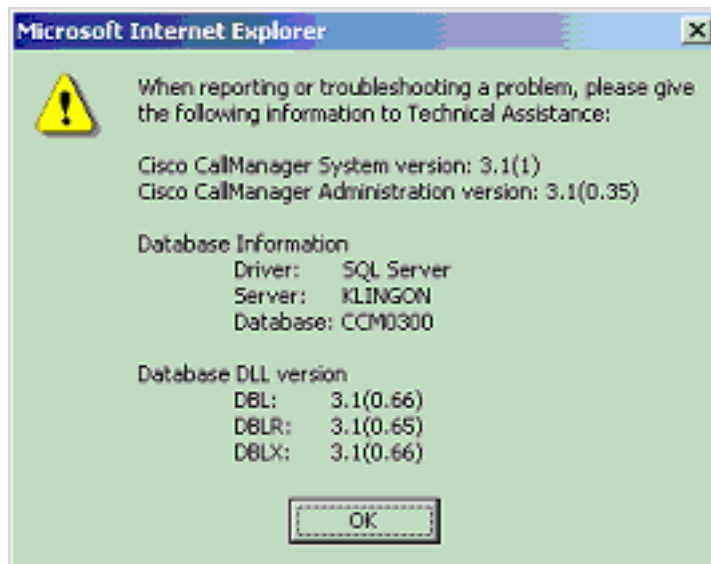
Table 6 Switch and Gateway Settings

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

The test results are the same as in previous section . Refer to Tables 2 through 5 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;
```

<



Catalyst 6000 Switch Configuration

```
Console> (enable) sh version
WS-C6006 Software, Version NmpSW: 5.5(6a)
Copyright (c) 1995-2001 by Cisco Systems
NMP S/W compiled on Feb 23 2001, 10:23:18
```

```
System Bootstrap Version: 5.3(1)
```

```
Hardware Version: 2.0 Model: WS-C6006 Serial #: TBA04511172
```

```
Mod Port Model Serial # Versions
-----
1 2 WS-X6K-SUP1A-2GE SAD05010NBK Hw : 7.0
Fw : 5.3(1)
Fw1: 5.4(2)
Sw : 5.5(6a)
Sw1: 5.5(6a)
3 48 WS-F6K-PFC SAD05020221 Hw : 1.1
WS-X6348-RJ-45 SAD04420N7B Hw : 1.4
Fw : 5.4(2)
Sw : 5.5(6a)
4 24 WS-F6K-VPWR Hw : 1.0
WS-X6624-FXS SAD050203M8 Hw : 3.0
Fw : 5.4(2)
Sw : 5.5(6a)
HP : A00203010010; DSP : A003E031 (3.3.
32)
5 8 WS-X6608-T1 SAD04400EM0 Hw : 1.1
Fw : 5.4(2)
Sw : 5.5(6a)
HP1: D00403010017; DSP1: D005E031 (3.3.
32)
HP2: D00403010017; DSP2: D005E031 (3.3.
32)
HP3: D00403010017; DSP3: D005E031 (3.3.
32)
HP4: D00403010017; DSP4: D005E031 (3.3.
32)
HP5: D00403010017; DSP5: D005E031 (3.3.
32)
HP6: D00403010017; DSP6: D005E031 (3.3.
32)
HP7: D00403010017; DSP7: D005E031 (3.3.
32)
HP8: D00403010017; DSP8: D005E031 (3.3.
32)
6 8 WS-X6608-E1 SAD04380DW1 Hw : 1.1
Fw : 5.4(2)
Sw : 5.5(6a)
HP1: D00403010017; DSP1: D005E031 (3.3.
32)
HP2: D00403010017; DSP2: D005E031 (3.3.
32)
HP3: D00403010017; DSP3: D005E031 (3.3.
```



```

32) HP4: D00403010017; DSP4: D005E031 (3.3.
32) HP5: D00403010017; DSP5: D005E031 (3.3.
32) HP6: D00403010017; DSP6: D005E031 (3.3.
32) HP7: D00403010017; DSP7: D005E031 (3.3.
32) HP8: D00403010017; DSP8: D005E031 (3.3.

```

Module	DRAM			FLASH			NVRAM		
	Total	Used	Free	Total	Used	Free	Total	Used	Free
1	65408K	37809K	27599K	16384K	11546K	4838K	512K	198K	314K

```

Uptime is 114 days, 6 hours, 11 minutes
Console> (enable)

```

```

Console> (enable) sh module

```

Mod	Slot	Ports	Module-Type	Model	Sub	Status
1	1	2	1000BaseX Supervisor	WS-X6K-SUP1A-2GE	yes	ok
3	3	48	10/100BaseTX Ethernet	WS-X6348-RJ-45	yes	ok
4	4	24	FXS	WS-X6624-FXS	no	ok
5	5	8	T1	WS-X6608-T1	no	ok
6	6	8	E1	WS-X6608-E1	no	ok

Mod	Module-Name	Serial-Num
1		SAD05010NBK
3		SAD04420N7B
4		SAD050203M8
5		SAD04400EM0
6		SAD04380DW1

Mod	MAC-Address(es)	Hw	Fw	Sw
1	00-04-c0-f8-42-02 to 00-04-c0-f8-42-03 00-04-c0-f8-42-00 to 00-04-c0-f8-42-01 00-04-9b-f0-78-00 to 00-04-9b-f0-7b-ff	7.0	5.3(1)	5.5(6a)
3	00-02-fc-20-5e-50 to 00-02-fc-20-5e-7f	1.4	5.4(2)	5.5(6a)
4	00-03-32-ba-2e-35	3.0	5.4(2)	5.5(6a)
5	00-01-c9-d9-3a-98 to 00-01-c9-d9-3a-9f	1.1	5.4(2)	5.5(6a)
6	00-01-c9-d8-63-3e to 00-01-c9-d8-63-45	1.1	5.4(2)	5.5(6a)

Mod	Sub-Type	Sub-Model	Sub-Serial	Sub-Hw
1	L3 Switching Engine	WS-F6K-PFC	SAD05020221	1.1
3	Inline Power Module	WS-F6K-VPWR		1.0

```

Console> (enable)

```

```

Console> (enable) sh port 6

```



Port	Name	Status	Vlan	Duplex	Speed	Type
6/1		connected	1	full	2.048	E1
6/2		notconnect	1	full	2.048	E1
6/3		notconnect	1	full	2.048	E1
6/4		notconnect	1	full	2.048	E1
6/5		notconnect	1	full	2.048	E1
6/6		notconnect	1	full	2.048	E1
6/7		notconnect	1	full	2.048	E1
6/8		notconnect	1	full	2.048	E1

Port	DHCP	MAC-Address	IP-Address	Subnet-Mask
6/1	enable	00-01-c9-d8-63-3e	10.1.1.104	255.255.255.0
6/2	enable	00-01-c9-d8-63-3f	10.1.1.118	255.255.255.0
6/3	enable	00-01-c9-d8-63-40	10.1.1.123	255.255.255.0
6/4	enable	00-01-c9-d8-63-41	10.1.1.117	255.255.255.0
6/5	enable	00-01-c9-d8-63-42	10.1.1.120	255.255.255.0
6/6	enable	00-01-c9-d8-63-43	10.1.1.121	255.255.255.0
6/7	enable	00-01-c9-d8-63-44	10.1.1.122	255.255.255.0
6/8	enable	00-01-c9-d8-63-45	10.1.1.124	255.255.255.0

Port	Call-Manager(s)	DHCP-Server	TFTP-Server	Gateway
6/1	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
6/2	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
6/3	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
6/4	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
6/5	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
6/6	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
6/7	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7
6/8	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7

Port	DNS-Server(s)	Domain
6/1	-	-
6/2	-	-
6/3	-	-
6/4	-	-
6/5	-	-
6/6	-	-
6/7	-	-
6/8	-	-

Port	CallManagerState	DSP-Type
6/1	registered	C549
6/2	registered	C549
6/3	registered	C549
6/4	registered	C549
6/5	registered	C549
6/6	registered	C549
6/7	registered	C549
6/8	registered	C549

Port	NoiseRegen	NonLinearProcessing
------	------------	---------------------



```
6/1  enabled  enabled
6/2  enabled  enabled
6/3  enabled  enabled
6/4  enabled  enabled
6/5  enabled  enabled
6/6  enabled  enabled
6/7  enabled  enabled
6/8  enabled  enabled
Console> (enable)
```











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