



# Siemens HiPath 4000 Release 1 and Siemens Hicom 330E Release 3.1 to Cisco IOS Voice Gateway using E1 NET5 with H.323

October 30, 2007 Revision 5

## Table of Contents

Introduction .....	1
Network Topology.....	2
System Components .....	2
Hardware Requirements .....	2
Software Requirements .....	2
Features .....	3
Features Supported.....	3
Features Not Supported.....	3
Limitations.....	4
Configuration.....	5
Configuring the Siemens HiPath 4000 .....	5
Configuring the Siemens Hicom 330E.....	18
Configuring the Cisco IOS Voice Gateway ‘A’ (Cisco 2651XM) .....	29
Configuring the Cisco IOS Voice Gateway ‘B’ (Cisco 3745).....	35
Acronyms .....	42

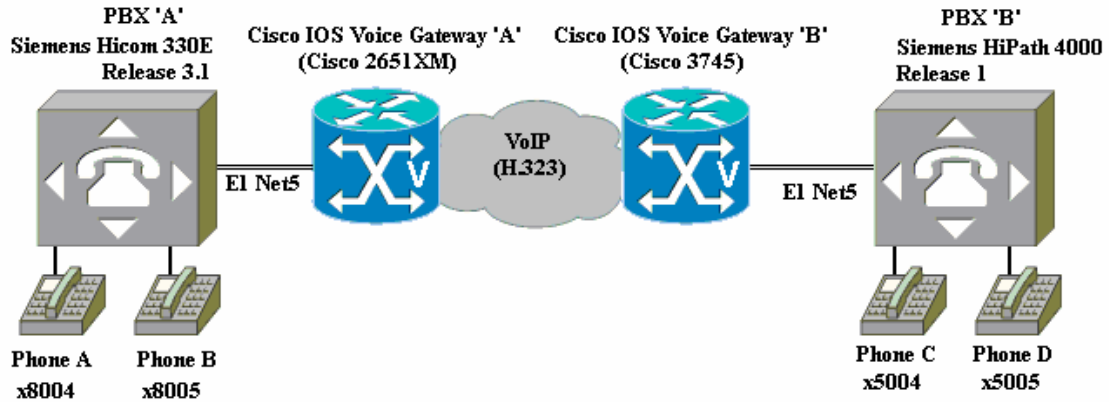
## Introduction

- Although specific gateway router models were used to validate its content, this application note also applies to all Cisco 1700/2600/3600/3700/2800/3800 series Cisco IOS voice gateways.
- This application note provides configuration guidelines for a toll-bypass network using Cisco IOS voice gateways to connect Siemens HiPath 4000 Release 1 and Siemens Hicom 330E Release 3.1 PBXs. The PBXs are connected to the Cisco IOS voice gateways by E1 NET5 trunk circuits. The Cisco IOS voice gateways “extend” the E1 NET5 trunk circuits with VoIP, using the H.323 protocol.
- A Siemens HiPath 4000 Release 1 PBX and a Siemens Hicom 330E Release 3.1 PBX were each connected via E1 NET5 trunk circuits to a Cisco IOS voice gateway. The two voice gateways were connected via IP over Ethernet, and configured for VoIP using H.323. End-to-end calls were placed between the PBXs to exercise and test basic calls as well as supplementary services such as call transfer, call conference, and call forward.
- Using the Siemens PBX configurations and Cisco IOS voice gateway configurations in this application note, successful toll bypass integration was achieved. This includes basic call, call transfer, call conference, and call forward, with some limitations on Caller ID features. Also, for certain call conference scenarios, dropped calls occurred when one party left the conference.



## Network Topology

Figure 1. Network Topology or Test Setup



## System Components

### Hardware Requirements

- (2) Cisco IOS voice gateways with E1 VWICs (voice/WAN interface cards)
- (1) Siemens HiPath 4000 PBX
- (1) Siemens Hicom 330E PBX
- (2) Siemens HiPath digital station telephones
- (2) Siemens Hicom digital station telephones

### Software Requirements

- Siemens HiPath PBX: V1.0 SA12 Patch0.
- Siemens Hicom PBX: Release 3.1 SA5 Rev14
- Cisco IOS voice gateways: Cisco IOS Release Version 12.3(7)T or later.



## Features

### Features Supported

- Basic Call (ENBLOC and Overlap)
- Calling Number
- Connected Number
- Call Transfer: Supervised Local Transfer
- Call Transfer: Supervised Network/External Transfer
- Call Conference: Local
- Call Conference: Network/External
- Call Forward: Local
- Call Forward: Network/External

### Features Not Supported

- Calling/Called/Connected Name
- Call Hold
- MWI



## Limitations

- Cisco IOS ver 12.3 was used in the testing represented in this app note. For 12.4 images and later, an additional configuration command is needed in the serial interface configuration: **isdn outgoing ie connected-number**. If this command is not implemented on both gateways, connected number is not sent across the toll bypass network.
- CALLING/CALLED/CONNECTED NAME is not supported. This is inherent to the PBXs and also occurs with the PBXs connected directly via an E1 NET5 trunk.
- CONNECTED NUMBER was supported in lieu of CALLED (ALERTING) NUMBER. This is inherent to the PBXs and also occurs with the PBXs connected directly via an E1 NET5 trunk.
- On Supervised Transfers originating with an external call (e.g., Phone A calls Phone C), the CONNECTED NUMBER is not displayed on the originating phone after the transfer is complete. Rather, the originating phone continues to display the transferring phone's number.
- On Supervised Transfers from PBX 'A' to PBX 'B' (e.g., Phone C calls Phone A, Phone A transfers to Phone D), the original CALLING NUMBER is not displayed on the final destination phone. Rather, the transferring phone's number is displayed.
- On Supervised Transfers from PBX 'B' to PBX 'A', (e.g., Phone A calls Phone C, Phone C transfers to Phone B), the original CALLING NUMBER is not displayed at the final destination. Rather, the number for the transferring phone is displayed. This is inherent to the PBXs and also occurs with the PBXs connected directly via an E1 NET5 trunk.
- On Conference Calls accomplished by an external call followed by an external conference (e.g., Phone C calls Phone A, Phone A conferences in Phone B), the CONNECTED NUMBER is not updated on the original calling phone when the conferencing phone drops out. Rather, the number for the conferencing phone is still displayed.
- On Conference Calls accomplished by an external call followed by a conference initiated by an external call from PBX 'A' to PBX 'B' (e.g., Phone C calls Phone A, Phone A conferences in Phone D), the conference completes successfully, but when the conferencing phone drops out, the entire call drops.
- On Conference calls accomplished by a local call followed by an external conference (e.g., Phone A calls Phone B, Phone B conferences in Phone C), the CALLING NUMBER is not passed to the remaining conferee when the conferencing phone drops out. Rather, the number for the conferencing phone is still displayed.
- On Conference Calls accomplished by an external call followed by a conference initiated by an external call from PBX 'B' to PBX 'A' (e.g., Phone C calls Phone A, Phone C conferences in Phone B), the CALLING NUMBER is not passed to the remaining conferee when the conferencing phone drops out. Rather, the conferencing phone's number is still displayed. This is inherent to the PBXs and also occurs with the PBXs connected directly via an E1 NET5 trunk.
- On Call Forwards from PBX 'A' to PBX 'B' (e.g., Phone A calls Phone B, which forwards to Phone C), the forwarding CALLED NUMBER is not passed to the final destination.
- On Call Forwards originated by an external call from PBX 'B' to PBX 'A' and followed by a local forward on PBX 'A' (e.g., Phone C calls Phone B, which forwards to Phone A), the CONNECTED NUMBER from the final destination is not updated at the original side. This is inherent to the PBXs and also occurs with the PBXs connected directly via an E1 NET5 trunk.
- Call Hold was not tested as a separate feature. The call is held automatically during Transfers or Conferences, and the call hold is facilitated in NOTIFY message from Siemens HiPath/Hicom PBX. Aside from Transfers or Conferences, it is not possible to put a call on hold from one of the Siemens HiPath/Hicom digital station phones.
- MWI was not tested, as a local voice mail system was not available on the PBXs at the time of testing, and Net5 does not support MWI.



## Configuration

### Configuring the Siemens HiPath 4000

#### DPLN

```
<dis-wabe:gen;
DIS-WABE:GEN;
H500: AMO WABE STARTED
```

DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS							
CODE		CALL PROGRESS STATE				DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO		
		1	11111	11112	22				
		0	12345	67890	12345	67890	12	*	
0		.	****	..****	**..	.....	*	CO	R
001	- 009	*	.....	.....	.....	.....	..	NETRTE	
111		.	****	*****	**..	.....	*	TIE	
12	- 14	.	****	*****	**..	.....	*	TIE	
21		.	.....	.....	.....	.....	*..	KNOVRKY	
22		.	.....	.....	.....	.....	*..	DNDKY	
222		.	****	*****	**..	.....	*	TIE	
23		.	.....	.....	.....	.....	*..	FWDKY	
24		.	.....	.....	.....	.....	*..	MBKY	
25		.	.....	.....	.....	.....	*..	MSGRKY	
26		.	.....	.....	.....	.....	*..	DAKY	
27		.	.....	.....	.....	.....	*..	DSSKY	
28		.	.....	.....	.....	.....	*..	VCRKY	
29		.	.....	.....	.....	.....	*..	VCKY	
30		.	.....	.....	.....	.....	*..	CONFKY	

DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS							
CODE		CALL PROGRESS STATE				DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO		
		1	11111	11112	22				
		0	12345	67890	12345	67890	12	*	
3000	- 3010	.	****	*****	**..	.....	*	STN	DESTNO 30 DNNO 0- 0-222
3011	- 3020	.	****	*****	**..	.....	*	STN	DESTNO 31 DNNO 0- 0- 31
3021	- 3030	.	****	*****	**..	.....	*	STN	DESTNO 32 DNNO 0- 0- 32
3031	- 3040	.	****	*****	**..	.....	*	STN	DESTNO 33 DNNO 0- 0- 33
3041	- 3050	.	****	*****	**..	.....	*	STN	DESTNO 35 DNNO 0- 0- 35
31		.	.....	.....	.....	.....	*..	NAMEKY	
32		.	.....	.....	.....	.....	*..	PARKKY	

DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS							
CODE		CALL PROGRESS STATE				DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO		
		1	11111	11112	22				
		0	12345	67890	12345	67890	12	*	
33		.	.....	.....	.....	.....	*..	CCKY	
34		.	.....	.....	.....	.....	*..	HTKY	
35		.	.....	.....	.....	.....	*..	STKY	



36 - 37	. **** ..*** **.. . . . . *	CO	
38	. . . . . . . . . . . . . . . *	TIMEKY	
39	. **** ***** **.. . . . . *	TIE	
4000 - 4050	. **** ***** **.. . . . . *	STN	DESTNO 111 DNNO 0- 0-111
4051 - 4566	. **** ***** **.. . . . . *	STN	DESTNO 222 DNNO 0- 0-222
4567	. **** ***** **.. . . . . *	STN	DESTNO 34 DNNO 0- 0-200

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE 1 1111 1112 22	DIGIT ANALYSIS RESULT	RESERVED/CONVERT
			DNI/ADD-INFO *=OWN NODE
0	12345 67890 12345 67890 12		

4568 - 4999	. **** ***** **.. . . . . *	STN	DESTNO 222 DNNO 0- 0-222
5000 - 5040	. **** ***** **.. . . . . *	STN	DESTNO 0 DNNO 0- 0-555*
5500 - 5501	. **** ***** **.. . . . . *	STN	DESTNO 56 DNNO 0- 0-560
555	. **** ***** **.. . . . . *	OWNNODE	
560	. **** ***** **.. . . . . *	TIE	
59	. **** ***** **.. . . . . *	TIE	
6000 - 6009	. **** ***** **.. . . . . *	STN	R DESTNO 0 DNNO 0- 0-555*

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE 1 1111 1112 22	DIGIT ANALYSIS RESULT	RESERVED/CONVERT
			DNI/ADD-INFO *=OWN NODE
0	12345 67890 12345 67890 12		

7000 - 7002	. **** ***** **.. . . . . *	STN	DESTNO 56 DNNO 0- 0-560
8000 - 8050	. **** ***** **.. . . . . *	STN	DESTNO 222 DNNO 0- 0-222
8060	. **** ***** **.. . . . . *	TIE	
8070	. **** ***** **.. . . . . *	TIE	
83	. **** ..*** **.. . . . . *	SPDC1	
84	. **** ..*** **.. . . . . *	SPDC2	
88	. . . . . * . . . . . . . . . *	SCONSI	R
89	. . . . . * . . . . . . . . . *	SCONSCO	R
9	. **** ***** **.. . . . . *	TIE	
*13	. . . . * . . . . . . . . . . *	AHTVCE	
*15	. * . . . . * . . . . . . . . . *	SPLIT	
*16	. . . . * . . . . . . . . . . *	AREM	
*17	. * . . . . * . . . . . . . . . *	TRACE	

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE 1 1111 1112 22	DIGIT ANALYSIS RESULT	RESERVED/CONVERT
			DNI/ADD-INFO *=OWN NODE
0	12345 67890 12345 67890 12		

*18	. . . . * . . . . . . . . . . *	ACOSX	
*19	. * . . . . . . . . . . . . . . *	KNOVR	



*20	. . . . *	. . . . .	. . . . .	. . . . .	. . . . .	ADND
*25	. . . . *	. . . . .	. . . . .	. . . . .	. . . . .	FWDTERM
*29	. . . . *	. . . . .	. . . . *	. . . . .	. . . . .	AFFWDVCE
*91	. . . . *	. . . . *	. . . . .	. . . . .	. . . . .	MBOFF
#91	. . . . *	. . . . *	. . . . .	. . . . .	. . . . .	MBON
##27	. . . . *	. . . . *	. . . . .	. . . . .	. . . . .	MWACT
##28	. . . . *	. . . . .	. . . . .	. . . . .	. . . . .	MWANS
##29	. . . . *	. . . . .	. . . . .	. . . . .	. . . . .	MWCAN
##30	. . . . *	. . . . *	. . . . *	. . . . *	. . . . *	MWCANORI

AMO-WABE -111      DIALLING PLANS, FEATURE ACCESS CODES  
DISPLAY COMPLETED;



### Overlap Sending Dial Plan

```
<DISPLAY-LDPLN:TYPE=LDP,LDP="8060"- "X" ;  
DISPLAY-LDPLN:TYPE=LDP,LDP="8060"- "X" ;  
H500: AMO LDPLN STARTED
```

LDPNO : 16	LDP : 8060-X	
	SPC : 22	
	FDSFIELD : 0	SDSFIELD : 0 PINDP : N
DPLN	LROUTE	LAUTH
0	806	1
1	806	1
2	806	1
3	806	1
4	806	1
5	806	1
6	806	1
7	806	1
8	806	1
9	806	1
10	806	1
11	806	1
12	806	1
13	806	1
14	806	1
15	806	1

```
AMO-LDPLN-111 ADMINISTRATION LCR DIALPLAN  
DISPLAY COMPLETED;
```

### ENBLOC Sending Dial Plan

```
<DISPLAY-LDPLN:TYPE=LDP,LDP="8060"- "XXXX" ;  
DISPLAY-LDPLN:TYPE=LDP,LDP="8060"- "XXXX" ;  
H500: AMO LDPLN STARTED
```

LDPNO : 16	LDP : 8060-XXXX	
	SPC : 22	
	FDSFIELD : 0	SDSFIELD : 0 PINDP : N
DPLN	LROUTE	LAUTH
0	806	1
1	806	1
2	806	1
3	806	1
4	806	1
5	806	1
6	806	1
7	806	1
8	806	1
9	806	1
10	806	1
11	806	1
12	806	1
13	806	1
14	806	1
15	806	1





AMO-LDPLN-111            ADMINISTRATION LCR DIALPLAN  
 DISPLAY COMPLETED;

**BCSU**

<DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=2,SLOT=49;  
 DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=2,SLOT=49;  
 H500: AMO BCSU STARTED

ADDRESS : LTG 1 LTU 2 SOURCE GROUP 1

PEN	ASSIGNED MODULE	MODULE TYPE	FCT ID	HWY BDL	INSERTED MODULE	STATE	HW-INFO	MODULE STATUS
49	Q2196-X	DIU-N2	1	A	Q2196-X	1	-06 -	READY

AMO-BCSU -111            BOARD CONFIGURATION, SWITCHING UNIT  
 DISPLAY COMPLETED;

**Class of Trunk, COT**

<dis-cot:21  
 FORMAT = ;  
 DIS-COT:21,;  
 H500: AMO COT STARTED

COT: 21 INFO:  
 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  
 CONNECTION TO ROUTE OPTIMIZATION NODE            ROPT  
 TSC-SIGNALING FOR NETWORKWIDE FEATURES (MANDATORY)            TSCS  
 INCOMING CDR BY ZONE OR FROM LINE            ICZL  
 AOC PER CALL (AUTOMATICAL OR ON REQUEST), MAND. CORNET-NQ            AOCC  
 LINE WITH IMPLICIT NUMBERS            LINO  
 NO TONE            NTON

AMO-COT -111            CLASS OF TRUNK FOR CALL PROCESSING  
 DISPLAY COMPLETED;

**Class of Parameters for Device Handlers, COP**

<DISPLAY-COP:COPNO=21;  
 DISPLAY-COP:COPNO=21;  
 H500: AMO COP STARTED

COP: 21 INFO:  
 DEVICE: INDEP            SOURCE: DB  
 PARAMETER:  
 LINE WITH END-OF-DIAL            EOD  
 SPECIAL MODE            SFRM  
 CODE CALLING RELEASE AFTER EVERY TASK            CCR  
 REGISTRATION OF LAYER 3 ADVISORIES            L3AR  
  
 CO TRUNK ACCESS:  
 TRUNK ACCESS            TA



TOLL ACCESS:  
TRUNK ACCESS

TA

AMO-COP -111 CLASS OF PARAMETER FOR DEVICE HANDLER  
DISPLAY COMPLETED;



**Class of Services, COSSU**

```
<DISPLAY-COSSU:TYPE=COS,COS=10;
DISPLAY-COSSU:TYPE=COS,COS=10;
H500: AMO COSSU STARTED
```

COS	VOICE	FAX	DTE
10	> TA TSUID TNOTCR RKOABS CDRINT CDRS CDRC COSXCD VCE FWDNWK MSN FWDECA CFB CFNR FWDEXT	NOCO NOTIE	NOCO NOTIE

```
AMO-COSSU-111 CLASSES OF SERVICE
DISPLAY COMPLETED;
<DISPLAY-COSSU:TYPE=LCOSV,LCOSV=1;
DISPLAY-COSSU:TYPE=LCOSV,LCOSV=1;
H500: AMO COSSU STARTED
```

LCOS	LAUTH																								COPIN		
V	1		2		3		4		5		6		7		8		9		0		A		B		C		NUM
>	SERVICE INFORMATION																								NUM		
1	X.....																								0		
>	LCR ATTENDANT FOR VOICE																										

```
AMO-COSSU-111 CLASSES OF SERVICE
DISPLAY COMPLETED;
```



### Trunk Group, BUEND

```
<DISPLAY-BUEND:TGRP=20;
DISPLAY-BUEND:TGRP=20;
H500: AMO BUEND STARTED
```

```
----- FORMAT = L -----
+-----+
| TGRP NUMBER :    20  TGRP NAME   : PRI PSSV1      MAXIMUM NO.   :    70 |
|                   CHARCON     : NEUTRAL          |
| SUBGROUP NO. :    3  DEVICE TYPE : S2CONN        TRACENO       :    0 |
| RESERVED    :    N  SEARCH MODE : ASCENDING     ACD THRESHOLD :    * |
| NUMBER OF ASSOCIATED ROUTES : 2                PRIORITY      :    2 |
| TDDRFLAG    :    ON  TDDRTHRESHOLD: 3           SOURCEGROUPIDX :    1 |
| GDTRRULE    :    0   ACDPMGRP   : 0             |
| THE FOLLOWING TRUNKS (LTG-LTU-SLOT-CCT) HAVE BEEN ALLOCATED: |
+-----+
| 1- 2- 49-0      1 | 1- 2- 49-0      2 | 1- 2- 49-0      3 |
| 1- 2- 49-0      4 | 1- 2- 49-0      5 | 1- 2- 49-0      6 |
| 1- 2- 49-0      7 | 1- 2- 49-0      8 | 1- 2- 49-0      9 |
| 1- 2- 49-0     10 | 1- 2- 49-0     11 | 1- 2- 49-0     12 |
| 1- 2- 49-0     13 | 1- 2- 49-0     14 | 1- 2- 49-0     15 |
| 1- 2- 49-0     16 | 1- 2- 49-0     17 | 1- 2- 49-0     18 |
| 1- 2- 49-0     19 | 1- 2- 49-0     20 | 1- 2- 49-0     21 |
| 1- 2- 49-0     22 | 1- 2- 49-0     23 | 1- 2- 49-0     24 |
| 1- 2- 49-0     25 | 1- 2- 49-0     26 | 1- 2- 49-0     27 |
| 1- 2- 49-0     28 | 1- 2- 49-0     29 | 1- 2- 49-0     30 |
+-----+
```

```
AMO-BUEND-111      TRUNK GROUP
DISPLAY COMPLETED;
```

### Trunk Configuration, TDCSU

```
<DISPLAY-TDCSU:PEN1=1-2-49-0;
DISPLAY-TDCSU:PEN1=1-2-49-0;
H500: AMO TDCSU STARTED
```

```
----- DIGITAL TRUNK (FORMAT=L) -----
+-----+
| DEV   = S2CONN      PEN   = 1-02-049-0  TGRP   = 20 |
+-----+
| PROTVAR = ETSI      INS   = N           SRCHMODE = ASC |
| COTNO   = 21        COPNO  = 21         DPLN   = 0 |
| ITR     = 1         COS    = 10         LCOSV  = 1 |
| LCOSD   = 1         CCT    = HICOM S2   DESTNO  = 1 |
| SEGMENT = 1         DEDSCC =           DEDSVC  = NONE |
| FACILITY =         DITIDX =           SRTIDX  = |
| TRTBLE  = GDTR     SIDANI = N          ATNTYP  = TIE |
| CBMATTR = NONE     NWMUXTIM = 10       TCHARG  = N |
| SUPPRESS = 0       DGTPR  =           CHIMAP  = N |
| ISDNIP  =         ISDNPN = |
| PNPL2P  =         PNPL1P =           PNPAC   = |
| TRACOUNT = 31      SATCOUNT = MANY    NNO    = 1  -1  -300 |
| ALARMNO  = 0       FIDX   = 1          CARRIER = 1 |
| ZONE     = EMPTY   COTX   = 21        FWDX   = 5 |
| DOMTYPE  =         DOMAINNO =         TPROFNO = |
| INIGHT   = |
| UUSCCX  = 16       UUSCCY = 8          FNIDX  = 1 |
| CLASSMRK = EC      & G711  & G729OPT  SRCGRP  = |
| TCCID   = |
+-----+
| BCNEG   = N        BCGR   = 1          LWPARR  = 1 |
| LWPP    = 0        LWLT   = 0          LWPS   = 0 |
| LWR1    = 0        LWR2   = 0 |
| SVCDOM  = |
| BCHAN   = 1 && 30 |
+-----+
```



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

AMO-TDCSU-111 DIGITAL TRUNKS
DISPLAY COMPLETED;
<DISPLAY-LWPAR:DEV=INDEP,TYPE=DIUS2,BLNO=0;
DISPLAY-LWPAR:DEV=INDEP,TYPE=DIUS2,BLNO=0;
H500: AMO LWPAR STARTED

Table with columns: LOADWARE PARAMETERS, CIRCUIT TYPE: DIUS2, SOURCE:DB, BLOCK: 1. Rows include parameters like LNTYPE, MASTER, PATTERN, SMD, CDG, TEIVERIF, DEV, INFO.

AMO-LWPAR-111 LOADWARE PARAMETERS FOR NETWORKING MODULES
DISPLAY COMPLETED;

For Slave Side Configuration

<DISPLAY-TDCSU:PEN1=1-2-49-0;
DISPLAY-TDCSU:PEN1=1-2-49-0;
H500: AMO TDCSU STARTED

Table with columns: DEV = S2CONN, PEN = 1-02-049-0, TGRP = 20. Rows include parameters like PROTVAR, COTNO, ITR, LCOSD, SEGMENT, FACILITY, TRTBL, CBMATTR, SUPPRESS, ISDNIP, PNPL2P, TRACOUNT, ALARMNO, ZONE, DOMTYPE, INIGHT, UUSCCX, CLASSMRK, TCCID, BCNEG, LWPP, LWR1, SVCDOM, BCHAN.

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

AMO-TDCSU-111 DIGITAL TRUNKS
DISPLAY COMPLETED;
<DISPLAY-LWPAR:DEV=INDEP,TYPE=DIUS2,BLNO=0;
DISPLAY-LWPAR:DEV=INDEP,TYPE=DIUS2,BLNO=0;
H500: AMO LWPAR STARTED



```

+-----+
| LOADWARE PARAMETERS      CIRCUIT TYPE: DIUS2  SOURCE:DB  BLOCK: 0 |
+-----+
| 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 =                  |
+-----+

```

AMO-LWPAR-111 LOADWARE PARAMETERS FOR NETWORKING MODULES  
 DISPLAY COMPLETED;

### Reference Clock Configuration, REFTA

For Master-side configuration

```

<DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-2-49-0;
DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-2-49-0;
H500: AMO REFTA STARTED

```

```

+-----+
| REFERENCE CLOCK CIRCUITS |
+-----+
| PEN      MODULE  DEVICE  PRI  ERROR  BLOCK  SUPP.  READY  SRCGRP |
|          |          |          |     |       |       |       | BUT  |
|          |          |          |     |       |       |       | ASYN. |
+-----+
| 1- 2- 49- 0 | DIU-N2 | S2CONN | 1 | 0 | N |     | N | 1 |
+-----+

```

AMO-REFTA-111 REFERENCE CLOCK TABLE  
 DISPLAY COMPLETED;

For Slave-side configuration

```

<DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-2-49-0;
DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-2-49-0;
H500: AMO REFTA STARTED

```

```

+-----+
| REFERENCE CLOCK CIRCUITS |
+-----+
| PEN      MODULE  DEVICE  PRI  ERROR  BLOCK  SUPP.  READY  SRCGRP |
|          |          |          |     |       |       |       | BUT  |
|          |          |          |     |       |       |       | ASYN. |
+-----+
| 1- 2- 49- 0 | DIU-N2 | S2CONN | 0 | 0 | N |     | N | 1 |
+-----+

```

AMO-REFTA-111 REFERENCE CLOCK TABLE  
 DISPLAY COMPLETED;

### Trunk Least Cost Routing Configuration

```

<DISPLAY-LDAT:TYPE=LCR;
DISPLAY-LDAT:TYPE=LCR;
H500: AMO LDAT STARTED

```

```

+-----+
| LROUTE = 806  LDPLN      NAME = OPEN NUMBER          SERVICE = ALL |
| TYPE = LCR                                DNNO OF ROUTE = 99 |
| SERVICE INFO = |
+-----+
| LRTEL | LVAL | TGRP | ODR | LAUTH | SCHEDULE | CARRIER | LATR | LDSRT |
|        |      |      |     |      | ABCDEFGH |         |     |      |
+-----+

```



1	1	20	15	1	*****	1	EMPTY	NONE
	DNNO =		99					

---



## RICHT

<DISPLAY-RICHT:MODE=LRTE;

DISPLAY-RICHT:MODE=LRTE;

H500: AMO RICHT STARTED

```

+-----+
| LRTE = 806   NAME = OPEN NUMBER   (NEUTRAL)  LSVC = ALL
| DNNO =      99 PDNNO =      0   DESTNO = 99
| ROUTOPT = YES  REROUT = YES  PLB = NO   FWDBL = NO
| DTMFCNV = WITHOUT DTMFDSP = WITHOUT DTMFTEXT =
| DTMFPULS =      BUGS = LIN  ROUTATT = NO   MAINGRP = 32
| EMCYRTT = NO   CONFONE = NO  RERINGRP = NO  RTENO = 32
| INFO =
| NOPRCFWD = NO
+-----+
| TGRP = 20  LDAT  PRI PSSV1           (NEUTRAL)  SUBGROUP = 3
+-----+

```

AMO-RICHT-111 TRUNK ROUTING

DISPLAY COMPLETED;

## Out-going Dialing Rule, LODR

<dis-lodr

ODR = ;

DIS-LODR;

H500: AMO LODR STARTED

```

+-----+
| ODR      POSITION  CMD      PARAMETER
+-----+
| 15      |      1  ECHO      2
|          |      2  END
+-----+

```

AMO-LODR -111 ADMINISTRATION OF LCR OUTDIAL RULES

DISPLAY COMPLETED;

## Digital Station Configuration

<DISPLAY-SBCSU:STNO=5004;

DISPLAY-SBCSU:STNO=5004;

H500: AMO SBCSU STARTED

```

----- USER DATA -----
STNO   =5004   OPT   =OPTI   COS1   =2       DPLN   =1
MAINO  =5004   CONN  =DIR     COS2   =2       ITR    =1
PEN    = 1- 3- 31- 4   LCOSV1 =6       COSX   =0
INS    =Y      ASYNCT =500   LCOSV2 =6
                PERMACT =      LCOSD1 =6
SSTNO  =N      EXTBUS  =      LCOSD2 =6       CBKBMAX =5
TRACE  =N
ALARMNO =0     DFSVCANA=      SPDI   =0       RCBKB  =N
HMUSIC =0     FLASH  =      SPDC1  =       RCBKNA =N
PMIDX  =1     SPDC2  =      CBKNAMB =Y
                COMGRP  =0
SECR   =N     DIGNODIS=N    DSSTNA =N
STD    =55    CALLOG  =NONE  DSSTNB =Y       TEXTSEL =ENGLISH
REP    =0     OPTICOM =N     OPTIUSB :      VPI    =
IDCR   =N     OPTICA  =1     OPTIS0A :0     VCI    =
                OPTIDA  =1     OPTISPA :0     PATTERN =
                OPTIABA :0
DCFWBUSY=N    HEADSET =N     APICLASS=
DNIDSP =N     HSKEY   =NORMAL ACFAPPL =
DTMFBLK =N
DTMFCTRDR=Y  BASICSVC=
IPPASSW =

```





DVCFIG =OPTISET TSI =1 SPROT = SOPTIDX =  
DPROT = DOPTIDX =  
FPROT = FOPTIDX =

----- ACTIVATION IDENTIFIERS FOR FEATURES -----  
FWDS :N HTOS :N DND :N  
FWDD :N HTOD :N VCP :Y TWLOGIN :N  
FWDF :N HTOF :N CWT :N  
----- FEATURES AND GROUP MEMBERSHIPS -----  
PUGR : ESSTN :  
KEYSYS :N NOPTNO :  
HUNT CD :N  
----- SUBSCRIBER ATTRIBUTES (AMO SDAT) -----  
NONE  
-----

AMO-SBCSU-111 STATION AND S0-BUS CONFIGURATION OF SWITCHING UNIT  
DISPLAY COMPLETED;  
<



## Configuring the Siemens Hicom 330E

### DPLN

```
<dis-wabe;
TYPE = gen;
DIS-WABE:GEN;
H500: AMO WABE STARTED
```

DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS			
CODE	CALL PROGRESS STATE	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO		
	1 11111 11112 22		*=OWN NODE		
	0 12345 67890 12345 67890 12				
001 - 010	* . . . . .	NETRTE		DESTNO 25	
1000	. ***** ** . . . . .	STN		DNNO 0- 0- 25	
11	. . . . .	MBKY			
111	. ***** ** . . . . .	TIE			
222	. ***** ** . . . . .	OWNNODE			
3000 - 3010	. ***** ** . . . . .	STN		DESTNO 33	
				DNNO 0- 0-333	
3011 - 3020	. ***** ** . . . . .	STN		DESTNO 43	
				DNNO 0- 0-444	
3021 - 3030	. ***** ** . . . . .	STN		DESTNO 53	
				DNNO 0- 0-445	
DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS			
CODE	CALL PROGRESS STATE	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO		
	1 11111 11112 22		*=OWN NODE		
	0 12345 67890 12345 67890 12				
3031 - 3040	. ***** ** . . . . .	STN		DESTNO 63	
				DNNO 0- 0-446	
3041 - 3050	. ***** ** . . . . .	STN		DESTNO 73	
				DNNO 0- 0-447	
3051 - 3060	. ***** ** . . . . .	STN		DESTNO 83	
				DNNO 0- 0-448	
32	. ***** ** . . . . .	TIE			
34 - 36	. ***** ** . . . . .	TIE			
39	. ***** ** . . . . .	TIE			
4000 - 4050	. ***** ** . . . . .	STN		DESTNO 111	
				DNNO 0- 0-111	
DIGIT INTERPRETATION		VALID FOR ALL DIAL PLANS			
CODE	CALL PROGRESS STATE	DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO		
	1 11111 11112 22		*=OWN NODE		
	0 12345 67890 12345 67890 12				
4051 - 4599	. ***** ** . . . . .	STN		R	
				DESTNO 0	



4700 - 4999	. **** * . . . . .	STN	DNNO 0- 0-222*
			R
			DESTNO 0
5000 - 5009	. **** * . . . . .	STN	DNNO 0- 0-222*
			DESTNO 55
5010	. **** * . . . . .	ATNDIND	DNNO 0- 0- 55
5011 - 5020	. **** * . . . . .	STN	R
			DESTNO 55
5021 - 5050	. **** * . . . . .	STN	DNNO 0- 0- 55
			DESTNO 111
5051	. **** * . . . . .	ATNDIND	DNNO 0- 0-111

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE 1 1111 11112 22 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT
			DNI/ADD-INFO *=OWN NODE
5500 - 5501	. **** * . . . . .	STN	DESTNO 56 DNNO 0- 0-560
555	. **** * . . . . .	TIE	
560	. **** * . . . . .	TIE	
6000	. **** * . . . . .	STN	DESTNO 33 DNNO 0- 0-333
7000 - 7002	. **** * . . . . .	STN	DESTNO 56 DNNO 0- 0-560
79	. **** * . . . . .	TIE	
8000 - 8019	. **** * . . . . .	STN	DESTNO 0 DNNO 0- 0-222*

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE 1 1111 11112 22 0 12345 67890 12345 67890 12	DIGIT ANALYSIS RESULT	RESERVED/CONVERT
			DNI/ADD-INFO *=OWN NODE
8020	. **** * . . . . .	STN	R DESTNO 0 DNNO 0- 0-222*
854	. **** * . . . . .	NETW	R DESTNO 2 DNNO 0- 0- 0
9	. **** * . . . . .	TIE	
*66	. . . . * . . . . .	SIGNON	
*91	. . . . * . . . . .	MBOFF	
#66	. . . . * . . . . .	SIGNOFF	
#91	. . . . * . . . . .	MBON	
##22	. . . . . . . . . . *	DAKY	
##24	. . . . . . . . . . *	DSSKY	
##25	. . . . . . . . . . *	FWDKY	
##26	. . . . . . . . . . *	HTKY	
##27	. . . . . . . . . . *	KNOVRKY	
##28	. . . . . . . . . . *	MBKY	

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

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



##29	. . . . . * ..	MSGRKY
##35	. . . . . * ..	TIMEKY
##36	. . . . . * ..	VCKY
##37	. . . . . * ..	VCRKY
##38	. . . . . * ..	CCKY
##39	. . . . . * ..	CONFKY
##41	. . . . . * ..	NAMEKY
##42	. . . . . * ..	PARKKY
##43	. . . . . * ..	REMKY
##44	. . . . . * ..	STKY
##45	. . . . . * ..	CBKKY
##46	. . . . . * ..	CONSKY
##47	. . . . . * ..	DNDKY
##48	. . . . . * ..	EXHOLDKY
##49	. . . . . * ..	HOLDKY
##50	. . . . . * ..	IUSEKY
##51	. . . . . * ..	LNRKY

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

CODE	CALL PROGRESS STATE	DIGIT ANALYSIS	RESERVED/CONVERT
0	1 1111 1112 22	RESULT	DNI/ADD-INFO *=OWN NODE

##52	. . . . . * ..	PRIVKY
##53	. . . . . * ..	RLSKY
##54	. . . . . * ..	SNRKY
##55	. . . . . * ..	TRNSKY
##56	. . . . . * ..	RCTOFFKY
##57	. . . . . * ..	TOGGLEKY

AMO-WABE -111 DIALLING PLANS, FEATURE ACCESS CODES  
DISPLAY COMPLETED;

### Overlap Sending Dial Plan

<DISPLAY-LDPLN:TYPE=LDP,LDPNO=35;  
DISPLAY-LDPLN:TYPE=LDP,LDPNO=35;  
H500: AMO LDPLN STARTED

LDPNO : 35	LDP : 79-X				
	SPC : 22				
DPLN	LRTE	LAUTH	DPLN	LRTE	LAUTH
0	79	1	8	79	1
1	79	1	9	79	1
2	79	1	10	79	1
3	79	1	11	79	1
4	79	1	12	79	1
5	79	1	13	79	1
6	79	1	14	79	1
7	79	1	15	79	1

AMO-LDPLN-111 ADMINISTRATION LCR DIALPLAN  
DISPLAY COMPLETED;

### Enbloc Sending Dial Plan

<DISPLAY-LDPLN:TYPE=LDP,LDPNO=35;  
DISPLAY-LDPLN:TYPE=LDP,LDPNO=35;



H500: AMO LDPLN STARTED

LDPNO : 35	LDP : 79-XXXX						
	SPC : 22						
DPLN	LRTE	LAUTH	DPLN	LRTE	LAUTH		
0	79	1	8	79	1		
1	79	1	9	79	1		
2	79	1	10	79	1		
3	79	1	11	79	1		
4	79	1	12	79	1		
5	79	1	13	79	1		
6	79	1	14	79	1		
7	79	1	15	79	1		

AMO-LDPLN-111 ADMINISTRATION LCR DIALPLAN

**BCSU**

DISPLAY COMPLETED;

<DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=1,SLOT=79;

DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=1,SLOT=79;

H500: AMO BCSU STARTED

ADDRESS : LTG 1 LTU 1

ASSIGNED	MODULE	FCT	HWY	INSERTED	STATE	HW-INFO	MODULE	
PEN	MODULE	TYPE	ID	BDL	MODULE	STATE	HW-INFO	STATUS
79	Q2196-X	DIU-N2	1	A	Q2196-X	1	-06 -	READY

AMO-BCSU -111 BOARD CONFIGURATION, SWITCHING UNIT

DISPLAY COMPLETED;

**Class of Trunk, COT**

<DISPLAY-COT:COTNO=5;

DISPLAY-COT:COTNO=5;

H500: AMO COT STARTED

COT: 5 INFO: 5:ECMA1 V2.0

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
CONNECTION TO ROUTE OPTIMIZATION NODE	ROPT
TSC-SIGNALING FOR NETWORKWIDE FEATURES (MANDATORY)	TSCS
INCOMING CDR BY ZONE OR FROM LINE	ICZL
AOC PER CALL (AUTOMATICAL OR ON REQUEST), MAND. CORNET-NQ	AOCC
LINE WITH IMPLICIT NUMBERS	LINO
NO TONE	NTON

AMO-COT -111 CLASS OF TRUNK FOR CALL PROCESSING

DISPLAY COMPLETED;



## Class of Parameters for Device Handlers, COP

```
<DISPLAY-COP:COPNO=4;
DISPLAY-COP:COPNO=4;
H500: AMO COP   STARTED

COP:   4   INFO: 4:Q931
DEVICE: INDEP           SOURCE: DB
PARAMETER:
    LINE WITH END-OF-DIAL           EOD
    SPECIAL MODE                   SFRM
    CODE CALLING RELEASE AFTER EVERY TASK   CCR
    REGISTRATION OF LAYER 3 ADVISORIES     L3AR

AMO-COP  -111           CLASS OF PARAMETER FOR DEVICE HANDLER
DISPLAY COMPLETED;
```



**Class of Services, COSSU**

```
<DISPLAY-COSSU:TYPE=COS,COS=32;
DISPLAY-COSSU:TYPE=COS,COS=32;
H500: AMO COSSU STARTED
```

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

```
AMO-COSSU-111 CLASSES OF SERVICE, SWITCHING UNIT
DISPLAY COMPLETED;
```

```
<DISPLAY-COSSU:TYPE=LCOSV,LCOSV=32;
DISPLAY-COSSU:TYPE=LCOSV,LCOSV=32;
H500: AMO COSSU STARTED
```

LCOS	LAUTH						LCR
V	1	2	3	4	5	6	OPTS=
	1234567890123456789012345678901234567890123456789012345678901234						LCRET
	>SERVICE INFORMATION						LCR
32	XX						.
	>32:TRUNKS						

```
AMO-COSSU-111 CLASSES OF SERVICE, SWITCHING UNIT
DISPLAY COMPLETED;
```

**Trunk Group, BUEND**

```
<DISPLAY-BUEND:TGRP=70;
DISPLAY-BUEND:TGRP=70;
H500: AMO BUEND STARTED
```

```
----- FORMAT = L -----
```

TGRP NUMBER :	70	TGRP NAME :	OPEN NUMBER E1	MAXIMUM NO. :	30
SUBGROUP NO.:	18	CHARCON :	NEUTRAL	TRACENO :	0
RESERVED :	N	DEVICE TYPE :	S2CONN	ACD THRESHOLD :	*
NUMBER OF ASSOCIATED ROUTES :	2	SEARCH MODE :	ASCENDING	PRIORITY :	2
THE FOLLOWING TRUNKS (LTG-LTU-SLOT-CCT) HAVE BEEN ALLOCATED:					
1- 1- 79-0	B-CHL: 1	1- 1- 79-0	B-CHL: 2	1- 1- 79-0	B-CHL: 3
1- 1- 79-0	B-CHL: 4	1- 1- 79-0	B-CHL: 5	1- 1- 79-0	B-CHL: 6
1- 1- 79-0	B-CHL: 7	1- 1- 79-0	B-CHL: 8	1- 1- 79-0	B-CHL: 9
1- 1- 79-0	B-CHL: 10	1- 1- 79-0	B-CHL: 11	1- 1- 79-0	B-CHL: 12
1- 1- 79-0	B-CHL: 13	1- 1- 79-0	B-CHL: 14	1- 1- 79-0	B-CHL: 15
1- 1- 79-0	B-CHL: 16	1- 1- 79-0	B-CHL: 17	1- 1- 79-0	B-CHL: 18
1- 1- 79-0	B-CHL: 19	1- 1- 79-0	B-CHL: 20	1- 1- 79-0	B-CHL: 21
1- 1- 79-0	B-CHL: 22	1- 1- 79-0	B-CHL: 23	1- 1- 79-0	B-CHL: 24
1- 1- 79-0	B-CHL: 25	1- 1- 79-0	B-CHL: 26	1- 1- 79-0	B-CHL: 27
1- 1- 79-0	B-CHL: 28	1- 1- 79-0	B-CHL: 29	1- 1- 79-0	B-CHL: 30

```
AMO-BUEND-111 TRUNK GROUP
DISPLAY COMPLETED;
```



## Trunk Configuration, TDCSU

<DISPLAY-TDCSU:PEN1=1-1-79-0;

DISPLAY-TDCSU:PEN1=1-1-79-0;

H500: AMO TDCSU STARTED

```

+----- DIGITAL TRUNK (FORMAT=L) -----+
|          DEV = S2CONN          PEN = 1-01-079-0          |
+-----+-----+-----+
| COTNO   = 5          COPNO   = 4          DPLN     = 0          |
| ITR     = 0          COS     = 32         LCOSV    = 32         |
| LCOSD   = 32         CCT     =           DESTNO   = 55         |
| 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      = 55         |
| ALARMNO = 0         FIDX    = 1          CARRIER = 1          |
| ZONE    = EMPTY    COTX    = 4          FWDX     = 10         |
| DOMTYPE =           DOMAINNO =          TPROFNO  =           |
| INIGHT  =           |
| CCHDL   =           UUSCCX  = 16        UUSCCY   = 8          |
+-----+-----+-----+
| TGRP    = 70        SRCHMODE = ASC       BCNEG    = N          |
| BCGR    = 1         INS      = N         LWPAR    = 2          |
| LWPP    = 0         LWLT    = 0         LWPS     = 0          |
| LWR1    = 0         LWR2    = 0          |
| BCHAN   1 && 30     |
+-----+-----+-----+

```

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

AMO-TDCSU-111 DIGITAL TRUNKS

DISPLAY COMPLETED;

<DISPLAY-LWPAR:INFOPAT="2";

DISPLAY-LWPAR:INFOPAT="2";

H500: AMO LWPAR STARTED

```

+-----+-----+-----+-----+
| LOADWARE PARAMETERS      CIRCUIT TYPE: DIUS2  SOURCE:DB  BLOCK: 2 |
+-----+-----+-----+-----+
| 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     = N             FIXEDTEI = 0          CNTRNR   = 255        |
| TEIVERIF = N           CRC4REP  = N          |
| DEV     = INDEP         |
| INFO    = 2:COPPER-MASTER CLOCK.(CORNET) |
+-----+-----+-----+-----+

```

AMO-LWPAR-111 LOADWARE PARAMETERS FOR NETWORKING MODULES

DISPLAY COMPLETED;





**For Slave Side Configuration**

```
<DISPLAY-TDCSU:PEN1=1-1-79-0;
DISPLAY-TDCSU:PEN1=1-1-79-0;
H500: AMO TDCSU STARTED
```

```

+----- DIGITAL TRUNK (FORMAT=L) -----+
|          DEV = S2CONN          PEN = 1-01-079-0          |
+-----+-----+-----+
| COTNO   = 5          COPNO   = 4          DPLN      = 0          |
| ITR     = 0          COS     = 32         LCOSV     = 32         |
| LCOSD   = 32         CCT     =           DESTNO    = 55         |
| PROTVAR = ETSI      SEGMENT = 1          TCHARG    = N          |
| SUPPRESS = 0        DGTPR   =           CHIMAP    = N          |
| ISDNCC  =           ISDNAC  =           ISDNLCL  =           |
| ISDNIP  =           ISDNNP  =           |
| PNPL2C  =           PNPL1C  =           PNPLC     =           |
| PNPL2P  =           PNPL1P  =           PNPAC     =           |
| TRACOUNT = 31       SATCOUNT = MANY     NNO       = 55         |
| ALARMNO  = 0        FIDX    = 1          CARRIER  = 1          |
| ZONE     = EMPTY   COTX    = 4          FWDX     = 10         |
| DOMTYPE  =           DOMAINNO =         TPROFNO  =           |
| INIGHT   =           |
| CCHDL    =           UUSCCX  = 16       UUSCCY   = 8          |
+-----+-----+-----+
| TGRP    = 70        SRCHMODE = ASC       BCNEG     = N          |
| BCGR    = 1         INS      = N         LWPAR    = 3          |
| LWPP    = 0        LWLT    = 0         LWPS     = 0          |
| LWR1    = 0        LWR2    = 0          |
| BCHAN   1 && 30     |
+-----+-----+-----+

```

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

```
AMO-TDCSU-111      DIGITAL TRUNKS
DISPLAY COMPLETED;
<DISPLAY-LWPAR:TYPE=DIUS2,BLNO=3;
DISPLAY-LWPAR:TYPE=DIUS2,BLNO=3;
H500: AMO LWPAR STARTED
```

```

+-----+-----+-----+-----+
| LOADWARE PARAMETERS      CIRCUIT TYPE: DIUS2  SOURCE:DB  BLOCK: 3 |
+-----+-----+-----+-----+
| 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    = 3:COPPER-DERIVE CLOCK(CORNET) |
+-----+-----+-----+-----+

```

```
AMO-LWPAR-111      LOADWARE PARAMETERS FOR NETWORKING MODULES
DISPLAY COMPLETED;
```



### Reference Clock Configuration, REFTA

For Master-side configuration

```
<DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-1-79-0;
DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-1-79-0;
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- 79- 0	DIU-N2	S2CONN	0	35	N		N

```
AMO-REFTA-111 REFERENCE CLOCK TABLE
DISPLAY COMPLETED;
```

For Slave-side configuration

```
<DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-1-79-0;
DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-1-79-0;
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- 79- 0	DIU-N2	S2CONN	11	535	N		N

```
AMO-REFTA-111 REFERENCE CLOCK TABLE
DISPLAY COMPLETED;
```

<

### Trunk Least Cost Routing Configuration

```
<DISPLAY-LDAT:TYPE=LCR,LROUTE=79;
DISPLAY-LDAT:TYPE=LCR,LROUTE=79;
H500: AMO LDAT STARTED
```

LROUTE = 79		LDPLN	NAME = OPEN NUMBER E1			SERVICE = ALL		
TYPE = LCR			DNNO OF ROUTE =			999		
SERVICE INFO =								
LRTEL	LVAL	TGRP	ODR	LAUTH	SCHEDULE ABCDEFGH	CARRIER ZONE	BAND WDTH	LATTR
1	1	70	1	1	*****	1 EMPTY	1	NONE
DNNO =		999						

```
AMO-LDAT -111 LCR-DIRECTIONS
DISPLAY COMPLETED;
```



**RICHT**

<DISPLAY-RICHT:MODE=LRTE,LRTE=79;  
DISPLAY-RICHT:MODE=LRTE,LRTE=79;  
H500: AMO RICHT STARTED

```

+-----+
| LRTE = 79      NAME = OPEN NUMBER E1      (NEUTRAL)  SRVC = ALL  |
| DNNO =          999  DESTNO = 99          |
| ROUTOPT = YES  REROUT = YES  PLB = NO      FWDBL = NO      |
| MFV: CNV=WITHOUT DSP=WITHOUT TEXT=        PULS=          |
| ROUTENO =      17  BUGS = LIN  ROUTATT = NO  MAINGRP = 17    |
| INFO =                                                |
+-----+
| TGRP = 70  LDAT OPEN NUMBER E1      (NEUTRAL)  SUBGROUP = 18  |
+-----+

```

AMO-RICHT-111 TRUNK ROUTING  
DISPLAY COMPLETED;

**Out-going Dialing Rule, LODR**

<DISPLAY-LODR:ODR=1;  
DISPLAY-LODR:ODR=1;  
H500: AMO LODR STARTED

```

+-----+
| ODR      POSITION  CMD      PARAMETER  |
+-----+
| 1        1      ECHO      2          |
|          2      END          |
+-----+
| INFO:PSTN  |
+-----+

```

H03: THE NEXT FREE ODR IS 7

AMO-LODR -111 ADMINISTRATION OF LCR OUTDIAL RULES  
DISPLAY COMPLETED;

**Digital Station Configuration**

<DISPLAY-SBCSU:STNO=8000;  
DISPLAY-SBCSU:STNO=8000;  
H500: AMO SBCSU STARTED

```

----- USER DATA -----
STNO   =8000  OPT   =OPTI   COS1   =7    DPLN   =0    SPDI   =Y
MAINO  =8000  CONN  =DIR    COS2   =7    ITR    =0    SPDC1  =0
PEN    = 1- 1- 55- 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-111      STATION AND S0-BUS CONFIGURATION OF SWITCHING UNIT
DISPLAY COMPLETED;
<
<
```



## Configuring the Cisco IOS Voice Gateway 'A' (Cisco 2651XM)

2651XM\_West#sho ver

Cisco IOS Software, C2600 Software (C2600-ADVENTERPRISEK9-M), Version 12.3(7)T,

RELEASE SOFTWARE (fc1)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2004 by Cisco Systems, Inc.

Compiled Sat 21-Feb-04 14:41 by eaarmas

ROM: System Bootstrap, Version 12.2(8r) [cmong 8r], RELEASE SOFTWARE (fc1)

2651XM\_West uptime is 16 hours, 27 minutes

System returned to ROM by reload

System image file is "flash:c2600-adventerprisek9-mz.123-7.T.bin"

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:

<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).



Cisco 2651XM (MPC860P) processor (revision 0x300) with 124928K/6144K bytes of memory.

Processor board ID JAE0817EK5Z (1672255744)

M860 processor: part number 5, mask 2

2 FastEthernet interfaces

31 Serial interfaces

2 Channelized E1/PRI ports

32K bytes of NVRAM.

49152K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102

2651XM\_West#sho run

Building configuration...

Current configuration : 1825 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2651XM\_West

!

boot-start-marker

boot system flash

boot-end-marker

!



```
!  
no network-clock-participate slot 1  
no network-clock-participate wic 0  
voice-card 1  
!  
ip subnet-zero  
!  
!  
ip cef  
no ip domain lookup  
ip audit po max-events 100  
no aaa new-model  
no ftp-server write-enable  
isdn switch-type primary-net5  
!  
!  
!  
voice service voip  
h323  
!  
!  
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  
  description ECN-4  
!  
controller E1 1/1  
!  
no crypto isakmp enable  
!  
!  
interface FastEthernet0/0  
  ip address 172.20.4.7 255.255.255.0  
  duplex auto  
  speed auto  
!  
interface FastEthernet0/1  
  no ip address  
  shutdown  
  duplex auto  
  speed auto  
!  
interface Serial1/0:15  
  description D-channel for ECN-4  
  no ip address  
  no logging event link-status  
  isdn switch-type primary-net5  
  isdn overlap-receiving  
  isdn incoming-voice voice
```





```
isdn send-alerting
isdn bchan-number-order ascending
isdn sending-complete
<isdn outgoing ie connected-number>1
no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 FastEthernet0/0
!
ip http server
no ip http secure-server
!
!
!
control-plane
!
!
!
voice-port 1/0:15
description voice port for ECN-4
!
!
!
dial-peer voice 323 voip
destination-pattern 5...
session target ipv4:172.20.4.9
```

---

<sup>1</sup> IOS ver 12.3 was used in the testing represented in this app note, and this configuration command was not included. For 12.4 images and later, this command is needed in the serial interface configuration. If this command is not implemented on both gateways, connected number is not sent across the toll bypass network.



```
!  
dial-peer voice 1015 pots  
destination-pattern 8...  
direct-inward-dial  
port 1/0:15  
forward-digits all  
!  
dial-peer voice 519 voip  
shutdown  
destination-pattern 6...  
session protocol sipv2  
session target ipv4:172.20.4.9  
supplementary-service pass-through  
!  
!  
!  
line con 0  
line aux 0  
line vty 0 4  
exec-timeout 0 0  
password cisco  
login  
transport input telnet  
!  
!  
!  
end
```

2651XM\_West#



## Configuring the Cisco IOS Voice Gateway 'B' (Cisco 3745)

3745\_West#sho ver

Cisco IOS Software, 3700 Software (C3745-ADVENTERPRISEK9-M), Version 12.3(7)T, R

RELEASE SOFTWARE (fc1)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2004 by Cisco Systems, Inc.

Compiled Sat 21-Feb-04 05:53 by eaarmas

ROM: System Bootstrap, Version 12.2(8r)T2, RELEASE SOFTWARE (fc1)

3745\_West uptime is 16 hours, 34 minutes

System returned to ROM by reload

System image file is "flash:c3745-adventerprisek9-mz.123-7.T.bin"

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A summary of U.S. laws governing Cisco cryptographic products may be found at:

<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>



If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

Cisco 3745 (R7000) processor (revision 2.0) with 116736K/14336K bytes of memory.

Processor board ID JMX0813L0Z3

R7000 CPU at 350MHz, Implementation 39, Rev 3.3, 256KB L2, 2048KB L3 Cache

2 FastEthernet interfaces

31 Serial interfaces

4 Channelized E1/PRI ports

2 Voice FXS interfaces

DRAM configuration is 64 bits wide with parity disabled.

151K bytes of NVRAM.

31168K bytes of ATA System CompactFlash (Read/Write)

Configuration register is 0x2102

3745\_West#sho run

Building configuration...

Current configuration : 2347 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 3745\_West

!

boot-start-marker

boot system flash



```
boot-end-marker
!
card type e1 1 1
logging buffered 5000000 debugging
!
no network-clock-participate slot 1
no network-clock-participate slot 2
no network-clock-participate slot 3
no network-clock-participate slot 4
no network-clock-participate wic 0
no network-clock-participate wic 1
no network-clock-participate wic 2
no network-clock-participate aim 0
no network-clock-participate aim 1
no aaa new-model
ip subnet-zero
ip cef
!
!
!
!
no ip domain lookup
ip audit po max-events 100
no ftp-server write-enable
isdn switch-type primary-net5
voice-card 1
dspfarm
!
!
```



```
!  
voice call carrier capacity active  
!  
voice service voip  
h323  
!  
!  
voice class codec 1  
codec preference 2 g711ulaw  
codec preference 3 g711alaw  
!  
!  
!  
!  
controller E1 1/0  
pri-group timeslots 1-31  
description ECN10  
!  
controller E1 1/1  
!  
controller E1 1/2  
!  
controller E1 1/3  
!  
no crypto isakmp enable  
!  
!  
!  
!
```



```
interface FastEthernet0/0
ip address 172.20.4.9 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface Serial1/0:15
description D-channel for ECN10
no ip address
no logging event link-status
isdn switch-type primary-net5
isdn overlap-receiving
isdn protocol-emulate network
isdn incoming-voice voice
isdn T310 120000
isdn send-alerting
isdn sending-complete
<isdn outgoing ie connected-number>2
no cdp enable
!
router eigrp 10
```

---

<sup>2</sup> IOS ver 12.3 was used in the testing represented in this app note, and this configuration command was not included. For 12.4 images and later, this command is needed in the serial interface configuration. If this command is not implemented on both gateways, connected number is not sent across the toll bypass network.



```
network 172.20.0.0
no auto-summary
!
ip classless
ip route 0.0.0.0 0.0.0.0 FastEthernet0/0
!
ip http server
no ip http secure-server
!
!
control-plane
!
!
voice-port 1/0:15
description voice port for ECN10
!
voice-port 3/0/0
!
voice-port 3/0/1
!
!
dial-peer cor custom
!
!
dial-peer voice 323 voip
destination-pattern 8...
session target ipv4:172.20.4.7
!
dial-peer voice 1015 pots
```





```
destination-pattern 5...
direct-inward-dial
port 1/0:15
forward-digits all
!
dial-peer voice 519 voip
shutdown
destination-pattern 3...
session protocol sipv2
session target ipv4:172.20.4.7
supplementary-service pass-through
!
!
!
line con 0
line aux 0
line vty 0 4
exec-timeout 0 0
password cisco
login
transport input telnet
!
!
end
```



Acronyms

Acronym	Definitions



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