

Cisco Unified CallManager Release 4.0—PBX Interoperability: Siemens HiPath 4000 Release 1 PBX to Cisco 6608 Gateway Using E1 Q.SIG with MGCP

Introduction

This application note shows how to connect a Siemens HiPath 4300 Release 1 PBX for end-to-end interoperability with Cisco Unified CallManager Release 4.0, using a Cisco Catalyst 6000 series switch and 6608 gateway with E1 QSIG as an MGCP gateway.

The network topology diagram in Figure 1 shows the test setup.

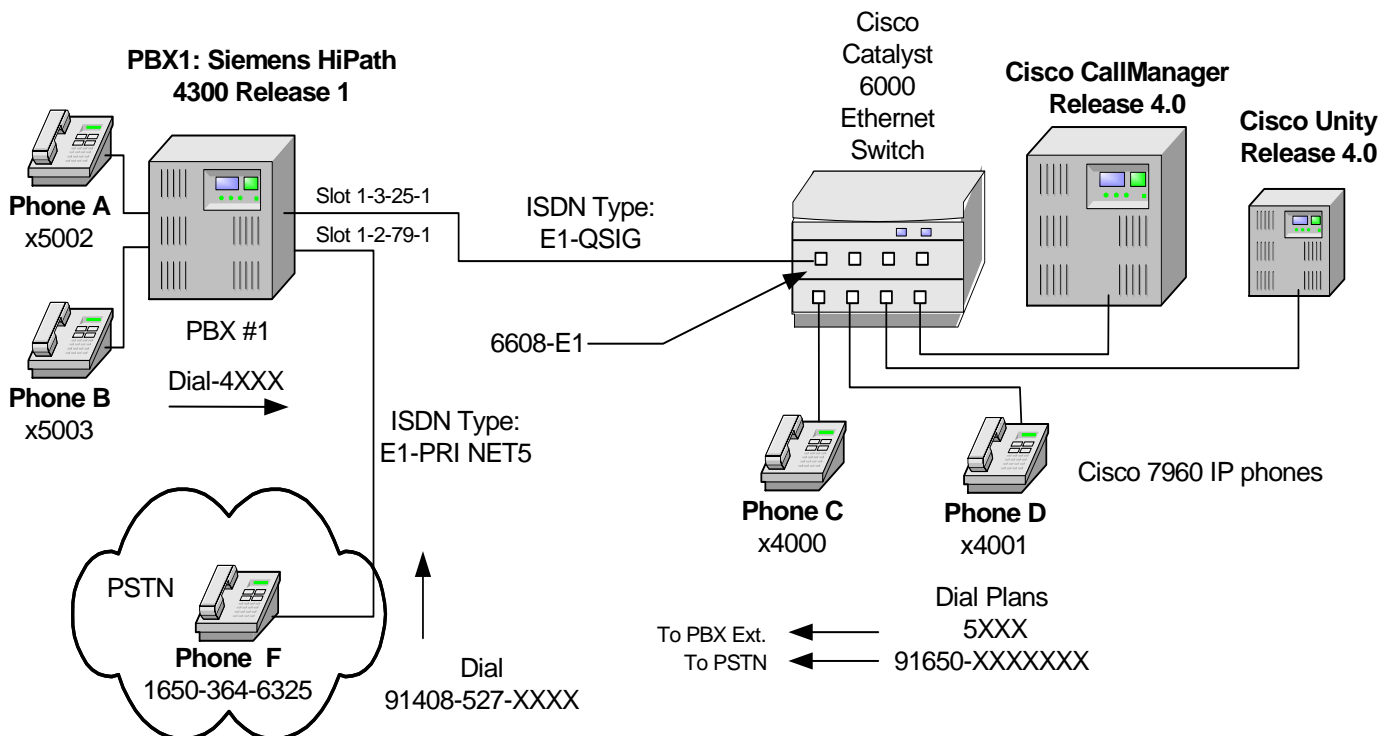
The MGCP gateway uses the PRI ISO E1 QSIG protocol type. The Siemens HiPath 4300 PBX uses the PSS1V2 switch type.

Basic calls worked fine in both directions with Calling/Connected Name and Calling/Connected Number features support.

Network Topology

Figure 1. End-to-End Configuration

Basic Call Setup End-to-End Configuration





Limitations

B-Channel Mapping

The Siemens HiPath 4300 PBX uses sequential channel numbering (1 to 30) when ISO QSIG protocol PSS1V2 is selected. The Cisco Catalyst 6608-E1 gateway configuration for **Channel IE Type** field should therefore be set to **Continuous Number**.

MWI

The Siemens HiPath 4300 PBX does not respond to QSIG Message Waiting Indication (MWI) requests (mwiActivate, mwiDeactivate) from CallManager.

System Components

Hardware Requirements

Cisco hardware

- Cisco Catalyst 6000 switch with 6608-E1 gateway

Siemens HiPath 4300 PBX hardware

- DIU-N2

Software Requirements

PBX Software version 1

Cisco Unified CallManager, Release 4.0

Features

Key Features Supported

- CLIP–Calling Line (Number) Identification Presentation
- CLIR–Calling Line (Number) Identification Restriction
- CNIP–Calling Name Identification Presentation
- CNIR–Calling Name Identification Restriction
- COLP–Connected Line (Number) Identification Presentation
- COLR– Connected Line (Number) Identification Restriction
- CONP–Connected Name Identification Presentation
- CONR– Connected Name Identification Restriction
- CT–Call Transfer (by join)
- CFU–Call Forwarding Unconditional (by join)
- CFB–Call Forwarding Busy (by join)
- CFNR–Call Forwarding No Reply (by join)

Key Features Not Supported

- CCM 4.0 release does not support sending Alerting Name or Busy Name Identification information
- MWI Message Waiting Indication (lamp on or off)

Configuration

Configuration Sequence and Tasks



Configuring the Siemens HiPath 4300 PBX

Follow these steps to configure the Siemens HiPath 4300 PBX:

1. Add the new access code to Dialing Plans using WABE + LDPLN.
2. Add the new trunk board using BCSU.
3. Configure Class of Trunk using COT.
4. Configure Class of Parameter for device handler using COP.
5. Configure Class of Service using COSSU.
6. Add the new trunk group access code using BUEND.
7. Configure trunk using TDCSU.
8. Configure Reference Clock using REFTA.
9. Configure trunk Least Cost Routing using LDAT + RICHT.
10. Configure LCR Out-dial Rules using LODR.
11. Enable In-Band DTMF signaling for the Digital Stations using SBCSU.
12. Configure Digital Station's Class of Service for Mailbox (MWI) application.

The menus and commands for these steps are shown below.



Configuration Menus and Commands for Siemens HiPath 4300 PBX

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 *=OWN NODE			
		0	1	2	3	4	5					
0		.	****	.	***	**	.	..	..	*	CO	R
001	- 009	*	.....	.....	.....	.....	.....	.....	.....	.....	NETRTE	
111		.	****	*****	**	.	.....	.....	.....	.....	TIE	
12		.	****	*****	**	.	.....	.....	.....	.....	TIE	R
13	- 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 *=OWN NODE			
		0	1	2	3	4	5					
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 *=OWN NODE			
		0	1	2	3	4	5					
33		.	.....	.....	.....	.....	.....	.....	.....	.....	CCKY	
34		.	.....	.....	.....	.....	.....	.....	.....	.....	HTKY	
35		.	.....	.....	.....	.....	.....	.....	.....	.....	STKY	
36		.	.....	.....	.....	.....	.....	.....	.....	.....	REMKY	
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						DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO
	1	11111	11112	22	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						DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO
	1	11111	11112	22	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						DIGIT ANALYSIS RESULT	RESERVED/CONVERT DNI/ADD-INFO
	1	11111	11112	22	0	12345 67890 12345 67890 12		

*18		. . . . .	*****	*****	**	. . . . .	*	ACOSX		
*19		. . . . .	*****	*****	**	. . . . .	*	KNOVR		
*20		. . . . .	*****	*****	**	. . . . .	*	ADND		
*25		. . . . .	*****	*****	**	. . . . .	*	FWDTERM		
*29		. . . . .	*****	*****	**	. . . . .	*	AFFWDVCE		



DISPLAY COMPLETED;

Enbloc Sending Dial Plan, DPLN

<DISPLAY-LDPLN:TYPE=LDP,LDPNO=4;
DISPLAY-LDPLN:TYPE=LDP,LDPNO=4;
H500: AMO LDPLN STARTED

LDPNO :	4	LDP :	111-X
		SPC :	22
		FDSFIELD :	0
		SDSFIELD :	0
		PINDP :	N
DPLN	LROUTE	LAUTH	
0	1	1	
1	1	1	
2	1	1	
3	1	1	
4	1	1	
5	1	1	
6	1	1	
7	1	1	
8	1	1	
9	1	1	
10	1	1	
11	1	1	
12	1	1	
13	1	1	
14	1	1	
15	1	1	

AMO-LDPLN-111 ADMINISTRATION LCR DIALPLAN
DISPLAY COMPLETED;

Overlap Sending Dial Plan, DPLN

<DISPLAY-LDPLN:TYPE=LDP,LDPNO=12;
DISPLAY-LDPLN:TYPE=LDP,LDPNO=12;
H500: AMO LDPLN STARTED

LDPNO :	12	LDP :	59-XXXX
		SPC :	22
		FDSFIELD :	0
		SDSFIELD :	0
		PINDP :	N
DPLN	LROUTE	LAUTH	
0	27	1	
1	27	1	
2	27	1	
3	27	1	
4	27	1	
5	27	1	
6	27	1	
7	27	1	
8	27	1	
9	27	1	
10	27	1	
11	27	1	
12	27	1	
13	27	1	
14	27	1	
15	27	1	

AMO-LDPLN-111 ADMINISTRATION LCR DIALPLAN



DISPLAY COMPLETED;

PSTN Dial Plan, DPLN

<DISPLAY-LDPLN:TYPE=LDP,LDPNO=5;

DISPLAY-LDPLN:TYPE=LDP,LDPNO=5;

H500: AMO LDPLN STARTED

LDPNO :	5	LDP :	9-1650-XXXXXXX
		SPC :	22
		FDSFIELD :	0
		SDSFIELD :	0
		PINDP :	N
DPLN	LROUTE	LAUTH	
0	165	1	
1	165	1	
2	165	1	
3	165	1	
4	165	1	
5	165	1	
6	165	1	
7	165	1	
8	165	1	
9	165	1	
10	165	1	
11	165	1	
12	165	1	
13	165	1	
14	165	1	
15	165	1	

AMO-LDPLN-111 ADMINISTRATION LCR DIALPLAN

DISPLAY COMPLETED;

BCSU

QSIG Board

<DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=3,SLOT=25;

DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=3,SLOT=25;

H500: AMO BCSU STARTED

ADDRESS : LTG 1 LTU 3 SOURCE GROUP 1

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

AMO-BCSU -111 BOARD CONFIGURATION, SWITCHING UNIT

DISPLAY COMPLETED;

<

PSTN board

<DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=2,SLOT=79;

DISPLAY-BCSU:TYPE=TBL,LTG=1,LTU=2,SLOT=79;

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
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

<dis-cot:22;
 DIS-COT:22;
 H500: AMO COT STARTED

```

COT: 22 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 Parameter for Device Handler, 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 Service, COSSU

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

COS	VOICE	FAX	DTE
32	> TA TNOTCR	NOCO NOTIE	TA TNOTCR



```

BASIC
MSN
CDRINT
MULTRA

```

```

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							NUM
>	SERVICE INFORMATION												
1	X	.....											0
>	LCR ATTENDANT FOR VOICE												

```

AMO-COSSU-111      CLASSES OF SERVICE
DISPLAY COMPLETED;

```

Trunk Group Access Code, BUEND

```

<DISPLAY-BUEND:TGRP=27,FORMAT=L;
DISPLAY-BUEND:TGRP=27,FORMAT=L;
H500: AMO BUEND STARTED

```

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

```

AMO-BUEND-111      TRUNK GROUP
DISPLAY COMPLETED;

```



Trunk Configuration, TDCSU

Master-side Configuration

```
<dis-tdcsu:1-3-25-1;
DIS-TDCSU:1-3-25-1;
H500: AMO TDCSU STARTED
```

```

+----- DIGITAL TRUNK (FORMAT=L) -----+
| DEV      = S2CONN      PEN      = 1-03-025-1  TGRP      = 27      |
+-----+-----+-----+-----+-----+-----+
| PROTVAR = PSS1V2      INS      = Y          SRCHMODE = CIR      |
| COTNO    = 22          COPNO    = 21          DPLN     = 0          |
| ITR      = 1          COS      = 32          LCOSV    = 1          |
| LCOSD    = 1          CCT      = PRI ECMA 4    DESTNO   = 111       |
| SEGMENT  = 1          DEDSCC   =              DEDSVC   = NONE     |
| FACILITY =              DITIDX  =              SRTIDX   =              |
| TRTBL    = GDTR       SIDANI   = N          ATNTYP   = TIE      |
| CBMATTR  = NONE      NWMUXTIM = 10         TCHARG   = N          |
| SUPPRESS = 0          DGTPR    =              CHIMAP  = N          |
| ISDNIP   =              ISDNNP  =              PNPAC   =              |
| PNPL2P   =              PNPL1P  =              NNO     = 111       |
| TRACOUNT = 31         SATCOUNT = MANY      CARRIER = 1          |
| ALARMNO  = 0          FIDX     = 1          FWDX    = 5          |
| ZONE     = EMPTY     COTX     = 22         TPROFNO =              |
| DOMTYPE  =              DOMAINNO =          CCHDL   =              |
| INIGHT   =              UUSCCY  = 8         FNIDX   = 1          |
| UUSCCX   = 16         & G711   & G729OPT  SRCGRP  =              |
| CLASSMRK = EC        & G711   & G729OPT  TCCID   =              |
+-----+-----+-----+-----+-----+
| BCNEG    = N          BCGR     = 1          LWPAR   = 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:FORMAT=L,BLNO=1,TYPE=DIUS2;
DISPLAY-LWPAR:FORMAT=L,BLNO=1,TYPE=DIUS2;
H500: AMO LWPAR STARTED
```

```

+-----+-----+-----+-----+-----+-----+
| LOADWARE PARAMETERS      CIRCUIT TYPE: DIUS2  SOURCE:DB  BLOCK: 1 |
+-----+-----+-----+-----+-----+-----+
| 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    =              |
+-----+-----+-----+-----+-----+

```

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



Slave-side Configuration

```
<dis-tdcsu:1-3-25-1;
DIS-TDCSU:1-3-25-1;
H500: AMO TDCSU STARTED
```

```
----- DIGITAL TRUNK (FORMAT=L) -----
DEV      = S2CONN      PEN      = 1-03-025-1  TGRP     = 27
-----
PROTVAR = PSS1V2      INS       = Y          SRCHMODE = CIR
COTNO    = 22          COPNO    = 21          DPLN     = 0
ITR      = 1          COS      = 32          LCOSV    = 1
LCOSD    = 1          CCT      = PRI ECMA 4  DESTNO   = 111
SEGMENT  = 1          DEDSCC   =             DEDSVC   = NONE
FACILITY =             DITIDX   =             SRTIDX   =
TRTBL    = GDTR       SIDANI   = N          ATNTYP   = TIE
CBMATTR  = NONE      NWMUXTIM = 10         TCHARG   = N
SUPPRESS = 0          DGTPR    =             CHIMAP   = N
ISDNIP   =           ISDNNP   =
PNPL2P   =           PNPL1P   =           PNPAC    =
TRACOUNT = 31         SATCOUNT = MANY     NNO      = 111
ALARMNO  = 0          FIDX    = 1          CARRIER = 1
ZONE     = EMPTY     COTX    = 22         FWDX     = 5
DOMTYPE  =           DOMAINNO =             TPROFNO =
INIGHT   =           UUSCCY   = 8          CCHDL    =
UUSCCX   = 16         & G711   & G729OPT  FNIDX    = 1
CLASSMRK = EC        & G711   & G729OPT  SRCGRP   =
TCCID    =
-----
BCNEG    = N          BCGR     = 1          LWPAR   = 0
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:FORMAT=L,BLNO=0,TYPE=DIUS2;
DISPLAY-LWPAR:FORMAT=L,BLNO=0,TYPE=DIUS2;
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;
```



PSTN Trunk Configuration, TDCSU

```
<dis-tdcsu:1-2-79-1;
DIS-TDCSU:1-2-79-1;
H500: AMO TDCSU STARTED
```

```
----- DIGITAL TRUNK (FORMAT=L) -----
DEV      = S2CONN      PEN      = 1-02-079-1  TGRP     = 23
-----
PROTVAR  = ETSI        INS      = Y          SRCHMODE = CIR
COTNO    = 21          COPNO    = 21          DPLN     = 0
ITR      = 1           COS      = 10          LCOSV    = 32
LCOSD    = 32          CCT      = PRI ECMA 2  DESTNO   = 100
SEGMENT  = 8           DEDSCC   =           DEDSVC   = NONE
FACILITY =             DITIDX   =           SRTIDX   =
TRTBL    = GDTR        SIDANI   = N          ATNTYP   = TIE
CBMATTR  = NONE        NWMUXTIM = 10         TCHARG   = N
SUPPRESS = 0           DGTPR   =           CHIMAP   = N
ISDNIP   =             ISDNNP   =
PNPL2P   =             PNPL1P   =           PNPAC    =
TRACOUNT = 31          SATCOUNT = MANY    NNO      = 1
ALARMNO  = 0           FIDX    = 1          CARRIER = 1
ZONE     = EMPTY       COTX    = 21         FWDX     = 10
DOMTYPE  =             DOMAINNO =           TPROFNO =
INIGHT   =             UUSCCY   = 8          CCHDL    =
UUSCCX   = 16          CLASSMRK = EC      & G711  & G729OPT  FNIDX    = 1
TCCID    =             SRCGRP   =
-----
BCNEG    = N           BCGR     = 1          LWPAR    = 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;
```

Reference Clock Configuration, REFTA

Master-side Configuration

```
<DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-3-25-1,KIND=ALL;
DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-3-25-1,KIND=ALL;
H500: AMO REFTA STARTED
```

```
-----
| REFERENCE CLOCK CIRCUITS |
-----+-----+-----+-----+-----+-----+-----+-----+
| PEN      | MODULE | DEVICE | PRI | ERROR | BLOCK | SUPP. | READY | SRCGRP |
|          |        |        |     |       |       |       | BUT  |        |
|          |        |        |     |       |       |       | ASYN. |        |
-----+-----+-----+-----+-----+-----+-----+
| 1- 3- 25- 1 | DIU-N2 | S2CONN | 0 | 0 | N | | N | 1 |
-----+-----+-----+-----+-----+-----+-----+

```

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



Slave-side Configuration

```
<DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-3-25-1,KIND=ALL;
DISPLAY-REFTA:TYPE=CIRCUIT,PEN=1-3-25-1,KIND=ALL;
H500: AMO REFTA STARTED
```

REFERENCE CLOCK CIRCUITS									
PEN	MODULE	DEVICE	PRI	ERROR	BLOCK	SUPP.	READY BUT ASYN.	SRCGRP	
1- 3- 25- 1	DIU-N2	S2CONN	11	0	N		N	1	

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

Trunk Least-Cost Routing Configuration

LDAT

```
<DISPLAY-LDAT:TYPE=LCR,LROUTE=1;
DISPLAY-LDAT:TYPE=LCR,LROUTE=1;
H500: AMO LDAT STARTED
```

LDAT -111 LCR-DIRECTIONS									
LROUTE = 1		LDPLN	NAME = ROPTCCM			SERVICE = ALL			
TYPE = LCR				DNN OF ROUTE =		111			
SERVICE INFO =									
LRTEL	LVAL	TGRP	ODR	LAUTH	SCHEDULE ABCDEFGH	CARRIER ZONE	LATTR	LDSRT	
1	1	27	111	1	*****	1 EMPTY	NONE		
DNN OF ROUTE =		111							

```
AMO-LDAT -111 LCR-DIRECTIONS
DISPLAY COMPLETED;
<DISPLAY-LDAT:TYPE=LCR,LROUTE=27;
DISPLAY-LDAT:TYPE=LCR,LROUTE=27;
H500: AMO LDAT STARTED
```

LDAT -111 LCR-DIRECTIONS									
LROUTE = 27		LDPLN	NAME = PRI 4 ECMA1			SERVICE = ALL			
TYPE = LCR				DNN OF ROUTE =		111			
SERVICE INFO =									
LRTEL	LVAL	TGRP	ODR	LAUTH	SCHEDULE ABCDEFGH	CARRIER ZONE	LATTR	LDSRT	
1	1	27	15	1	*****	1 EMPTY	NONE		

```
AMO-LDAT -111 LCR-DIRECTIONS
DISPLAY COMPLETED;
<DISPLAY-LDAT:TYPE=LCR,LROUTE=165;
DISPLAY-LDAT:TYPE=LCR,LROUTE=165;
H500: AMO LDAT STARTED
```

LDAT -111 LCR-DIRECTIONS									
LROUTE = 165		LDPLN	NAME = PSTN 91650			SERVICE = ALL			
TYPE = LCR				DNN OF ROUTE =		89			
SERVICE INFO =									
LRTEL	LVAL	TGRP	ODR	LAUTH	SCHEDULE ABCDEFGH	CARRIER ZONE	LATTR	LDSRT	
1	1	23	50	1	*****	1 EMPTY	NONE		



```
|          | DNNO =          89          |
+-----+-----+-----+-----+-----+-----+-----+-----+
```

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

RICHT

```
DISPLAY-RICHT:MODE=LRTE,LRTE=1;
H500: AMO RICHT STARTED
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+
| LRTE = 1      NAME = ROPTCCM          (NEUTRAL)  LSVC = ALL
| DNNO =       111 PDNNO =             0  DESTNO =111
| ROUTOPT = YES  REROUT = YES  PLB = NO  FWDBL = NO
| DTMFCNV = WITHOUT DTMFDSP = WITHOUT DTMFTEXT =
| DTMFPULS =     BUGS = LIN  ROUTATT = NO      MAINGRP = 24
| EMCYRTT = NO   CONFONE = NO  RERINGRP = NO  RTENO = 24
| INFO =
| NOPRCFWD = NO
+-----+-----+-----+-----+-----+-----+-----+-----+
| TGRP = 27 LDAT  PRI ECMA 4          (NEUTRAL)  SUBGROUP = 10
+-----+-----+-----+-----+-----+-----+-----+-----+
```

```
AMO-RICHT-111          TRUNK ROUTING
DISPLAY COMPLETED;
<DISPLAY-RICHT:MODE=LRTE,LRTE=27;
DISPLAY-RICHT:MODE=LRTE,LRTE=27;
H500: AMO RICHT STARTED
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+
| LRTE = 27     NAME = PRI 4 ECMA1     (NEUTRAL)  LSVC = ALL
| DNNO =       111 PDNNO =             0
| ROUTOPT = YES  REROUT = YES  PLB = NO  FWDBL = NO
| DTMFCNV = FIX   DTMFDSP = WITHOUT DTMFTEXT =
| DTMFPULS = PP300 BUGS = LIN  ROUTATT = NO      MAINGRP = 15
| EMCYRTT = NO   CONFONE = NO  RERINGRP = NO  RTENO = 15
| INFO =
| NOPRCFWD = NO
+-----+-----+-----+-----+-----+-----+-----+-----+
| TGRP = 27 LDAT  PRI ECMA 4          (NEUTRAL)  SUBGROUP = 10
+-----+-----+-----+-----+-----+-----+-----+-----+
```

```
AMO-RICHT-111          TRUNK ROUTING
DISPLAY COMPLETED;
```

PSTN RICHT

```
<DISPLAY-RICHT:MODE=LRTE,LRTE=165;
DISPLAY-RICHT:MODE=LRTE,LRTE=165;
H500: AMO RICHT STARTED
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+
| LRTE = 165    NAME = PSTN 91650     (NEUTRAL)  LSVC = ALL
| DNNO =        89 PDNNO =             0  DESTNO = 89
| ROUTOPT = YES  REROUT = YES  PLB = NO  FWDBL = NO
| DTMFCNV = WITHOUT DTMFDSP = WITHOUT DTMFTEXT =
| DTMFPULS =     BUGS = LIN  ROUTATT = NO      MAINGRP = 27
| EMCYRTT = NO   CONFONE = NO  RERINGRP = NO  RTENO = 27
| INFO =
| NOPRCFWD = NO
+-----+-----+-----+-----+-----+-----+-----+-----+
| TGRP = 23 LDAT  ECMA 2          (NEUTRAL)  SUBGROUP = 6
+-----+-----+-----+-----+-----+-----+-----+-----+
```

```
AMO-RICHT-111          TRUNK ROUTING
DISPLAY COMPLETED;
```



LCR Out-dial Rules, LODR

<DISPLAY-LODR:ODR=111,FORMAT=L;

H500: AMO LODR STARTED

ODR	POSITION	CMD	PARAMETER
111	1	ECHO	1
	2	ECHO	2
	3	END	

H03: THE NEXT FREE ODR IS 2

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

<DISPLAY-LODR:ODR=15,FORMAT=L;

DISPLAY-LODR:ODR=15,FORMAT=L;

H500: AMO LODR STARTED

ODR	POSITION	CMD	PARAMETER
15	1	ECHO	2
	2	END	

H03: THE NEXT FREE ODR IS 2

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

<DISPLAY-LODR:ODR=50,FORMAT=L;

DISPLAY-LODR:ODR=50,FORMAT=L;

H500: AMO LODR STARTED

ODR	POSITION	CMD	PARAMETER
50	1	ECHO	2
	2	ECHO	3
	3	END	

H03: THE NEXT FREE ODR IS 2

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

In-Band DTMF signaling:

To enable in-band DTMF signaling on digital stations for voicemail applications, the station configuration must be set to DTMFCTRD=Y.

Name and Number Restrictions:

To use Name and Number Restrictions, the station configuration must be set to SSTNO=Y.

<dis-sbcusu:5002;

DIS-SBCSU:5002;

H500: AMO SBCSU STARTED

STNO		=5002		OPT		=OPTI		COS1		=2		DPLN		=1	
MAINO	=5002	CONN	=DIR	COS2	=2	ITR	=1	LCOSV1	=6	COSX	=0				
PEN	= 1- 3- 31-	2		LCOSV2	=6			LCOSD1	=6						
INS	=Y	ASYNCT	=500	LCOSD2	=6	CBKBMX	=5								
		PERMACT	=			RCBKB	=N								
SSTNO	=Y	EXTBUS	=			RCBKNA	=N								
TRACE	=N			SPDI	=0										
ALARMNO	=0	DFSVCANA	=	SPDC1	=	CBKNAMB	=Y								
HMUSIC	=0	FLASH	=												



```

PMIDX   =0
SECR    =N          DIGNODIS=N          DSSTNA  =N          COMGRP  =0
STD     =55         CALLOG   =NONE        DSSTNB  =Y          TEXTSEL =ENGLISH

REP     =0          OPTICOM  =N          OPTIUSB :0          VPI     =
IDCR    =N          OPTICA   =1          OPTIS0A :          VCI     =
                                OPTIDA  =          OPTISPA :0         PATTERN =
                                OPTIABA :0

DCFWBUSY=N        HEADSET  =N          APICLASS=
DNIDSP  =N        HSKEY   =NORMAL    ACFAPPL =0
DTMFBLK =N
DTMFCTRD=Y      BASICSVC=
DVCFIG  =OPTIP500 TSI      =1          IPPASSW =
                                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

Configure Digital Station's Class of Service for Mailbox (MWI) application

```

<DISPLAY-COSSU:TYPE=COS,COS=2,FORMAT=L;
DISPLAY-COSSU:TYPE=COS,COS=2,FORMAT=L;
H500: AMO COSSU STARTED

```

COS	VOICE	FAX	DTE
2	>		
	TA	NOCO	TA
	TSUID	NOTIE	TNOTCR
	TNOTCR	BASIC	BASIC
	CDRINT		
	CDRS		
	CDRC		
	MB		
	COSXCD		
	VCE		
	SPKR		
	DATA		
	FWDNWK		
	RERING		
	CDRIND		
	MSN		
	FWDECA		
	FWDBAS		
	FWDDIR		
	CFB		
	CFNR		
	CCBS		
	CW		
	FWDEXT		
	GRPCAL		
	SUTVA		

```

AMO-COSSU-111      CLASSES OF SERVICE
DISPLAY COMPLETED;

```




Configuring Cisco Unified CallManager

Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

← Back → Search Favorites Media

Address <http://cm-klington/CCMAdmin/gatewayconfig.asp?pkid={2E043967-780A-4425-8FEF-343CBAD17186}&type=2> Go Links

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Gateway Configuration

[Back to Find/List Gateways](#)
[Dependency Records](#)

Product : Cisco Catalyst 6000 E1 VoIP Gateway
Gateway : S0/DS1-0@SDA0001C9D8633E
Device Protocol: Digital Access PRI
Registration: Registered with Cisco CallManager 172.20.32.254
IP Address: [172.20.32.103](#)

Status: Ready

Device Information

MAC Address*	<input type="text" value="0001C9D8633E"/>
Description	<input type="text" value="SDA0001C9D8633E"/>
Device Pool*	<input type="text" value="Default"/>
Network Locale	<input type="text" value="United States"/>
Media Resource Group List	<input type="text" value=" < None >"/>
Location	<input type="text" value=" < None >"/>
AAR Group	<input type="text" value=" < None >"/>
Load Information	<input type="text"/>

Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain (e.g., "0000FF")	<input type="text"/>
MLPP Indication	Not available on this device
MLPP Preemption	Not available on this device

Interface Information

PRI Protocol Type*	<input type="text" value="PRI ISO QSIG E1"/>
Protocol Side*	<input type="text" value="User"/>
Channel Selection Order*	<input type="text" value="Top Down"/>
Channel IE Type*	<input type="text" value="Continuous Number"/>

Local intranet



Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address <http://cm-klington/CCMAdmin/gatewayconfig.asp?pkid={2E043967-780A-4425-8FEF-343CBAD17186}&type=2> Go Links

PCM Type* A-law

Delay for first restart (1/8 sec ticks) 32

Delay between restarts (1/8 sec ticks) 4

Inhibit restarts at PRI initialization

Enable status poll

Call Routing Information

Inbound Calls

Significant Digits* All

Calling Search Space Phones

AAR Calling Search Space < None >

Prefix DN

Outbound Calls

Calling Line ID Presentation* Default

Calling Party Selection* Originator

Called party IE number type unknown* Cisco CallManager

Calling party IE number type unknown* Cisco CallManager

Called Numbering Plan* Private

Calling Numbering Plan* Cisco CallManager

Number of digits to strip* 0

Caller ID DN

SMDI Base Port* 0

PRI Protocol Type Specific Information

Display IE Delivery

Redirecting Number IE Delivery - Outbound

Redirecting Number IE Delivery - Inbound

Send Extra Leading Character In DisplayIE***

Setup non-ISDN Progress Indicator IE Enable****

Local intranet



Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address <http://cm-klingson/CCMAdmin/gatewayconfig.asp?pkid={2E043967-780A-4425-8FEF-343CBAD17186}&type=2> Go Links

MCDN Channel Number Extension Bit Set to Zero**

Send Calling Name In Facility IE

Interface Identifier Present**

Interface Identifier Value**

Connected Line ID Presentation (QSIG Inbound Call)*

Connected PBX Model

Product Specific Configuration

Clock Reference*

Framing*

Audio Signal Adjustment into IP Network*

Audio Signal Adjustment from IP Network*

Zero Suppression*

Digit On Duration(50-500ms)*

Interdigit Duration(50-500msec)*

SNMP Community String

Disable SNMP Set operations*

Debug Port Enable*

Hold Tone Silence Duration*

Port Used for Voice Calls*

Port Used for Modem Calls*

Port Used for Fax Calls*

Fax and Modem Parameters

Fax Relay Enable*

Fax Error Correction Mode Override*

Maximum Fax Rate*

Fax Payload Size*

Non Standard Facilities Country Code*

Non Standard Facilities Header

Local intranet



Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address <http://cm-klington/CCMAdmin/gatewayconfig.asp?pkid={2E043967-780A-4425-8FEF-343CBAD17186}&type=2> Go Links >>

Non Standard Facilities Vendor Code*

Fax/Modem Packet Redundancy*

NSE Type*

Playout Delay Parameters

Initial Playout Delay*

Minimum Playout Delay*

Maximum Playout Delay*

Echo Canceller Configuration

Echo TailLength (ms)*

Minimum ERL (db)*

* indicates required item
** applicable to DMS-100 protocol only
*** applicable to DMS-100 protocol and DMS-250 protocol only
**** may be required to force ringback from some PBXs

[Back to Find/List Gateways](#)

Local intranet



Partitions Configuration

The screenshot shows the Cisco CallManager 4.0 Administration web interface in Microsoft Internet Explorer. The browser address bar shows the URL: `http://cm-klingson/CCMAdmin/routepartitionlist.asp?findBy=name&match=begins&pattern=&submit1=Find&rows=20`. The page title is "Cisco CallManager Administration - Find and List Partitions".

The main content area has a navigation menu with links: System, Route Plan, Service, Feature, Device, User, Application, Help. Below the menu is the Cisco CallManager Administration logo and the Cisco Systems logo.

Find and List Partitions

[Add a New Partition](#)

2 matching record(s) for Partition Name begins with ""

Find Partitions where Partition Name

and show items per page

To list all items, click Find without entering any search text.

Matching record(s) 1 to 2 of 2

<input type="checkbox"/>	Partition Name	Description
<input type="checkbox"/>	Incoming Trunk	Incoming Trunk
<input type="checkbox"/>	Phones	Phones

First Previous Next Last Page of 1

Local intranet



Calling Search Space Configuration

The screenshot shows the Cisco CallManager 4.0 Administration web interface in Microsoft Internet Explorer. The browser title is "Cisco CallManager 4.0 Administration - Calling Search Space Configuration - Microsoft Internet Explorer". The address bar shows the URL: <http://cm-klington/CCMAdmin/callingsearchspace.asp?pkid={9106F9C5-B86A-4C9E-A3A3-BA0F27017989}>. The navigation menu includes System, Route Plan, Service, Feature, Device, User, Application, and Help. The page header features the Cisco CallManager Administration logo and the Cisco Systems logo.

Calling Search Space Configuration

[Add New Calling Search Space](#)
[Back to Find/List Calling Search Spaces](#)
[Dependency Records](#)

Calling Search Space: Incoming Trunk
Status: Ready

Calling Search Space Information

Calling Search Space Name*
Description

Route Partitions for this Calling Search Space

Find Partitions containing

Available Partitions

Selected Partitions*
(ordered by highest priority)

* indicates required item



Cisco CallManager 4.0 Administration - Calling Search Space Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address <http://cm-klington/CCMAdmin/callingsearchspace.asp?pkid={607F7659-E6E6-4AB2-A2CC-3A124448754B}> Go Links

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Calling Search Space Configuration

[Add New Calling Search Space](#)
[Back to Find/List Calling Search Spaces](#)
[Dependency Records](#)

Calling Search Space: Phones (in use)
Status: Ready

Copy Update Delete Restart Devices

Calling Search Space Information

Calling Search Space Name*
Description

Route Partitions for this Calling Search Space

Find Partitions containing Find

Available Partitions
Incoming Trunk

Selected Partitions*
(ordered by highest priority)
Phones

* indicates required item

Done Local intranet



Enbloc Route Pattern Configuration

Cisco CallManager 4.0 Administration - Route Pattern/Hunt Pilot Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://cm-klingson/CCMAdmin/routepatternconfig.asp?pkid={89F5482D-22A8-4FEE-A402-C2E89728F18D} Go Links >>

Route Pattern/Hunt Pilot: 5XXX

Status: Ready
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

Route Pattern/Hunt Pilot* 5XXX

Partition < None >

Description

Numbering Plan* North American Numbering Plan

Route Filter < None >

MLPP Precedence Default

Gateway or Route/Hunt List* S0/DS1-0@SDA0001C9D8633E (Edit)

Route Option

Route this pattern

Block this pattern — Not Selected —

Provide Outside Dial Tone Allow Overlap Sending Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation Default

Calling Name Presentation Default

Connected Party Transformations

Connected Line ID Presentation Default

Connected Name Presentation Default

Called Party Transformations

Discard Digits < None >

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

ISDN Network-Specific Facilities Information Element

Carrier Identification Code

Network Service Protocol — Not Selected —

Network Service	Service Parameter Name	Service Parameter Value
— Not Selected —	< Not Exist >	

Done Local intranet



Overlap Sending Route Pattern Configuration

Cisco CallManager 4.0 Administration - Route Pattern/Hunt Pilot Configuration - Microsoft Internet Explorer

Address: http://cm-klington/CCMAdmin/routepatternconfig.asp?pkid={E959BFF6-5645-4444-9E24-2768AFCAAD03}

Route Pattern/Hunt Pilot: 9.X

Status: Ready
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

Route Pattern/Hunt Pilot*	9.X	
Partition	< None >	
Description		
Numbering Plan*	North American Numbering Plan	
Route Filter	< None >	
MLPP Precedence	Default	
Gateway or Route/Hunt List*	S0/DS1-0@SDA0001C9D8633E (Edit)	
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern — Not Selected —	
<input checked="" type="checkbox"/> Provide Outside Dial Tone	<input checked="" type="checkbox"/> Allow Overlap Sending	<input type="checkbox"/> Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask	
Prefix Digits (Outgoing Calls)	
Calling Line ID Presentation	Default
Calling Name Presentation	Default

Connected Party Transformations

Connected Line ID Presentation	Default
Connected Name Presentation	Default

Called Party Transformations

Discard Digits	PreDot
Called Party Transform Mask	
Prefix Digits (Outgoing Calls)	

ISDN Network-Specific Facilities Information Element

Carrier Identification Code		
Network Service Protocol	— Not Selected —	
Network Service	Service Parameter Name	Service Parameter Value
— Not Selected —	< Not Exist >	

Done Local intranet



PSTN Route Pattern Configuration

Cisco CallManager 4.0 Administration - Route Pattern/Hunt Pilot Configuration - Microsoft Internet Explorer

Address: http://cm-klington/CCMAdmin/routepatternconfig.asp?pkid={A0E58AC2-80ED-4857-9D43-DCC43AA6EA56}

Route Pattern/Hunt Pilot: 91650XXXXXX

Status: Ready
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

Route Pattern/Hunt Pilot* 91650XXXXXX

Partition < None >

Description

Numbering Plan* North American Numbering Plan

Route Filter < None >

MLPP Precedence Default

Gateway or Route/Hunt List* S0/DS1-0@SDA0001C9D8633E (Edit)

Route Option

Route this pattern

Block this pattern — Not Selected —

Provide Outside Dial Tone Allow Overlap Sending Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls) 408527

Calling Line ID Presentation Default

Calling Name Presentation Default

Connected Party Transformations

Connected Line ID Presentation Default

Connected Name Presentation Default

Called Party Transformations

Discard Digits < None >

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

ISDN Network-Specific Facilities Information Element

Carrier Identification Code

Network Service Protocol — Not Selected —

Network Service	Service Parameter Name	Service Parameter Value
— Not Selected —	< Not Exist >	

Done Local intranet



Route Pattern for Cisco Unity Voicemail

Cisco CallManager 4.0 Administration - Route Pattern/Hunt Pilot Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://cm-klington/CCMAdmin/routepatternconfig.asp?pkid={00F4BC16-DECD-4E94-86B8-E7156C5006B7} Go Links

Route Pattern/Hunt Pilot: 499X

Status: Ready
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

Route Pattern/Hunt Pilot* 499X

Partition Phones

Description

Numbering Plan* North American Numbering Plan

Route Filter < None >

MLPP Precedence Default

Gateway or Route/Hunt List* UnityHuntList (Edit)

Route Option

Route this pattern

Block this pattern — Not Selected —

Provide Outside Dial Tone Allow Overlap Sending Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation Default

Calling Name Presentation Default

Connected Party Transformations

Connected Line ID Presentation Default

Connected Name Presentation Default

Called Party Transformations

Discard Digits < None >

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

ISDN Network-Specific Facilities Information Element

Carrier Identification Code

Network Service Protocol — Not Selected —

Network Service	Service Parameter Name	Service Parameter Value
— Not Selected —	< Not Exist >	

Done Local intranet



Cisco Unity Voicemail Hunt List

The screenshot shows the Cisco CallManager 4.0 Administration web interface in Microsoft Internet Explorer. The browser title is "Cisco CallManager 4.0 Administration - Route/Hunt List Configuration - Microsoft Internet Explorer". The address bar shows the URL: <http://cm-klngon/CCMAdmin/routelistmainconfig.asp?pkid={C0689627-534D-45CA-AAAC-90A2C00FE547}>. The navigation menu 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.

Route/Hunt List Configuration

[Add a new Route/Hunt List](#)
[Back to Find/List Route/Hunt Lists](#)
[Dependency Records](#)

Route/Hunt List Details
CiscoUM1

Route/Hunt List: UnityHuntList
Status: Ready
Copy Update Delete Reset

Route/Hunt List Information
Route/Hunt List Name* UnityHuntList
Description
Cisco CallManager Group* Default
 Enable this Route/Hunt List (change effective on Update; no reset required)

Route/Hunt List Member Information
Add Route Group Add Line Group

Selected Groups* (ordered by highest priority)
CiscoUM1

Removed Groups (to be removed from Route/Hunt List when you click Update)

* indicates required item



Cisco Unity Voicemail Line Group

Cisco CallManager 4.0 Administration - Line Group Configuration - Microsoft Internet Explorer

Address: http://cm-klngon/CCMAdmin/linegroupconfig.asp?Action=Update&pkid={A31668E7-267F-4CF3-A540-3034B3169534}

Line Group Configuration

[Add new Line Group](#)
[Back to Find/List Line Groups](#)
[Dependency Records](#)

Directory Numbers

- 4990
- 4991

Line Group: CiscoUM1
Status: Ready

Line Group Information

Line Group Name*
RNA Reversion Timeout*
Distribution Algorithm*

Hunt Options

No Answer*
Busy**
Not Available**

Line Group Member Information

Find Directory Numbers to add to Line Group

Route Partition
Directory Numbers Contains

Available DN/Route Partition
(Do not include directory numbers of application-controlled IP phones, or application-monitored IP phones in the line group.)

Current Line Group Members

Selected DN/Route Partition*

Removed DN/Route Partition
(to be removed from Line Group when you click Update)



Cisco Unity Subscriber

Subscribers

- [Profile](#)
- [Account](#)
- [Phone Password](#)
- [Private Lists](#)
- [Conversation](#)
- [Call Transfer](#)
- [Greetings](#)
- [Caller Input](#)
- [Messages](#)
- [Message Notification](#)
- [Alternate Extensions](#)

Digital Test2 HiPath 4300

Profile

Subscriber Information

First name:

Last name:

Display name:

Class of service: [View](#)

Extension:

Fax ID:

Recorded voice: Volume

Active schedule: [View](#)

Time zone:

Set subscriber for self-enrollment at next login

List in phone directory

Show subscriber in e-mail server address book

Exchange Information

Alias:

Server:

Cisco
Unity

[Log off](#)

© 1998-2003 Cisco Systems, Inc.

Done Local intranet



Translation Pattern for Incoming Calls

Cisco CallManager 4.0 Administration - Translation Pattern Configuration - Microsoft Internet Explorer

Address: http://cm-klngon/CCMAdmin/translationconfig.asp?pkid={89B55D17-7179-4943-ASCF-EED9D09BF290}

Translation Pattern Configuration

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

Translation Pattern: 4XXX
Status: Ready

Pattern Definition

Translation Pattern	4XXX	
Partition	Incoming Trunk	
Description		
Numbering Plan*	North American Numbering Plan	
Route Filter	< None >	
Calling Search Space	Phones	
MLPP Precedence	Default	
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern — Not Selected —	
<input checked="" type="checkbox"/> Provide Outside Dial Tone	<input type="checkbox"/> Allow Overlap Sending	<input checked="" type="checkbox"/> Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask	
Prefix Digits (Outgoing Calls)	
Calling Line ID Presentation	Default
Calling Name Presentation	Default

Connected Party Transformations

Connected Line ID Presentation	Default
Connected Name Presentation	Default

Called Party Transformations

Discard Digits	< None >
Called Party Transform Mask	
Prefix Digits (Outgoing Calls)	

* indicates required item.



CLIR Route Pattern Configuration

Cisco CallManager 4.0 Administration - Route Pattern/Hunt Pilot Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://cm-kingon/CCMAdmin/routepatternconfig.asp?pkid={89F5482D-22A8-4FEE-A402-C2E89728F18D} Go Links >>

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

Route Pattern/Hunt Pilot Configuration

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

Route Pattern/Hunt Pilot: 5XXX

Status: Ready
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

Route Pattern/Hunt Pilot* 5XXX

Partition < None >

Description Siemens HiPath 4300 route

Numbering Plan* North American Numbering Plan

Route Filter < None >

MLPP Precedence Default

Gateway or Route/Hunt List* S0/DS1-0@SDA0001C9D8633E (Edit)

Route Option
 Route this pattern
 Block this pattern — Not Selected —

Provide Outside Dial Tone Allow Overlap Sending Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation Restricted

Calling Name Presentation Default

Connected Party Transformations

Connected Line ID Presentation Default

Connected Name Presentation Default

Called Party Transformations

Discard Digits < None >

Done Local intranet



CNIR Route Pattern Configuration

Cisco CallManager 4.0 Administration - Route Pattern/Hunt Pilot Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://cm-klngon/CCMAdmin/routepatternconfig.asp?pkid={89F5482D-22A8-4FEE-A402-C2E89728F18D}&status=uc

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration

For Cisco IP Telephony Solutions

CISCO SYSTEMS

Route Pattern/Hunt Pilot Configuration

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

Route Pattern/Hunt Pilot: 5XXX
Status: Update completed
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

Route Pattern/Hunt Pilot*	5XXX
Partition	< None >
Description	Siemens HiPath 4300 route
Numbering Plan*	North American Numbering Plan
Route Filter	< None >
MLPP Precedence	Default
Gateway or Route/Hunt List*	S0/DS1-0@SDA0001C9D8633E (Edit)
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern — Not Selected —

Provide Outside Dial Tone Allow Overlap Sending Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask	
Prefix Digits (Outgoing Calls)	
Calling Line ID Presentation	Default
Calling Name Presentation	Restricted

Connected Party Transformations

Connected Line ID Presentation	Default
Connected Name Presentation	Default

Called Party Transformations

Discard Digits	< None >
----------------	----------

Done Local intranet



COLR Translation Pattern Configuration

Cisco CallManager 4.0 Administration - Translation Pattern Configuration - Microsoft Internet Explorer

Address: http://cm-klngon/CCMAdmin/translationconfig.asp?pkid={89B55D17-7179-4943-A5CF-EED9D09BF290}&status=uc

Translation Pattern Configuration

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

Translation Pattern: 4XXX
Status: Update completed

Pattern Definition

Translation Pattern	<input type="text" value="4XXX"/>
Partition	<input type="text" value="Incoming Trunk"/>
Description	<input type="text"/>
Numbering Plan*	<input type="text" value="North American Numbering Plan"/>
Route Filter	<input type="text" value="< None >"/>
Calling Search Space	<input type="text" value="Phones"/>
MLPP Precedence	<input type="text" value="Default"/>
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern <input type="text" value="— Not Selected —"/>
<input checked="" type="checkbox"/> Provide Outside Dial Tone	<input checked="" type="checkbox"/> Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
Calling Line ID Presentation	<input type="text" value="Default"/>
Calling Name Presentation	<input type="text" value="Default"/>

Connected Party Transformations

Connected Line ID Presentation	<input type="text" value="Restricted"/>
Connected Name Presentation	<input type="text" value="Default"/>

Called Party Transformations

Discard Digits	<input type="text" value="< None >"/>
Called Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>

* indicates required item.

Done Local intranet



CONR Translation Pattern Configuration

Cisco CallManager 4.0 Administration - Translation Pattern Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://cm-klingson/CCMAdmin/translationconfig.asp?pkid={89B55D17-7179-4943-A5CF-EED9D09BF290}&status=uc Go Links >>

Translation Pattern Configuration

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

Translation Pattern: 4XXX
Status: Update completed

Copy Update Delete

Pattern Definition

Translation Pattern	4XXX
Partition	Incoming Trunk
Description	
Numbering Plan*	North American Numbering Plan
Route Filter	< None >
Calling Search Space	Phones
MLPP Precedence	Default
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern — Not Selected —
<input checked="" type="checkbox"/> Provide Outside Dial Tone	<input checked="" type="checkbox"/> Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask	
Prefix Digits (Outgoing Calls)	
Calling Line ID Presentation	Default
Calling Name Presentation	Default

Connected Party Transformations

Connected Line ID Presentation	Default
Connected Name Presentation	Restricted

Called Party Transformations

Discard Digits	< None >
Called Party Transform Mask	
Prefix Digits (Outgoing Calls)	

* indicates required item.

Done Local intranet



7960 IP Phone Configuration

Cisco CallManager 4.0 Administration - Phone Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://cm-kingon/CCMAdmin/phoneconfig.asp?pkid={ED74929A-A8BB-4A58-8129-2E4358F511BB}>

Phone Configuration

[Add a new phone](#)
[Add/Update Speed Dials](#)
[Subscribe/Unsubscribe Services](#)
[Dependency Records](#)
[Back to Find/List Phones](#)

Directory Numbers

Base Phone

- Line 1 - 4001 in Phones
- Line 2 - Add new DN

Phone: SEP003094C39863 (Auto 4001)
Registration: Registered with Cisco CallManager 172.20.32.254
IP Address: 172.20.32.110
Status: Ready

Phone Configuration (Model = Cisco 7960)

Device Information

MAC Address*	<input type="text" value="003094C39863"/>
Description	<input type="text" value="Auto 4001"/>
Owner User ID	<input type="text"/> (Select User ID)
Device Pool*	<input type="text" value="Default"/> (View details)
Calling Search Space	<input type="text" value="< None >"/>
AAR Calling Search Space	<input type="text" value="< None >"/>
Media Resource Group List	<input type="text" value="< None >"/>
User Hold Audio Source	<input type="text" value="< None >"/>
Network Hold Audio Source	<input type="text" value="< None >"/>
Location	<input type="text" value="< None >"/>
User Locale	<input type="text" value="< None >"/>
Network Locale	<input type="text" value="< None >"/>
Device Security Mode	<input type="text" value="Use System Default"/>
Built In Bridge	<input type="text" value="Default"/>
Privacy	<input type="text" value="Default"/>

Phone Button Template Information

Phone Button Template*	<input type="text" value="Standard 7960"/> (View button list)
------------------------	---

Softkey Template Information

Softkey Template	<input type="text" value="< None >"/>
------------------	---

Expansion Module Information

Module 1	<input type="text" value="< None >"/>
Module 2	<input type="text" value="< None >"/>

Done Local intranet



Cisco CallManager 4.0 Administration - Phone Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://cm-klington/CCMAdmin/phoneconfig.asp?pkid={ED74929A-A8BB-4A58-8129-2E4358F511BB}> Go Links

Module 1 Load Name (Module 1 selection required)

Module 2 Load Name (Module 2 selection required)

Cisco IP Phone - External Data Locations (leave blank to use default)

Information

Directory

Messages

Services

Authentication Server

Proxy Server

Idle

Idle Timer (seconds)

Extension Mobility (Device Profile) Information

Enable Extension Mobility Feature

Log Out Profile

Log In User ID

Log In Time

Log Out Time

Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain (e.g., "0000FF")

MLPP Indication

MLPP Preemption

Product Specific Configuration

Disable Speakerphone

Disable Speakerphone and Headset

Forwarding Delay*

PC Port*

Settings Access*

Gratuitous ARP*

PC Voice VLAN Access*

Video Capabilities*

Auto Line Select*

Done Local intranet



Cisco CallManager 4.0 Administration - Directory Number Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://cm-klington/CCMAdmin/directorynumber.asp?NumPlanMapID={17A63DCE-8B3B-4403-A131-B02B19FC9CF4} Go Links

Directory Number Configuration

[Configure Device \(SEP003094C39863\)](#)
[Dependency Records](#)

Associated With
SEP003094C39863
7960 (Line 1)

Directory Number: 4001 (Phones)
Status: Ready
Note: Any update to this Directory Number automatically resets the associated devices

Update Remove from Device Reset Devices

Directory Number

Directory Number* 4001
Partition Phones

Directory Number Settings

Voice Mail Profile <None> (Choose <None> to use default)
Calling Search Space Phones
AAR Group <None>
User Hold Audio Source <None>
Network Hold Audio Source <None>
Auto Answer Auto Answer Off

Call Forward and Pickup Settings

	Voice Mail Destination	Calling Search Space
Forward All	<input type="checkbox"/>	<None>
Forward Busy	<input type="checkbox"/>	<None>
Forward No Answer	<input type="checkbox"/>	<None>
No Answer Ring Duration		(seconds)
Call Pickup Group	<None>	

MLPP Alternate Party Settings

Target (Destination)
Calling Search Space <None>
No Answer Ring Duration (seconds)

Line Settings for this Device

Display (Internal Caller ID) JOHN DOE
Line Text Label
External Phone Number Mask

Done Local intranet



Cisco CallManager 4.0 Administration - Directory Number Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://cm-klington/CCMAdmin/directorynumber.asp?NumPlanMapID={17A63DCE-8B3B-4403-A131-B02B19FC9CF4}> Go Links

Message Waiting Lamp Policy Use System Policy

Ring Setting (Phone Idle) Use System Default

Ring Setting (Phone Active)** Use System Default

Multiple Call / Call Waiting Settings

Maximum Number of Calls* 4 (1 - 200)

Busy Trigger* 2 (<= Max. Calls)

Forwarded Call Information Display

Caller Name Caller Number

Redirected Number Dialed Number

* indicates required item; changes to Line or Directory Number settings require restart.

** Ring Setting (Phone Active) applies to this line when any line on the phone has a call in progress.

Note:
If you are using a language other than English for Display (Internal Caller ID) or Line Text Label text, make sure the correct character set (shown below) is selected. Text displays incorrectly if the wrong character set is selected. (English characters are included in all character sets.)

Character Set Western European (Latin 1)

Done Local intranet



Acronyms

Acronym	Definitions
AOC	Advice-of-charge. Information element is sent with connection setup information for incoming Euro-ISDN connections. The AOC IE is used for call charge calculation.
CCM	Cisco Unified CallManager
CFB	Call Forwarding Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CLIP	Calling Line (Number) Identification Presentation
CLIR	Calling Line (Number) Identification Restriction
CNIP	Calling Name Identification Presentation
CNIR	Calling Name Identification Restriction
COLP	Connected Line (Number) Identification Presentation
COLR	Connected Line (Number) Identification Restriction
CONP	Connected Name Identification Presentation
CONR	Connected Name Identification Restriction
CT	Call Transfer
MWI	Message Waiting Indicator
PSTN	Public Switched Telephone Network



Important Information

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.



Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International
BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on **the Cisco Web site at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2005 Cisco Systems, Inc. All rights reserved. CCSP, the Cisco Square Bridge logo, Follow Me Browsing, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Access Registrar, Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MeetingPlace, MGX, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StrataView Plus, SwitchProbe, TeleRouter, The Fastest Way to Increase Your Internet Quotient, TransPath, and VCO are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0501R)