Application Note

Siemens HiPath 4000 Release 1 using E1 ECMA QSIG to Cisco Unified CallManager 4.1

November 6, 2007 Revision 3

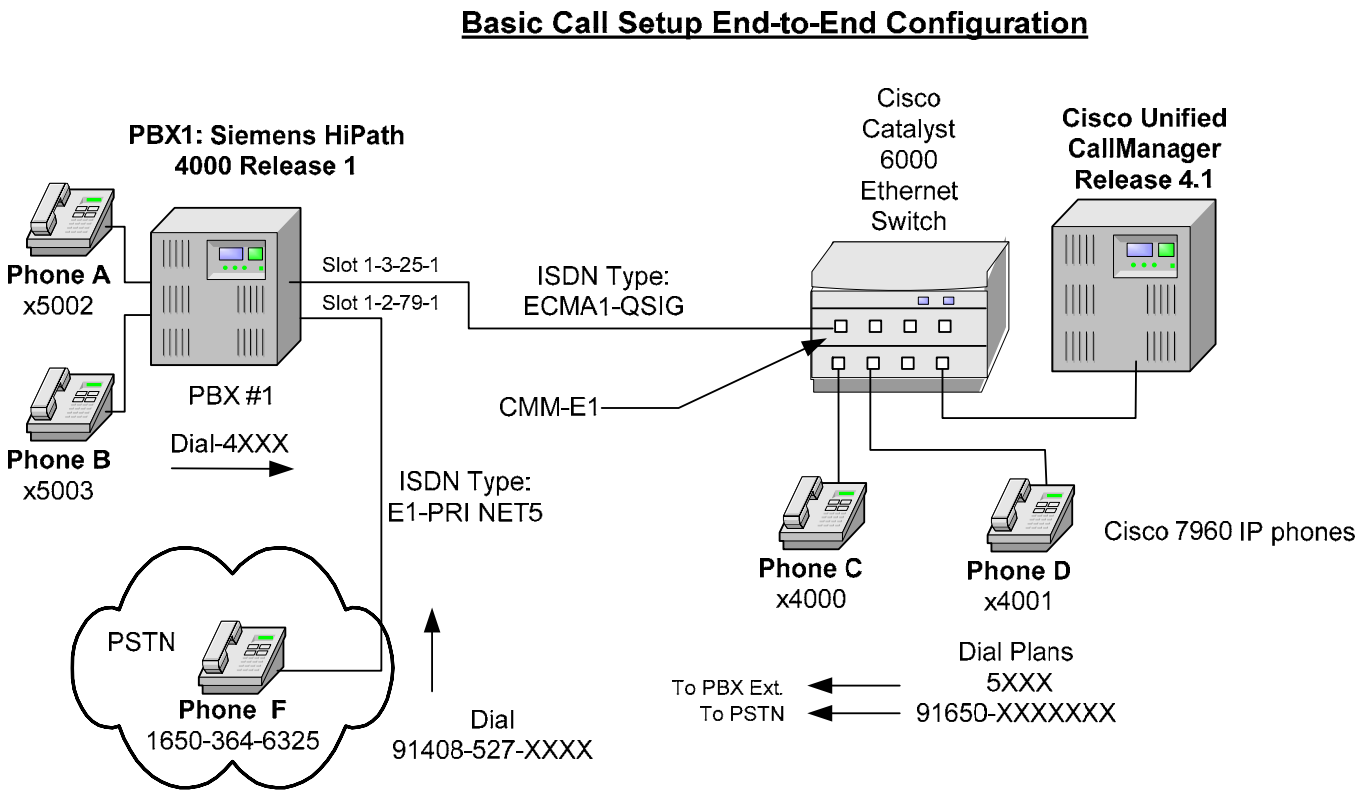
Table of Contents

Introduction

- This is an application note for connectivity of Siemens HiPath 4000 Release 1 PBX with Cisco Unified CallManager Release 4.1 via Cisco Communication Media Module CMM-E1 as MGCP gateway using ECMA1 QSIG protocol.
- The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco Unified CallManager connected to the PBX via CMM-E1 QSIG link as MGCP gateway.
- Connectivity is achieved by using the PRI ISO QSIG E1 protocol type on the MGCP gateway with Cisco Unified CallManager Service parameter QSIG variant of ECMA and ECMA1 switch type on the Siemens HiPath 4000 PBX.
- This Application Note uses the CMM-E1 voice gateway, however other Cisco voice gateways are also an option to use since Cisco Unified CallManager QSIG implementation does not depend on the physical interface.

Network Topology

Figure 1. Network Topology



Limitations

B-Channel Mapping

- Siemens HiPath 4000 PBX uses Timeslot channel numbering (1-15, 17-31) when QSIG protocol "ECMA1" is selected, therefore the Cisco CMM-E1 Gateway configuration for **Channel IE Type** field should be set to **Timeslot Number.**

Connected Name and Number Restrictions

- Siemens phone displayed dialed number and trunk name when CUCM sends Connected Name and Number as restricted.
- Connected Name of the Diverted to user is NOT Displayed on IP 7960 phone when the Siemens PBX diverts the call upon no reply to another local Siemens phone. The Siemens HiPath did not send Connected Name in this case. It was sending DivertingLegInformation3 APDUs with presentationAllowedIndicator set to false. This is a Siemens HiPath PBX issue since Connected Name was not sent by the PBX.

Additional Network Feature Path Replacement for Call Diversion

- Siemens HiPath 4000 PBX does not send Path Replacement proposal for Call Diversion by forward switching.

MWI

- Siemens HiPath 4000 PBX responded with “reject” Facility IE to the QSIG MWI (mwiActivate, mwiDeactivate) requests from Cisco Unified CallManager. This is a Siemens issue.

System Components

Hardware Requirements

- Cisco Hardware:
  - Cisco Catalyst 6000 switch with CMM-E1 Gateway
  - Cisco Unified CallManager Server
- Siemens HiPath 4000 PBX Hardware:
  - DIU-N2

Software Requirements

- PBX Software version 1
- Cisco Unified CallManager 4.1

Features

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
- Sending Alerting Name
- CT-Call Transfer (by join)
- CFU-Call Forwarding Unconditional (by join)
- CFB-Call Forwarding Busy (by join)
- CFNR-Call Forwarding No Reply (by join)
- CFU-Call Forwarding Unconditional (by Reroute)
- CFB-Call Forwarding Busy (by Reroute)
- CFNR-Call Forwarding No Reply (by Reroute)
- CCBS-Call Completion to Busy Subscriber
- CCNR-Call Completion No Reply

- ANF-PR-Additional Network Feature Path Replacement (for Call Transfer by join)
- ANF-PR-Additional Network Feature Path Replacement (for Call Diversion by forward switching)
- ANF-PR-Additional Network Feature Path Replacement (for Trombone connection)

Features Not Supported

- MWI- Message Waiting Indication (lamp ON, lamp OFF)

Configuration

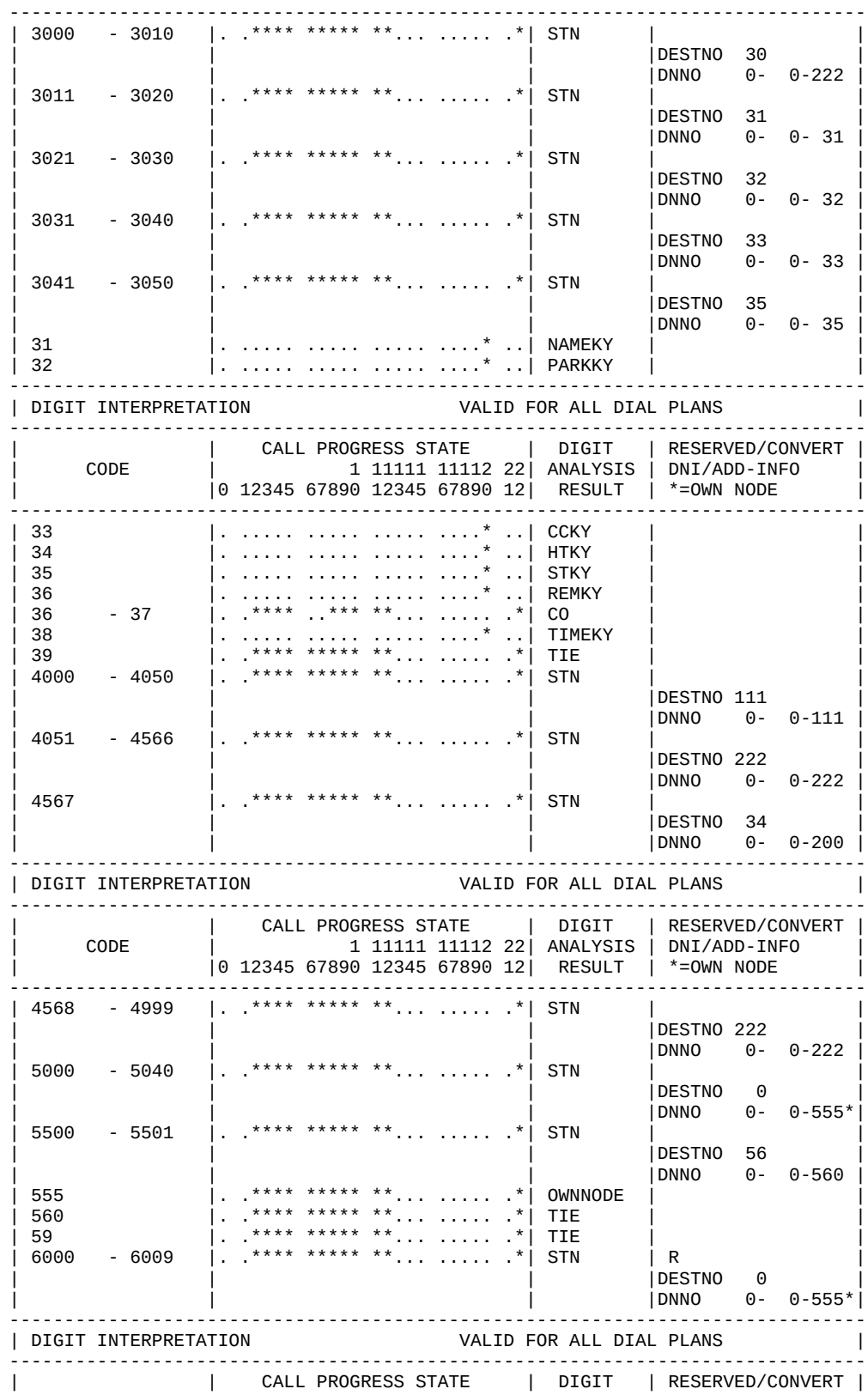
Configuring the Siemens HiPath 4000 PBX

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.

Configuration Menus and Commands

DPLN

```
  <dis-wabe:gen;
DIS-WABE:GEN;
H500:  AMO WABE  STARTED
  ------------------------------------------------------------------------------
  | DIGIT INTERPRETATION                  VALID FOR ALL DIAL PLANS             |
  ------------------------------------------------------------------------------
  |                 |    CALL PROGRESS STATE     |  DIGIT    | RESERVED/CONVERT |
  |      CODE       |            1 11111 11112 22| ANALYSIS  | DNI/ADD-INFO     |
  |                 |0 12345 67890 12345 67890 12|  RESULT   | *=OWN NODE       |
  ------------------------------------------------------------------------------
  | 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             |
  ------------------------------------------------------------------------------
  |                 |    CALL PROGRESS STATE     |  DIGIT    | RESERVED/CONVERT |
  |      CODE       |            1 11111 11112 22| ANALYSIS  | DNI/ADD-INFO     |
  |                 |0 12345 67890 12345 67890 12|  RESULT   | *=OWN NODE       |
```



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

```
|      CODE       |            1 11111 11112 22| ANALYSIS | DNI/ADD-INFO     |
|                 |0 12345 67890 12345 67890 12|  RESULT  | *=OWN NODE       |
-------------------------------------------------------------------------------
| 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             |
-------------------------------------------------------------------------------
|                 |    CALL PROGRESS STATE     |  DIGIT   | RESERVED/CONVERT |
|      CODE       |            1 11111 11112 22| ANALYSIS | DNI/ADD-INFO     |
|                 |0 12345 67890 12345 67890 12|  RESULT  | *=OWN NODE       |
-------------------------------------------------------------------------------
| *18             |. ....* ..... ..... ..... ..| ACOSX    |                  |
| *19             |. *.... ..... ..... ..... ..| KNOVR    |                  |
| *20             |. ....* ..... ..... ..... ..| ADND     |                  |
| *25             |. ....* ..... ..... ..... ..| FWDTERM  |                  |
| *29             |. ....* ..... ....* ..... ..| AFFWDVCE |                  |
-------------------------------------------------------------------------------

AMO-WABE -111       DIALLING PLANS, FEATURE ACCESS CODES
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;
```

Access code for 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-X                                      |
   |              | 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
-----+-----------+---------+---+---+-+------------+-----+--------+------------+
     | ASSIGNED  | MODULE  |FCT|HWY| | INSERTED   |     |        | MODULE     |
 PEN | MODULE    | TYPE    |ID |BDL| | MODULE     |STATE| HW-INFO| 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
-----+-----------+---------+---+---+-+------------+-----+--------+------------+
     | ASSIGNED  | MODULE  |FCT|HWY| | INSERTED   |     |        | 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

```
<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;
```

For Call Forwarding by Reroute need to add FNAN and FWDN to COT22

```
<CHANGE-COT:COTNO=22,COTTYPE=COTADD,PAR=FNAN&FWDN;
CHANGE-COT:COTNO=22,COTTYPE=COTADD,PAR=FNAN&FWDN;
H500:  AMO COT   STARTED
H07: CHANGED COT STILL LINKED WITH FOLLOWING TRUNKS:
   COT   TRUNK         BCGR  DEVICE
   ---------------------------------
    22   1- 3- 55-  0   1    CDGCONN
         1- 3- 55-  1   1    CDGCONN
         1- 3- 25-  0   1    S2CONN
         1- 3- 25-  1   1    S2CONN
   ---------------------------------
H06: COT 22 CHANGED

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

<DISPLAY-COT:COTNO=22;
DISPLAY-COT:COTNO=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
        NETWORKWIDE CALL FORWARDING PERMITTED                        FWDN
        NETWORKWIDE FORWARDING NO-ANSWER                             FNAN
        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      |      NOCO     |         TA      |
   |      |     TNOTCR      |     NOTIE     |     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                            |     |
   |  V |         1         2         3         4         5         6  |     |
   |    |12345678901234567890123456789012345678901234567890123456789012|COPIN|
   |    |>SERVICE INFORMATION                                         | NUM |
   +----+----+----|----+----|----+----|----+----|----+----|----+----|----+-----+
   |   1|X...........................................................|  0  |
   |    |>LCR ATTENDANT FOR VOICE                                     |     |
   +----+-------------------------------------------------------------+-----+

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

Trunk Group Access Code, BUEND

```
<DISPLAY-BUEND:TGRP=26,FORMAT=L;
DISPLAY-BUEND:TGRP=26,FORMAT=L;
H500:  AMO BUEND STARTED

+------------------------------ FORMAT = L ----------------------------------+
|  TGRP NUMBER :    26   TGRP NAME    : PRI ECMA 3         MAXIMUM NO.   :   30 |
|                        CHARCON     : NEUTRAL                               |
|  SUBGROUP NO.:     9   DEVICE TYPE : S2CONN             TRACENO       :    0 |
|  RESERVED    :     N   SEARCH MODE : CIRCULAR           ACD THRESHOLD :    * |
|  NUMBER OF ASSOCIATED ROUTES       : 6                  PRIORITY      :    2 |
|  TDDRFLAG    :    ON  TDDRTHRESHOLD: 3                 SOURCEGROUPIDX :    1 |
|  GDTRRULE    :     0      ACDPMGRP : 0                                       |
|  THE FOLLOWING TRUNKS (LTG-LTU-SLOT-CCT) HAVE BEEN ALLOCATED:                |
+------------------------------------------------------------------------------+
|   1- 3- 25-0           1 |  1- 3- 25-0           2 |  1- 3- 25-0           3 |
|   1- 3- 25-0           4 |  1- 3- 25-0           5 |  1- 3- 25-0           6 |
```

```
|   1- 3- 25-0           7 |  1- 3- 25-0           8 |  1- 3- 25-0           9 |
|   1- 3- 25-0          10 |  1- 3- 25-0          11 |  1- 3- 25-0          12 |
|   1- 3- 25-0          13 |  1- 3- 25-0          14 |  1- 3- 25-0          15 |
|   1- 3- 25-0          16 |  1- 3- 25-0          17 |  1- 3- 25-0          18 |
|   1- 3- 25-0          19 |  1- 3- 25-0          20 |  1- 3- 25-0          21 |
|   1- 3- 25-0          22 |  1- 3- 25-0          23 |  1- 3- 25-0          24 |
|   1- 3- 25-0          25 |  1- 3- 25-0          26 |  1- 3- 25-0          27 |
|   1- 3- 25-0          28 |  1- 3- 25-0          29 |  1- 3- 25-0          30 |
+-------------------------------------------------------------------------------+

AMO-BUEND-111       TRUNK GROUP
DISPLAY COMPLETED;


<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

For 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  = ECMA1         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   =                                        CCHDL    =              |
  | UUSCCX   = 16            UUSCCY   = 8             FNIDX    = 1            |
  | CLASSMRK = EC     & G711   & G729OPT              SRCGRP   =              |
  | 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;
```

For 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  = ECMA1         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   =                                        CCHDL    =             |
  | UUSCCX   = 16            UUSCCY   = 8             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;
```

Trunk Configuration to Hicom node, TDCSU

```
<DISPLAY-TDCSU:PEN1=1-3-25-0;
DISPLAY-TDCSU:PEN1=1-3-25-0;
H500:  AMO TDCSU STARTED
  +------------------------ DIGITAL TRUNK (FORMAT=L) -------------------------+
  | DEV      = S2CONN        PEN      =  1-03-025-0   TGRP     = 26          |
  |-------------------------------------------------------------------------|
  | PROTVAR  = ECMA1         INS      = Y             SRCHMODE = CIR         |
  | COTNO    = 22            COPNO    = 21            DPLN     = 0           |
  | ITR      = 1             COS      = 32            LCOSV    = 1           |
  | LCOSD    = 1             CCT      = PRI ECMA 3    DESTNO   = 222         |
  | 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      = 222         |
  | ALARMNO  = 0             FIDX     = 1             CARRIER  = 1           |
  | ZONE     = EMPTY         COTX     = 22            FWDX     = 10          |
  | DOMTYPE  =               DOMAINNO =               TPROFNO  =             |
  | INIGHT   =                                        CCHDL    =             |
  | UUSCCX   = 16            UUSCCY   = 8             FNIDX    = 1           |
  | CLASSMRK = EC     & G711   & G729OPT              SRCGRP   =             |
  | 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;
```

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   =                                        CCHDL    =             |
  | UUSCCX   = 16            UUSCCY   = 8             FNIDX    = 1           |
  | CLASSMRK = EC     & G711   & G729OPT              SRCGRP   =             |
  | 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;
```

Reference Clock Configuration, REFTA

For 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
   +-------------------------------------------------------------------------+
   |          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|SRCGRP|
```

```
   |              |         |          |   |      |      |      |BUT  |      |
   |              |         |          |   |      |      |      |ASYN.|      |
   +--------------+---------+----------+---+------+------+------+-----+------+
   |  1- 3- 25- 1 | DIU-N2  | S2CONN   |  0|     0|    N |      |  N  |     1|
   +--------------+---------+----------+---+------+------+------+-----+------+

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

For 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
   +-------------------------------------------------------------------------+
   |           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|SRCGRP|
   |              |         |          |   |      |      |      |BUT  |      |
   |              |         |          |   |      |      |      |ASYN.|      |
   +--------------+---------+----------+---+------+------+------+-----+------+
   |  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
   +-------------------------------------------------------------------------+
   | LROUTE = 1     LDPLN      NAME = ROPTCCM                 SERVICE =  ALL |
   | TYPE = LCR                                  DNNO OF ROUTE  =        111 |
   | SERVICE INFO =                                                          |
   +-------+-----+-----+-----+------+----------+------------+----------+------+
   |       |     |     |     |      | SCHEDULE | CARRIER    |          |      |
   | LRTEL | LVAL| TGRP|  ODR| LAUTH| ABCDEFGH |       ZONE |    LATTR | LDSRT|
   +-------+-----+-----+-----+------+----------+------------+----------+------+
   |     1 |    1|   27|  111|  1   | ******** | 1    EMPTY |     NONE |      |
   |       | DNNO =        111                                               |
   +-------+-----+-----+-----+------+----------+------------+----------+------+

AMO-LDAT -111       LCR-DIRECTIONS
DISPLAY COMPLETED;

<DISPLAY-LDAT:TYPE=LCR,LROUTE=26;
DISPLAY-LDAT:TYPE=LCR,LROUTE=26;
H500:  AMO LDAT  STARTED
   +-------------------------------------------------------------------------+
   | LROUTE = 26               NAME = PRI 3 ECMA1              SERVICE =  ALL |
   | TYPE = LCR                                  DNNO OF ROUTE  =        111 |
   | SERVICE INFO =                                                          |
   +-------+-----+-----+-----+------+----------+------------+----------+------+
   |       |     |     |     |      | SCHEDULE | CARRIER    |          |      |
   | LRTEL | LVAL| TGRP|  ODR| LAUTH| ABCDEFGH |       ZONE |    LATTR | LDSRT|
   +-------+-----+-----+-----+------+----------+------------+----------+------+
   |     1 |    1|   26|   15|  3   | ******** | 1    EMPTY |     NONE |      |
   +-------+-----+-----+-----+------+----------+------------+----------+------+

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

```
  <DISPLAY-LDAT:TYPE=LCR,LROUTE=27;
DISPLAY-LDAT:TYPE=LCR,LROUTE=27;
H500:  AMO LDAT  STARTED
   +-------------------------------------------------------------------------+
   | LROUTE = 27    LDPLN      NAME = PRI 4 ECMA1              SERVICE =  ALL |
   | TYPE = LCR                                    DNNO OF ROUTE  =        111 |
   | SERVICE INFO =                                                          |
   +-------+-----+-----+-----+------+----------+------------+----------+------+
   |       |     |     |     |      | SCHEDULE | CARRIER    |          |      |
   | LRTEL | LVAL| TGRP|  ODR| LAUTH| ABCDEFGH |       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
   +-------------------------------------------------------------------------+
   | LROUTE = 165   LDPLN      NAME = PSTN 91650               SERVICE =  ALL |
   | TYPE = LCR                                    DNNO OF ROUTE  =        89  |
   | SERVICE INFO =                                                          |
   +-------+-----+-----+-----+------+----------+------------+----------+------+
   |       |     |     |     |      | SCHEDULE | CARRIER    |          |      |
   | LRTEL | LVAL| TGRP|  ODR| LAUTH| ABCDEFGH |       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       CONFTONE = 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=26;
DISPLAY-RICHT:MODE=LRTE,LRTE=26;
H500:  AMO RICHT STARTED
+-----------------------------------------------------------------+
| LRTE = 26     NAME = PRI 3 ECMA1      (NEUTRAL)  LSVC = ALL     |
| DNNO =       111 PDNNO =       0                              |
| ROUTOPT = YES    REROUT = YES   PLB = NO     FWDBL = NO         |
| DTMFCNV = WITHOUT DTMFDSP = WITHOUT DTMFTEXT =                  |
| DTMFPULS =       BUGS = LIN  ROUTATT = NO       MAINGRP =   14  |
| EMCYRTT = NO       CONFTONE = NO   RERINGRP = NO   RTENO =   14 |
| INFO =                                                          |
```

```
| NOPRCFWD = NO                                                        |
+----------------------------------------------------------------------+
| TGRP =  26  LDAT  PRI ECMA 3         (NEUTRAL)  SUBGROUP =    9 |
+----------------------------------------------------------------------+

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       CONFTONE = 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       CONFTONE = 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:

In order to enable In-band DTMF signaling on digital stations for Voicemail applications, the station configuration has to be changed so that the parameter **DTMFCTRD=Y**.

Name and Number Restrictions:

To use Name and Number Restrictions, the station configuration should be changed so that the parameter **SSTNO=Y**, (Secret Station Number must be set to Yes).

```
  <dis-sbcsu:5002;
DIS-SBCSU:5002;
H500:  AMO SBCSU STARTED

 ---------------------------- USER DATA ---------------------------------------
  STNO    =5002      OPT     =OPTI      COS1    =2         DPLN    =1
  MAINO   =5002      CONN    =DIR       COS2    =2         ITR     =1
  PEN     = 1- 3- 31-  2                LCOSV1  =6         COSX    =0
  INS     =Y         ASYNCT  =500       LCOSV2  =6
                     PERMACT =          LCOSD1  =6
  SSTNO   =Y         EXTBUS  =          LCOSD2  =6         CBKBMAX =5
  TRACE   =N                                               RCBKB   =N
  ALARMNO =0         DFSVCANA=          SPDI    =0         RCBKNA  =N
  HMUSIC  =0         FLASH   =          SPDC1   =          CBKNAMB =Y
  PMIDX   =0                            SPDC2   =
                                                           COMGRP  =0
  SECR    =N         DIGNODIS=N         DSSTNA  =N
  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                            IPPASSW =
```

```
  DTMFCTRD=Y          BASICSVC=
  DVCFIG  =OPTIP500   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
```

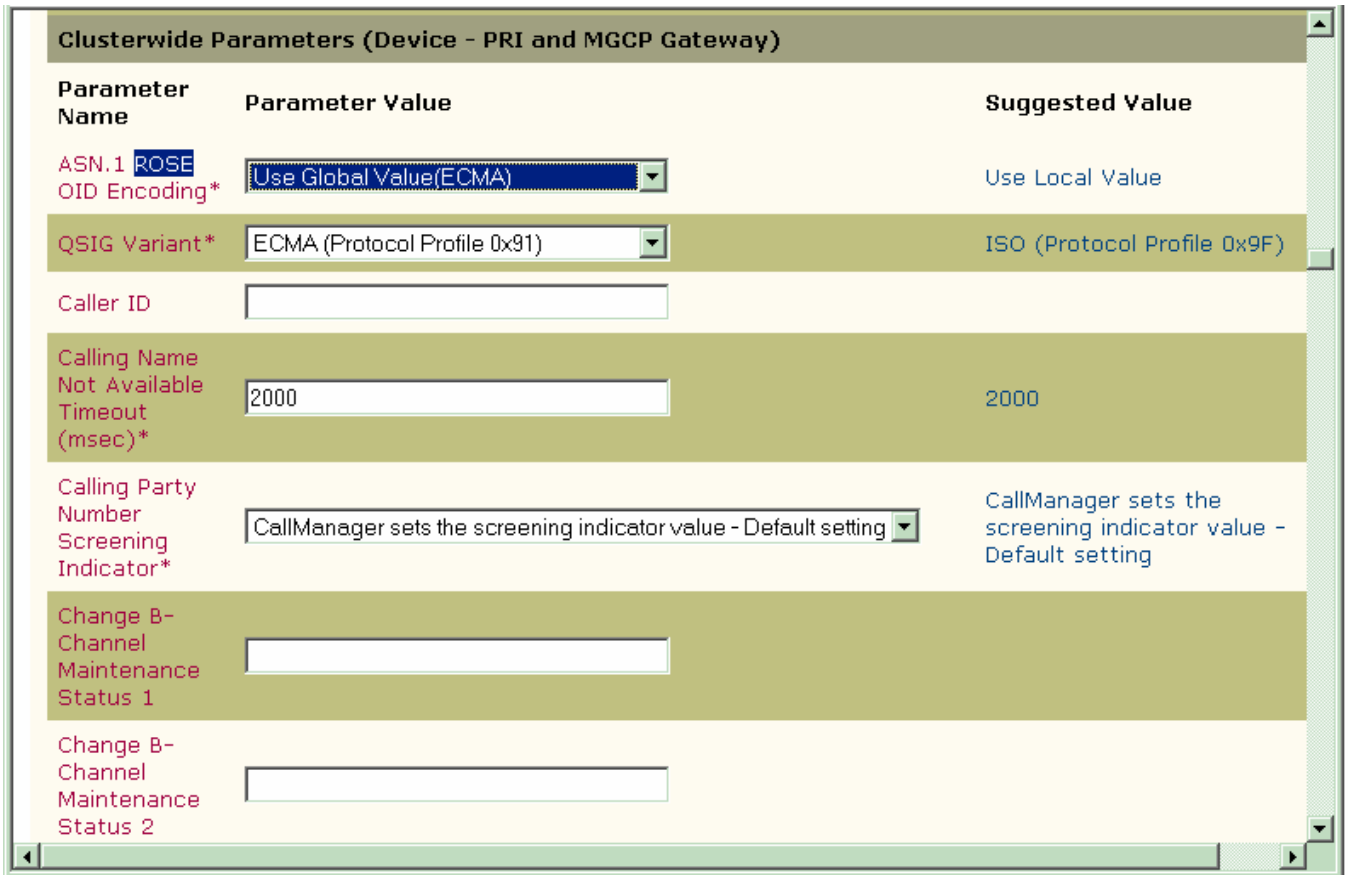
Configure Digital Station's Class of Service for Mailbox (MWI) application

```
<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;

<DISPLAY-PERSI:TYPE=NAME,STNO=5002;
DISPLAY-PERSI:TYPE=NAME,STNO=5002;
H500:  AMO PERSI STARTED
+--------+----------------------------------------+--------------------------+
| STNO   |    CHRISTIAN AND SURNAME        CHARCON |   ORGANIZATIONAL UNIT    |
+--------+----------------------------------------+--------------------------+
|        |                                        |                          |
```

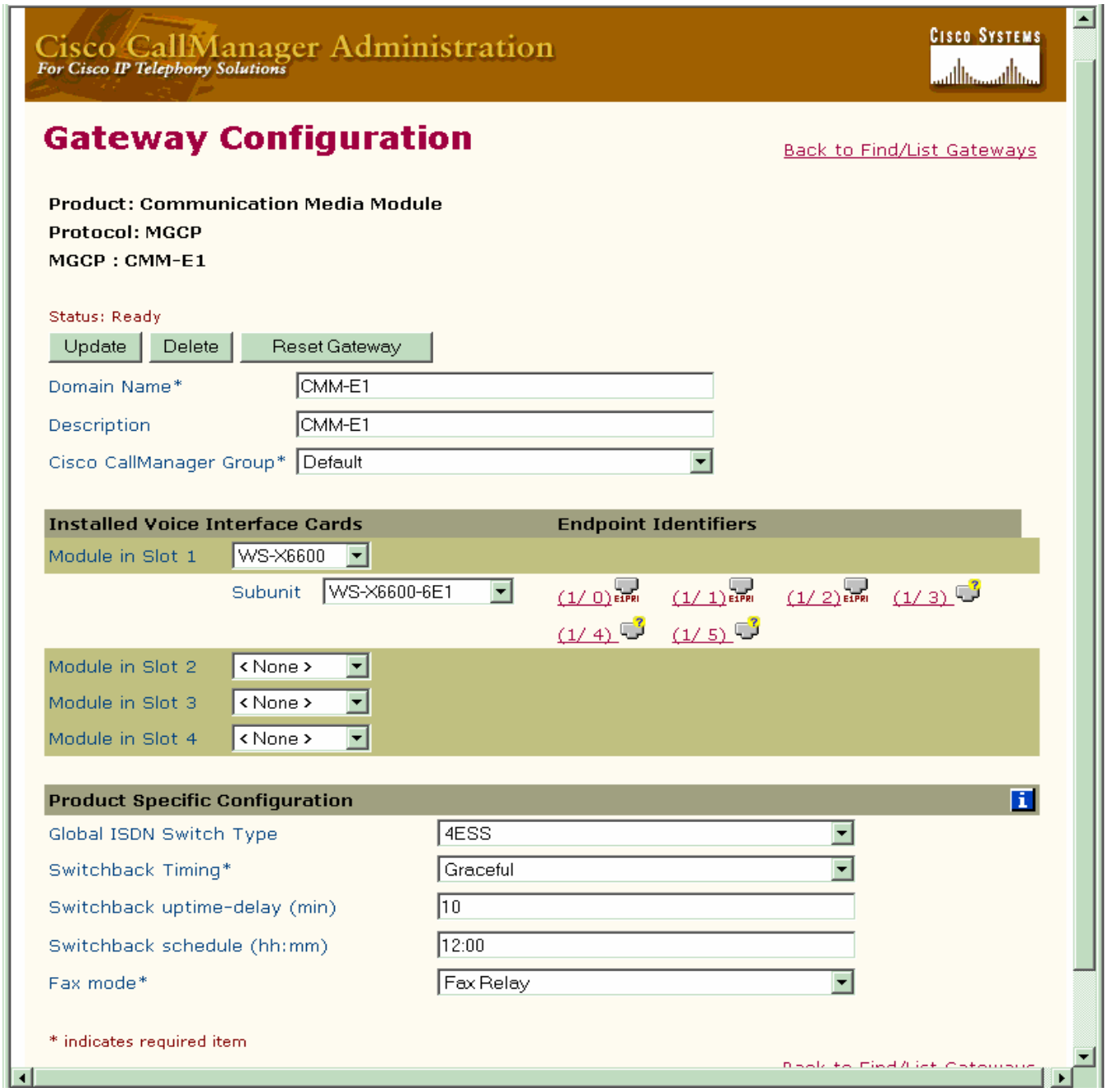
```
| 5002   | HIPATH DT2*                              |                            |
|        |                                          |                            |
+--------+------------------------------------------+----------------------------+

AMO-PERSI-111       PERSONAL IDENTIFICATION DATA
DISPLAY COMPLETED;
```

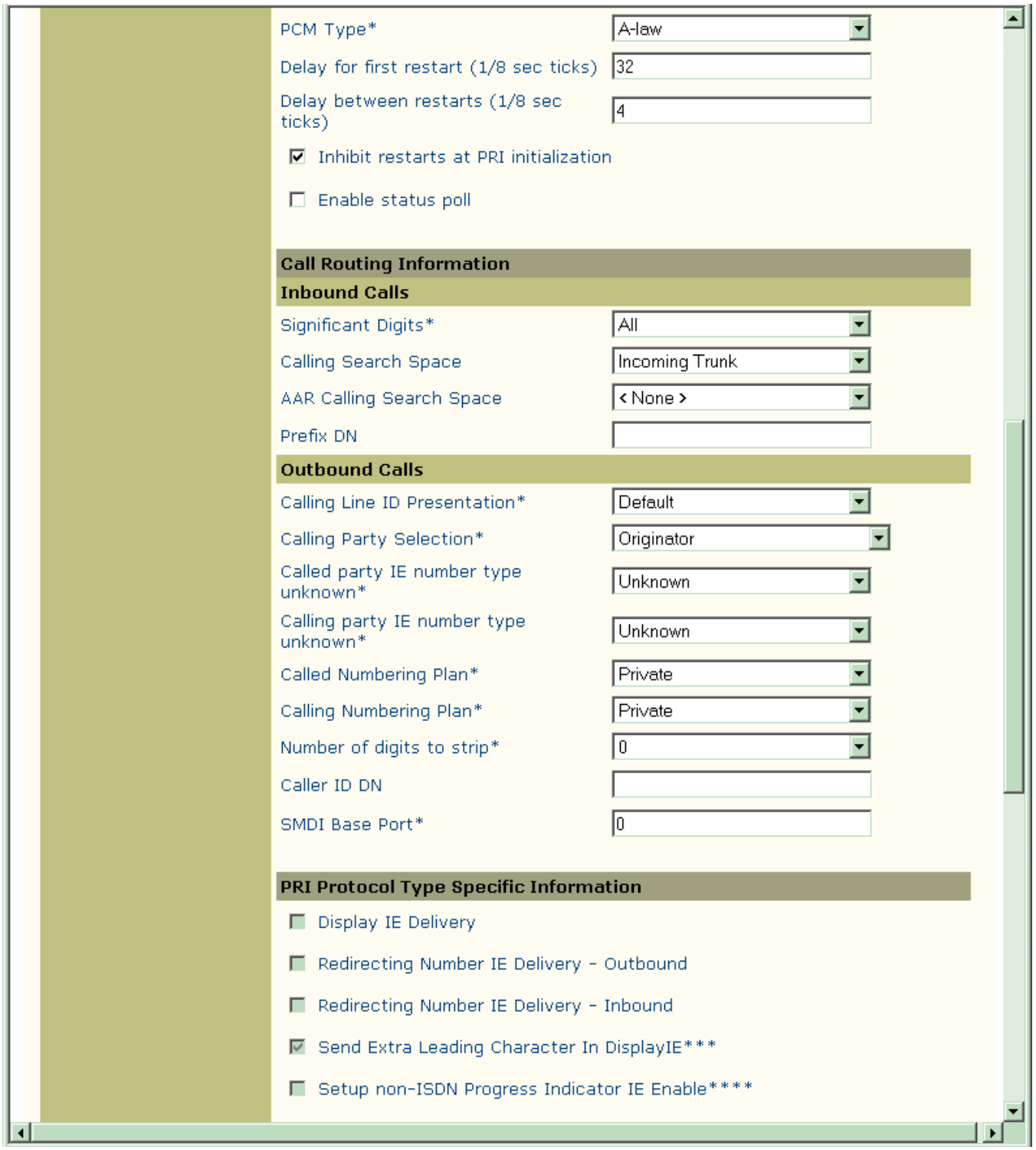
Configuring the Cisco Unified CallManager

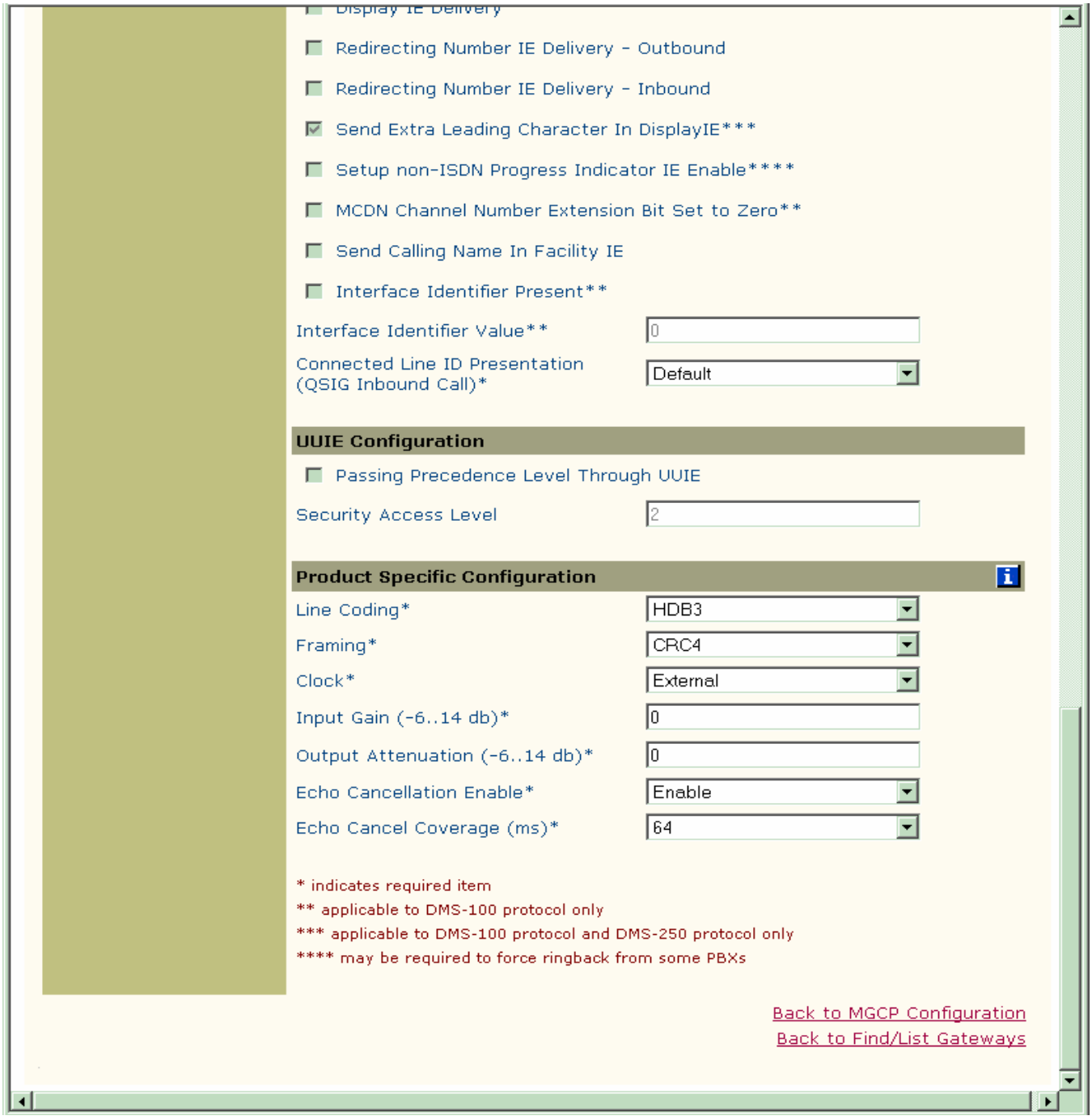
ECMA Protocol Service Parameter



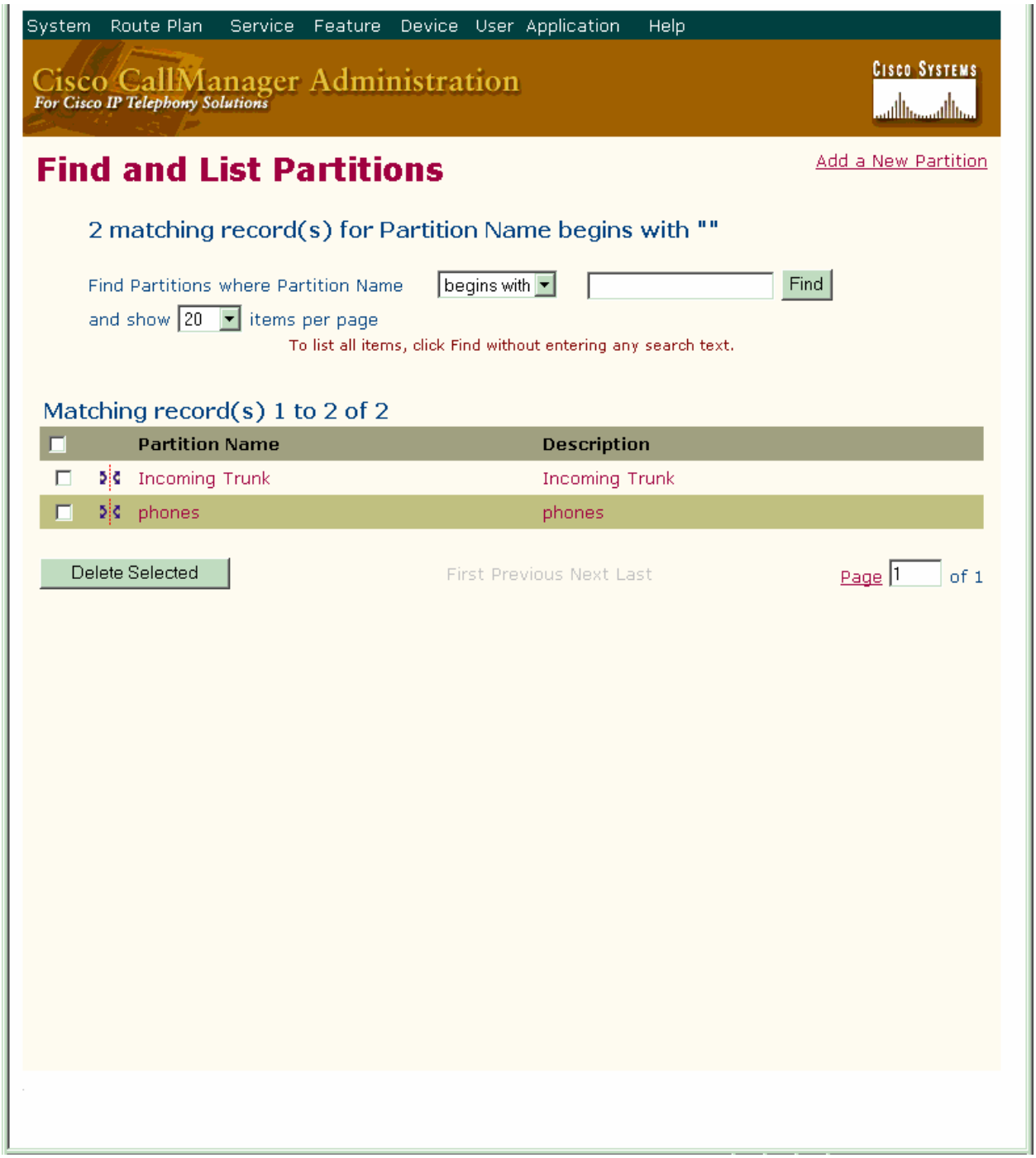
CMM-E1 Gateway Configuration



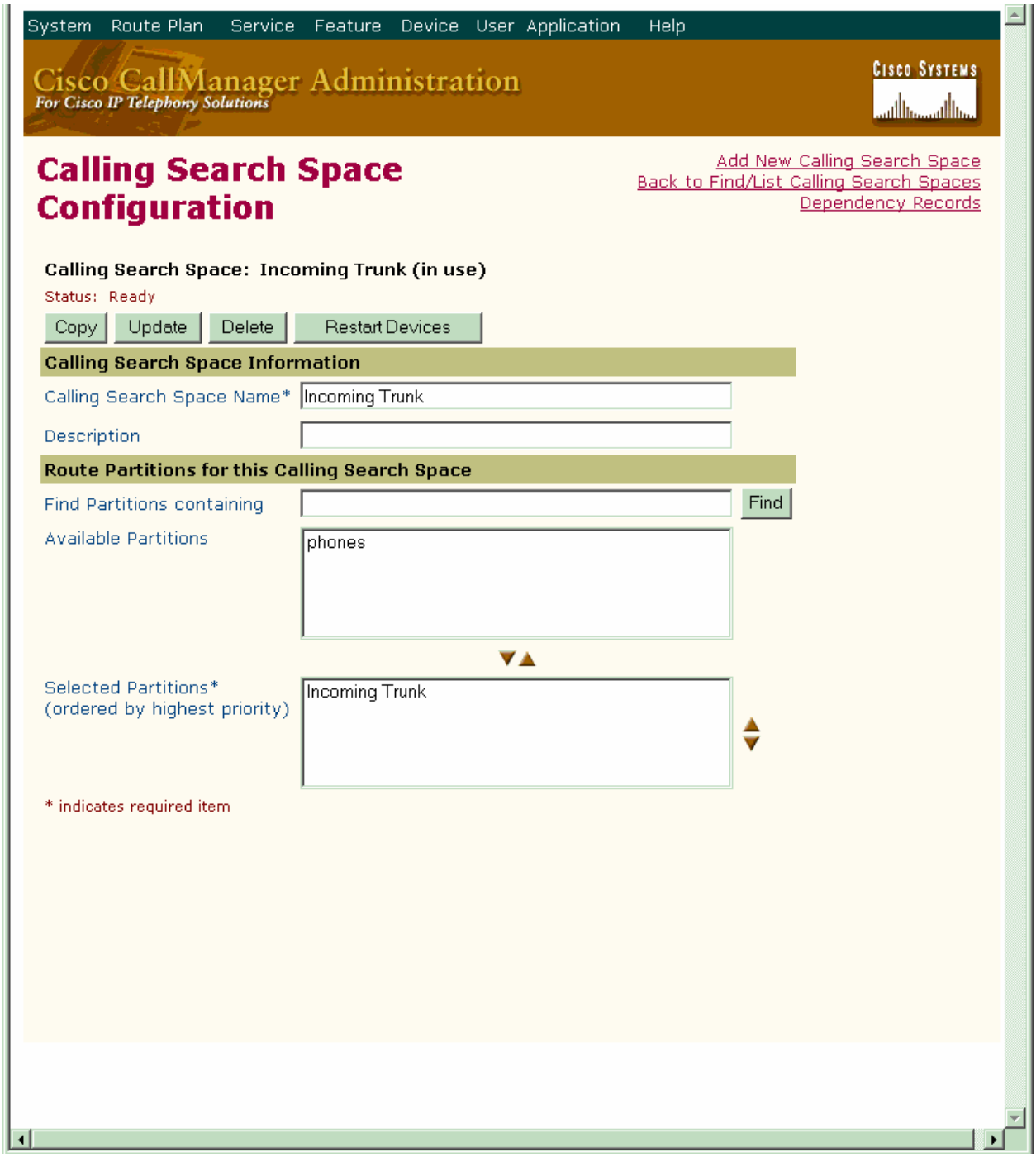


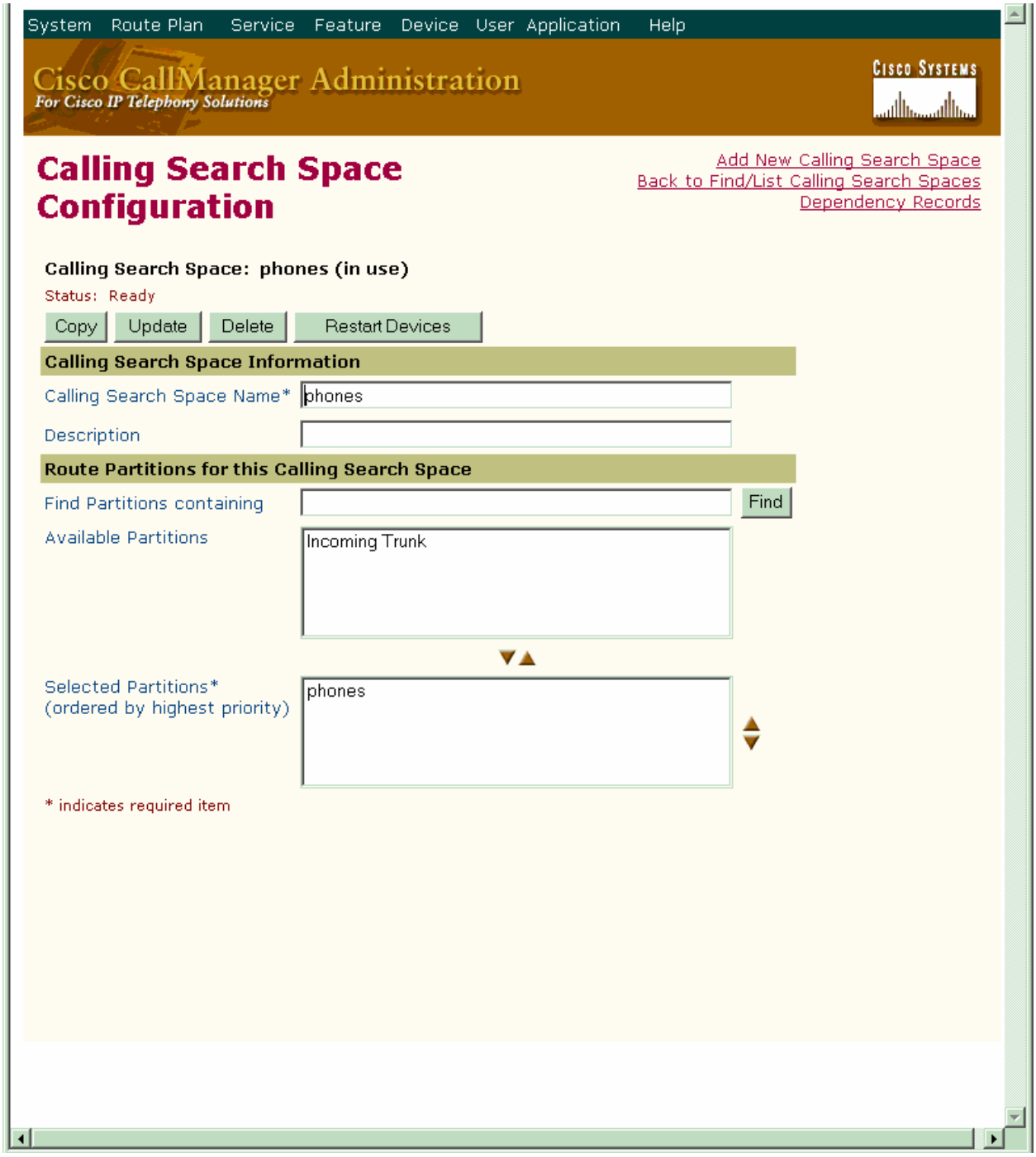


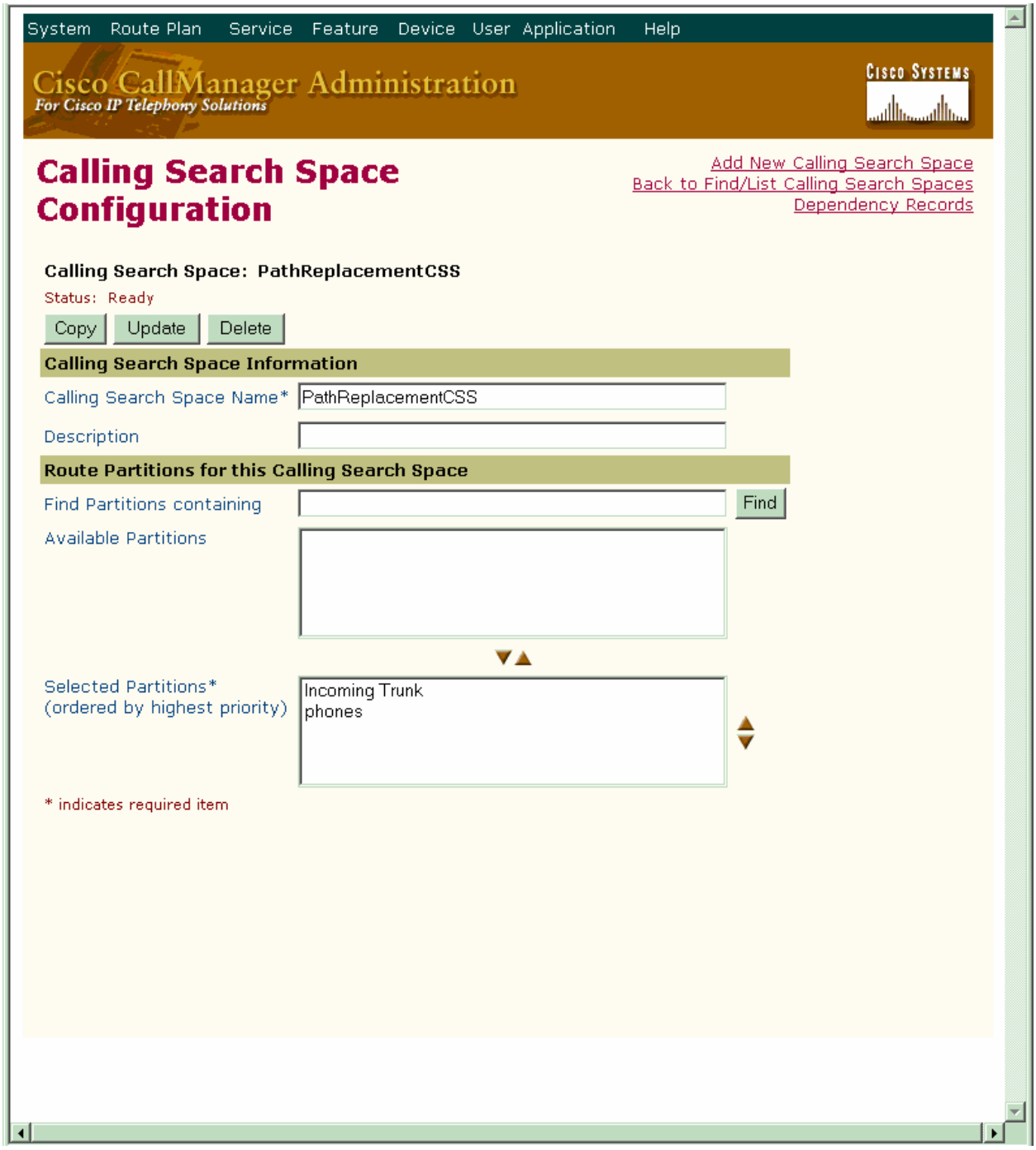
Partitions Configuration



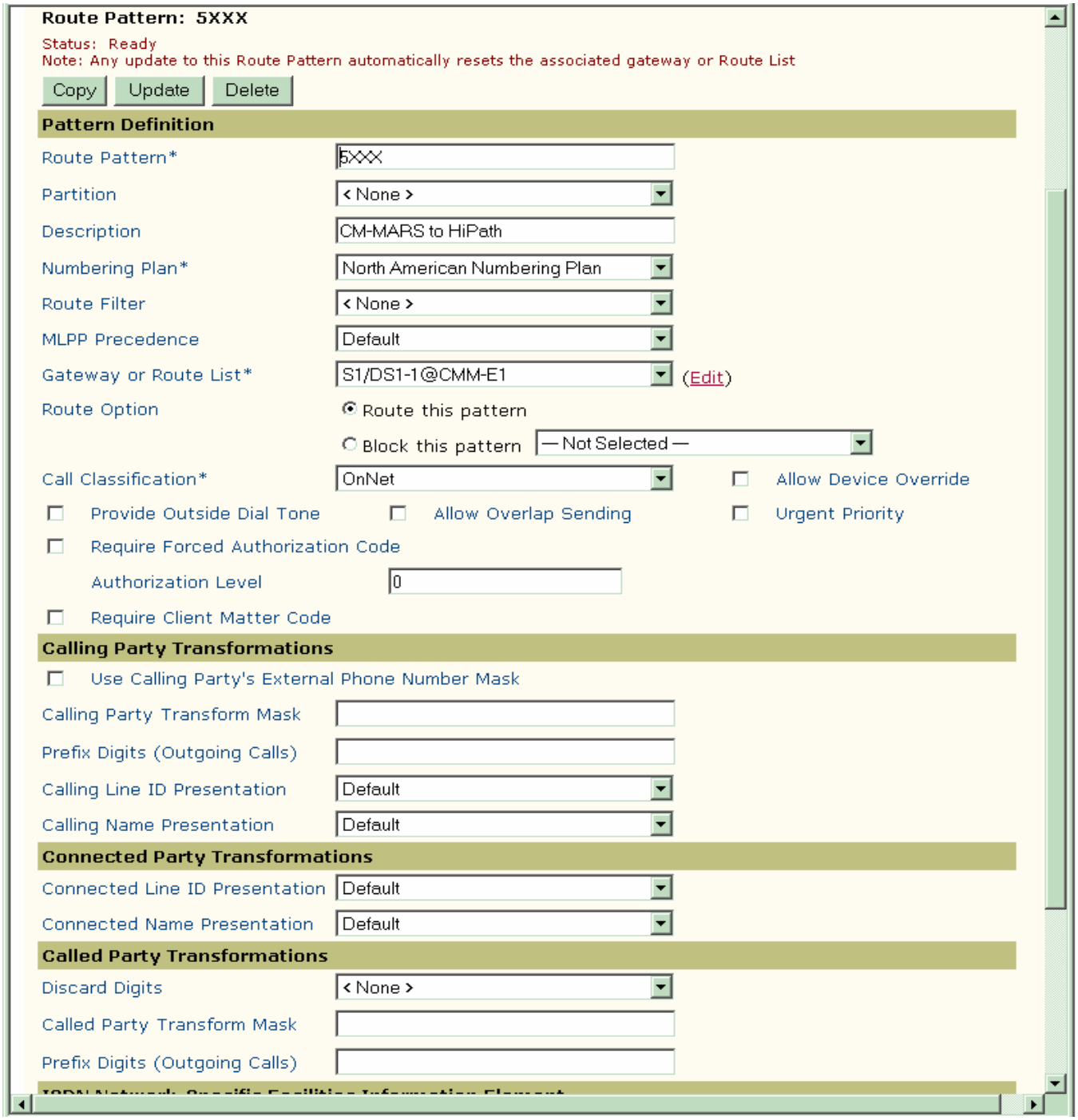
Calling Search Space Configuration

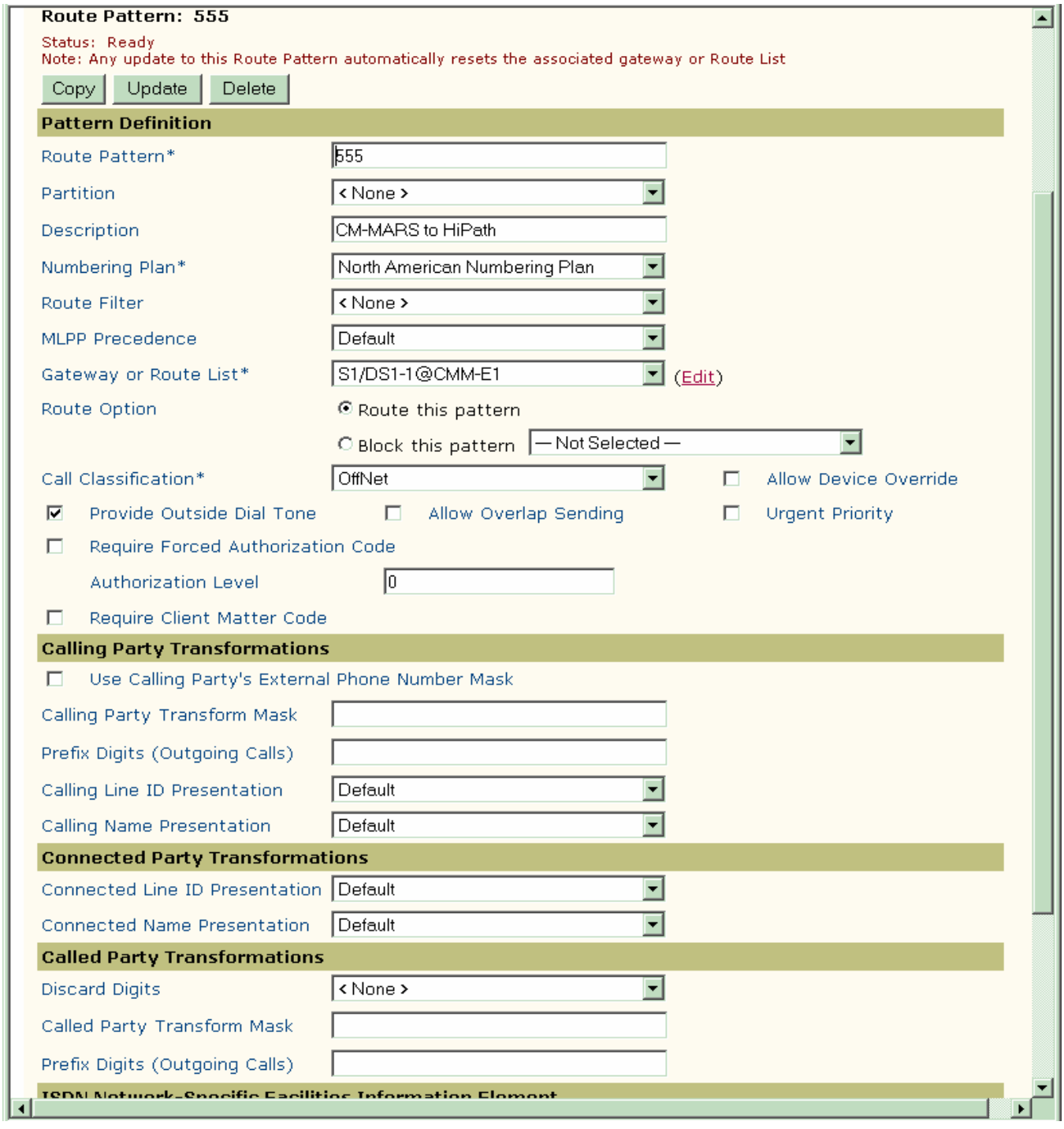


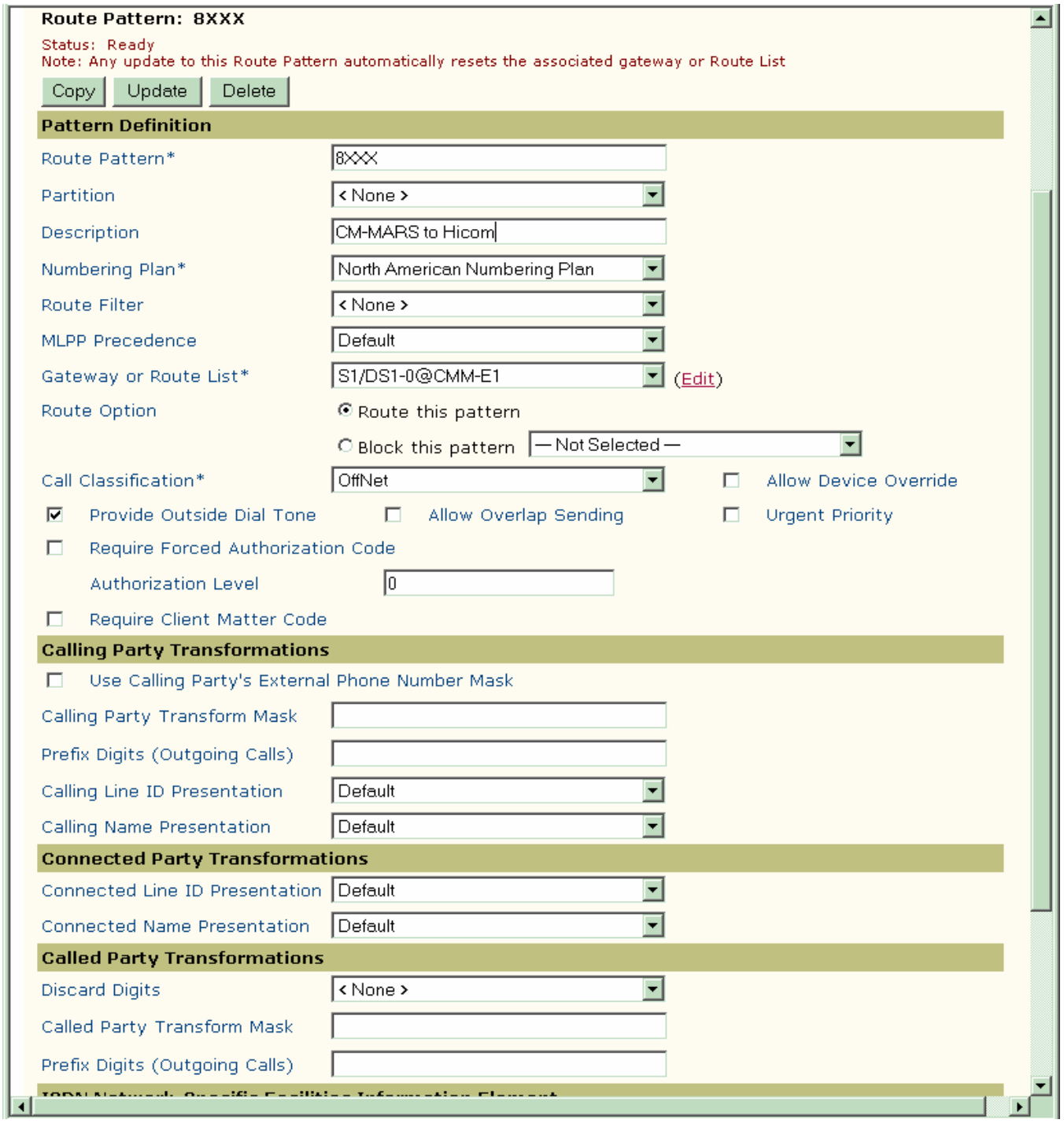


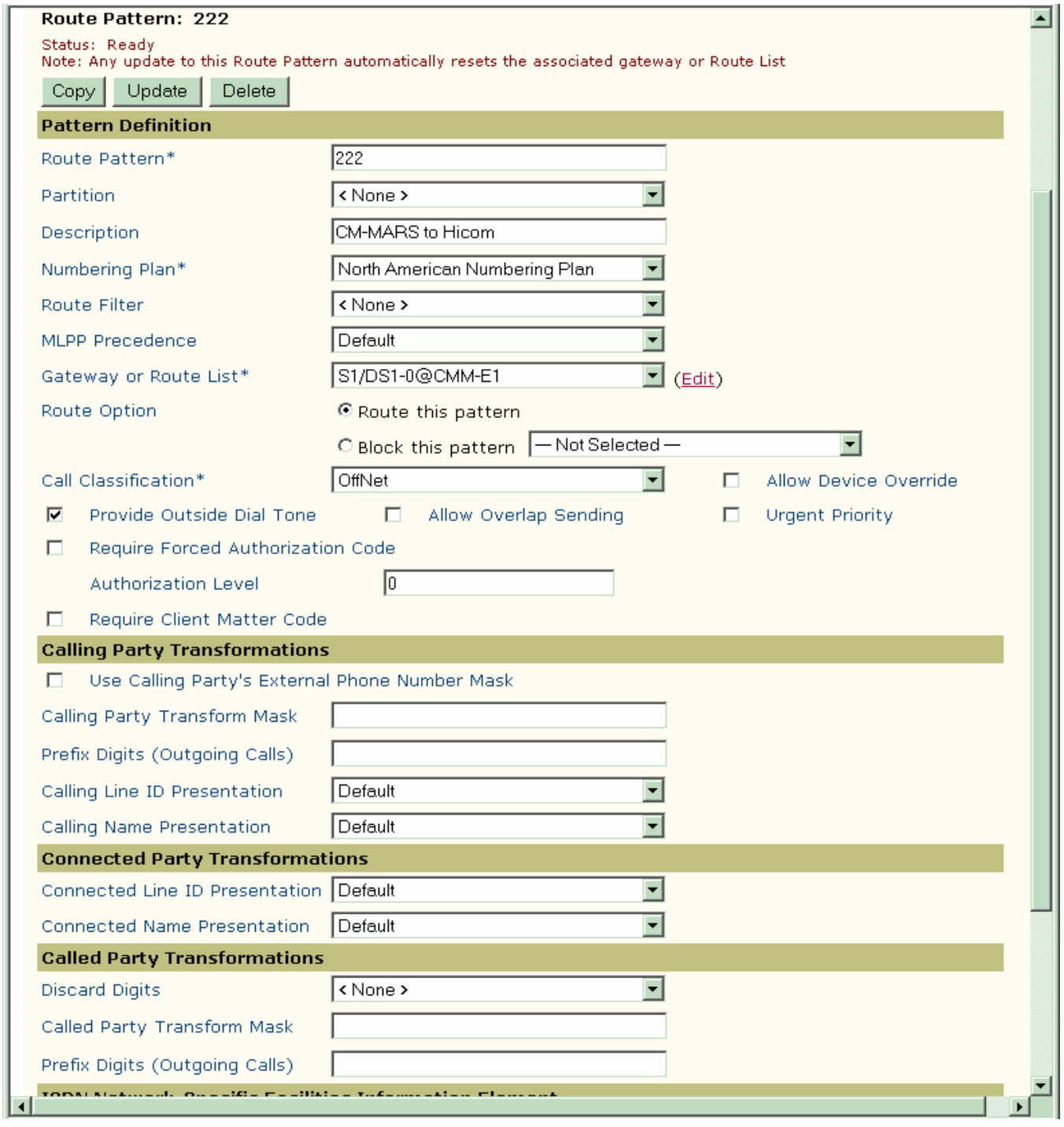


Enbloc Route Pattern Configuration

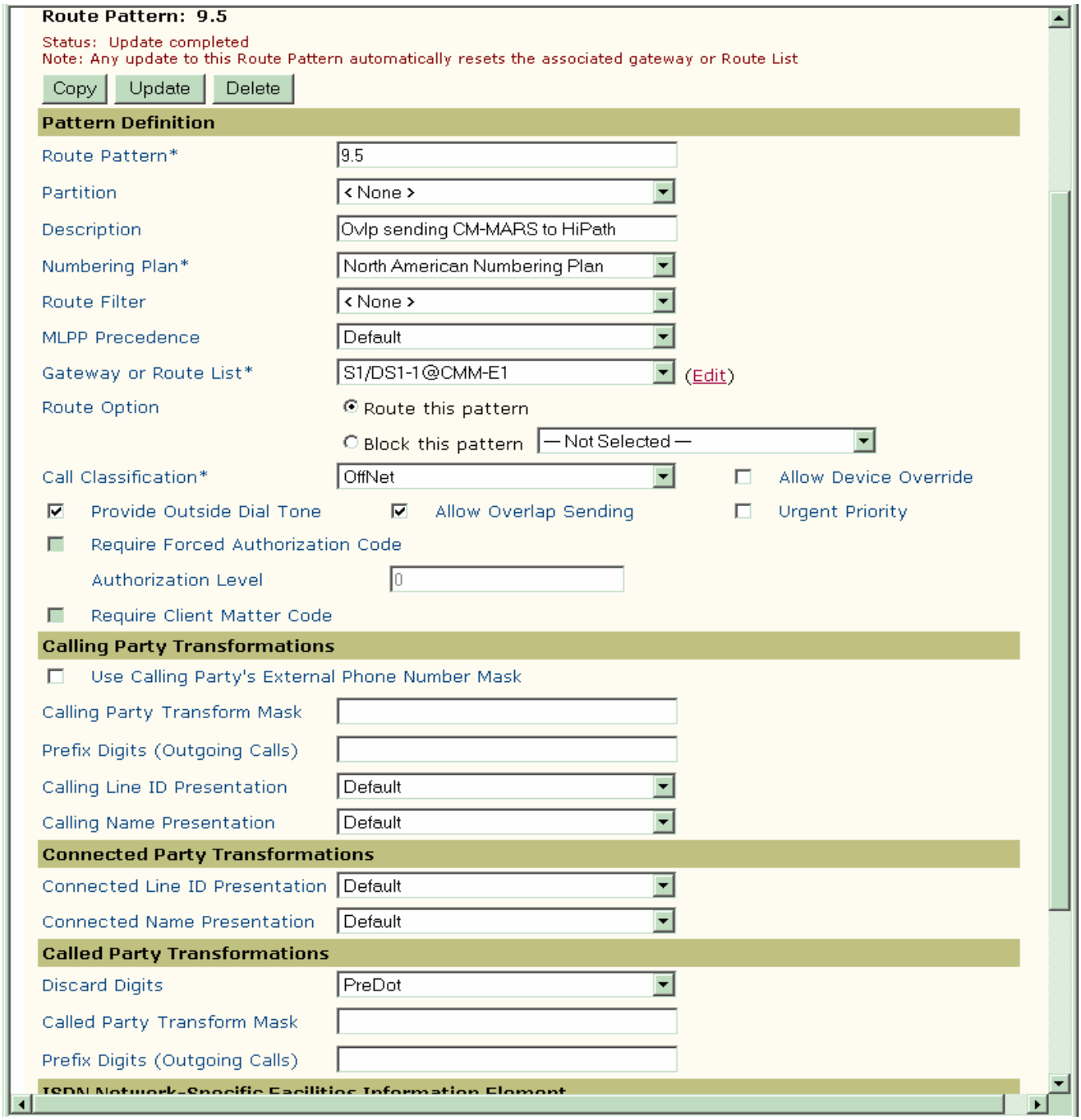




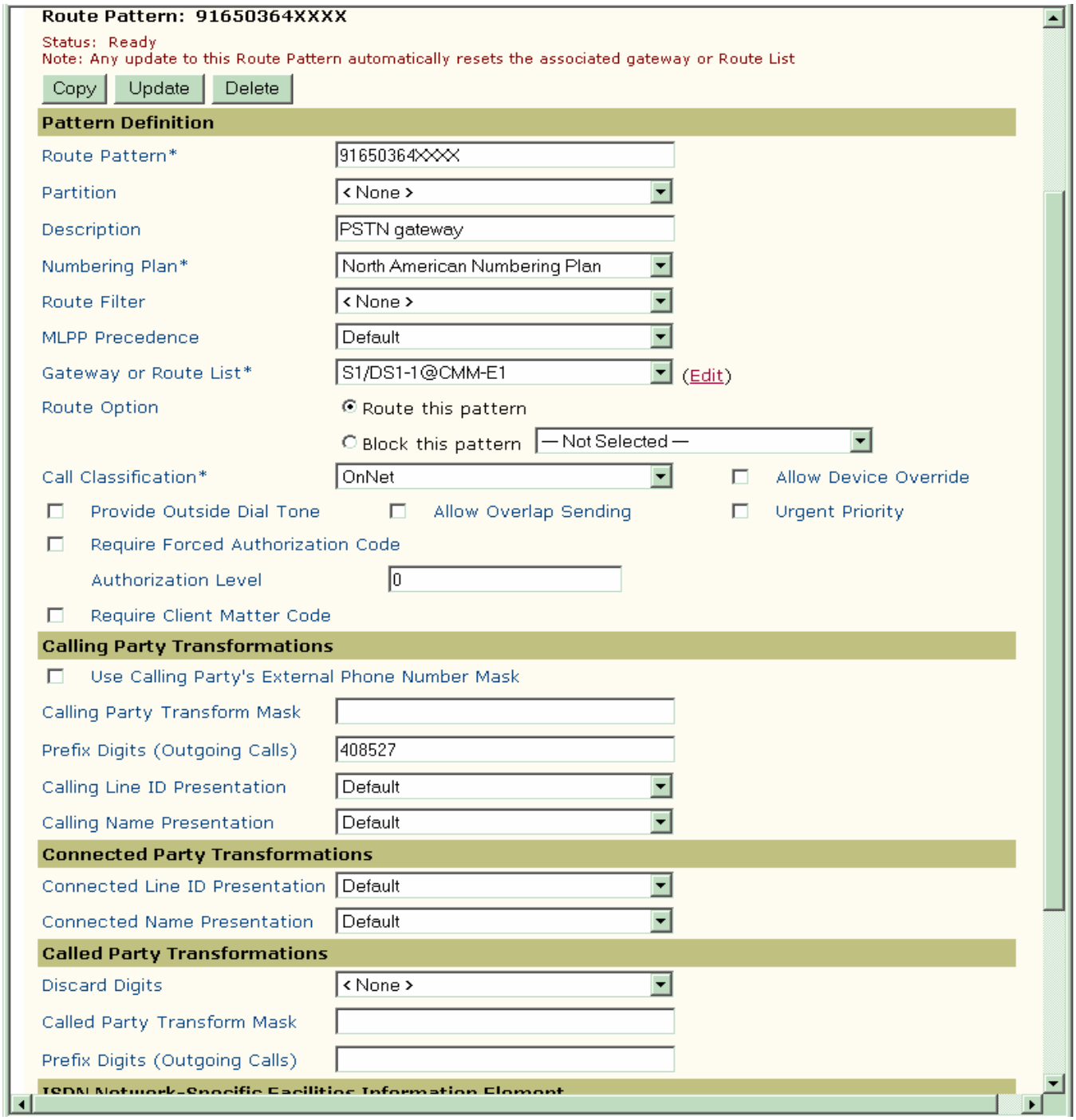




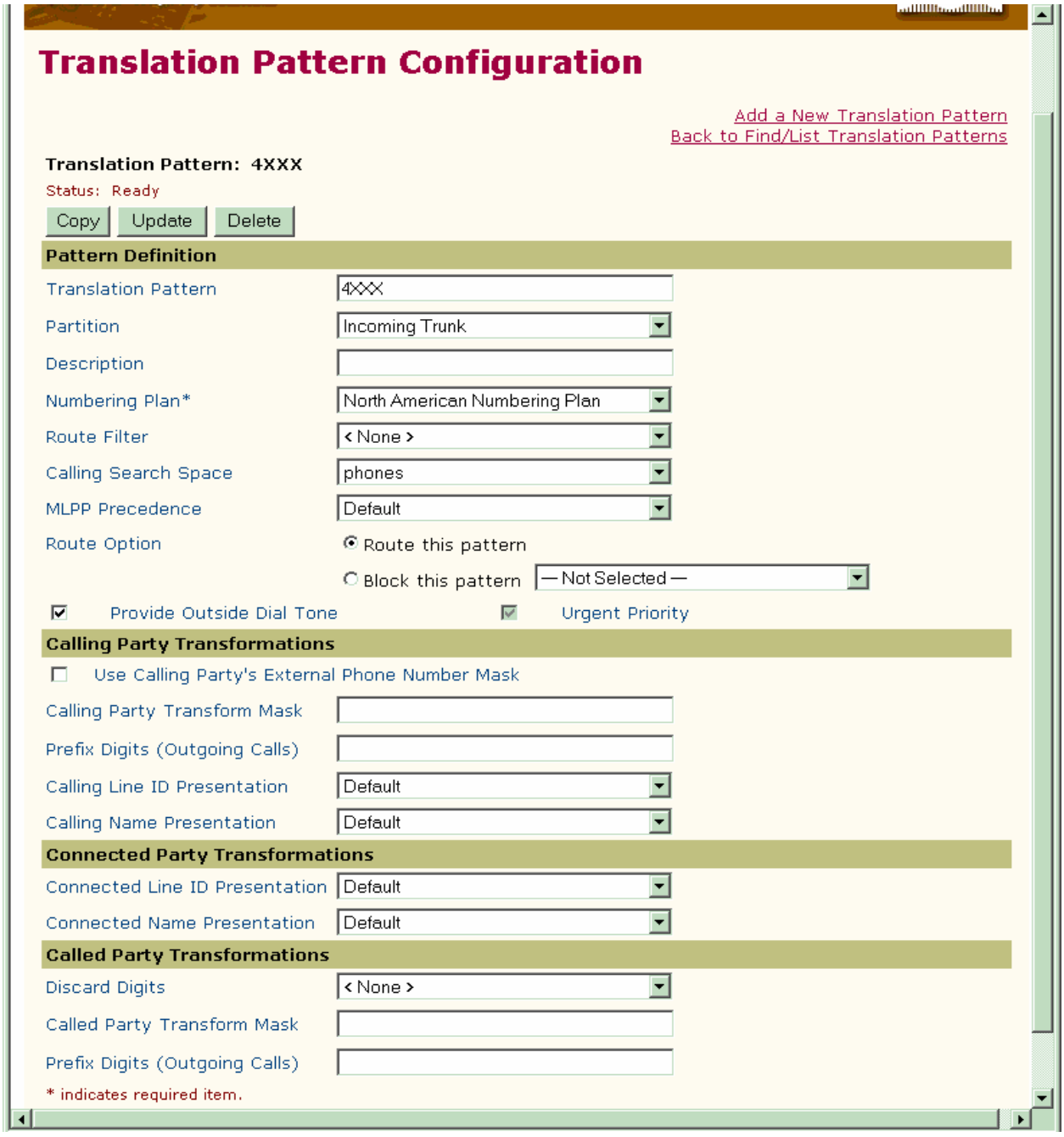
Overlap Sending Route Pattern Configuration



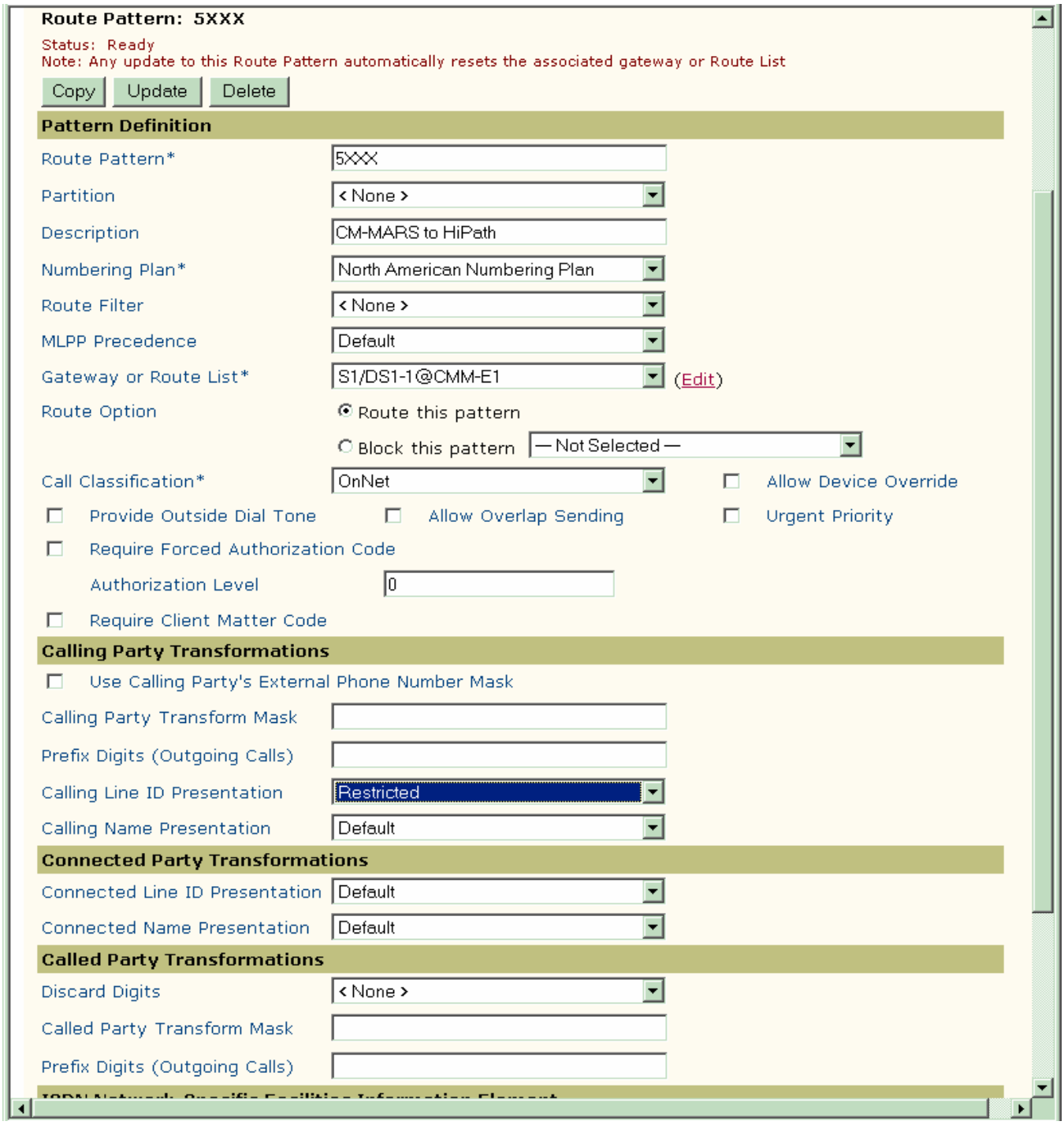
PSTN Route Pattern Configuration



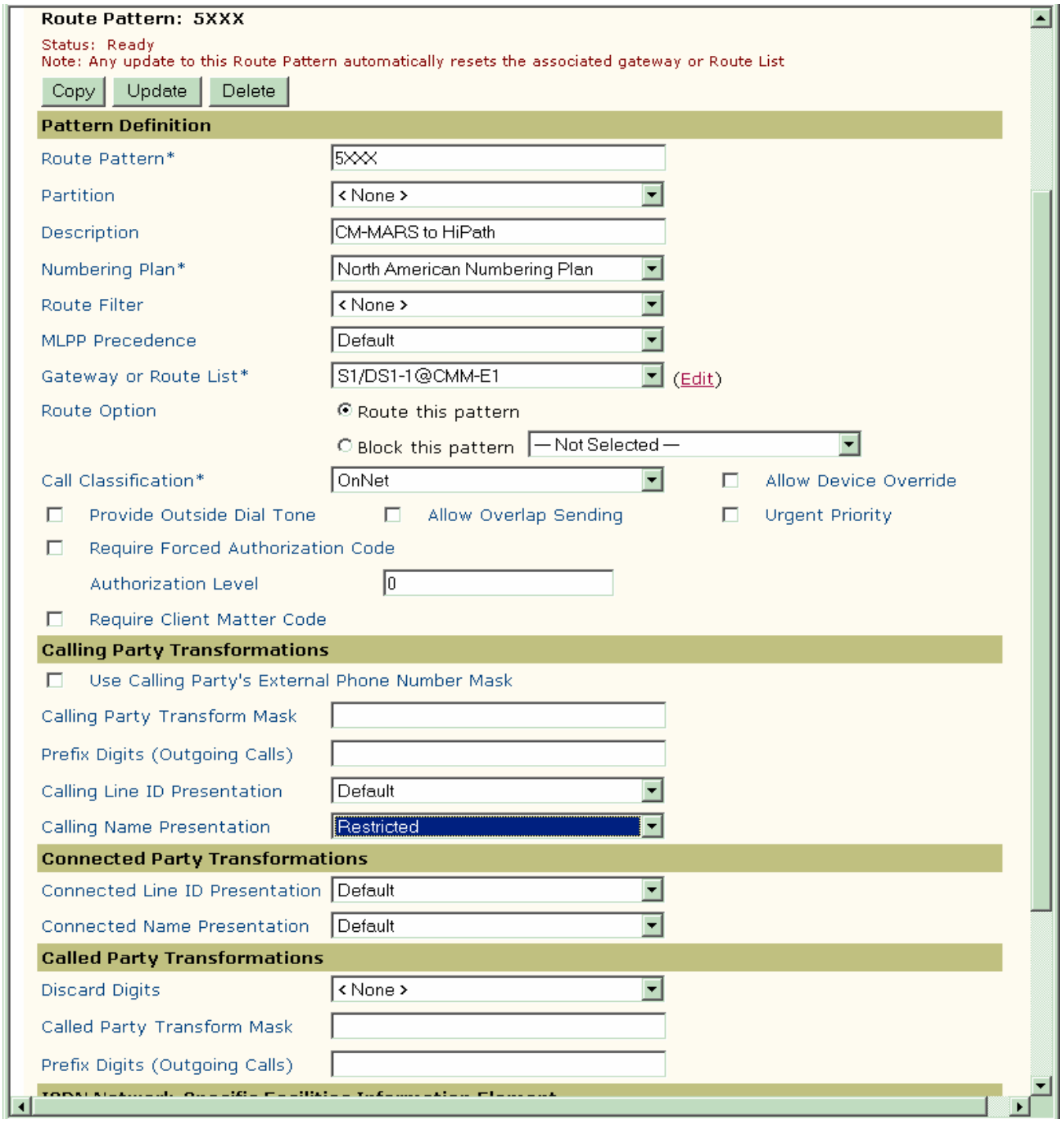
Translation Pattern for Incoming Calls



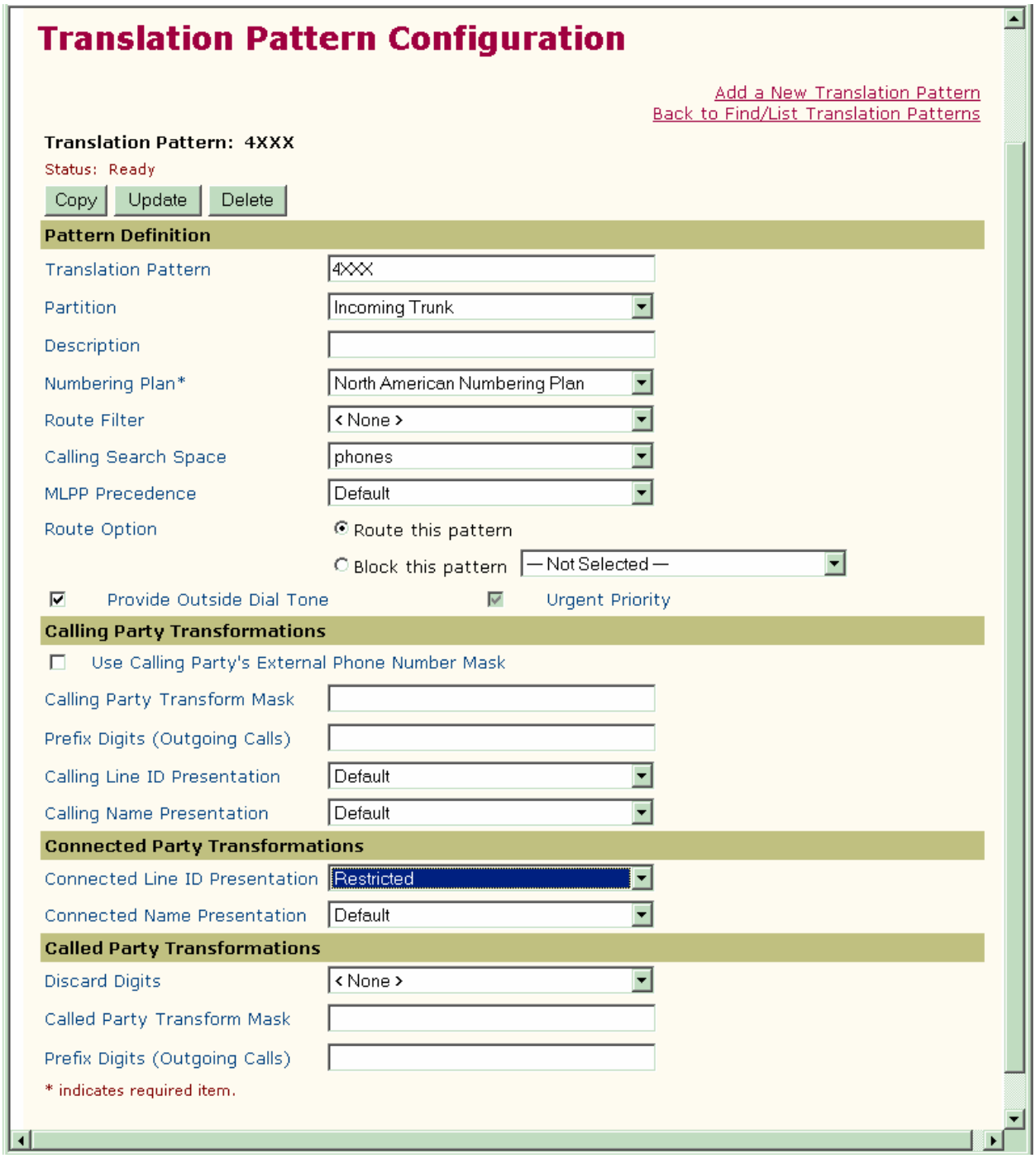
CLIR Route Pattern Configuration



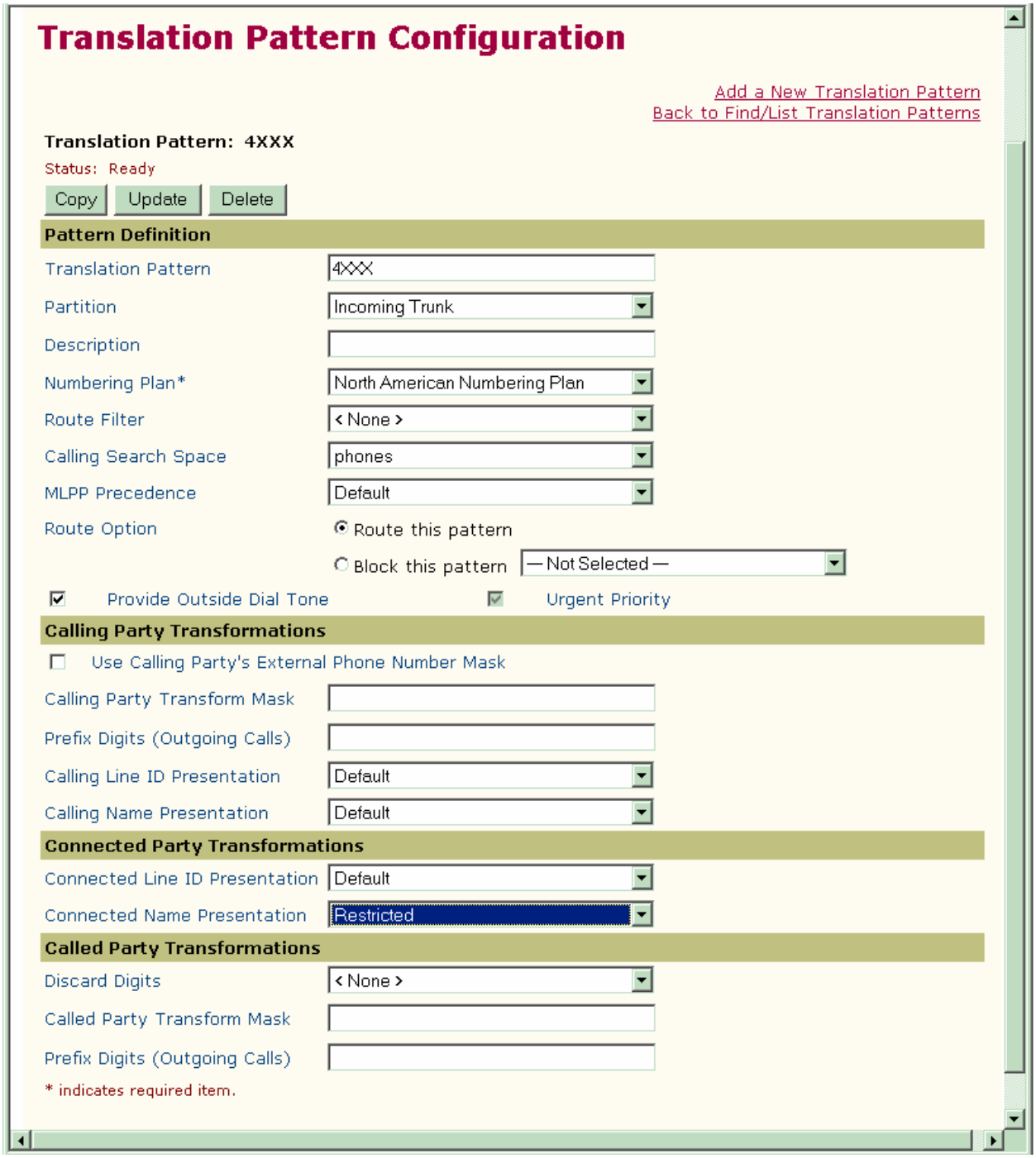
CNIR Route Pattern Configuration



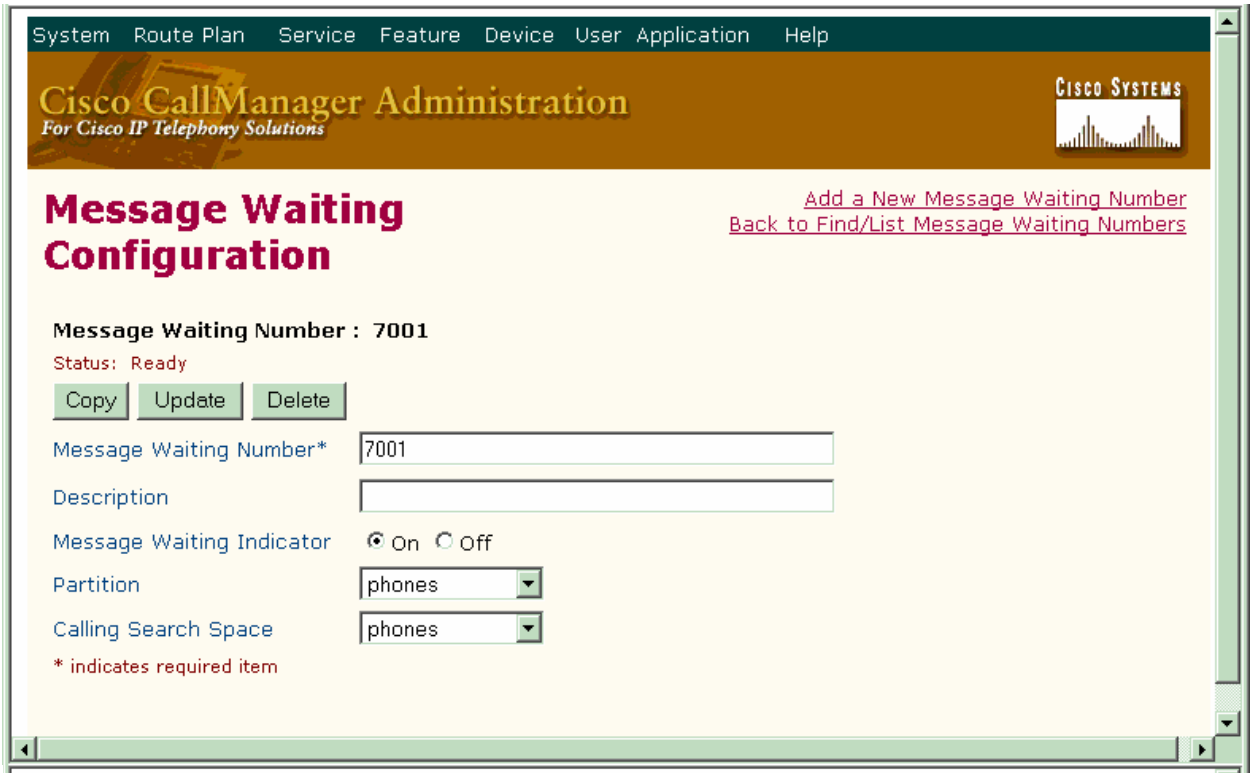
COLR Translation Pattern Configuration

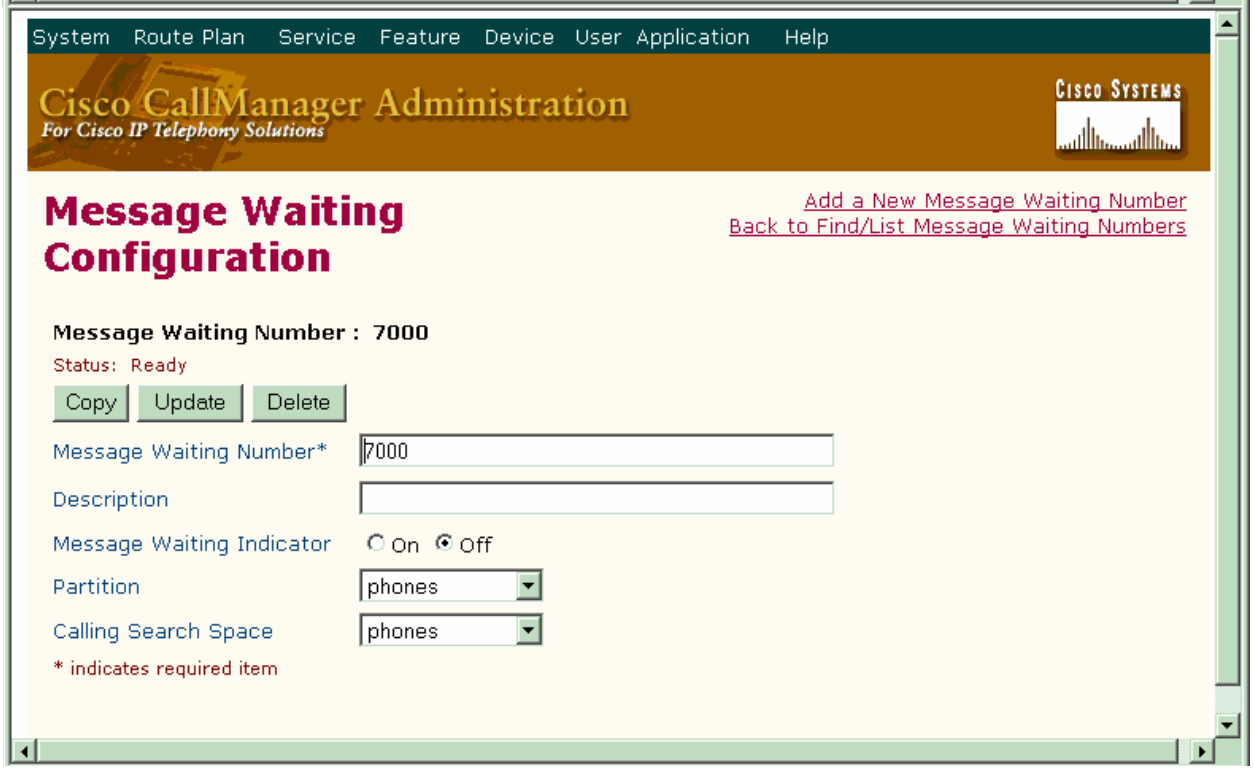


CONR Translation Pattern Configuration

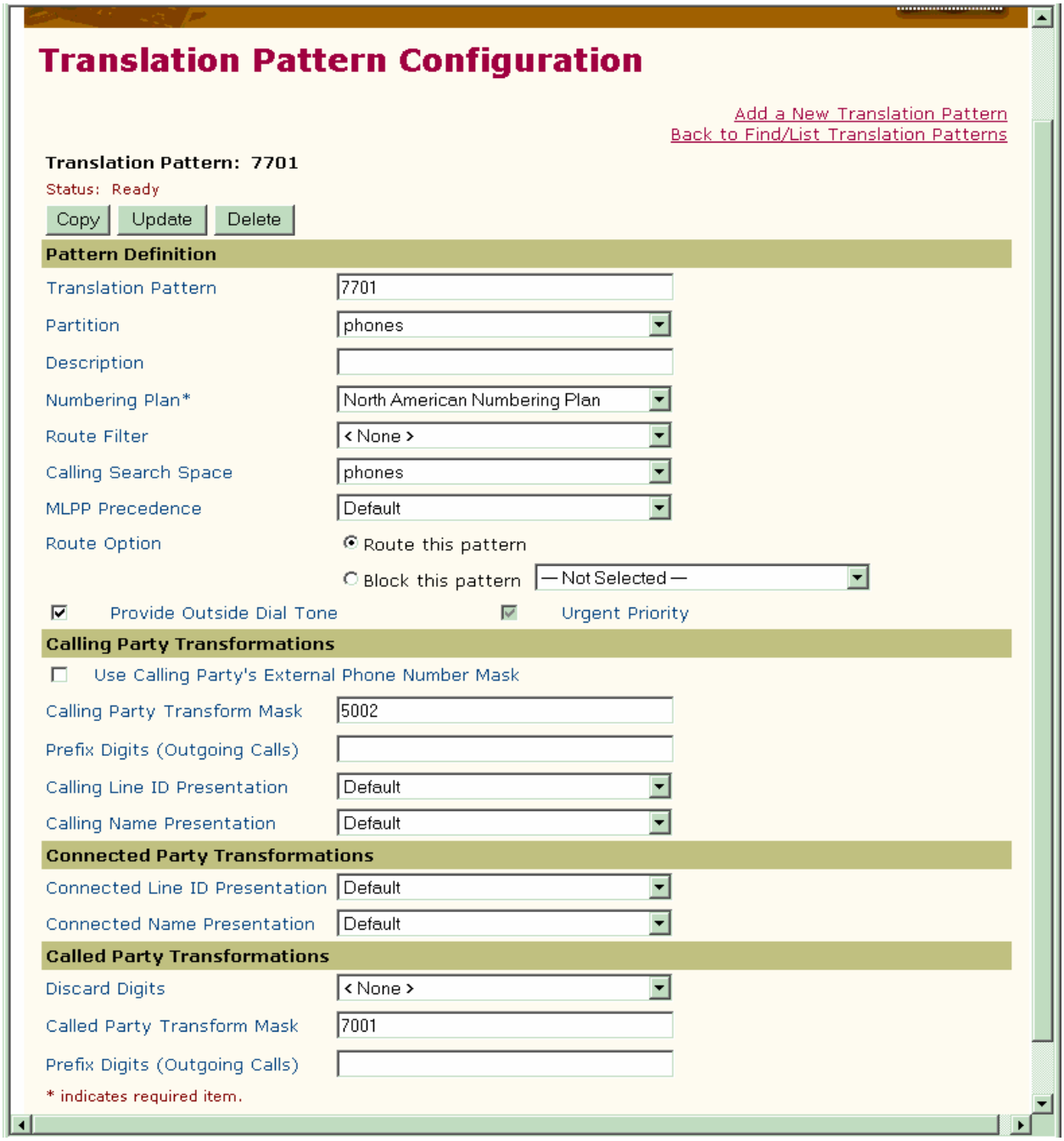


MWI lamp On/Off Configuration

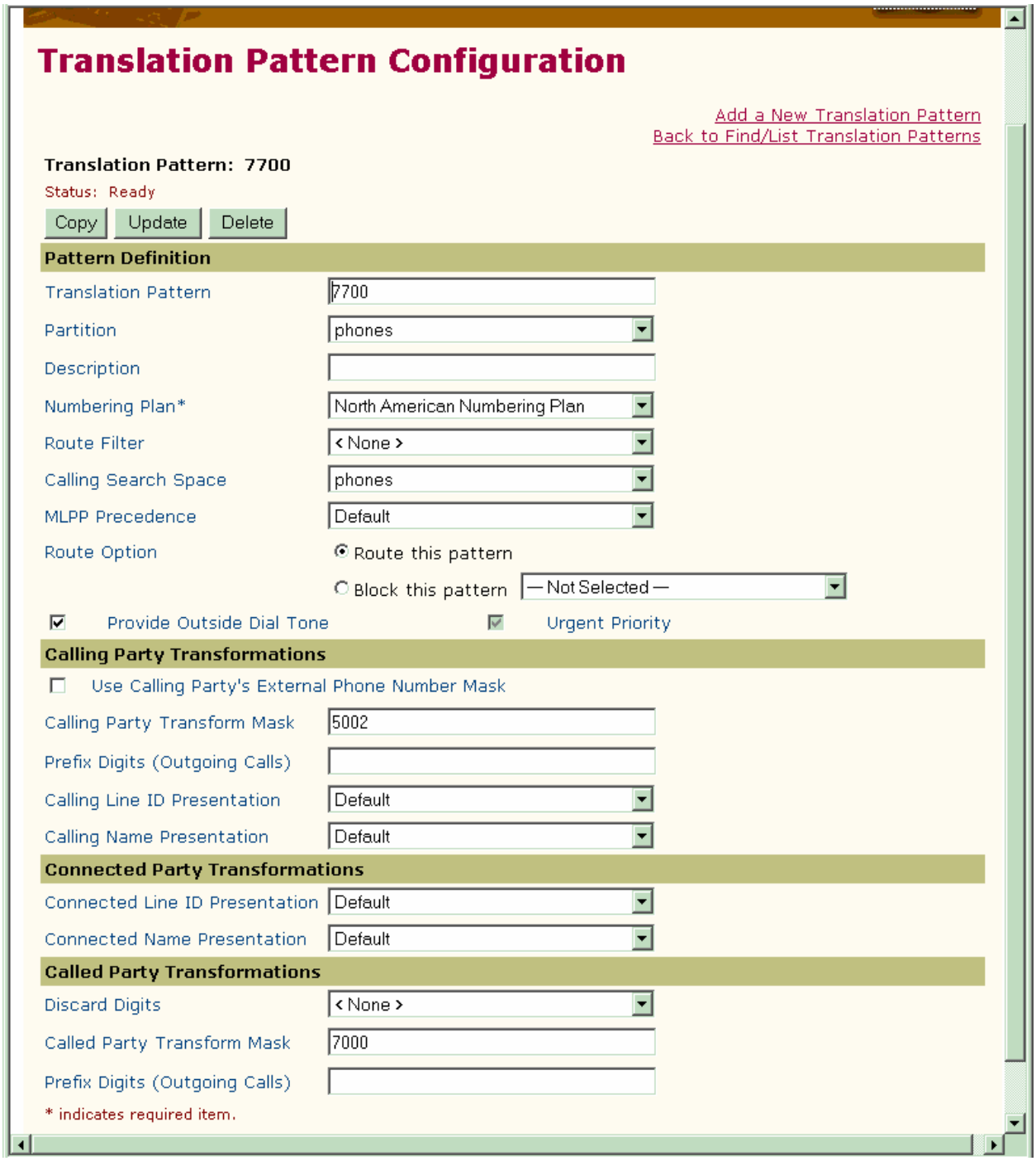




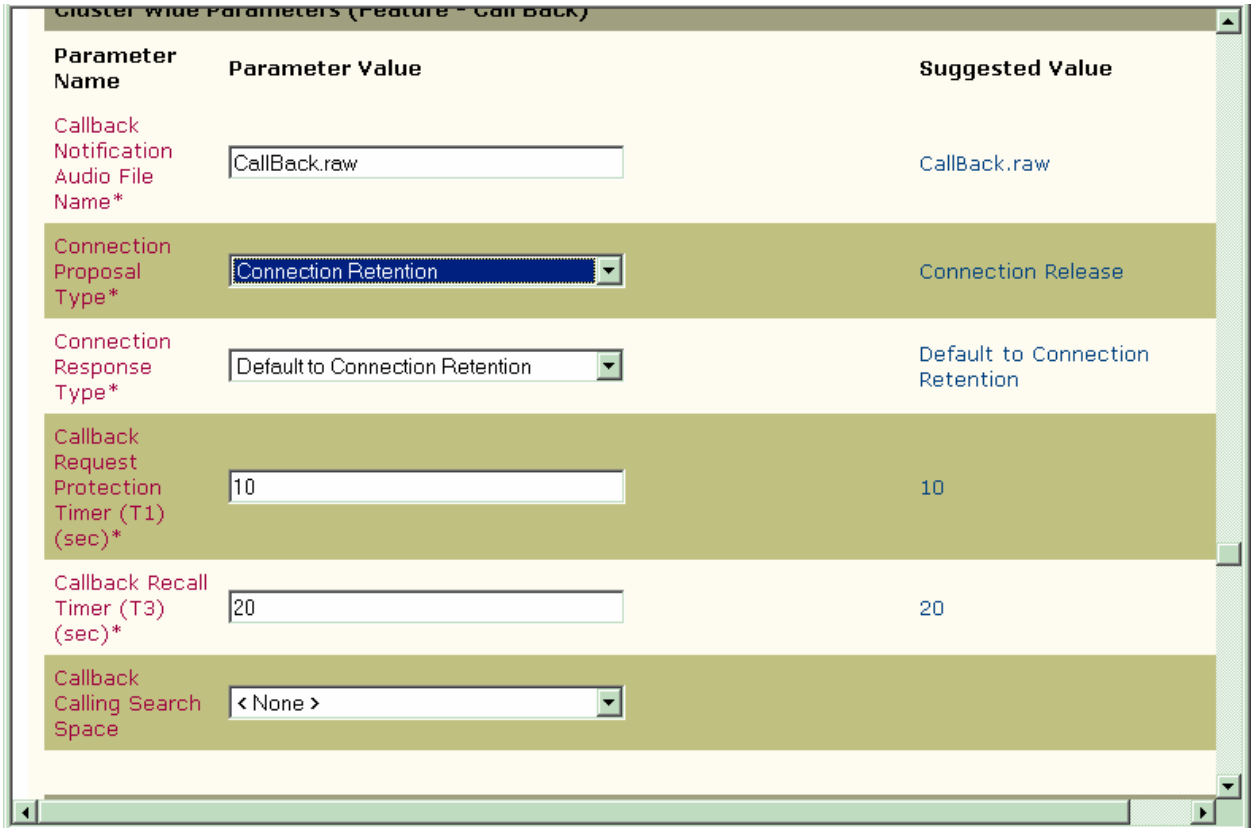
MWI Activate Translation Pattern Configuration



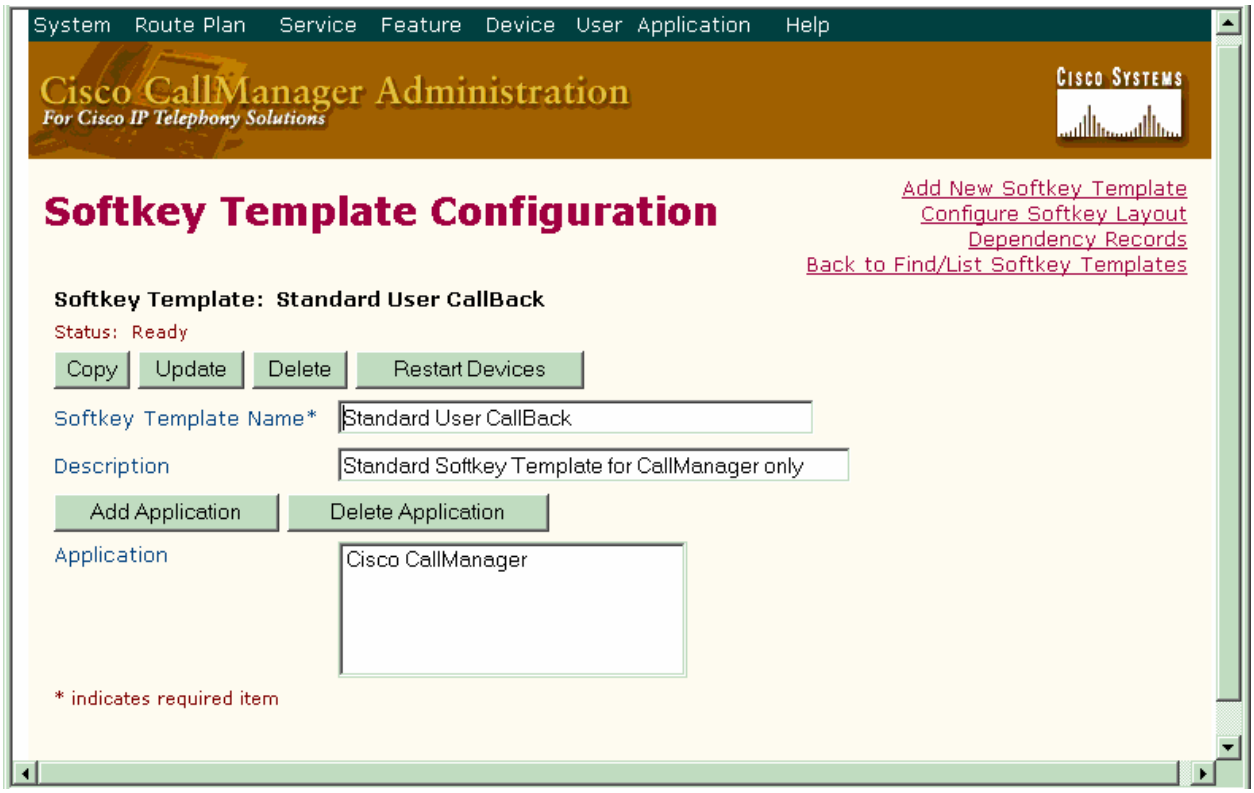
MWI Deactivate Translation Pattern Configuration

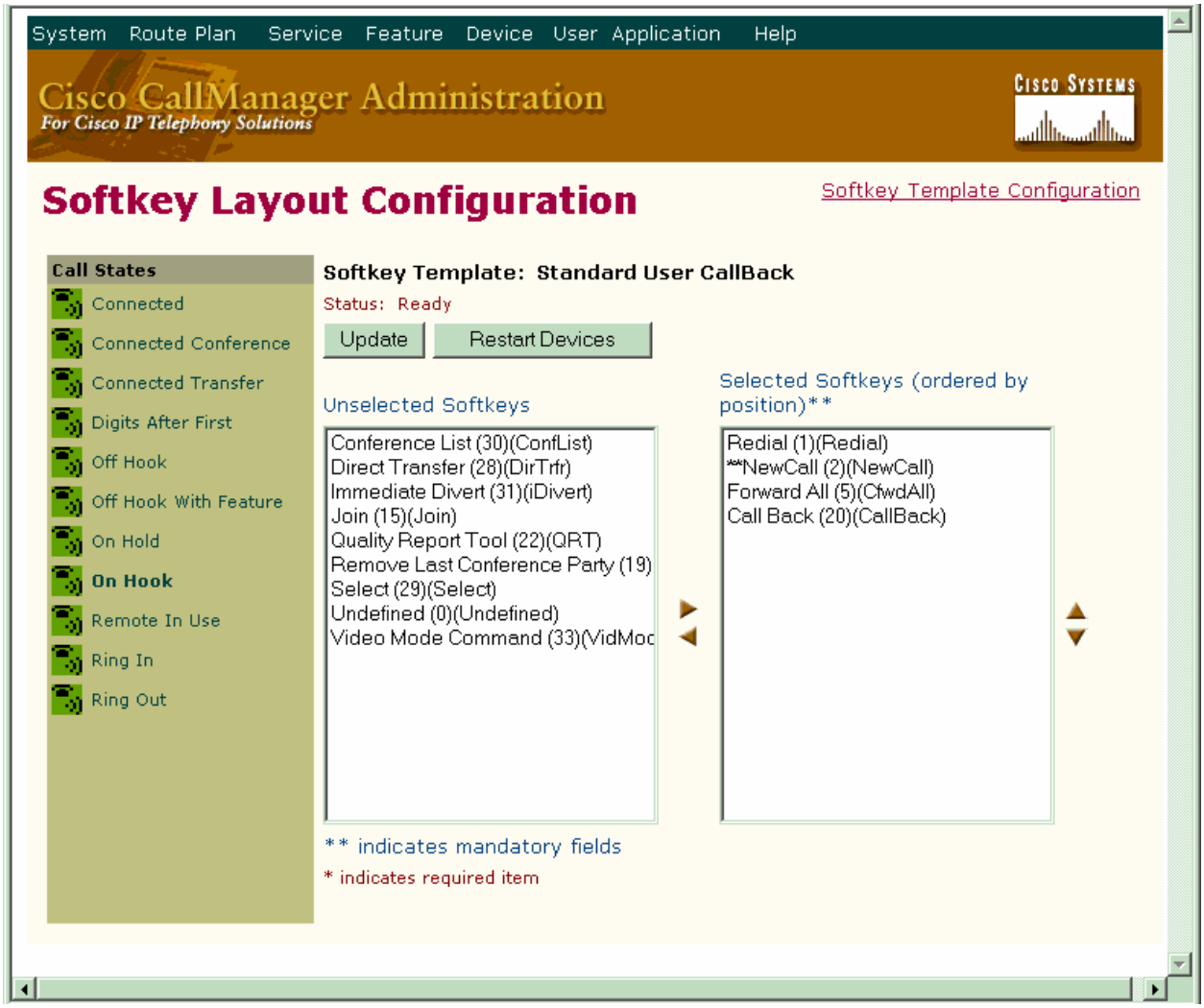


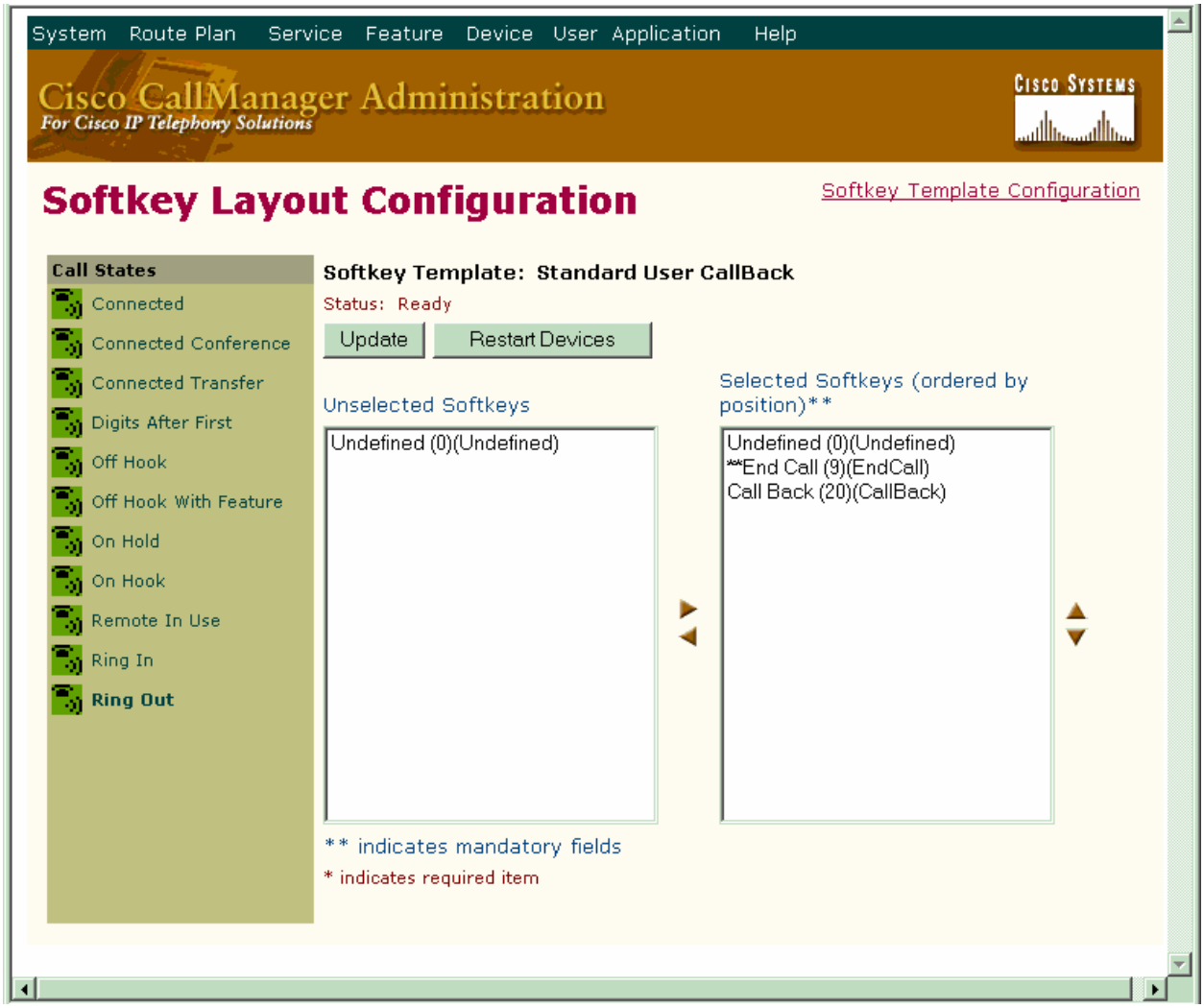
CallBack Service Parameters



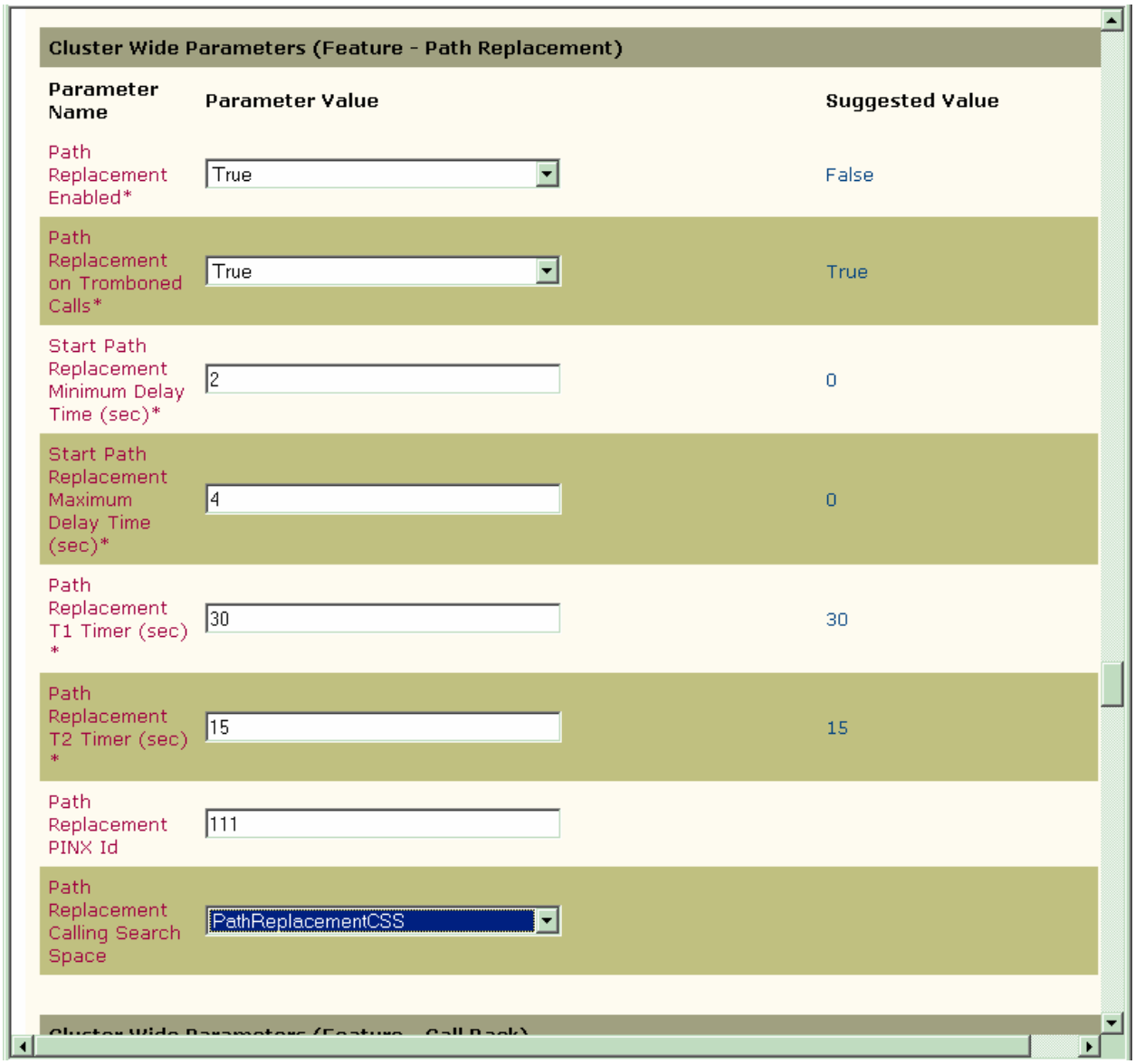
CallBack Softkey Configuration





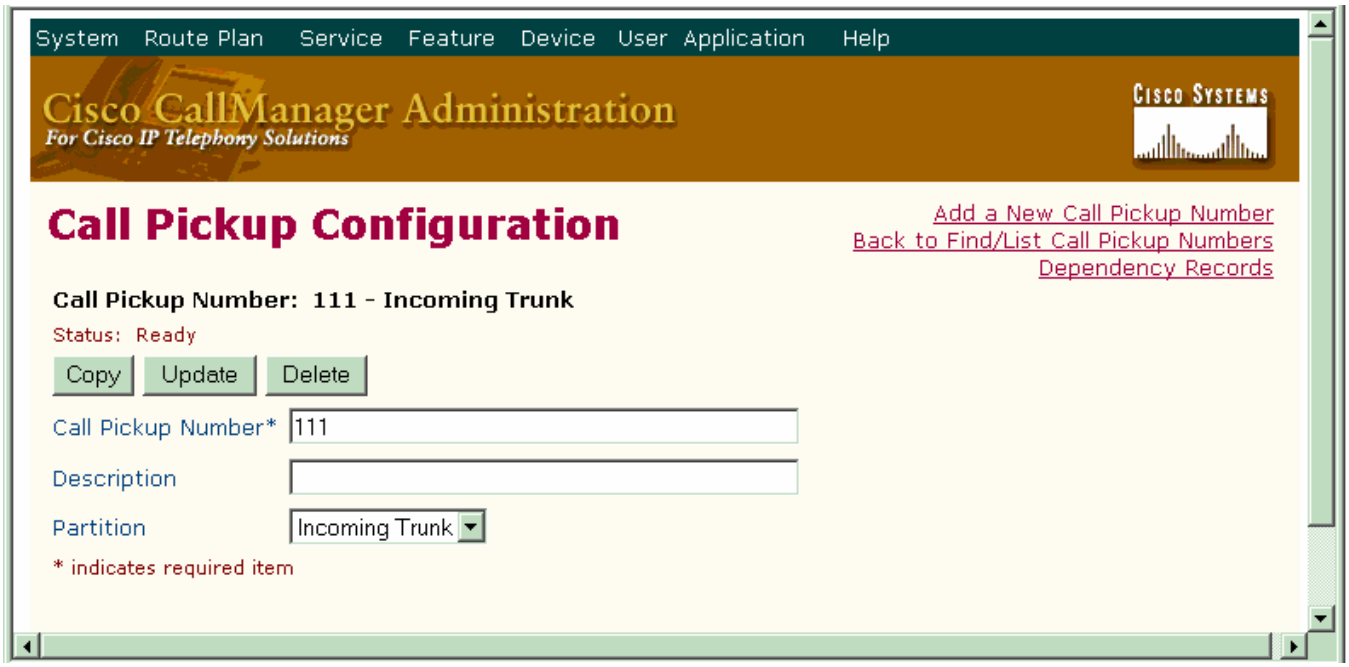


Path Replacement Service Parameters

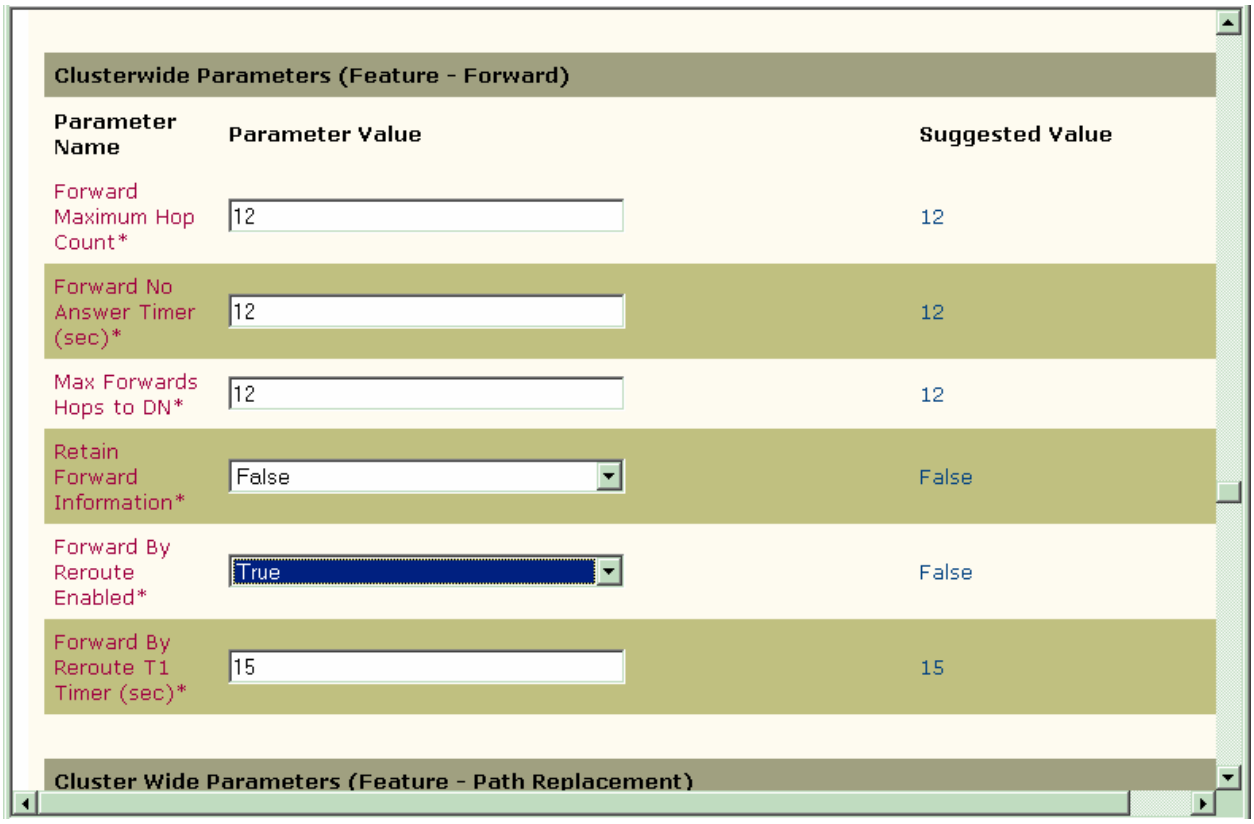


Cluster Wide Parameters (Feature - Path Replacement)

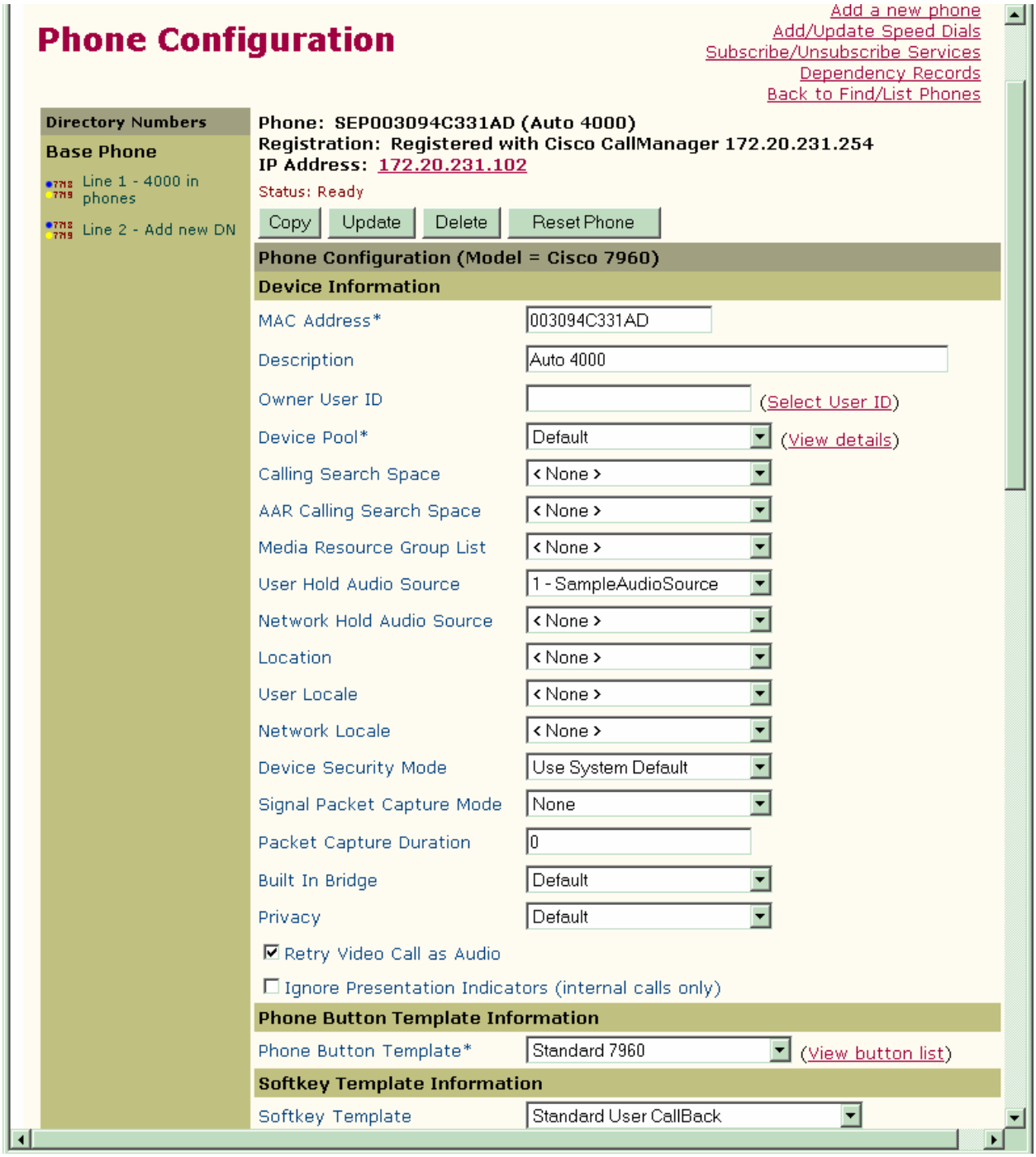
Parameter Name	Parameter Value	Suggested Value
Path Replacement Enabled*	True	False
Path Replacement on Tromboned Calls*	True	True
Start Path Replacement Minimum Delay Time (sec)*	2	0
Start Path Replacement Maximum Delay Time (sec)*	4	0
Path Replacement T1 Timer (sec) *	30	30
Path Replacement T2 Timer (sec) *	15	15
Path Replacement PINX Id	111	
Path Replacement Calling Search Space	PathReplacementCSS	

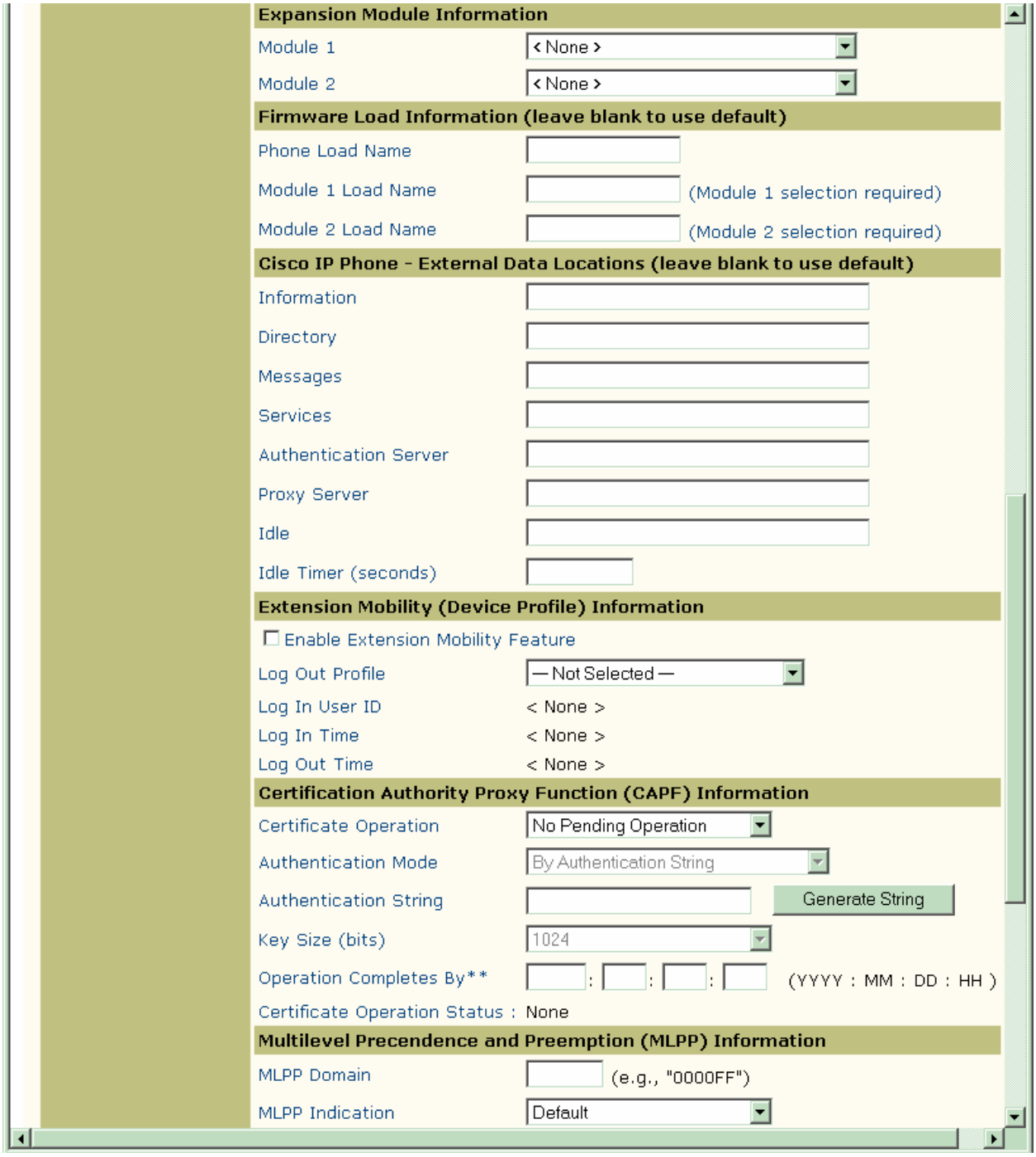


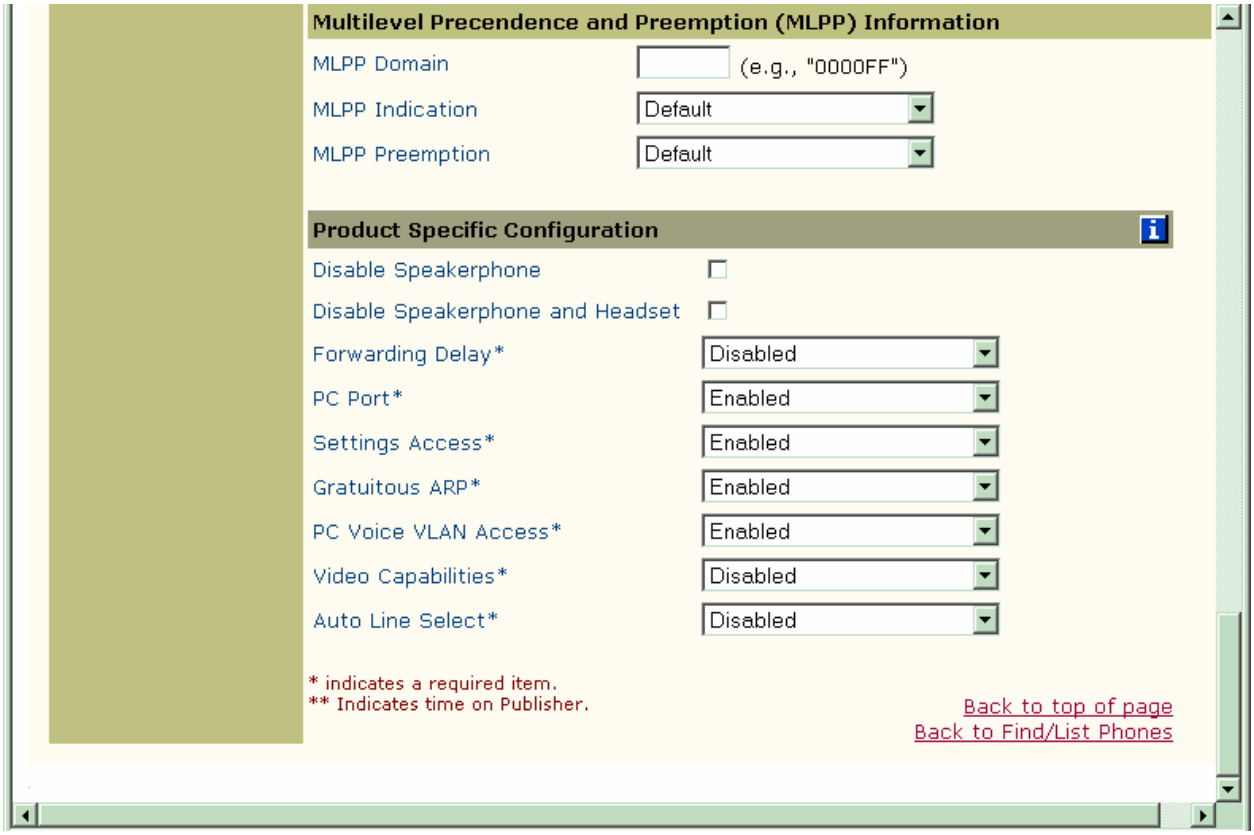
Forward by Reroute Service Parameter

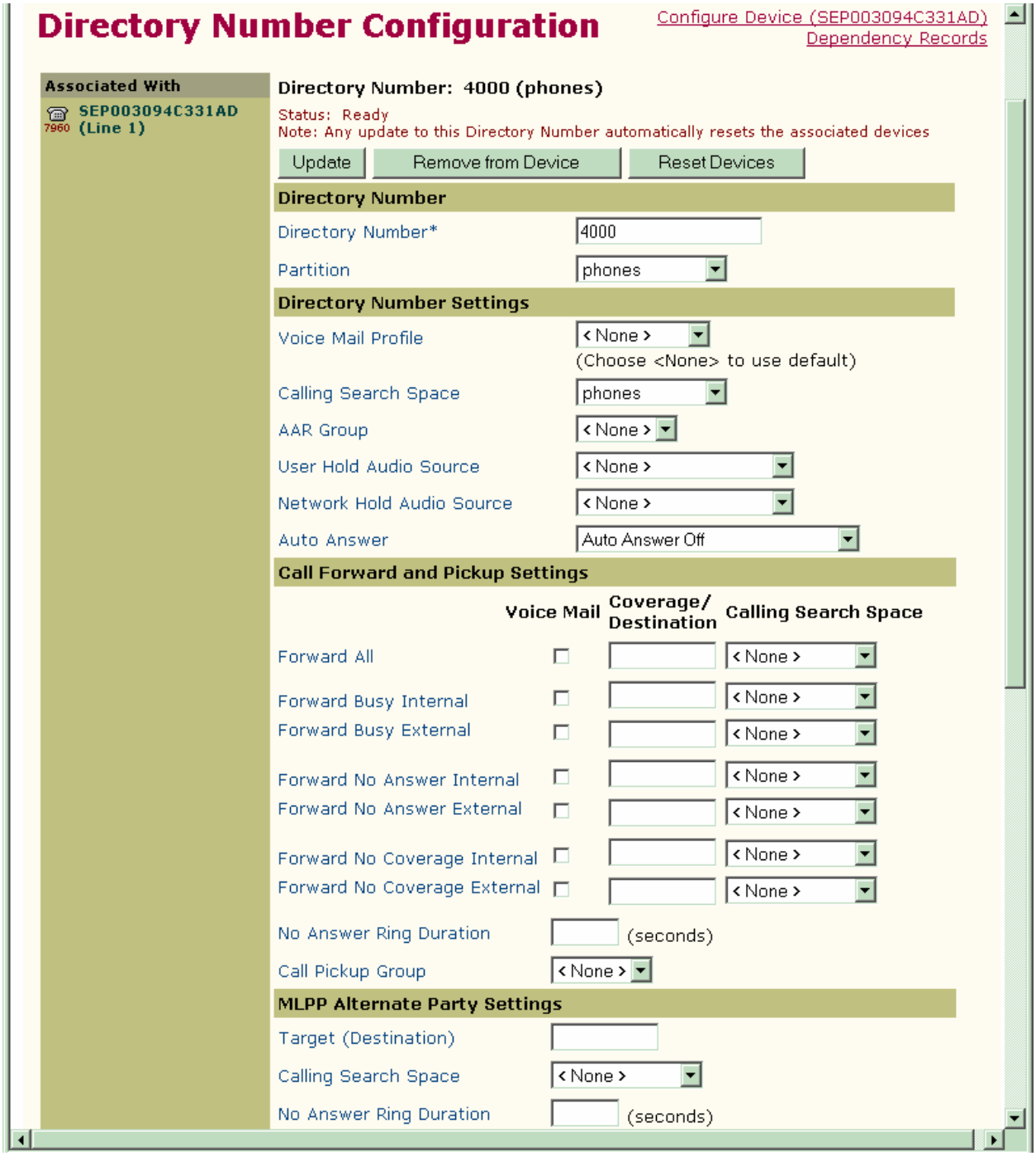


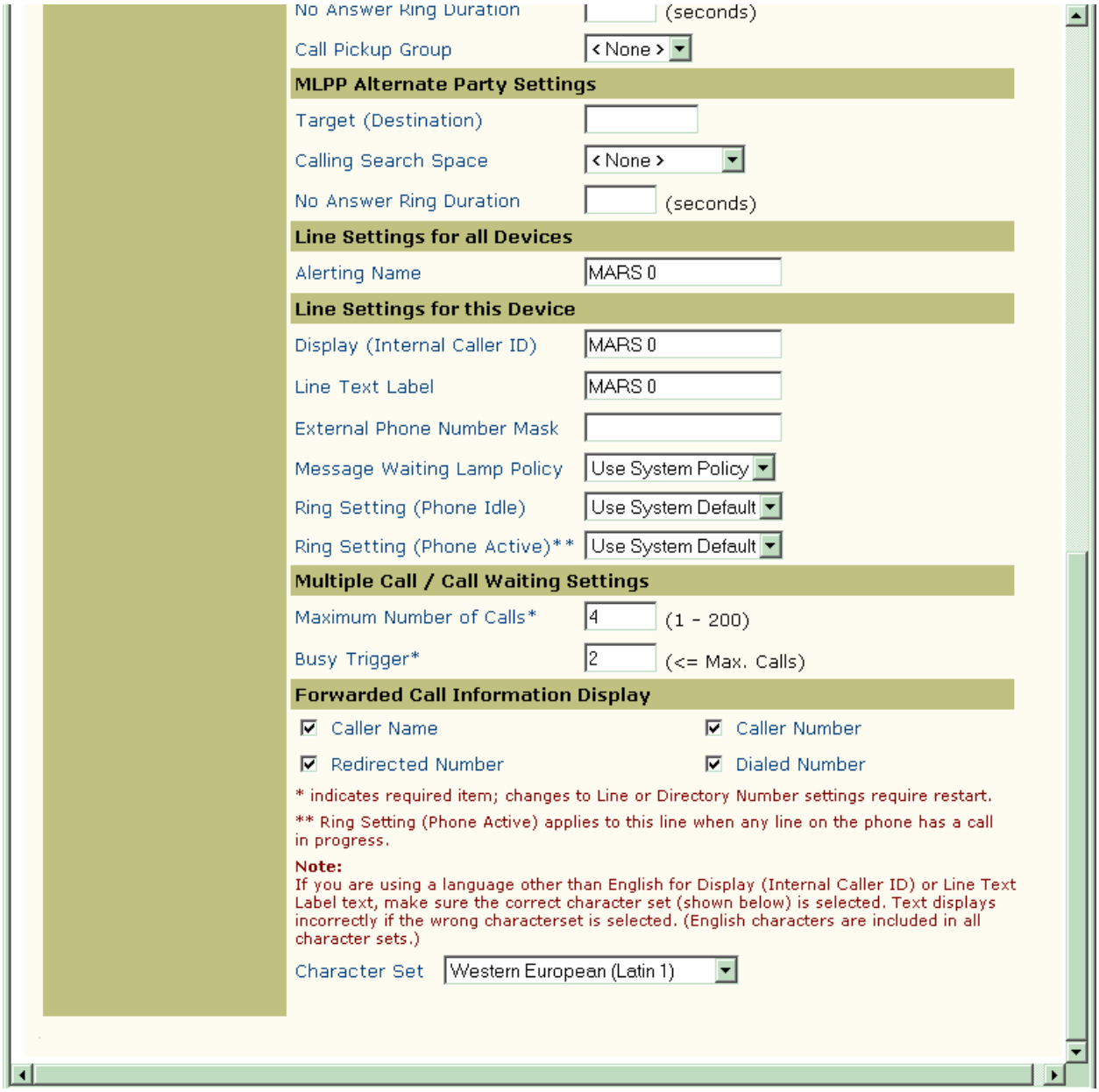
IP phone Configuration











Configuring the Cisco CMM-E1 MGCP Router

```
CMM-E1#
CMM-E1#sh ver
Cisco Internetwork Operating System Software
IOS (tm) Cat6K-lc Software (wscmm-I6S-M), Version 12.2(13)ZP3, EARLY DEPLOYMENT
RELEASE SOFTWARE (fc1)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Thu 05-Feb-04 17:38 by pwade
Image text-base: 0x60010940, data-base: 0x60D80000

ROM: System Bootstrap, Version 12.2(1r)T2, RELEASE SOFTWARE (fc1)
ROM: Cat6K-lc Software (wscmm-I6S-M), Version 12.2(13)ZP3, EARLY DEPLOYMENT RELE
ASE SOFTWARE (fc1)

CMM-E1 uptime is 9 minutes
System returned to ROM by power-on
System image file is "bootflash:wscmm-i6s-mz.122-13.ZP3.bin"

cisco WS-SVC-CMM Cat6k Voice Linecard (R7000) processor (revision 0xFF) with 196
608K/65536K bytes of memory.
R7000 CPU at 400Mhz, Implementation 39, Rev 3.3, 256KB L2 Cache
Last reset from power-on
Bridging software.
Primary Rate ISDN software, Version 1.1.
Channelized E1, Version 1.0.
1 FastEthernet/IEEE 802.3 interface(s)
1 Gigabit Ethernet/IEEE 802.3 interface(s)
186 Serial network interface(s)
6 Channelized E1/PRI port(s)
32768K bytes of processor board bootflash (Read/Write)

Configuration register is 0x2


CMM-E1#sh run
Building configuration...

Current configuration : 3490 bytes
!
version 12.2
no service config
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname CMM-E1
!
!
ip subnet-zero
ip tcp synwait-time 13
ip host CM-MARS 172.20.231.254
!
isdn switch-type primary-4ess
!
!
```

```
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server CM-MARS
ccm-manager config
ms dsp firmware 0 bundled
ms dsp firmware 1 bundled
ms dsp firmware 2 bundled
!
!
controller E1 1/0
 pri-group timeslots 1-31 service mgcp
!
controller E1 1/1
 pri-group timeslots 1-31 service mgcp
!
controller E1 1/2
 pri-group timeslots 1-31 service mgcp
!
controller E1 1/3
 pri-group timeslots 1-31 service mgcp
!
controller E1 1/4
 pri-group timeslots 1-31 service mgcp
!
controller E1 1/5
 pri-group timeslots 1-31 service mgcp
!
!
interface GigabitEthernet1/0
 ip address 172.20.231.51 255.255.255.0
 no ip proxy-arp
 no negotiation auto
 no keepalive
!
interface Serial1/0:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
interface Serial1/1:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn protocol-emulate network
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
interface Serial1/2:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn protocol-emulate network
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
```

```
interface Serial1/3:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
interface Serial1/4:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
interface Serial1/5:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.20.231.1
no ip http server
!
!
arp 127.0.0.30 0000.0300.0000 ARPA
arp 127.0.0.12 0000.2100.0000 ARPA
arp 127.0.0.11 0000.1100.0000 ARPA
call rsvp-sync
!
voice-port 1/0:15
 echo-cancel coverage 64
!
voice-port 1/1:15
 echo-cancel coverage 64
!
voice-port 1/2:15
 echo-cancel coverage 64
!
voice-port 1/3:15
 echo-cancel coverage 64
!
voice-port 1/4:15
 echo-cancel coverage 64
!
voice-port 1/5:15
 echo-cancel coverage 64
!
mgcp
mgcp call-agent CM-MARS 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000 action notify
mgcp modem passthrough voip mode nse
mgcp package-capability rtp-package
no mgcp package-capability res-package
mgcp package-capability sst-package
```

```
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
dial-peer voice 1 pots
 application mgcpapp
!
dial-peer voice 2 pots
 application mgcpapp
!
dial-peer voice 3 pots
 application mgcpapp
!
dial-peer voice 4 pots
 application mgcpapp
 port 1/3:15
!
dial-peer voice 5 pots
 application mgcpapp
 port 1/4:15
!
dial-peer voice 6 pots
 application mgcpapp
 port 1/5:15
!
dial-peer voice 9991015 pots
 application mgcpapp
 port 1/0:15
!
dial-peer voice 9991115 pots
 application mgcpapp
 port 1/1:15
!
dial-peer voice 9991215 pots
 application mgcpapp
 port 1/2:15
!
!
line con 0
line vty 0 4
 login
!
!
end

CMM-E1#
```

Acronyms

Acronym	Definitions
ANF-PR	Additional Network Feature Path Replacement
AOC	Advice-of-charge. Information element is sent with the connection setup information for incoming Euro-ISDN connections. The AOC IE is used for call charge calculation.

CUCM	Cisco Unified CallManager
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply
CFB	Call Forwarding on Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CLIP	Calling Line (Number) Identification Presentation
CLIR	Calling Line (Number) Identification Restriction
CMM	Communication Media Module (CMM) is a Cisco Catalyst® 6500 Series and Cisco 7600 Series line card that provides flexible and high-density T1/E1 gateways
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

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Printed in the USA