Application Note

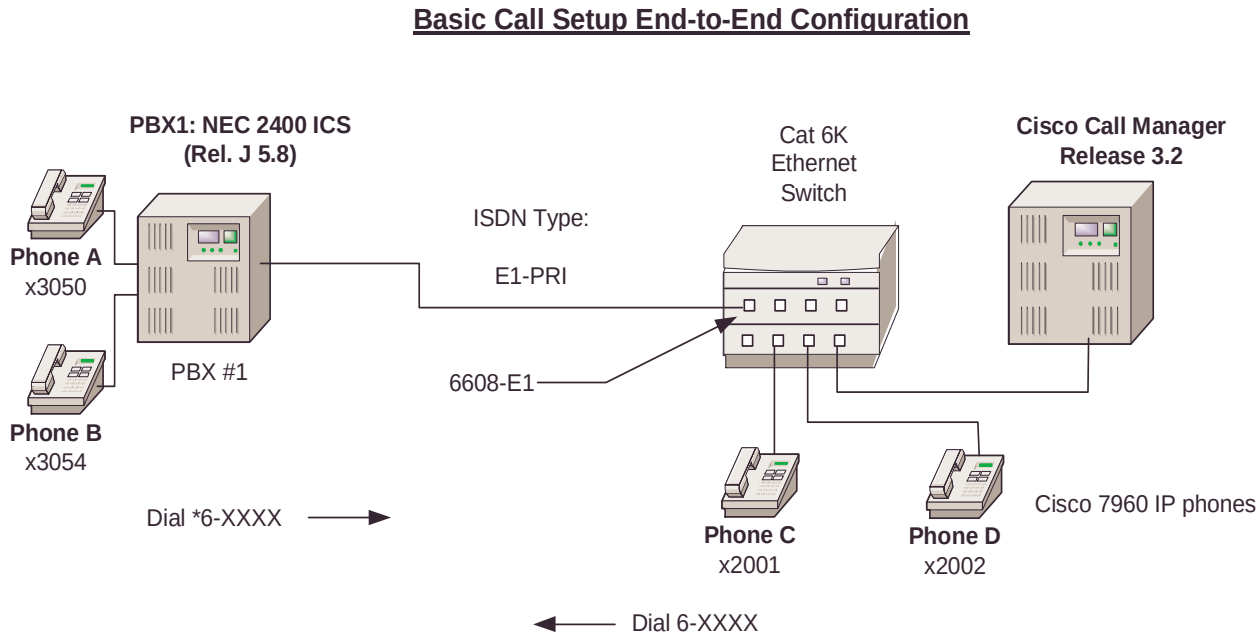
Cisco 6608 Gateway - PBX Interoperability: NEC 2400 ICS Rel. J 5.8 PBX with CallManager using E1 PRI EURO to an MGCP Gateway

Introduction

- This note describes the interoperability of the NEC 2400 ICS Release J 5.8 PBX, Cisco CallManager, and Cisco 6608 Catalyst switch in an MGCY gateway The signaling protocol is E1 PRI.
- The network topology diagram shows the end-to-end interoperability.
- Connectivity is achieved by using the PRI EURO protocol on the gateway and NEC/ETSI switch type on the NEC 2400 PBX.

Network Topology

Figure 1. Network Topology



Limitations

- Though the NEC 2400 PBX can be configured as either “network side” (master) or “user side” (slave), this is not recommended and the NEC TAC center will not resolve a case presented with the NEC PBX configured as “network side.”
- Calling name delivery and presentation features are not supported by the NEC 2400 PBX.
- Cisco CallManager does not send “Connected Number” information in the CONNECT message back to PBX.

EDCS# 208881

- When calling from a Cisco 7960 IP phone to a NEC digital phone, both phones display the calling number after the call is answered as expected. When calling from a NEC digital phone to a Cisco 7960 IP phone, the Cisco IP phone displays the connected number after the call is answered. The NEC phone, however, does not get updated when the call is answered. It displays the numbers being dialed instead (that is, access code + extension number). It was verified using an ISDN protocol analyzer that the Cisco CallManager was not sending "Connected Number" information in the CONNECT message back to PBX.

System Components

Hardware Requirements

- Cisco Catalyst 6000 switch with Cisco 6608-E1 gateway
- NEC 2400 ICS PBX, PA-30PRTB

Software Requirements

- PBX Software Release J 5.8.
- Cisco CallManager Release 3.2

Configuration

Configuring the NEC 2400 ICS Rel. J5.8 PBX

The NEC requires a substantial amount of programming and circuit card switch settings to properly install E1 PR. It is beyond the scope of this document to provide the entire configuration; therefore the NEC information below is mostly helpful for NEC techs. It is highly recommended to have a NEC ISDN certified technician setup the NEC portion. Refer to the NEC 2400 PBX documentation for complete configuration information.

Step 1. Install the circuit card (PA-30PRTB) and set the switches.

Switch	Position	Description	Setting
SW00		Make Busy	Down
SW01	0	All Channel Make Busy	Off
	1	External Loop Back	Off
	2	Internal Loop Back	Off
	3	Dch Handler Make Busy	Off
SW02 (SENSE - Rotary)		1 = AT&T 2 = Australia 3 = NTT Japan 4 = NEC/ETSI 5 = AT&T 6 = INS A = Q.SIG	4
SW10	Jumper	Off = Coax On = Twisted Pair	On
SW11	Jumper	Off = Coax On = Twisted Pair	On
SW12	Jumper	Off = Coax On = Twisted Pair	On

Switch	Position	Description	Setting
SW13	1	On = PAD ROM Special Version Off = PAD ROM Standard Version	Off
	2	On = ISDN BUS Not Used Off = ISDN BUS Used	On
	3	Not Used	Off
	4	Not Used	Off
SW14	1	On = CCITT Signaling Off =CEPT Signaling	On
	2	On = Alarm Release: 2sec (Aus) Off = Alarm Release 15 Sec.	On
	3	PAD	On
	4	PAD	On
	5	PAD	On
	6	PAD	On
	7	PAD	On
	8	Fixed Off	Off
SW15	1	Loopback Pattern Off = Loopback inhibited	Off
	2	Loopback Pattern Off = Loopback inhibited	Off
	3	Loopback Pattern Off = Loopback inhibited	Off
	4	Loopback Pattern Off = Loopback inhibited	Off
	5	TS16 Control: On = Data Through (CCIS/ISDN) Off = Signaling	On
	6	On = No CRC4 Off = CRC4	Off
	7	Firmware (CCITT/China/Thailand/Aux)	On
	8	Firmware (CCITT/China/Thailand/Aux)	On
SW16	1	Fixed Off	Off
	2	Fixed Off	Off
	3	All “1” Supervision On = To be controlled Off = Not to be controlled	Off
	4	On = Dch User Side Off = Dch Network Side	On

Switch	Position	Description	Setting
	5	On = Dch NegativeLogic Off = Dch Positive Logic	Off
	6	On = Dch Packet Service On Off = Dch Packet Service Off	Off
	7	Fixed Off	Off
	8	Fixed Off	Off

Step 2. Configure the route (ARTD). Below are the route settings found in ARTD. Route 12 is the B channel and route 13 is the D channel.

```
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            *  ROUTE CLASS DATA LIST  *

                 -------  R O U T E     N U M B E R  -------
CDN FUNCTION      11        12        13        14        15

  1  OSGS          7         0         0         0         0
  2  ONSG          3         2         0         2         2
  3  ISGS          7         0         0         0         0
  4  INSG          3         2         0         2         2
  5   TF           3         3         3         3         3

  6   TCL          4         4         4         4         4
  7   L/T          1         1         1         1         1
  8   RLP          2         2         0         2         0
  9   TQ           0         0         0         0         0
 10  SMDR          0         1         1         1         1

 11   TD           0         0         0         0         0
 12   DR           0         0         0         0         0
 13   AC           1         1         0         1         0
 14   TNT          0         0         0         0         0
 15   LSG          5        12        13        12        13

 16 SMDR2          0         0         0         0         0
 17   H/M          0         0         0         0         0
 18   MC           0         0         0         0         0
 19   ANI          0         1         1         1         0
 20   D            0         0         0         0         0

 21   MSB          0         0         0         0         0
 22   MSW          0         0         0         0         0
 23   TR           0         0         0         0         0
 24   OC           0         0         0         0         0
 25   R/L          0         0         0         0         0

 26  RVSD          0         0         0         0         0
 27   TL           0         0         0         0         0
 28   ANS          0         1         1         1         1
 29  TELP          0         0         0         0         0
 30   PAD          0         4         7         4         7

 31  OGRL          0         1         1         1         1
 32  ICRL          0         1         1         1         1
 33   HD           0         0         0         0         0
 34 GUARD          0         1         1         1         1
 35  WINK          0         0         0         0         0

 36   VAD          0         0         0         0         0
 37   CLD          0         0         0         0         0
 38   FA           0         0         0         0         0
```

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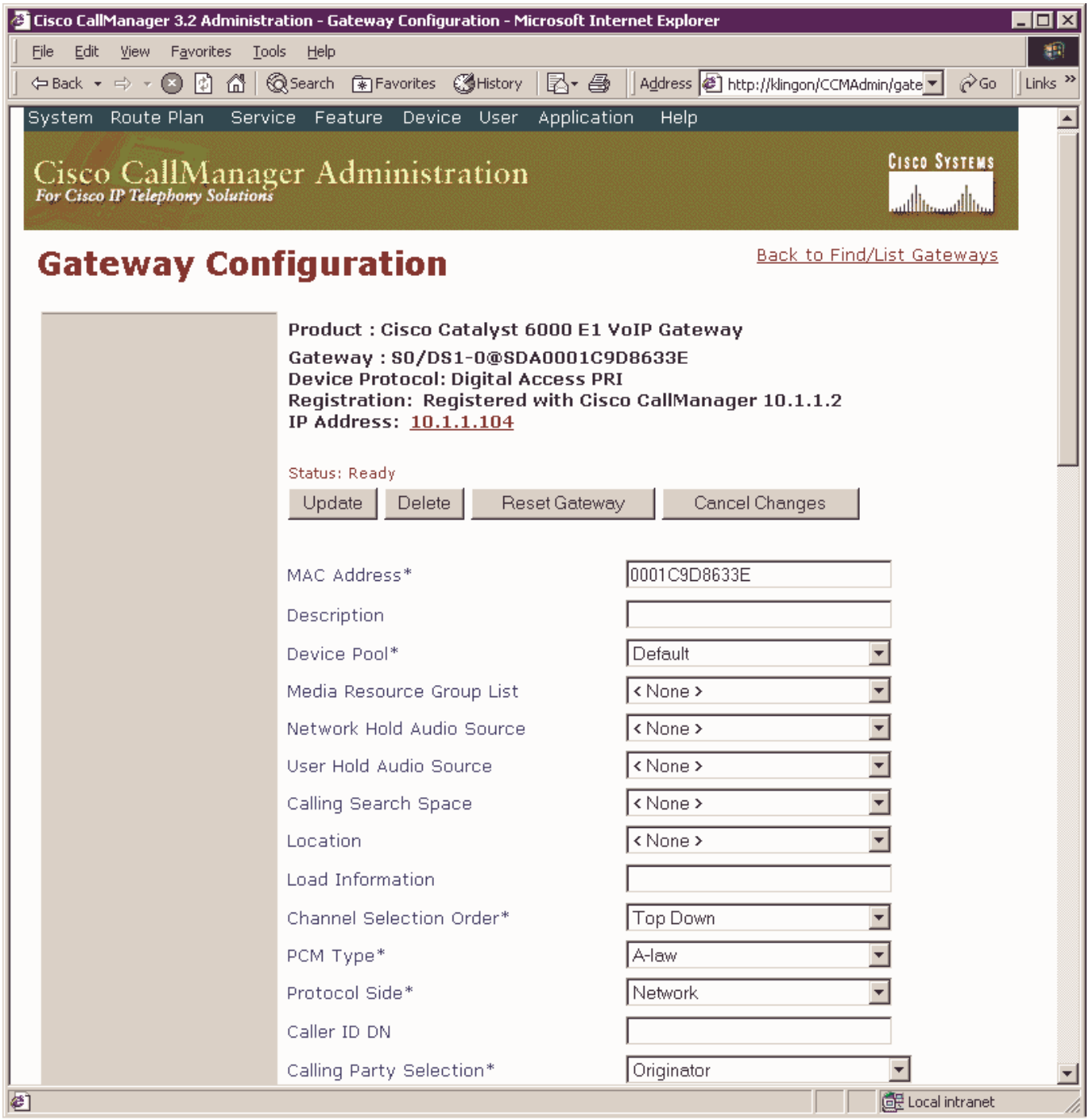
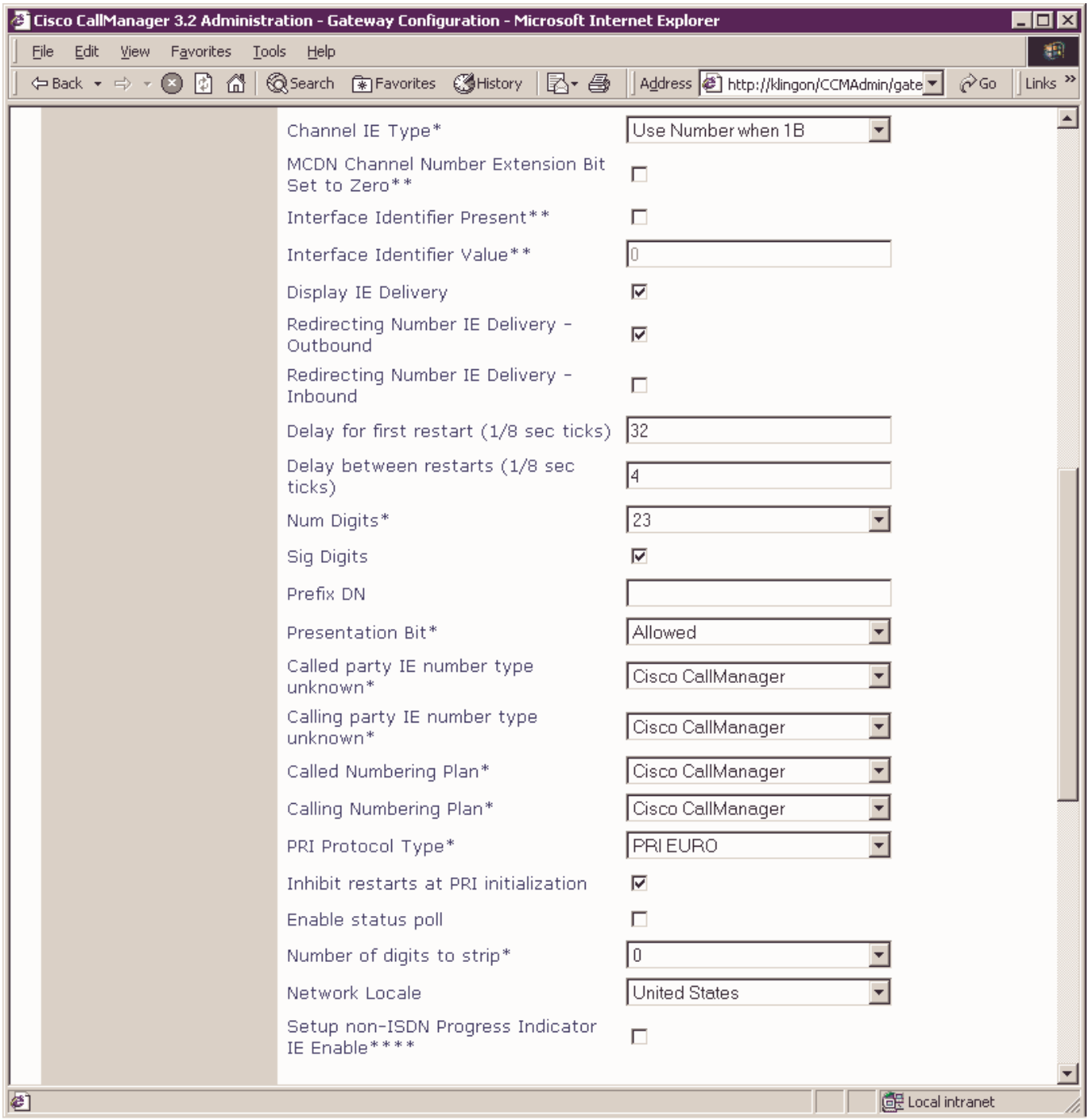
* ROUTE CLASS DATA LIST *

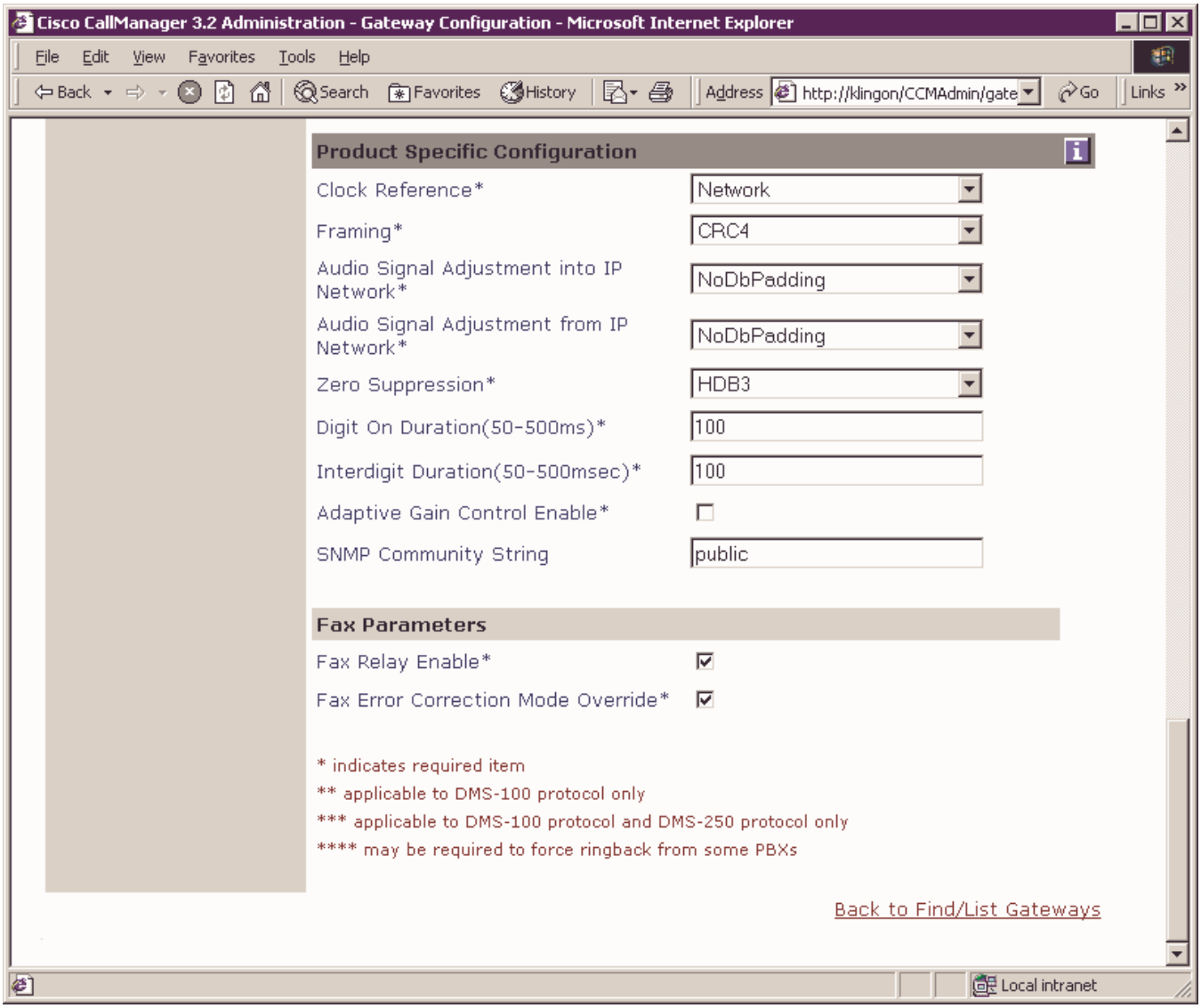
CDN	FUNCTION	ROUTE NUMBER 11	12	13	14	15
39	BC	0	0	0	0	0
40	TCM	0	0	0	0	0
41	TDMQ	0	0	0	0	0
42	TRSC	0	0	0	0	0
43	BT	0	1	0	1	1
44	PRV	0	0	0	0	0
45	A/D	0	1	1	1	1
46	CW	0	0	0	0	0
47	TPQ	0	0	0	0	0
48	BL	0	0	0	0	0
49	TRKS	0	1	1	0	0
50	DPLY	0	1	1	1	1
51	ACD	0	0	0	0	0
52	2W/4W	1	0	0	0	0
53	FAAT	0	0	0	0	0
54	GW	0	0	0	0	0
55	TCMA	0	0	0	0	0
56	SMDR3	0	0	0	0	0
57	HDT	0	0	0	0	0
58	CD	0	0	0	0	0
59	CCH	0	0	0	0	0
60	TC/EC	0	0	0	0	0
61	IRE	0	0	0	0	0
62	SCR	0	0	0	0	0
63	LYER1	0	1	1	1	1
64	NET	0	1	0	0	0
65	INT	0	4	4	4	4
66	DC	0	4	4	4	4
67	HKS	0	0	0	0	0
68	SCF	0	0	0	0	0
69	SMDR4	0	0	0	0	0

Configuring Cisco CallManager

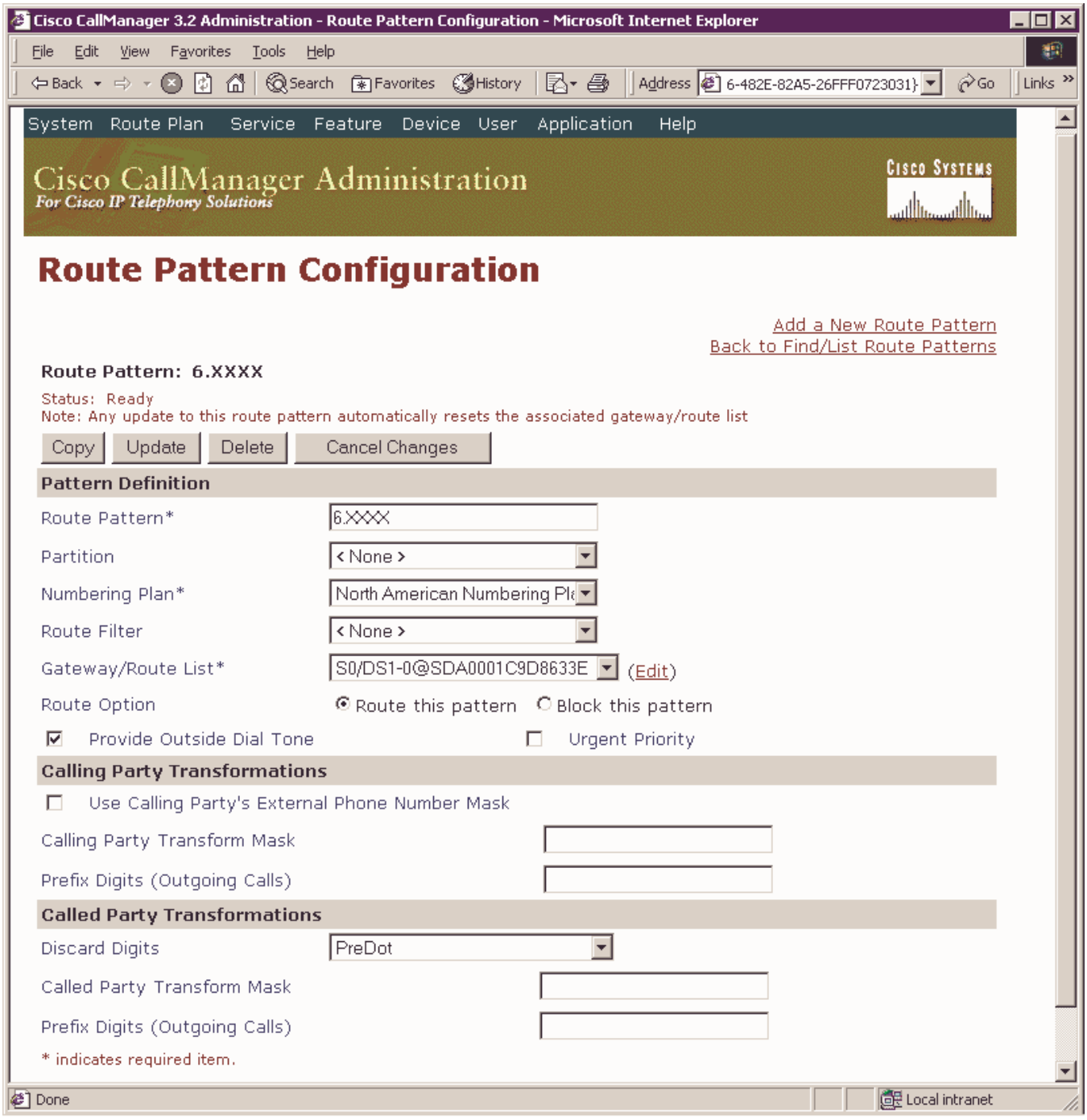
Step 1. Configure the Cisco 6608-E1 gateway. Use the following screens as a reference.







Step 2. Configure the route pattern. Use the following screen as a reference.



Configuring the Catalyst 6000 Switch

- Verify the software version using the **show version** command. The following is sample output.

```
Console> (enable) sh version

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

System Bootstrap Version: 5.3(1)

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

Mod Port Model               Serial #    Versions
--- ---- ------------------- ----------- -------------------------------------
1   2    WS-X6K-SUP1A-2GE    SAD05010NBK Hw : 7.0
                                         Fw : 5.3(1)
                                         Fw1: 5.4(2)
                                         Sw : 5.5(6a)
                                         Sw1: 5.5(6a)
         WS-F6K-PFC          SAD05020221 Hw : 1.1
3   48   WS-X6348-RJ-45      SAD04420N7B Hw : 1.4
                                         Fw : 5.4(2)
                                         Sw : 5.5(6a)
         WS-F6K-VPWR                     Hw : 1.0
4   24   WS-X6624-FXS        SAD050203M8 Hw : 3.0
                                         Fw : 5.4(2)
                                         Sw : 5.5(6a)
                                         HP : A00203010038; DSP : A003Q031 (3.6.
15)
6   8    WS-X6608-E1         SAD04380DW1 Hw : 1.1
                                         Fw : 5.4(2)
                                         Sw : 5.5(6a)
                                         HP1: D00403010044; DSP1: D005Q031 (3.6.
15)
                                         HP2: D00403010044; DSP2: D005Q031 (3.6.
15)
                                         HP3: D00403010044; DSP3: D005Q031 (3.6.
15)
                                         HP4: D00403010044; DSP4: D005Q031 (3.6.
15)
                                         HP5: D00403010044; DSP5: D005Q031 (3.6.
15)
                                         HP6: D00403010044; DSP6: D005Q031 (3.6.
15)
                                         HP7: D00403010044; DSP7: D005Q031 (3.6.
15)
                                         HP8: D00403010044; DSP8: D005Q031 (3.6.
15)

       DRAM                    FLASH                   NVRAM
Module Total   Used    Free    Total   Used    Free    Total Used  Free
------ ------- ------- ------- ------- ------- ------- ----- ----- -----
1       65408K  37340K  28068K  16384K  11546K   4838K  512K  198K  314K

Uptime is 127 days, 7 hours, 31
```

- Verify modules using the **show module** command. The following is sample output.

```
Console> (enable) sh module

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

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

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

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

- Verify the ports using the **show port** command. The following is sample output.

```
Console> (enable) sh port 6/1

Port  Name               Status     Vlan       Duplex Speed Type
----- ------------------ ---------- ---------- ------ ----- ------------
 6/1                     connected  1            full 2.048 E1

Port     DHCP    MAC-Address       IP-Address      Subnet-Mask
-------- ------- ----------------- --------------- ---------------
 6/1     enable  00-01-c9-d8-63-3e 10.1.1.104      255.255.255.0

Port     Call-Manager(s)   DHCP-Server     TFTP-Server     Gateway
-------- ----------------- --------------- --------------- ---------------
 6/1     10.1.1.2          10.1.1.2        10.1.1.2        10.1.1.7

Port     DNS-Server(s)     Domain
-------- ----------------- ------------------------------------------------
 6/1     -                 -

Port     CallManagerState DSP-Type
-------- ---------------- --------
 6/1     registered       C549

Port  NoiseRegen NonLinearProcessing
----- ---------- -------------------
 6/1  enabled    enabled
Console> (enable)
```

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