



Cisco Catalyst 6000 Series Gateway-PBX Interoperability: Nortel Meridian Option 11C PBX with CallManager using T1 PRI Signaling

This document describes the interoperability and configuration of a Cisco Catalyst 6000 series voice gateway with a Nortel Meridian Option 11C PBX with CallManager using 6608-T1 PRI. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

PBX Model	Nortel Meridian Option11C
PBX Release	Software Version Rel 25
Telephony Signaling	T1 PRI
Voice Gateway	Cisco Catalyst 6608
Gateway Release	IOS™ Version 5.5(6a)
Call Manager Release	3.1.1
VoX Protocol	MCCP

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Nortel Meridian Option 11C configuration
- Call Manager Configuration
- Cisco Catalyst 6608 Gateway Configuration

Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

Connectivity Diagrams

Basic Call Setup End-to-End Configuration

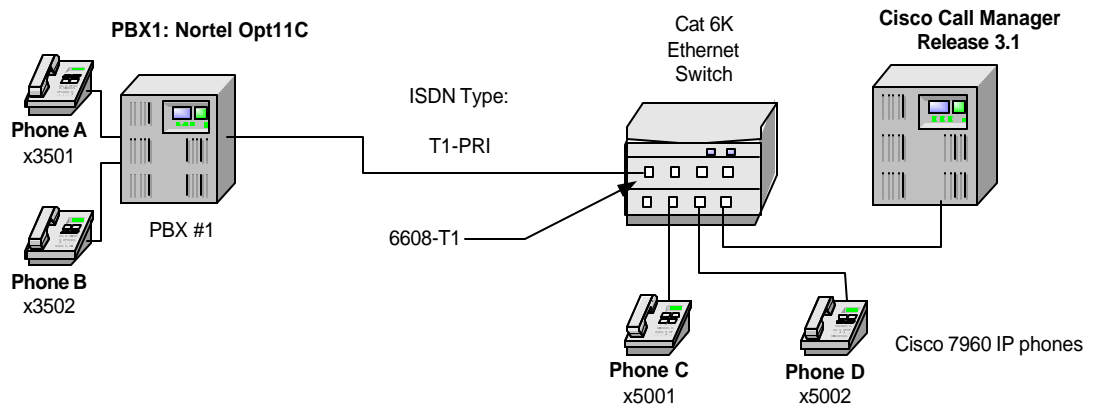


Figure 1: Test Configuration

Figure 1 represents the configuration used for testing: A Nortel Meridian Option 11C PBX connected to a Cisco Catalyst 6608 voice gateway via a T1 PRI connection.

Set Up Notes

- The Cisco 6608-T1 Gateway with ISDN protocol type setting of PRI supports both protocol sides by selecting network/user in the protocol side field when configuring the Gateway via CallManager.
- The Nortel Meridian Option 11C supports both “USER” (slave) and “NETWORK” (master) protocol sides.

Nortel Meridian Opt11C PBX Configuration

Nortel Meridian Option 11C PBX Version Information

- Software: Rel 25
- Hardware: NTAK09BA, 1.5 Mb DTI/PRI, Rel 02

Nortel Meridian Opt11C PBX Sample Configuration

Configure in the following sequence:

1. Configure Common Equipment
2. Configure D-Channel
3. Configure Route Data Block
4. Configure Trunk
5. Configure Coordinated Dialing Plan

Configure Common Equipment

```
>LD 22
PT2000
MARP NOT ACTIVATED
```

```
REQ PRT
TYPE CEQU
```

```
CEQU
```

```
MPED 8D
SUPL 000 004 008 012
      016 032 036 040
      044 048 064 068
      072
XCT 000
CONF 029 030 031 062
      094 095
```

```
DLOP NUM DCH FRM LCMT YALM T1TE TRSH
PRI 004 23 ESF B8S FDL - 00
     005 23 ESF B8S FDL - 00
```

```
MISP
```

```
REQ ****
>
```

Configure D-Channel

```
>LD 22
PT2000
MARP NOT ACTIVATED
```

```
REQ PRT
TYPE ADAN DCH 5
```

```
ADAN      DCH 5
  CTYP MSDL
  CARD 05
  PORT 1
  DES
  USR PRI
  DCHL 5
  OTBF 32
  PARM RS422 DTE
  DRAT 64KC
  CLOK EXT
  IFC NI2
    ISDN_MCNT 300
  CLID OPT0
  CO_TYPE STD
  SIDE NET
  CNEG 1
  RLS ID **
  RCAP ND2 COLP
  MBGA NO
  OVLR NO
  OVLS NO
  T310 120
  T200 3
  T203 10
  N200 3
  N201 260
  K 7
```

Configure Route Data Block

```
>LD 21
PT1000
```

```
REQ: PRT
TYPE: RDB
CUST 0
ROUT 105
```

```
TYPE RDB
CUST 00
DMOD
ROUT 105
DES NI2
TKTP DID
M911_ANI NO
M911_TONE NO
NPID_TBL_NUM 0
SAT NO
RCLS EXT
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
MODE PRA
```

```
IFC NI2
CBCR NO
NCOS 0
SBN NO
PNI 00001
NCNA YES
NCRD YES
CHTY BCH
CPFXS YES
CPUB OFF
DAPC NO
BCOT 0
INTC NO
DSEL VOD
PTYT PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
RANX NO
SRCH RRB
TRMB YES
STEP
ACOD 705
TCPP NO
PII NO
TARG 01
CLEN 1
BILN NO
OABS
INST
ICIS YES
TIMR ICF 512
      OGF 512
      EOD 13952
      NRD 10112
      DDL 70
      ODT 4096
      RGV 640
      FLH 510
      GRD 896
      SFB 3
      NBS 2048
      NBL 4096
      TFD 0
DRNG NO
CDR NO

PAGE 002

MUS NO
EQAR NO
OHQ NO
OHQT 00
TTBL 0
PLEV 2
MCTS NO
ALRM NO
ART 0
SGRP 0
AACR NO

REQ: ****
```

Configure Trunk

```
>LD 20

PT0000
MARP NOT ACTIVATED

REQ: PRT
TYPE: TNB
TN 5 1
DTC103

DATE
PAGE
DES

TN 005 01
TYPE DID
CDEN SD
CUST 0
TRK PRI
PDCA 1
PCML MU
NCOS 0
RTMB 105 1
B-CHANNEL SIGNALING
NITE
STRI/STRO OWK OWK
AST NO
IAPG 0
CLS UNR DTN CND WTA LPR APN THFD HKD
P10 VNL
TKID
DATE 8 MAR 2001
```

```
NACT ****
>
```

Configure Coordinated Dialing Plan

```
>LD 87
ESN000

MEM AVAIL: (U/P): 1302848   USED U P: 62313 27478   TOT: 1392639
DISK RECS AVAIL: 491
REQ PRT
CUST 0
FEAT CDP
TYPE DSC
DSC 50
DSC 50
FLEN 0
DSP LSC
RLI 5
NPA
NXX

MEM AVAIL: (U/P): 1302848   USED U P: 62313 27478   TOT: 1392639
DISK RECS AVAIL: 491
REQ ****

>
OVL000
```

>LD 86
ESN000

MEM AVAIL: (U/P): 1302848 USED U P: 62313 27478 TOT: 1392639

DISK RECS AVAIL: 491

REQ PRT

CUST 0

FEAT RLB

RLI 5

RLI 5

ENTR 0

LTER NO

ROUT 105

TOD 0 ON 1 ON 2 ON 3 ON

4 ON 5 ON 6 ON 7 ON

CNV NO

EXP NO

FRL 0

DMI 0

FCI 0

FSNI 0

SBOC NRR

OHQ NO

CBQ NO

ISET 0

NALT 5

MFRL 0

OVLL 0

MEM AVAIL: (U/P): 1302848 USED U P: 62313 27478 TOT: 1392639

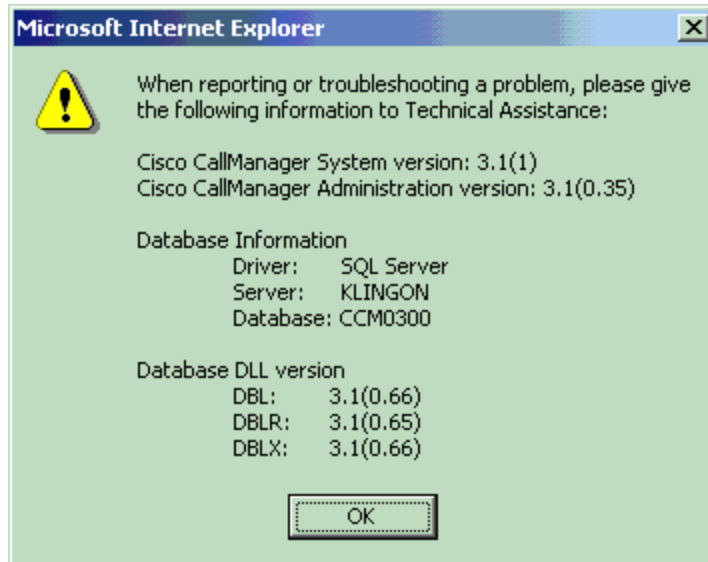
DISK RECS AVAIL: 491

REQ ****

>

Call Manager Configuration

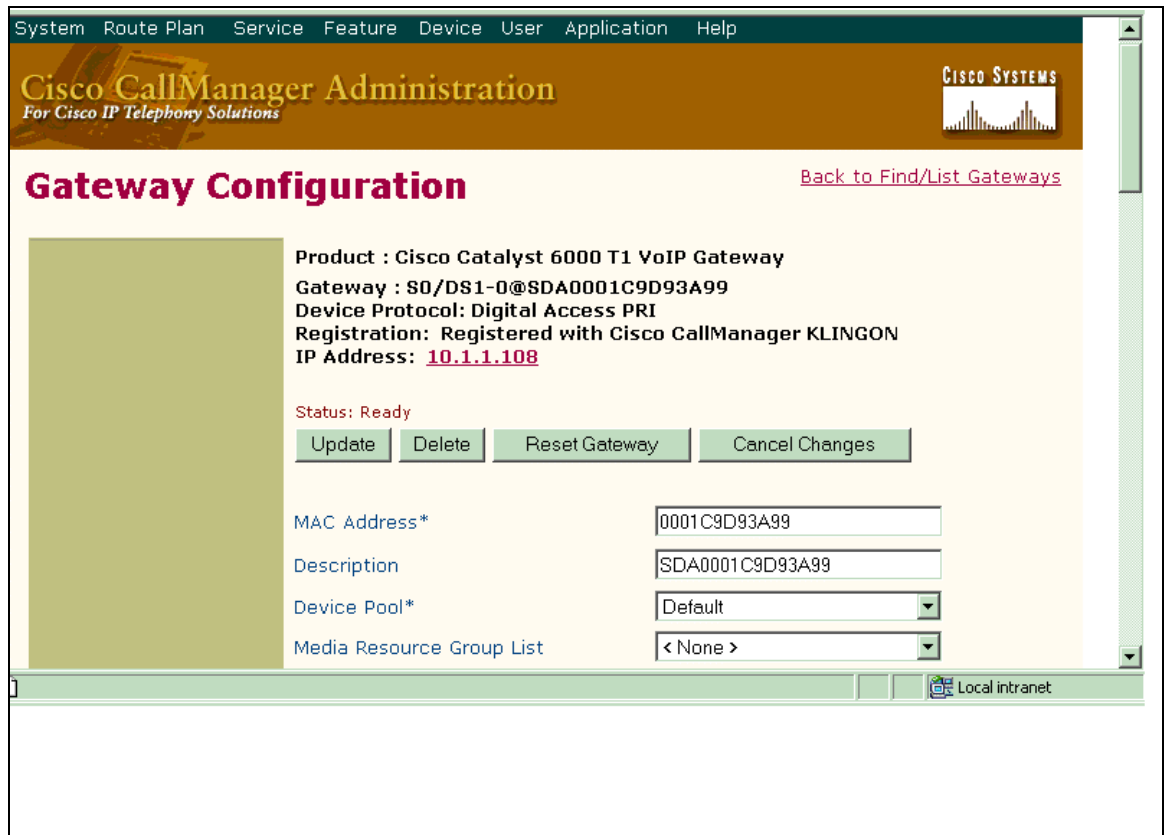
Call Manager Version Information



Cisco Catalyst 6608 Gateway Configuration

The following is the configuration of the Cisco Catalyst 6608 voice gateway connected to the Nortel Meridian Option 11C PBX T1 PRI NI-2 interface.

Cisco Catalyst 6608 Voice Gateway Version Information



The screenshot shows the Cisco CallManager Administration interface for Gateway Configuration. The page title is "Gateway Configuration" and it includes a "Back to Find/List Gateways" link. The configuration details are as follows:

Product :	Cisco Catalyst 6000 T1 VoIP Gateway
Gateway :	S0/DS1-0@SDA0001C9D93A99
Device Protocol:	Digital Access PRI
Registration:	Registered with Cisco CallManager KLINGON
IP Address:	10.1.1.108

Status: Ready

Update Delete Reset Gateway Cancel Changes

MAC Address*	0001C9D93A99
Description	SDA0001C9D93A99
Device Pool*	Default
Media Resource Group List	< None >


Local intranet

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

Restart succeeded. Local intranet

Delay between restarts (1/8 sec ticks)	4
Num Digits*	23
Sig Digits	<input checked="" type="checkbox"/>
Prefix DN	
Presentation Bit*	Allowed
Called party IE number type unknown*	Cisco CallManager
Calling party IE number type unknown*	Cisco CallManager
Called Numbering Plan*	Cisco CallManager
Calling Numbering Plan*	Cisco CallManager
PRI Protocol Type*	PRI NI2
Inhibit restarts at PRI initialization	<input checked="" type="checkbox"/>
Enable status poll	<input type="checkbox"/>
Number of digits to strip*	0
Country Code*	North America
Setup non-ISDN Progress Indicator IE Enable***	<input type="checkbox"/>

Local intranet

Product Specific Configuration 	
Clock Reference*	Network
TX-Level CSU*	0dB
FDL Channel*	ATT 54016
Framing*	ESF
Audio Signal Adjustment into IP Network*	NoDbPadding
Audio Signal Adjustment from IP Network*	NoDbPadding
Yellow Alarm*	Bit2
Zero Suppression*	B8ZS

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

[Back to Find/List Gateways](#)

Local intranet

Route Pattern Configuration

The screenshot displays the Cisco CallManager Administration web interface. At the top, there is a navigation menu with items: System, Route Plan, Service, Feature, Device, User, Application, and Help. Below the menu is a header banner with the text "Cisco CallManager Administration For Cisco IP Telephony Solutions" and the Cisco Systems logo. The main heading is "Route Pattern Configuration".

On the right side, there are two links: "Add a New Route Pattern" and "Back to Find/List Route Patterns".

The configuration details for the route pattern "6.XXXX" are as follows:

- Route Pattern:** 6.XXXX
- Status:** Ready
- Note:** Any update to this route pattern automatically resets the associated gateway/route list
- Buttons:** Copy, Update, Delete, Cancel Changes
- Pattern Definition:**
 - Route Pattern*:** 6.XXXX
 - Partition:** < None >
 - Numbering Plan*:** North American Numbering Plan
 - Route Filter:** < None >
 - Gateway/Route List*:** S0/DS1-0@SDA0001C9D93A99 (Edit)
 - Route Option:** Route this pattern Block this pattern

The browser window title bar at the bottom shows "Local intranet".

Route Pattern*	<input type="text" value="6.XXX"/>
Partition	< None >
Numbering Plan*	North American Numbering Pl
Route Filter	< None >
Gateway/Route List*	S0/DS1-0@SDA0001C9D93A99 (Edit)
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern
	<input checked="" type="checkbox"/> Provide Outside Dial Tone <input type="checkbox"/> Urgent Priority
Calling Party Transformations	
	<input type="checkbox"/> Use Calling Party's External Phone Number Mask
Calling Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
Called Party Transformations	
Discard Digits	PreDot
Called Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
* indicates required item.	

Cisco Catalyst 6608 Voice Gateway Sample Configuration

The following is the configuration of the Cisco Catalyst 6608 voice gateway connected to the Nortel Meridian Option 11C PBX T1 PRI NI-2 interface.

```

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

System Bootstrap Version: 5.3(1)

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

Mod Port Model Serial # Versions
-----
1 2 WS-X6K-SUP1A-2GE SAD05010NBK Hw : 7.0
Fw : 5.3(1)
Fw1: 5.4(2)
Sw : 5.5(6a)
Sw1: 5.5(6a)
3 48 WS-F6K-PFC SAD05020221 Hw : 1.1
WS-X6348-RJ-45 SAD04420N7B Hw : 1.4
Fw : 5.4(2)
Sw : 5.5(6a)
4 24 WS-F6K-VPWR Hw : 1.0
WS-X6624-FXS SAD050203M8 Hw : 3.0
Fw : 5.4(2)
Sw : 5.5(6a)
HP : A00203010010; DSP : A003E031 (3.3.
  
```

```

32)
5 8 WS-X6608-T1 SAD04400EM0 Hw : 1.1
                               Fw : 5.4(2)
                               Sw : 5.5(6a)
                               HP1: D00403010017; DSP1: D005E031 (3.3.
32)
                               HP2: D00403010017; DSP2: D005E031 (3.3.
32)
                               HP3: D00403010017; DSP3: D005E031 (3.3.
32)
                               HP4: D00403010017; DSP4: D005E031 (3.3.
32)
                               HP5: D00403010017; DSP5: D005E031 (3.3.
32)
                               HP6: D00403010017; DSP6: D005E031 (3.3.
32)
                               HP7: D00403010017; DSP7: D005E031 (3.3.
32)
                               HP8: D00403010017; DSP8: D005E031 (3.3.
32)
6 8 WS-X6608-E1 SAD04380DW1 Hw : 1.1
                               Fw : 5.4(2)
                               Sw : 5.5(6a)
                               HP1: D00403010017; DSP1: D005E031 (3.3.
32)
                               HP2: D00403010017; DSP2: D005E031 (3.3.
32)
                               HP3: D00403010017; DSP3: D005E031 (3.3.
32)
                               HP4: D00403010017; DSP4: D005E031 (3.3.
32)
                               HP5: D00403010017; DSP5: D005E031 (3.3.
32)
                               HP6: D00403010017; DSP6: D005E031 (3.3.
32)
                               HP7: D00403010017; DSP7: D005E031 (3.3.
32)
                               HP8: D00403010017; DSP8: D005E031 (3.3.
32)

```

Module	DRAM			FLASH			NVRAM		
	Total	Used	Free	Total	Used	Free	Total	Used	Free
1	65408K	37863K	27545K	16384K	11546K	4838K	512K	198K	314K

Uptime is 83 days, 2 hours, 34 minutes
Console> (enable)

```

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

```

```

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

```

6 SAD04380DW1

```

Mod  MAC-Address(es)                Hw      Fw      Sw
-----
1    00-04-c0-f8-42-02 to 00-04-c0-f8-42-03  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)
5    00-01-c9-d9-3a-98 to 00-01-c9-d9-3a-9f  1.1     5.4(2)  5.5(6a)
6    00-01-c9-d8-63-3e to 00-01-c9-d8-63-45  1.1     5.4(2)  5.5(6a)

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

```

```

Console> (enable) sh port 5
Port  Name                Status      Vlan      Duplex  Speed  Type
-----
5/1   -                    notconnect  1         full    1.544  T1
5/2   -                    connected  1         full    1.544  T1
5/3   -                    notconnect  1         full    1.544  T1
5/4   -                    notconnect  1         full    1.544  T1
5/5   -                    notconnect  1         full    1.544  T1
5/6   -                    notconnect  1         full    1.544  T1
5/7   -                    notconnect  1         full    1.544  T1
5/8   -                    notconnect  1         full    1.544  T1

```

```

Port      DHCP      MAC-Address      IP-Address      Subnet-Mask
-----
5/1       enable   00-01-c9-d9-3a-98 10.1.1.107      255.255.255.0
5/2       enable   00-01-c9-d9-3a-99 10.1.1.108      255.255.255.0
5/3       enable   00-01-c9-d9-3a-9a 10.1.1.109      255.255.255.0
5/4       enable   00-01-c9-d9-3a-9b 10.1.1.110      255.255.255.0
5/5       enable   00-01-c9-d9-3a-9c 10.1.1.111      255.255.255.0
5/6       enable   00-01-c9-d9-3a-9d 10.1.1.112      255.255.255.0
5/7       enable   00-01-c9-d9-3a-9e 10.1.1.113      255.255.255.0
5/8       enable   00-01-c9-d9-3a-9f 10.1.1.114      255.255.255.0

```

```

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

```

```

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

```

```

Port      CallManagerState DSP-Type
-----

```



```
5/1    registered    C549
5/2    registered    C549
5/3    registered    C549
5/4    registered    C549
5/5    registered    C549
5/6    registered    C549
5/7    registered    C549
5/8    registered    C549
```

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

Caveats

- Calling Name delivery and presentation features are not supported by the Nortel Meridian Option 11C PBX NI-2.
- When configuring Cisco 6608 Gateway to emulate User side (Nortel emulate Network side), make sure that the “Display IE Delivery” box is NOT checked, otherwise calls will not be completed. Nortel Meridian Option 11C PBX NI-2 complains about the Display information being sent in the “SETUP” message from CallManager by sending STATUS message with cause of “IE non-existent/unimplemented”.
- When calling from Cisco 7960 IP phone to Nortel Meridian Option 11C digital phone, Calling/Called Number is displayed on both phones after the call is answered as expected.
- When calling from Nortel Meridian digital phone to Cisco 7960 IP phone, IP phone displays Connected Number after the call is answered. The Nortel phone however does NOT get updated when the call is answered. It displays the trunk name.