



Cisco 6608-T1 PRI DMS-100 Gateway Interoperability with Nortel Meridian Opt11C PBX with CallManager

This document describes the interoperability and configuration of a Cisco Catalyst 6608 series voice gateway with a Nortel Meridian Opt11C PBX using T1 PRI DMS-100I signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

| | |
|-----------------------------|--|
| PBX Model | Nortel Meridian Opt11C |
| PBX Release | 24 |
| Telephony Signaling | T1 PRI DMS-100 |
| Voice Gateway | Cisco Catalyst 6608 series voice gateway |
| Gateway Release | 5.5(6a) |
| Call Manager Release | 3.1.1 |
| VoX Protocol | MGCP |

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Nortel Meridian Opt11C PBX Configuration
- CallManager Configuration
- Cisco Catalyst 6608 Gateway Configuration

Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

Connectivity Diagrams

Figure 1: Test Configuration

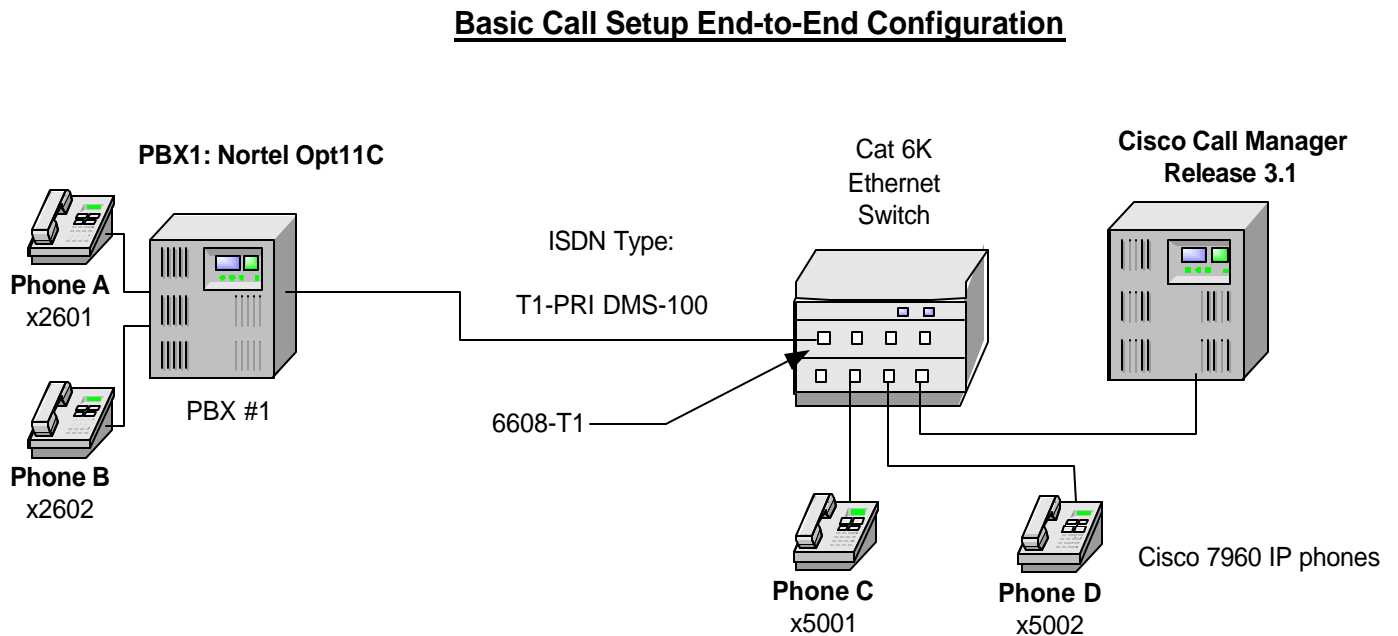


Figure 1 represents the configuration used for testing: a Nortel Meridian Opt 11C PBX through an ISDN T1 PRI link to a Cisco 6608-T1 Gateway.

Set Up Notes

- The Cisco 6608-T1 Gateway with ISDN protocol type setting of **PRI DMS-100** supports both protocol sides by selecting “Network/User” in the protocol side field when configuring the Gateway via CallManager.
- The Nortel Meridian Opt11C supports “User” side only when switch type is set to DMS-100. Therefore, the Cisco 6608 Gateway should be configured to emulate “Network” side. This USER choice is set on the Nortel by using LD 17.
- The Nortel configuration screen for the T1 trunk interface is reached using LD 17, setting the common equipment parameters (CEQU).

Nortel Meridian Opt11C PBX Configuration

Nortel Meridian Opt11C PBX Version Information

- Software: Version 2111 release 24 Issue 24
- Hardware: NTA09BA, 1.5 Mb DTI/PRI, Release 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 003 24 ESF B8S FDL - 00
    004 24 ESF B8S FDL - 00
    005 24 ESF B8S FDL - 00
    006 24 ESF B8S FDL - 00

DTI2
MISP

REQ ****
>
```

Configure D-Channel

```
>ld 22
PT2000
MARP NOT ACTIVATED

REQ prt
TYPE adan dch 4
ADAN DCH 4
  CTYP MSDL
  CARD 04
  PORT 1
  DES DMS100
  USR PRI
  DCHL 4
  OTBF 32
  PARM RS422 DTE
  DRAT 64KC
  CLOK EXT
```

```
IFC D100
SIDE USR
CNEG 1
RLS ID **
RCAP ND2
MBGA NO
OVLN NO
OVLS NO
T200 3
T203 10
N200 3
N201 260
K 7
```

REQ ****

Configure Route Data Block

```
>ld 21

PT1000
REQ: prt
TYPE: rdb

CUST 0
ROUT 104
TYPE RDB
CUST 00
DMOD
ROUT 104
DES DMS100
TKTP TIE
ESN NO
CNVT NO
SAT NO
RCLS EXT
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
    MODE PRA
    IFC D100
    SBN NO
    PNI 00000
    NCNA YES
    NCRD NO
    CHTY BCH
    CTYP UKWN
    INAC NO
    ISAR NO
    DAPC NO
    BCOT 0
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH RRB
TRMB YES
STEP
ACOD 704
TCPP NO
PII NO
TARG 01
CLN 1
BILN NO
OABS
INST
ANTK
SIGO STD
ICIS YES
```

TIMR ICF 512
OGF 512
EOD 13952
NRD 10112
DDL 70
ODT 4096
RGV 640
GRD 896
SFB 3
NBS 2048
NBL 4096
TFD 0

DRNG NO
CDR NO
MUS NO
OHQ NO
OHQT 00

PAGE 002

CBQ NO
AUTH NO
TTBL 0
PLEV 2
ALRM NO
ART 0
SGRP 0
AACR NO

REQ: ****
>

Configure Trunk

>ld 20
PT0000
MARP NOT ACTIVATED

REQ: prt
TYPE: tnb
TN 4 1
DATE
PAGE
DES

TN 004 01
TYPE TIE
CDEN SD
CUST 0
TRK PRI
PDCA 1
PCML MU
NCOS 0
RTMB 104 1
B-CHANNEL SIGNALING
TGAR 1
AST NO
IAPG 0
CLS UNR DTN CND WTA LPR APN THFD HKD
P10 VNL

TKID
DATE 25 JUL 2001

NACT ****
>

Configure Coordinated Dialing Plan

Coordinated Dialing Plan Configuration

>ld 87

ESN000

MEM AVAIL: (U/P): 1288248 USED U P: 96449 89862 TOT: 1474559
DISK RECS AVAIL: 485
REQ prt
CUST 0
FEAT cdp
TYPE dsc
DSC 5001
DSC 5001
FLEN 0
DSP LSC
RLI 18

MEM AVAIL: (U/P): 1288248 USED U P: 96449 89862 TOT: 1474559
DISK RECS AVAIL: 485
REQ ****
>
OVL000

>ld 86

ESN000

MEM AVAIL: (U/P): 1288063 USED U P: 96449 90047 TOT: 1474559
DISK RECS AVAIL: 485
REQ prt

CUST 0
FEAT rlb
RLI 18
RLI 18
ENTR 0
LTER NO
ROUT 104
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): 1288063 USED U P: 96449 90047 TOT: 1474559
DISK RECS AVAIL: 485
REQ ****
>

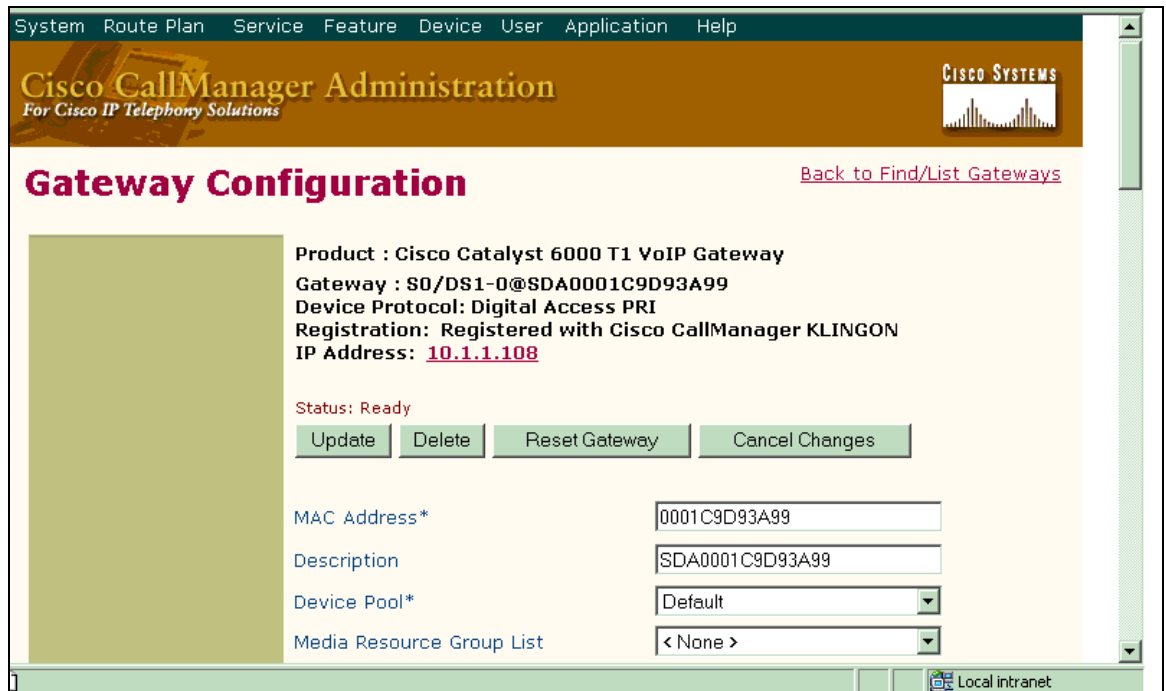
CallManager Configuration

Use the Cisco CallManager Administration program and the following information to configure the Cisco CallManager.

CallManager Version Information

Cisco CallManager System Version: 3.1.1

Cisco Catalyst 6608 Gateway Configuration



The screenshot shows 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 content area is titled "Gateway Configuration" and includes a link "Back to Find/List Gateways". The configuration details for a gateway 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](#)

The status is "Ready". Below this, there are four buttons: Update, Delete, Reset Gateway, and Cancel Changes. At the bottom, there are four input fields:

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

The bottom of the page shows a status bar with "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* | Network |
| 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 checked="" 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 DMS-100 |
| 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"/> |

Restart succeeded. 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

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Route Pattern Configuration

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

Route Pattern: 6.XXXX

Status: Ready
Note: Any update to this route pattern automatically resets the associated gateway/route list

Pattern Definition

Route Pattern*

Partition

Numbering Plan*

Route Filter

Gateway/Route List* [\(Edit\)](#)

Route Option Route this pattern Block this pattern

Local intranet

Route Pattern*

Partition

Numbering Plan*

Route Filter

Gateway/Route List* [\(Edit\)](#)

Route Option Route this pattern Block this pattern

Provide Outside Dial Tone Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Called Party Transformations

Discard Digits

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

* indicates required item.

Local intranet

Cisco Catalyst 6608 Gateway Configuration

The following is the configuration of the Cisco Catalyst 6608 voice gateway connected to the Nortel Meridian Opt11C PBX interface.

Cisco Catalyst 6608 Voice Gateway Version Information

Hardware (Gateway): Cisco Catalyst 6608 T1 Port

Cisco Catalyst 6608 Voice Gateway Sample Configuration

```

Console> 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 SAD050203M8 Hw : 1.0
WS-X6624-FXS Hw : 3.0
Fw : 5.4(2)
Sw : 5.5(6a)
5 8 WS-X6608-T1 SAD04400EM0 HP : A00203010007; DSP : A003C031 (3.3.30)
Hw : 1.1
Fw : 5.4(2)
Sw : 5.5(6a)
HP1: D00403010013; DSP1: D005C031 (3.3.30)
HP2: D00403010013; DSP2: D005C031 (3.3.30)
HP3: D00403010013; DSP3: D005C031 (3.3.30)
HP4: D00403010013; DSP4: D005C031 (3.3.30)
HP5: D00403010013; DSP5: D005C031 (3.3.30)
HP6: D00403010013; DSP6: D005C031 (3.3.30)
HP7: D00403010013; DSP7: D005C031 (3.3.30)
HP8: D00403010013; DSP8: D005C031 (3.3.30)
6 8 WS-X6608-E1 SAD04380DW1 Hw : 1.1
Fw : 5.4(2)
Sw : 5.5(6a)
HP1: D00403010013; DSP1: D005C031 (3.3.30)
HP2: D00403010013; DSP2: D005C031 (3.3.30)
HP3: D00403010013; DSP3: D005C031 (3.3.30)
HP4: D00403010013; DSP4: D005C031 (3.3.30)
HP5: D00403010013; DSP5: D005C031 (3.3.30)
HP6: D00403010013; DSP6: D005C031 (3.3.30)
HP7: D00403010013; DSP7: D005C031 (3.3.30)
HP8: D00403010013; DSP8: D005C031 (3.3.30)

Module DRAM FLASH NVRAM
Total Used Free Total Used Free Total Used Free
-----
1 65408K 37527K 27881K 16384K 11546K 4838K 512K 198K 314K

```

Uptime is 22 days, 23 hours, 13 minutes
Console>

Console> **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 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 | 7.0 | 5.3(1) | 5.5(6a) |
| 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>

Console> **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>

```

Caveats

- Calling Name delivery and presentation features are supported by the Nortel PBX as of Release 24 for DMS-100 switch-type.
- The Nortel Meridian Opt11C supports “User” side only when the switch type is set to DMS-100. Therefore, Cisco 6608 Gateway should be configured to emulate “Network” side.
- When calling from a Cisco 7960 IP phone to a Nortel digital phone, Calling/Called Name and Number are displayed on both phones after the call is answered as expected.
- When calling from a Nortel digital phone to a Cisco 7960 IP phone, the IP phone displays Connected Name and Number after the call is answered. The Nortel phone however does not get updated when the call is answered. It displays the numbers being dialed instead (i.e. Access Code + extension number).