



Nortel Communication Server 1000M Release 4.0 using T1 PRI DMS-100 to Cisco CallManager Release 4.1(3)

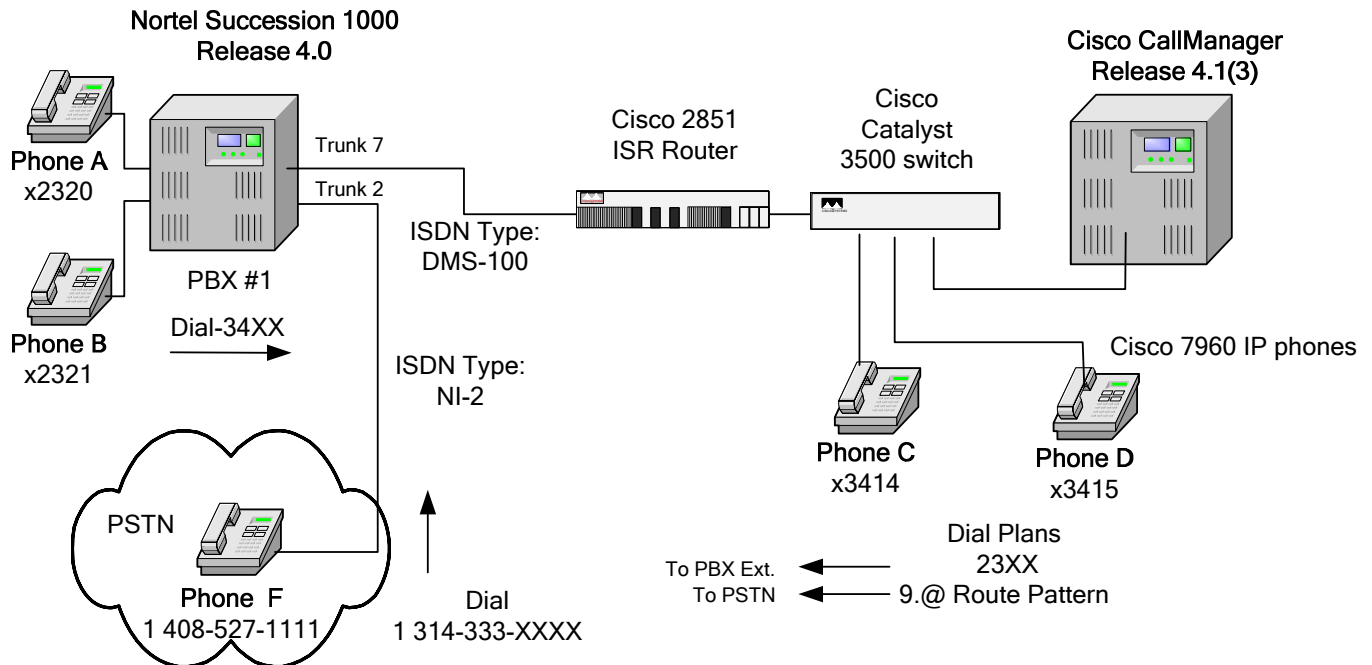
Introduction

- This is an application note for interoperability connectivity of Nortel Communication Server 1000 (formerly known as Succession 1000) PBX with Cisco CallManager Release 4.1(3) using a Cisco 2851 MGCP Gateway configured with T1 PRI DMS-100 switch-type.
- The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability between the Nortel CS1000 PBX and Cisco CallManager using ISDN PRI DMS-100 switch-type protocol.
- Cisco CallManager must be configured as ISDN network-side signaling since Nortel CS1000 PBX only allows for ISDN user-side signaling for PRI DMS-100 switch-type protocol.
- Basic calls worked fine in both directions with calling/connected name feature. Both CCM and Nortel use the DISPLAY IE with the ISDN signaling messages to pass the phone's name information across to each other. Please ensure the **Display IE Delivery**, **Send Extra Leading Character In DisplayIE** and **MCDN Channel Number Extension Bit Set to Zero** boxes are all checked.
- CCM does not support ISDN Overlapping Sending/Receiving feature with DMS-100 switch-type protocol.

Network Topology

Figure 1. Network Topology or Test Setup

Basic Call Setup End-to-End Configuration



Limitations

- Both Cisco CallManager and Nortel PBX support the passing of calling/called party name information across to each other. However, Nortel does not send out additional ISDN Notify message to update the display information once the call have entered the Connected state. Therefore, for call scenarios such as Call Transfer and Call Forward, called name information does not get updated on the originating side after the call-transfer/call-forward is completed when if Nortel PBX is the transferring/forwarding node.
- Cisco CallManager support the passing of the Connected Number IE within the ISDN Notify message during the Alerting or Connected state of the call, however, Nortel PBX doesn't support this feature. This is an optional information element for DMS-100 switch-type protocol.
- For CLIR and CNIR features, both CCM and Nortel PBX just omit the sending of the Display IE information completed from the ISDN signaling messages. The reason is that the Display IE field doesn't have any Presentation Bit indicator value associated with it.
- Cisco CallManager must have the **Display IE Delivery**, **Send Extra Leading Character In DisplayIE** and **MCDN Channel Number Extension Bit Set to Zero** boxes are all checked under the Gateway Configuration web page.
- The Nortel Meridian Opt11C supports "User" side only when switch type is set to DMS-100 but will support both User-side and Network-side when switch type is set to S100. Therefore, the Cisco CallManager should be configured as ISDN network-side signaling and ISDN user-side signaling for Nortel when ISDN PRI DMS-100 switch-type is used.
- CCM does not support ISDN Overlapping Sending/Receiving feature with DMS-100 switch-type protocol.



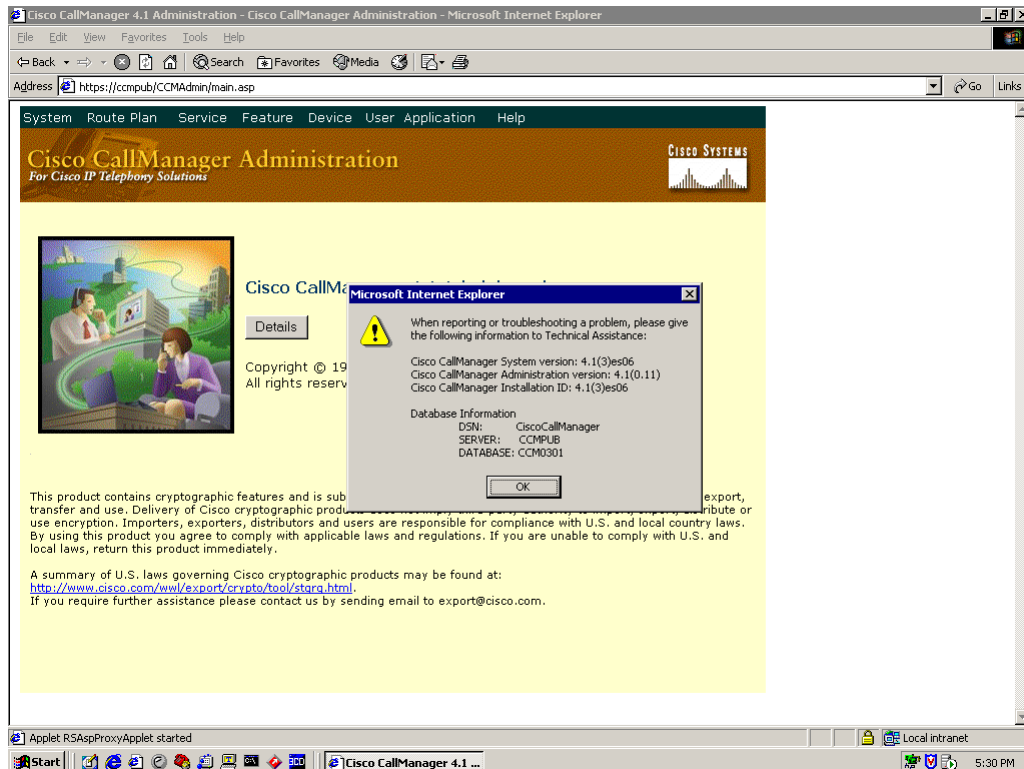
System Components

Hardware Requirements

- Cisco CallManager MCS server, Cisco 2851 ISR router and Cisco 7960 IP phones
- Nortel Communication System 1000 (which includes Call Server, Signaling Server and Media gateway) and Nortel's 2616 digital phones

Software Requirements

- Cisco CallManager Release 4.1(3)



- Nortel Succession 4.0 Release

>ld 22
PT2000

REQ iss

CALL SERVER/MAIN CAB
VERSION 2121
RELEASE 4
ISSUE 00 T +
IDLE_SET_DISPLAY NORTEL

- Cisco IOS Software for 2851 ISR Router: c2800nm-ipvoicek9-mz.124-1a.bin



Features

- CLIP-Calling Line (Number) Identification Presentation (Please see the Limitation section)
- CLIR-Calling Line (Number) Identification Restriction (Please see the Limitation section)
- CNIP-Calling Name Identification Presentation (Please see the Limitation section)
- CNIR-Calling Name Identification Restriction (Please see the Limitation section)
- Alerting Name

Not Supported Features

- COLP-Connected Line (Number) Identification Presentation (Please see the Limitation section)
- COLR- Connected Line (Number) Identification Restriction
- CONP-Connected Name Identification Presentation (Please see the Limitation section)
- CONR-Connected Name Identification Presentation
- MWI- Message Waiting Indication (lamp ON, lamp OFF) across the T1 PRI DMS-100 Trunk

Configuration

Nortel Communication Server 1000 PBX Configuration Sequence and Tasks

Call Server Setup via SSC card console

1. LD 17 – Configure the Common Equipment (CEQU) on the Call Server
2. LD 17 – Configure the D-channel signaling for T1 PRI and PSTN PRI
3. LD 16 – Configure the Route Data Block for the T1 PRI and PSTN PRI
4. LD 14 – Configure the Trunks Data Block for the PRI and PSTN PRI
5. LD 86 – Configure the Route List Block for the T1 PRI and PSTN PRI
6. LD 87 – Configure CDP steering codes
7. LD 90 – Configure AC1 for Tandem Trunk calls
8. LD 11 – Configure the Nortel 2616 digital phones

Cisco CallManager Setup

1. Add an MGCP gateway for the Cisco 2851 ISR router with T1 PRI to Nortel CS1000 PBX under the Device pull-down menu
2. Add a Route Pattern to reach the Nortel's phone DN extensions and to access PSTN via the Nortel PBX
3. Configure Cisco 7960 phone and line DN
4. Configure the Cisco 2851 ISR router to communicate with Cisco CallManager using MGCP protocol

Configuration Menus and Commands

Nortel Communication Server 1000 (CS1000) Call Server Configuration

1. LD 17 – Configure the Common Equipment (CEQU) on the Call Server

```
>ld 22
```

```
PT2000
```

```
REQ prt
```

```
TYPE cequ
```

```
CEQU
```

```
MPED 8D
```



```
SUPL 000 004 008 012
      016 032 036 040
      044 048 064 068
      072 V096 V100
TDS 000
CONF 029 030 031 062
      094 095
```

```
DLOP NUM DCH FRM TMDI LCMT YALM T1TE TRSH
  PRI 02 24 ESF NO B8S FDL - 00 → PSTN NI-2 PRI line
      06 23 ESF NO B8S FDL - 00
      07 23 ESF NO B8S FDL - 00 → CCM DMS-100 PRI line
PRI2 04 05
DTI2
MISP
```

2. LD 17 – Configure the D-channel Signaling for T1 PRI and PSTN PRI

```
REQ prt
TYPE adan dch 7
```

```
ADAN DCH 7 → Assign tag 7 to the dchannel
CTYP MSDL → MSDL card type
CARD 07 → MSDL card located in slot 7
PORT 1
DES dms100
USR PRI
DCHL 7 → Slot7, D-channel to Cisco CallManager
OTBF 32
PARM RS422 DTE
DRAT 64KC → 64K clear channel for the d-channel
CLOK EXT
IFC D100 → DMS-100 Switchtype
SIDE USR → user-side signaling
CNEG 1
RLS ID **
RCAP ND2 → Name Display Method 2
MBGA NO
```



OVLR NO
OVLS NO
T200 3
T203 10
N200 3
N201 260
K 7

REQ prt
TYPE adan dch 12

ADAN	DCH 12	→ Assign tag 12 to the d-channel
CTYP	MSDL	→ MSDL card type
CARD	02	→ MSDL card located in slot 2
PORT	1	
DES	T1_NI2	
USR	PRI	
DCHL	2	→ slot2, D-channel to the PSTN
OTBF	32	
PARM	RS422 DTE	
DRAT	64KC	→ 64K clear channel
CLOK	EXT	
IFC	NI2	→ NI-2 switchtype protocol
ISDN_MCNT	300	
CLID	OPT0	→ Caller id type
CO_TYPE	STD	→ Central Office switch type, Bellcore standard
SIDE	USR	→ user-side signaling
CNEG	1	
RLS	ID **	
RCAP	COLP NDS	→ Connection Line Presentation (COLP), NI-2 Name Display (NDS)
MBGA	NO	
OVLR	NO	
OVLS	NO	
T310	120	
T200	3	
T203	10	
N200	3	



```
N201 260
K 7
BSRV NO
```

REQ

3. LD 16 – Configure the Route Data Block for the T1 PRI and PSTN PRI

```
>ld 21
PT1000
```

```
REQ: prt
TYPE: rdb
CUST 0
ROUT 107
```

```
TYPE RDB
CUST 00
DMOD
```

ROUT 107 → **Route Data Block to Cisco CallManager**

```
DES D100
```

TKTP TIE → **Tie-line trunk type**

```
NPID_TBL_NUM 0
```

```
ESN NO
```

```
CNVT NO
```

```
SAT NO
```

```
RCLS EXT
```

```
VTRK NO
```

```
NODE
```

DTRK YES → **Digital Trunk**

```
BRIP NO
```

DGTP PRI → **ISDN PRI Digital Trunk Type for the route**

```
ISDN YES
```

```
MODE PRA
```

IFC D100 → **ISDN DMS-100 switchtype**

```
SBN NO
```

```
PNI 00001
```

NCNA YES → **Network Calling Name Allow**



NCRD YES	→ Network Redirecting Name Allow
CHTY BCH	→ Channel Type = B-channel
CTYP UKWN	
INAC NO	
ISAR NO	
CPUB OFF	
DAPC NO	
BCOT 0	
DSEL VOD	→ Data Select = Voice or Data (VOD)
PTYP PRI	
AUTO NO	
DNIS NO	
DCCR NO	
ICOG IAO	→ Incoming and Outgoing Trunk
SRCH RRB	→ Round-ribbon search order
TRMB YES	→ Trombone call allow
STEP	
ACOD 207	→ Trunk Access code
TCPP NO	
PII NO	
TARG 01	
CLEN 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

IENB 5

PAGE 002

TFD 0

VSS 0

VGD 6

DRNG NO

CDR NO

VRAT NO

MUS NO

FRL 0 0

FRL 1 0

FRL 2 0

FRL 3 0

FRL 4 0

FRL 5 0

FRL 6 0

FRL 7 0

OHQ NO

OHQT 00

CBQ NO

AUTH NO

TTBL 0

ATAN NO

PLEV 2

ALRM NO

ART 0

SGRP 0

AACR NO

REQ:



>ld 21

PT1000

REQ: prt

TYPE: rdb

CUST 0

ROUT 102

TYPE RDB

CUST 00

DMOD

ROUT 102

→ Route Data Block to the PSTN Switch

DES T1_NI2

TKTP DID

→ Direct-Inward-Dial trunk type

NPID_TBL_NUM 0

SAT NO

RCLS EXT

VTRK NO

NODE

DTRK YES

→ Digital Trunk

BRIP NO

DGTP PRI

→ ISDN PRI Digital Trunk type

ISDN YES

MODE PRA

IFC NI2

→ ISDN NI-2 switchtype

CBCR NO

NCOS 0

SBN NO

PNI 00000

NCNA YES

→ Network Calling Name Allow

NCRD YES

→ Network Redirecting Name Allow

CHTY BCH

→ Channel Type = B-channel

CPFXS YES

CPUB OFF

DAPC NO

BCOT 0

INTC NO



DSEL VOD → Data Selection = Voice or Data (VOD)
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO → Incoming and Outgoing Trunk
RANX NO
SRCH RRB → Round-ribbon search order
TRMB YES → Trombone call allow
STEP
ACOD 202 → Trunk Access code
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

IENB 5
VSS 0

PAGE 002



```
        VGD  6
DRNG NO
CDR  NO
VRAT NO
MUS  NO
EQAR NO
FRL  0 0
FRL  1 0
FRL  2 0
FRL  3 0
FRL  4 0
FRL  5 0
FRL  6 0
FRL  7 0
OHQ  NO
OHQT 00
TTBL  0
ATAN NO
PLEV  2
MCTS NO
ALRM NO
ART   0
SGRP  0
AACR NO
```

```
REQ: ****
```

4. LD 14 – Configure the Trunk Data Block for the T1 PRI and PSTN PRI

```
>ld 20
```

```
PT0000
```

```
REQ: prt
```

```
TYPE: tnb
```

```
TN  7 1
```

➔ **Trunk Data Block for T1 PRI to Cisco CallManager**

```
DATE
```

```
PAGE
```



DES

DES D100

TN 007 01 → Terminal Number, need to configure 23 TNs(one for each b-ch)

TYPE TIE

CDEN SD

CUST 0

TRK PRI

PDCA 1

PCML MU → u-law encoding scheme

NCOS 0

RTMB 107 1 → Route Number and Member number

B-CHANNEL SIGNALING

TGAR 0

AST NO

IAPG 0

CLS **UNR DTN** WTA LPR APN THFD HKD → UNR = Unrestricted Digital, DTN = Digitone

P10 VNL

TKID

AACR NO

DATE 31 MAY 2005

NACT



>ld 20

PT0000

REQ: prt

TYPE: tnb

TN 2 1

➔ **Trunk Data Block for T1 PRI to the PSTN**

DATE

PAGE

DES

DES T1_NI2

TN 002 01

➔ **Terminal Number, need to configure 23 TNs(one for each b-ch)**

TYPE DID

➔ **Direct-Inward-Dial Trunk Type**

CDEN SD

CUST 0

TRK PRI

PDCA 1

PCML MU

NCOS 0

RTMB 102 1

➔ **Route Number and Member number**

B-CHANNEL SIGNALING

NITE

STRI/STRO OWK OWK

AST NO

IAPG 0

CLS **UNR DTN** WTA LPR APN THFD HKD

➔ **UNR = Unrestricted Digital, DTN = DigiTone**

P10 VNL

TKID

AACR NO

DATE 10 JUN 2005

NACT



DISK RECS AVAIL: 1152

REQ prt

CUST 0

FEAT rlb

RLI 2

RLI 2

➔ **Route List Number**

ENTR 0

➔ **Route List Entry Number for CDP**

LTER NO

ROUT 102

➔ **Route Number**

TOD 0 ON 1 ON 2 ON 3 ON

4 ON 5 ON 6 ON 7 ON

VNS NO

CNV NO

EXP NO

FRL 0

DMI 0

FCI 0

FSNI 0

SBOC NRR

IDBB DBD

IOHQ NO

OHQ NO

CBQ NO

ISET 0

NALT 5

MFRL 0

OVLL 0

6. LD 87 – Configure the CDP DSC steering codes

>ld 87

ESN000

MEM AVAIL: (U/P): 2821735 USED U P: 206155 68685 TOT: 3096575

DISK RECS AVAIL: 1152

REQ prt



CUST 0

FEAT cdp

→ CDP Dialplan

TYPE dsc

→ Digit Steering Code

DSC 34

→ Route for extension prefix beginning with 34

DSC 34

FLEN 0

DSP LSC

RLI 7

→ Send call to Route List 7 which use Rout 107

NPA

NXX

MEM AVAIL: (U/P): 2821735 USED U P: 206155 68685 TOT: 3096575

DISK RECS AVAIL: 1152

REQ

7. LD 90 – Configure the AC1 for the Tandem Trunk calls

>ld 90

ESN000

MEM AVAIL: (U/P): 2821735 USED U P: 206155 68685 TOT: 3096575

DISK RECS AVAIL: 1152

REQ prt

CUST 0

FEAT net

→ Network Translation Table

TRAN ac1

→ Access code 1 (NARS/BARS)

TYPE npa

NPA

NPA 1408

→ NPA begins with 1408

RLI 2

→ send to Route List 2 which use Rout 102

SDRR NONE

ITEI NONE

MEM AVAIL: (U/P): 2821735 USED U P: 206155 68685 TOT: 3096575



DISK RECS AVAIL: 1152

REQ

8. LD 11 – Configure the Route Nortel 2616 Digital Phones

>>ld 11

SL1000

MEM AVAIL: (U/P): 2821735 USED U P: 206155 68685 TOT: 3096575

DISK RECS AVAIL: 1152

DIGITAL TELEPHONES AVAIL: 4 USED: 4 TOT: 8

IP USERS AVAIL: 6 USED: 2 TOT: 8

BASIC IP USERS AVAIL: 7 USED: 1 TOT: 8

ACD AGENTS AVAIL: 10 USED: 0 TOT: 10

PCA AVAIL: 0 USED: 0 TOT: 0

AST AVAIL: 1 USED: 0 TOT: 1

TNS AVAIL: 2304 USED: 196 TOT: 2500

DATA PORTS AVAIL: 2500 USED: 0 TOT: 2500

REQ: prt

TYPE: 2616

TN 1 0 0 2

DATE

PAGE

DES

DES CS101A

TN 001 0 00 02

TYPE 2616

CDEN 8D

CUST 0

AOM 0

FDN 2321

TGAR 1

LDN NO

NCOS 0

SGRP 0



RNPG 0
SCI 0
SSU
XLST
CLS CTD **FBA** WTA LPR MTD **FNA HTA** ADD HFD
MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
POD DSX VMD CMSD SLKD CCSD SWD LND **CNDA**
CFTD SFD MRD DDV **CNIA** CDCA MSID DAPA BFED RCB
ICDD CDMA LLCN MCTD CLBD AUTU
GPUD DPUD DNDA **CFXA** ARHD CLTD ASCD
CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD AHD
DDGA NAMA
DRDD EXR0
USRD ULAD RTDD RBDD RBHD PGND OCB
D FLXD FTTC DNDY DNO3 MCBN CDMR
CPND_LANG ENG
RCO 0
HUNT 2321
LHK 0
PLEV 02
CSDN
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY 00 SCR 2320 0 MARP
CPND
NAME ZEUS20
XPLN 6
DISPLAY_FMT FIRST, LAST
01
02
03 CFW 4 3415
04 A06
05 TRN
06



07

08

09

10

11

12

13

14

15 RGA

DATE 8 JUN 2005

NACT

REQ: prt

TYPE: 2616

TN 1 0 0 3

DATE

PAGE

DES

DES CS101A

TN 001 0 00 03

TYPE 2616

CDEN 8D

CUST 0

AOM 0

FDN

TGAR 1

LDN NO

NCOS 0

SGRP 0

RNPG 0

SCI 0

SSU

XLST

CLS CTD **FBA** WTA LPR MTD **FNA HTA** ADD HFD

MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1

POD DSX VMD CMSD SLKD CCSD SWD LND **CNDA**



CFTD SFD MRD DDV **CNIA** CDCA MSID DAPA BFED RCBD

ICDD CDMD LLCN MCTD CLBD AUTU

GPUD DPUD DNDA **CFXA** ARHD CLTD ASCD

CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD AHD

DDGA NAMA

DRDD EXR0

USRD ULAD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN CDMR

CPND_LANG ENG

HUNT

PLEV 02

CSDN

AST

IAPG 0

AACS NO

ITNA NO

DGRP

MLWU_LANG 0

DNDR 0

KEY 00 SCR 2321 0 MARP

CPND

NAME ZEUS21

XPLN 6

DISPLAY_FMT FIRST, LAST

01

02

03 CFW 4

04 AO6

05 TRN

06

07

08

09

10

11

12

13

14

15 RGA



DATE 6 JUN 2005

NACT

REQ:

Cisco CallManager Configuration

Add an MGCP gateway for the Cisco 2851 ISR router with T1 PRI

The screenshot shows the Cisco CallManager Administration web interface. The page title is "Gateway Configuration" and it includes navigation links: "Back to MGCP Configuration", "Back to Find/List Gateways", and "Dependency Records". The main content area displays the following information:

Product : Cisco 2851
Gateway : S0/SU0/DS1-1@Router2851
Device Protocol: Digital Access PRI
Registration: Registered with Cisco CallManager 172.20.150.253
IP Address: 172.20.150.201

Status: Ready

Buttons: Update, Delete, Reset Gateway

Device Information

End-Point Name*	S0/SU0/DS1-1@Router2851
Description	S0/SU0/DS1-1@Router2851
Device Pool*	Default
Call Classification*	Use System Default
Network Locale	< None >
Signal Packet Capture Mode	None
Packet Capture Duration	60
Media Resource Group List	< None >



Media Resource Group List	<None>
Location	<None>
AAR Group	<None>
Load Information	
V150 (subset)	<input type="checkbox"/>
Multilevel Precedence and Preemption (MLPP) Information	
MLPP Domain (e.g., *0000FF*)	
MLPP Indication	Default
MLPP Preemption	Default
Interface Information	
PRI Protocol Type*	PRI DMS-100
Protocol Side*	Network
Channel Selection Order*	Bottom Up
Channel IE Type*	Use Number when 1B
PCM Type*	µ-law
Delay for first restart (1/8 sec ticks)	32
Delay between restarts (1/8 sec ticks)	4
<input type="checkbox"/> Inhibit restarts at PRI initialization	
<input checked="" type="checkbox"/> Enable status poll	
Call Routing Information	
Inbound Calls	

Call Routing Information	
Inbound Calls	
Significant Digits*	
Calling Search Space	
AAR Calling Search Space	
Prefix DN	
Outbound Calls	
Calling Line ID Presentation*	
Calling Party Selection*	
Called party IE number type unknown*	
Calling party IE number type unknown*	
Called Numbering Plan*	
Calling Numbering Plan*	
Number of digits to strip*	
Caller ID DN	
SMDI Base Port*	0
PRI Protocol Type Specific Information	
<input checked="" type="checkbox"/> Display IE Delivery	
<input type="checkbox"/> Redirecting Number IE Delivery - Outbound	
<input type="checkbox"/> Redirecting Number IE Delivery - Inbound	
<input checked="" type="checkbox"/> Send Extra Leading Character In DisplayIE***	



<input type="checkbox"/> Setup non-ISDN Progress Indicator IE Enable****	
<input checked="" type="checkbox"/> MCDN Channel Number Extension Bit Set to Zero**	
<input type="checkbox"/> Send Calling Name In Facility IE	
<input type="checkbox"/> Interface Identifier Present**	
Interface Identifier Value**	<input type="text" value="0"/>
Connected Line ID Presentation (QSIG Inbound Call)*	<input type="text" value="Default"/>
UUIE Configuration	
<input type="checkbox"/> Passing Precedence Level Through UUIE	
Security Access Level	<input type="text" value="2"/>
Product Specific Configuration	
Line Coding*	<input type="text" value="B8ZS"/>
Framing*	<input type="text" value="ESF"/>
Clock*	<input type="text" value="External"/>
Input Gain (-6..14 db)*	<input type="text" value="0"/>
Output Attenuation (-6..14 db)*	<input type="text" value="0"/>
Echo Cancellation Enable*	<input type="text" value="Enable"/>
Echo Cancellation Coverage (ms)*	<input type="text" value="Default"/>
* indicates required item	
** applicable to DMS-100 protocol only	
*** applicable to DMS-100 protocol and DMS-250 protocol only	



Add a Route Pattern to reach Nortel's digital phone DN extensions and to access the PSTN via the Nortel PBX

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: 232X
Status: Ready
Note: Any update to this Route Pattern automatically resets the associated gateway or Route List

Copy Update Delete

Pattern Definition

Route Pattern* 232X
Partition <None>
Description
Numbering Plan* North American Numbering Plan
Route Filter <None>
MLPP Precedence Default
Gateway or Route List* S0/SU0/DS1-1@Router2851 (Edit)
Route Option
 Route this pattern
 Block this pattern — Not Selected —
Call Classification* OffNet Allow Device Override
 Provide Outside Dial Tone Allow Overlap Sending Urgent Priority
 Require Forced Authorization Code

Provide Outside Dial Tone Allow Overlap Sending Urgent Priority
 Require Forced Authorization Code
Authorization Level 0
 Require Client Matter Code

Calling Party Transformations

Use Calling Party's External Phone Number Mask
Calling Party Transform Mask
Prefix Digits (Outgoing Calls)
Calling Line ID Presentation Default
Calling Name Presentation Default

Connected Party Transformations

Connected Line ID Presentation Default
Connected Name Presentation Default

Called Party Transformations

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

ISDN Network-Specific Facilities Information Element

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

* indicates required item.



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: 9.@
Status: Update completed
Note: Any update to this Route Pattern automatically resets the associated gateway or Route List

Copy Update Delete

Pattern Definition

Route Pattern*
Partition
Description
Numbering Plan*
Route Filter
MLPP Precedence
Gateway or Route List* (Edit)
Route Option
 Route this pattern
 Block this pattern
Call Classification* Allow Device Override
 Provide Outside Dial Tone Allow Overlap Sending Urgent Priority
 Require Forced Authorization Code

Require Forced Authorization Code
Authorization Level
 Require Client Matter Code

Calling Party Transformations

Use Calling Party's External Phone Number Mask
Calling Party Transform Mask
Prefix Digits (Outgoing Calls)
Calling Line ID Presentation
Calling Name Presentation

Connected Party Transformations

Connected Line ID Presentation
Connected Name Presentation

Called Party Transformations

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

ISDN Network-Specific Facilities Information Element

Carrier Identification Code
Network Service Protocol
Network Service Service Parameter Name Service Parameter Value

* indicates required item.



Add an Cisco 7960 IP phones and assigned the DN extension (3414 and 3415)

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Directory Number Configuration

[Configure Device \(SEP00124362BF79\)](#)
[Dependency Records](#)

Associated With
SEP00124362BF79
7960 (Line 1)

Directory Number: 3414
Status: Ready
Note: Any update to this Directory Number automatically resets the associated devices

Directory Number

Directory Number*
Partition

Directory Number Settings

Voice Mail Profile
(Choose <None> to use default)

Calling Search Space
AAR Group
User Hold Audio Source
Network Hold Audio Source
Auto Answer

Call Forward and Pickup Settings

	Voice Mail	Coverage/ Destination	Calling Search Space
Forward All	<input type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>

Call Forward and Pickup Settings

	Voice Mail	Coverage/ Destination	Calling Search Space
Forward All	<input type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>
Forward Busy Internal	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>
Forward Busy External	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>
Forward No Answer Internal	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>
Forward No Answer External	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>
Forward No Coverage Internal	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>
Forward No Coverage External	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="<None >"/>
No Answer Ring Duration	<input type="text"/>	(seconds)	
Call Pickup Group	<input type="text" value="<None >"/>	(View Details)	

MLPP Alternate Party Settings

Target (Destination)
Calling Search Space
No Answer Ring Duration (seconds)

Line Settings for all Devices

Alerting Name

Line Settings for this Device

Display (Internal Caller ID)
Line Text Label
External Phone Number Mask
Message Waiting Lamp Policy



No Answer Ring Duration (seconds)

Line Settings for all Devices

Alerting Name Phone14_A

Line Settings for this Device

Display (Internal Caller ID) Phone14_C

Line Text Label

External Phone Number Mask

Message Waiting Lamp Policy Use System Policy

Ring Setting (Phone Idle) Use System Default

Ring Setting (Phone Active)** Use System Default

Multiple Call / Call Waiting Settings

Maximum Number of Calls* 4 (1 - 200)

Busy Trigger* 1 (<= Max. Calls)

Forwarded Call Information Display

Caller Name Caller Number

Redirected Number Dialed Number

* indicates required item; changes to Line or Directory Number settings require restart.
** Ring Setting (Phone Active) applies to this line when any line on the phone has a call in progress.

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

Character Set Western European (Latin 1)

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration For Cisco IP Telephony Solutions

Directory Number Configuration [Configure Device \(SEP003094C290B3\)](#) [Dependency Records](#)

Associated With SEP003094C290B3 (Line 1)

Directory Number: 3415

Status: Ready
Note: Any update to this Directory Number automatically resets the associated devices

Update Remove from Device Reset Devices

Directory Number

Directory Number* 3415

Partition <None>

Directory Number Settings

Voice Mail Profile Default (Choose <None> to use default)

Calling Search Space <None>

AAR Group <None>

User Hold Audio Source <None>

Network Hold Audio Source <None>

Auto Answer Auto Answer Off

Call Forward and Pickup Settings

Voice Mail	Coverage/ Destination	Calling Search Space
Forward All <input type="checkbox"/>		<None>



Call Forward and Pickup Settings

	Voice Mail	Coverage/ Destination	Calling Search Space
Forward All	<input type="checkbox"/>	<input type="text"/>	<None >
Forward Busy Internal	<input checked="" type="checkbox"/>	<input type="text"/>	<None >
Forward Busy External	<input checked="" type="checkbox"/>	<input type="text"/>	<None >
Forward No Answer Internal	<input checked="" type="checkbox"/>	<input type="text"/>	<None >
Forward No Answer External	<input checked="" type="checkbox"/>	<input type="text"/>	<None >
Forward No Coverage Internal	<input checked="" type="checkbox"/>	<input type="text"/>	<None >
Forward No Coverage External	<input checked="" type="checkbox"/>	<input type="text"/>	<None >

No Answer Ring Duration: (seconds)

Call Pickup Group: ([View Details](#))

MLPP Alternate Party Settings

Target (Destination):

Calling Search Space:

No Answer Ring Duration: (seconds)

Line Settings for all Devices

Alerting Name:

Line Settings for this Device

Display (Internal Caller ID):

Line Text Label:

External Phone Number Mask:

Message Waiting Lamp Policy:

No Answer Ring Duration: (seconds)

Line Settings for all Devices

Alerting Name:

Line Settings for this Device

Display (Internal Caller ID):

Line Text Label:

External Phone Number Mask:

Message Waiting Lamp Policy:

Ring Setting (Phone Idle):

Ring Setting (Phone Active)**:

Multiple Call / Call Waiting Settings

Maximum Number of Calls*: (1 - 200)

Busy Trigger*: (<= Max. Calls)

Forwarded Call Information Display

Caller Name Caller Number

Redirected Number Dialed Number

* indicates required item; changes to Line or Directory Number settings require restart.
** Ring Setting (Phone Active) applies to this line when any line on the phone has a call in progress.

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

Character Set:



Configure the Cisco 2851 ISR router to communicate with Cisco CallManager using MGCP protocol

```
Router2851>en
Password:
Router2851#sh version
Cisco IOS Software, 2800 Software (C2800NM-IPVOICEK9-M), Version 12.4(1a), RELEASE SOFTWARE
(fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Fri 27-May-05 21:02 by hqluong
```

```
ROM: System Bootstrap, Version 12.3(8r)T7, RELEASE SOFTWARE (fc1)
```

```
Router2851 uptime is 6 days, 5 hours, 45 minutes
System returned to ROM by reload at 10:07:59 PST Tue Jun 7 2005
System restarted at 10:08:49 PST Tue Jun 7 2005
System image file is "flash:c2800nm-ipvoicek9-mz.124-1a.bin"
```

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
<http://www.cisco.com/wvl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

```
Cisco 2851 (revision 53.51) with 249856K/12288K bytes of memory.
Processor board ID FHK0847F03X
16 FastEthernet interfaces
2 Gigabit Ethernet interfaces
48 Serial interfaces
```



```
2 Channelized T1/PRI ports
4 Voice FXO interfaces
2 Voice FXS interfaces
DRAM configuration is 64 bits wide with parity enabled.
239K bytes of non-volatile configuration memory.
62592K bytes of ATA CompactFlash (Read/Write)
```

```
Configuration register is 0x2102
```

```
Router2851#term len 0
Router2851#sh run
Building configuration...
```

```
Current configuration : 5036 bytes
```

```
!
! Last configuration change at 13:22:53 PST Wed Jun 8 2005
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname Router2851
!
boot-start-marker
boot system flash:c2800nm-ipvoicek9-mz.124-1a.bin
boot-end-marker
!
logging buffered 5000000 debugging
enable secret 5 $1$v0tv$DYoywWasCG5us.lpzy6Th.
!
no aaa new-model
!
resource policy
!
clock timezone PST -8
network-clock-participate wic 0
network-clock-select 1 T1 0/0/0
ip subnet-zero
```



```
!  
!  
ip cef  
no ip dhcp use vrf connected  
!  
!  
no ip ftp passive  
ip ftp username cisco  
ip ftp password 7 01100F175804575D72  
no ip domain lookup  
isdn switch-type primary-ni  
!  
voice-card 0  
  no dspfarm  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!  
username chinh password 7 104D000A0618  
!  
!  
controller T1 0/0/0  
  shutdown  
  framing esf  
  linecode b8zs  
  cablelength short 133  
  pri-group timeslots 1-24 service mgcp  
!  
controller T1 0/0/1
```



```
framing esf
linecode b8zs
cablelength short 133
pri-group timeslots 1-24 service mgcp
!
translation-rule 1
!
!
!
!
interface GigabitEthernet0/0
 ip address 172.20.150.201 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial0/0/0:23
 no ip address
 isdn switch-type primary-qsig
 isdn incoming-voice voice
 isdn bind-13 ccm-manager
 no cdp enable
!
interface Serial0/0/1:23
 no ip address
 isdn switch-type primary-dms100
 isdn protocol-emulate network
 isdn incoming-voice voice
 isdn bind-13 ccm-manager
 isdn channel-id invert extend-bit
 no cdp enable
!
interface FastEthernet1/0
 shutdown
```



```
!  
interface FastEthernet1/1  
  shutdown  
!  
interface FastEthernet1/2  
  shutdown  
!  
interface FastEthernet1/3  
  shutdown  
!  
interface FastEthernet1/4  
  shutdown  
!  
interface FastEthernet1/5  
  shutdown  
!  
interface FastEthernet1/6  
  shutdown  
!  
interface FastEthernet1/7  
  shutdown  
!  
interface FastEthernet1/8  
  shutdown  
!  
interface FastEthernet1/9  
  shutdown  
!  
interface FastEthernet1/10  
  shutdown  
!  
interface FastEthernet1/11  
  shutdown  
!  
interface FastEthernet1/12  
  shutdown  
!  
interface FastEthernet1/13  
  shutdown
```



```
!  
interface FastEthernet1/14  
  shutdown  
!  
interface FastEthernet1/15  
  shutdown  
!  
interface Vlan1  
  no ip address  
!  
ip classless  
ip route 0.0.0.0 0.0.0.0 172.20.150.1  
!  
ip http server  
no ip http secure-server  
!  
!  
!  
tftp-server flash:c2800nm-ipvoice-mz.123-12.11.T1  
!  
control-plane  
!  
!  
!  
voice-port 0/0/0:23  
!  
voice-port 0/1/0  
  station-id name FXS_PhoneE  
  station-id number 14085232200  
  caller-id enable  
!  
voice-port 0/1/1  
!  
voice-port 0/0/1:23  
!  
voice-port 0/2/0  
!  
voice-port 0/2/1  
!  
!
```



```
voice-port 0/2/2
!
voice-port 0/2/3
!
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 172.20.150.253
ccm-manager config
!
mgcp
mgcp call-agent 172.20.150.253 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 package-capability fxr-package
mgcp package-capability pre-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
!
!
line con 0
line aux 0
line vty 0 4
  exec-timeout 0 0
  password 7 0822455D0A16
  login
line vty 5 10
  exec-timeout 0 0
  password 7 0822455D0A16
  login
!
```



```
scheduler allocate 20000 1000
ntp clock-period 17179609
ntp server 171.68.10.80
ntp server 171.68.10.150
!
end
```

```
Router2851#sh mgcp
MGCP Admin State ACTIVE, Oper State ACTIVE - Cause Code NONE
MGCP call-agent: 172.20.150.253 2427 Initial protocol service is MGCP 0.1
MGCP validate call-agent source-ipaddr DISABLED
MGCP block-newcalls DISABLED
MGCP send SGCP RSIP: forced/restart/graceful/disconnected DISABLED
MGCP quarantine mode discard/step
MGCP quarantine of persistent events is ENABLED
MGCP dtmf-relay voip codec all mode out-of-band
MGCP dtmf-relay for voAAL2 is SDP controlled
MGCP voip modem passthrough mode: NSE, codec: g711ulaw, redundancy: DISABLED,
MGCP voaal2 modem passthrough disabled
MGCP voip modem relay: Disabled.
MGCP TSE payload: 100
MGCP T.38 Named Signalling Event (NSE) response timer: 200
MGCP Network (IP/AAL2) Continuity Test timer: 200
MGCP 'RTP stream loss' timer disabled
MGCP request timeout 500
MGCP maximum exponential request timeout 4000
MGCP rtp unreachable timeout 1000 action notify
MGCP gateway port: 2427, MGCP maximum waiting delay 3000
MGCP restart delay 0, MGCP vad DISABLED
MGCP rtrcac DISABLED
MGCP system resource check DISABLED
MGCP xpc-codec: DISABLED, MGCP persistent hookflash: DISABLED
MGCP persistent offhook: ENABLED, MGCP persistent onhook: DISABLED
MGCP piggyback msg ENABLED, MGCP endpoint offset DISABLED
MGCP simple-sdp ENABLED
MGCP undotted-notation DISABLED
MGCP codec type g711ulaw, MGCP packetization period 20
MGCP JB threshold lwm 30, MGCP JB threshold hwm 150
MGCP LAT threshold lwm 150, MGCP LAT threshold hwm 300
```



```
MGCP PL threshold lwm 1000, MGCP PL threshold hwm 10000
MGCP CL threshold lwm 1000, MGCP CL threshold hwm 10000
MGCP playout mode is adaptive 60, 40, 200 in msec
MGCP Fax Playout Buffer is 300 in msec
MGCP media (RTP) dscp: ef, MGCP signaling dscp: af31
MGCP default package: trunk-package
MGCP supported packages: gm-package dtmf-package trunk-package line-package
                        hs-package rtp-package atm-package ms-package dt-package
                        mo-package mt-package sst-package pre-package
MGCP Digit Map matching order: shortest match
SGCP Digit Map matching order: always left-to-right
MGCP VoAAL2 ignore-lco-codec DISABLED
MGCP T.38 Max Fax Rate is DEFAULT
MGCP T.38 Fax is DISABLED
MGCP T.38 Fax ECM is ENABLED
MGCP T.38 Fax NSF Override is DISABLED
MGCP T.38 Fax Low Speed Redundancy: 0
MGCP T.38 Fax High Speed Redundancy: 0
MGCP control bind :DISABLED
MGCP media bind :DISABLED
MGCP Upspeed payload type for G711ulaw: 0, G711alaw: 8
MGCP Static payload type for G.726-16K codec
MGCP Dynamic payload type for G.726-24K codec
MGCP Dynamic payload type for G.Clear codec
MGCP Guaranteed scheduler time is disabled
```

```
Router2851#sh ccm
```

```
MGCP Domain Name: Router2851
```

Priority	Status	Host
Primary	Registered	172.20.150.253
First Backup	None	
Second Backup	None	

```
Current active Call Manager: 172.20.150.253
Backhaul/Redundant link port: 2428
Failover Interval: 30 seconds
Keepalive Interval: 15 seconds
Last keepalive sent: 15:54:11 PST Jun 13 2005 (elapsed time: 00:00:12)
```



Last MGCP traffic time: 15:54:11 PST Jun 13 2005 (elapsed time: 00:00:12)
Last failover time: None
Last switchback time: None
Switchback mode: Graceful
MGCP Fallback mode: Not Selected
Last MGCP Fallback start time: None
Last MGCP Fallback end time: None
MGCP Download Tones: Disabled

Backhaul Link info:

Link Protocol: TCP
Remote Port Number: 2428
Remote IP Address: 172.20.150.253
Current Link State: OPEN

Statistics:

Packets recvd: 520
Recv failures: 0
Packets xmitted: 424
Xmit failures: 0

PRI Ports being backhauled:

Slot 0, port 1
Slot 0, port 0

Configuration Auto-Download Information

=====

Current version-id: {DF50D6DF-A27D-4AFD-AAAD-2967DFD1DDBA}

Last config-downloaded:00:00:00

Current state: Waiting for commands

Configuration Download statistics:

Download Attempted : 13
Download Successful : 13
Download Failed : 0
Configuration Attempted : 1
Configuration Successful : 1
Configuration Failed(Parsing): 0
Configuration Failed(config) : 0

Last config download command: New Registration

Configuration Error History:

FAX mode: cisco

Router2851#s isdn status s0/0/1:23



Global ISDN Switchtype = primary-ni

%Q.931 is backhauled to CCM MANAGER 0x0003 on DSL 1. Layer 3 output may not apply

ISDN Serial0/0/1:23 interface

***** Network side configuration *****

dsl 1, interface ISDN Switchtype = primary-dms100

L2 Protocol = Q.921 0x0000 L3 Protocol(s) = CCM MANAGER 0x0003

Layer 1 Status:

ACTIVE

Layer 2 Status:

TEI = 0, Ces = 1, SAPI = 0, State = MULTIPLE_FRAME_ESTABLISHED

Layer 3 Status:

0 Active Layer 3 Call(s)

Active dsl 1 CCBS = 0

The Free Channel Mask: 0x807FFFFF

Number of L2 Discards = 0, L2 Session ID = 10

Total Allocated ISDN CCBS = 0

Router2851#

Acronyms

Acronym	Definitions
ANF-PR	Additional Network Feature Path Replacement
CCM	Cisco 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



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