

Cisco Unified CallManager Release 4.1(3)-PBX Interoperability: Nortel Succession 1000 Release 4.0 to a Cisco 2851 Using T1 PRI NI-2 with MGCP

Table of Contents

Introduction	1
Network Topology.....	2
Limitations.....	2
System Components	2
Hardware Requirements	2
Software Requirements	3
Features	4
Not Supported Features	4
Configuration.....	4
Nortel Communication Server 1000 PBX Configuration Sequence and Tasks	4
Configuration Sequence and Tasks	5
Configuration Menus and Commands	5
Acronyms	35

Introduction

This is an application note for interoperability connectivity of Nortel Communication Server 1000 (formerly known as Succession 1000) private branch exchange (PBX) with Cisco Unified CallManager Release 4.1(3) using a Cisco 2851 Media Gateway Control Protocol (MGCP) Gateway configured with T1 Primary Rate Interface (PRI) NI-2 switch-type.

The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability between the Nortel CS1000 PBX and Cisco Unified CallManager using Integrated Services Digital Network (ISDN) PRI NI-2 switch-type protocol.

Nortel use the Facility information element (IE) with the ISDN signaling messages to pass the calling name information across T1 PRI trunk. Please ensure the **Send Calling Name In Facility IE** box is checked and uncheck the **Display IE Delivery** box. Nortel doesn't support the sending or receiving of the Display IE within the ISDN SETUP or NOTIFY messages. Cisco Unified CallManager supports both Display IE and Facility IE methods.

Cisco Unified CallManager supports calling name delivery using Facility IE in the forward direction (ISDN SETUP) of the call only. There is currently no support for alerting name or connected party name for NI-2 switch-type for Cisco Unified CallManager.

Both Cisco Unified CallManager and Nortel have the ability to support either ISDN Network-side or ISDN user-side signaling. For this application note, Cisco Unified CallManager is configured as ISDN network-side signaling and Nortel CS1000 PBX as ISDN user-side signaling for PRI NI-2 switch-type protocol.

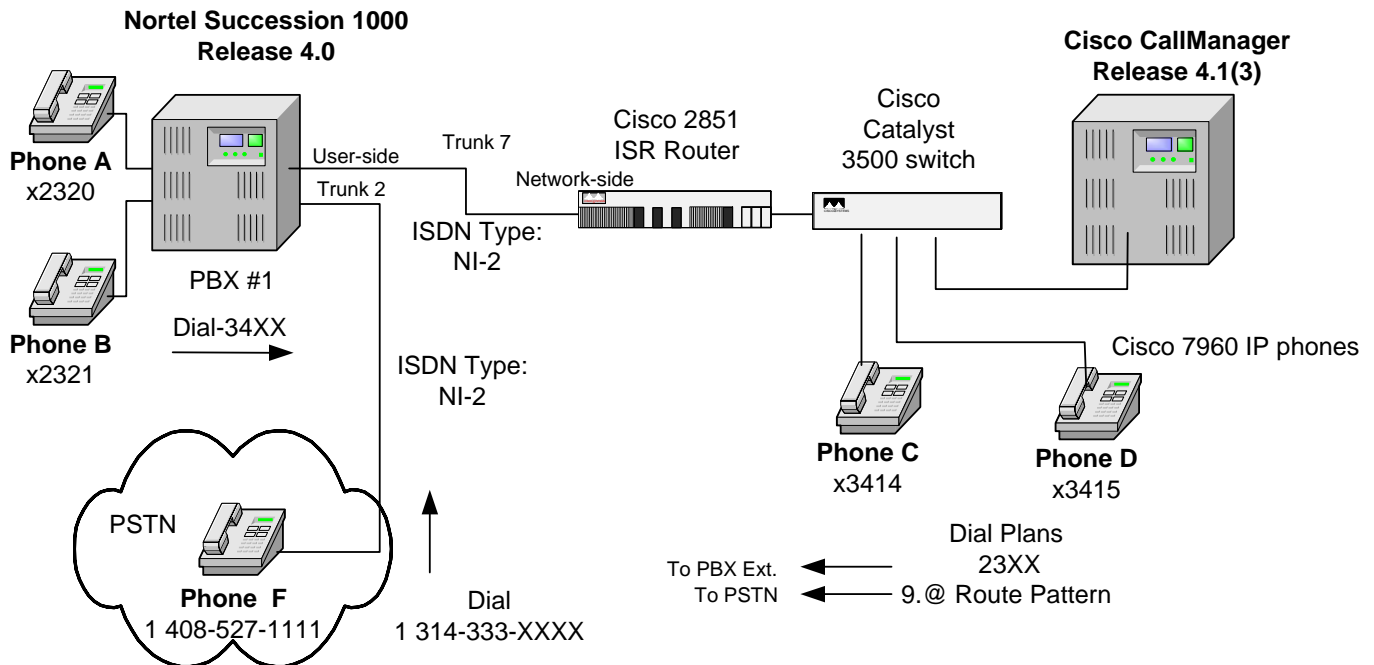
Nortel does not support ISDN Overlapping Sending/Receiving feature for ISDN PRI NI-2 switch-type protocol.



Network Topology

Figure 1. Network Topology or Test Setup

Basic Call Setup End-to-End Configuration



Limitations

Nortel use the Facility IE with the ISDN signaling messages to pass the calling name information across T1 PRI trunk. Nortel doesn't support the sending or receiving of the Display IE within the ISDN SETUP or NOTIFY messages. Cisco Unified CallManager supports both Display IE and Facility IE methods. Therefore, please ensure the **Send Calling Name In Facility IE** box is checked and uncheck the **Display IE Delivery** box.

Cisco Unified CallManager supports calling name delivery using Facility IE in the forward direction (ISDN SETUP) of the call only. There is currently no support for alerting name or connected party name for NI-2 switch-type for Cisco Unified CallManager.

For CNIR features, Nortel PBX send out a Facility IE without any calling name information within it. Cisco Unified CallManager, on the other hand, send out the Facility IE with the actually calling name information with the presentation bit set to be RESTRICTED.

Nortel does not support ISDN Overlapping Sending/Receiving feature for ISDN PRI NI-2 switch-type protocol.

Tandem calls through the Nortel PBX is not possible for NI-2 trunk type configured as Direct-Inward-Dial (DID).

System Components

Hardware Requirements

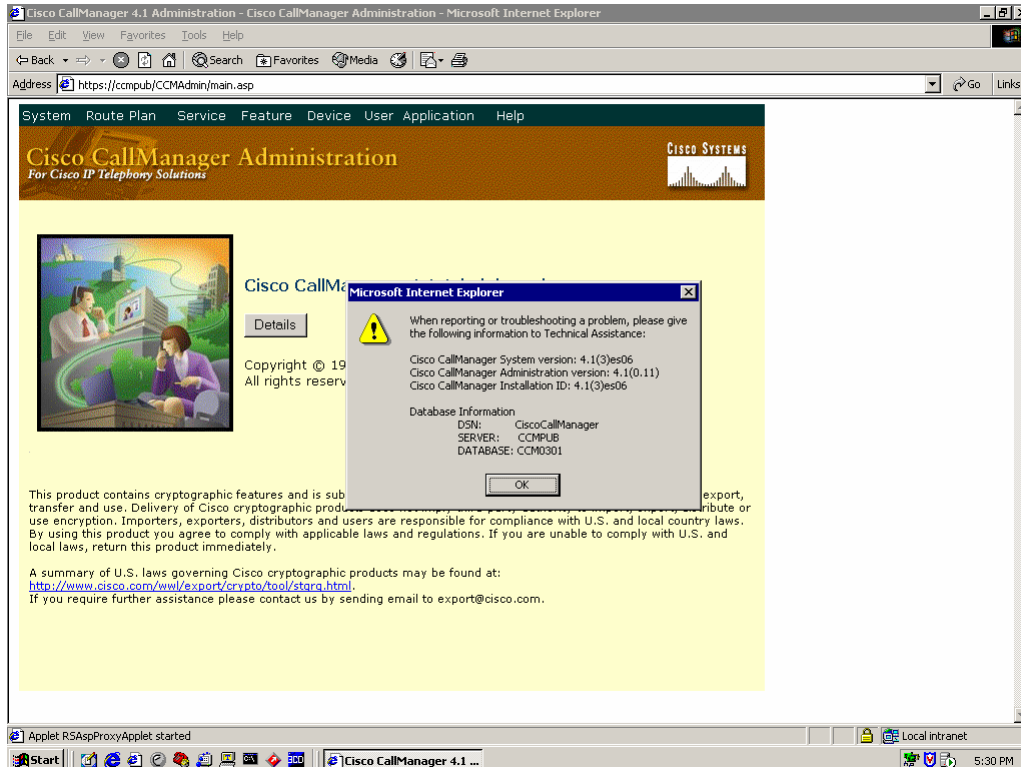
Cisco Unified CallManager MCS server, Cisco 2851 Intermediate Session Routing (ISR) router and Cisco 7960 Internet Protocol (IP) phones



Nortel Communication System 1000 (which includes Call Server, Signaling Server and Media gateway) and Nortel's 2616 digital phones

Software Requirements

Cisco Unified CallManager Release 4.1(3)



Nortel Succession 4.0 Release and packages

>ld 22

PT2000

REQ iss

CALL SERVER/MAIN CAB

VERSION 2121

RELEASE 4

ISSUE 00 T +

IDLE_SET_DISPLAY NORTEL

The following packages are required for the PRI NI-2 interface:



ISDN Signaling (ISDN) package 145

Primary Rate Interface (PRA) package 146

Multi-Purpose Serial Data Link (MSDL) package 222

National ISDN-2 Interface (NI-2) package 291

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

COLR- Connected Line (Number) Identification Restriction

CONP-Connected Name Identification Presentation

CONR-Connected Name Identification Presentation

MWI- Message Waiting Indication (lamp ON, lamp OFF) across the T1 PRI NI-2 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 Unified 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 the PSTN via the Nortel PBX
3. Configure Cisco 7960 phone and line DN
4. Configure the Cisco 2851 ISR router to communicate with Cisco Unified CallManager using MGCP protocol



Configuration Sequence and Tasks

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 NI-2 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 T1_NI2
```



USR PRI
DCHL 7 → Slot7, D-channel to Cisco Unified CallManager
OTBF 32
PARM RS422 DTE
DRAT 64KC → 64K clear channel for the d-channel
CLOK EXT
IFC NI2 → NI-2 Switchtype
ISDN_MCNT 300
CLID OPT0
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
OVLN NO
OVLS NO
T310 120
T200 3
T203 10
N200 3
N201 260
K 7
BSRV NO

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
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
OVLN 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 Unified CallManager
DES  T1_NI2
```



TKTP DID → Direct-Inward-Dial (DID) 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 for the route
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 Select = 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 207 → Trunk Access code
TCP P 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:

>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
TCPD 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 Unified CallManager

DATE

PAGE

DES

DES T1_NI2

TN 007 01

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

TYPE DID

→ Direct-Inward-Dial (DID) Trunk Type

CDEN SD

CUST 0

TRK PRI

→ PRI Trunk

PDCA 1

PCML MU

→ u-law encoding scheme

NCOS 0

RTMB 107 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 16 JUN 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

➔ PRI Trunk

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

5. LD 86–Configure the Route List Block for the T1 PRI and PSTN PRI

>ld 86



ESN000

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

DISK RECS AVAIL: 1152

REQ prt

CUST 0

FEAT rlb

RLI 7

RLI 7 ➔ **Route List Number**
ENTR 0 ➔ **Route List Entry Number for CDP**
LTER NO
ROUT 107 ➔ **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 DEB

IOHQ NO

OHQ NO

CBQ NO

ISSET 0

NALT 5

MFRL 0

OVLL 0

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

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 OCBD 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 AO6
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 Unified CallManager Configuration

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

The screenshot shows the Cisco CallManager Administration web interface in Microsoft Internet Explorer. The browser title is "Cisco CallManager 4.1 Administration - Gateway Configuration - Microsoft Internet Explorer". The address bar shows a URL with a GUID and parameters: "https://ccmpub/CCMAAdmin/gatewayconfig.asp?pkid={6DA9B9AD-F748-4E78-A267-851C6908F6EE}&Action=Update&Type=52&MGCP={89C11B57-E8D9-4B93-84E9-EE628F1...}".

The page content includes a navigation menu (System, Route Plan, Service, Feature, Device, User, Application, Help) and a Cisco Systems logo. The main heading is "Gateway Configuration". On the right, there are links: "Back to MGCP Configuration", "Back to Find/List Gateways", and "Dependency Records".

The configuration details for the gateway are as follows:

- 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

The status is "Ready". There are buttons for "Update", "Delete", and "Reset Gateway".

The "Device Information" section contains the following fields:

- 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 >

The taskbar at the bottom shows the Start button, several application icons, and the system tray with the time 4:54 PM.



Cisco CallManager 4.1 Administration - Gateway Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAdmin/gatewayconfig.asp?plid={6DA9B9AD-F748-4E78-A267-851C6908F6EE}&Action=Update&type=52

Media Resource Group List: <None >

Location: <None >

AAR Group: <None >

Load Information: []

V150 (subset):

Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain (e.g., "0000FF"): []

MLPP Indication: Default

MLPP Preemption: Default

Interface Information

PRI Protocol Type*: PRI NI2

Protocol Side*: Network

Channel Selection Order*: Top Down

Channel IE Type*: Use Number when 1B

PCM Type*: u-law

Delay for first restart (1/8 sec ticks): 32

Delay between restarts (1/8 sec ticks): 4

Inhibit restarts at PRI initialization

Enable status poll

Call Routing Information

Reset succeeded.

Local intranet

3:53 PM

Cisco CallManager 4.1 Administration - Gateway Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAdmin/gatewayconfig.asp?plid={6DA9B9AD-F748-4E78-A267-851C6908F6EE}&Action=Update&type=52

Call Routing Information

Inbound Calls

Significant Digits*: All

Calling Search Space: <None >

AAR Calling Search Space: <None >

Prefix DN: []

Outbound Calls

Calling Line ID Presentation*: Default

Calling Party Selection*: Originator

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

Number of digits to strip*: 0

Caller ID DN: []

SMDI Base Port*: 0

PRI Protocol Type Specific Information

Display IE Delivery

Redirecting Number IE Delivery - Outbound

Redirecting Number IE Delivery - Inbound

Send Extra Leading Character In DisplayIE***

Reset succeeded.

Local intranet

3:54 PM



Reset succeeded.

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

Applet RSAsProxyApplet started



Cisco CallManager 4.1 Administration - Route Pattern Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAAdmin/routepatternconfig.asp?pkid={E2884F93-4838-4EE8-A409-959F768697B9}

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: -- Not Selected -- Service Parameter Name: < Not Exist > Service Parameter Value:

* indicates required item.

Cisco CallManager 4.1 Administration - Route Pattern Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAAdmin/routepatternconfig.asp?pkid={E2781AC3-03D1-488F-85EC-C6C2F706501C}

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

Route Pattern Configuration

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

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

Copy Update Delete

Pattern Definition

Route Pattern*: 9.@
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*: OnNet
 Provide Outside Dial Tone Allow Overlap Sending Allow Device Override
 Urgent Priority
 Require Forced Authorization Code



Cisco CallManager 4.1 Administration - Route Pattern Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAdmin/routepatternconfig.asp?pkid=(E2781AC3-03D1-488F-85EC-C6C2F70B501C)

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.

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

Cisco CallManager 4.1 Administration - Directory Number Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAdmin/directorynumber.asp?NumPlanMapID=(C189A2A2-AF03-49D0-BCS2-18FB1E7A5DA)

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration For Cisco IP Telephony Solutions

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:



Cisco CallManager 4.1 Administration - Directory Number Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAdmin/directorynumber.asp?NumPlanMapID={C189A2A2-AF03-49D0-BC52-18EFB1E7A5DA}&status=uc

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	<input type="text"/>	(seconds)	
Call Pickup Group	<input type="text"/>	<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

Applet: RSAspxProxyApplet started

Local intranet 5:03 PM

Cisco CallManager 4.1 Administration - Directory Number Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAdmin/directorynumber.asp?NumPlanMapID={C189A2A2-AF03-49D0-BC52-18EFB1E7A5DA}&status=uc

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

Applet: RSAspxProxyApplet started

Local intranet 5:03 PM



Cisco CallManager 4.1 Administration - Directory Number Configuration - Microsoft Internet Explorer

Address: https://ccmpub/CCMAdmin/directorynumber.asp?NumPlanMapID=(C1A1E315-58C4-47EC-AC76-79273792B068)

Directory Number Configuration

Configure Device (SEP003094C290B3)
Dependency Records

Associated With
SEP003094C290B3
7900 (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>

Applet RSAspxProxyApplet started

Local intranet

Call Forward and Pickup Settings

	Voice Mail	Coverage/ Destination	Calling Search Space
Forward All	<input type="checkbox"/>		<None>
Forward Busy Internal	<input checked="" type="checkbox"/>		<None>
Forward Busy External	<input checked="" type="checkbox"/>		<None>
Forward No Answer Internal	<input checked="" type="checkbox"/>		<None>
Forward No Answer External	<input checked="" type="checkbox"/>		<None>
Forward No Coverage Internal	<input checked="" type="checkbox"/>		<None>
Forward No Coverage External	<input checked="" type="checkbox"/>		<None>
No Answer Ring Duration	10 (seconds)		
Call Pickup Group	<None>	(View Details)	

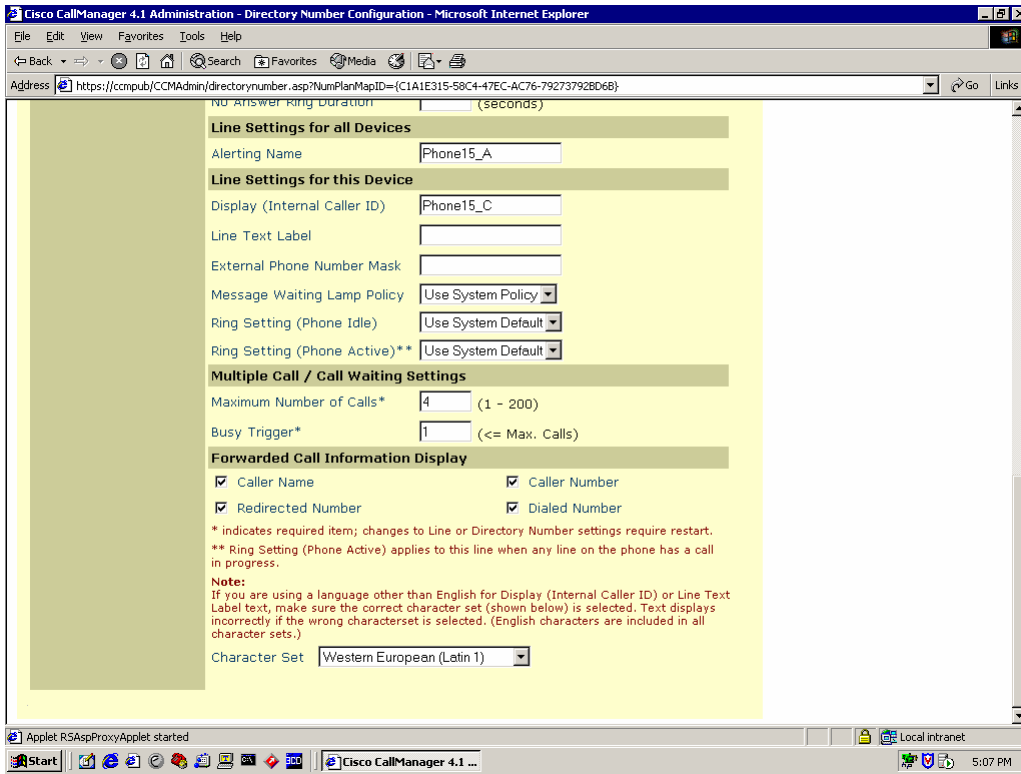
MLPP Alternate Party Settings
Target (Destination)
Calling Search Space <None>
No Answer Ring Duration (seconds)

Line Settings for all Devices
Alerting Name Phone15_A

Line Settings for this Device
Display (Internal Caller ID) Phone15_C
Line Text Label
External Phone Number Mask
Message Waiting Lamp Policy Use System Policy

Applet RSAspxProxyApplet started

Local intranet



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

```
Router2851>en
Password:
Router2851#
Router2851#
Router2851#term len 0
Router2851#show running-config
Building configuration...

Current configuration : 3526 bytes
!
! Last configuration change at 14:52:45 PST Mon Jun 20 2005
! NVRAM config last updated at 14:07:57 PST Mon Jun 20 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.lpyz6Th.  
!  
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-ni
isdn protocol-emulate network
isdn incoming-voice voice
isdn bind-13 ccm-manager
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 17179608  
ntp server 171.68.10.80  
ntp server 171.68.10.150  
!  
end
```

Router2851#

Router2851#

Acronyms

Acronym	Definitions
ANF-PR	Additional Network Feature Path Replacement
CCM	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

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.



**Corporate
Headquarters**

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

**European
Headquarters**

Cisco Systems International
BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

**Americas
Headquarters**

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

**Asia Pacific
Headquarters**

Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the Cisco Web site at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

© 2005 Cisco Systems, Inc. All rights reserved. CCSP, CCVP, the Cisco Square Bridge logo, Follow Me Browsing, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Access Registrar, Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MeetingPlace, MGX, the Networkers logo, Networking Academy, Network Registrar, Packet, PIX, Post-Routing, Pre-Routing, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StrataView Plus, TeleRouter, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0502R)

Printed in the USA