

Cisco CallManager Release 4.1(2) - PBX Interoperability: Nortel Communication Server 1000 Release 4.0 Using H.323 Trunk

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(2)SR1 via H.323 trunk.

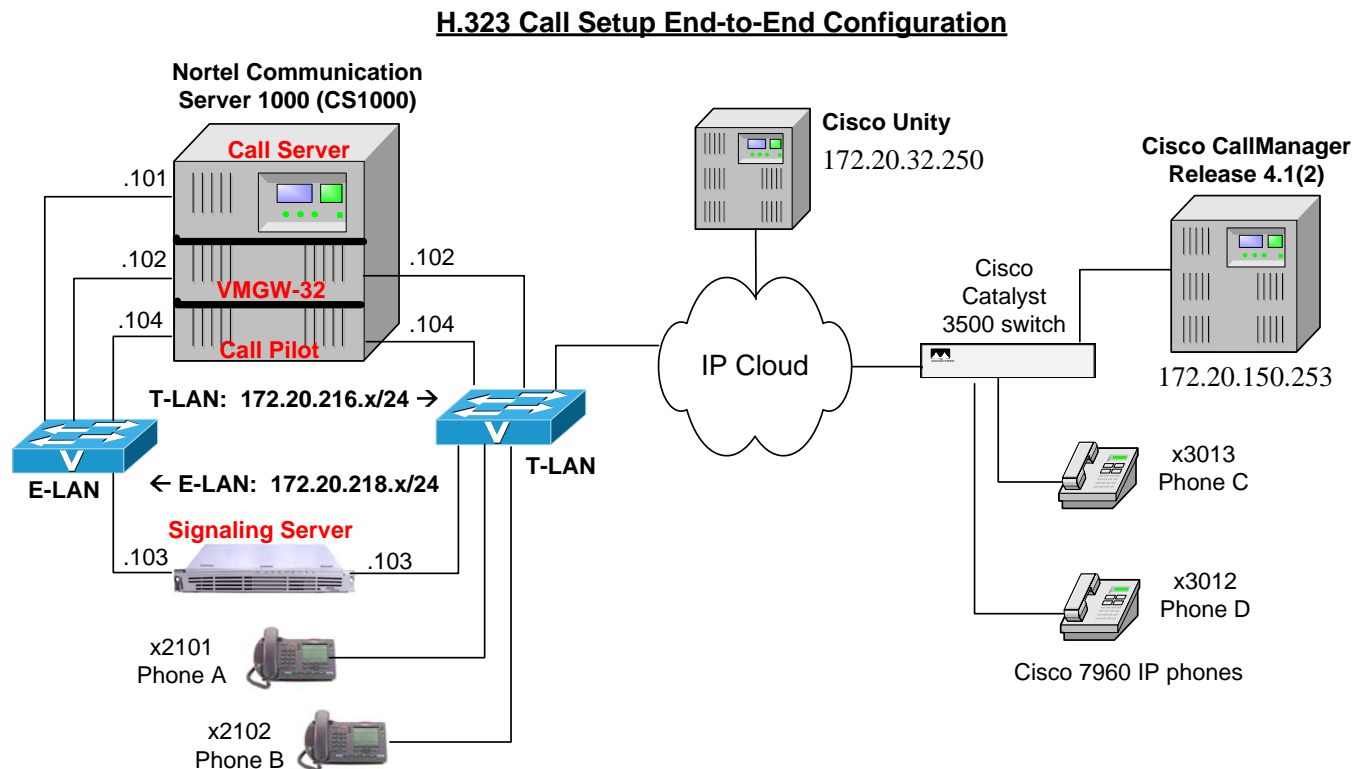
The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Nortel CS1000 PBX configured as a H323 gateway with the Cisco CallManager 4.1(2)SR1 release.

On Cisco CallManager H323 Gateway Configuration web page defined for the Nortel PBX, please ensure the following “Media Termination Point Required”, “Enable Inbound FastStart” and “Enable Outbound FastStart” boxes are all checked.

Network Topology

Draw a diagram of the network topology or test setup.

Figure 1. Network Topology or Test Setup





Limitations

Alerting/Connected Name and Number are supported by both PBX. However, they do not interoperate with one another. Cisco CallManager use "Display IE" and "Connected Number" field within the H.225 message to pass these information across the H.323 session. Nortel on the other hand, use a proprietary method of passing these information across using the "nonStandardData" field within the H.225 message.

Call Transfer and Call Forward features work without any phone's name or number display update capability.

Call Completion (Callback) Feature is not supported on both Cisco CallManager and Nortel CS1000 using standard H.323 protocol. However, it is supported on between their own system using each proprietary tunneling method.

MWI ON/OFF messages doesn't work across the H.323 connection between the two PBX systems.

End-to-end DTMF relay signaling doesn't work for Nortel phone when calling Cisco IP Phone which have Nortel Call Pilot as a voice mail system. DTMF relays is not negotiated for the H323 call session

On the Cisco CallManager H323 Gateway Configuration for the Nortel PBX, "Media Termination Point Required", "Enable Inbound FastStart" and "Enable Outbound FastStart" boxes all must be checked.

Both CCM and Nortel currently do not support H.450 Supplementary Services.

System Components

Hardware Requirements

Cisco CallManager MCS server, Unity server, and Cisco 7960 phones

Nortel Communication System 1000 (which includes Call Server, Signaling Server and Media gateway) and Nortel's i2004/i2000 IP phones

Software Requirements

Cisco CallManager Release 4.1(2)

Nortel Succession 4.0 Release

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)

CT-Call Transfer by Join (Please see the Limitation section)

CFU-Call Forwarding Unconditional (Please see the Limitation section)

CFB-Call Forwarding Busy (Please see the Limitation section)

CFB-Call Forwarding Busy (Please see the Limitation section)

COLP-Connected Line (Number) Identification Presentation (Please see the Limitation section)

COLR- Connected Line (Number) Identification Restriction (Please see the Limitation section)

CONP-Connected Name Identification Presentation (Please see the Limitation section)

End-to-End DTMF signaling (Please see the Limitation section)



Features Not Supported

- MWI- Message Waiting Indication (lamp ON, lamp OFF) across the H.323 Trunk
- Call Completion (Callback; Automatic Callback)
- Alerting Name
- CT-Call Transfer with Path Replacement
- Call Completion

Configuration

Nortel Communication Server 1000 PBX Configuration Sequence and Tasks

Call Server Setup via SSC card console

1. LD 17 – Configure the D-channel (signaling channel) between the Call Server and the Signaling Server
2. LD 97 – Configure the Super-loop for the Virtual Trunks
3. LD 14 – Configure the H.323 Virtual Trunks to the Signaling Server
4. LD 14 – Configure the Virtual Gateway Trunks
5. LD 11 – Configure for the Virtual lines for the Nortel IP phone (i200x series)
6. LD 16 – Configure the H.323 route
7. LD 86 – Configure the Route List Block for the Virtual Trunk route
8. LD 87 – Configure CDP steering codes

Signaling Server Setup via the Nortel Element Manager

9. Configure the Zones
10. Configure a new IP Telephony Node summary
11. Configure the Node section
12. Configure the VGW and IP phone codec profile section
13. Configure the Quality of Service (QoS) section
14. Configure LAN Configuration section
15. Configure the H323 GW Setting section
16. Configure the Card section for the MC-32 VGMC card section
17. Configure the Signaling Server section

NRS (Network Routing Server)

18. Configure the System Wide Settings
19. Configure the NRS Server Settings
20. Configure a Service Domain
21. Configure a L1 Domain (UDP)
22. Configure a L0 Domain (CDP)
23. Configure a H.323 gateway
24. Configure the Routing Entries

Cisco CallManager Setup

25. Create the Media Resource Group and Media Resource Group List for the MTP requirement
26. Add an H323 gateway for the Nortel CS1000 PBX under the Device pull-down menu
27. Add a Route Pattern to reach the Nortel's phone DN extensions
28. Configure Cisco 7960 phone and line DN



Configuration Menus and Commands

Nortel Communication Server 1000 (CS1000) Configuration

Call Server Setup:

1. LD 17 – Configure the D-channel (signaling channel) between the Call Server and the Signaling Server

```
>ld 22
PT2000

REQ prt
TYPE adan dch 3

ADAN DCH 3
CTYP DCIP
DES IP_Trunk_DCH
USR ISLD
ISLM 4000
SSRC 1800
OTBF 32
NASA NO
IFC SL1
CNEG 1
RLS ID 4
RCAP ND2
MBGA NO
H323
OVLR NO
OVLS NO
```

2. LD 97 – Configure the Super-loop for the Virtual Trunks

```
>ld 97
SCSYS000
MEM AVAIL: (U/P): 2854769 USED U P: 182454 59352 TOT: 3096575
DISK RECS AVAIL: 1152
REQ prt
TYPE supl
SUPL

SUPL SUPT SLOT XPEC0 XPEC1

000 STD LEFT 01 0 1 ----
004 STD LEFT 02 0 1 ----
008 STD LEFT 03 0 1 ----
012 STD LEFT 04 0 1 ----
016 STD LEFT 05 0 1 ----
032 STD LEFT 06 0 3 ----
036 STD LEFT 07 0 3 ----
040 STD LEFT 08 0 3 ----
044 STD LEFT 10 0 3 ----
048 STD LEFT 09 0 3 ----
064 STD LEFT 11 0 3 ----
068 STD LEFT 12 0 3 ----
```



```
072 STD LEFT 13 0 3 ---
096 VIRTUAL CARDS 61 - 64 81 - 84
100 VIRTUAL CARDS 65 - 68 85 - 88
128 STD LEFT 32 0 1 33 2 3
132 STD LEFT 34 0 1 35 2 3
136 STD LEFT 36 0 1 37 2 3
140 STD LEFT 38 0 1 39 2 3
144 STD LEFT 40 0 1 41 2 3
148 STD LEFT 42 0 1 43 2 3
152 STD LEFT 44 0 1 45 2 3
156 STD LEFT 46 0 1 47 2 3
```

- LD 14 – Configure the H.323 Virtual Trunks to the Signaling Server (One trunk = one line connection)

```
>ld 20
REQ: prt
TYPE: tnb
TN 63 0 0 0 → H323 Virtual trunk to Signaling Server
DATE
PAGE
DES

DES H323_IP_VTRK
TN 063 0 00 00 VIRTUAL
TYPE IPTI
CDEN 8D
CUST 0
XTRK VTRK
ZONE 000
LDOP BOP
TIMP 600
BIMP 600
AUTO_BIMP NO
TRK ANLG
NCOS 0
RTMB 11 1
CHID 101
TGAR 1
STRI/STRO IMM IMM
SUPN YES
AST NO
IAPG 0
CLS CTD DTN WTA LPR APN THFD
P10 NTC MID
TKID
AACR NO
DATE 25 FEB 2005
```

- LD 14 – Configure the Virtual Gateway Trunks (upto 32 trunks per MC-32)

```
>ld 20
REQ: prt
TYPE: tnb
TN 3
```



CDEN
CUST
DATE
PAGE
DES

DES 192.168.1.2
TN 003 0 00 00
TYPE VGW
CUST 0
XTRK MC32
ZONE 000

DES 192.168.1.2
TN 003 0 00 01
TYPE VGW
CUST 0
XTRK MC32
ZONE 000

5. LD 11 – Configure for the Virtual lines for the Nortel IP phones (phone A and phone B)
Phone A (i2004)

```
>ld 11
SL1000
MEM AVAIL: (U/P): 2854769  USED U P: 182454 59352  TOT: 3096575
DISK RECS AVAIL: 1152
DIGITAL TELEPHONES AVAIL: 6  USED: 2  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: 2405  USED: 95  TOT: 2500
DATA PORTS AVAIL: 2500  USED: 0  TOT: 2500
```

REQ: prt
TYPE: tnb

TN 61 0 0 02
DATE
PAGE
DES

DES I2004
TN 061 0 00 02 VIRTUAL
TYPE I2004
CDEN 8D
CUST 0
ZONE 000
FDN 3019
TGAR 1
LDN NO
NCOS 0
SGRP 0



RNPG 0
SCI 0
SSU
LNRS 16
XLST
CLS CTD **FBA** WTA LPR MTD **FNA HTA** TDD HFD CRPD
MWA LMPN RMMD SMWD AAD IMD XHD IRA NID OLD VCE DRG1
POD DSX VMD CMSD SLKD CCSD SWD LNA **CNDA**
CFTA 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 OCBF FLXD FTTC DNDY DNO3 MCBN
VOLA VOUD CDMR
CPND_LANG ENG
RCO 0
EFD 3019
HUNT 3019
EHT 3019
LHK 0
LPK 1
PLEV 02
CSDN
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY 00 SCR 2101 0 MARP
CPND
NAME ZEUS1_L1
XPLN 8
DISPLAY_FMT FIRST, LAST
01 SCR 2201 0 MARP
CPND
NAME ZEUS1_L2
XPLN 8
DISPLAY_FMT FIRST, LAST
02
03 MIK
04 MCK
05
06
07
08
09
10
11
12
13



14
15
16 MWK 2500
17 TRN
18 AO6
19 CFW 16 3019
20 RGA
21 PRK
22 RNP
23
24 PRS
25 CHG
26 CPN
27
28
29
30
31
DATE 21 APR 2005
NACT

Phone B (i2002):

REQ: prt
TYPE: tnb
TN 61 0 0 1
DATE
PAGE
DES

DES I2002
TN 061 0 00 01 VIRTUAL
TYPE I2002
CDEN 8D
CUST 0
ZONE 000
FDN 2500
TGAR 1
LDN NO
NCOS 0
SGRP 0
RNPG 0
SCI 0
SSU
LNRS 16
XLST
CLS CTD **FBD WTA** LPR MTD **FNA HTA** TDD HFD CRPD
MWA LMPN RMMD SMWD AAD IMD XHD IRA NID OLD VCE DRG1
POD DSX VMD CMSD SLKD CCSD SWD LNA CNDA
CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBF
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
VOLA VOUD CDMR
CPND_LANG ENG
RCO 0
HUNT 2500
LHK 0
LPK 1
PLEV 02
CSDN
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY 00 SCR 2102 0 MARP
CPND
NAME ZEUS2_L1
XPLN 8
DISPLAY_FMT FIRST, LAST
01 SCR 2202 0 MARP
CPND
NAME ZEUS2_L2
XPLN 8
DISPLAY_FMT FIRST, LAST
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16 MWK 2500
17 TRN
18 AO6
19 CFW 16 2500
20 RGA
21 PRK
22 RNP
23
24 PRS
25 CHG
26 CPN
27
28



29
30
31

DATE 12 APR 2005
NACT

6. LD 16 – Configure the H.323 route

>ld 21
PT1000

REQ: prt
TYPE: rdb
CUST 0
ROUT 11

TYPE RDB
CUST 00
DMOD
ROUT 11
DES H323_TIE
TKTP TIE
NPID_TBL_NUM 0
ESN NO
CNVT NO
SAT NO
RCLS EXT
VTRK YES
ZONE 000
PCID H323
CRID NO
NODE 101
DTRK NO
ISDN YES
MODE ISLD
DCH 3
IFC SL1
PNI 00001
NCNA YES
NCRD YES
TRO NO
FALT NO
CTYP UKWN
INAC NO
ISAR NO
DAPC NO
PTYT ATT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP



ACOD 2311

TCPP NO
TARG 01
CLEN 1
BILN NO
OABS
INST
ANTK
SIGO STD
STYP SDAT
ICIS YES
TIMR ICF 512
 OGF 512
 EOD 13952
 DSI 34944
 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
SST 5 0
NEDC ORG
FEDC ORG
CPDC NO
DLTN NO
HOLD 02 02 40
SEIZ 02 02
SVFL 02 02
DRNG NO
CDR NO
VRAT NO
MUS NO
MANO 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
OHTD NO
PLEV 2
ALRM NO
ART 0
SGRP 0
AACR NO

7. LD 86 – Configure the Route List Block for the Virtual Trunk route

>ld 86
ESN000

MEM AVAIL: (U/P): 2854769 USED U P: 182454 59352 TOT: 3096575
DISK RECS AVAIL: 1152
REQ prt
CUST 0
FEAT rlb
RLI 11

RLI 11
ENTR 0
LTER NO
ROUT 11
TOD 0 ON 1 ON 2 ON 3 ON
4 ON 5 ON 6 ON 7 ON
VNS NO
SCNV NO
CNV NO
EXP NO
FRL 0
DMI 0
ISDM 0
FCI 0
FSNI 0
SBOC NRR
IDBB DBD
IOHQ NO
OHQ NO
CBQ NO

ISET 0
NALT 5
MFRL 0
OVLL 1

8. LD 87 – Configure CDP steering codes

>ld 87
ESN000



MEM AVAIL: (U/P): 2854769 USED U P: 182454 59352 TOT: 3096575
DISK RECS AVAIL: 1152
REQ prt
CUST 0
FEAT cdp
TYPE dsc
DSC
DSC 30 → Dial 30xx send it via H323 route
FLEN 0
DSP LSC
RLI 11 → H323 Route
NPA
NXX
DSC 31 → Dial 30xx send it via SIP route
FLEN 0
DSP LSC
RLI 10 → SIP Route
NPA
NXX
DSC 40
FLEN 0
DSP LSC
RLI 4
NPA
NXX
DSC 490
FLEN 0
DSP LSC
RLI 4
NPA
NXX
DSC 51
FLEN 0
DSP LSC
RLI 11
NPA
NXX
DSC 52
FLEN 0
DSP LSC
RLI 10
NPA
NXX

Signaling Server Setup:

9. Configure the Zones



Site: 172.20.218.101 > Configuration > Call Server Configuration > Zone List > Zone 0 >

Zone Basic Property and Bandwidth Management

Input Description	Input Value
Zone Number (ZONE):	<input type="text" value="0"/>
Intrazone Bandwidth (INTRA_BW):	<input type="text" value="10000"/>
Intrazone Strategy (INTRA_STGY):	Best Quality (BQ) <input type="button" value="v"/>
Interzone Bandwidth (INTER_BW):	<input type="text" value="10000"/>
Interzone Strategy (INTER_STGY):	Best Quality (BQ) <input type="button" value="v"/>
Resource Type (RES_TYPE):	Shared (SHARED) <input type="button" value="v"/>
Branch Office Support (ZBRN):	<input type="checkbox"/>
Description (ZDES):	<input type="text"/>

10. Configure a new IP Telephony Node summary

Site: 172.20.218.101 > Configuration > IP Telephony Configuration >

Node Summary

New Node

Node: 101	Node IP: 172.20.216.100	<input type="button" value="Edit"/>	<input type="button" value="Transfer / Status"/>	<input type="button" value="Delete"/>
Voice LAN (TLAN) IP address	TN			
Signaling Server	172.20.216.103			
Pentium Card				
Succession Media Card	172.20.216.102	3 0	<input type="button" value="VGW Channels"/>	

11. Configure the Node section



Site: 172.20.218.101 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 101 >

Edit

Save and Transfer Cancel

Node

Node ID: 101

Voice LAN (TLAN) Node IP address: 172.20.216.100

Management LAN (ELAN) gateway IP address: 172.20.218.1

Management LAN (ELAN) subnet mask: 255.255.255.0

Voice LAN (TLAN) subnet mask: 255.255.255.0

SNMP [Add](#)

VGW and IP phone codec profile

QoS

LAN configuration

SNTP

H323 GW Settings

12. Configure the VGW and IP phone codec profile section

VGW and IP phone codec profile

Enable Echo canceller

Echo canceller tail delay: 128

Voice activity detection threshold: -17 Range: -20 to +10

Idle noise level: -65 Range: -327 to +327

DTMF Tone detection

Enable V.21 FAX tone detection

FAX maximum rate (bps): 14400

FAX payout nominal delay: 100 Range: 0 to 300

FAX no activity timeout: 20 Range: 10 to 32000

FAX packet size: 30

Codec	G711	Select	<input checked="" type="checkbox"/>
Codec	G729A	Select	<input checked="" type="checkbox"/>
Codec	G723.1	Select	<input type="checkbox"/>
Codec	T38 FAX	Select	<input checked="" type="checkbox"/>

QoS

LAN configuration

SNTP



The screenshot shows a configuration page with a left-hand navigation menu and a main configuration area. The navigation menu includes: System Status, Call Server, IP Telephony, Configuration, Call Server, IP Telephony, Network Numbering Plan, Call Server, Network Routing Service, Software Upgrade, Patching, System Utility, Administration, Support, Tools, and Logout. The main configuration area is divided into sections for three codecs: G711, G729A, and T38 FAX. Each section includes fields for Codec Name, Voice payload size (ms/frame), Voice playback (jitter buffer) nominal delay, and Voice playback (jitter buffer) maximum delay. There are also checkboxes for VAD. Red text below each section indicates: "Modifications may cause changes to dependent settings".

Codec	Codec Name	Voice payload size (ms/frame)	Voice playback (jitter buffer) nominal delay	Voice playback (jitter buffer) maximum delay	VAD
G711	G711	20	40	80	<input type="checkbox"/>
G729A	G729A	20	40	80	<input type="checkbox"/>
T38 FAX	T38 FAX				

13. Configure the QoS section

The screenshot shows the same configuration page as above, but with the QoS section expanded. The navigation menu is the same. The QoS section includes: Diffserv Codepoint(DSCP) Control packets (40, Range: 0 to 63), Diffserv Codepoint(DSCP) Voice packets (46, Range: 0 to 63), Enable 802.1Q support (checkbox), and 802.1Q Bits value (802.1p) (6, Range: 0 to 7). Below these are expandable sections for LAN configuration, SNTP, H323 GW Settings, Firmware, SIP GW Settings, SIP URI Map, SIP CD Services, Cards, and Signaling Servers. There are "Add" buttons next to the Cards and Signaling Servers sections.

Setting	Value	Range
Diffserv Codepoint(DSCP) Control packets	40	0 to 63
Diffserv Codepoint(DSCP) Voice packets	46	0 to 63
802.1Q Bits value (802.1p)	6	0 to 7



Configure LAN Configuration section

Codec T38 FAX		Select <input checked="" type="checkbox"/>
QoS		
Diffserv Codepoint(DSCP) Control packets	<input type="text" value="40"/>	Range: 0 to 63
Diffserv Codepoint(DSCP) Voice packets	<input type="text" value="46"/>	Range: 0 to 63
Enable 802.1Q support	<input type="checkbox"/>	
802.1Q Bits value (802.1p)	<input type="text" value="6"/>	Range: 0 to 7
LAN configuration		
Management LAN (ELAN) configuration		
Call server IP address	<input type="text" value="172.20.218.101"/>	
Survivable Succession Media Gateway IP address	<input type="text" value="0.0.0.0"/>	
Signaling port	<input type="text" value="15000"/>	Range: 1024 to 65535
Broadcast port	<input type="text" value="15001"/>	Range: 1024 to 65535
Voice LAN (TLAN) configuration		
Signaling port	<input type="text" value="5000"/>	Range: 1024 to 65535
Voice port	<input type="text" value="5200"/>	Range: 1024 to 65535
Routes <input type="button" value="Add"/>		
IP address	Subnet mask	<input type="button" value="Remove"/>
<input type="text" value="172.20.216.1"/>	<input type="text" value="255.255.255.0"/>	

14. Configure the H323 GW Setting section



The screenshot displays a Cisco configuration web interface. On the left is a navigation menu with categories like System Status, Configuration, Network Numbering Plan, Software Upgrade, Patching, System Utility, Administration, Support, Tools, and Logout. The main content area is divided into sections: SNTP Server, SNTP Client, and H323 GW Settings. Each section contains various configuration parameters with input fields and dropdown menus. Some fields have green text indicating valid ranges.

Section	Parameter	Value	Range
SNTP Server	Mode	active	
	Interval	256	Range: 1 to 2147483647
	Port	20101	
SNTP Client	Mode	passive	
	Interval	256	Range: 1 to 2147483647
	Port	20101	
H323 GW Settings	SNTP server IP address	0.0.0.0	
	Primary gatekeeper IP address	172.20.216.103	
	Alternate gatekeeper IP address	172.20.217.103	
	Primary Network Connect Server IP address	172.20.216.103	
	Primary Network Connect Server Port number	16500	Range: 1024 to 65535
	Alternate Network Connect Server IP address	172.20.217.103	
	Alternate Network Connect Server Port number	16500	Range: 1024 to 65535
Primary Network Connect Server timeout	10	Range: 1 to 30	

15. Configure the Card section for the MC-32 VGMC card section



The screenshot shows the configuration page for a signaling server card. On the left is a navigation menu with categories like System Status, Configuration, Network Numbering Plan, Software Upgrade, Patching, System Utility, Administration, Support, Tools, and Logout. The main content area is titled 'SIP GW Settings' and includes sections for 'SIP URI Map', 'SIP CD Services', and 'Cards'. The 'Cards' section is expanded to show 'Card 172.20.218.102 Properties'. The card's role is 'Follower'. The configuration fields are as follows:

Field	Value
Management LAN (ELAN) IP address	172.20.218.102
Management LAN (ELAN) MAC address	00:11:F9:E4:D0:11
Voice LAN (TLAN) IP address	172.20.216.102
Voice LAN (TLAN) gateway IP address	172.20.216.1
Hostname	MG_Node101_3
Card TN	3
Card processor type	Succession Media Card
H323 ID	MG_Node101
Enable set TPS	<input checked="" type="checkbox"/>
System name	MG_Node_101
System location	Dewey Lab
System contact	Fred McClintic

16. Configure the Signaling Server section



▼ Signaling Servers Add

▼ Signaling Server 172.20.218.103 Properties Remove

Role	Leader
Management LAN (ELAN) IP address	<input type="text" value="172.20.218.103"/> *
Management LAN (ELAN) MAC address	<input type="text" value="00:02:b3:f7:3a:86"/> *
Voice LAN (TLAN) IP address	<input type="text" value="172.20.216.103"/> *
Voice LAN (TLAN) gateway IP address	<input type="text" value="172.20.216.1"/>
Hostname	<input type="text" value="SS_Node101_Ldr"/> *
H323 ID	<input type="text" value="Gateway_Node101"/>
Enable set TPS	<input checked="" type="checkbox"/>
Enable virtual trunk TPS	<input type="text" value="H.323 and SIP"/> ▼
Enable SIP Proxy / Redirect Server	<input checked="" type="checkbox"/>
SIP Transport Protocol	<input type="text" value="TCP"/> ▼
Local SIP Port	<input type="text" value="5060"/>
SIP Domain name	<input type="text" value="birch.com"/>
SIP Gateway Endpoint Name	<input type="text" value="Gateway_Node101"/>
SIP Gateway Authentication Password	<input type="text" value="••••"/>
Enable H323 Gatekeeper	<input checked="" type="checkbox"/>
Network Routing Service Role	<input type="text" value="Primary"/> ▼
System name	<input type="text" value="SS_Node101_Ldr"/>

▼ System Status

- Call Server
- IP Telephony

▼ Configuration

- Call Server
- IP Telephony

▼ Network Numbering Plan

- Call Server
- Network Routing Service

► Software Upgrade

► Patching

► System Utility

► Administration

► Support

Tools

Logout



Network Routing Server Setup:

17. Configure the System Wide Settings

The screenshot shows the 'System Wide Settings' configuration page for the Network Routing Service. The page has a navigation bar with 'Home', 'Configuration', 'Tools', 'Reports', and 'Administration' tabs, and 'Help' and 'Logout' links. The current location is 'Home > System Wide Settings >'. The left sidebar contains 'NRS Overview' with a link to '=> System Wide Settings' and 'NRS Server Settings'. The main content area contains the following settings:

DB sync interval for alternate [Hours]	<input type="text" value="24"/>
SIP registration time to live timer [Seconds]	<input type="text" value="30"/>
H.323 gatekeeper registration time to live timer [Seconds]	<input type="text" value="30"/>
H.323 alias name	<input type="text" value="H323NRS101"/>
Alternate NRS server is permanent	<input type="checkbox"/>
Auto backup time [HH:MM]	<input type="text" value="23:59"/>
Auto backup to FTP site enabled	<input type="checkbox"/>
Auto backup FTP site IP address	<input type="text"/>
Auto backup FTP site path	<input type="text"/>
Auto backup FTP username	<input type="text"/>
Auto backup FTP password	<input type="text"/>

A 'Save' button is located at the bottom of the form.

18. Configure the NRS Server Settings



Network Routing Service

[Home](#)[Configuration](#)[Tools](#)[Reports](#)[Administration](#)[Help](#) | [Logout](#)

Location: [Home](#) > [NRS Server Settings](#) >

NRS Overview

System Wide Settings

=> [NRS Server Settings](#)

NRS Settings

Host name *

Primary IP (TLAN) *

Alternate IP (TLAN) *

Control priority

H.323 Gatekeeper Settings

Location request (LRQ) response timeout [Seconds]

SIP Server Settings

Mode

UDP transport enabled

UDP port

UDP maximum transmission unit (MTU)



Network Routing Service

Home Configuration Tools Reports Administration Help | Logout

SIP Server Settings

HRS Overview
System Wide Settings
=> HRS Server Settings

Mode

UDP transport enabled

UDP port

UDP maximum transmission unit (MTU)

TCP transport enabled

TCP port

TCP maximum transmission unit (MTU)

Network Connection Server (NCS) Settings

Primary NCS port

Alternate NCS port

Primary NCS timeout (Seconds)

19. Configure a Service Domain



Network Routing Service

[Home](#)[Configuration](#)[Tools](#)[Reports](#)[Administration](#)[Active DB view](#) (set Standby DB view)[Help](#) | [Logout](#)

Location: [Configuration](#) > [Service Domains](#) > [View Service Domain Property](#) >

View Service Domain Property

[=> Service Domains](#)[L1 Domains \(UDP\)](#)[L0 Domains \(CDP\)](#)[Gateway Endpoints](#)[User Endpoints](#)[Routing Entries](#)[Default Routes](#)[Collaborative Servers](#)Domain name *Domain description

** Mandatory field indicator*



20. Configure a L1 Domain (UDP)

Network Routing Service

Home Configuration Tools Reports Administration Active DB view (set Standby DB view) Help Logout

View L1 Domain Property (birch.com)

Service Domains
=> L1 Domains (UDP)
L0 Domains (CDP)
Gateway Endpoints
User Endpoints
Routing Entries
Default Routes
Collaborative Servers

Domain name *

Domain description

Endpoint authentication enabled

Authentication password

E.164 country code

E.164 area code

International dialing access code

L1 domain dialing access code

National dialing access code

Local dialing access code

Special number 1

Special number 2

21. Configure a L0 Domain (CDP)



Network Routing Service

Home **Configuration** Tools Reports Administration **Active DB view** (set Standby DB view) Help | Logout

View L0 Domain Property (birch.com / mcccmm.com)

Service Domains	Domain name	<input type="text" value="CDP"/>
L1 Domains (UDP)	Domain description	<input type="text" value="CDP (local extension) domain"/>
=> L0 Domains (CDP)	Special number label	<input type="text"/>
Gateway Endpoints	Unqualified number label	<input type="text"/>
User Endpoints	Endpoint authentication enabled	<input type="text" value="Authentication off"/>
Routing Entries	Authentication password	<input type="text"/>
Default Routes	E.164 country code	<input type="text" value="1"/>
Collaborative Servers	E.164 area code	<input type="text" value="314"/>
	International dialing access code	<input type="text" value="011"/>
	L1 domain dialing access code	<input type="text"/>
	National dialing access code	<input type="text"/>
	Local dialing access code	<input type="text"/>



Configure a H.323 gateway

Network Routing Service

Home **Configuration** Tools Reports Administration [Active DB view](#) (set Standby DB view) [Help](#) [Logout](#)

Location: Configuration > Gateway Endpoints > View Gateway Endpoint Property >

View Gateway Endpoint Property (birch.com / mcccmm.com / CDP)

Endpoint name	<input type="text" value="NortelCS101"/>	*
Endpoint description	<input type="text" value="Chinh CCM ICT"/>	
Tandem endpoint name	<input type="text"/>	Look up
Endpoint authentication enabled	<input type="text" value="Authentication off"/>	
Authentication password	<input type="text"/>	
E.164 country code	<input type="text" value="1"/>	
E.164 area code	<input type="text" value="408"/>	
International dialing access code	<input type="text" value="011"/>	
L1 domain dialing access code	<input type="text"/>	
National dialing access code	<input type="text"/>	
Local dialing access code	<input type="text"/>	



Network Routing Service

Home Configuration Tools Reports Administration **Active DB view** (set Standby DB view) Help | Logout

International dialing access code

L1 domain dialing access code

National dialing access code

Local dialing access code

Special number 1

Special number 2

Static endpoint address type

Static endpoint address

H.323 Support

SIP support

SIP transport

SIP port

Network Connection Server enabled

** Mandatory field indicator*



22. Configure the Routing Entries

Network Routing Service

Home **Configuration** Tools Reports Administration [Active DB view](#) (set Standby DB view) [Help](#) | [Logout](#)

Location: Configuration > Routing Entries >

Routing Entries

Show Routing Entries for (Service Domain / L1 Domain / L0 Domain / Endpoint):

/ / / [Look up](#)

Showing 1 - 1 of 1 < Previous | Next >

#	DN Prefix	DN Type	Route Cost	SIP URI Phone Context
1	3	Level0 regional	1	CDP.mccomm.com



Network Routing Service

Home **Configuration** Tools Reports Administration **Active DB view** (set Standby DB view) Help | Logout

Location: Configuration > Routing Entries >

Routing Entries

Show Routing Entries for (Service Domain / L1 Domain / L0 Domain / Endpoint):

birch.com / mccomm.com / CDP / Gateway_Node101 [Look up](#)

Showing 1 - 1 of 1 < Previous | Next >

#	DN Prefix	DN Type	Route Cost	SIP URI Phone Context
1	2	Level0 regional	1	CDP.mccomm.com



Cisco CallManager Configuration

25. Create the Media Resource Group and Media Resource Group List for the MTP requirement

The screenshot displays the Cisco CallManager Administration web interface. At the top, there is a navigation menu with links for System, Route Plan, Service, Feature, Device, User, Application, and Help. The main header area includes the Cisco CallManager Administration logo and the Cisco Systems logo. The page title is "Media Resource Group Configuration".

On the right side of the header, there are three links: "Add a New Media Resource Group", "Back to Find/List Media Resource Groups", and "Dependency Records".

The main content area shows the configuration for a Media Resource Group named "sw_mrg", which is currently used by 1 device. The status is "Ready". Below this, there are four buttons: "Copy", "Update", "Delete", and "Reset Devices".

The "Media Resource Group Information" section contains two text input fields: "Media Resource Group Name*" with the value "sw_mrg" and "Description" with the value "sw_mrg".

The "Devices for this Group" section features two list boxes. The "Available Media Resources**" list box contains "ANN_CCMPUB (ANN)" and "MOH_CCMPUB (MOH)". The "Selected Media Resources*" list box contains "CFB_CCMPUB (CFB)" and "MTP_CCMPUB (MTP)". There are up and down arrow buttons between the two list boxes.

At the bottom of the configuration area, there is a checkbox labeled "Use Multicast for MOH Audio (requires at least one multicast MOH resource)" which is currently unchecked. Below this, there are two lines of asterisked footnotes: "* indicates required item" and "** Includes Annunciators (ANN), Conference Bridges (CFB), Media Termination Points (MTP), Music On Hold Servers (MOH), and Transcoders (XCODE)".



System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Media Resource Group List Configuration

[Add a New Media Resource Group List](#)
[Back to Find/List Media Resource Group Lists](#)
[Dependency Records](#)

Media Resource Group List: sw_mrgl (used by 1 devices)
Status: Ready

Media Resource Group List Information

Media Resource Group List Name*

Media Resource Groups for this List

Available Media Resource Groups

▼ ▲

Selected Media Resource Groups*

(Groups listed in order of priority)

* indicates required item



26. Add an H323 gateway for the Nortel CS1000 PBX under the Device pull-down menu

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Gateway Configuration

[Back to Find/List Gateways](#)
[Dependency Records](#)

Product : H.323 Gateway
Gateway : 172.20.216.100
Device Protocol: H.225
Registration: Unknown
IP Address: 172.20.216.100

Status: Ready

Device Information

Device Name*	<input type="text" value="172.20.216.100"/>
Description	<input type="text" value="Nortel Node 101"/>
Device Pool*	<input type="text" value="Default"/>
Call Classification*	<input type="text" value="OnNet"/>
Media Resource Group List	<input type="text" value="sw_mrgl"/>
Location	<input type="text" value="< None >"/>
AAR Group	<input type="text" value="< None >"/>
Signaling Port*	<input type="text" value="1720"/>

Media Termination Point Required



<input checked="" type="checkbox"/>	Media Termination Point Required
<input type="checkbox"/>	Retry Video Call as Audio
<input type="checkbox"/>	Wait for Far End H.245 Terminal Capability Set
Multilevel Precedence and Preemption (MLPP) Information	
MLPP Domain (e.g., "0000FF")	<input type="text"/>
MLPP Indication	Not available on this device
MLPP Preemption	Not available on this device
Call Routing Information	
Inbound Calls	
Significant Digits*	<input type="text" value="All"/>
Calling Search Space	<input type="text" value="< None >"/>
AAR Calling Search Space	<input type="text" value="< None >"/>
Prefix DN	<input type="text"/>
<input checked="" type="checkbox"/>	Redirecting Number IE Delivery - Inbound
<input checked="" type="checkbox"/>	Enable Inbound FastStart
Outbound Calls	
Calling Party Selection*	<input type="text" value="Originator"/>
Calling Party Presentation*	<input type="text" value="Default"/>
Called party IE number type unknown*	<input type="text" value="Unknown"/>
Calling party IE number type unknown*	<input type="text" value="Unknown"/>
Called Numbering Plan*	<input type="text" value="Unknown"/>



Significant Digits*	All
Calling Search Space	< None >
AAR Calling Search Space	< None >
Prefix DN	
<input checked="" type="checkbox"/> Redirecting Number IE Delivery - Inbound	
<input checked="" type="checkbox"/> Enable Inbound FastStart	
Outbound Calls	
Calling Party Selection*	Originator
Calling Party Presentation*	Default
Called party IE number type unknown*	Unknown
Calling party IE number type unknown*	Unknown
Called Numbering Plan*	Unknown
Calling Numbering Plan*	Unknown
Caller ID DN	
<input checked="" type="checkbox"/> Display IE Delivery	
<input checked="" type="checkbox"/> Redirecting Number IE Delivery - Outbound	
<input checked="" type="checkbox"/> Enable Outbound FastStart	
Codec For Outbound FastStart*	G711 u-law 64K

* indicates required item

[Back to Find/List Gateways](#)

27. Add a Route Pattern to reach the Nortel's phone DN extensions



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: 210X
Status: Ready
Note: Any update to this Route Pattern automatically resets the associated gateway or Route List

Pattern Definition

Route Pattern*	<input type="text" value="210X"/>	
Partition	<input type="text" value="< None >"/>	
Description	<input type="text" value="To Nortel H323"/>	
Numbering Plan*	<input type="text" value="North American Numbering Plan"/>	
Route Filter	<input type="text" value="< None >"/>	
MLPP Precedence	<input type="text" value="Default"/>	
Gateway or Route List*	<input type="text" value="172.20.216.100"/> (Edit)	
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern <input type="text" value="— Not Selected —"/>	
Call Classification*	<input type="text" value="OnNet"/> <input type="checkbox"/> Allow Device Override	
<input type="checkbox"/> Provide Outside Dial Tone	<input type="checkbox"/> Allow Overlap Sending	<input type="checkbox"/> Urgent Priority
<input type="checkbox"/> 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
<input type="text" value="-- Not Selected --"/>	<input type="text" value="< Not Exist >"/>	<input type="text"/>

* indicates required item.

28. Configure Cisco 7960 phones with 3012 and 3013 DN.



System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Directory Number Configuration

[Configure Device \(SEP00036B800663\)](#)
[Dependency Records](#)

Associated With
SEP00036B800663
7980 (Line 1)

Directory Number: 3012
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" value="3019"/>	<input type="text" value="<None >"/>
Forward Busy Internal	<input type="checkbox"/>	<input type="text" value="3019"/>	<input type="text" value="<None >"/>



Forward No Coverage Internal	<input type="checkbox"/>	<input type="text" value="3013"/>	<None >
Forward No Coverage External	<input type="checkbox"/>	<input type="text" value=""/>	<None >
No Answer Ring Duration	<input type="text" value="5"/>	(seconds)	
Call Pickup Group	<None >		
MLPP Alternate Party Settings			
Target (Destination)	<input type="text" value=""/>		
Calling Search Space	<None >		
No Answer Ring Duration	<input type="text" value=""/>	(seconds)	
Line Settings for all Devices			
Alerting Name	<input type="text" value="H3012_A"/>		
Line Settings for this Device			
Display (Internal Caller ID)	<input type="text" value="H3012_C"/>		
Line Text Label	<input type="text" value="H3012"/>		
External Phone Number Mask	<input type="text" value=""/>		
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*	<input type="text" value="1"/>	(1 - 196)	
Busy Trigger*	<input type="text" value="1"/>	(<= Max. Calls)	
Forwarded Call Information Display			
<input checked="" type="checkbox"/> Caller Name	<input checked="" type="checkbox"/> Caller Number		
<input checked="" type="checkbox"/> Redirected Number	<input checked="" type="checkbox"/> Dialed Number		



Directory Number Configuration

[Configure Device \(SEP000BBEAD4EB1\)](#)
[Dependency Records](#)

Associated With
SEP000BBEAD4EB1
7960 (Line 1)

Directory Number: 3013
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 >"/>
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 >"/>



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

Address: https://ccmpub/CCMAdmin/directorynumber.asp?NumPlanMapID={D77E4997-8A2F-4578-83EC-CF6DA51BAA92}

Forward No Coverage Internal <None >

Forward No Coverage External <None >

No Answer Ring Duration (seconds)

Call Pickup Group <None >

MLPP Alternate Party Settings

Target (Destination)

Calling Search Space <None >

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 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* (1 - 196)

Busy Trigger* (<= Max. Calls)

Forwarded Call Information Display

Caller Name Caller Number

Redirected Number Dialed Number

Done Local intranet

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

Important Information

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Test Results

Test was performed by Chinh Trieu on 04/11/05.

Table 1. Basic Calls with Enbloc Signaling

Calls Made	Call Comp.?	Calling Number Displayed on Final Destination?	Calling Name Displayed on Final Destination?	Called Number Displayed on Orig. Side?	Called Name Displayed on Orig. Side?
Phone A call Phone C	Yes	Yes	No ¹	Yes	No ¹
Phone C call Phone A	Yes	No ²	No ²	Yes	No ²

Note1: Nortel sends the calling/called party name information via the “nonStandardData” field within the H225 IP packet.

This is why CCM could not display the name information.

CallManager sends out the “connected” name and number information via the H.225 Notify message using the “Display IE” and “Connected Number IE” fields. However, Nortel does not interpret H.225 Notify message. As a result, the information is lost.

Note2: CallManager sends out the calling party number in the H.225 SETUP message, but Nortel doesn’t display it. It displays the trunk access code (ACOD) defined in the H.323 Route Data Block for the Rout 10 entry. Not sure why this is the case.

CallManager does display the called party name information but instead, it displays Nortel’s NRS node name.

The reason for this is that Nortel sends its NRS system node name via the “Display IE” in the H.225 CONNECT message. CCM interprets and treats it as the “Connected Name” information.

Table 2. Basic Calls with Overlap Sending/Receiving:

Calls Made	Call Comp.?	Calling Number Displayed on Final Destination?	Calling Name Displayed on Final Destination?	Called Number Displayed on Orig. Side?	Called Name Displayed on Orig. Side?
Phone A call Phone C	No	No	No	No	No
Phone C call Phone A	No	No	No	No	No

Note: Cisco CallManager currently doesn’t support Overlap Sending and Receiving feature for H.323 gateway/device

Table 3. Basic Calls with Calling Name and Number Restrictions

Calls Made	Call Comp.?	Calling Number Restriction was honored at Final Destination?	Calling Name Restriction was honored at Final Destination?	Called Number Displayed on Orig. Side?	Called Name Displayed on Orig. Side?
Phone A call Phone C Phone A Restrict Calling Name and Number	Yes	Yes ¹	Yes ¹	Yes ¹	No ¹
Phone C call Phone A Phone C Restrict Calling Name and Number	Yes	Yes ²	Yes ²	No ²	No ²

Note1: Nortel does not sent out any calling party field within the H225 SETUP message. This is probably their method of CLIR.

Nortel sends out their calling party name information via a “nonStandardData” field with the H.225 SETUP which CCM does not support. Thus, the calling name information was not displayed. We couldn’t verify if the PI bit was set to restricted or not due to Nortel’s proprietary signaling.

CallManager sends out the called name and number information via the “Display IE” and “Connected Number IE” fields within the H.225 Notify message. However, Nortel does not interpret the information within the Notify message.

Note2: Nortel displays the trunk access code (ACOD) only and no calling name information.

CCM phone displays the called party number (this is just the dialed digits and not the alerting/connected number) and Nortel node name. The node name was received via “Display IE” field within H225 CONNECT message.



CCM does not send out any DISPLAY IE field within the H.225 SETUP message and set the calling party number PI bit to be restricted when it's configured with CLIR and CNIR feature.

Table 4. Basic Calls with Called Name and Number Restrictions

Calls Made	Call Comp.?	Calling Number Displayed on Final Destination?	Calling Name Displayed on Final Destination?	Connected Number Restriction was honored at Orig. Side?	Connected Name Restriction was honored at Orig. Side?
Phone A call Phone C Phone C Restrict Called Name and Number	Yes	Yes	No ¹	Yes ¹	Yes ¹
Phone C call Phone A Phone A Restrict Called Name and Number	Yes	No ²	No ²	No ²	No ²

Note1: Nortel sends the calling/called party name information using the "nonStandardData" field within the H225 IP packet. This is why CCM could not display the name information. With CallManager sends the Connected Number with the PI bit set to be Restricted and didn't included the Display IE field in H.225 Notify message sent toward the originating side (Nortel PBX). However, Nortel does not interpret the information within the H.225 Notify message

Note2: CallManager sends out the Connected Name and Number information via the H.225 Notify message, but Nortel does not interpret the information within the message. Nortel displays only the Trunk Access Code (ACOD) number only. Nortel does not send out any Connected Name or Number information back to CCM. It does include a Display IE field within the H.225 CONNECT message however, that's not the actual called party name information. It's Nortel NRS node name.

Table 5. Alerting Name

Calls Made	Call Setup Comp.?	Alerting Name was sent by Final Destination during Alerting (ringing)?	Alerting Name was displayed on Orig. Side during Alerting (ringing)?
Phone A to Phone C Phone C does not answer	Yes	Yes ²	No ¹
Phone C to Phone A Phone A does not answer	Yes	No ¹	No ²

Note1: CallManager sends out the Connected Name using the Display IE field in H.225 Notify message, however, Nortel does not interpret/support that type of message.

Note2: Nortel sends the calling/called party name information using the "nonStandardData" field within the H225 IP packet. This is why CCM could not display the name information.

Table 6. Call Transfers (Consultation Local Transfers)

Calls Made	Call Comp?	Orig. Calling Number Displayed on Final Dest. Phone?	Orig. Calling Name Displayed on Final Dest. phone?	Called Number Display on Orig. phone Updated After Transfer?	Called Name Display on Orig. Phone Updated After Transfer?
Phone A to Phone C Xfr to Phone D	Yes	Yes	No ¹	No ¹	No ¹
Phone C to Phone A Xfr to Phone B	Yes	No ²	No ²	No ²	No ²

Note1: CCM phone displays only the calling party number information at the final destination. Nortel phone displays only the original called party number with no name.



CCM sends out a H.225 Notify message with the Transferred-to party's name and number using the DISPLAY IE and Connected Number fields within the H.225 Notify message. However, Nortel does not interpret/understand the message and thus it did not update the phone's display.

Note2: Calling party phone displays the original called party number (2101) and Nortel node name (SS_Node1_Ldr) and not the actual called party phone name. When the call is transferred, Nortel doesn't send out any H.225 Transfer-update information message. As a result, CCM phone's display remains the same after the transfer has completed. Nortel phone displays a "XFER" keyword with the ACOD number after the transfer is completed. The calling party name in the DISPLAY IE of the H.225 SETUP sent by CCM to Nortel was ignored and not used.

Table 7. Call Transfers (Blind Local Transfers)

Calls Made	Call Comp.?	Orig. Calling Number Displayed on Final Dest. Phone?	Orig. Calling Name Displayed on Final Dest. phone?	Called Number Display on Orig. phone Updated After Transfer?	Called Name Display on Orig. Phone Updated After Transfer?
Phone A to Phone C Xfr to Phone D	Yes	Yes	No ¹	No ¹	No ¹
Phone C to Phone A Xfr to Phone B	Yes	No ²	No ²	No ²	No ²

Note1: CCM phone displays only the calling party number information at the final destination with no name information. Nortel phone displays only the original called party number with no name. CCM sends out a H.225 Notify message with the Transferred-to party's name and number using the DISPLAY IE and Connected Number field within the H.225 Notify message. However, Nortel does not interpret/understand the message and thus it didn't update the phone display.

Note2: CCM displays the original called party number and Nortel node name (SS_Node1_Ldr) and not the actual called party phone name. When the call is transferred, Nortel doesn't send out any H.225 Transfer-update information message. As a result, CCM phone's display remains the same after the transfer has completed. Nortel phone display a "XFER" keyword with the ACOD number after the transfer occurred. The calling party name in the DISPLAY IE of the H.225 SETUP sent by CCM to Nortel was ignored and not used.

Table 8. Call Transfers (Consultation Network/External)

Calls Made	Call Comp.?	Orig. Calling Number Displayed on Final Dest. Phone?	Orig. Calling Name Displayed on Final Dest. Phone?	Called Number Display on Orig. Phone Updated After Transfer?	Called Name Display on Orig. Phone Updated After Transfer?
Phone A to Phone C Xfr to Phone B	Yes	No ¹	No ¹	No ¹	No ¹
Phone C to Phone A Xfr to Phone D	Yes	No ²	No ²	No ²	No ²

Note1: Nortel calling party phone displays only the original called party number 3013 with no name information. Nortel final destination (transferred-to) phone display the ACOD number (2311-1) CCM send out a H.225 Notify message with the Transferred-to party's name and number using the DISPLAY IE and Connected Number field within the H.225 Notify message. However, Nortel doesn't interpret/understand the message and thus didn't update the phone display.

Note2: CCM calling party phone displays the original called party number (2101) and Nortel node name (SS_Node1_Ldr) and not the actual called party phone name. When the call is transferred, Nortel doesn't send out any H.225 Transfer-update information message. As a result, CCM phone's display remained the same after the Transfer has occurred. CCM final destination phone (Transferred-To) displayed the Transferring phone number (2101) and no name.

*** Nortel maintained the TCP H.323 signaling session up for the calls. It takes the IP address and port information received from the CCM OLC_ACK message and transparently pass it across between the two call legs. As a result, both CCM phones RTP stream are communicating to the CCM SW MTP, but the H.323 signaling is between CCM and Nortel for each call leg.



Table 9. Call Transfers (Blind Network/External)

Calls Made	Call Comp.?	Orig. Calling Number Displayed on Final Dest. Phone?	Orig. Calling Name Displayed on Final Dest. Phone?	Called Number Display on Orig. Phone Updated After Transfer?	Called Name Display on Orig. Phone Updated After Transfer?
Phone A to Phone D Xfr to Phone A	Yes	No ¹	No ¹	No ¹	No ¹
Phone C to Phone A Xfr to Phone D	Yes	No ²	No ²	No ²	No ²

Note1: Nortel calling party phone displays the original called party number 3013 with no name information. Nortel final destination (Transferred-to) phone displays the ACOD number (2311-1) CCM send out a H225 Notify message with the Transferred-to party's name and number using the DISPLAY IE and Connected Number field within the H.225 Notify message. However, Nortel does interpret/understand the message and thus didn't update it's phone display. After the call was transferred, CCM again send out another transfer-update using H.225 Notify with Display IE and Connected number IE field to the calling party, but nothing happen. Nortel ignores it also.

*** Note, RTP streams are between the Nortel phone 2101 and CCM MTP for original call leg and CCM and phone 2102 for the network blind-transferred out call ==> Both systems doesn't support H.450.2 Supplementary Services.

Note2: CCM displays the original called party number (2101) and Nortel node name (SS_Node1_Ldr) and not the actual called party phone name. When the call is transferred, Nortel doesn't send out any H225 Transfer-update information message. As a result, CCM phone's display remains the same after the Transfer has occurred. CCM final destination phone (Transferred-to) displays the transferring phone number (2101) and no name.

*** Nortel maintained the TCP H.323 signaling session up for the calls. It takes the IP address and port information received from CCM OLC_ACK message and transparently passes it across between the two call legs. As a result, both CCM phones RTP stream are communicating to the CCM SW MTP, but the H.323 signaling is between CCM and Nortel for each call leg.

Table 10. Call Forward Unconditional by join (Local)

Calls Made	Call Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Forwarding Called Number Displayed on Final Dest.?	Forwarding Called Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at orig. Side?	Final Dest. "Connected Name" Updated at Orig. Side?
Phone A to Phone C-CFU to Phone D	Yes	Yes	No ¹	Yes	Yes	No ¹	No ¹
Phone C to Phone A-CFU to Phone B	Yes	Yes	No ²	Yes	Yes	No ²	No ²

Note1: Nortel calling party phone displays the dialed number (3013) with no name information. CCM sends out a H225 Notify message with the Forwarded-to party's name and number using the DISPLAY IE and Connected Number field within the H225 Notify message. However, Nortel does interpret/understand the message and thus it didn't update the phone display. The forwarded-to party (3012) displays the forwarding phone information along with the calling party number only (no name). The reason is that the calling party name information is sent by Nortel using the "nonStandardData" field within the H225 SETUP message instead of the DISPLAY IE which CCM support. The display of the forwarding phone information at the final destination is controlled by the "Retain Forward Information*" field in the CCM Advance Service Parameter page.

Note2: The CCM calling party phone displayed the original called party number (2101) with the CS1000 system node name (SS_Node1_Ldr) and not the actual called party phone name. The system node name is received in the H225 CONNECT message via the DISPLAY IE field.



Nortel final destination phone (forwarded-to) displays the calling party number along with the forwarding phone number and name information (2101 and it's name) along with "CFWD" keyword
 It does not have the calling party phone name information. CCM, however, does include the calling party name information with the H225 SETUP message using the DISPLAY IE field which Nortel ignored.

Table 11. Call Forward Unconditional by join (Network/External)

Calls Made	Call Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Forwarding Called Number Displayed on Final Dest.?	Forwarding Called Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at Orig. Side?	Final Dest. Connected Name Updated at Orig. Side?
Phone A to Phone C-CFU to Phone B	Yes	Yes	No ¹	No ¹	No ¹	No ¹	No ¹
Phone C to Phone A-CFU to Phone D	Yes	No ²	No ²	No ²	No ²	No ²	No ²

Note1: Nortel calling party phone displays the dialed number (3013) with no name information.
 CCM sent out a H225 Notify message with the Forwarded-to party's name and number using the DISPLAY IE and Connected Number field within the H225 Notify message. However, Nortel does interpret/understand the message and thus it didn't update the phone display.
 The final destination phone (2102) displays the original calling party number only. This is because in the outbound diverted call setup from CCM, the calling party number field is set to be the original calling party number instead of the original called party number (forwarding device DN). When the final destination phone answers the call, there is no change to the display.
 CCM does send out an H.225 Notify message to original calling party (2101) to update its display with the forwarded-to/final destination) phone number. However, Nortel ignores it and does not update the display of the calling party phone.
 In the H225 CONNECT message for the outgoing diverted call, there is a DISPLAY IE field populated with Nortel node name (SS_Node1_Ldr). CCM receives it and does transparently pass onward and populates the H.225 Connect message with the same information using the same field for the original inbound call leg. However, Nortel doesn't interpret that information. It's expecting the information to be in the "nonStandardData" field within the H.225 CONNECT message.

*** RTP streams is between Nortel calling party and CCM SW MTP for the original call leg and CCM SW MTP and the final destination party for the outbound diverted call leg. So, even though the two parties (calling and final destination) are both on the Nortel system, the RTP streams are directed to CCM MTP and redirected out.

Note2: Calling party phone display the original called party number (2102) and CS1000 Node name (SS_Nod1_Ldr) receive in the H225 CONNECT message via the DISPLAY IE field.
 The final destination (forwarded-to) phone on CCM did sent out a H.225 Notify message (with it's name and number) to Nortel (forwarding station), but Nortel didn't interpret the information or forward them onward to the original calling party device.

The final destination phone display "Private and Unknown number" on it's screen. The reason is that Nortel didn't include the calling party ie field within the H225 SETUP message sent to CCM for the diverted call attempt.
 Nortel acting as the forwarding node doesn't send out any update information to the calling or final destination devices

*** RTP streams are from CCM phones and CCM SW MTP. RTP streams are not directed through the Nortel node.
 However, Nortel does maintain the TCP H.323 signaling session up for the calls. It takes the IP address and port information received from the CCM OLC_ACK message and transparently passed it across between the two call legs. As a result, both CCM phones RTP stream are communicating to the CCM SW MTP, but the H.323 signaling is between CCM and Nortel for each call leg.

Table 12. Call Forward Busy by join(Local)

Calls Made	Call Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Forwarding Called Number Displayed on Final Dest.?	Forwarding Called Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at orig. Side?	Final Dest. "Connected Name" Updated at Orig. Side?
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Calls Made	Call Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Forwarding Called Number Displayed on Final Dest.?	Forwarding Called Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at orig. Side?	Final Dest. "Connected Name" Updated at Orig. Side?
Phone A to Phone C-CFB to Phone D	Yes	Yes	No ¹	Yes	Yes	No ¹	No ¹
Phone C to Phone A-CFB to Phone B	Yes	Yes	No ²	Yes	Yes	No ²	No ²

Note1: Please see Call Forward Unconditional by Join (Local)

Note2: Please see Call Forward Unconditional by Join (Local)

Table 13. Call Forward Busy by join (Network/External)

Calls Made	Call Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Forwarding Called Number Displayed on Final Dest.?	Forwarding Called Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at Orig. Side?	Final Dest. Connected Name Updated at Orig. Side?
Phone A to Phone C-CFB to Phone B	Yes	Yes	No ¹	No ¹	No ¹	No ¹	No ¹
Phone C to Phone A-CFB to Phone D	Yes	No ²	No ²	No ²	No ²	No ²	No ²

Note1: Please see Call Forward Unconditional by Join (Network)

Note2: Please see Call Forward Unconditional by Join (Network)

Table 14. Call Forward No Reply by join (Local)

Calls Made	Call Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Forwarding Called Number Displayed on Final Dest.?	Forwarding Called Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at Orig. Side?	Final Dest. "Connected Name" Updated at Orig. Side?
Phone A to Phone C-CFNR to Phone D	Yes	Yes	No ¹	Yes	Yes	No ¹	No ¹
Phone C to Phone A-CFNR to Phone B	Yes	Yes	No ²	Yes	Yes	No ²	No ²

Note1: Please see Call Forward Unconditional by Join (Network)

Note2: Please see Call Forward Unconditional by Join (Network)

Table 15. Call Forward No Reply by join (Network/External)

Calls Made	Call Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Forwarding Called Number Displayed on Final Dest.?	Forwarding Called Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at Orig. Side?	Final Dest. Connected Name Updated at Orig. Side?
Phone A to Phone C-CFNR to Phone B	Yes	Yes	No ¹	No ¹	No ¹	No ¹	No ¹
Phone C to Phone A-CFNR to Phone D	Yes	No ²	No ²	No ²	No ²	No ²	No ²



Note1: Please see Call Forward Unconditional by Join (Network)

Note2: Please see Call Forward Unconditional by Join (Network)

Table 16. Call Completion to Busy Subscriber

Calls Made	Call Back Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at Orig. Side?	Final Dest. Connected Name Updated at Orig. Side?
Phone A to Phone C-Busy Subscriber Invoke CallBAck feature from A	No	N/A	N/A	N/A	N/A
Phone C to Phone A-Busy Subscriber Invoke CallBAck feature from C	No	N/A	N/A	N/A	N/A

Note: Cisco CallManager doesn't support Call Completion across H323 gateway.
Nortel Call Completion is tunnel across H323 using their proprietary method.

Table 17. Call Completion on No Reply

Calls Made	CallBack Comp.?	Original Calling Number Displayed on Final Dest.?	Original Calling Name Displayed on Final Dest.?	Final Dest. Connected Number Updated at Orig. Side?	Final Dest. Connected Name Updated at Orig. Side?
Phone A to Phone C-No Reply Invoke CallBAck feature from A	No	N/A	N/A	N/A	N/A
Phone C to Phone A-No Reply Invoke CallBAck feature from C	No	N/A	N/A	N/A	N/A

Note: Cisco CallManager doesn't support Call Completion across H323 gateway.
Nortel Call Completion is tunnel across H323 using their proprietary method.

Table 18. QSIG MWI Activate

Calls Made	Message Sent?	MWI lamp turned ON?	Notes
Phone A to Phone C – CFU to Call Pilot Call Pilot send MWI activate message to user C	No	No	1
Phone A to Phone D – CFU to Unity Unity send MWI activate message to user D	Yes	Yes	
Phone C to Phone A – CFU to Unity Unity send MWI activate message to user C	No	NO	2
Phone C to Phone B – CFU to Call Pilot Call Pilot send MWI activate message to user B	Yes	Yes	



Calls Made	Message Sent?	MWI lamp turned ON?	Notes
Phone C to Phone D – CFU to Unity Unity send MWI activate message to user C	Yes	Yes	
Phone D to Phone C – CFU to Call Pilot Call Pilot send MWI activate message to user C	No	No	3
Phone A to Phone B – CFU to Call Pilot Call Pilot send MWI activate message to user C	Yes	Yes	
Phone B to Phone A – CFU to Unity Unity send MWI activate message to user C	No	No	4

Note1: Phone A hears Call Pilot Opening Greeting and not the Subscriber’s Personal VM Greeting. No MWI and No DTMF capability.

Note2: Phone C hears Unity Opening Greeting and not the Subscriber’s Personal VM Greeting. No MWI but DTMF works via dtmf-relay h.245-alphanumeric method.

Note3: Phone D hears Call Pilot Opening Greeting and not the Subscriber’s Personal VM Greeting. No MWI but DTMF works via dtmf-relay h.245-alphanumeric method.

Note4: Phone B hears its own VM sign-in. When Phone A forwards the call to Unity, it populates the calling party number in the outgoing H.225 SETUP to Unity without any redirect information. Thus, Unity treats the call as a direct-call call-type and return the sign-in prompt since Unity have Phone B extension as a subscriber.

Table 19. QSIG MWI Deactivate

Calls Made	Message Sent?	MWI lamp turned OFF?	Notes
Phone A to Phone C – CFU to Call Pilot Call Pilot send MWI activate message to user C	No	No	1
Phone A to Phone D – CFU to Unity Unity send MWI activate message to user C	Yes	Yes	
Phone C to Phone A – CFU to Unity Unity send MWI activate message to user C	No	NO	2
Phone A to Phone B – CFU to Call Pilot Call Pilot send MWI activate message to user C	Yes	Yes	
Phone C to Phone D – CFU to Unity Unity send MWI activate message to user C	Yes	Yes	
Phone D to Phone C – CFU to Call Pilot Call Pilot send MWI activate message to user C	No	No	3
Phone A to Phone B – CFU to Call Pilot Call Pilot send MWI activate message to user C	Yes	Yes	
Phone B to Phone A – CFU to Unity Unity send MWI activate message to user C	No	No	4

For Note 1, 2, 3, 4: Please see comments in QSIG MWI Activation Section above.



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