



Nortel CS1000 Succession 4.0 with Cisco Multiservice IP-to-IP Gateway for SIP-to-SIP Calls

July 25, 2007 Initial Version

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Introduction

This is an application note for connectivity of Nortel CS1000 Succession 4.0 with Cisco Multiservice IP-to-IP Gateway via SIP (10/100baseT).

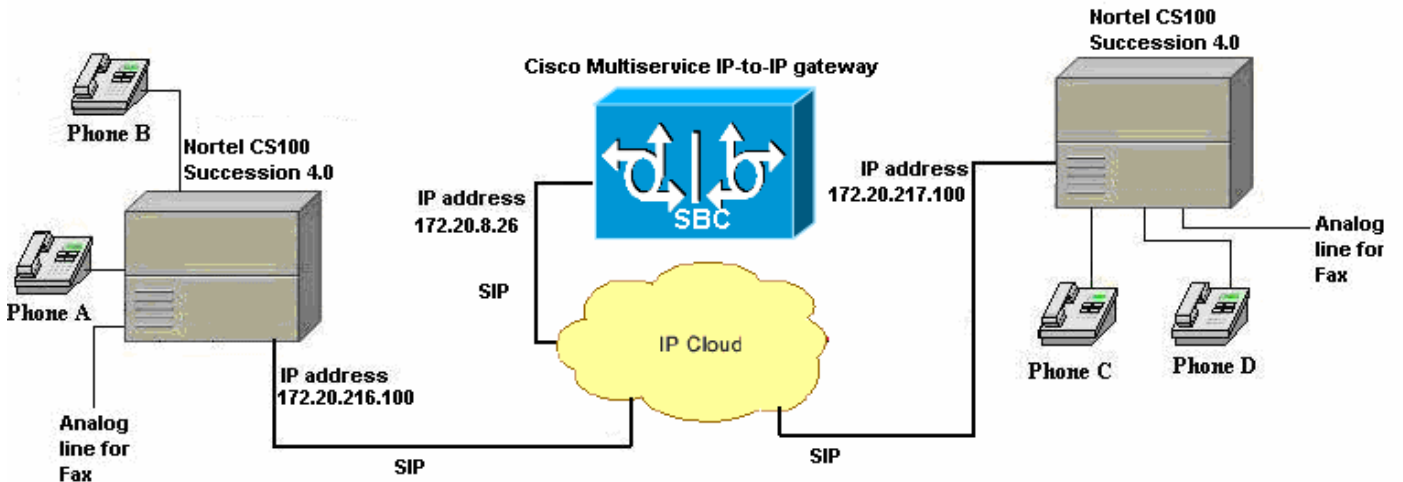
The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco Multiservice IP-to-IP Gateway connected to the IP PBX via SIP (10/100baseT). Connectivity is achieved by using the SIP protocol.

This Application Note uses the Cisco 3845 Cisco IOS-voice-gateway, however other Cisco voice gateways are also an option to use since IPIPGW implementation does not depend on the platform. Here is a list of Cisco Products capable of IPIPGW functionality:

- [Cisco 2800 Series Integrated Services Routers](#)
- [Cisco 3800 Series Integrated Services Routers](#)
- [Cisco 2600XM Series Multiservice Platforms](#)
- [Cisco 3700 Series Routers](#)
- [Cisco 7200VXR Routers](#)
- [Cisco 7301 Routers](#)
- [Cisco AS5350XM Universal Gateway](#)
- [Cisco AS5400XM Universal Gateway](#)

Network Topology

Figure 1. Test Setup



Limitations

Connected Name is not presented at originating Phone. Nortel does not include Final destination NAME in the SIP ringing status, or in the OK status.

Basic Call using G.726 codec is not supported on Nortel PBX

Call Transfer Name and Number updates do not occur

Call Forward Name and Number updates do not occur

DTMF tones are not played across established call. Nortel PBX utilizes SIP "INFO" messages to signal DTMF tones, Cisco IOS does not support SIP INFO message as of version 124-7.9.PI4a.

A fax call is supported using only codec G.711 (A or u-law)



System Components

Hardware Requirements

Cisco equipment

Cisco 3845 (Cisco 3800 family routers)

Cisco Catalyst 6500

Avaya equipment

Nortel Communication System 1000 (which includes Call Server, Signaling Server and Media gateway)

Software Requirements

PBX Software: Nortel Succession 4.0 Release

Cisco IOS Release: c3845-ipvoice_ivs-mz.124-9.T

Features

Features Supported

Basic call using G711u and A law, G729 and G723 codecs

Call Transfer blind and Call Transfer supervised

Call Conference

Call on-hold

Call Forward No Reply, Busy and All

FAX integrity (only using G.711)

Features Not Supported

Connected Name

DTMF



Configuration

Configuring the Nortel PBX

Call Server Setup Using SSC Card Console:

1. LD 17 – Configure the IP 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 SIP Virtual Trunks to the Signaling Server
4. LD 14 – Configure the Virtual Gateway Trunks
5. LD 16 – Configure the SIP route
6. LD 86 – Configure the Route List Block for the Virtual Trunk route
7. LD 87 – Configure CDP steering codes
8. Configure Digital Stations (Phones)

Signaling Server Setup Using 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 SIP 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 SIP gateway
24. Configure the Routing Entries

Call Server Setup Using SSC Card Console:

1. LD 17 – Configure the IP 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 YES  
IFC SL1  
CNEG 1
```



RLS ID 4
RCAP ND2 CPK
MBGA NO
H323
OVLN NO
OVLN NO

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

```
>ld 97
SCSYS000
MEM AVAIL: (U/P): 2718718  USED U P: 327039 50818  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 1 ----
036 STD LEFT 07 0 1 ----
040 STD LEFT 08 0 1 ----
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
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
```



3. LD 14 – Configure the SIP Virtual Trunks to the Signaling Server (One trunk = one line connection)

>ld 20

```
PT0000
REQ: prt
TYPE: tnb
TN 62 0 0 0 => SIP Virtual trunk to Signaling Server
```

```
DATE
PAGE
DES
```

```
DES SIP_IP_VTRK
TN 062 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 10 1
CHID 1
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
```

```
NACT
```



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

```
>ld 20

PT0000
REQ: prt
TYPE: tnb
TN 3
CDEN
CUST
DATE
PAGE
DES

DES 192.168.21.2
TN 003 0 00 00
TYPE VGW
CUST 0
XTRK MC32
ZONE 000

DES 192.168.21.2
TN 003 0 00 01
TYPE VGW
CUST 0
XTRK MC32
ZONE 000
```

5. LD 16 – Configure the SIP route

```
>ld 21
PT1000

REQ: prt
TYPE: rdb
CUST 0
ROUT 10

TYPE RDB
CUST 00
DMOD
ROUT 10
DES SIP_TIE
TKTP TIE
NPID_TBL_NUM 0
ESN NO
```



CNVT NO
SAT NO
RCLS EXT
VTRK YES
ZONE 000
PCID SIP
CRID YES
NODE 102
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
PTYP ATT
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH LIN
TRMB YES
STEP
ACOD 710
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
OHQ NO
OHQT 00
CBQ NO
AUTH NO
TTBL 0
ATAN NO
OHTD NO
PLEV 2
ALRM NO
ART 0
SGRP 0
AACR NO

REQ:

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

>ld 86
ESN000

MEM AVAIL: (U/P): 2718718 USED U P: 327039 50818 TOT: 3096575
DISK RECS AVAIL: 1152

REQ prt
CUST 0
FEAT rlb
RLI 10

RLI 10
ENTR 0
LTER NO
ROUT 10



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 0

MEM AVAIL: (U/P): 2718718 USED U P: 327039 50818 TOT: 3096575
DISK RECS AVAIL: 1152
REQ

7. LD 87 – Configure CDP steering codes

>ld 87
ESN000

MEM AVAIL: (U/P): 2718718 USED U P: 327039 50818 TOT: 3096575
DISK RECS AVAIL: 1152

REQ prt
CUST 0
FEAT cdp
TYPE dsc
DSC 233
DSC 233 => Note: Dialing plan
FLEN 0
DSP LSC
RLI 10 => Note: SIP Route list used for DSC dialed numbers
NPA
NXX
>ld 87
ESN000

MEM AVAIL: (U/P): 2718718 USED U P: 327039 50818 TOT: 3096575
DISK RECS AVAIL: 1152
REQ prt
CUST 0



FEAT cdp
TYPE dsc
DSC 24
DSC 24 => Note: Dialing plan
FLEN 0
DSP LSC
RLI 10 => Note: SIP Route list used for DSC dialed numbers
NPA
NXX

8. LD 11 – Configure Digital Stations (Phones)

```
>ld 11
SL1000
MEM AVAIL: (U/P): 2718718  USED U P: 327039 50818  TOT: 3096575
DISK RECS AVAIL: 1152
DIGITAL TELEPHONES AVAIL: 0  USED: 8  TOT: 8
IP USERS AVAIL: 2  USED: 6  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: 2296  USED: 204  TOT: 2500
DATA PORTS AVAIL: 2500  USED: 0  TOT: 2500

REQ: prt
TYPE: 2616
```

```
TN 1 06
DATE
PAGE
DES
```

```
DES CS102
TN 001 0 00 06
TYPE 2616
CDEN 8D
CUST 0
AOM 0
FDN 2332
TGAR 1
LDN NO
NCOS 0
SGRP 0
RNPG 0
SCI 0
SSU
XLST
CLS CTD FBA WTA LPR MTD FNA HTA ADD HFD
MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
POD DSX VMD CMSD SLKD CCSD SWD LND CNDA
```



CFTA SFD MRD DDV CNID 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 FLXD FTTC DNDY DNO3 MCBN CDMR
CPND_LANG ENG
RCO 0
EFD 2332
HUNT 2332
EHT 2332
LHK 0
PLEV 02
CSDN
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY 00 SCR 5332 0 MARP
 CPND
 NAME ATHENA_5332
 XPLN 13
 DISPLAY_FMT FIRST, LAST
01
02
03 CFW 4 2332
04 AO6
05 TRN
06
07
08
09
10
11
12
13
14
15 RGA
DATE 16 MAR 2006

NACT
REQ:
REQ PRT
TYPE:
TYPE 2616
TN 1 07
DATE
PAGE



DES

DES CS102
TN 001 0 00 07
TYPE 2616
CDEN 8D
CUST 0
AOM 0
FDN 2332
TGAR 1
LDN NO
NCOS 0
SGRP 0
RNPG 0
SCI 0
SSU
XLST

CLS CTD FBA WTA LPR MTD FNA HTA ADD HFD
MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
POD DSX VMD CMSD SLKD CCSD SWD LND CNDA
CFTA SFD MRD DDV CNID CDCA MSID DAPA BFED RCB
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 FLXD FTTC DNDY DNO3 MCBN CDMR

CPND_LANG ENG

RCO 0
EFD 2332
HUNT 2332
EHT 2332
LHK 0
PLEV 02
CSDN
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0

KEY 00 SCR 5333 0 MARP

CPND
NAME ATHENA_5333
XPLN 13
DISPLAY_FMT FIRST, LAST

01
02
03 CFW 4 2333
04 AO6
05 TRN
06



07
08
09
10
11
12
13
14
15 RGA
DATE 14 MAR 2006

NACT



Signaling Server Setup Using the Nortel Element Manager:

9. Configure the Zones

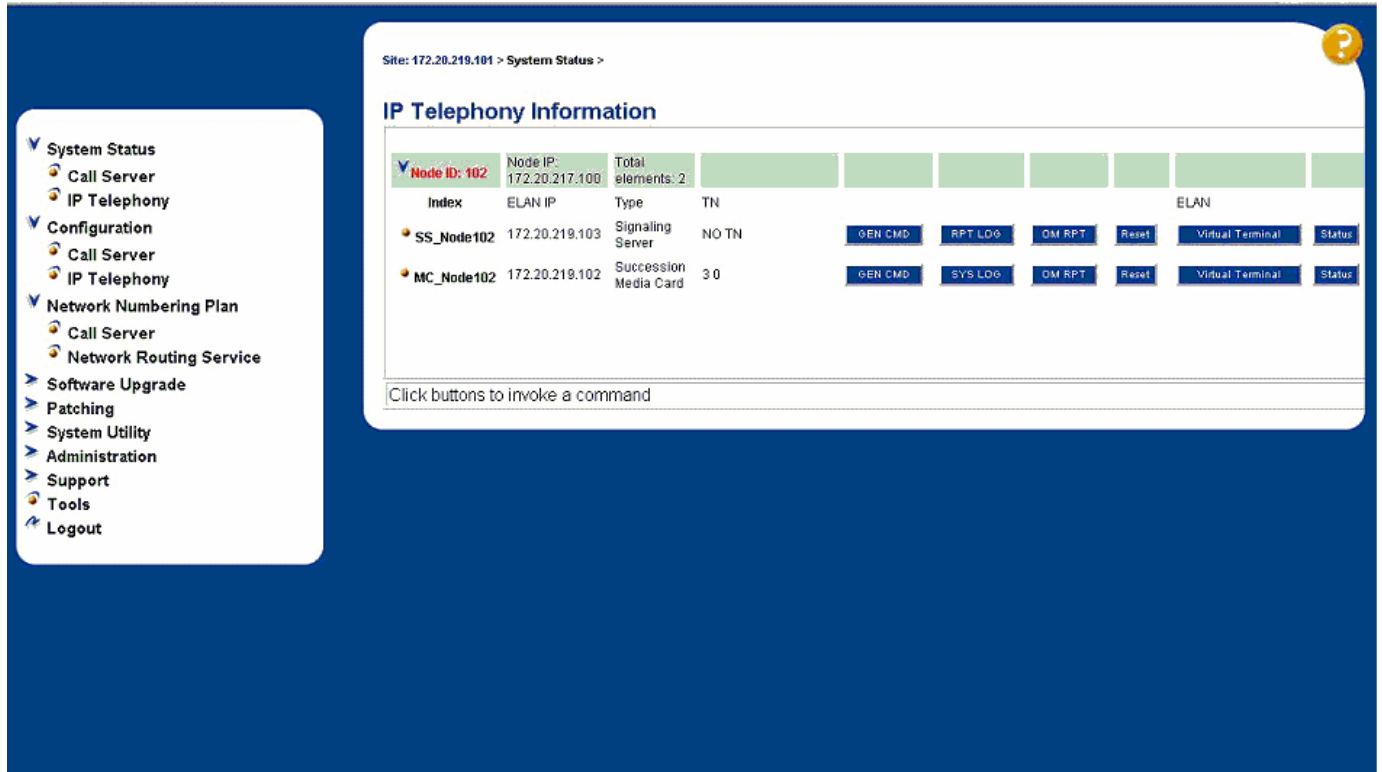
Site: 172.20.249.101 > Configuration > Call Server Configuration > Zone List > Zone 0 >

Zone Basic Property and Bandwidth Management

Input Description	Input Value
Zone Number (ZONE):	<input type="text"/>
Intrazone Bandwidth (INTRA_BW):	<input type="text" value="10300"/>
Intrazone Strategy (INTRA_STGY):	Best Quality (DQ) ▾
Interzone Bandwidth (INTER_BW):	<input type="text" value="10300"/>
Interzone Strategy (INTER_STGY):	Best Quality (BQ) ▾
Resource Type (RES_TYPE):	Shared (SHARED) ▾
Branch Office Support (ZBRN):	<input type="checkbox"/>
Description (ZDES):	<input type="text"/>



10. Configure a new IP Telephony Node summary



The screenshot shows the Cisco IP Telephony Information page. On the left is a navigation menu with the following items: 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 content area is titled "IP Telephony Information" and shows a table of nodes. The table has columns for Index, ELAN IP, Type, and TN. There are also buttons for GEN CMD, RPT LOG, OM RPT, Reset, Virtual Terminal, and Status for each node. The table contains two nodes: SS_Node102 and MC_Node102.

Site: 172.20.219.101 > System Status >

IP Telephony Information

Node ID: 102	Node IP: 172.20.217.100	Total elements: 2							
Index	ELAN IP	Type	TN						ELAN
SS_Node102	172.20.219.103	Signaling Server	NO TN	GEN CMD	RPT LOG	OM RPT	Reset	Virtual Terminal	Status
MC_Node102	172.20.219.102	Succession Media Card	3 0	GEN CMD	SYS LOG	OM RPT	Reset	Virtual Terminal	Status

Click buttons to invoke a command



11. Configure the Node section

Site: 172.20.219.101 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 102 >

Edit

Save and Transfer Cancel

Node

Node ID 102

Voice LAN (ILAN) Node IP address 172.20.217.100

Management LAN (ELAN) gateway IP address 172.20.219.1

Management LAN (ELAN) subnet mask 255.255.255.0

Voice LAN (ILAN) subnet mask 255.255.255.0

- SNMP Add
- VGW and IP phone codec profile
- QoS
- LAN configuration
- SNTP
- H323 GW Settings
- Firmware
- SIP GW Settings
- SIP URI Map
- SIP CD Services
- Cards Add
- Signaling Servers Add

12. Configure the VGW and IP phone codec profile section



- ▼ 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

Edit

▶ Node	
▶ SNMP Add	
▶ VGW and IP phone codec profile	
Enable Echo canceller	<input checked="" type="checkbox"/>
Echo canceller tail delay	12t ▼
Voice activity detection threshold	-17 Range: -20 to +10
Idle noise level	-6b Range: -327 to +327
DTMF Tone detection	<input checked="" type="checkbox"/>
Enable V.21 FAX tone detection	<input checked="" type="checkbox"/>
FAX maximum rate (bps)	14400 ▼
FAX playout 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 G720A	Select <input type="checkbox"/>
▶ Codec G723.1	Select <input type="checkbox"/>
▶ Codec T38 FAX	Select <input checked="" type="checkbox"/>
▶ QoS	
▶ LAN configuration	
▶ SNMP	
▶ H323 GW Settings	



- System Status
 - Call Server
 - IP Telephony
- Configuration
 - Call Server
 - IP Telephony
- Network Numbering Plan
- Software Upgrade
- Patching
- System Utility
- Administration
- Support
- Tools
- Logout

Idle noise level	<input type="text" value="-65"/>	Range: -327 to +327
DTMF Tone detection	<input checked="" type="checkbox"/>	
Enable V.21 FAX tone detection	<input checked="" type="checkbox"/>	
FAX maximum rate (bps)	<input type="text" value="14400"/>	
FAX playout nominal delay	<input type="text" value="100"/>	Range: 0 to 300
FAX no activity timeout	<input type="text" value="20"/>	Range: 10 to 32000
FAX packet size	<input type="text" value="30"/>	
Codec G711	Select <input checked="" type="checkbox"/>	
Codec Name	G711	
Voice payload size (ms.frame)	<input type="text" value="20"/>	
Voice playout (jitter buffer) nominal delay	<input type="text" value="40"/>	
<small>Modifications may cause changes to dependent settings</small>		
Voice playout (jitter buffer) maximum delay	<input type="text" value="00"/>	
<small>Modifications may cause changes to dependent settings</small>		
VAD	<input type="checkbox"/>	
Codec G729A	Select <input checked="" type="checkbox"/>	
Codec Name	G729A	
Voice payload size (ms.frame)	<input type="text" value="20"/>	
Voice playout (jitter buffer) nominal delay	<input type="text" value="40"/>	
<small>Modifications may cause changes to dependent settings</small>		
Voice playout (jitter buffer) maximum delay	<input type="text" value="00"/>	
<small>Modifications may cause changes to dependent settings</small>		
VAD	<input type="checkbox"/>	
Codec G723.1	Select <input checked="" type="checkbox"/>	
Codec Name	G723.1	
Voice payload size (ms.frame)	30	



13. Configure the QoS section

Tools
Logout

VAD <input type="checkbox"/>	
Codec G729A	Select <input checked="" type="checkbox"/>
Codec Name	G729A
Voice payload size (ms.frame)	20
Voice playout (jitter buffer) nominal delay	40
<small>Modifications may cause changes to dependent settings</small>	
Voice playout (jitter buffer) maximum delay	00
<small>Modifications may cause changes to dependent settings</small>	
VAD <input type="checkbox"/>	
Codec G723.1	Select <input checked="" type="checkbox"/>
Codec Name	G723.1
Voice payload size (ms.frame)	30
Voice playout (jitter buffer) nominal delay	60
<small>Modifications may cause changes to dependent settings</small>	
Voice playout (jitter buffer) maximum delay	12L
<small>Modifications may cause changes to dependent settings</small>	
VAD <input type="checkbox"/>	
Codec T38 FAX	Select <input checked="" type="checkbox"/>
Codec Name	T38 FAX

14. Configure LAN Configuration section



- Call Server
- IP Telephony
- Network Numbering Plan
- Call Server
- Network Routing Service
- Software Upgrade
- Patching
- System Utility
- Administration
- Support
- Tools
- Logout

QoS

LAN configuration

Management LAN (ELAN) configuration

Call server IP address	<input type="text" value="172.20.219.101"/>	
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 [Add](#)

SNTP

H323 GW Settings

Firmware

SIP GW Settings

SIP URI Map

SIP CD Services

Cards [Add](#)

Signaling Servers [Add](#)

*Mandatory fields of current configuration

15. Configure the SIP GW Setting section



- System Status
 - Call Server
 - IP Telephony
- Configuration
 - Call Server
 - IP Telephony
- Network Numbering Plan
- Software Upgrade
- Patching
- System Utility
- Administration
- Support
- Tools
- Logout

Firmware	
SIP GW Settings	
Primary Proxy / Re-direct IP address	172.20.217.103
Primary Proxy / Re-direct IP Port	5060
Primary Proxy Supports Registration	<input checked="" type="checkbox"/>
Primary CDS Proxy or Re-direct server flag	<input checked="" type="checkbox"/>
Secondary Proxy / Re-direct IP address	0.0.0.0
Secondary Proxy / Re-direct IP Port	5060
Secondary Proxy Supports Registration	<input type="checkbox"/>
Secondary CDS Proxy or Re-direct server flag	<input type="checkbox"/>
SIP URI Map	
Public E.164/National domain name	+1
Public E.164/Subscriber domain name	+1408
Public E.164/Unknown domain name	
Public E.164/Special Number domain name	
Private/UDP domain name	sj
Private/CDP domain name	interop.sj
Private/Special Number domain name	spn.sj
Private/Unknown (vacant number routing) domain name	
Unknown/Unknown domain name	



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

Call Server
Network Routing Service
Software Upgrade
Patching
System Utility
Administration
Support
Tools
Logout

IP Services
Cards **Add**
Card 172.20.219.102 Properties **Remove**

Role	Follower
Management LAN (ELAN) IP address	172.20.219.102 *
Management LAN (ELAN) MAC address	00:11:F9:E4:D5:09 *
Voice LAN (TLAN) IP address	172.20.217.102 *
Voice LAN (TLAN) gateway IP address	172.20.217.1
Hostname	MC_Node102 *
Card TN	3 *
Card processor type	Succession Media Card ▾
H323 ID	MC_Node102
Enable set TPS	<input checked="" type="checkbox"/>
System name	SS_Node102
System location	
System contact	

Signaling Servers **Add**

** Mandatory fields of current configuration*



17. Configure the Signaling Server section

The screenshot shows the configuration page for a Signaling Server. On the left is a navigation menu with options like IP Telephony, Configuration, Call Server, Network Numbering Plan, Software Upgrade, Patching, System Utility, Administration, Support, Tools, and Logout. The main area is titled '* Signaling Server 172.20.219.103 Properties' and contains the following fields:

Role	Leader
Management LAN (ELAN) IP address	172.20.219.103 *
Management LAN (ELAN) MAC address	00:02:b3:f7:33:76 *
Voice LAN (TLAN) IP address	172.20.217.103 *
Voice LAN (TLAN) gateway IP address	172.20.217.1
Hostname	SS_Node102 *
H323 ID	SS_Node102
Enable set TPS	<input checked="" type="checkbox"/>
Enable virtual trunk TPS	H.323 and SIP
Enable SIP Proxy / Redirect Server	<input checked="" type="checkbox"/>
SIP Transport Protocol	TCP
Local SIP Port	5060
SIP Domain name	pbxlab.org
SIP Gateway Endpoint Name	SS_Node102
SIP Gateway Authentication Password	•••••
Enable H323 Gatekeeper	<input checked="" type="checkbox"/>
Network Routing Service Role	Primary
System name	SS_Node102
System location	
System contact	

Buttons for 'Save and Transfer' and 'Cancel' are visible at the bottom.



NRS (Network Routing Server):

18. Configure the System Wide Settings

The screenshot displays the Network Routing Service (NRS) configuration interface. At the top, there is a navigation bar with tabs for Home, Configuration, Tools, Reports, and Administration, along with Help and Logout links. The main content area is titled "System Wide Settings" and contains several configuration fields:

- DB sync interval for alternate [Hours]: 24
- SIP registration time to live timer [Seconds]: 30
- H.323 gatekeeper registration time to live timer [Seconds]: 3600
- H.323 alias name: H323NRS102
- Alternate NRS server is permanent:
- Auto backup time [HH:MM]: 23:59
- Auto backup to FTP site enabled:
- Auto backup FTP site IP address: [Empty field]
- Auto backup FTP site path: [Empty field]
- Auto backup FTP username: [Empty field]
- Auto backup FTP password: [Empty field]

A "Save" button is located at the bottom left of the configuration area.



19. 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):

TCP transport enabled:

TCP port:



H.323 Gatekeeper Settings	
Location request (LRQ) response timeout [Seconds]	3
SIP Server Settings	
Mode	Redirect
UDP transport enabled	<input checked="" type="checkbox"/>
UDP port	5060
UDP maximum transmission unit (MTU)	1500
TCP transport enabled	<input checked="" type="checkbox"/>
TCP port	5060
TCP maximum transmission unit (MTU)	1500
Network Connection Server (NCS) Settings	
Primary NCS port	16500
Alternate NCS port	16500
Primary NCS timeout [Seconds]	10
<input type="button" value="Save"/>	



20. 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

Domain name	<input type="text" value="pbxlab.org"/> *
Domain description	<input type="text" value="PBX Lab Domain name"/>

* Mandatory field indicator

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



21. Configure a L1 Domain (UDP)

Network Routing Service

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

Location: Configuration > L1 Domains (UDP) > View L1 Domain Property >

View L1 Domain Property (pbxlab.org)

Domain name	<input type="text" value="sj"/>
Domain description	<input type="text" value="San Jose"/>
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"/>
International dialing access code	<input type="text" value="011"/>
L1 domain dialing access code	<input type="text" value="9"/>
National dialing access code	<input type="text" value="9"/>
Local dialing access code	<input type="text" value="9"/>
Special number 1	<input type="text"/>
Special number 2	<input type="text"/>



22. Configure a L0 Domain (CDP)

Network Routing Service

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

Location: Configuration > L0 Domains (CDP) > View L0 Domain Property >

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

Service Domains

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

Domain name:

Domain description:

Special number label:

Unqualified number label:

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:



23. Configure a SIP 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 (pbxlab.org / sj / interop)

Endpoint name	<input type="text" value="TonyB"/>	*
Endpoint description	<input type="text" value="Tony B IPIGW testing"/>	
Tandem endpoint name	<input type="text"/>	Look up
Endpoint authentication enabled	<input type="text" value="Not configured"/>	
Authentication password	<input type="text"/>	
E.164 country code	<input type="text"/>	
E.164 area code	<input type="text"/>	
International dialing access code	<input type="text"/>	
L1 domain dialing access code	<input type="text"/>	
National dialing access code	<input type="text"/>	
Local dialing access code	<input type="text"/>	
Special number 1	<input type="text"/>	
Special number 2	<input type="text"/>	



- Routing Entries
- Default Routes
- Collaborative Servers

Random endpoint name [Look up](#)

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

Static endpoint address type

Static endpoint address

H.323 Support

SIP support

SIP transport

SIP port

Network Connection Server enabled



25. Configure the Routing Entries

pbxlab.org / sj / interop /

NRS Manager - Lookup - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Lookup path for gateway endpoints: pbxlab.org / sj / interop /

Search by:

Showing 1 - 11 of 11 < Previous Next >

#	ID [Click to select]	Support Protocol(s)	Description	# of routing entries	# of default routes
1	CCM41_1	RAS H.323 / Static SIP	CCM 4.1(3)	7	0
2	CME	Not RAS H.323 / Static SIP	CME 3.2 172.20. . .	6	0
3	CM_KINGS	Not RAS H.323 / Static SIP	CCM 5.0 172.20. . .	7	0
4	CM_LAKERS	Not RAS H.323 / Static SIP	CM_LAKERS 172.2. . . .	3	0
5	CM_SATURN	Not RAS H.323 / Static SIP	CCM 5.0 172.20. . .	0	0
6	SS_Node101	Not RAS H.323 / Static SIP	CS1K SS101 172. . . .	4	0
7	SS_Node102	Not RAS H.323 / Static SIP	CS1K SS102	8	0
8	Talal_CME1	Not RAS H.323 / Static SIP	Talal CME 1 172. . .	1	0
9	Talal_CME2	Not RAS H.323 / Static SIP	Talal CME 2 172. . .	1	0
10	TombB_IPIPGW1	Not RAS H.323 / Static SIP	TombB_IPIPGW1 . . .	1	0



Configuring Cisco IOS Software on the Cisco 3845

```
tony_3845#sh run
Building configuration...

Current configuration : 2286 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname tony_3845
!
boot-start-marker
boot system flash:c3845-ipvoice_ivs-mz.124-7.9.PI4a
boot-end-marker
!
logging buffered 100000000 debugging
no logging console
enable password cisco
!
no aaa new-model
!
resource policy
!
ip subnet-zero
ip cef
!
!
!
no ip domain lookup
voice-card 0
no dspfarm
!
!
!
voice service voip
allow-connections h323 to h323
allow-connections h323 to sip
allow-connections sip to h323
allow-connections sip to sip
h323
sip
!
!
!
voice class codec 1
codec preference 1 g711ulaw ===> Note: This is set to G.729 or G.723 to test voice quality and initiate T.38
!
!
!
!
!
```



```
!  
!  
!  
!  
!  
!  
!  
interface GigabitEthernet0/0  
ip address 172.20.8.26 255.255.255.0  
duplex auto  
speed auto  
media-type rj45  
negotiation auto  
!  
interface GigabitEthernet0/1  
no ip address  
shutdown  
duplex auto  
speed auto  
media-type rj45  
negotiation auto  
!  
ip default-gateway 172.20.8.1  
ip classless  
ip route 0.0.0.0 0.0.0.0 172.20.8.1  
!  
ip http server  
!  
!  
!  
control-plane  
!  
!  
!  
!  
!  
!  
!  
dial-peer voice 3000 voip  
destination-pattern 30..  
voice-class codec 1  
session target ipv4:172.20.213.253  
dtmf-relay h245-alphanumeric  
fax-relay ecm disable  
no fax-relay sg3-to-g3  
no vad  
!  
dial-peer voice 4150 voip  
destination-pattern 41..  
voice-class codec 1  
session target ipv4:172.20.212.253  
dtmf-relay h245-alphanumeric  
fax-relay ecm disable  
no fax-relay sg3-to-g3  
no vad  
!  
dial-peer voice 1660 voip  
destination-pattern 16..
```



```
voice-class codec 1
session target ipv4:172.20.7.252
dtmf-relay h245-alphanumeric
fax-relay ecm disable
no fax-relay sg3-to-g3
no vad
!
dial-peer voice 5330 voip
destination-pattern 5...
signaling forward unconditional
voice-class codec 1
session protocol sipv2
session target ipv4:172.20.217.100
dtmf-relay rtp-nte
no fax-relay sg3-to-g3
fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback pass-through g711ulaw → Note: must be removed for three party conference feature
to work
no vad
supplementary-service pass-through
!
dial-peer voice 2330 voip
destination-pattern 2...
signaling forward unconditional
voice-class codec 1
session protocol sipv2
session target ipv4:172.20.216.100
dtmf-relay rtp-nte
no fax-relay sg3-to-g3
fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback pass-through g711ulaw → Note: must be removed for three party conference
feature to work
no vad
supplementary-service pass-through
!
!
gatekeeper
shutdown
!
!
line con 0
password cisco
stopbits 1
line aux 0
stopbits 1
line vty 0 4
password cisco
login
!
scheduler allocate 20000 1000
!
end

tony_3845#
```



Acronyms

Acronym	Definitions
IPIP GW	IP-to-IP Gateway
Cisco IOS	Cisco Internetwork Operating System
SIP	Session Initiation Protocol
RTP	Real-Time Protocol



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