Application Note

Nortel CS1000 Succession 4.0 with Cisco Unified Border Element for H323-to-H323 Calls

Table of Contents

Introduction

- This is an application note for connectivity of Nortel CS1000 Succession 4.0 with Cisco Unified Border Element via H.323 (10/100baseT).
- The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco Unified Border Element (CUBE) connected to the IP PBX via H.323 (10/100baseT). Connectivity is achieved by using the H.323 protocol.
- This Application Note uses the c3845 IOS-voice-gateway, however other Cisco voice gateways are also an option to use since CUBE implementation does not depend on the platform. Here is a list of Cisco Products capable of CUBE functionality:

Cisco 2800 Series Integrated Services Routers
Cisco 3800 Series Integrated Services Routers
Cisco AS5350XM Universal Gateway
Cisco AS5400XM Universal Gateway

Network Topology

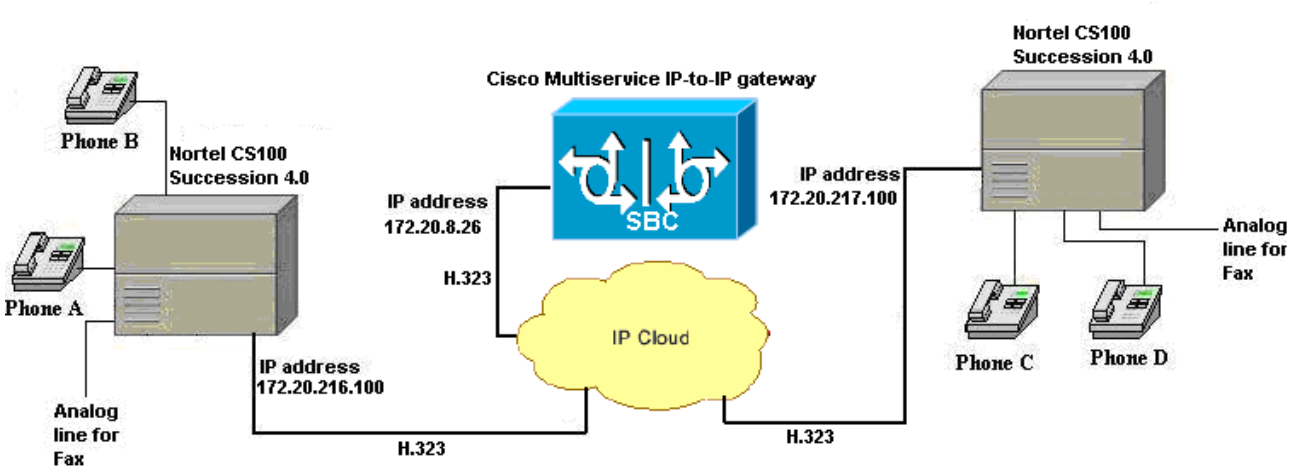


Figure 1. Network Topology or Test Setup

Limitations

- Connected Name is not presented to the originating (calling) Phone display. CUBE relays the ”Connected Number” info in a method not understood by Nortel CS1000 PBX
- Basic Call using G.726 codec is not accepted on Nortel PBX.
- Call Transfer Nework/External (Trombone), When phone A calls Phone C and Phone C xfers call to Phone B, call is dropped. Nortel PBX drops call.
- Call Conference Network/External , When Phone A calls Phone C and Phone C attempts to conference in Phone B, call is dropped. Nortel PBX drops call.
- Call Forward All and No Reply Network/External, when Phone C is set to CFA/B to Phone B and Phone A calls Phone C, the call is dropped. Nortel PBX drops call.
- Fax T.38 did not interoperate, when attempted to use T.38 for fax transmission the fax was unsuccesful. H245 terminalCapabilities negotiations were unsuccessful between the CUBE and the Nortel CS1000
- DTMF in-band signaling did not interoperate. Nortel PBX did not play in-band DTMF tones

System Components

Hardware Requirements

Cisco equipment

- Cisco 3845 (Cisco 3800 family routers)
- Cisco Catalyst 6500

Nortel 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
- Local Call Transfer blind and Local Call Transfer supervised
- Local Call Conference
- Call on-hold
- Local Call Forward Busy and All
- Call Forward no reply (both local and external)
- Out-of-band DTMF signaling (H.245)
- FAX integrity (only using G.711)

Features Not Supported

- Connected Name
- Call Transfer Nework/External (Trombone)
- Call Conference Network/External
- Call Forward All and No Reply Network/External
- Fax T.38
- DTMF in-band

Configuration

Configuration Sequence and Tasks

Configuration Menus and Commands

Nortel Configuration

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 16 – Configure the H.323 route
6. LD 86 – Configure the Route List Block for the Virtual Trunk route
7. LD 87 – Configure CDP steering codes
8. LD 11 – Configure Digital Stations

Signaling Server Setup via the Nortel Element Manager

1. Configure the Zones
2. Configure a new IP Telephony Node summary
3. Configure the Node section
4. Configure the VGW and IP phone codec profile section
5. Configure the Quality of Service (QoS) section
6. Configure LAN Configuration section
7. Configure the H323 GW Setting section
8. Configure the Card section for the MC-32 VGMC card section
9. Configure the Signaling Server section

NRS (Network Routing Server)

10. Configure the System Wide Settings
11. Configure the NRS Server Settings
12. Configure a Service Domain
13. Configure a L1 Domain (UDP)
14. Configure a L0 Domain (CDP)
15. Configure a H.323 gateway
16. Configure the Routing Entries

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
```

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

4. 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
TN   003 0 00 00
TYPE VGW
CUST 0
XTRK MC32
ZONE 000

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

5. 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
PTYP 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

6. 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

7. LD 87 – Configure CDP steering codes

>ld 87
ESN000

MEM AVAIL: (U/P): 2828167 USED U P: 200856 67552 TOT: 3096575
DISK RECS AVAIL: 1152
REQ prt
CUST 0

FEAT dsc

ESN009
FEAT cdp
TYPE dsc
DSC 533
DSC 533 ======➔ **Dial 533 number pattern goes out H.323**
FLEN 0
DSP LSC
RLI 11 ======➔ **H.323 Trunk**
NPA
NXX

MEM AVAIL: (U/P): 2828167 USED U P: 200856 67552 TOT: 3096575
DISK RECS AVAIL: 1152
REQ prt
CUST 0
FEAT cdp
TYPE dsc
DSC 54
DSC 54 ======➔ **Dial 533 number pattern goes out H.323**
FLEN 0
DSP LSC
RLI 11 ======➔ **H.323 Trunk**
NPA
NXX

17. LD 11 – Configure Digital Stations (Phones)

DES CS101A
TN 001 0 00 08
TYPE 2616
CDEN 8D
CUST 0
AOM 0
FDN 6001
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

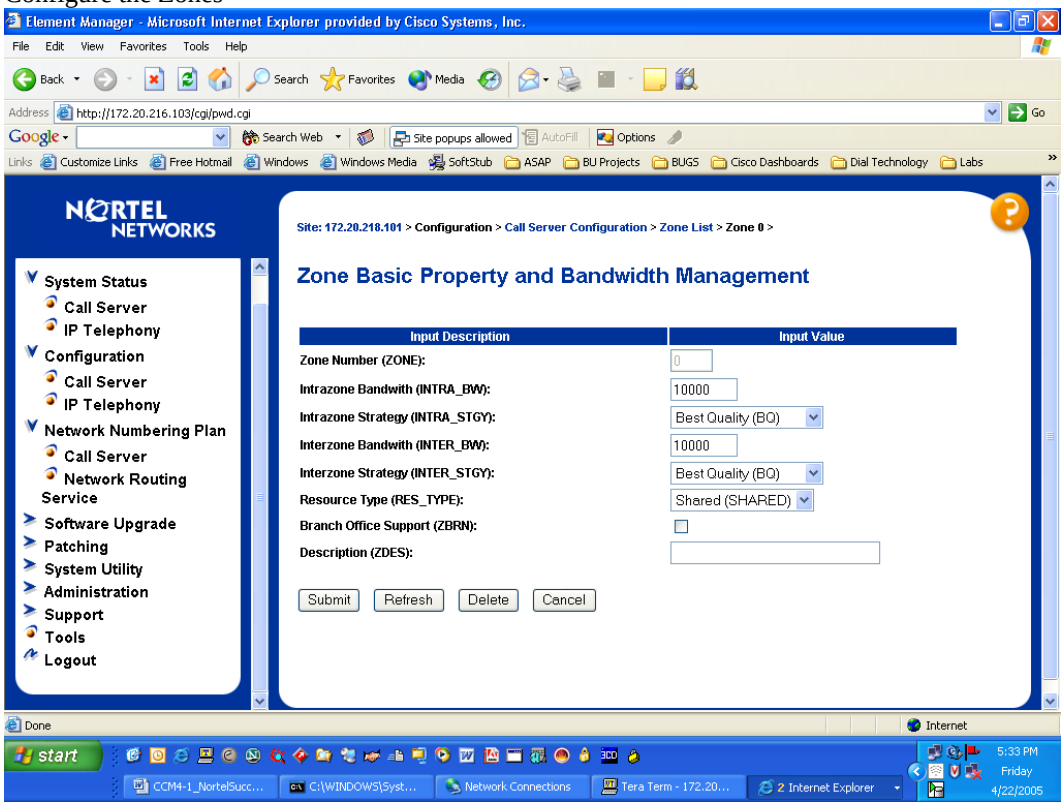
```
    DDGA NAMA
    DRDD EXR0
    USRD ULAD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN CDMR
CPND_LANG ENG
RCO  0
EFD  6001
HUNT 6001
EHT  6001
LHK  0
PLEV 02
CSDN
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY  00 SCR 2332 0     MARP
       CPND
         NAME ZEUS_2332
         XPLN 9
         DISPLAY_FMT FIRST,LAST
    01
    02
    03 CFW 4  4103
    04 AO6
    05 TRN
    06
    07
    08
    09
    10
    11
    12
    13
    14
    15 RGA
DATE  7 MAR 2006

DES  CS101A
TN   001 0 00 09
TYPE 2616
CDEN 8D
CUST 0
AOM  0
FDN  6001
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 OCBD FLXD FTTC DNDY DNO3 MCBN CDMR
CPND_LANG ENG
RCO 0
EFD 6001
HUNT 6001
EHT 6001
LHK 0
PLEV 02
CSDN
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY 00 SCR 2333 0   MARP
      CPND
        NAME ZEUS_2333
        XPLN 9
        DISPLAY_FMT FIRST,LAST
    01
    02
    03 CFW 4 5332
    04 AO6
    05 TRN
    06
    07
    08
    09
    10
    11
    12
    13
    14
    15 RGA
DATE 7 MAR 2006

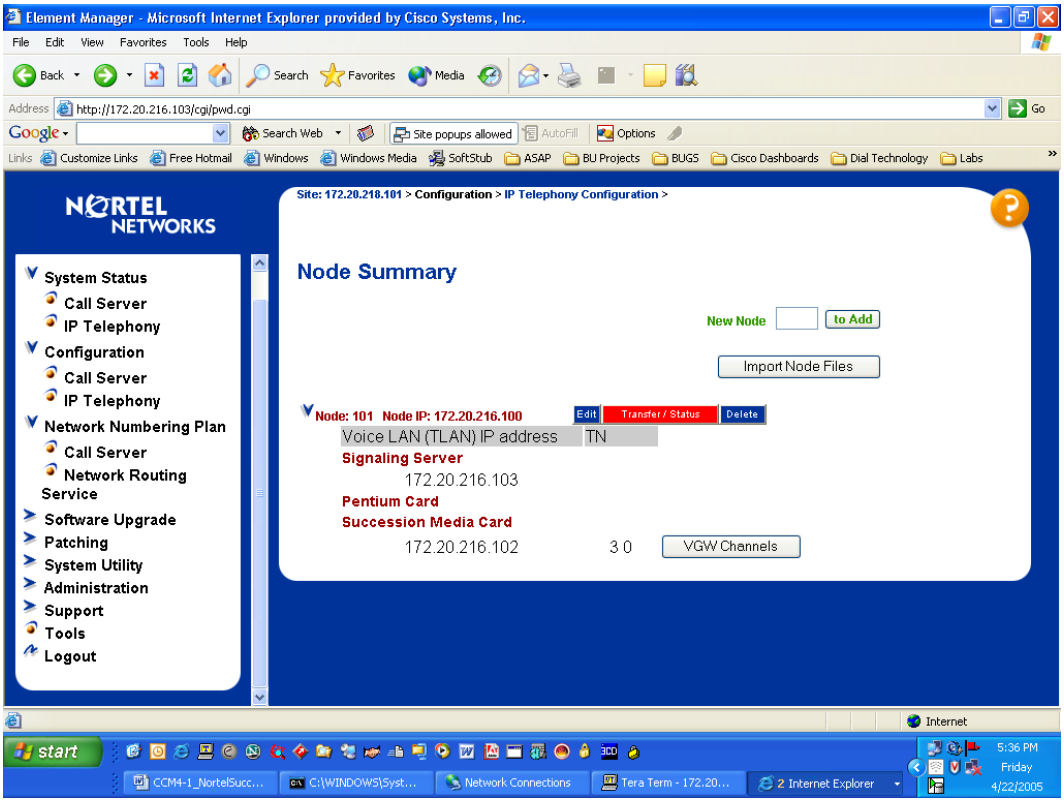
NACT

Signaling Server Setup:

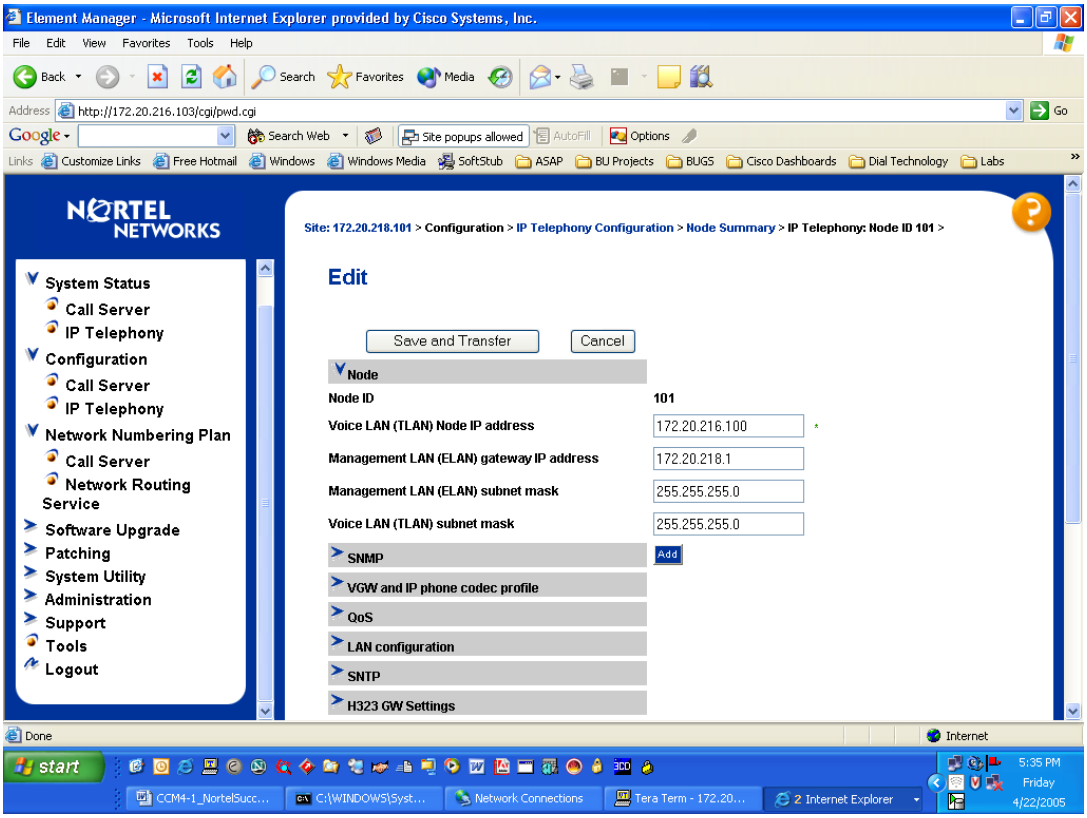
Configure the Zones



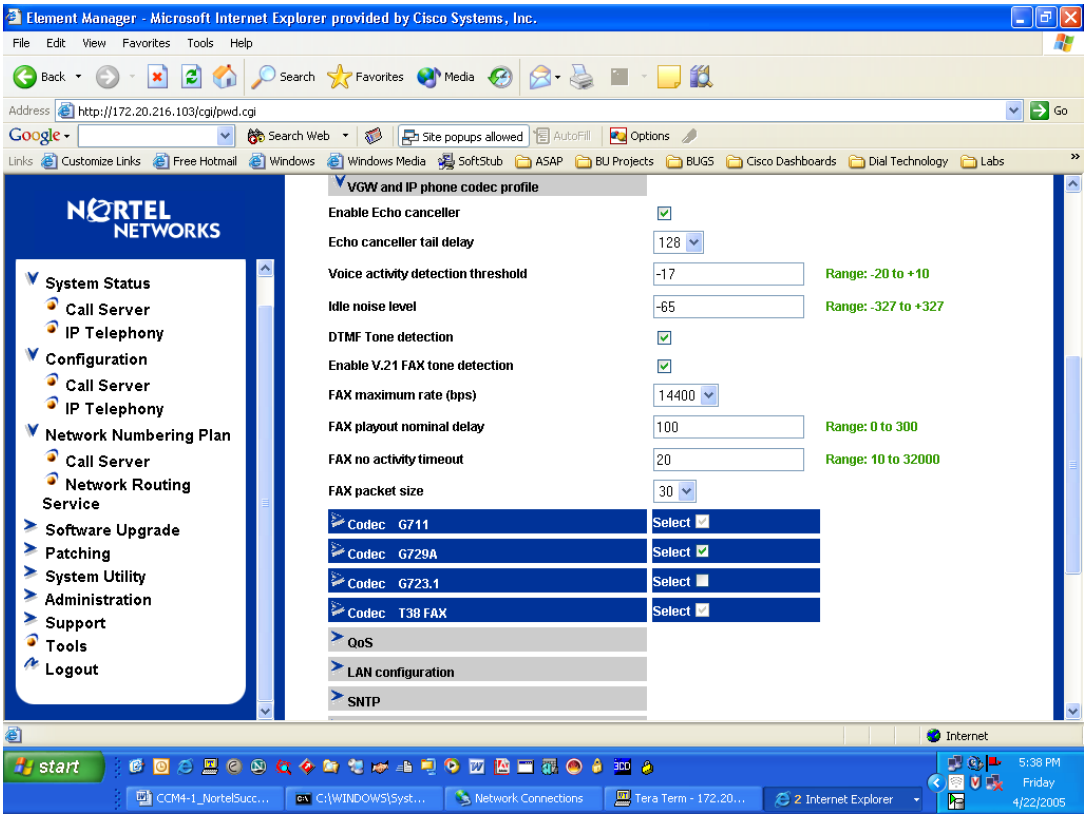
Configure a new IP Telephony Node summary

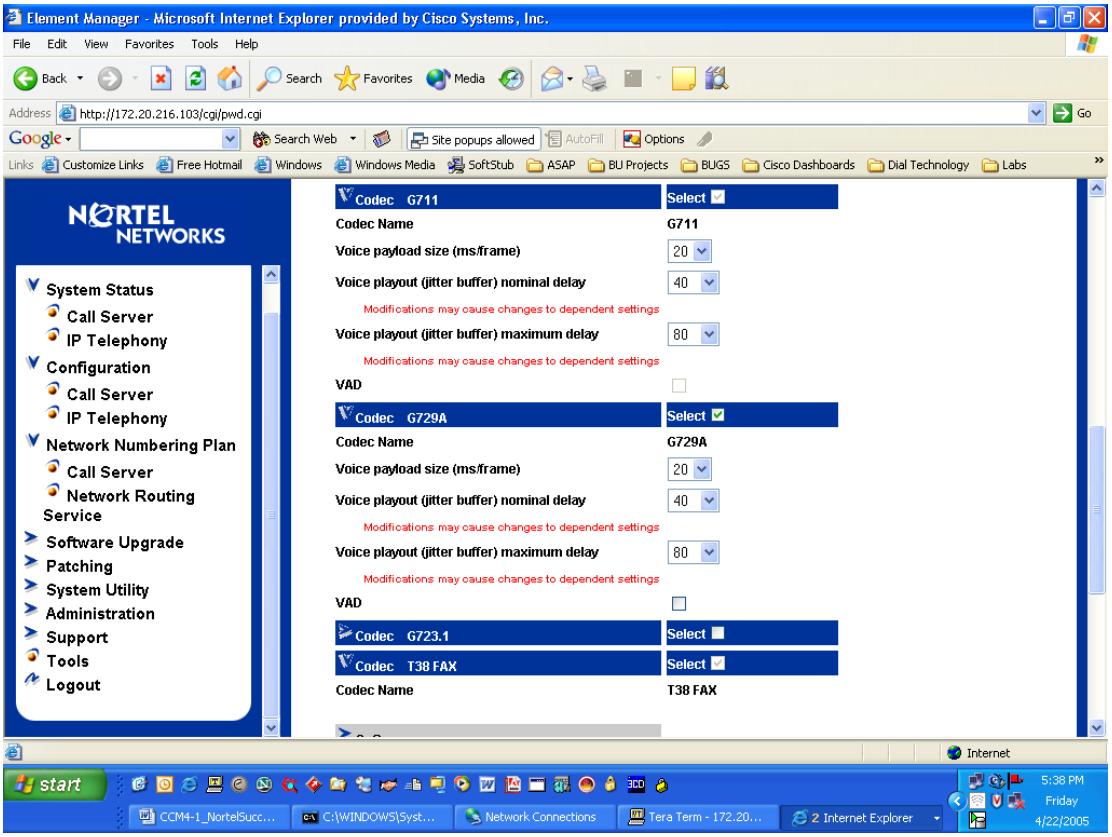


Configure the Node section

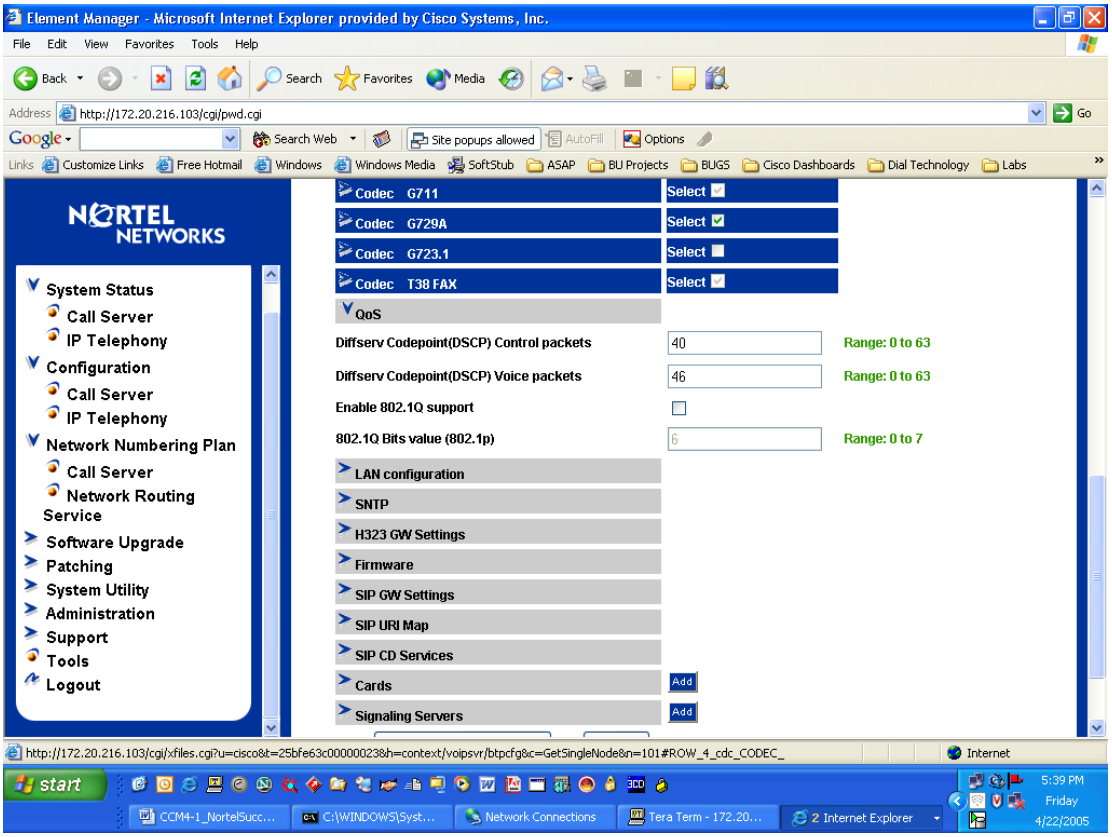


Configure the VGW and IP phone codec profile section

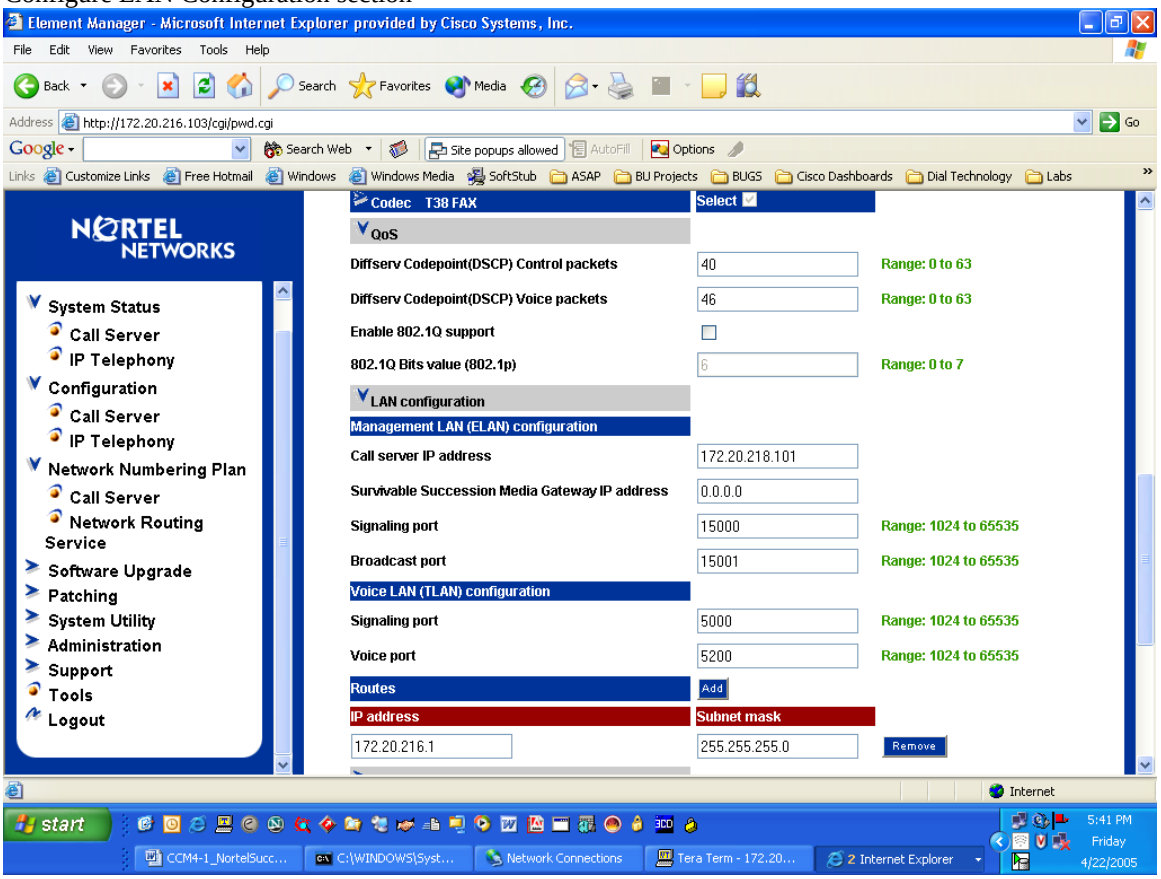




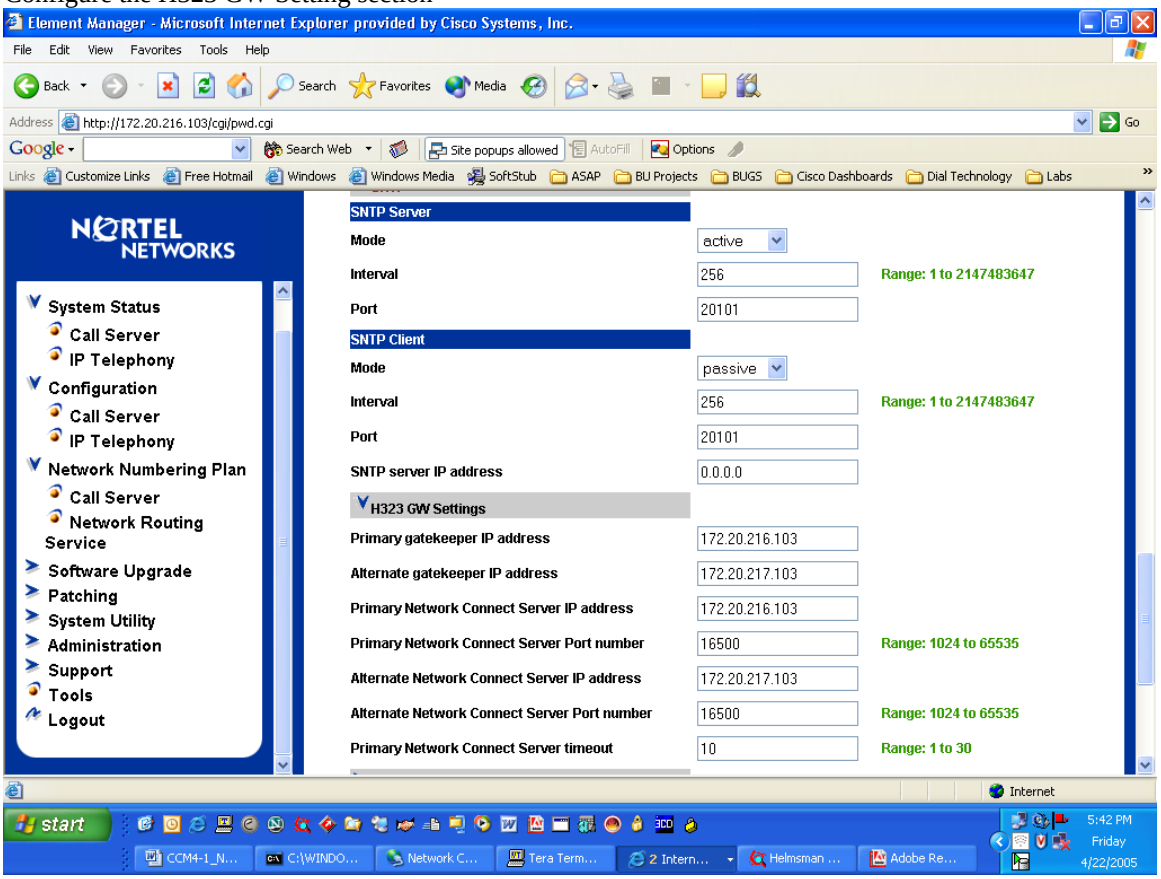
Configure the QoS section



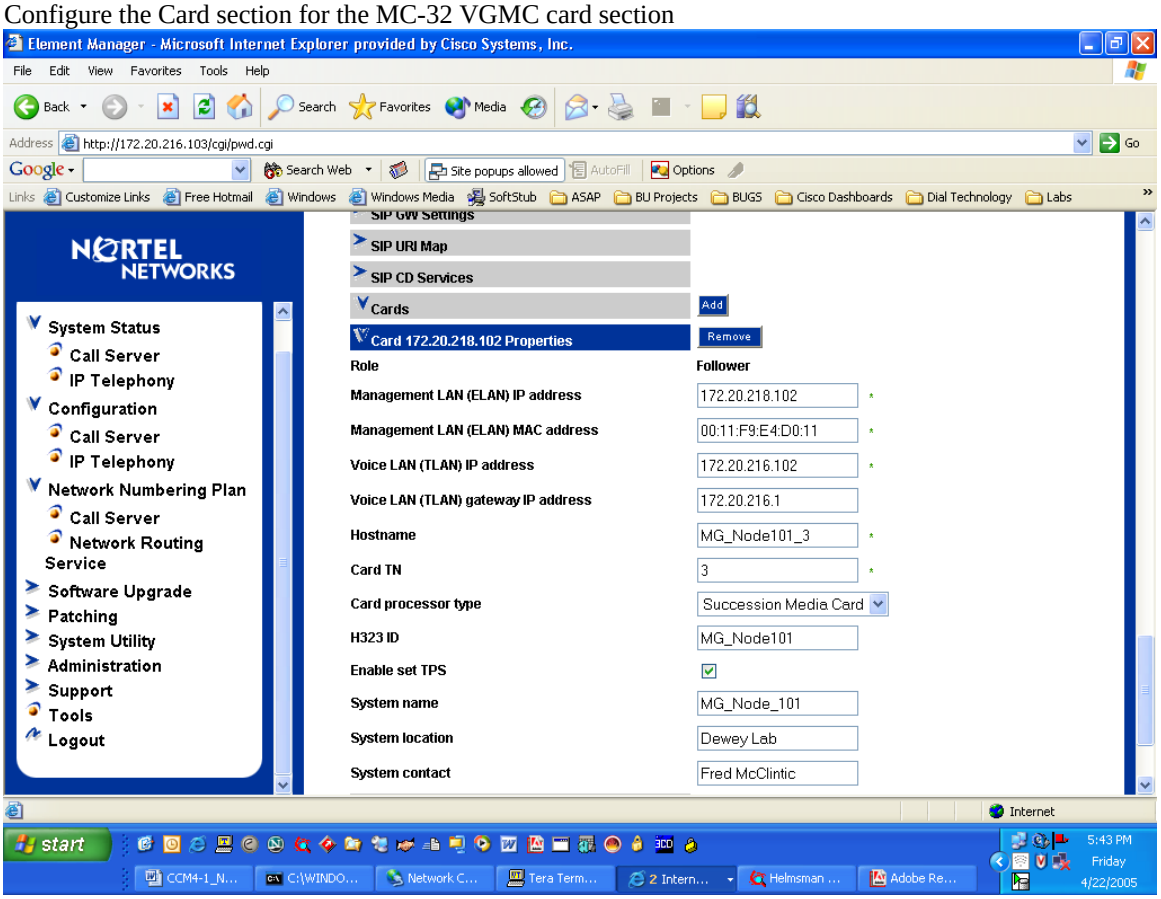
Configure LAN Configuration section



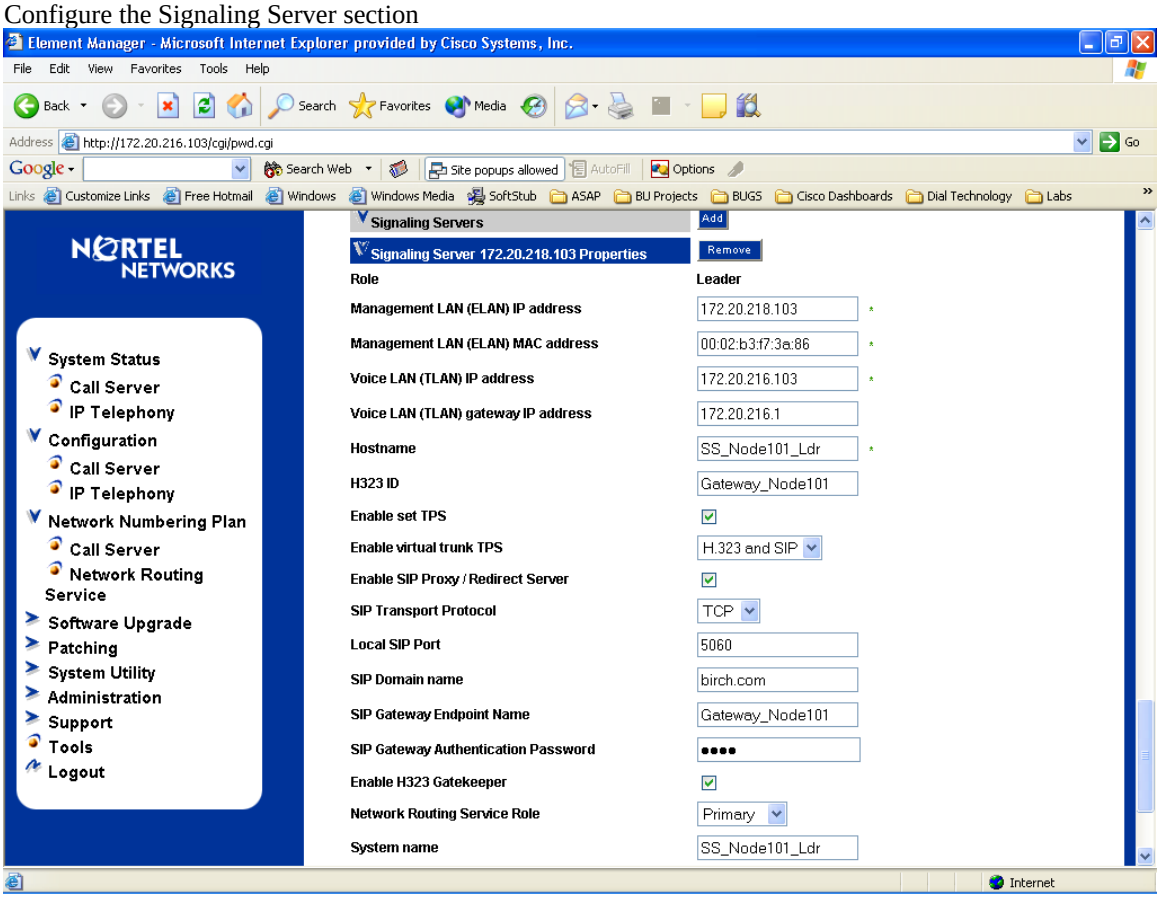
Configure the H323 GW Setting section



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

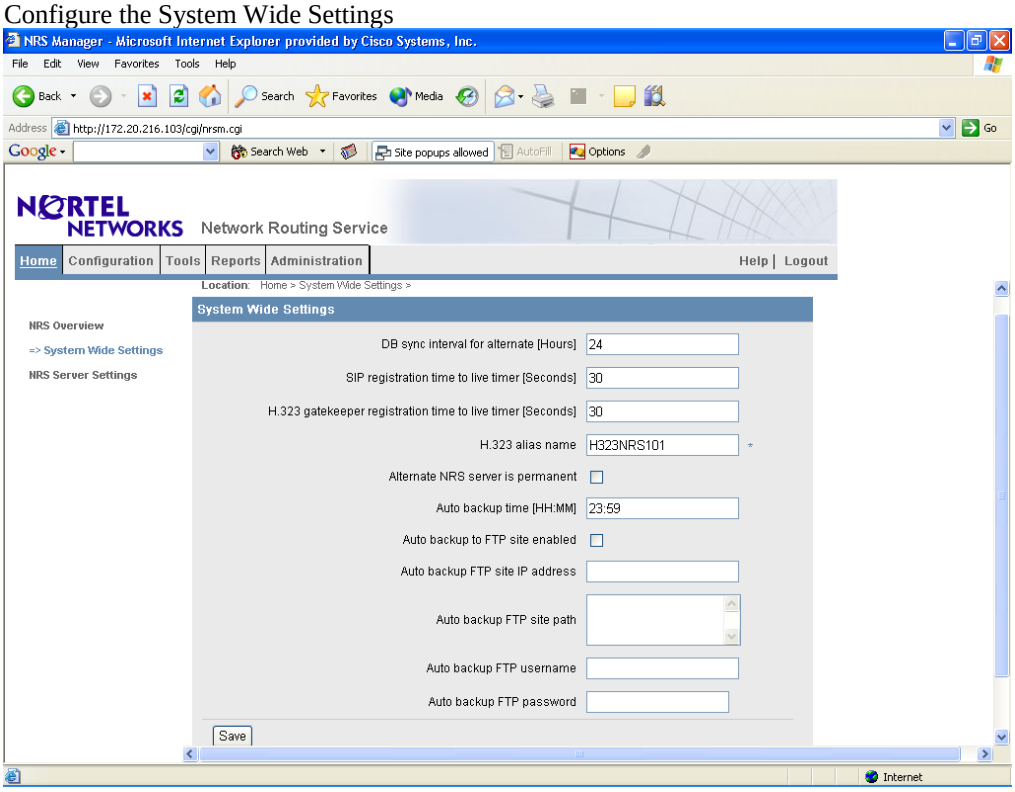


Configure the Signaling Server section

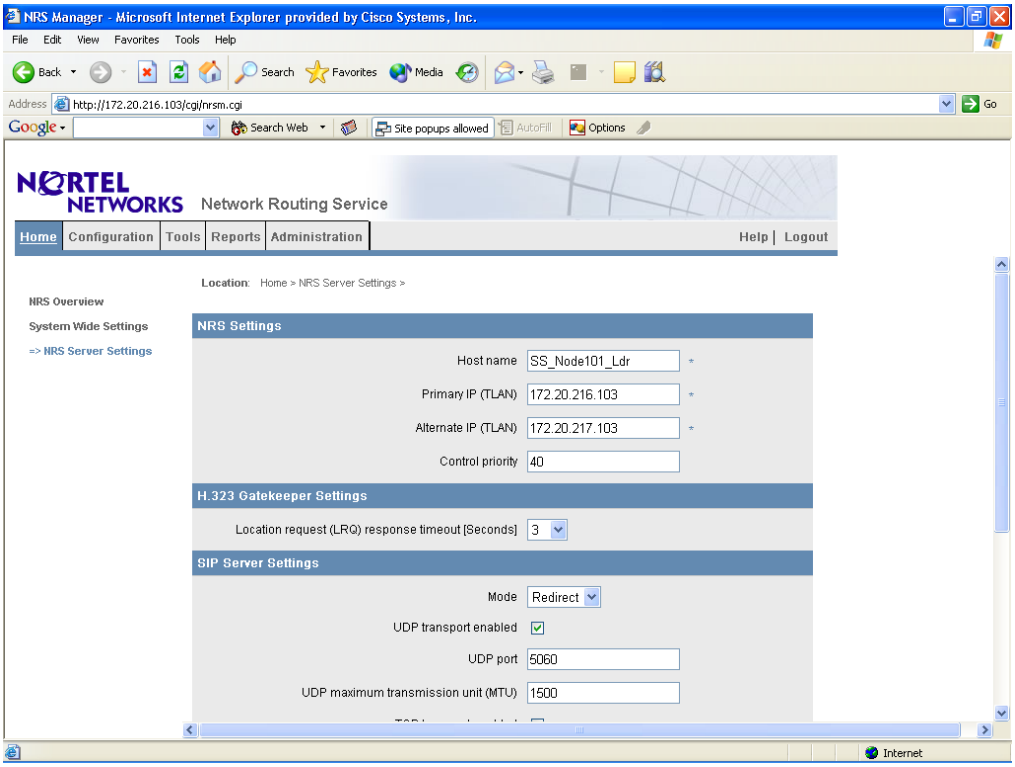


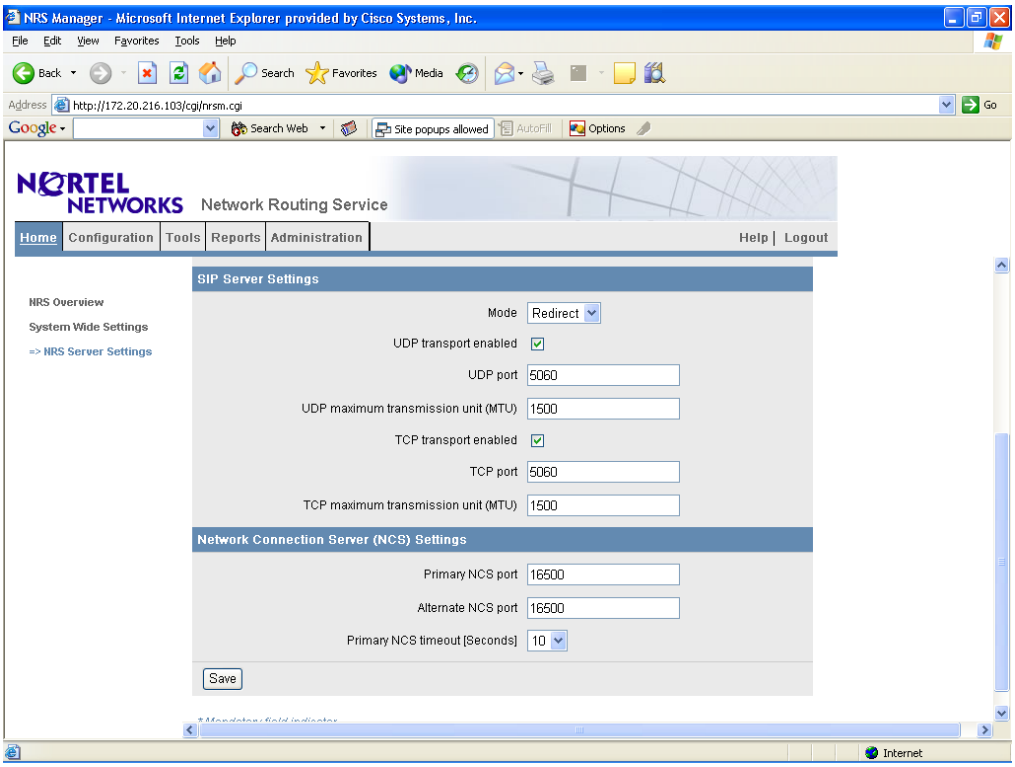
Network Routing Server Setup:

Configure the System Wide Settings

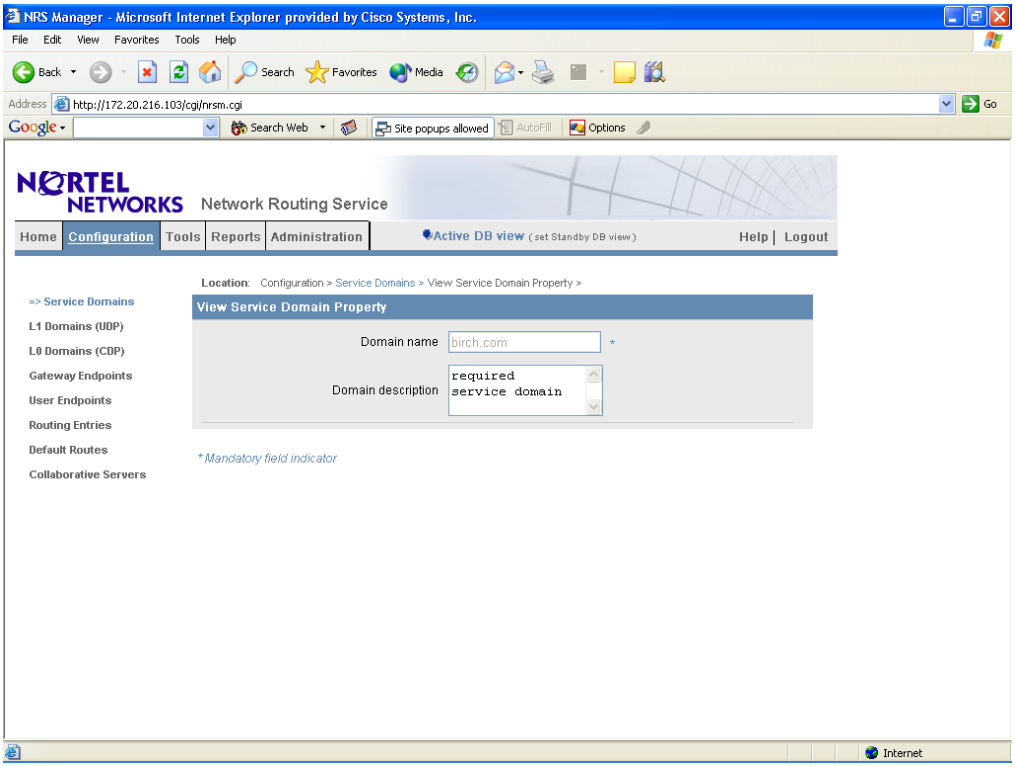


Configure the NRS Server Settings

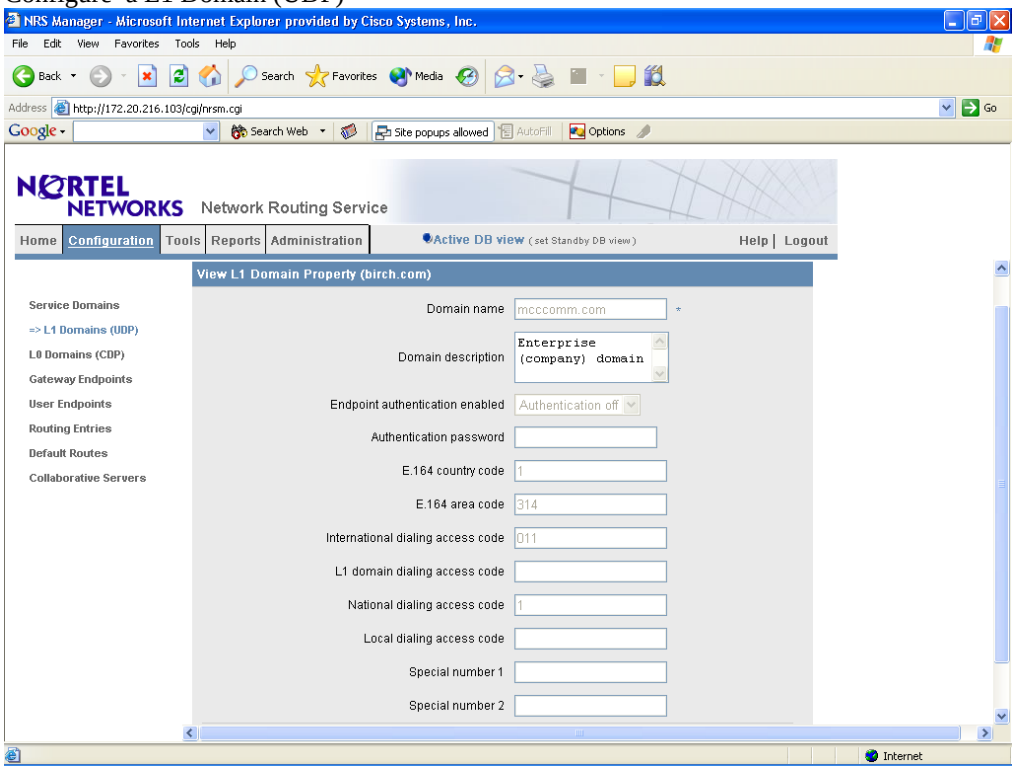




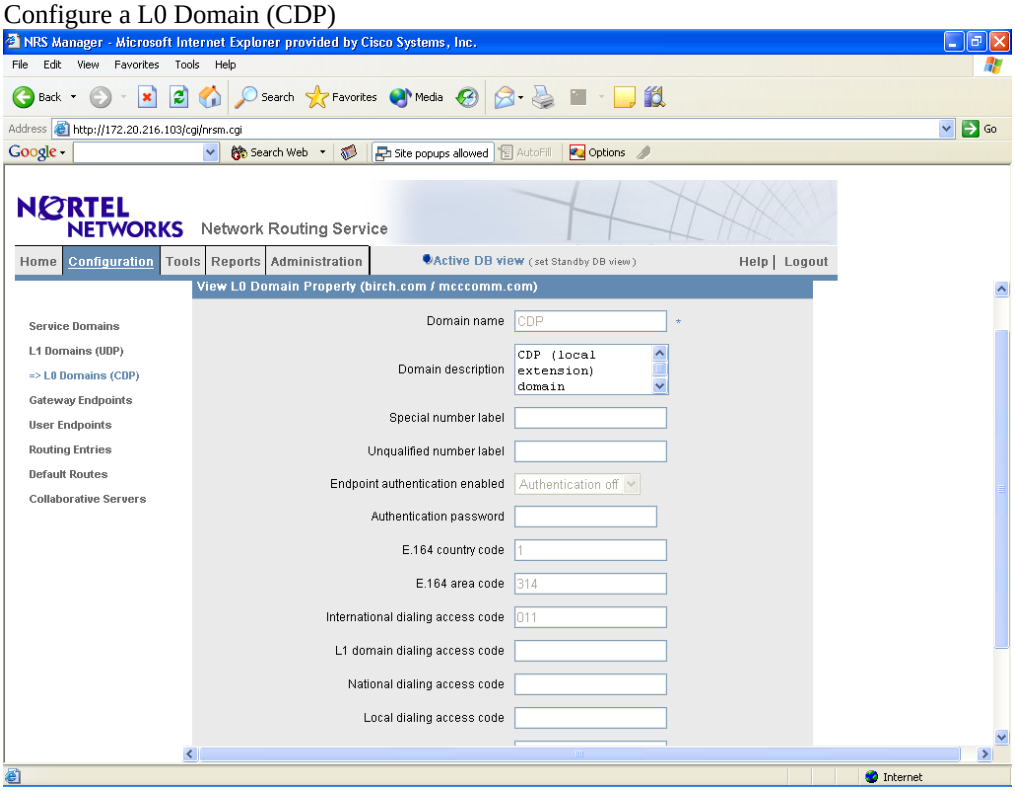
Configure a Service Domain



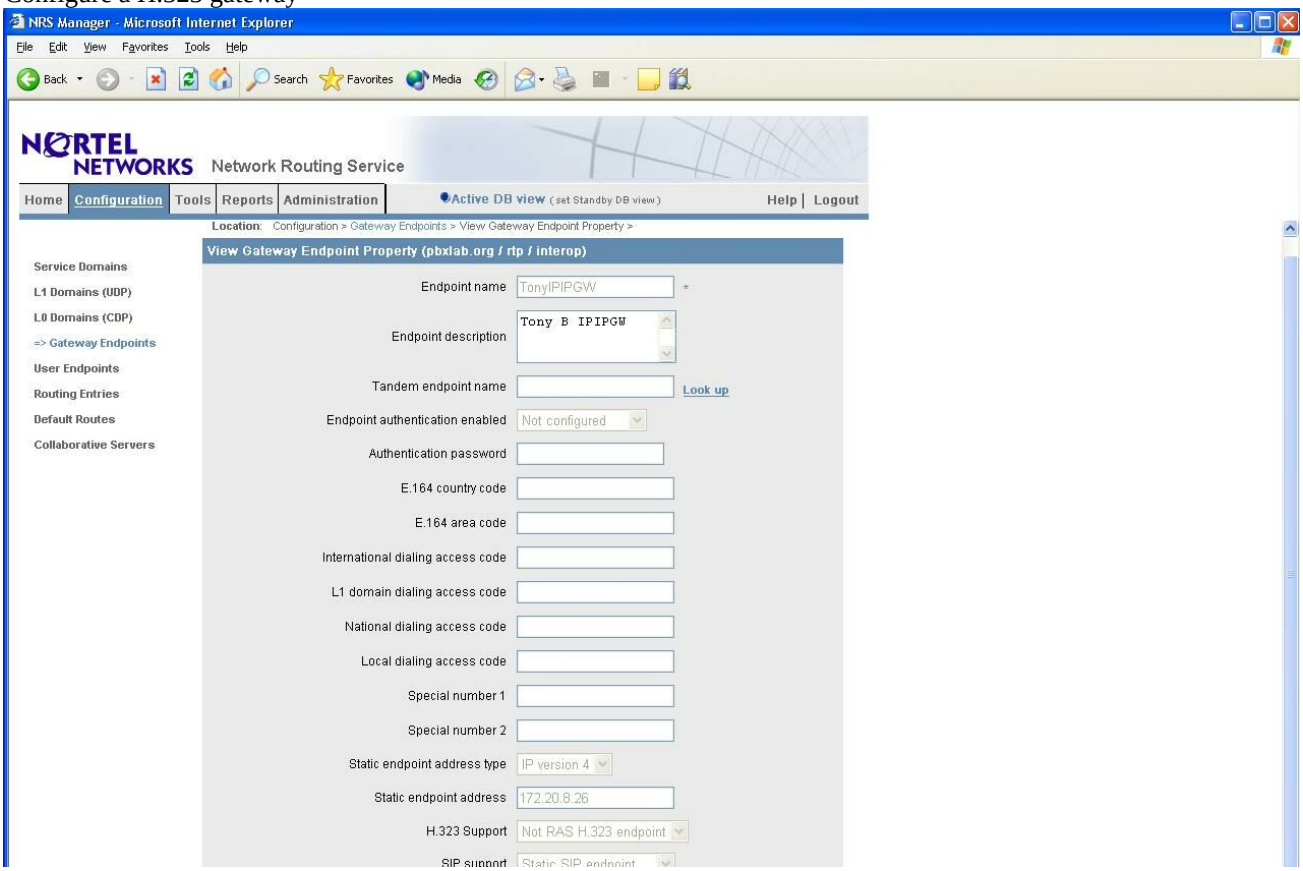
Configure a L1 Domain (UDP)



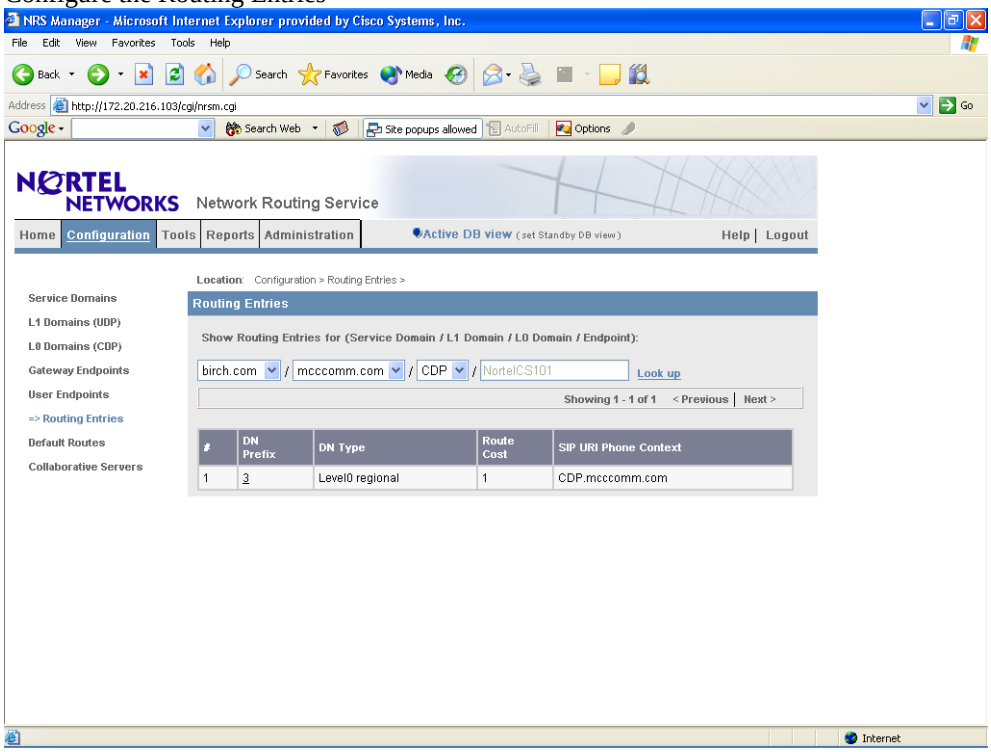
Configure a L0 Domain (CDP)



Configure a H.323 gateway



Configure the Routing Entries



Cisco 3845 IOS Configuration

```
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.124-3.9.PI3d
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
 fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback pass-through g711ulaw
 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 5330 voip
 destination-pattern 5...
 signaling forward unconditional
 voice-class codec 1
 session target ipv4:172.20.217.100
 dtmf-relay h245-alphanumeric
 no fax-relay sg3-to-g3
 no vad
 supplementary-service pass-through
!
dial-peer voice 2330 voip
 destination-pattern 2...
 signaling forward unconditional
 voice-class codec 1
 session target ipv4:172.20.216.100
 dtmf-relay h245-alphanumeric
 no fax-relay sg3-to-g3
 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
CUBE	Cisco Unified Border Element
Cisco IOS	Cisco Internetwork Operating System

Important Information

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