Nortel CS1000M Release 4.0 to a Cisco IAD243X using T1-ISDN NI2 with SIP

January 16, 2007 Initial Version

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Introduction

This is an application note for connectivity to Nortel CS1000 Succession 4.0 PBX with Cisco IAD243X Gateway via T1 ISDN NI2-to-SIP communication (10/100baseT).
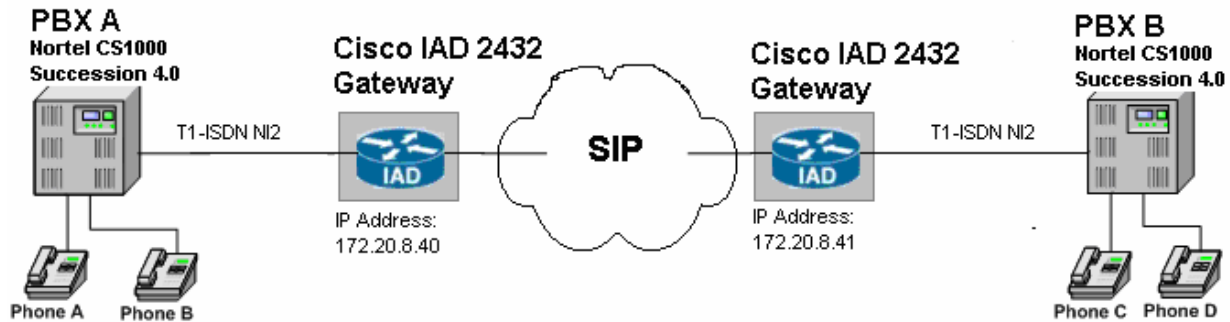
The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco IAD243X Gateway connected to the PBX via ISDN NI2 (T1 PRI). IP trunk connectivity between the IAD243X's is achieved by using SIP protocol.

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Network Topology

Figure 1. Network Topology

Basic Call Setup End-to-End Configuration

Limitations

Connected Name (CONP) feature does not interoperate. The limitation is due to the CISCO IAD2432 not supporting this feature.

Connected Number does not follow the CallForward feature (e.g. If Phone A calls Phone C, and Phone C is forwarded to Phone D, the connected number displayed on Phone A will be Phone C's number, not Phone D's). The limitation is due to the CISCO IAD2432.

Redirecting Number IE, on a Call Forward busy network/external, does not interoperate. The PBX configuration, detailed in this document, does not send standard Redirecting Number IE coding.

When a 3-way call conference is initiated by the external calling phone to conference a local phone (e.g. Phone A calls Phone C, Phone C answers. Phone A conferences in Phone D), the call will be dropped on all phones if the external calling phone hangs-up.

Hardware Requirements

2 Cisco IAD2432 24FXS

2 Nortel CS1000M PBX

2 Nortel 2616 Digital phones

1 Cisco Catalyst switch

Software Requirements

Nortel PBX: Succession 4.0

Cisco IOS Release: c2430-ik9o3s-mz-124-9.T1

Features

Features Supported

Basic end-to-end calls with CLNP , CLIP (Calling Name and Number) and COLP (Connected Number)

Calling Number Restricted

Call Transfer – Local and Network/External

Call on-hold

Call Forward (Unconditional, Busy and No answer) – local and Network/External with Redirecting Number IE, only on Call Forward All and No Answer

3-way Conference

Features Not Supported

Connected Name presentation

Alerting Name presentation

Configuration

Configuring the Nortel Meridian 1 Option 11C PBX

Configure in the following sequence:
1. Configure common equipment

2. Configure the D-Channel

3. Configure the Route Data Block.

4. Configure the Trunk Data Block

5. Configure the Coordinated Dialing Plan

6. Configure the Digital Station Phone

****

Common Equipment Configuration

****
```
>ld 22
PT2000

REQ  prt
TYPE cequ
```

CEQU
 MPED 8D
 SUPL 000 004 008 012
       016 032 036 040
       044 048 064 068
       072 V096 V100
 TDS   000
 CONF 029 030 031 062
       094 095

DLOP	NUM	DCH	FRM	TMDI	LCMT	YALM	T1TE	TRSH
PRI	02	23	ESF	NO	B8S	FDL	-	00
	04	24	ESF	YES	B8S	DG2	0	00
	05	24	ESF	NO	B8S	FDL	-	00
	06	23	ESF	NO	B8S	FDL	-	00
	07	23	ESF	NO	B8S	FDL	-	00
PRI2	11							
DTI2	12	13	21					
MISP								

****
D-channel Configuration

****
REQ prt
TYPE adan dch 6

ADAN   DCH 6
 CTYP MSDL
 CARD 06
 PORT 1
 DES T1_NI
 USR PRI
 DCHL 6
 OTBF 32
 PARM RS422 DTE
 DRAT 64KC
 CLOK EXT
 IFC NI2
  ISDN_MCNT 300
 CLID OPT0
 CO_TYPE STD
 SIDE NET
 CNEG 1
 RLS ID **
 RCAP COLP NDS
 MBGA NO
 OVLR NO
 OVLS NO
 T310 120
 T200 3
 T203 10
 N200 3
 N201 260
 K   7
 BSRV NO

****

Route Data Block Configuration

****
REQ: prt
TYPE: rdb
CUST 0
ROUT 106

TYPE RDB
CUST 00
DMOD
ROUT 106
DES T1_NI
TKTP DID
NPID_TBL_NUM 0
SAT NO
RCLS EXT
VTRK NO
NODE
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
    MODE PRA
    IFC NI2
    CBCR NO
    NCOS 0
    SBN NO
    PNI 00000
    NCNA YES
    NCRD NO
    CHTY BCH
    CPFXS YES
    CPUB OFF
    DAPC NO
    BCOT 0
    INTC NO
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
RANX NO
SRCH LIN
TRMB YES
STEP
ACOD 506
TCPP NO
PII NO
TARG 01
CLEN 1
BILN NO
OABS
INST
ICIS YES
TIMR ICF 512
    OGF 512

```
   EOD  13952
   NRD  10112
   DDL  70
   ODT  4096
   RGV  640
   FLH  510
   GRD  896
   SFB  3
   NBS  2048
   NBL  4096

   IENB  5
   VSS  0


PAGE 002

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

REQ:
```

****

Trunk Data Block Configuration

****

>ld 20

PT0000
REQ: prt
TYPE: tnb
TN   6 1
DATE
PAGE
DES

DES T1_NI
TN   006 01
TYPE DID
CDEN SD
CUST 0
TRK PRI
PDCA 1
PCML MU
NCOS 0
RTMB 106 1
B-CHANNEL SIGNALING
NITE
STRI/STRO OWK OWK
AST NO
IAPG 0
CLS UNR DIP WTA LPR APN THFD HKD
    P10 VNL
TKID 506
AACR NO
DATE 16 OCT 2006

```
**********
CDP config
**********
>ld 87
ESN000

MEM AVAIL: (U/P): 2827806    USED U P: 200312 68457    TOT: 3096575
DISK RECS AVAIL: 1152
REQ  prt
CUST 0
FEAT cdp
TYPE dsc
DSC  533
DSC  533
FLEN 0
DSP  LSC
RLI  6
NPA
NXX
```

Station Data Configuration

REQ: prt
TYPE: 2616

TN   1 9
DATE
PAGE
DES

DES CS101A
TN   001 0 00 09
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 CNIA CDCA MSID DAPA BFED RCBD
     ICDD CDMD LLCN MCTD CLBD AUTU
     GPUD DPUD DNDA CFXA ARHD CLTD ASCD
     CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD AHD
     DDGA NAMA
     DRDD EXR0
     USRD ULAD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN CDMR
CPND_LANG ENG
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 2333 0   MARP
     CPND
       NAME ZEUS_2333
       XPLN 9
       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
```

Configuring the Cisco IAD2432 24FXS

```
IAD_cs102#
IAD_cs102#sh run
Building configuration...

Current configuration : 2207 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname IAD_cs102
!
boot-start-marker
boot system flash:c2430-ik9o3s-mz-124-9.T1.bin
boot-end-marker
!
```

```
card type t1 1
logging buffered 10000000 debugging
no logging console
enable secret 5 $1$39sy$WJXNyjgXw.0HypvItDAMD/
!
no aaa new-model
!
resource policy
!
network-clock-participate T1 1/0
network-clock-participate T1 1/1
network-clock-select 1 T1 1/0
!
!
!
!
!
isdn switch-type primary-qsig
!
voice-card 0
!
!
!
!
!
!
controller T1 1/0
 framing esf
 linecode b8zs
 pri-group timeslots 1-24
!
controller T1 1/1
 framing esf
 linecode b8zs
!
!
!
!
!
!
interface FastEthernet0/0
 ip address 172.20.8.41 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial1/0:23
 no ip address
 encapsulation hdlc
 isdn switch-type primary-ni ==➔ Although IOS "sh run" displays 'ni', this parameter must be set to "isdn switch-type primary-ni2c
 isdn incoming-voice voice
 isdn supp-service name calling
 isdn send-alerting
 no cdp enable
```

```
!
ip default-gateway 172.20.8.1
ip http server
no ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 172.20.8.1
!
!
!
!
!
control-plane
!
!
!
voice-port 1/0:23
!
voice-port 2/0
!
voice-port 2/1
!
voice-port 2/2
!
voice-port 2/3
!
voice-port 2/4
!
voice-port 2/5
!
voice-port 2/6
!
voice-port 2/7
!
voice-port 2/8
!
voice-port 2/9
!
voice-port 2/10
!
voice-port 2/11
!
voice-port 2/12
!
voice-port 2/13
!
voice-port 2/14
!
voice-port 2/15
!
voice-port 2/16
!
voice-port 2/17
!
voice-port 2/18
!
voice-port 2/19
!
voice-port 2/20
!
```

```
voice-port 2/21
!
voice-port 2/22
!
voice-port 2/23
!
!
!
!
dial-peer voice 2330 voip
 destination-pattern 2...
 session protocol sipv2
 session target ipv4:172.20.8.40
 dtmf-relay rtp-nte
 supplementary-service pass-through
!
dial-peer voice 5330 pots
 destination-pattern 5...
 supplementary-service pass-through
 direct-inward-dial
 port 1/0:23
 forward-digits all
!
dial-peer voice 4000 pots
 destination-pattern 4...
 supplementary-service pass-through
 direct-inward-dial
 port 1/0:23
 forward-digits all
!
!
!
!
line con 0
 password cisco
 login
line aux 0
line vty 0 4
 exec-timeout 0 0
 password cisco
 login
!
end
```

Acronyms

Acronym	Definitions
IAD	Integrated Access Device
SIP	Session Initiation Protocol

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