Application Note

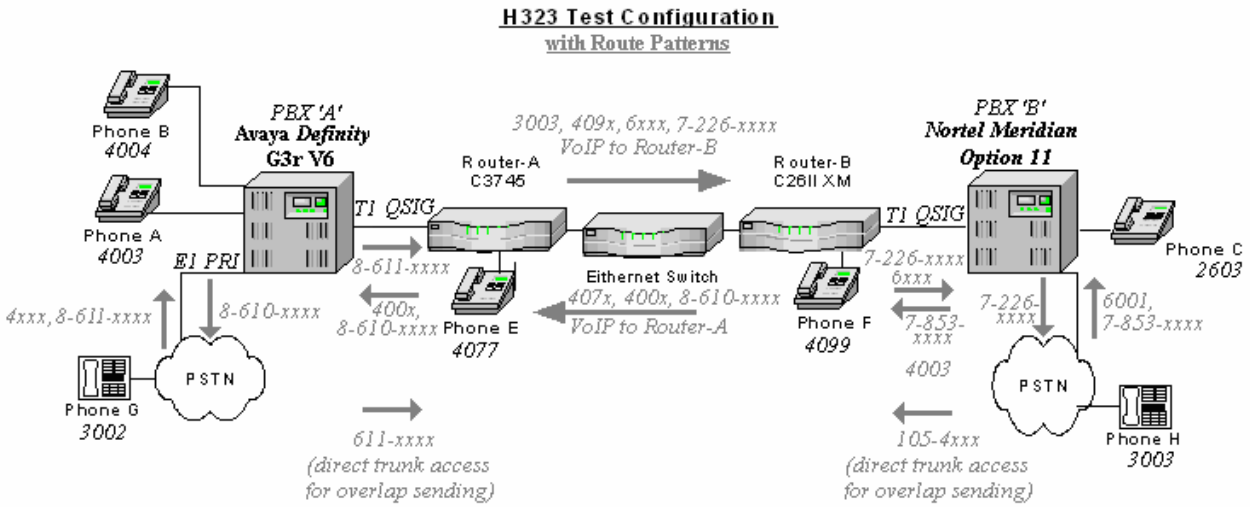
Cisco 2611XM Gateway-PBX Interoperability: Nortel Meridian-1 using NM-HDV2-T1 QSIG with H.323

Introduction

- This application note contains the test results of PBX interoperability testing from a PBX via digital trunk (T1 QSIG) interfaces under test to a Cisco voice router via NM-HDV2-T1/E1 modules.
- This application note is directed toward testing interoperability of the NM-HDV2-T1/E1 Voice Interface Module with a Nortel Meridian Option 11 PBX.
- The application note is for Connectivity/Interoperability testing of the selected PBXs connected via the NM-HDV2-T1/E1 interface to a C2611XM. The Routers under test are connected to an Ethernet switch so that VoIP session targets could be established.
- The diagram in Figure 1 is representative of the configuration used for testing. The diagram shows the test set-up for two Cisco voice gateways connected through an Ethernet switch and controlled via H.323.

Network Topology

Figure 1. Network Topology or Test Setup



Limitations

- It is important to note that the correct position of J7 on the NM-HDV2-T1/E1 Voice Interface Module is critical to establish Layer 1 connectivity. Looking into the NM-HDV2-T1/E1 Voice Interface Module in the direction of insertion into the router, the jumper should be placed to connect the left and middle pins.

- The called number was not generated by the Nortel PBX in the ALERTING or CALL PROCEEDING messages.
- The called name was generated by the Nortel PBX in the ALERTING message and passed to the Avaya PBX. However, it was not read by the Avaya PBX. The Avaya PBX does not support called name/number.
- The called name/number was not generated by the Avaya PBX. The Avaya PBX does not support called name/number.
- The calling name was generated by the Avaya PBX in the SETUP message. However, Router A (3745) did not decode the name for display on phone F. An IOS gateway cannot support the calling name when terminating a QSIG call without a call agent.
- The called/connected names/numbers were not generated by Router A (3745). An IOS gateway cannot support the called/connected name/number when terminating a QSIG call without a call agent.
- The calling name was not properly generated by Router B. An IOS gateway cannot support sending calling name when originating a QSIG call without a call agent.
- The dialed number (not the called number) was visible on the phone E display.
- The called name was generated by the Nortel PBX in the ALERTING message and passed to Router B. However, it was not read by Router B. An IOS gateway does not support called name when terminating a QSIG call without a call agent.
- The connected name/number was generated by the Nortel PBX in the CONNECT message and passed to Router B. However, it was not read by Router B. An IOS gateway does not support connected name/number when terminating a QSIG call without a call agent.
- The calling name was not generated by the originating PSTN.
- The called/connected name/number was not generated by the destination PSTN.
- The calling name was generated by the originating PSTN and forwarded to the destination PSTN. However, it was not supported by the destination PSTN.

System Components

Hardware Requirements

- Cisco C2611XM router with NM-HDV2-1T1/E1 interface or module
- Nortel Meridian Option 11 PBX

Software Requirements

- Nortel Meridian Option 11 PBX: RELEASE 25, ISSUE 15
- C2611XM router: Cisco IOS Software, C2600 Software (C2600-ADVENTERPRISEK9-M), Version 12.3(7)T, RELEASE SOFTWARE (fc1)

Configuration

Configuration Menus and Commands

Configuring the Nortel Meridian Option 11 PBX Configuration[1]

ISO Q.SIG D-Channel Configuration

```
REQ  prt
TYPE adan dch 5
```

[1] ENBLOC configuration shown.

```
ADAN     DCH 5
  CTYP MSDL
  CARD 05
  PORT 1
  DES  T1_ISGF_Network
  USR  PRI
  DCHL 5
  OTBF 32
  PARM RS422  DTE
  DRAT 64KC
  CLOK EXT
  IFC  ISGF
    PINX_CUST 0
    ISDN_MCNT 300
  CLID OPT0
  CO_TYPE  STD
  SIDE NET
  CNEG 1
  RLS  ID  25
  RCAP MWI COLP NDI CCBI CCNI PRI DV3I CTI
  PR_TRIGS DIV 2 3
           CON 2 3
  PR_RTN NO
  MBGA NO
  OVLR NO
  OVLS NO
  T310 120
  T200 3
  T203 10
  N200 3
  N201 260
  K    7
```

Route Data Block Configuration

```
REQ: prt
TYPE: rdb
CUST 0
ROUT 105

TYPE RDB
CUST 00
DMOD
ROUT 105
DES  T1_ISGF_NETWORK
TKTP TIE
NPID_TBL_NUM   0
ESN  NO
RPA  NO
CNVT NO
SAT  NO
RCLS EXT
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
    MODE PRA
    IFC  ISGF
    SBN  NO
    PNI  00001
    NCNA NO
    NCRD NO
    CHTY BCH
    CTYP UKWN
    INAC NO
    ISAR NO
```

```
    CPFXS YES
    DAPC NO
    INTC NO
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH RRB
TRMB YES
STEP
ACOD 105
TCPP NO
TARG 01
BILN NO
OABS
INST
SIGO STD
MFC  NO
ICIS YES
OGIS YES
TIMR ICF 1920
     OGF 1920
     EOD 13952
     LCT 256
     NRD 10112
     DDL 70
     ODT 4096
     RGV 640
     GTO 896
     GTI 896
```

```
      SFB 3
      PRPS 800
      NBS 2048
      NBL 4096
     IENB 5
      TFD 0
      VSS 0
      VGD 6
DTD  NO
SCDT NO
2 DT NO
DRNG NO
CDR  NO
NATL YES
SSL
CFWR NO
IDOP NO
VRAT NO
MUS  NO
PANS YES
OHQ  NO
OHQT 00
CBQ  NO
AUTH NO
TTBL 0
PLEV 2
OPR  NO
ALRM NO
ART  0
TIDY 105 105
SGRP 0
AACR NO
```

Trunk Data Block Configuration

```
REQ: prt
TYPE: tnb
TN   5 1
DATE
PAGE
DES

TN   005 01
TYPE TIE
CDEN SD
CUST 0
TRK  PRI
PDCA 1
PCML MU
NCOS 0
RTMB 105 1
B-CHANNEL SIGNALING
TGAR 1
AST  NO
IAPG 0
CLS  UNR DTN CND WTA LPR APN THFD XREP BARD HKD
     P10 VNL
TKID
DATE 28 OCT 2004
Digital Station Phone Configuration
REQ: prt
TYPE: 2616


MARP NOT ACTIVATED
```

```
TN   001 0 0 0
DATE
PAGE
DES

DES  TEST1
TN   001 0 00 00
TYPE 2616
CDEN 8D
CUST 0
AOM  0
FDN
TGAR 0
LDN  NO
NCOS 0
SGRP 0
RNPG 0
SCI  0
SSU
XLST
SFLT NO
CAC_MFC 0
CLS  CTD FBA WTA LPR MTD FNA HTD ADD HFD
     MWA LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
     POD DSX VMD CMSD CCSD SWD LND CNDA
     CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
     ICDD CDMD MCTD CLBD AUTU
     GPUD DPUD DNDA CFXA ARHD CLTD ASCD
     ABDD CFHD FICD NAID BUZZ AGRD MOAD
     UDI RCC HBTD AHD IPND  DDGA NAMA MIND PRSD NRWD NRCD NROD
     DRDD EXR0
     USRD ULAD RTDD RBDD RBHD PGND FLXD FTTC DNDY DNO3 MCBN
```

```
CPND_LANG ENG
RCO  0
HUNT
PLEV 02
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
DNDR 0
KEY  00 SCR 6001 0     MARP
        CPND
          CPND_LANG ROMAN
            NAME BIG BIRD
            XPLN 13
            DISPLAY_FMT FIRST,LAST
     01 SCR 6011 0     MARP
     02 MIK
     03 CFW 12  78534004
     04 AO6
     05 TRN
     06 DSP
     07
     08 ADL 16
     09 ADL 16
     10 ADL 16
     11 ADL 16
     12 ADL 16
     13 ADL 16
     14 RGA
     15 MCK
```

```
DATE  3 DEC 2004
NACT
```

D-Channel Configuration for DMS-100 emulating PSTN trunk

```
REQ  prt
TYPE adan dch 7


ADAN     DCH 7
  CTYP MSDL
  CARD 07
  PORT 1
  DES  t1_d100_trj(
  USR  PRI
  DCHL 7
  OTBF 32
  PARM RS422  DTE
  DRAT 64KC
  CLOK EXT
  IFC  S100
  SIDE USR
  CNEG 1
  RLS  ID  **
  RCAP ND2
  MBGA NO
  OVLR NO
  OVLS NO
  T200 3
  T203 10
  N200 3
  N201 260
  K    7
```

Route Data Block for PSTN Trunk

```
>ld 21
PT1000

REQ: prt
TYPE: rdb
CUST 0
ROUT 107

TYPE RDB
CUST 00
DMOD
ROUT 107
DES  T1_D100_TRK
TKTP TIE
NPID_TBL_NUM   0
ESN  NO
RPA  NO
CNVT NO
SAT  NO
RCLS EXT
DTRK YES
BRIP NO
DGTP PRI
ISDN YES
    MODE PRA
    IFC  S100
    SBN  NO
    PNI  00000
    NCNA YES
    NCRD YES
    CHTY BCH
```

```
    CTYP UKWN
    INAC NO
    ISAR NO
    CPUB OFF
    DAPC NO
    BCOT 0
DSEL VOD
PTYP PRI
AUTO NO
DNIS NO
DCDR NO
ICOG IAO
SRCH RRB
TRMB YES
STEP
ACOD 507
TCPP NO
TARG 01
BILN NO
OABS
INST
SIGO STD
MFC  NO
ICIS YES
OGIS YES
TIMR ICF 1920
     OGF 1920
     EOD 13952
     LCT 256
     NRD 10112
     DDL 70
     ODT 4096
```

```
      RGV 640
      GTO 896
      GTI 896
      SFB 3
      PRPS 800
      NBS 2048
      NBL 4096
     IENB 5
      TFD 0
      VSS 0
      VGD 6
DTD   NO
SCDT NO
2 DT NO
DRNG NO
CDR   NO
NATL YES
SSL
CFWR NO
IDOP NO
VRAT NO
MUS   NO
PANS YES
OHQ   NO
OHQT 00
CBQ   NO
AUTH NO
TTBL 0
PLEV 2
OPR   NO
ALRM NO
ART   0
```

```
TIDY 507 107
SGRP 0
AACR NO

REQ:
```

Trunk Data Block For PSTN Trunk

```
REQ: prt
TYPE: tnb
TN   7 1
DATE
PAGE
DES

TN   007 01
TYPE TIE
CDEN SD
CUST 0
TRK  PRI
PDCA 1
PCML MU
NCOS 0
RTMB 107 1
B-CHANNEL SIGNALING
TGAR 0
AST  NO
IAPG 0
CLS  UNR DTN CND WTA LPR APN THFD XREP BARD HKD
     P10 VNL
TKID
DATE  4 MAR 2004
```

NACT

Configuring the 2611XM Router[2]

```
2611XM-B#sho run

Building configuration...


Current configuration : 2234 bytes

!

version 12.3

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname 2611XM-B

!

boot-start-marker

boot-end-marker

!

card type t1 1 1

!

no network-clock-participate slot 1

no network-clock-participate wic 0

ip subnet-zero

!

!

ip cef

ip audit po max-events 100

no aaa new-model

no ftp-server write-enable

isdn switch-type primary-qsig
```

[2] ENBLOC configuration shown. The command "3745-A (config-if)# **isdn overlap-receiving**" was added on the trunk serial interface (int ser 1/0:23) for overlap calls.

```
voice-card 1
!
!
voice rtp send-recv
!
!
voice class h323 1
!
!
controller T1 1/0
 framing esf
 linecode b8zs
 pri-group timeslots 1-24
 description connection to Nortel T1 PRI
!
no crypto isakmp enable
!
!
interface Tunnel1
 no ip address
!
interface FastEthernet0/0
 ip address 172.20.43.155 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
```

```
interface Serial1/0:23
 description connection to Nortel T1 PRI
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 isdn incoming-voice voice
 isdn send-alerting
 isdn outgoing display-ie
 no cdp enable
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.20.43.1
ip route 0.0.0.0 255.255.255.0 FastEthernet0/0
!
no ip http server
no ip http secure-server
!
!
control-plane
!
!
voice-port 1/0/0
 station-id name phone F
 station-id number 4099
 caller-id enable type 1
!
voice-port 1/0/1
 station-id name phone FF
 station-id number 4098
 caller-id enable
!
voice-port 1/0/2
```

```
!
voice-port 1/0/3
!
voice-port 1/0:23
!
!
dial-peer voice 1 voip
 destination-pattern 407.
 session target ipv4:172.20.43.151
 ip qos dscp cs1 media
!
dial-peer voice 100 pots
 destination-pattern 4099
 port 1/0/0
!
dial-peer voice 2 voip
 destination-pattern 400.
 session target ipv4:172.20.43.151
 ip qos dscp cs1 media
!
dial-peer voice 3 voip
 destination-pattern 8610....
 session target ipv4:172.20.43.151
 ip qos dscp cs1 media
!
dial-peer voice 1023 pots
 destination-pattern 6...
 direct-inward-dial
 port 1/0:23
 forward-digits all
!
dial-peer voice 1024 pots
```

```
 destination-pattern 710....
 port 1/0:23
 forward-digits all
!
dial-peer voice 7226 pots
 destination-pattern 7226....
 port 1/0:23
 forward-digits all
!
!
line con 0
line aux 0
line vty 0 4
 login
!
!
end
2611XM-B#
```

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

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

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

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

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

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

Printed in the USA