

Cisco 3745 Gateway – PBX Interoperability: Avaya Definity G3r to an NM-HDV2-T1/E1 Digital Voice Network Module with H.323

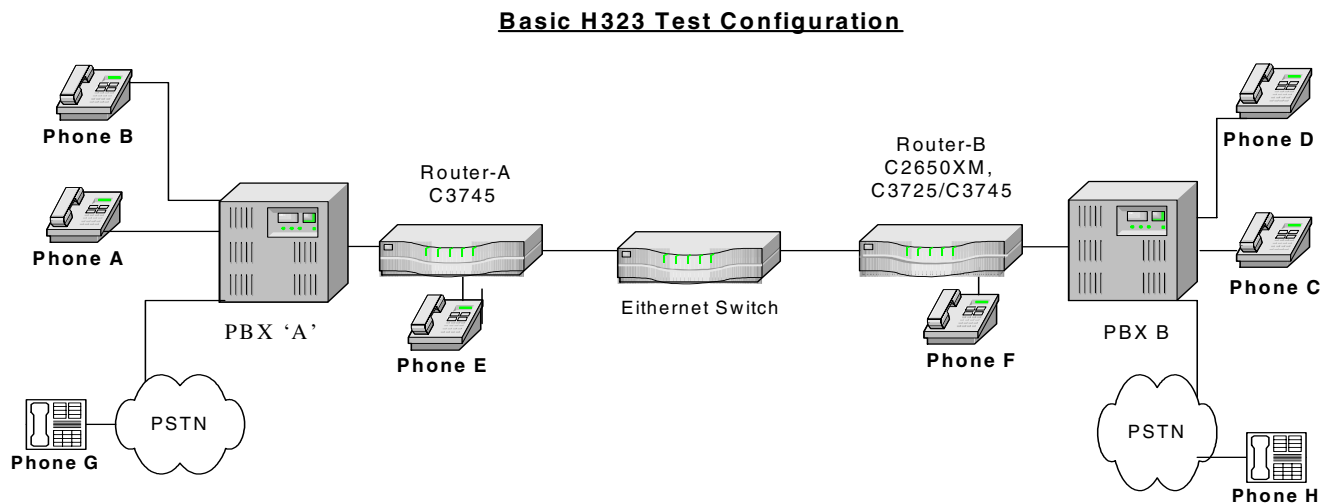
Introduction

This is an application note for connectivity for PBX interoperability testing between PBXs and the NM-HDV2 T1/E1 Network Module installed in Cisco voice gateways.

- The network topology diagram (Figure 1) is representative of the configuration used for testing. The diagram shows the test set-up for the pair of Cisco voice gateways being tested. The Cisco voice gateways are configured for back-to-back VoIP operation.
- This application note uses the Cisco 3745 voice gateway; however other Cisco voice gateways are also an option to use.

Network Topology

Figure 1. Network Topology or Test Setup



The above diagram is representative of the various configurations used for testing. As shown in the diagram above, a PBX is connected via an interface to a Cisco router, which in turn, is connected to an Ethernet switch which is connected to a second Cisco router. The second Cisco router is connected to a second PBX. The interoperability testing involved signaling and audio path confirmation on the voice interfaces under test between each Cisco router and it's associated PBX.

Limitations

- The FXO voice port goes off-hook on the first ring of an incoming seizure, before the targeted phone has answered. The PBX Analog extension does not support disconnect supervision, which causes trunk hang issues and long ring-no answer times. FXO Answer and Disconnect Supervision URL:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t2/ft_ansds.htm



- The POTS Line to FXO topology should not be used with this PBX as it does not support disconnect supervision on its analog extensions and ring-no-answer will result in hung circuits. This feature needs to be supported on the FXO port and the POTS line. The universal trunk card of Nortel Option 11 PBX used in this test case does not support the feature set to provide proper disconnect tone or loop-break-disconnect supervision to allow FXO port to hang-up

System Components

Hardware Requirements

- Cisco C3745
- Avaya Definity G3r
- Interfaces
 - NM-HDV2-2T1/E1
 - PVDM2-8
 - PVDM2-16
 - PVDM2-32
 - PVDM2-48
 - PVDM2-64

Software Requirements

- Cisco 3745 - Cisco IOS Software, 3700 Software Release 12.3(7)T
- Avaya Definity G3r - V6

Features

- Supported
 - Disconnect supervision feature is supported by Cisco VIC-2 FXO voice interface card.
- Not Supported
 - Nortel Option 11 PBX analog pots lines do not support disconnect supervision.

Configuration

Configuration Sequence and Tasks

Configure in the following sequence:

Avaya Definity G3r PBX

Cisco 3745 Router

Configuration Menus and Commands

Configuring the Avaya Definity G3r PBX



Trunk Groups

```
display trunk-group 7                                     Page 1 of 11
TRUNK GROUP
Group Number: 7          Group Type: co          CDR Reports: y
Group Name: CO TRUNK - SLOT 7      COR: 1          TN: 1          TAC: 607
Direction: two-way        Outgoing Display? y
Dial Access? y           Busy Threshold: 99          Night Service:
Queue Length: 0          Country: 1          Incoming Destination: 4004
Comm Type: voice         Auth Code? n          Digit Absorption List:
Prefix-1? n             Trunk Flash? n          Toll Restricted? n

TRUNK PARAMETERS
Trunk Type: ground-start
Outgoing Dial Type: tone          Cut-Through? y
Trunk Termination: 600ohm        Disconnect Timing(nsec): 500
Auto Guard? n          Call Still Held? n          Sig Bit Inversion: none
Terminal Balanced? n          RA Trunk Loss: 0db
Trunk Gain: high

Disconnect Supervision - In? y Out? y
Answer Supervision Timeout: 10    Receive Answer Supervision? n

CANCEL  REFRESH  [ ]  [ ]  HELP  GO TO PAGE  NEXT PAGE  PREV PAGE
```

```
display trunk-group 7                                     Page 2 of 11
TRUNK FEATURES
ACA Assignment? n          Measured: none          Maintenance Tests? y
Data Restriction? n

Abandoned Call Search? n
Suppress # Outpulsing? n

Charge Conversion: 1
Decimal Point: none
Currency Symbol:
Charge Type: units

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```



```
display trunk-group 7 Page 3 of 11
TRUNK GROUP
ADMINISTRABLE TIMERS
  Incoming Disconnect(msec): 500      Outgoing Disconnect(msec): 500
  Incoming Glare Guard(msec): 1500    Outgoing Dial Guard(msec): 1600
                                       Outgoing Glare Guard(msec): 1500

  Ringing Monitor(msec): 5200         Incoming Seizure(msec): 500
  Outgoing End of Dial(sec): 10       Outgoing Seizure Response(sec): 5
  Programmed Dial Pause(msec): 1500   Disconnect Signal Error(sec): 240
  Flash Length(msec): 540

END TO END SIGNALING
  Tone(msec): 350      Pause(msec): 150

OUTPUTSING INFORMATION
  PPS: 10      Make(msec): 40      Break(msec): 60      PPM? n

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```

```
display trunk-group 7 Page 4 of 11
ATMS THRESHOLDS
  TTL Type: 105-w-r1      Far End Test No:
  TTL Vendor:             TTL Contact:
  Trunk Vendor:          Trunk Contact:
  Trunk Length:

          MARGINAL          UNACCEPTABLE
          Min Max          Min Max
1004 Hz Loss: -2 21          -2 21
          -Dev +Dev          -Dev +Dev
  404 Hz Loss: 9 9           9 9
  2804 Hz Loss: 9 9          9 9

Maximum C Message Noise: 55          55
Maximum C Notched Noise: 74          74
Minimum SRL-HI: 0 0
Minimum SRL-LO: 0 0
Minimum ERL: 0 0

Allow ATMS Busyout, Error Logging and Alarming? n

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```



```
display trunk-group 7                                     Page 5 of 11
TRUNK GROUP
Administered Members (min/max): 1/1
Total Administered Members: 1

GROUP MEMBER ASSIGNMENTS

   Port   Code Sfx Name      Night      Mode      Type      Ans Delay
1: 01A0701 TN747 B
2:
3:
4:
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

CANCEL REFRESH [ ] [ ] HELP GO TO PAGE NEXT PAGE PREU PAGE
```

Configuring the Cisco 3745 Router

show Running-Config

```
A-3745#sho runn
Building configuration...
```

```
Current configuration : 1421 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname A-3745
!
boot-start-marker
boot-end-marker
!
card type e1 2 1
!
no network-clock-participate slot 1
no network-clock-participate slot 2
no network-clock-participate slot 3
no network-clock-participate slot 4
no network-clock-participate wic 0
no network-clock-participate wic 1
no network-clock-participate wic 2
```



```
no network-clock-participate aim 0
no network-clock-participate aim 1
no aaa new-model
ip subnet-zero
ip cef
!
ip audit po max-events 100
no ftp-server write-enable
voice-card 2
dspfarm
!
controller E1 2/0
!
controller E1 2/1
!
no crypto isakmp enable
!
interface FastEthernet0/0
ip address 172.20.43.151 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
ip classless
ip route 0.0.0.0 0.0.0.0 FastEthernet0/0
!
ip http server
no ip http secure-server
!
control-plane
!
voice-port 2/0/0
ren 5
signal groundStart
!
voice-port 2/0/1
!
dial-peer voice 7000 pots
destination-pattern 3000
port 2/0/0
forward-digits 0
!
dial-peer voice 1000 voip
destination-pattern ....
session target ipv4:172.20.43.155
!
dial-peer voice 7001 pots
destination-pattern 3001
port 2/0/1
```



```
!  
line con 0  
line aux 0  
line vty 0 4  
login  
!  
end
```

Acronyms

Acronym	Definition
FXO	Foreign Exchange Office
MFT	Multi-Flex Trunk, an interface
PBX	Private branch exchange
POTS	Plain Old Telephone Service
VoIP	Voice over IP

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