

Cisco Unified CallManager Release 4.01-PBX Interoperability: Avaya Definity G3r V6 to a Cisco 3745 Gateway using NM-HDV2-T1 CAS, E&M, Wink-Start with MGCP

Introduction

- This application note contains the test results of Avaya Definity G3r V6 PBX interoperability testing via digital trunk (T1 CAS, E&M, wink start) interfaces under test to a Cisco C3745 Voice Router via installed NM-HDV2-T1/E1 Voice Interface Modules.
- This application note is directed toward testing interoperability of the NM-HDV2-T1/E1 Voice Interface Modules with an Avaya G3r V6 PBX.
- The application note is for Connectivity/Interoperability testing of the Avaya Definity G3r V6 PBX connected via the NM-HDV2-T1/E1 Voice Interface Modules to a Cisco C3745 Voice Router. The Cisco C3745 Voice Router under test is connected via Ethernet to an Ethernet switch which also has a Cisco Call Manager and IP Phones in the Network Topology.
- Figure 1 shows the test set-up for a Cisco C3745 Voice Router connected through an Ethernet switch and controlled via MGCP by a Cisco Call Manager.

Network Topology

Figure 1. Network Topology or Test Setup



The above diagram is representative of the configuration 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 also has the CCM (cisco call manager) IP Phones and 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

- It was found that the correct position of J7 was critical to establish Layer 1 connectivity with the Nortel T1 PBX interface. Looking into the NM-HDV2-T1/E1 Voice Interface Modules in the direction of insertion into the Cisco Voice Router, the jumper should be placed to connect the left and middle pins.
- When phone A calls phone C and phone C answers the call or not, the actual call was placed from phone A to phone K, and then forwarded to phone C (see Figure 1).
- When phone C calls phone A and phone A answers the call or not, the actual call was placed from phone C to phone K, and then forwarded to phone A (see Figure 1).
- When phone G calls phone H and phone H answers the call, it may take a few seconds for this call to be torn down before it can be repeated (see Figure 1).
- When phone G calls phone H and phone H answers the call or not, it may take a few seconds for this call to be torn down before it can be repeated.
- When phone K calls phone H and phone H answers the call or not, the actual call was placed from phone K to phone C, and then forwarded to phone H (see Figure 1).

System Components

Hardware Requirements

- Cisco C3745 Voice Router with NM-HDV2-T1/E1 Voice Interface Modules
- Avaya Definity G3r V6 PBX

Software Requirements

- Cisco Unified CallManager Release 4.01
- Avaya Definity G3V6i.01.0.018.2
- Cisco Voice Router C3745: Cisco IOS Software, 3700 Software (C3745-ADENTERPRISEK9-M), Version 12.3(7)T, RELEASE SOFTWARE (fc1)

Configuration

Configuration Menus and Commands



Configuring the Avaya Definity G3 V6 PBX

Terminal Screenshot for Avaya T1 Trunk Configuration (1 of 5)

```
display trunk-group 13                                     Page 1 of 11
                                     TRUNK GROUP
Group Number: 13                Group Type: tie                CDR Reports: n
Group Name: T1/E1 TRUNK - SLOT 13    COR: 1                TN: 1                TAC: 613
Direction: two-way                Outgoing Display? y    Trunk Signaling Type:
Dial Access? y                    Busy Threshold: 99                Night Service:
Queue Length: 0                    Incoming Destination:
Comm Type: voice                    Auth Code? n
                                     Trunk Flash? n

TRUNK PARAMETERS
Trunk Type (in/out): wink/wink        Incoming Rotary Timeout(sec):
Outgoing Dial Type: tone                Incoming Dial Type: tone
Wink Timer(msec): 300                Disconnect Timing(msec):
Digit Treatment:                        Digits:
                                     Sig Bit Inversion: none
Connected to Toll? n                STT Loss: normal                DTT to DCO Loss: normal
Incoming Dial Tone? y

Disconnect Supervision - In? y  Out? n
Answer Supervision Timeout: 0        Receive Answer Supervision? y

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



Terminal Screenshot for Avaya T1 Trunk Configuration (2 of 5)

```
display trunk-group 13                                     Page 2 of 11
TRUNK FEATURES
  ACA Assignment? n           Measured: none
                               Internal Alert? n       Maintenance Tests? y
                               Data Restriction? n
                               Glare Handling: none
  Used for DCS? n
  Suppress # Outpulsing? n
                               Seize When Maintenance Busy: neither-end

Incoming Tone (DTMF) ANI? n
  Connected to CO? n
```

CANCEL REFRESH HELP GO TO NEXT PREV
PAGE PAGE PAGE



Terminal Screenshot for Avaya T1 Trunk Configuration (3 of 5)

```
display trunk-group 13                                     Page 3 of 11
TRUNK GROUP
ADMINISTRABLE TIMERS
  Incoming Disconnect(msec): 500                          Outgoing Disconnect(msec): 500
  Incoming Dial Guard(msec): 70                          Outgoing Dial Guard(msec): 1600
  Incoming Glare Guard(msec): 1500                       Outgoing Glare Guard(msec): 1500

  Outgoing Seizure Response(sec): 5
  Programmed Dial Pause(msec): 1500                      Disconnect Signal Error(sec): 240
  Flash Length(msec): 540                               Incoming Incomplete Dial Alarm(sec): 255

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

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

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



Terminal Screenshot for Avaya T1 Trunk Configuration (4 of 5)

```
display trunk-group 13                                     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

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



Terminal Screenshot for Avaya T1 Trunk Configuration (5 of 5)

```
display trunk-group 13                                     Page 5 of 11
TRUNK GROUP
Administered Members (min/max): 1/12
GROUP MEMBER ASSIGNMENTS                                Total Administered Members: 12

  Port   Code Sfx Name      Night      Mode      Type      Ans Delay
1: 01A1301 TN464 F
2: 01A1302 TN464 F
3: 01A1303 TN464 F
4: 01A1304 TN464 F
5: 01A1305 TN464 F
6: 01A1306 TN464 F
7: 01A1307 TN464 F
8: 01A1308 TN464 F
9: 01A1309 TN464 F
10: 01A1310 TN464 F
11: 01A1311 TN464 F
12: 01A1312 TN464 F
13:
14:
15:

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



Configuring Cisco Unified CallManager

Route Patterns

Screenshot for Cisco Unified CallManager Route Patterns (Overview)

The screenshot shows the Cisco CallManager Administration web interface in Microsoft Internet Explorer. The browser address bar shows `http://b9/CCMAdmin/routepatternlist.asp`. The page title is "Find and List Route Patterns/Hunt Pilots". The interface includes a navigation menu with options like System, Route Plan, Service, Feature, Device, User, Application, and Help. The main content area displays the title "Find and List Route Patterns/Hunt Pilots" and a search form. The search results show 5 matching records for patterns beginning with an empty string. The table lists the following records:

<input type="checkbox"/>	Route Pattern/Hunt Pilot	Partition	Description	Route Filter	Gateway/Route List	Copy
<input type="checkbox"/>	11XX	9900X	11xx		S4/DS1-0@A-3745	
<input type="checkbox"/>	42XX	9900X			S4/DS1-0@A-3745	
<input type="checkbox"/>	7.XXXX	9900X			S4/DS1-1@A-3745	
<input type="checkbox"/>	8.2	9900X			S4/DS1-0@A-3745	
<input type="checkbox"/>	9.XXXX	9900X			S1/DS1-0@B-2611XM	

At the bottom of the table, there is a "Delete Selected" button and pagination controls showing "Page 1 of 1".



Screenshot for Cisco Unified CallManager Route Patterns (Pattern 7.XXXX to Avaya PBX)

Cisco CallManager 4.0 Administration - Route Pattern/Hunt Pilot Configuration - Microsoft Internet Explorer

Address: http://b9/CCMAdmin/routepatternconfig.asp?pkid={698615D4-2613-4161-AD6E-D480CED274EF}

Route Pattern/Hunt Pilot: 7.XXXX

Status: Ready
Note: Any update to this Route Pattern or Hunt Pilot automatically resets the associated gateway or Route/Hunt List

Copy Update Delete

Pattern Definition

Route Pattern/Hunt Pilot*

Partition

Description

Numbering Plan*

Route Filter

MLPP Precedence

Gateway or Route/Hunt List* (Edit)

Route Option
 Route this pattern
 Block this pattern

Provide Outside Dial Tone Allow Overlap Sending Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation

Calling Name Presentation

Connected Party Transformations

Connected Line ID Presentation

Connected Name Presentation

Called Party Transformations

Discard Digits

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

ISDN Network-Specific Facilities Information Element

Carrier Identification Code

Network Service Protocol

Network Service	Service Parameter Name	Service Parameter Value
<input type="text" value=" - Not Selected -"/>	<input type="text" value=" < Not Exist >"/>	<input type="text"/>

* indicates required item.



Cisco Unified CallManager Configuration for Cisco C3745 Voice Router

Screenshot for Cisco Unified CallManager – Cisco C3745 Voice Router Configuration

The screenshot shows the Cisco CallManager Administration web interface in Microsoft Internet Explorer. The browser address bar shows the URL: `http://b9/CCMAdmin/mgcpconfig.asp?MGCP={295ED5AB-8E13-4765-8E7E-5ABF74E41132}`. The page title is "Cisco CallManager Administration - Gateway Configuration - Microsoft Internet Explorer".

The main navigation bar includes: System, Route Plan, Service, Feature, Device, User, Application, Help. The page header features the Cisco CallManager Administration logo and the Cisco Systems logo.

Gateway Configuration

[Back to Find/List Gateways](#)

Product: Cisco 3745
Gateway : A-3745

Status: Ready

Update Delete Reset Gateway

Domain Name*
Description
Cisco CallManager Group*

Installed Voice Interface Cards		Endpoint Identifiers	
Mainboard Slot	<input type="text" value="< None >"/>		
Module in Slot 1	<input type="text" value="< None >"/>		
Module in Slot 2	<input type="text" value="< None >"/>		
Module in Slot 3	<input type="text" value="< None >"/>		
Module in Slot 4	<input type="text" value="NM-HD-2VE"/>		
Subunit 0	<input type="text" value="VIC2-2FXS"/>	Begin Port 0	(4/0/0) POTS (4/0/1) POTS
Subunit 1	<input type="text" value="VVIC-2MFT-T1"/>	Begin Port 0	(4/0/0) T1PRI (4/0/1) T1CAS

Product Specific Configuration

Global ISDN Switch Type
Switchback Timing*
Switchback uptime-delay (min)
Switchback schedule (hh:mm)

* indicates required item



Screenshot for Cisco Unified CallManager – Cisco C3745 Voice Router T1 Trunk Configuration

The screenshot displays the Cisco CallManager 4.0 Administration interface for Gateway Configuration. The browser window title is "Cisco CallManager 4.0 Administration - Gateway Configuration - Microsoft Internet Explorer". The address bar shows the URL: <http://b9/CCMAdmin/gatewayconfig.asp?pkid={F07B3849-763D-4201-8893-A66B6D95A832}&Action=Update&Type=52&MGCP={295E...}>

Gateway : S4/DS1-1@A-3745
Device Protocol: Digital Access T1
Registration: Registered with Cisco CallManager 172.20.43.253
IP Address: 172.20.43.151

Status: Ready

Buttons: Update, Delete, Reset Gateway

Configuration Fields:

- End-Point Name*: S4/DS1-1@A-3745
- Description: S4/DS1-1@A-3745
- Device Pool*: Default
- Media Resource Group List: < None >
- Calling Search Space: < None >
- AAR Calling Search Space: < None >
- Location: < None >
- AAR Group: < None >
- MLPP Domain (e.g., "0000FF"):
- MLPP Indication*: Default
- MLPP Preemption*: Default
- Handle DTMF Precedence Signals:
- Load Information:
- Port Selection Order*: Top Down
- Digit Sending*: DTMF
- Network Locale: < None >
- SMDI Base Port*: 0

Product Specific Configuration

- Line Coding*: B8ZS
- Framing*: ESF
- Clock*: External
- Input Gain (-6..14 db)*: 0
- Output Attenuation (-6..14 db)*: 0
- Echo Cancellation Enable*: Enable
- Echo Cancellation Coverage (ms)*: Default

Configuring the Cisco C3745 Voice Router

```
A-3745# sho run
```



Building configuration...

Current configuration : 2425 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 t1 4 1

logging buffered 4096 debugging

!

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 host B9 172.20.43.253

ip audit po max-events 100



```
no ftp-server write-enable
isdn switch-type primary-4ess
voice-card 4
  dspfarm
!
!
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 172.20.43.253
ccm-manager config
!
!
controller T1 4/0
  framing esf
  linecode b8zs
  pri-group timeslots 1-2,24 service mgcp
!
controller T1 4/1
  framing esf
  linecode b8zs
  ds0-group 1 timeslots 1-12 type e&m-wink-start
!
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
!
interface Serial4/0:23
no ip address
no logging event link-status
isdn switch-type primary-dms100
isdn protocol-emulate network
isdn incoming-voice modem
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
!
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 4/0/0
!
voice-port 4/0/1
!
voice-port 4/0:23
!
voice-port 4/1:1
!
mgcp
```



```
mgcp call-agent 172.20.43.253 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000 action notify
mgcp modem passthrough voip mode nse
mgcp package-capability rtp-package
no mgcp package-capability res-package
mgcp package-capability sst-package
no mgcp package-capability fxr-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
!
dial-peer voice 999411 pots
  application mgcpapp
  port 4/1:1
!
dial-peer voice 999400 pots
  application mgcpapp
  port 4/0/0
!
dial-peer voice 999401 pots
  application mgcpapp
  port 4/0/1
!
line con 0
line aux 0
line vty 0 4
  login
```



!
end



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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

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