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# 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



**Basic MGCP Cisco Call Manager Test Configuration**

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 takes 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
```

**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

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


    CANCEL    REFRESH                      HELP        GO TO      NEXT      PREV
                                                       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-rl              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
```

**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)

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

File   Edit   View   Favorites   Tools   Help

← Back ▾ → ▾ ⊗ ⓘ ⌂ | ⓠSearch ⟨Favorites ⟨Media ⟨⟩ | ⟨⟩ ⟨⟩ ⟨⟩

Address 🔗 http://b9/CCMAdmin/routepatternconfig.asp?pkid={698615D4-2613-4161-AD6E-D480CED274EF}          ▾ ⟨⟩ Go   Links

**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* | 7.XXXX |
| Partition | < None > |
| Description | |
| Numbering Plan* | North American Numbering Plan |
| Route Filter | < None > |
| MLPP Precedence | Default |
| Gateway or Route/Hunt List* | S4/DS1-1@A-3745     (Edit) |
| Route Option | ⦿ Route this pattern |
| | ○ Block this pattern    — Not Selected — |

☑ 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 | Default |
| Calling Name Presentation | Default |

**Connected Party Transformations**

| Connected Line ID Presentation | Default |
| Connected Name Presentation | Default |

**Called Party Transformations**

| Discard Digits | PreDot 11/10D->7D |
| Called Party Transform Mask | |
| Prefix Digits (Outgoing Calls) | |

**ISDN Network-Specific Facilities Information Element**

| Carrier Identification Code | |
| Network Service Protocol | — Not Selected — |

| Network Service | Service Parameter Name | Service Parameter Value |
| — Not Selected — | < Not Exist > | |

* indicates required item.

🔗 Done                                                          🖳 Local intranet

**Cisco Unified CallManager Configuration for Cisco C3745 Voice Router**

Screenshot for Cisco Unified CallManager – Cisco C3745 Voice Router Configuration

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



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-l3 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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