

Cisco 2621 - PBX Interoperability: Lucent/Avaya Definity G3si V7 PBX with Cisco CallManager using an E1 PRI-NET5 Gateway

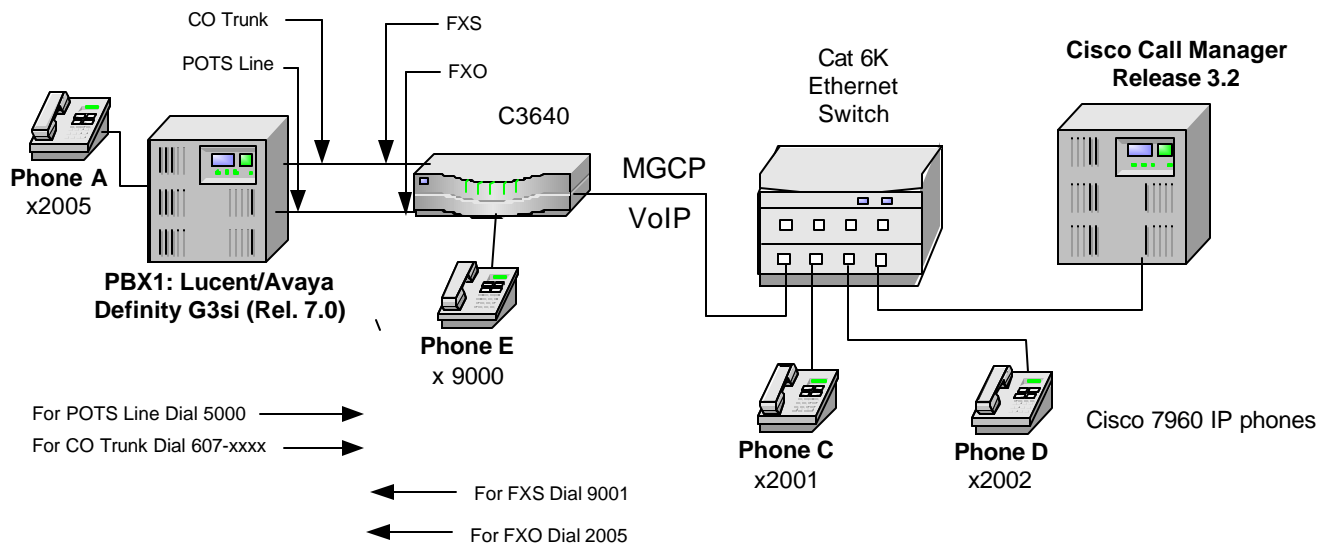
Introduction

This is an application note for connectivity of Lucent/Avaya Definity G3si Version 7 PBX with Cisco CallManager using Cisco C3640 analog FXS and FXO ports as an MGCP Gateway.

Connectivity is achieved first by using the analog FXS loop start voice port on the MGCP gateway to a loop start CO trunk port on the Lucent/Avaya PBX, then by using the analog FXO loop start voice port on the MGCP gateway to a loop start phone line (POTS) port on the Lucent/Avaya PBX.

Network Topology

Basic Call Setup End-to-End Configuration



Limitations

- FXS Ground Start Signaling type is not supported on Cisco CallManager MGCP gateway configuration GUI.
- FXS Ground Start Signaling type is not supported on a PBX POTS line.
- The FXO gateway voice port goes off-hook on the first ring of an incoming seizure before the targeted phone has answered. This disables the PBX from forwarding the incoming call on a ring-no-answer to voice-mail or other forward target.
- In the FXO port connected to the PBX analog POTS line, the MGCP FXO connection does not support Hook-Flash toward the PBX.



System Components

Hardware Requirements

- Cisco C3640 Gateway with analog FXS & FXO Ports
- Cisco Catalyst 6000 switch
- Lucent/Avaya Definity G3si Version 7 PBX.

Software Requirements

- Cisco IOS Software Release 12.2(2)XN
- PBX Software Release
- Cisco CallManager Release 3.2

Configuration

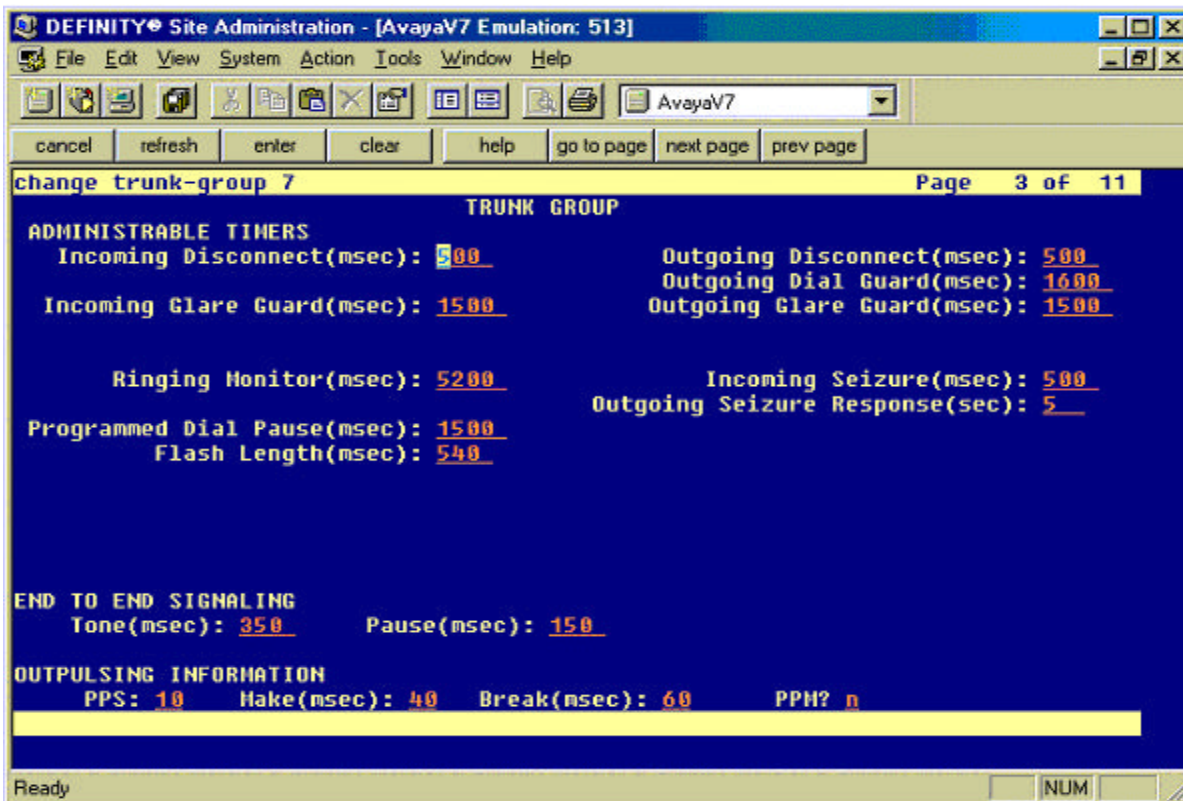
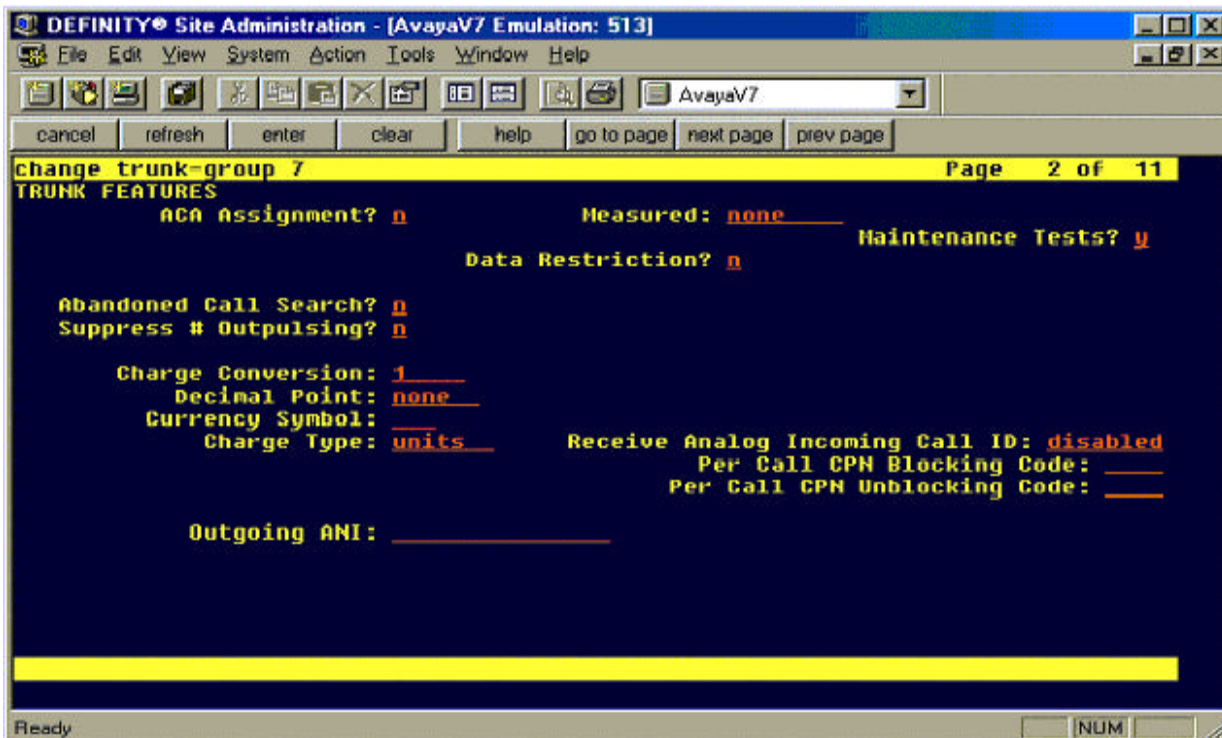
Configuring the Lucent/Avaya Definity G3si Version 7 PBX

Configure PBX in the following sequence:

- Configure the CO loop start trunk
- Configure the incoming and outgoing dial plan
- Configure the analog station

Configuring the CO Trunk

```
DEFINITY® Site Administration - [AvayaV7 Emulation: 513]
File Edit View System Action Tools Window Help
cancel refresh enter clear help go to page next page prev page
change trunk-group 7 Page 1 of 11
TRUNK GROUP
Group Number: 7 Group Type: co CDR Reports: y
Group Name: OUTSIDE CALL 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: 2005
Comm Type: voice Auth Code? n Digit Absorption List:
Prefix-1? n Trunk Flash? n Toll Restricted? n
TRUNK PARAMETERS
Trunk Type: loop-start
Outgoing Dial Type: tone Cut-Through? y
Trunk Termination: rc Disconnect Timing(msec): 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? n Cyclical Hunt? y
Answer Supervision Timeout: 10 Receive Answer Supervision? y
Ready NUM
```





DEFINITY Site Administration - [AvayaV7 Emulation: 513]

File Edit View System Action Tools Window Help

cancel refresh enter clear help go to page next page prev page

change 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:	<u>-2</u>	<u>21</u>	<u>-2</u>	<u>21</u>
	-Dev	+Dev	-Dev	+Dev
404 Hz Loss:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
2804 Hz Loss:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Maximum C Message Noise:	<u>55</u>		<u>55</u>	
Maximum C Notched Noise:	<u>74</u>		<u>74</u>	
Minimum SRL-HI:	<u>0</u>		<u>0</u>	
Minimum SRL-LO:	<u>0</u>		<u>0</u>	
Minimum ERL:	<u>0</u>		<u>0</u>	

Allow ATMS Busyout, Error Logging and Alarming? n

Ready NUM



DEFINITY Site Administration - [AvayaV7 Emulation: 513]

File Edit View System Action Tools Window Help

cancel refresh enter clear help go to page next page prev page

change 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:	1A0701	TN747	B						
2:									
3:									
4:									
5:									
6:									
7:									
8:									
9:									
10:									
11:									
12:									
13:									
14:									
15:									

Ready NUM



POTS Line Analog Phone Configuration

DEFINITY Site Administration - AvayaV7 GEDI

File Edit View System Action Tools Window Help

AvayaV7

change station 5000 send (return) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1 2 3

STATION

Extension: 5000 Lock Messages? BCC: 0
Type: 2500 Security Code: TN: 1
Port: 01A0503 Coverage Path 1: COR: 1
Name: Test Phone 3 Coverage Path 2: COS: 1
Hunt-to Station: Tests?

STATION OPTIONS

OFF Premise Station? Message Waiting Indicator:

Ready NUM

DEFINITY Site Administration - AvayaV7 GEDI

File Edit View System Action Tools Window Help

AvayaV7

change station 5000 send (return) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1 2 3

STATION

FEATURE OPTIONS

LWC Reception: msa-spe
LWC Activation?
CDR Privacy?
Redirect Notification?
Per Button Ring Control?
Bridged Call Alerting?
Switchhook Flash?
Ignore Rotary Digits?
H.320 Conversion?

Coverage Msg Retrieval?
Auto Answer: none
Data Restriction?
Call Waiting Indication?
Att. Call Waiting Indication?
Distinctive Audible Alert?
Adjunct Supervision?

Per Station CPN - Send Calling Number?
Audible Message Waiting?

MWI Served User Type:

Ready NUM



Configuring Cisco CallManager

Cisco CallManager 3.2 Administration - MGCP Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Address [-4059-A053-C8D87C97DA0F](#) Go Links

Cisco CallManager Administration

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CISCO SYSTEMS

MGCP Configuration

[Back to Find/List Gateways](#)

Product: Cisco 364X
MGCP : MGCP_3640

Status: Ready

Update Delete Reset Gateway Cancel Changes

MGCP Domain Name*

Description

Cisco CallManager Group*

Installed Voice Interface Cards		Endpoint Identifiers	
Module in Slot 0	< None >		
Module in Slot 1	NM-HDV		
	Sub-Unit 0	VVIC-2MFT-E1	(1/0) ESPP1 (1/1)
Module in Slot 2	NM-2V		
	Sub-Unit 0	VIC-2FXS	(2/0/0) POTS (2/0/1) POTS
	Sub-Unit 1	VIC-2FXO	(2/1/0) TS (2/1/1) TS
Module in Slot 3	NM-HDV		
	Sub-Unit 0	VVIC-2MFT-T1	(3/0) TSPP1 (3/1)

Product Specific Configuration

Global ISDN Switch Type

Switchback Timing*

Switchback uptime-delay (min)

Local intranet



FXS Port Configuration

The screenshot shows the Cisco CallManager Administration web interface in Microsoft Internet Explorer. The browser title is "Cisco CallManager 3.2 Administration - Gateway Configuration - Microsoft Internet Explorer". The address bar shows "53-C8D87C97DA0F}&iPort=1". The page has a navigation menu with "System", "Route Plan", "Service", "Feature", "Device", "User", "Application", and "Help". The main content area is titled "Gateway Configuration" and includes a Cisco Systems logo. On the left, there is a tree view showing "Slot 2/ Sub-Unit 0" with ports "2/0/0" (9000) and "2/0/1" (9001), and "Slot 2/ Sub-Unit 1" with ports "2/1/0" and "2/1/1". The main configuration area shows "Product : Cisco 364X", "Gateway : AALN/S2/SU0/0@MGCP_3640", "Registration: Registered with Cisco CallManager 10.1.1.2", and "IP Address: 10.1.1.230". The status is "Ready". There are buttons for "Update", "Delete", "Reset Gateway", and "Cancel Changes". Below this are sections for "Gateway Information" and "Port Information".

Gateway Configuration

[Back to MGCP Configuration](#)
[Back to Find/List Gateways](#)

Slot 2/ Sub-Unit 0
POTS 2/0/0 9000
POTS 2/0/1 9001
Slot 2/ Sub-Unit 1
LS 2/1/0
LS 2/1/1

Product : Cisco 364X
Gateway : AALN/S2/SU0/0@MGCP_3640
Registration: Registered with Cisco CallManager 10.1.1.2
IP Address: 10.1.1.230

Status: Ready

Update Delete Reset Gateway Cancel Changes

Gateway Information

Description	AALN/S2/SU0/0@MGCP_3640
Device Pool*	Default
Calling Search Space	< None >
Media Resource Group List	< None >
Network Hold Audio Source	< None >
User Hold Audio Source	< None >
Location	< None >
Network Locale	United States

Port Information

Prefix DN	
Num Digits*	4
Expected Digits*	4

Done Local intranet



FXO Port Configuration

Cisco CallManager 3.2 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address [97DA0F}&Type=18&Trunk=2](#) Go Links >>

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
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CISCO SYSTEMS

Gateway Configuration

[Back to MGCP Configuration](#)
[Back to Find/List Gateways](#)

Slot 2/ Sub-Unit 0
POTS 2/0/0 [9000](#)
POTS 2/0/1 [9001](#)
Slot 2/ Sub-Unit 1
LS 2/1/0
LS 2/1/1

Product : Cisco 364X
Gateway : AALN/S2/SU1/0@MGCP_3640
Registration: Registered with Cisco CallManager 10.1.1.2
IP Address: 10.1.1.230

Status: Ready

Gateway Information

Description	<input type="text" value="AALN/S2/SU1/0@MGCP_3640"/>
Device Pool*	<input type="text" value="Default"/>
Calling Search Space	<input type="text" value="< None >"/>
Media Resource Group List	<input type="text" value="< None >"/>
Network Hold Audio Source	<input type="text" value="< None >"/>
User Hold Audio Source	<input type="text" value="< None >"/>
Location	<input type="text" value="< None >"/>
Network Locale	<input type="text" value="United States"/>

Port Information



Route Pattern Configuration

Cisco CallManager 3.2 Administration - Route Pattern Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Address 4-47BE-8491-B0F211090F29 Go Links

Cisco CallManager Administration For Cisco IP Telephony Solutions CISCO SYSTEMS

Route Pattern Configuration

[Add a New Route Pattern](#)
[Back to Find/List Route Patterns](#)

Route Pattern: 5.XXXX
Status: Ready
Note: Any update to this route pattern automatically resets the associated gateway/route list

Copy Update Delete Cancel Changes

Pattern Definition

Route Pattern* 5.XXXX
Partition < None >
Numbering Plan* North American Numbering Pl
Route Filter < None >
Gateway/Route List* AALN/S2/SU1/0@MGCP_3640 (Edit)
Route Option Route this pattern Block this pattern
 Provide Outside Dial Tone Urgent Priority

Calling Party Transformations

Use Calling Party's External Phone Number Mask
Calling Party Transform Mask
Prefix Digits (Outgoing Calls)

Called Party Transformations

Discard Digits PreDot
Called Party Transform Mask
Prefix Digits (Outgoing Calls)

Done Local intranet



Configuring the Cisco C3640 Router

```
MGCP_3640# show running config
```

```
Building configuration...
```

```
Current configuration : 2546 bytes
```

```
version 12.2
```

```
no parser cache
```

```
no service single-slot-reload-enable
```

```
service timestamps debug uptime
```

```
service timestamps log uptime
```

```
no service password-encryption
```

```
no service dhcp
```

```
!
```

```
hostname MGCP_3640
```

```
!
```

```
logging rate-limit console 10 except errors
```

```
voice-card 1
```

```
!
```

```
voice-card 3
```

```
!
```

```
ip subnet-zero
```

```
!
```

```
no ip domain-lookup
```

```
!
```

```
no ip dhcp-client network-discovery
```

```
mgcp
```

```
mgcp call-agent 10.1.1.2 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 cisco
```



```
mgcp sdp simple
mgcp package-capability rtp-package
mgcp package-capability sst-package
no mgcp timer receive-rtcp
no mgcp explicit hookstate
isdn switch-type primary-ni
call rsvp-sync
!
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 10.1.1.2
ccm-manager config
!
controller E1 1/0
    framing NO-CRC4
    pri-group timeslots 1-31 service mgcp
!
controller E1 1/1
!
controller T1 3/0
    framing esf
    linecode b8zs
    cablelength short 133
    pri-group timeslots 1-24 service mgcp
!
controller T1 3/1
    framing sf
    linecode ami
!
interface Ethernet0/0
    ip address 10.1.1.230 255.255.255.0
```



```
half-duplex
!
interface Ethernet0/1
  no ip address
  shutdown
  half-duplex
!
interface Serial11/0:15
  no ip address
  no logging event link-status
  isdn switch-type primary-net5
  isdn protocol-emulate network
  isdn incoming-voice voice
  isdn bind-13 ccm-manager
  no cdp enable
!

interface Serial3/0:23
no ip address
  no logging event link-status
  isdn switch-type primary-dms100
  isdn incoming-voice voice
  isdn bind-13 ccm-manager
  no cdp enable
!
ip classless
no ip http server
!
snmp-server manager
!
voice-port 2/0/0
!
```



```
voice-port 2/0/1
!
voice-port 2/1/0
  timing hookflash-out 50
!
voice-port 2/1/1
  timing hookflash-out 50
!
dial-peer cor custom
!
dial-peer voice 201 pots
  application mgcpapp
  port 2/0/1
!
dial-peer voice 200 pots
  application mgcpapp
  port 2/0/0
!
dial-peer voice 210 pots
  application mgcpapp
  port 2/1/0
!
dial-peer voice 999200 pots
  application mgcpapp
port 2/0/0
!
dial-peer voice 999201 pots
  application mgcpapp
  port 2/0/1
!
dial-peer voice 999210 pots
```



```
application mgcpapp
port 2/1/0
!
dial-peer voice 999211 pots
application mgcpapp
port 2/1/1
!
line con 0
line aux 0
line vty 0 4
login
!
end
```

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