



# Cisco 2621 Gateway-PBX Interoperability: Lucent/Avaya Definity G3si with E1 PRI NET5 Signaling

This document describes the interoperability and configuration of a Cisco 2621 voice gateway with a Lucent/Avaya Definity G3si PBX using E1 PRI NET5 signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

## System Components

<b>PBX Model</b>	Lucent/Avaya Definity G3si
<b>PBX Release</b>	7.0
<b>Telephony Signaling</b>	E1 PRI
<b>Voice Gateway</b>	Cisco 2621 with 2MFT E1 Port
<b>Gateway Release</b>	Cisco IOS Release 12.2(3.5)T
<b>Call Manager Release</b>	3.1
<b>VoX Protocol</b>	H.323

## Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up command.
- Lucent/Avaya PBX Configuration
- Call Manager Configuration

## Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

### Connectivity Diagrams

Figure 1: Test Configuration

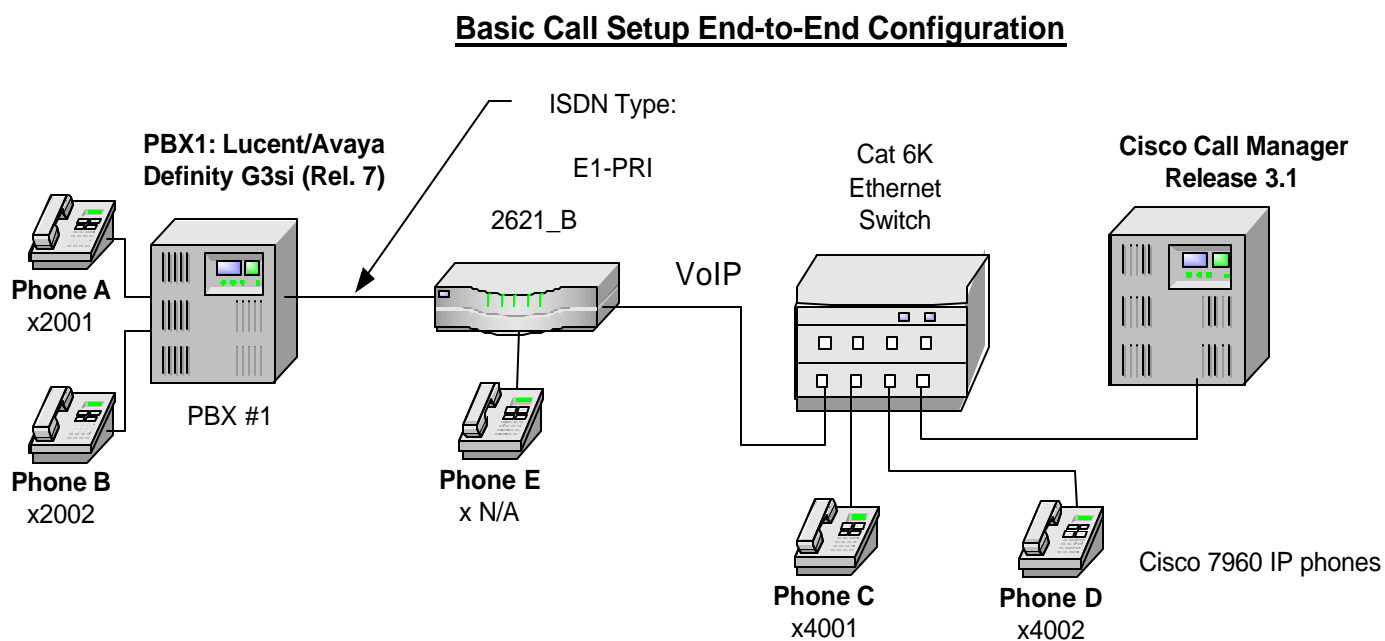


Figure 1 represents the configuration used for testing: an Lucent/Avaya Definity G3si PBX connected to a Cisco 2621 voice gateway via an E1 PRI connection.

### Set Up Notes

The Cisco 2621 Gateway with ISDN protocol type setting of **primary-net5** supports both protocol sides by using the **isdn protocol-emulate network/user** command.

The Lucent/Avaya Definity G3si PBX supports both “USER” and “NETWORK” protocol sides by using **change ds1 a12** command.

## Lucent/Avaya PBX Configuration

### Lucent/Avaya PBX Version Information

---

- Software: Version 7.0
- Hardware: TN464F, DS1 INTFC 24/32

## Lucent/Avaya PBX Sample Configuration

### DS1 CIRCUIT PACK

DEFINITY Site Administration - [Lucent Test PBX GED]

File Edit View Tools Window Help

Lucent Test PBX

change ds1 a12 send (rtn) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f6)

1

DS1 CIRCUIT PACK

Location: 01A12 Name: E1 ISDN PRI  
Bit Rate: 2.048 Line Coding: hdb3

Signaling Mode: isdn-pri  
Connect: network

Country Protocol: etsi  
Protocol Version: a  
Interface Companding: alaw CRC?: u  
Idle Code: 11111111 DCP/Analog Bearer Capability: 3.1kHz

Slip Detection? n Near-end CSU Type: other

Right-click in a field to see a list of valid entries or help text  
Ready

## Signaling Group

The screenshot shows the 'DEFINITY Site Administration - [Lucent Test PBX GEDI]' window. The main area is titled 'SIGNALING GROUP' and displays the configuration for 'Group Number: 3'. The configuration includes:

- Associated Signaling?:  (checked)
- Primary D-Channel:
- Max number of NCA TSC:
- Max number of CA TSC:
- Trunk Group for NCA TSC:
- Trunk Group for Channel Selection:
- Supplementary Service Protocol:

At the bottom of the window, there is a status bar with the text 'Right-click in a field to see a list of valid entries or help text' and 'Ready'.

## Trunk Group

DEFINITY Site Administration - [Lucent Test PBX GEDI]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (fn) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f6)

1 2 3 4 5 6 7 8 9 10

TRUNK GROUP

Group Number: 7 Group Type: **isdn** CDR Reports:

Group Name: ISDN E1 PRI COR: 1 TN: 1 TAC: 668

Direction: two-way Outgoing Display?

Dial Access?  Busy Threshold: 99 Night Service:

Queue Length: 0

Service Type: tie Auth Code?  TestCall ITC: rest

Far End Test Line No:

TestCall BCC: 4

TRUNK PARAMETERS

Codeset to Send Display: 0 Codeset to Send TCM,Lookahead: 7

Max Message Size to Send: 260 Charge Advice: none

Supplementary Service Protocol: a Digit Handling (in/out): enbloc/enbloc

Trunk Hunt: ascend

Connected to Toll?  STT Loss: normal DTT to DCO Loss: normal

Calling Number - Delete:  Insert:  Numbering Format:

Bit Rate: 1200 Synchronization: async Duplex: full

Disconnect Supervision - In?  Out?

Answer Supervision Timeout: 0

Right-click in a field to see a list of valid entries or help text

Ready

DEFINITY Site Administration - [Lucent Test PBX GEDI]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (rtn) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1 2 3 4 5 6 7 8 9 10

**TRUNK FEATURES**

ACA Assignment?  Measured:  Wideband Support?

Internal Alert?  Maintenance Tests?

Data Restriction?  NCA-TSC Trunk Member:

Send Name:  Send Calling Number:

Used for DCS?

Suppress # Outpulsing?  Numbering Format:

Outgoing Channel ID Encoding:  UUI IE Treatment:

Send Connected Number:

Send UCID?

Send Codeset 6/7 LAI IE?

Right-click in a field to see a list of valid entries or help text

Ready

DEFINITY Site Administration - [Lucent Test PBX GEDI]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (fn) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1 2 3 4 5 6 7 8 9 10

**TRUNK GROUP**  
Administered Members (min/max): 1/30  
Total Administered Members: 30

**GROUP MEMBER ASSIGNMENTS**

	Port	Code	Sfx	Name	Night	Sig Grp
1:	01A1201	TN464	F			3
2:	01A1202	TN464	F			3
3:	01A1203	TN464	F			3
4:	01A1204	TN464	F			3
5:	01A1205	TN464	F			3
6:	01A1206	TN464	F			3
7:	01A1207	TN464	F			3
8:	01A1208	TN464	F			3
9:	01A1209	TN464	F			3
10:	01A1210	TN464	F			3
11:	01A1211	TN464	F			3
12:	01A1212	TN464	F			3
13:	01A1213	TN464	F			3
14:	01A1214	TN464	F			3
15:	01A1215	TN464	F			3

Right-click in a field to see a list of valid entries or help text  
Ready

DEFINITY Site Administration - [Lucent Test PBX GEDI]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (fn) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1 2 3 4 5 6 7 8 9 10

**TRUNK GROUP**

Administered Members (min/max): 1/30  
Total Administered Members: 30

**GROUP MEMBER ASSIGNMENTS**

	Port	Code	Sfx	Name	Night	Sig Grp
16:	01A1217	TN464	F			3
17:	01A1218	TN464	F			3
18:	01A1219	TN464	F			3
19:	01A1220	TN464	F			3
20:	01A1221	TN464	F			3
21:	01A1222	TN464	F			3
22:	01A1223	TN464	F			3
23:	01A1224	TN464	F			3
24:	01A1225	TN464	F			3
25:	01A1226	TN464	F			3
26:	01A1227	TN464	F			3
27:	01A1228	TN464	F			3
28:	01A1229	TN464	F			3
29:	01A1230	TN464	F			3
30:	01A1231	TN464	F			3

Right-click in a field to see a list of valid entries or help text

Ready

## Uniform Dialing Plan

DEFINITY Site Administration - [Lucent Test PBX GEDI]

File Edit View Tools Window Help

Lucent Test PBX

change dialplan send (rn) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f6)

1

DIAL PLAN RECORD

Local Node Number:

ETA Node Number:

ETA Routing Pattern:

Uniform Dialing Plan:

UDP Extension Search Order:

FIRST DIGIT TABLE

First Digit	- 1 -	- 2 -	- 3 -	- 4 -	- 5 -	- 6 -
1:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2:	<input type="text"/>	<input type="text"/>	<input type="text"/>	extension	<input type="text"/>	<input type="text"/>
3:	<input type="text"/>	<input type="text"/>	<input type="text"/>	extension	<input type="text"/>	<input type="text"/>
4:	<input type="text"/>	<input type="text"/>	<input type="text"/>	extension	<input type="text"/>	<input type="text"/>
5:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6:	<input type="text"/>	<input type="text"/>	dac	<input type="text"/>	<input type="text"/>	<input type="text"/>
7:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8:	fac	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
9:	fac	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
0:	attd	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
*:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
#:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Right-click in a field to see a list of valid entries or help text

Ready

DEFINITY Site Administration - [Lucent Test PBX GEDI]

File Edit View Tools Window Help

Lucent Test PBX

change udp 4 send (fn) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1 2

UNIFORM DIALING PLAN  
Ext Codes: 4ddx

Ext Code: 4xxx Type: UDPCode 444

dd	Type	dd	Type	dd	Type	dd	Type	dd	Type
0x:	<input type="text"/>	1x:	<input type="text"/>	2x:	<input type="text"/>	3x:	<input type="text"/>	4x:	UDPCode 444
00:	<input type="text"/>	10:	<input type="text"/>	20:	<input type="text"/>	30:	<input type="text"/>	40:	<input type="text"/>
01:	<input type="text"/>	11:	<input type="text"/>	21:	<input type="text"/>	31:	<input type="text"/>	41:	<input type="text"/>
02:	<input type="text"/>	12:	<input type="text"/>	22:	<input type="text"/>	32:	<input type="text"/>	42:	<input type="text"/>
03:	<input type="text"/>	13:	<input type="text"/>	23:	<input type="text"/>	33:	<input type="text"/>	43:	<input type="text"/>
04:	<input type="text"/>	14:	<input type="text"/>	24:	<input type="text"/>	34:	<input type="text"/>	44:	<input type="text"/>
05:	<input type="text"/>	15:	<input type="text"/>	25:	<input type="text"/>	35:	<input type="text"/>	45:	<input type="text"/>
06:	<input type="text"/>	16:	<input type="text"/>	26:	<input type="text"/>	36:	<input type="text"/>	46:	<input type="text"/>
07:	<input type="text"/>	17:	<input type="text"/>	27:	<input type="text"/>	37:	<input type="text"/>	47:	<input type="text"/>
08:	<input type="text"/>	18:	<input type="text"/>	28:	<input type="text"/>	38:	<input type="text"/>	48:	<input type="text"/>
09:	<input type="text"/>	19:	<input type="text"/>	29:	<input type="text"/>	39:	<input type="text"/>	49:	<input type="text"/>

Right-click in a field to see a list of valid entries or help text

Ready

# Call Manager Configuration

## Call Manager Version Information



## H.323 (Cisco 2621) Gateway Configuration

The screenshot shows the Cisco CallManager Administration interface for configuring an H.323 Gateway. The page title is "Gateway Configuration" and it includes a navigation menu at the top with options: System, Route Plan, Service, Feature, Device, User, Application, and Help. The main content area displays the following configuration details:

- Product : H.323 Gateway
- Gateway : 10.1.1.129
- Device Protocol: H.225
- Registration: Unknown
- IP Address: 10.1.1.129

A status message indicates: "Status: Update completed. Reset the gateway to have the changes take affect." Below this message are four buttons: Update, Delete, Reset Gateway, and Cancel Changes.

The configuration form includes the following fields:

- Device Name\*: 10.1.1.129
- Description: Cisco 2621
- Device Pool\*: Default
- Media Resource Group List: < None >

At the bottom of the window, a taskbar shows a notification "Restart succeeded." and the system tray includes "Local intranet".

Network Hold Audio Source	< None >
User Hold Audio Source	< None >
Calling Search Space	< None >
Location	< None >
Caller ID DN	
Calling Party Selection*	Originator
Presentation Bit*	Allowed
Display IE Delivery	<input checked="" type="checkbox"/>
Gatekeeper Name	< None >
Media Termination Point Required	<input type="checkbox"/>
Num Digits*	23
Sig Digits	<input type="checkbox"/>
Prefix DN	
Run H225D On Every Node	<input checked="" type="checkbox"/>
Called party IE number type unknown*	Cisco CallManager

Restart succeeded.

Local intranet

Required	
Num Digits*	23
Sig Digits	<input type="checkbox"/>
Prefix DN	
Run H225D On Every Node	<input checked="" type="checkbox"/>
Called party IE number type unknown*	Cisco CallManager
Calling party IE number type unknown*	Cisco CallManager
Called Numbering Plan*	Cisco CallManager
Calling Numbering Plan*	Cisco CallManager
* indicates required item	
<a href="#">Back to Find/List Gateways</a>	

Restart succeeded. Local intranet

## Route Pattern Configuration

The screenshot displays the Cisco CallManager Administration web interface. At the top, there is a navigation menu with links for System, Route Plan, Service, Feature, Device, User, Application, and Help. Below the menu is a header banner with the text "Cisco CallManager Administration For Cisco IP Telephony Solutions" and the Cisco Systems logo. The main heading is "Route Pattern Configuration".

On the right side, there are two links: "Add a New Route Pattern" and "Back to Find/List Route Patterns".

The configuration details for the route pattern "6.XXXX" are as follows:

- Route Pattern:** 6.XXXX
- Status:** Ready
- Note:** Any update to this route pattern automatically resets the associated gateway/route list
- Buttons:** Copy, Update, Delete, Cancel Changes
- Pattern Definition:**
  - Route Pattern\*:** 6.XXXX
  - Partition:** < None >
  - Numbering Plan\*:** North American Numbering Plk
  - Route Filter:** < None >
  - Gateway/Route List\*:** 10.1.1.129 (Edit)
  - Route Option:**  Route this pattern  Block this pattern

The bottom of the interface shows a taskbar with a "Local intranet" icon.

Partition	< None >
Numbering Plan*	North American Numbering Pln
Route Filter	< None >
Gateway/Route List*	10.1.1.129 (Edit)
Route Option	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern
<input checked="" type="checkbox"/> Provide Outside Dial Tone	<input type="checkbox"/> Urgent Priority
<b>Calling Party Transformations</b>	
<input type="checkbox"/> Use Calling Party's External Phone Number Mask	
Calling Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
<b>Called Party Transformations</b>	
Discard Digits	PreDot
Called Party Transform Mask	<input type="text"/>
Prefix Digits (Outgoing Calls)	<input type="text"/>
* indicates required item.	

## Cisco 2621 Gateway Configuration

The following is the configuration of the Cisco 2621 voice gateway connected to the Lucent/Avaya Definity G3si PBX E1 PRI interface.

### Cisco 2621 Voice Gateway Version Information

```

2621_B#sh version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-JS-M), Version 12.2(3.5)T, MAINTENANCE INTERIM S
SOFTWARE
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 03-Aug-01 22:45 by ccai
Image text-base: 0x80008088, data-base: 0x81631DD8

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)

2621_B uptime is 4 minutes
System returned to ROM by power-on
System image file is "flash:c2600-js-mz.122-3.5.T"

cisco 2621 (MPC860) processor (revision 0x200) with 56320K/9216K bytes of memory
.
Processor board ID JAD051516TX (503811939)
M860 processor: part number 0, mask 49

```

Channelized E1, Version 1.0.  
Bridging software.  
X.25 software, Version 3.0.0.  
SuperLAT software (copyright 1990 by Meridian Technology Corp).  
TN3270 Emulation software.  
Primary Rate ISDN software, Version 1.1.  
2 FastEthernet/IEEE 802.3 interface(s)  
31 Serial network interface(s)  
2 Channelized E1/PRI port(s)  
32K bytes of non-volatile configuration memory.  
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102

---

## Cisco 2621 Voice Gateway Sample Configuration

---

```
2621_B#sh configuration
Using 1785 out of 29688 bytes
!
version 12.2
no parser cache
service timestamps debug datetime msec localtime show-timezone
service timestamps log uptime
no service password-encryption
!
hostname 2621_B
!
no logging buffered
enable password cisco
!
!
!
memory-size iomem 15
voice-card 1
  dspfarm
!
ip subnet-zero
!
!
no ip domain-lookup
!
isdn switch-type primary-net5
!
!
voice class codec 1
  codec preference 1 g729r8
  codec preference 2 g711ulaw
  codec preference 3 g711alaw
!
!
!
!
!
!
controller E1 1/0
  pri-group timeslots 1-31
!
controller E1 1/1
  shutdown
!
!
!
!
interface FastEthernet0/0
  ip address 192.168.100.2 255.255.255.0
  no ip mroute-cache
```

---

```
load-interval 30
no keepalive
speed auto
half-duplex
!
interface FastEthernet0/1
ip address 10.1.1.129 255.255.255.0
no ip mroute-cache
duplex auto
speed auto
!
interface Serial1/0:15
no ip address
no logging event link-status
isdn switch-type primary-net5
isdn protocol-emulate network
isdn incoming-voice voice
isdn T321 40000
isdn T203 30000
isdn bchan-number-order ascending
no cdp enable
!
router rip
network 1.0.0.0
network 192.168.100.0
!
ip classless
no ip http server
ip pim bidir-enable
!
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
!
!
snmp-server packetsize 4096
snmp-server manager
tftp-server nvram
call rsvp-sync
!
voice-port 1/0:15
!
!
mgcp profile default
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
destination-pattern 2...
direct-inward-dial
port 1/0:15
prefix 2
!
dial-peer voice 3 voip
destination-pattern 4...
progress_ind setup enable 1
voice-class codec 1
session target ipv4:10.1.1.2
dtmf-relay h245-alphanumeric
!
!
line con 0
exec-timeout 0 0
line aux 0
exec-timeout 0 0
line vty 0 4
```

---

```
exec-timeout 0 0
password cisco
login
line vty 5 15
exec-timeout 0 0
login
!
scheduler allocate 3996 1000
!
end
```

---

## Caveats

- When calling from Lucent/Avaya digital phone to Cisco 7960 IP phone, IP phone displays Connected Name and Number after the call is answered. Lucent/Avaya phone however does NOT get updated when the call is answered. It displays the numbers being dialed instead (e.g. Access Code + extension number). It was verified using ISDN protocol analyzer that the CallManager was not sending "Connected Name" or "Connected Number" information in the connect message back to PBX.
- When calling from Cisco 7960 IP phone to Lucent/Avaya digital phone, Lucent/Avaya phone displays Calling Name and Number after the call is answered as expected. Cisco 7960 phone however only displays "Called Number" but no "Connected Name" even though Lucent/Avaya PBX was sending both "Connected Name" and "Connected Number" IE information in the "CONNECT" message back to 2621 Gateway.