



Cisco 2621 Gateway-PBX Interoperability: Lucent/Avaya Definity G3si with T1 PRI Signaling

This document describes the interoperability and configuration of a Cisco 2621 voice gateway with a Lucent/Avaya Definity G3si PBX using T1 PRI signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

PBX Model	Lucent/Avaya Definity G3si
PBX Release	7.0
Telephony Signaling	T1 PRI
Voice Gateway	Cisco 2621 with 2MFT T1 Port
Gateway Release	Cisco IOS Release 12.2(3.5)T
Call Manager Release	3.1
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- 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

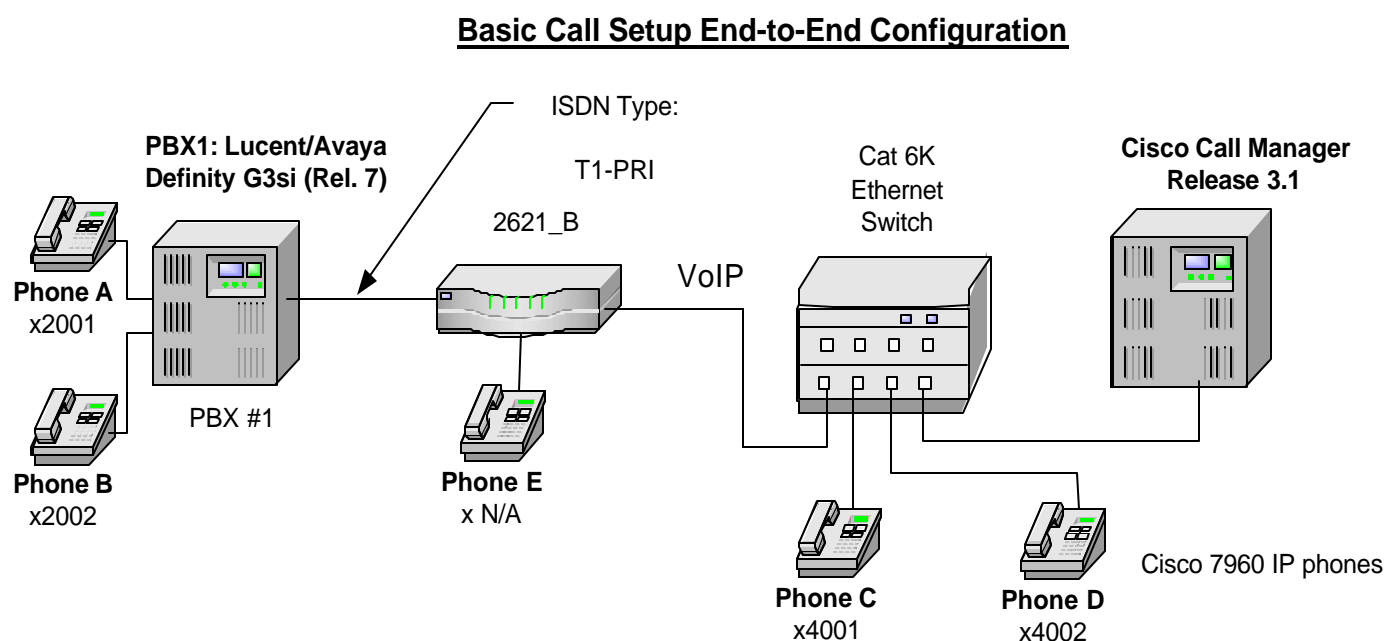


Figure 1 represents the configuration used for testing: an Lucent/Avaya Definity G3si PBX connected to a Cisco 2621 voice gateway via an T1 PRI connection.

Set Up Notes

The Cisco 2621 Gateway with ISDN protocol type setting of **primary-ni** 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 2

DS1 CIRCUIT PACK

Location:	01A12	Name:	ISDN PRI
Bit Rate:	1.544	Line Coding:	b8zs
Line Compensation:	1	Framing Mode:	esf
Signaling Mode:	isdn-pri		
Connect:	line-side		
		Country Protocol:	1
Interface Companding:	mulaw	Protocol Version:	a
Idle Code:	11111111	CRC?	n
		DCP/Analog Bearer Capability:	3.1kHz
Slip Detection?	n	Near-end CSU Type:	other
		Alarm When PRI Endpoint Detached?	y

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

Ready

The screenshot shows a web-based interface for "DEFINITY Site Administration - [Lucent Test PBX GED]". The interface includes a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with icons for file operations. Below the toolbar is a navigation bar with a dropdown menu set to "Lucent Test PBX" and several buttons: "change ds1 a12", "send (rtn)", "help (f5)", "cancel (esc)", "enter (f3)", "schedule (f9)", "next (f7)", and "previous (f6)".

The main content area is titled "DS1 CIRCUIT PACK" and contains a section for "ESF DATA LINK OPTIONS". The options are as follows:

- Network Management Protocol: tabs
- Send ANSI-T1.403 One-Second Performance Reports? n
- Far-end CSU Address: b

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

Signaling Group

The screenshot shows the DEFINTY Site Administration window for [Lucent Test PBX GED]. The window has a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with icons for file operations and navigation. Below the toolbar is a status bar with the text "change signaling-group 3" and several function keys: send (rtt), help (f5), cancel (esc), enter (f3), schedule (f9), next (f7), and previous (f6).

The main area is titled "SIGNALING GROUP" and displays the configuration for Group Number 3. The fields are as follows:

- Group Number: 3
- Associated Signaling?: ☐
- Primary D-Channel: 01A1224
- Max number of NCA TSC: 0
- Max number of CA TSC: 0
- Trunk Group for NCA TSC: ☐
- Trunk Group for Channel Selection: 7
- Supplementary Service Protocol: a

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 GEDII]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (rtm) 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: y

Group Name: ISDN T1 PRI COR: 1 TN: 1 TAC: 668

Direction: two-way Outgoing Display? y

Dial Access? y Busy Threshold: 99 Night Service:

Queue Length: 0

Service Type: tie Auth Code? n 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? n STT Loss: normal DTT to DCO Loss: normal

Calling Number - Delete: Insert: Numbering Format:

Bit Rate: 1200 Synchronization: async Duplex: full

Disconnect Supervision - In? y Out? y

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 GED1]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (ftr) 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 GED]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (f11) 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): 1/23

GROUP MEMBER ASSIGNMENTS Total Administered Members: 23

	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 GED]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (f11) 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): 1/23

GROUP MEMBER ASSIGNMENTS Total Administered Members: 23

	Port	Code	Sfx	Name	Night	Sig Grp
16:	01A1216	TN464	F			3
17:	01A1217	TN464	F			3
18:	01A1218	TN464	F			3
19:	01A1219	TN464	F			3
20:	01A1220	TN464	F			3
21:	01A1221	TN464	F			3
22:	01A1222	TN464	F			3
23:	01A1223	TN464	F			3
24:						
25:						
26:						
27:						
28:						
29:						
30:						

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 (rtt) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f6)

1

DIAL PLAN RECORD

Local Node Number: 1

ETA Node Number:

ETA Routing Pattern:

Uniform Dialing Plan: 4-digit

UDP Extension Search Order: udp-table-first

FIRST DIGIT TABLE

First

Length

Digit	- 1 -	- 2 -	- 3 -	- 4 -	- 5 -	- 6 -
1:						
2:				extension		
3:				extension		
4:				extension		
5:						
6:			dac			
7:						
8:	fac					
9:	fac					
0:	attd					
*:						
#:						

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

Ready

DEFINITY Site Administration - [Lucent Test PBX GED]

File Edit View Tools Window Help

Lucent Test PBX

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

1 2

UNIFORM DIALING PLAN
Ext Codes: 4ddx

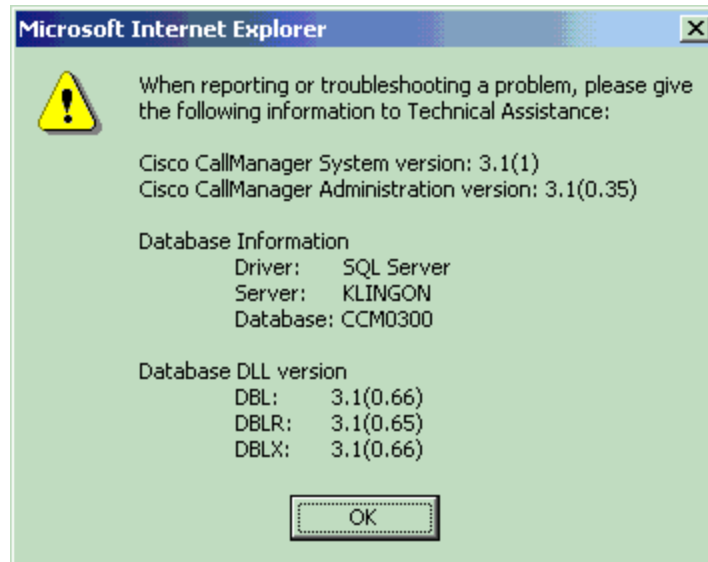
Ext Code: 4xxx Type: UDPCode 444

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

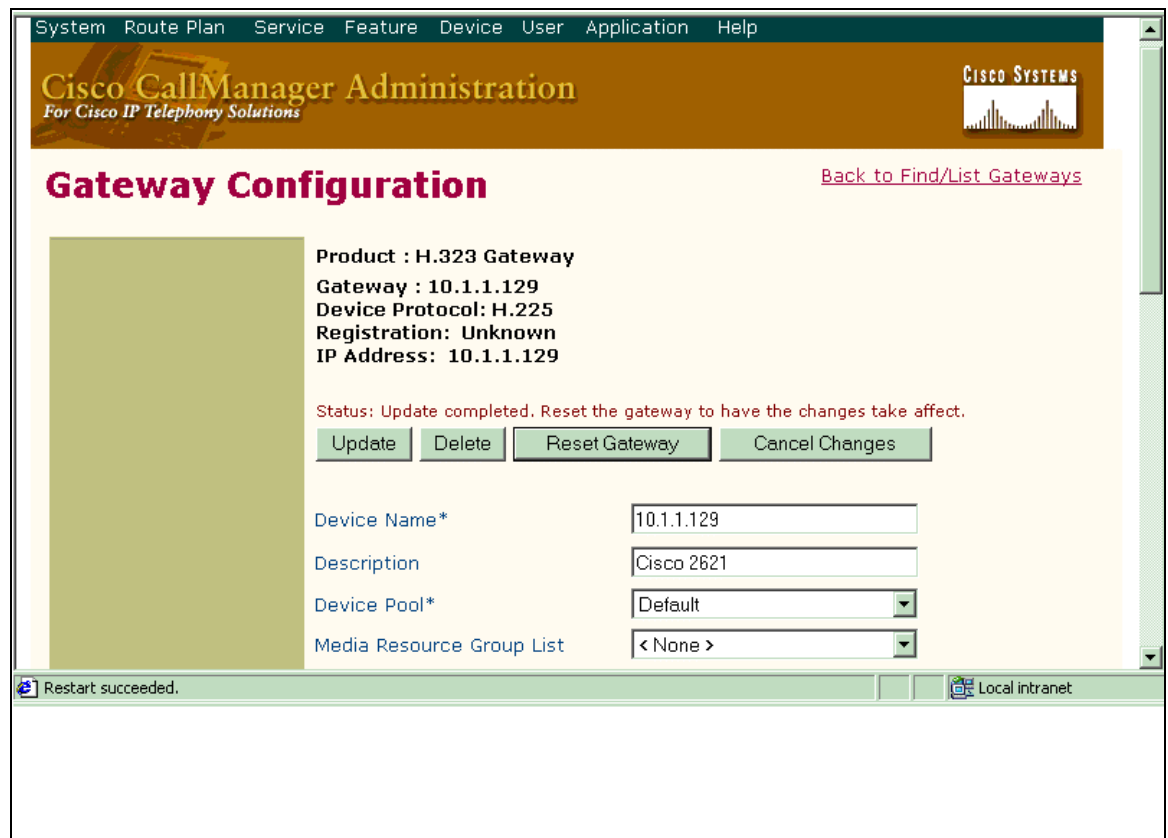
Right-click in a field to see a list of valid entries or help text
Ready

Call Manager Configuration

Call Manager Version Information



H.323 (Cisco 2621) Gateway Configuration



System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

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

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


Status: Update completed. Reset the gateway to have the changes take affect.


Device Name*

Description

Device Pool*

Media Resource Group List

 Restart succeeded.

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

Restart succeeded.

Local intranet

Route Pattern Configuration

The screenshot displays the Cisco CallManager Administration web interface. At the top, a navigation bar includes links for System, Route Plan, Service, Feature, Device, User, Application, and Help. The main header area features the Cisco CallManager Administration logo and the Cisco Systems logo. The page title 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

The **Pattern Definition** section includes the following fields:

- Route Pattern*:** 6.XXXX
- Partition:** < None >
- Numbering Plan*:** North American Numbering Plan
- 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 status bar with a "Local intranet" icon.

Partition	< None >
Numbering Plan*	North American Numbering Plan
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
Calling Party Transformations	
<input type="checkbox"/> 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)	
* indicates required item.	

Local intranet

Cisco 2621 Gateway Configuration

The following is the configuration of the Cisco 2621 voice gateway connected to the Lucent/Avaya Definity G3si PBX T1 PRI interface.

Cisco 2621 Voice Gateway Version Information

```
2621_B#sh ver
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-JS-M), Version 12.2(3.5)T,  MAINTENANCE INTERIM S
FTWARE
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 1 week, 4 days, 3 hours, 15 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
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)
24 Serial network interface(s)
2 Channelized T1/PRI port(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102

2621_B#

Cisco 2621 Voice Gateway Sample Configuration

```
2621_B#sh configuration
Using 1824 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-ni
!
!
voice class codec 1
    codec preference 1 g729r8
    codec preference 2 g711ulaw
    codec preference 3 g711alaw
!
!
!
!
!
!
controller T1 1/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24
!
controller T1 1/1
    shutdown
    framing esf
    linecode b8zs
!
!
!
!
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 Serial1/0:23
no ip address
no logging event link-status
isdn switch-type primary-ni
isdn incoming-voice voice
isdn T309-enable
isdn T306 30000
isdn T310 40000
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 1/0:23
!
!
mgcp profile default
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
destination-pattern 2...
direct-inward-dial
port 1/0:23
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 the Cisco 2621 router is set to emulate Network side, the Lucent/Avaya PBX must send at least 10 digits for the router to properly route the call. Since the PBX is configured for 4 digit dialing, calls were tested in one direction only, from Cisco 7960 IP phone to Lucent/Avaya digital phone.
- 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.
- 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 did not display “Called Name” or “Called Number”, it displays trunk name instead. 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.