



# Lucent/Avaya Definity G3si V9 PBX with CallManager using the Cisco 2621-T1 PRI NI-2 Gateway

**This application note discusses the integration of the Lucent/Avaya Definity G3si V9 PBX with CallManager using the Cisco 2621-T1 PRI NI-2 Gateway.**

## Integration Description

Connectivity is achieved by using the industry standard PRI NI-2 protocol. The Lucent/Avaya Definity G3si can be configured as either the NETWORK or USER side. The figure below shows the general network layout for the integration.

### Network Layout

## Features

Key features supported:

- Calling/Called Number
- Calling Name

Key features not supported:

- Connected Name
- Connected Number

## Cisco Systems Equipment Needed

- Hardware (Cisco 2621 Gateway): 2MFT T1 Port
- Software: CallManager Release 3.1

## PBX Requirements

- Hardware: TN464F, DS1 INTFC 24/32.
- Software: Version V9



## Configuring the Lucent/Avaya Definity G3si PBX

To configure the Lucent/Avaya Definity G3si PBX, do the following:

- Step 1.** Add the new circuit pack.
- Step 2.** Add the new signaling group.
- Step 3.** Add the new trunk group.
- Step 4.** Add the Uniform Dialing Plan.

### Circuit Pack

The following figures show the configuration of the DS1 circuit pack.

#### DS1 Circuit Pack

The screenshot shows the 'DEFINITY Site Administration - [Lucent Test PBX GED]' window. The main area displays the configuration for a 'DS1 CIRCUIT PACK'. The configuration parameters are as follows:

Location:	01A12	Name:	ISDN PRI
Bit Rate:	1.544	Line Coding:	b8zs
Line Compensation:	1	Framing Mode:	esf
Signaling Mode:	isdn-pri		
Connect:	network		
CentreU Long Timers?	n	Country Protocol:	1
Interworking Message:	PROGress	Protocol Version:	a
Interface Companding:	mulaw	CRC?	n
Idle Code:	11111111	DCP/Analog Bearer Capability:	3.1kHz
Slip Detection?	n	Near-end CSU Type:	other

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'. The window title bar includes 'DEFINITY Site Administration - [Lucent Test PBX GED]' and standard menu options: File, Edit, View, Tools, Window, Help. The toolbar contains icons for file operations and a dropdown menu set to 'Lucent Test PBX'. The status bar at the bottom right of the window contains the number '76812'.



## DS1 Circuit Pack—ESF Data Link Options

The screenshot shows a web-based configuration interface for a DS1 circuit pack. The window title is "DEFINITY Site Administration - [Lucent Test PBX GEDI]". The interface includes a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with various icons. Below the toolbar is a navigation bar with buttons for "send (f)", "help (h)", "cancel (esc)", "enter (t)", "schedule (s)", "next (n)", and "previous (p)". The main content area is titled "DS1 CIRCUIT PACK" and contains the following options:

ESF DATA LINK OPTIONS

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". A small number "76813" is visible in the bottom right corner of the window frame.



## Signaling Group

The following figure shows the configuration of the signaling group.

### Signaling Group

The screenshot shows the DEFINITY Site Administration interface for a Lucent Test PBX GED. The window title is "DEFINITY Site Administration - [Lucent Test PBX GED]". The menu bar includes File, Edit, View, Tools, Window, and Help. The toolbar contains icons for file operations and a dropdown menu showing "Lucent Test PBX". Below the toolbar is a navigation bar with buttons for "change signaling-group 3", "send (fn)", "help (F5)", "cancel (esc)", "enter (F3)", "schedule (F9)", "next (F7)", and "previous (F6)".

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

Group Number:	3	Associated Signaling?	U	Max number of NCA TSC:	0
Primary D-Channel:	01A1224	Max number of CA TSC:	0	Trunk Group for NCA TSC:	
Trunk Group for Channel Selection:	14				
Supplementary Service Protocol:	a				

At the bottom left 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". The window ID "76814" is visible in the bottom right corner.



## Trunk Group

The following figures show the configuration of the trunk group.

### Trunk Group

The screenshot displays the configuration for Trunk Group 14 in the DEFINITY Site Administration application. The interface includes a menu bar (File, Edit, View, Tools, Window, Help), a toolbar, and a command line. The main configuration area is titled "TRUNK GROUP" and contains the following fields:

- Group Number: 14
- Group Name: ISDN T1 PRI
- Group Type: **iedn**
- CDR Reports:
- Direction: two-way
- Outgoing Display?:
- Dial Access?:
- Busy Threshold: 99
- Night Service:
- Queue Length: 8
- Service Type: tie
- Auth Code?: n
- TestCall ITC: rest
- TestCall BCC: 4
- Far End Test Line No:
- TRUNK PARAMETERS
  - Codeset to Send Display: 0
  - Codeset to Send National IEs: 7
  - Max Message Size to Send: 260
  - Charge Advice: none
  - Supplementary Service Protocol: a
  - Digit Handling (in/out): enbloc/enbloc
  - Trunk Hunt: ascend
- Calling Number - Delete:  Insert:
- Digital Loss Group: 13
- Bit Rate: 1200
- Synchronization: async
- Numbering Format:
- Duplex: full
- Disconnect Supervision - In?:  Out?:
- Answer Supervision Timeout: 0

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". A vertical label "768115" is visible on the right side of the window.



### Trunk Group—Trunk Features

DEFINITY Site Administration - [Lucent Test PBX GED]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 14 send (7) help (F5) cancel (esc) enter (T3) schedule (T3) next (T7) previous (T8)

1 2 3 4 5 6 7 8 9 10

TRUNK FEATURES

ACA Assignment?  Measured: none Wideband Support?   
Internal Alert?  Maintenance Tests?   
Data Restriction?  NCA-TSC Trunk Member: 1  
Send Name: y Send Calling Number: y

Used for DCS?   
Suppress # Outpulsing?  Numbering Format: public  
Outgoing Channel ID Encoding: preferred UII IE Treatment: service-provider

Replace Restricted Numbers?   
Replace Unavailable Numbers?   
Send Connected Number: u

Send UCID?   
Send Codeset 6/7 LAI IE?  Dsl Echo Cancellation?   
US NI Delayed Calling Name Update?

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

7:68:16



### Trunk Group—Group Member Assignments

DEFINITY Site Administration - [Lucent Test PBX GEDJ]

File Edit View Tools Window Help

Lucent Test PBX

Change trunk-group 14 send (n) help (h) cancel (esc) enter (t) schedule (s) next (r) previous (l)

1 2 3 4 5 6 7 8 9 10

**TRUNK GROUP**  
Administered Members (min/max): 1/23  
Total Administered Members: 23

**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

7/88/17



Trunk Group—Group Member Assignments Continued

DEFINITY Site Administration - [Lucent Test PBX GED]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 14 send (F5) help (F5) cancel (esc) enter (T3) schedule (T9) next (F7) previous (F6)

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

7 68 18





## Uniform Dialing Plan

The following figures show the configuration of the uniform dialing plan.

### Dial Plan Record

The screenshot shows the 'DEFINITY Site Administration - [Lucent Test PBX GED]' window. The 'DIAL PLAN RECORD' section is active, displaying the following configuration:

- Local Node Number: 2
- ETA Node Number: [ ]
- ETA Routing Pattern: [ ]
- Uniform Dialing Plan: 4-digit
- UDP Extension Search Order: udp-table-first

The 'FIRST DIGIT TABLE' is displayed below, showing a grid of digits (1-0, \*, #) and their corresponding lengths (1-6). The table is as follows:

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

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'. The window title bar includes 'DEFINITY Site Administration - [Lucent Test PBX GED]' and standard menu options (File, Edit, View, Tools, Window, Help). The toolbar contains various icons and a dropdown menu set to 'Lucent Test PBX'. The bottom right corner of the window shows the number '76819'.



### Uniform Dialing Plan

DEFINITY Site Administration - [Lucent Test PBX GEDJ]

File Edit View Tools Window Help

Lucent Test PBX

change udp 2 send (F4) help (F5) cancel (esc) enter (F3) schedule (F3) next (F7) previous (F8)

1 2

UNIFORM DIALING PLAN  
Ext Codes: 2ddx

Ext Code: 2xxx Type: UDPCode 222

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:	<input type="text"/>
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

7.688.20



## Configuring Cisco CallManager

To configure Cisco CallManager, do the following:

- Step 1.** Configure the gateway.
- Step 2.** Configure the route pattern.

### Gateway Configuration

The following figures show the configuration of the Cisco 2621 H.323 Gateway.

Cisco 2621 H.323 Gateway Configuration

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration  
For Cisco IP Telephony Solutions

CISCO SYSTEMS

### 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.

Update Delete Reset Gateway Cancel Changes

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

Restart succeeded. Local intranet 76821

Cisco 2621 H.323 Gateway Configuration Continued

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   
Gatekeeper Name < None >  
Media Termination Point Required   
Num Digits\* 23  
Sig Digits   
Prefix DN  
Run H225D On Every Node   
Called party IE number type unknown\* Cisco CallManager

Restart succeeded. Local intranet 76822



### Cisco 2621 H.323 Gateway Configuration Continued

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 76823

### Route Pattern Configuration

The following figures show the configuration of the route pattern.

#### Route Pattern Configuration

System Route Plan Service Feature Device User Application Help

**Cisco CallManager Administration**  
For Cisco IP Telephony Solutions

**Route Pattern Configuration**

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

**Route Pattern: 6.XXXX**  
Status: Ready  
Note: Any update to this route pattern automatically resets the associated gateway/route list

**Pattern Definition**

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	<input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern

Local intranet 76824



## Route Pattern Configuration Continued

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  
 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):

\* indicates required item.

## Considerations

### User/Network Settings

The Cisco 2621 router with an ISDN switch type setting of primary-ni supports both protocol sides using the **isdn protocol-emulate network/user** command. When the router is set to emulate the Network side and the Lucent/Avaya is set to emulate the User side, the Lucent/Avaya PBX must send at least 10 digits for the router to properly route the call. Otherwise, the Cisco 2621 router sends back a release message containing a release cause of “Invalid Number Format.”

### Calling Name and Number Feature

When calling from a Cisco 7960 IP phone to a Lucent/Avaya digital phone, the Lucent/Avaya phone displays the Calling Name and Number after the call is answered as expected. The Cisco 7960 phone, however, displays only the Called Number but not the Connected Name, even though Lucent/Avaya PBX is sending both the Connected Name and the Connected Number IE information in the CONNECT message back to the Cisco 2621 Gateway.

When calling from a Lucent/Avaya digital phone to a Cisco 7960 IP phone, the IP phone displays the Connected Name and Number after the call is answered. The Lucent/Avaya phone, however, does not display the Called Name or Called Number. It displays the trunk name instead. It was verified using an ISDN protocol analyzer that the CallManager was not sending Connected Name or Connected Number information in the connect message back to PBX.

### Integration Testing

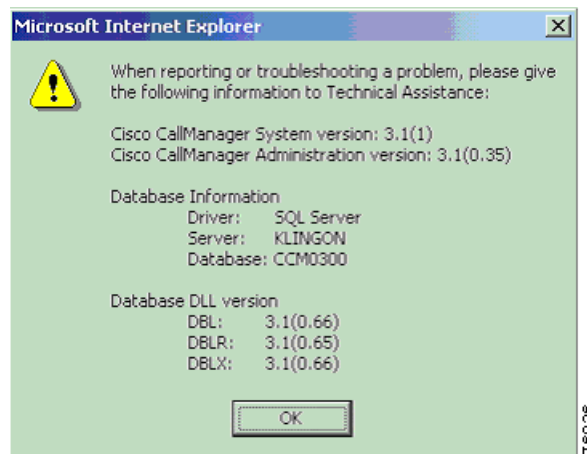
This section contains information about the setup used in testing the integration of the Lucent/Avaya Definity G3si and the Cisco 2621-T1 PRI NI-2 Gateway.



## CallManager Software Release

The following figure shows the information about the release of CallManager being used.

### CallManager Software Release



## Lucent/Avaya Definity G3si Software Release

The following release of the Lucent/Avaya Definity G3si was used:

- System: G3siV6
- Software Version: G3V9i.02.0.033.2

## Cisco 2621 Router Configuration

The following shows the configuration of the Cisco 2621 router.

```
2621_B#show version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-JS-M), Version 12.2(3.5)T, MAINTENANCE INTERIM 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 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#show diag

Slot 0:

C2621 2FE Mainboard Port adapter, 2 ports  
Port adapter is analyzed  
Port adapter insertion time unknown  
EEPROM contents at hardware discovery:  
Hardware Revision : 2.0  
PCB Serial Number : JAD051516TX (503811939)  
Part Number : 73-3200-08  
RMA History : 00  
RMA Number : 0-0-0-0  
Board Revision : A0  
Deviation Number : 0-21249  
EEPROM format version 4  
EEPROM contents (hex):  
0x00: 04 FF 40 00 A2 41 02 00 C1 17 4A 41 44 30 35 31  
0x10: 35 31 36 54 58 20 28 35 30 33 38 31 31 39 33 39  
0x20: 29 82 49 0C 80 08 04 00 81 00 00 00 00 42 41 30  
0x30: 80 00 00 53 01 FF FF FF FF FF FF FF FF FF FF  
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

Slot 1:

High Density Voice Port adapter  
Port adapter is analyzed  
Port adapter insertion time unknown  
EEPROM contents at hardware discovery:  
Hardware Revision : 1.1  
Top Assy. Part Number : 800-03567-01  
Board Revision : F1  
Deviation Number : 0-0  
Fab Version : 02  
PCB Serial Number : JAB05080LU9  
RMA Test History : 00  
RMA Number : 0-0-0-0  
RMA History : 00  
EEPROM format version 4  
EEPROM contents (hex):  
0x00: 04 FF 40 00 CC 41 01 01 C0 46 03 20 00 0D EF 01  
0x10: 42 46 31 80 00 00 00 00 02 02 C1 8B 4A 41 42 30  
0x20: 35 30 38 30 4C 55 39 03 00 81 00 00 00 04 00  
0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF



```
VIC Slot 0:
  T1 (2 Port) Multi-Flex Trunk (Drop&Insert) WAN Daughter Card
  Hardware revision 1.0          Board revision B0
  Serial number 17759676        Part number 800-04614-01
  Test history 0x0              RMA number 00-00-00
  Connector type PCI
  EEPROM format version 1
  EEPROM contents (hex):
    0x20: 01 24 01 00 01 0E FD BC 50 12 06 01 00 00 00 00
    0x30: 58 00 00 00 00 01 15 00 FF FF FF FF FF FF FF FF

  HDV firmware: Compiled Fri 23-Mar-01 00:20 by miriyala
  HDV memory size 524280 heap free 175065
```

```
2621_B#
```

---

```
2621_B#show controllers t1 1/0
```

```
T1 1/0 is up.
  Applique type is Channelized T1
  Cablelength is long gain36 0db
  No alarms detected.
  alarm-trigger is not set
  Version info Firmware: 20010710, FPGA: 15
  Framing is ESF, Line Code is B8ZS, Clock Source is Line.
  Data in current interval (184 seconds elapsed):
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

```
2621_B#
```

---

```
2621_B#show 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 4...
 direct-inward-dial
 port 1/0:23
 prefix 4
!
dial-peer voice 3 voip
 destination-pattern 2...
 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

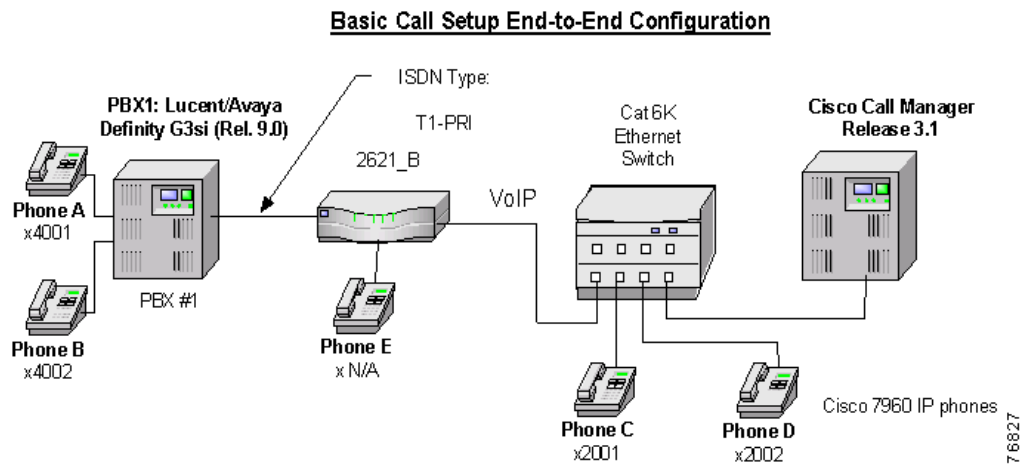
2621_B#
```



## Test Configuration

The following figure represents the various configurations used for testing.

### Testbed Network Configuration



As shown in the figure above, a Lucent/Avaya Definity G3si PBX was connected via an ISDN T1 PRI link to a Cisco 2621 Gateway, which in turn, was connected to an Ethernet switch. The interoperability testing involved Layers 1, 2 and 3 on the ISDN PRI link between a Cisco 2621 and the PBX.

#### Layer 1 (Physical Layer)

The Lucent/Avaya Definity G3si PBX configuration screen for the DS1 trunk interface is reached using the **change ds1 a12** command, which sets the T1 physical layer parameters.

#### Layers 2 & 3 (Q.921 and Q.931)

Layer 2 and 3 packet exchanges were monitored using an Acacia Clarinet protocol analyzer, bridged across the PRI link in high impedance mode.

Layer 2 Q.921 packets were monitored to ensure that each PBX/2621 software configuration properly exchanged SABME/UA packets to initialize the ISDN link, and then RR packets were exchanged every 30 seconds.

Layer 3 Q.931 packets were monitored to ensure that the appropriate call setup/teardown packets were exchanged for each configuration, and that the SETUP packets contained the mandatory Information Elements with the necessary details, as well as optional IEs such as Calling Name and Number.

Telephone calls were made end-to-end in both directions through the Cisco 2621 Gateway, and a check was made to ensure that there was an audio path in both directions for each call.

#### User/Network Settings

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 the **change ds1 a12** command.



## Test Results

Testing was performed by Test Engineer(s): Samir Batio, October 2, 2001

### Test 1

In test 1:

- The PBX1 country-protocol is set to 1a (US / AT&T TR 41449/41459) to emulate the Network.
- The Cisco 2621 Gateway is configured as a PRI NI2 to emulate the User.

The results are shown in the following tables.

**Table 1** Basic Calls (Enbloc Sending)

Calls Made	Call Comp?	Calling Number passed to final destination?	Calling Name passed to final destination?	Called Number passed to original side?	Called Name passed to the original side?
Phone A to Phone C	Yes	Yes	Yes	No <sup>1</sup>	No <sup>1</sup>
Phone C to Phone A	Yes	Yes	Yes	Yes	No

1. CallManager is not sending the Connected Name or the Connected Number information in the connect message back to PBX.

**Table 2** Call Transfers (Supervised Local Transfers)

Calls Made	Call Comp?	Original Calling Number displayed on final dest phone?	Original Calling Name displayed on final dest phone?	Called Number display on original phone updated after transfer?	Called Name display on original phone updated after transfer?
Phone C to Phone A Xfr to Phone B	Yes	Yes	Yes	No	No
Phone A to Phone C Xfr to Phone D	Yes	Yes	Yes	No	No

**Table 3** Call Conferencing (Local)

Calls Made	Call Comp?	Calling Number passed to the remaining conferee when the conferencing phone drops out?	Calling Name passed to the remaining conferee when the conferencing phone drops out?	Connected Number updated on original caller phone display when a conferee drops out?	Connected Name updated on original caller phone display when a conferee drops out?
Phone C to Phone A, Phone A conf Phone B	Yes	(A Drops out) Yes	(A Drops out) Yes	(A Drops out) No	(A Drops out) No



**Table 3** Call Conferencing (Local)

Calls Made	Call Comp?	Calling Number passed to the remaining conferee when the conferencing phone drops out?	Calling Name passed to the remaining conferee when the conferencing phone drops out?	Connected Number updated on original caller phone display when a conferee drops out?	Connected Name updated on original caller phone display when a conferee drops out?
Phone C to Phone A, Phone C conf Phone D	Yes	(C Drops out) No	(C Drops out) No	(D Drops out) No	(D Drops out) No
Phone A to Phone C, Phone C conf Phone D	Yes	(C Drops out) No	(C Drops out) No	(C Drops out) No	(C Drops out) No
Phone A to Phone C, Phone A conf Phone B	Yes	(A Drops out) No	(A Drops out) No	(B Drops out) No	(B Drops out) Yes

**Table 4** Call Forward (Local)

Calls Made	Call Comp?	Original Calling Number passed to final dest?	Original Calling Name passed to final dest?	Forwarding Called Number passed to final dest?	Forwarding Called Name passed to final dest	Final destination Connected Number updated at original side?	Final destination Connected Name updated at original side?
Phone C to Phone A fwd to Phone B	Yes	No	Yes	No	Yes	No	No
Phone A to Phone C fwd to Phone D	Yes	Yes	Yes	No	No	No	No

**Test 2**

In test 2:

- The PBX1 country-protocol is set to 1a (US / AT&T TR 41449/41459) to emulate the User.
- The Cisco 2621 Gateway is configured as a PRI NI2 to emulate the Network.

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. The test results are identical to those in Test 1.

