

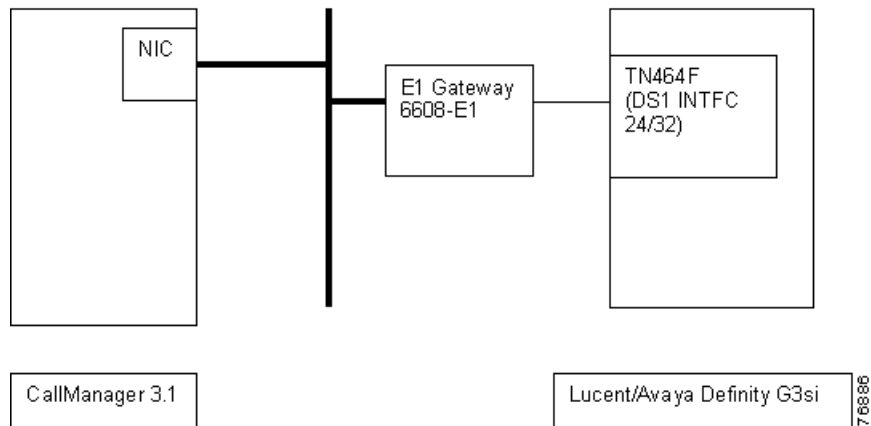
Lucent/Avaya Definity G3si V9 PBX with CallManager using the Cisco 6608-E1 PRI EURO Gateway

This application note discusses the integration of the Lucent/Avaya Definity G3si V9 PBX with CallManager using the Cisco 6608-T1 PRI EURO Gateway.

Integration Description

Connectivity is achieved by using the ETSI standard PRI 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 (Gateway): Cisco 6608 E1 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 GE01]' window. The main area is titled 'DS1 CIRCUIT PACK' and contains the following configuration fields:

| | | | |
|-----------------------|----------|-------------------------------|-------------|
| Location: | 81A12 | Name: | E1 ISDN PRI |
| Bit Rate: | 2.048 | Line Coding: | hdb3 |
| Signaling Mode: | isdn-pri | | |
| Connect: | network | | |
| CentreUu Long Timers? | n | Country Protocol: | etsi |
| Interworking Message: | PROGress | Protocol Version: | a |
| Interface Companding: | slaw | CRC? | y |
| 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 following figure shows the configuration of the signaling group.

Signaling Group

The screenshot shows the 'DEFINITY Site Administration - (Lucent Test PBX GED)' window. The 'SIGNALING GROUP' configuration page is displayed, showing the following fields:

- Group Number: 3
- Associated Signaling?: 1
- Primary D-Channel: 81A1216
- Trunk Group for Channel Selection: 14
- Supplementary Service Protocol: a
- Max number of NCA TSC: 0
- Max number of CA TSC: 0
- Trunk Group for NCA TSC: (empty)

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'.



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 tool. The window title is "DEFINITY Site Administration - [Lucent Test PBX GED]". The configuration fields are as follows:

- Group Number: 14
- Group Name: ISDN E1 PRI
- Group Type: isdn
- CDR Reports:
- COR: 1
- TN: 1
- TAC: 669
- Direction: two-way
- Outgoing Display?
- Dial Access?
- Busy Threshold: 99
- Night Service:
- Queue Length: 0
- Service Type: tie
- Auth Code? n
- TestCall ITC: rest
- Far End Test Line No:
- TestCall BCC:
- TRUNK PARAMETERS
 - Codeset to Send Display: 8
 - Codeset to Send National IEs: 7
 - Max Message Size to Send: 268
 - Charge Advice: none
 - Supplementary Service Protocol: c
 - Digit Handling (in/out): enbloc/enbloc
- Trunk Hunt: ascend
- Digital Loss Group: 13
- Calling Number - Delete: Insert: Numbering Format:
- Bit Rate: 1280
- 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



Trunk Group—Trunk Features

DEFINITY Site Administration - (Lucent Test PBX GED)

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 14 | help (F5) | cancel (esc) | enter (F3) | schedule (F5) | next (F7) | previous (F9)

1 2 3 4 5 6 7 8 9 10

TRUNK FEATURES

| | | |
|---|--|---|
| ACA Assignment? <input type="checkbox"/> | Measured: none | Wideband Support? <input type="checkbox"/> |
| | Internal Alert? <input type="checkbox"/> | Maintenance Tests? <input type="checkbox"/> |
| | Data Restriction? <input type="checkbox"/> | NCA-TSC Trunk Member: <input type="checkbox"/> |
| | Send Name: <input type="checkbox"/> | Send Calling Number: <input type="checkbox"/> |
| Used for DCS? <input type="checkbox"/> | Numbering Format: public | |
| Suppress # Outpulsing? <input type="checkbox"/> | Outgoing Channel ID Encoding: preferred | UI IE Treatment: service-provider |
| | | Replace Restricted Numbers? <input type="checkbox"/> |
| | | Replace Unavailable Numbers? <input type="checkbox"/> |
| | | Send Connected Number: <input type="checkbox"/> |
| Send UCID? <input type="checkbox"/> | | |
| Send Codeset 6/7 LAI IE? <input type="checkbox"/> | | Ds1 Echo Cancellation? <input type="checkbox"/> |

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

Ready



Trunk Group—Group Member Assignments

DEFINITY Site Administration - (Lucent Test PBX GEO)

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 14 | help (F5) | cancel (esc) | enter (F3) | schedule (F6) | 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



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 help (F5) cancel (ESC) enter (F3) schedule (F5) next (F7) previous (F3)

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

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

Dial Plan Record

The screenshot shows the 'DEFINTY Site Administration - Lucent Test PBX GEDI' 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 as follows:

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

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 GED)

File Edit View Tools Window Help

Lucent Test PBX

Save as: help (F5) cancel (esc) enter (F3) schedule (F8) next (F7) previous (F9)

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



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 6608 Gateway.

Cisco 6608 Gateway Configuration

The screenshot shows the Cisco CallManager Administration interface for Gateway Configuration. The page title is "Gateway Configuration" with a link "Back to Find/List Gateways". The configuration details are as follows:

| | |
|-----------------|---|
| Product | Cisco Catalyst 6000 E1 VoIP Gateway |
| Gateway | S0/DS1-0@SDA0001C9D8633E |
| Device Protocol | Digital Access PRI |
| Registration | Registered with Cisco CallManager KLINGON |
| IP Address | 10.1.1.104 |

Status: Ready

Buttons: Update, Delete, Reset Gateway, Cancel Changes

Fields:

| | |
|---------------------------|-----------------|
| MAC Address* | 0001C9D8633E |
| Description | SDA0001C9D8633E |
| Device Pool* | Default |
| Media Resource Group List | <None> |

Cisco 6608 Gateway Configuration Continued

The screenshot shows the continuation of the Gateway Configuration page. The configuration details are as follows:

| | |
|---|-------------------------------------|
| Network Hold Audio Source | <None> |
| User Hold Audio Source | <None> |
| Calling Search Space | <None> |
| Location | <None> |
| Load Information | |
| Channel Selection Order* | Top Down |
| PCM Type* | µ-law |
| Protocol Side* | Network |
| Caller ID DN | |
| Calling Party Selection* | Originator |
| Channel IE Type* | Use Number when 1B |
| Interface Identifier Present** | <input type="checkbox"/> |
| Interface Identifier Value** | 0 |
| Display IE Delivery | <input checked="" type="checkbox"/> |
| Redirecting Number IE Delivery | <input checked="" type="checkbox"/> |
| Delay for first restart (1/8 sec ticks) | 32 |



Cisco 6608 Gateway Configuration Continued

| | |
|--|-------------------------------------|
| Delay between restarts (1/8 sec ticks) | 4 |
| Num Digits* | 23 |
| Sig Digits | <input checked="" type="checkbox"/> |
| Prefix DN | |
| Presentation Bit* | Allowed |
| 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 |
| PRI Protocol Type* | PRI NI2 |
| Inhibit restarts at PRI initialization | <input checked="" type="checkbox"/> |
| Enable status poll | <input type="checkbox"/> |
| Number of digits to strip* | 0 |
| Country Code* | North America |
| Setup non-ISDN Progress Indicator IE Enable*** | <input type="checkbox"/> |

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Cisco 6608 Gateway Configuration Continued

| | |
|--|-------------|
| Product Specific Configuration | |
| Clock Reference* | Network |
| Framing* | CRC4 |
| Audio Signal Adjustment into IP Network* | NoDbPadding |
| Audio Signal Adjustment from IP Network* | NoDbPadding |
| Zero Suppression* | HDB3 |

* Indicates required item
** applicable to DMS-100 protocol only
*** may be required to force ringback from some PBXs

[Back to Find/List Gateways](#)

Local intranet



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

Cisco Systems

Route Pattern Configuration

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

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

Pattern Definition

| | |
|---------------------|--|
| Route Pattern* | 6XXXX |
| Partition | < None > |
| Numbering Plan* | North American Numbering Plan |
| Route Filter | < None > |
| Gateway/Route List* | S0/DST-0@SDA0001C9D8633E (Edit) |
| Route Option | <input checked="" type="radio"/> Route this pattern <input type="radio"/> Block this pattern |

Local intranet

Route Pattern Configuration Continued

| | |
|---|--|
| Partition | < None > |
| Numbering Plan* | North American Numbering Plan |
| Route Filter | < None > |
| Gateway/Route List* | S0/DST-0@SDA0001C9D8633E (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

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Called Party Transformations

Discard Digits

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

* indicates required item.

Local intranet



Considerations

Calling Name and Number Feature

When calling from a Cisco 7960 IP phone to a Lucent/Avaya digital phone, Calling Name and Number are displayed on both phones after the call is answered. The Cisco 7960 phone, however, displays only the Called Number even though Lucent/Avaya sends both the Connected Name and Connected Number in the CONNECT message.

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 the Called Number. It was verified using an ISDN protocol analyzer that the CallManager was not sending the Connected Name or Connected Number information in the connect message back to PBX.

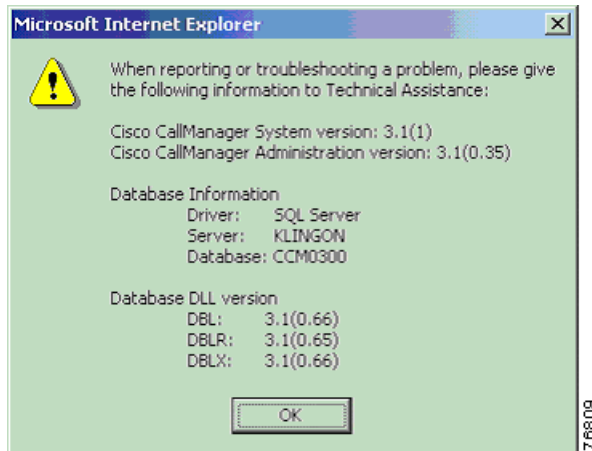
Integration Testing

This section contains information about the setup used in testing the integration of the Lucent/Avaya Definity G3si and the Cisco 6608-E1 PRI EURO 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



Catalyst 6000 Switch Configuration

The following shows the configuration of the Catalyst 6000 Switch.

```
Console> (enable) show version
```

```
WS-C6006 Software, Version NmpSW: 5.5(6a)  
Copyright (c) 1995-2001 by Cisco Systems  
NMP S/W compiled on Feb 23 2001, 10:23:18
```

```
System Bootstrap Version: 5.3(1)
```

```
Hardware Version: 2.0 Model: WS-C6006 Serial #: TBA04511172
```

```
Mod Port Model Serial # Versions  
-----  
1 2 WS-X6K-SUP1A-2GE SAD05010NBK Hw : 7.0  
Fw : 5.3(1)  
Fw1: 5.4(2)  
Sw : 5.5(6a)  
Sw1: 5.5(6a)  
3 48 WS-F6K-PFC SAD05020221 Hw : 1.1  
WS-X6348-RJ-45 SAD04420N7B Hw : 1.4  
Fw : 5.4(2)  
Sw : 5.5(6a)  
4 24 WS-F6K-VPWR Hw : 1.0  
WS-X6624-FXS SAD050203M8 Hw : 3.0  
Fw : 5.4(2)  
Sw : 5.5(6a)  
HP : A00203010010; DSP : A003E031 (3.3.  
32)  
5 8 WS-X6608-T1 SAD04400EM0 Hw : 1.1  
Fw : 5.4(2)  
Sw : 5.5(6a)  
HP1: D00403010017; DSP1: D005E031 (3.3.  
32)  
HP2: D00403010017; DSP2: D005E031 (3.3.  
32)  
HP3: D00403010017; DSP3: D005E031 (3.3.  
32)  
HP4: D00403010017; DSP4: D005E031 (3.3.  
32)  
HP5: D00403010017; DSP5: D005E031 (3.3.  
32)  
HP6: D00403010017; DSP6: D005E031 (3.3.  
32)  
HP7: D00403010017; DSP7: D005E031 (3.3.  
32)  
HP8: D00403010017; DSP8: D005E031 (3.3.  
32)  
6 8 WS-X6608-E1 SAD04380DW1 Hw : 1.1  
Fw : 5.4(2)  
Sw : 5.5(6a)  
HP1: D00403010017; DSP1: D005E031 (3.3.  
32)  
HP2: D00403010017; DSP2: D005E031 (3.3.  
32)  
HP3: D00403010017; DSP3: D005E031 (3.3.
```



```

32) HP4: D00403010017; DSP4: D005E031 (3.3.
32) HP5: D00403010017; DSP5: D005E031 (3.3.
32) HP6: D00403010017; DSP6: D005E031 (3.3.
32) HP7: D00403010017; DSP7: D005E031 (3.3.
32) HP8: D00403010017; DSP8: D005E031 (3.3.

```

| Module | DRAM | | | FLASH | | | NVRAM | | |
|--------|--------|--------|--------|--------|--------|-------|-------|------|------|
| | Total | Used | Free | Total | Used | Free | Total | Used | Free |
| 1 | 65408K | 37781K | 27627K | 16384K | 11546K | 4838K | 512K | 198K | 314K |

Uptime is 105 days, 5 hours, 12 minutes

Console> (enable) **show module**

| Mod | Slot | Ports | Module-Type | Model | Sub | Status |
|-----|------|-------|-----------------------|------------------|-----|--------|
| 1 | 1 | 2 | 1000BaseX Supervisor | WS-X6K-SUP1A-2GE | yes | ok |
| 3 | 3 | 48 | 10/100BaseTX Ethernet | WS-X6348-RJ-45 | yes | ok |
| 4 | 4 | 24 | FXS | WS-X6624-FXS | no | ok |
| 5 | 5 | 8 | T1 | WS-X6608-T1 | no | ok |
| 6 | 6 | 8 | E1 | WS-X6608-E1 | no | ok |

| Mod | Module-Name | Serial-Num |
|-----|-------------|-------------|
| 1 | | SAD05010NBK |
| 3 | | SAD04420N7B |
| 4 | | SAD050203M8 |
| 5 | | SAD04400EM0 |
| 6 | | SAD04380DW1 |

| Mod | MAC-Address(es) | Hw | Fw | Sw |
|-----|--|-----|--------|---------|
| 1 | 00-04-c0-f8-42-02 to 00-04-c0-f8-42-03 00-04-c0-f8-42-00 to 00-04-c0-f8-42-01 00-04-9b-f0-78-00 to 00-04-9b-f0-7b-ff | 7.0 | 5.3(1) | 5.5(6a) |
| 3 | 00-02-fc-20-5e-50 to 00-02-fc-20-5e-7f | 1.4 | 5.4(2) | 5.5(6a) |
| 4 | 00-03-32-ba-2e-35 | 3.0 | 5.4(2) | 5.5(6a) |
| 5 | 00-01-c9-d9-3a-98 to 00-01-c9-d9-3a-9f | 1.1 | 5.4(2) | 5.5(6a) |
| 6 | 00-01-c9-d8-63-3e to 00-01-c9-d8-63-45 | 1.1 | 5.4(2) | 5.5(6a) |

| Mod | Sub-Type | Sub-Model | Sub-Serial | Sub-Hw |
|-----|---------------------|-------------|-------------|--------|
| 1 | L3 Switching Engine | WS-F6K-PFC | SAD05020221 | 1.1 |
| 3 | Inline Power Module | WS-F6K-VPWR | | 1.0 |

Console> (enable)

Console> (enable) sh port 6

| Port | Name | Status | Vlan | Duplex | Speed | Type |
|------|------|-----------|------|--------|-------|------|
| 6/1 | | connected | 1 | full | 2.048 | E1 |



| | | | | | |
|-----|------------|---|------|-------|----|
| 6/2 | notconnect | 1 | full | 2.048 | E1 |
| 6/3 | notconnect | 1 | full | 2.048 | E1 |
| 6/4 | notconnect | 1 | full | 2.048 | E1 |
| 6/5 | notconnect | 1 | full | 2.048 | E1 |
| 6/6 | notconnect | 1 | full | 2.048 | E1 |
| 6/7 | notconnect | 1 | full | 2.048 | E1 |
| 6/8 | notconnect | 1 | full | 2.048 | E1 |

| Port | DHCP | MAC-Address | IP-Address | Subnet-Mask |
|------|--------|-------------------|------------|---------------|
| 6/1 | enable | 00-01-c9-d8-63-3e | 10.1.1.104 | 255.255.255.0 |
| 6/2 | enable | 00-01-c9-d8-63-3f | 10.1.1.118 | 255.255.255.0 |
| 6/3 | enable | 00-01-c9-d8-63-40 | 10.1.1.123 | 255.255.255.0 |
| 6/4 | enable | 00-01-c9-d8-63-41 | 10.1.1.117 | 255.255.255.0 |
| 6/5 | enable | 00-01-c9-d8-63-42 | 10.1.1.120 | 255.255.255.0 |
| 6/6 | enable | 00-01-c9-d8-63-43 | 10.1.1.121 | 255.255.255.0 |
| 6/7 | enable | 00-01-c9-d8-63-44 | 10.1.1.122 | 255.255.255.0 |
| 6/8 | enable | 00-01-c9-d8-63-45 | 10.1.1.124 | 255.255.255.0 |

| Port | Call-Manager(s) | DHCP-Server | TFTP-Server | Gateway |
|------|-----------------|-------------|-------------|----------|
| 6/1 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |
| 6/2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |
| 6/3 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |
| 6/4 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |
| 6/5 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |
| 6/6 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |
| 6/7 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |
| 6/8 | 10.1.1.2 | 10.1.1.2 | 10.1.1.2 | 10.1.1.7 |

| Port | DNS-Server(s) | Domain |
|------|---------------|--------|
| 6/1 | - | - |
| 6/2 | - | - |
| 6/3 | - | - |
| 6/4 | - | - |
| 6/5 | - | - |
| 6/6 | - | - |
| 6/7 | - | - |
| 6/8 | - | - |

| Port | CallManagerState | DSP-Type |
|------|------------------|----------|
| 6/1 | registered | C549 |
| 6/2 | registered | C549 |
| 6/3 | registered | C549 |
| 6/4 | registered | C549 |
| 6/5 | registered | C549 |
| 6/6 | registered | C549 |
| 6/7 | registered | C549 |
| 6/8 | registered | C549 |

| Port | NoiseRegen | NonLinearProcessing |
|------|------------|---------------------|
| 6/1 | enabled | enabled |
| 6/2 | enabled | enabled |
| 6/3 | enabled | enabled |



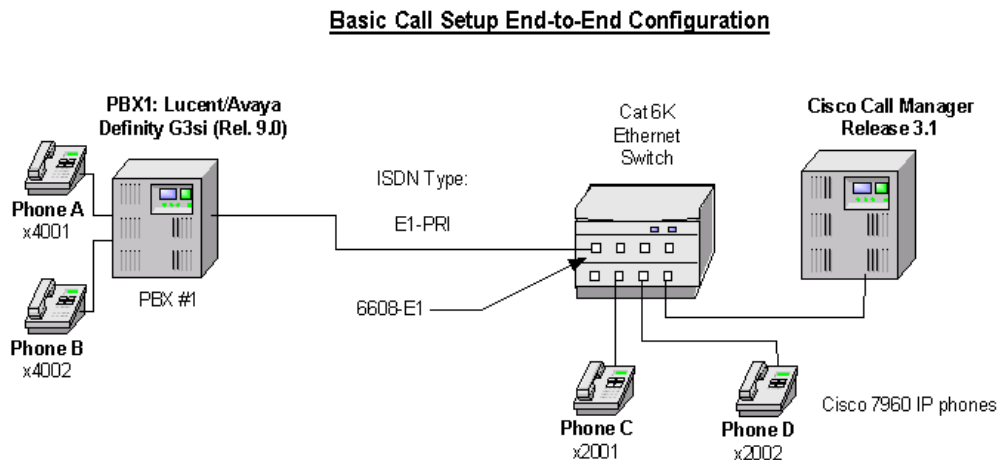
```
6/4 enabled enabled
6/5 enabled enabled
6/6 enabled enabled
6/7 enabled enabled
6/8 enabled enabled
Console> (enable)
```



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 E1 PRI link to a Cisco 6608-E1 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 6608-E1 and the PBX.

Layer 1 (Physical Layer)

The Lucent/Avaya Definity G3si PBX configuration screen for the E1 trunk interface is reached using the **change ds1 a12** command, which sets the E1 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/6608-E1 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 6608-E1 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 6608-E1 Gateway with ISDN protocol type setting of PRI-EURO supports both protocol sides by selecting “Network/User” in the protocol side field when configuring the Gateway via CallManager.

The Lucent/Avaya Definity G3si PBX supports both “USER” and “NETWORK” protocol sides.



Test Results

Testing was performed by Test Engineer(s): Samir Batio, October 3, 2001

Test 1

In test 1:

- The PBX1 country-protocol is set to ETSI to emulate the Network.
- The Cisco 6608-E1 Gateway was configured as a PRI EURO 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 ¹ | No ¹ |
| Phone C to Phone A | Yes | Yes | Yes | Yes | No |

1. CallManager is not sending "Connected Name" or "Connected Number" information in the connect message back to the 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) Yes | (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 | Yes | Yes | No | Yes | No | No |
| Phone A to Phone C fwd to Phone D | Yes | Yes | Yes | No | No | No | Yes |

Test 2

In test 2:

- The PBX1 country-protocol is set to ETSI to emulate the User.
- The Cisco 6608-E1 Gateway is configured as a PRI EURO to emulate the Network.

The test results are identical to those in Test 1.