



Cisco 3600 Series Gateway-PBX Interoperability: Lucent Definity G3 with T1 PRI Signaling

This document describes the interoperability and configuration of a Cisco 3600 series voice gateway with a Lucent Definity G3 PBX using T1 PRI signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

PBX Model	Lucent Definity G3
PBX Release	G3V7i.01.0.343.7
Telephony Signaling	T1 PRI
Voice Gateway	Cisco 3660
Gateway Release	Cisco IOS™ 12.2.2T
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Lucent PBX Configuration
- Cisco 3660 Gateway Configuration

Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

Connectivity Diagrams

Figure 1: Test Configuration

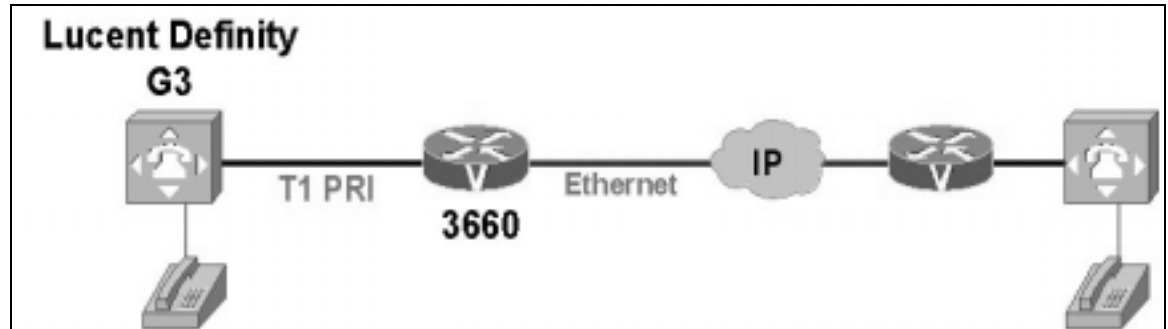


Figure 1 represents the configuration used for testing: a Lucent Definity G3 PBX connected to a Cisco 3660 voice gateway via a T1 PRI connection.

PRI switch types tested include:

- primary-5ess
 - Lucent Country/Protocol Setting: 1a
 - Lucent Country/Protocol Definition: US / AT&T TR 41449/41459
- primary-ni
 - Lucent Country/Protocol Setting: 1b
 - Lucent Country/Protocol Definition: US / Bellcore TR 1268; NIUF.302; ANSI T1.607
- primary-dms100
 - Lucent Country/Protocol Setting: 1c
 - Lucent Country/Protocol Definition: US / Nortel DMS-250BCS36/IEC01
- primary-ntt
 - Lucent Country/Protocol Setting: 3
 - Lucent Country/Protocol Definition: Japan NTT INS-NET

Support for Calling Name and Number using Codeset 0 or 7 is summarized in Table 1.

Table 1: Calling Name and Calling Number Support

Lucent : Country/Protocol Setting	Lucent: Country/Protocol Definition	3660 ISDN switch-type	Calling Name Passed	Calling Number Passed
1a	US / AT&T TR 41449/41459 (also known as 5ESS Custom?)	Primary-5ess	Yes	Yes
1b	US / Bellcore TR 1268; NIUF.302; ANSI T1.607 (also known as National ISDN?)	Primary-ni	Yes	Yes
1c	US / Nortel DMS-250 BCS36/IEC01	Primary-dms100	No	Yes
3	Japan NTT INS-NET	Primary-ntt	Yes	Yes

Set Up Notes

- Lucent Definity G3 has no provision to receive clock on the T1 interface; it always wants to provide clock on the interface. Therefore, the Cisco 3660 T1 interface must be set to “line clock” to work with it.
- Lucent Definity G3 uses the same TN464F DS1 INTFC 24/32 card for both T1 and E1 trunking. To select T1 functionality, some database entries are made in the Lucent trunk configuration screen, and there are two DIP switches on the card itself:
 - 24CH/30CH – Set to 24CH for T1, 30CH for E1
 - 120Ω/75Ω -- Set to 120Ω to use with a twisted pair E1 circuit; if set to 75Ω to use with a coaxial wire E1 circuit, must use an external adapter provided by Lucent. Not applicable for the T1 setting – leave at 120Ω.

Lucent PBX Configuration

Lucent PBX Version Information

- G3V7i.01.0.343.7

Lucent PBX Sample Configuration

See the following figures for sample PBX configuration:

- Figure 2: Optional Features
- Figure 3: DS1 Circuit Pack
- Figure 4: DS1 Circuit Pack II
- Figure 5: ISDN Numbering
- Figure 6: Trunk Group
- Figure 7: Trunk Features
- Figure 8: Trunk Group II
- Figure 9: Signaling Group


 **Note:** The only setup screens shown are those containing features specifically needed to bring up an ISDN PRI T1 trunk.

Figure 2: Optional Features

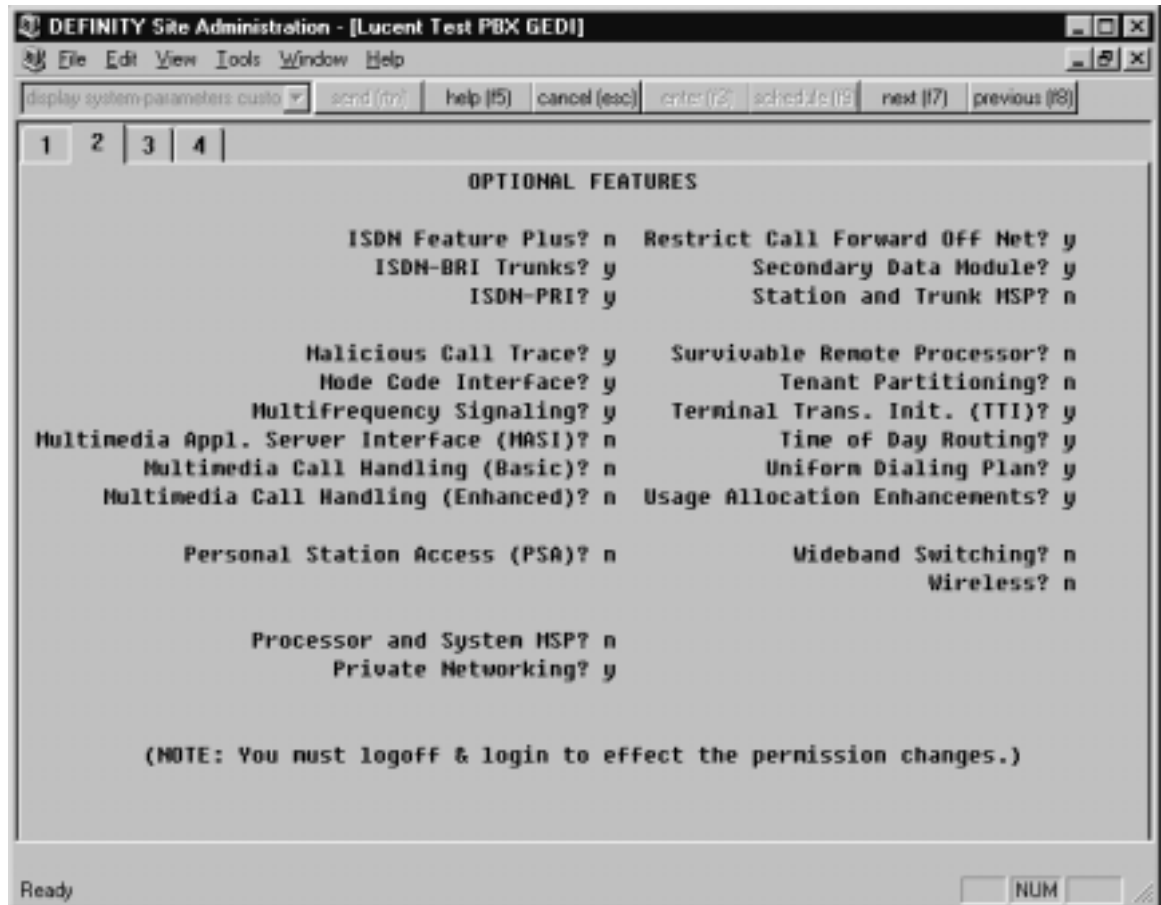


Figure 3: DS1 Circuit Pack

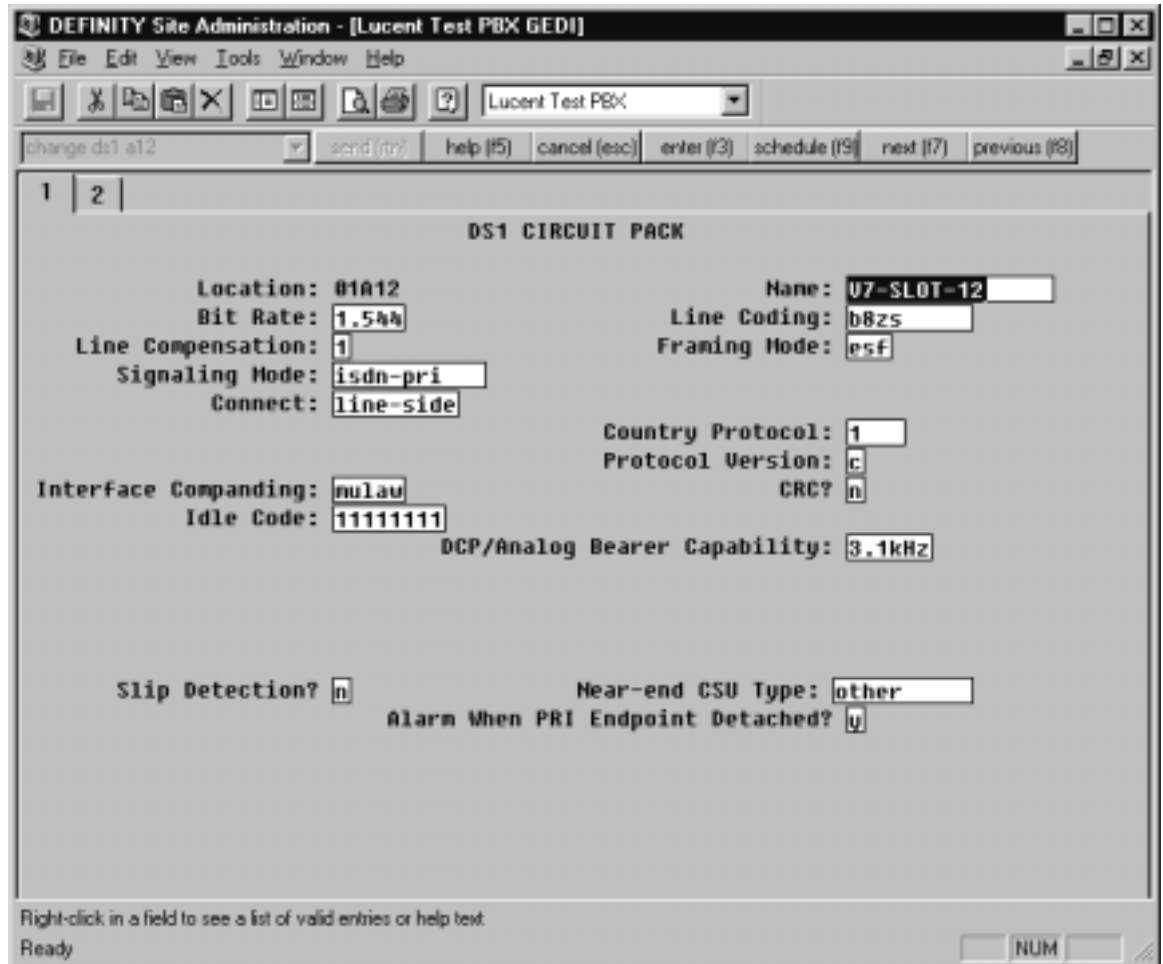


Figure 4: DS1 Circuit Pack II

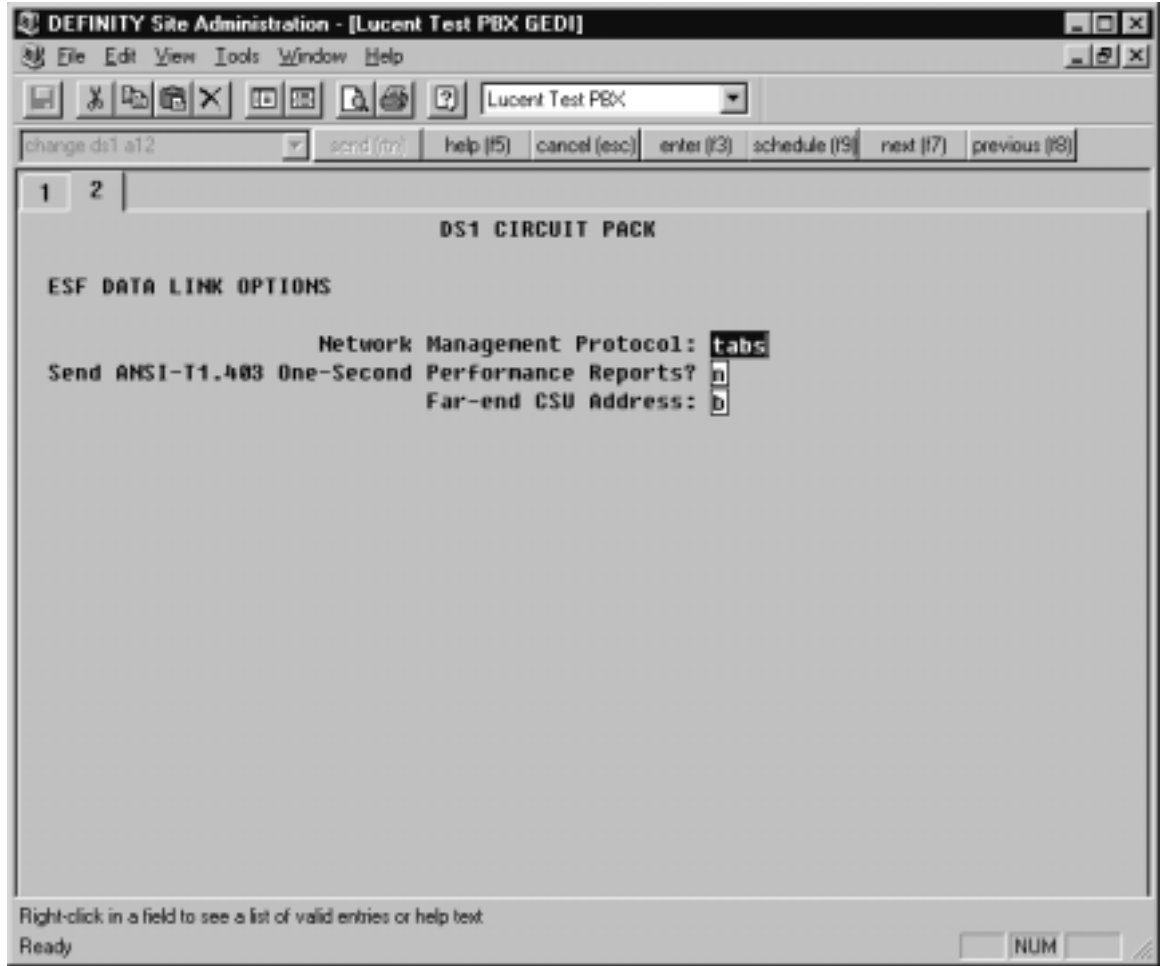


Figure 5: ISDN Numbering

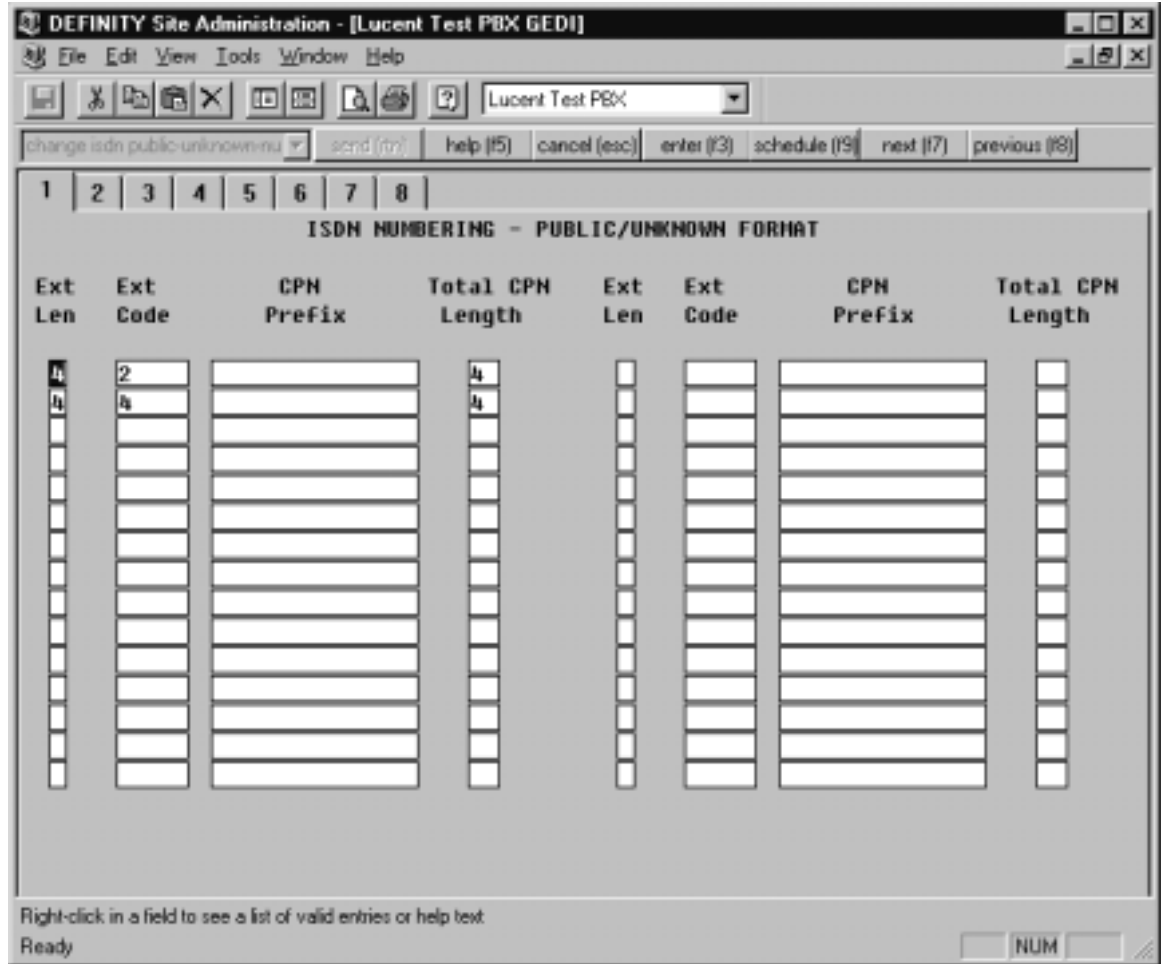


Figure 6: Trunk Group

DEFINITY Site Administration - [Lucent Test PBX GEDI]

File Edit View Tools Window Help

Lucent Test PBX

change trunk-group 7 send (m) help (F5) cancel (esc) enter (F3) schedule (F9) next (F7) previous (F8)

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

TRUNK GROUP

Group Number: 7 Group Type: isdn CDR Reports:

Group Name: Port 01A12 CDR: 1 TN: 1 TAC: 668

Direction: two-way Outgoing Display?

Dial Access? Busy Threshold: 99 Night Service:

Queue Length: 0

Service Type: tandem TestCall ITC: rest

Far End Test Line No:

TestCall BCC:

TRUNK PARAMETERS

Codeset to Send Display: 6 Codeset to Send TCH,Lookahead: 6

Max Message Size to Send: 260 Charge Advice: none

Supplementary Service Protocol: 0 Digit Handling (in/out): enbloc/enbloc

Trunk Hunt: cyclical

Connected to Toll? SIT Loss: normal DTT to DC0 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 NUM

Figure 7: Trunk Features

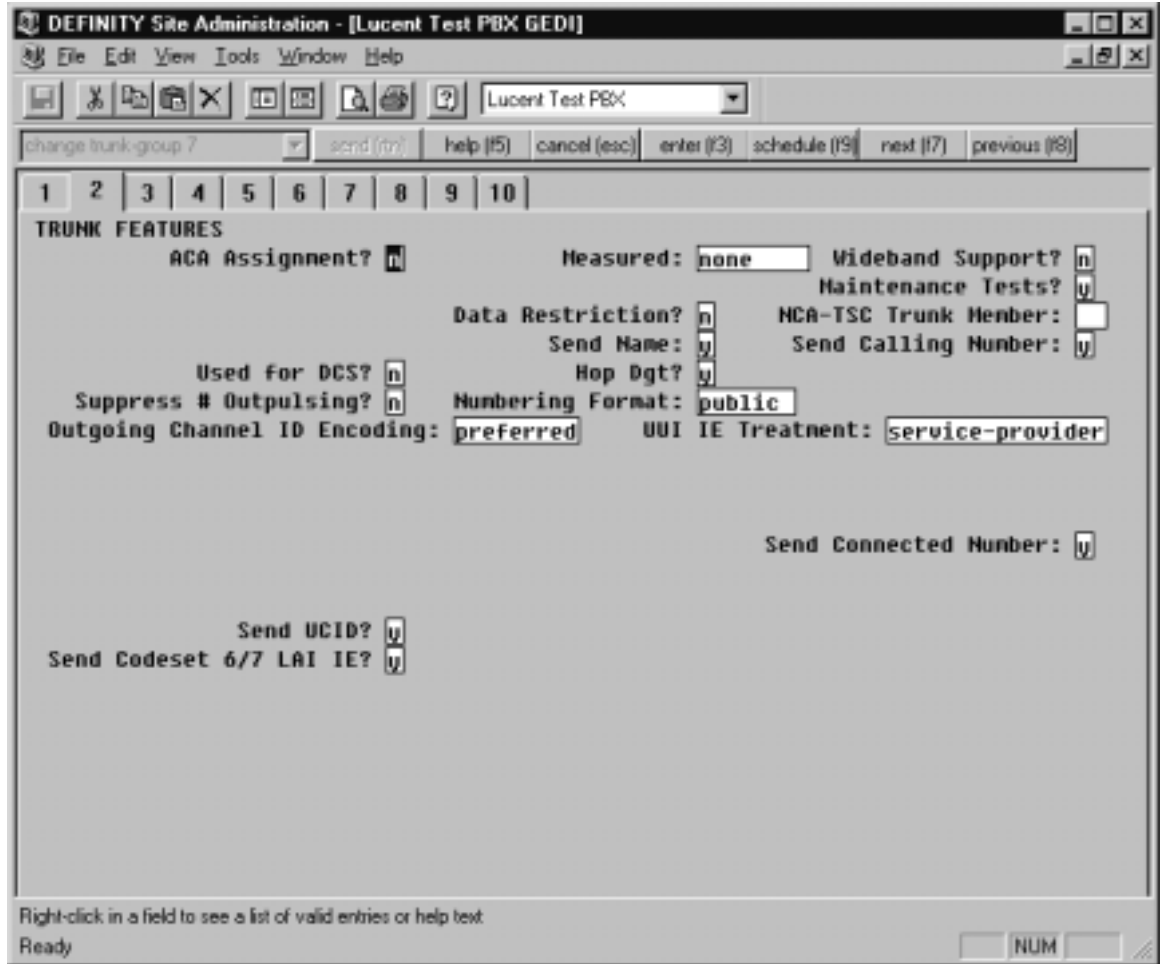


Figure 8: Trunk Group II

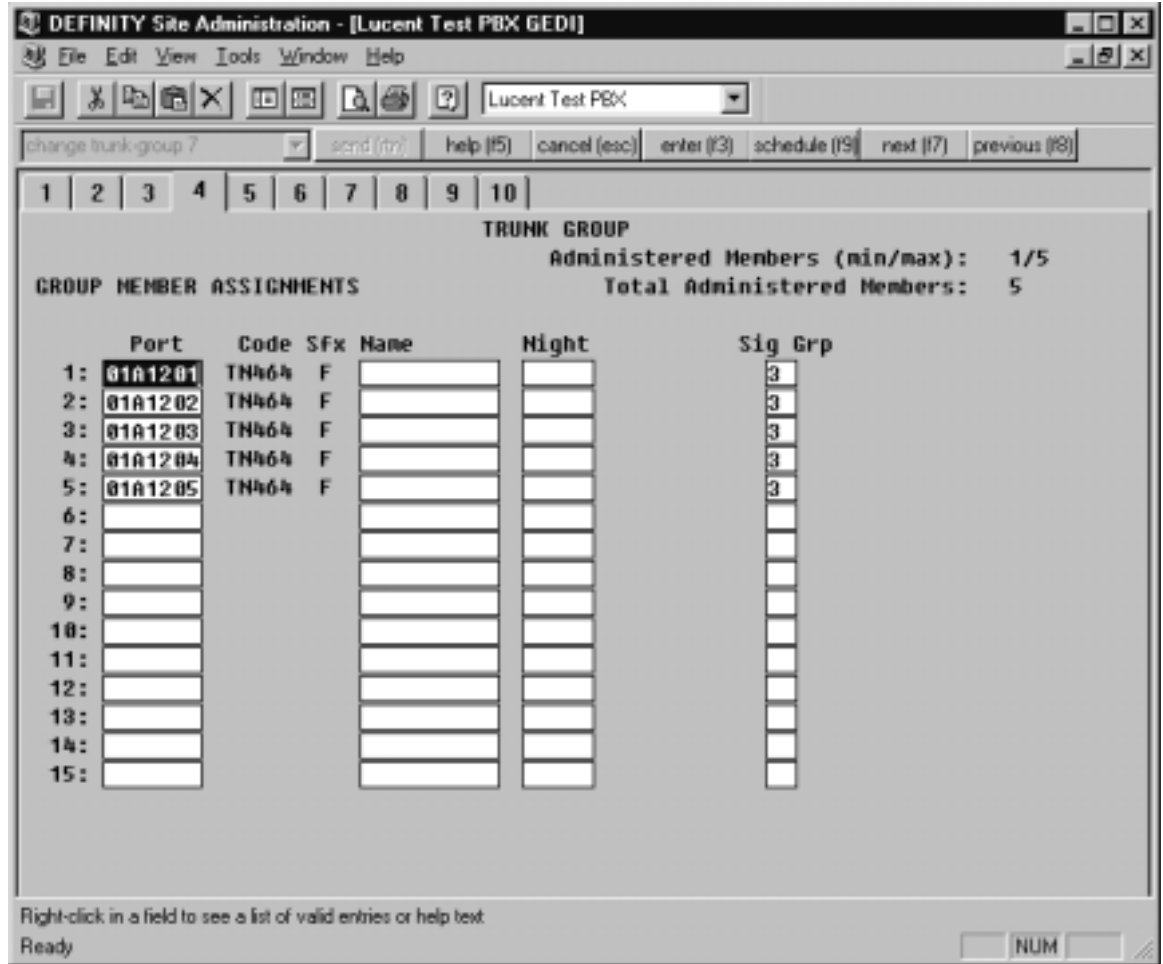


Figure 9: Signaling Group



Cisco 3660 Gateway Configuration

The following is the configuration of the Cisco 3660 voice gateway connected to the Lucent Definity PBX T1 PRI interface.

Cisco 3660 Voice Gateway Version Information

```
Cisco_3660# show version
```

```

Cisco Internetwork Operating System Software
IOS (tm) 3600 Software (C3660-JS-M), Experimental Version 12.2(20010328:140530) [dekumar-015T 101]
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Wed 28-Mar-01 20:44 by dekumar
Image text-base: 0x60008960, data-base: 0x61660000
  
```

```
ROM: System Bootstrap, Version 12.0(6r)T, RELEASE SOFTWARE (fc1)
```

```

Cisco_3660 uptime is 2 hours, 1 minute
System returned to ROM by power-on
System image file is "slot0:c3660-js-mz.dt31743_deepaks"
  
```

cisco 3660 (R527x) processor (revision B0) with 111616K/19456K bytes of memory.
Processor board ID JAB040880KP
R527x CPU at 225Mhz, Implementation 40, Rev 10.0, 2048KB L2 Cache
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.

3660 Chassis type: ENTERPRISE
1 Ethernet/IEEE 802.3 interface(s)
3 FastEthernet/IEEE 802.3 interface(s)
1 Token Ring/IEEE 802.5 interface(s)
48 Serial network interface(s)
1 HSSI network interface(s)
4 Channelized T1/PRI port(s)
2 Voice FXS interface(s)
DRAM configuration is 64 bits wide with parity disabled.
125K bytes of non-volatile configuration memory.
32768K bytes of processor board System flash (Read/Write)

Configuration register is 0x0

Cisco 3660 Voice Gateway Sample Configuration

Cisco_3660# **show running-config**

Building configuration...

```
Current configuration : 2220 bytes
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Cisco_3660
!
logging rate-limit console 10 except errors
!
!
!
memory-size iomem 15
voice-card 2
!
ip subnet-zero
!
!
!
no ip dhcp-client network-discovery
no mgcp timer receive-rtcp
isdn switch-type primary-ni
call rsvp-sync
!
!
!
!
!
fax interface-type modem
mta receive maximum-recipients 0
!
!
controller T1 1/0
shutdown
framing sf
linecode ami
!
controller T1 1/1
shutdown
framing sf
```

```
linecode ami
!
controller T1 2/0
 framing esf
 linecode b8zs
 pri-group timeslots 1-24
!
controller T1 2/1
 shutdown
 framing esf
 linecode b8zs
 pri-group timeslots 1-24
!
!
interface FastEthernet0/0
 ip address 10.0.0.1 255.255.0.0
 no ip mroute-cache
 duplex auto
 speed auto
!
interface FastEthernet0/1
 ip address 10.1.1.117 255.255.255.0
 no ip mroute-cache
 duplex auto
 speed auto
!
interface FastEthernet1/0
 no ip address
 no ip mroute-cache
 shutdown
 duplex auto
 speed auto
!
interface Serial2/0:23
 no ip address
 no logging event link-status
 isdn switch-type primary-ntt
 isdn incoming-voice voice
 isdn T310 60000
 no cdp enable
!
interface Serial2/1:23
 no ip address
 no logging event link-status
 shutdown
 isdn switch-type primary-ni
 isdn incoming-voice voice
 no cdp enable
!
interface Hssi5/0
 no ip address
 no ip mroute-cache
 shutdown
!
interface Ethernet6/0
 ip address 1.3.145.1 255.255.255.0
 no ip mroute-cache
 no keepalive
 half-duplex
!
ip classless
ip http server
!
!
!
!
snmp-server packetsize 4096
snmp-server manager
!
!
voice-port 2/0:23
!
```

```
voice-port 2/1:23
!
voice-port 4/0/0
!
voice-port 4/0/1
!
dial-peer cor custom
!
!
!
dial-peer voice 1000 voip
 destination-pattern 777444....
 session target ipv4:10.0.0.2
!
dial-peer voice 100 pots
 destination-pattern 777222....
 direct-inward-dial
 port 2/0:23
!
dial-peer voice 2 pots
 destination-pattern 2222
 port 4/0/0
!
!
line con 0
 exec-timeout 0 0
line aux 0
 exec-timeout 0 0
line vty 0 4
 exec-timeout 0 0
 login
line vty 5 15
 exec-timeout 0 0
 login
!
scheduler allocate 3996 1000
!
end
```

Caveats

- When configured for isdn switch-type primary-5ess, the Cisco 3660 does not pass the optional IE Calling Name, although it does pass the Calling Number.
- Overlap-signaling is not supported for the configurations detailed in this Application Note.
- Overlap-signaling is only supported for NET3, NET5 and QSIG protocols on the IOS™ voice gateways.