# Cisco 3600 Series Gateway-PBX Interoperability: Alcatel 4400 PBX with E1 PRI Signaling

This document describes the interoperability and configuration of a Cisco 3600 series voice gateway with an Alcatel 4400 PBX using E1 PRI signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

## System Components

| | |
|---|---|
| **PBX Model** | Alcatel 4400 PBX |
| **PBX Release** | Software Version R3.2, Version c1.712 |
| **Telephony Signaling** | E1 PRI |
| **Voice Gateway** | Cisco 3640 |
| **Gateway Release** | Cisco IOS™ 12.2(1) |
| **VoX Protocol** | H.323 |

## Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Alcatel PBX Configuration
- Cisco 3640 Gateway Configuration

# Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

### Connectivity Diagrams

**Figure 1: Test Configuration**

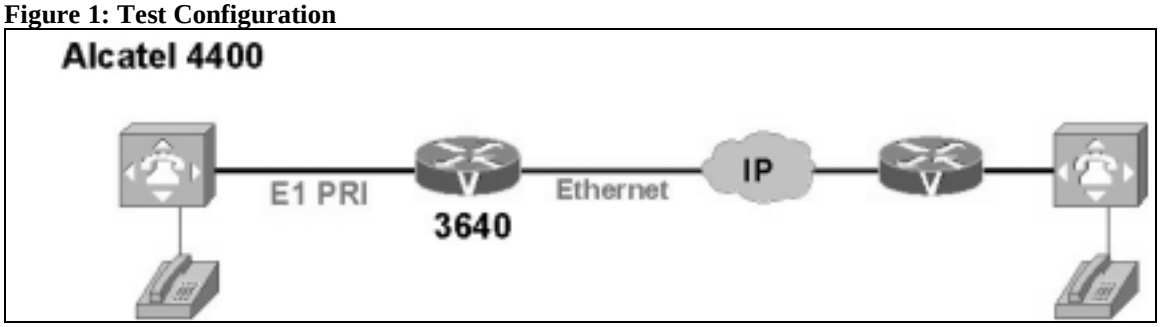


Figure 1 represents the configuration used for testing: an Alcatel 4400 PBX connected to a Cisco 3640 voice gateway via an E1 PRI NET5 connection.

### Set Up Notes

- Both the Alcatel 4400 PBX and the Cisco 3640 voice gateway support Network and User side PRI connectivity.
- Trunk interface type must be set to PRA2.
- Network/User options are set in the Board/Digital Access Options menu. Network mode must be set to Yes for Master/Network or No for Slave/User.
- Access Type must be set to T2.
- The Q931 signal variant is used to determine Protocol type. This option was set to ISDN all countries during testing
- The Cisco 2621 router with ISDN switch type setting of primary-net5 supports both protocol sides by using the **isdn protocol-emulate network/user** command.

# Alcatel PBX Configuration

☞**Note:** The Alcatel 4400 PBX configuration screen for the E1 trunk interface is reached using both Alcatel Board and Board\Digital Access menus, setting the E1 physical layer parameters.

### PBX Version Information

```
\compidea\Node

         Node Number (reserved)   1
         Software Version         R3.2
         Version name             c1.712
         Patch No.                5
         Notes
         Object Identity
         Node Number (reserved)   1
         Ethernet Notes
               Netmask
               Local CPU
```

```
            Name          x000000_tun
            IP Address    172.30.253.253
      Twin Cpu
            Name
            IP Address
      Main Cpu
            Name          xm000000
            IP Address    10.253.253.3
      StandBy Cpu
            Name
            IP Address
SL Notes
IP/X25 Tunnel Notes
      Netmask             255.255.0.0
      Local Node
            Name          x000000_tun
            IP Address    172.30.253.253
```

## PBX Sample Configuration

See the following sections for sample PBX configuration

- Trunk Card Configuration
- Digital Access Configuration
- Trunk Group Configuration
- Trunk Detail

### Trunk Card Configuration

```
                  \compidea\Shelf::0\Board::3

Board Address                          3
Interface Type                         PRA2
Usage State                            Busy
Operational State                      Enabled
Main/Standby State                     Main (Master)
Number Of Sets Being Connect.          1
CRC4                                   YES
Country Protocol Type                  USA
Incidents Teleservice                  YES
ISDN Board Layer 2 Parameters
      Retransmission Timer             100
      TEI Identity Check Timer         100
      Polling Timer                    1000
      Nb_Of_Retransmission             3
      Max Frame Size (Bytes)           260
      Window Size In Frames SAPI S T0  1
      Window Size In Frames SAPI P T0  3
      Window Size In Frames SAPI S T2  7
      Window Size In Frames SAPI P T2  7
Passive board                          NO
SS7 signalling                         NO
```

**Note**: The trunk cards were configured the same.

### Digital Access Configuration

```
          \compidea\Shelf::0\Board::3\Digital Access::0

T0/T2 Access No.                 0
Access Type                      T2
Synchronisation Priority         255
Network Mode                     YES
Max Nb Of Used B Channels        30
Max_Nb_Of_Compressed_B_Channels  0
```

```
          TieLine Mode                      NO
          With Alarm                        NO
          Reserved1                         YES
          Reserved2                         YES
          Network Date Time Update          NO
          CRC4                              YES
```

## Trunk Group Configuration

```
\compidea\Trunk Groups::0

          Trunk Group Id                        0
          Trunk Group Type                      T2
          Trunk Group Name                      PRA2_EURO
          Node number                           1
          Transcom Trunk Group                  False
          Auto.reserv.by Attendant              False
          Overflow trunk group No.              -1
          Tone on seizure                       True
          Private Trunk Group                   False
          Q931 signal variant                   ISDN all countries
          Number Compatible With                -1
          Number Of Digits To Send              4
          Channel selection type                Quantum
          Remote Network                        15
          Shared Trunk Group                    False
          auto.DTMF dialing on outgoing call    NO
          T2 Specificity                        None
          Public Network Category               0
          DDI transcoding                       False
          Special Services                      Nothing
          Can support UUS in SETUP              True
```

## Trunk Detail

```
\compidea\Trunk Groups::0\Trunk Group::1

          Instance (reserved)                   1
          Trunk Group Type                      T2
          Public Network Ref.
          Dialling end to end                   NO
          DTMF end to end signal.               NO
          Trunk group used in DISA              NO
          DISA Secret Code
          VG for non-existent No.               YES
          Routing To Executive                  NO
          Trunk Category Id                     19
          Nb of digits unused (ISDN)            0
          B Channel Choice                      YES
          Channels Reserved By Attend.          0
          Dissuasion For ACD                    NO
          DTO joining                           NO
          Enquiry Call On B Channel             NO
          Automated Attendant                   NO
          Calling party Rights category         0
          Entity Number                         0
          TS Overflow                           YES
          Number To Be Added
          Supervised by Routing                 NO
          VPN Cost Limit for Incom.Calls        0
          Immediat Trk Listening For VPNCall    YES
          VPN TS %                              50
          Csta Monitored                        NO
          Max.% of trunks out CCD               0
          Charge Calling And ADN Creation       NO
          Ratio analog.to ISDN tax
          LogicalChannel                        1__15 & 17__31
```

```
TS Distribution on Accesses          YES
Use Split Acces                      NO
Heterogeneous Remote Network         NO
Barring mode                         Not barred
ARS class of service                 31
Quality profile for voice on IP      Profile #1
IP compression type                  Default
Use of volume in system              YES
```

# Cisco 3640 Gateway Configuration

The following is the configuration of the Cisco 3640 gateway connected to the Alcatel 4400 PBX, slot 3 ISDN PRI interface.

### Cisco 3640 Voice Gateway Version Information

```
Cisco_3640# show version

Cisco Internetwork Operating System Software
IOS (tm) 3600 Software (C3640-JS-M), Version 12.2(1), RELEASE SOFTWARE (fc2)
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 27-Apr-01 05:00 by cmong
Image text-base: 0x60008950, data-base: 0x61492000

ROM: System Bootstrap, Version 11.1(20)AA2, EARLY DEPLOYMENT RELEASE SOFTWARE (f
c1)

Cisco_3640 uptime is 2 weeks, 6 days, 23 hours, 45 minutes
System returned to ROM by power-on
System image file is "flash:c3640-js-mz.122-1"

cisco 3640 (R4700) processor (revision 0x00) with 59392K/6144K bytes of memory.
Processor board ID 24827507
R4700 CPU at 100Mhz, Implementation 33, Rev 1.0
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 Ethernet/IEEE 802.3 interface(s)
31 Serial network interface(s)
2 Channelized E1/PRI port(s)
2 Voice FXO interface(s)
2 Voice FXS interface(s)
DRAM configuration is 64 bits wide with parity disabled.
125K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)
16384K bytes of processor board PCMCIA Slot0 flash (Read/Write)
```

Configuration register is 0x2102

### Cisco 3640 Voice Gateway Sample Configuration

```
Cisco_3640# show configuration

Using 1954 out of 129016 bytes
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Cisco_3640
!
```

```
logging rate-limit console 10 except errors
enable secret 5 $1$MO.1$djDfp226W.PgF/0DpeuSn0
enable password cisco
!
voice-card 1
!
ip subnet-zero
!
!
no ip finger
no ip domain-lookup
!
no ip dhcp-client network-discovery
isdn switch-type primary-net5
call rsvp-sync
!
!
!
!
!
!
!
controller E1 1/0
 pri-group timeslots 1-31
!
controller E1 1/1
!
!
interface Ethernet0/0
 bandwidth 100000
 ip address 10.1.1.1 255.255.255.0
 no ip mroute-cache
 load-interval 30
 no keepalive
 full-duplex
!
interface Ethernet0/1
 no ip address
 shutdown
 half-duplex
 no cdp enable
!
interface Serial1/0:15
 no ip address
 no logging event link-status
 isdn switch-type primary-net5
 isdn overlap-receiving
 isdn incoming-voice voice
 isdn T203 30000
 isdn T310 60000
 isdn bchan-number-order ascending
 no cdp enable
!
router rip
 network 1.0.0.0
!
ip kerberos source-interface any
ip classless
ip http server
!
dialer-list 1 protocol ip permit
dialer-list 1 protocol ipx permit
!
snmp-server packetsize 4096
snmp-server manager
tftp-server nvram
!
voice-port 1/0:15
!
voice-port 2/0/0
!
voice-port 2/0/1
```

```
!
voice-port 3/0/0
!
voice-port 3/0/1
!
dial-peer cor custom
!
!
!
dial-peer voice 1 pots
 destination-pattern 3001
 direct-inward-dial
 port 1/0:15
 prefix 3001
!
dial-peer voice 2 voip
 destination-pattern 3103
 progress_ind setup enable 1
 session target ipv4:10.1.1.2
!
dial-peer voice 3 pots
 destination-pattern 3050
 port 3/0/0
!
dial-peer voice 4 voip
 destination-pattern 3000
 session target ipv4:10.1.1.2
!
dial-peer voice 5 voip
 destination-pattern 3003
 session target ipv4:10.1.1.2
!
dial-peer voice 6 pots
 destination-pattern 3002
 direct-inward-dial
 port 1/0:15
 prefix 3002
!
!
line con 0
 exec-timeout 0 0
 transport input none
line aux 0
line vty 0 4
 password lab
 login
!
end
```

# Caveats

- Calling and Called Name display are not supported on an Alcatel ISDN PRI link.
- Overlap Sending is not yet supported on an Alcatel PBX.