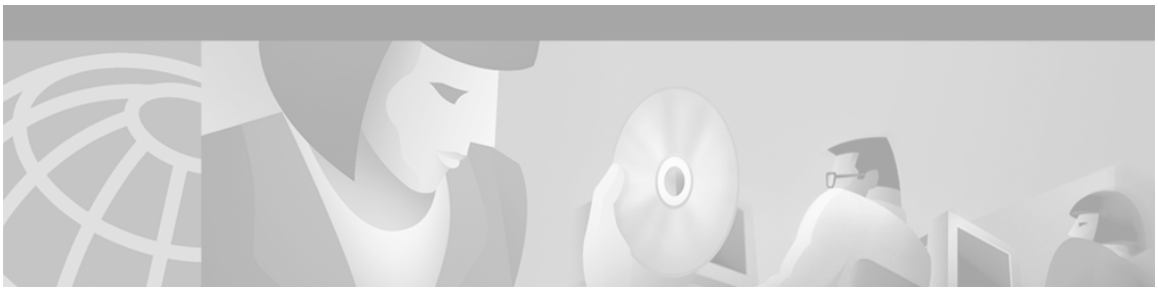

Cisco 7200 Series Gateway-PBX Interoperability: PA-VXC-2T1E1+ card to Alcatel 4400 PBX with E1 ISDN PRI QSIG Signaling

This document describes the interoperability and configuration of a Cisco 7206 series voice gateway with a PA-VXC-2T1E1+ card to an Alcatel 4400 PBX using ISDN PRI E1 QSIG signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

PBX Model	Alcatel 4400
PBX Release	R3.2
Telephony Signaling	E1 QSIG
Voice Gateway	Cisco 7206 series router
Gateway Release	Cisco IOS Release 12.2(1a)
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Alcatel PBX Configuration
- Cisco 7206VXR Gateway Configuration

Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

Connectivity Diagrams

Figure 1: Test Configuration

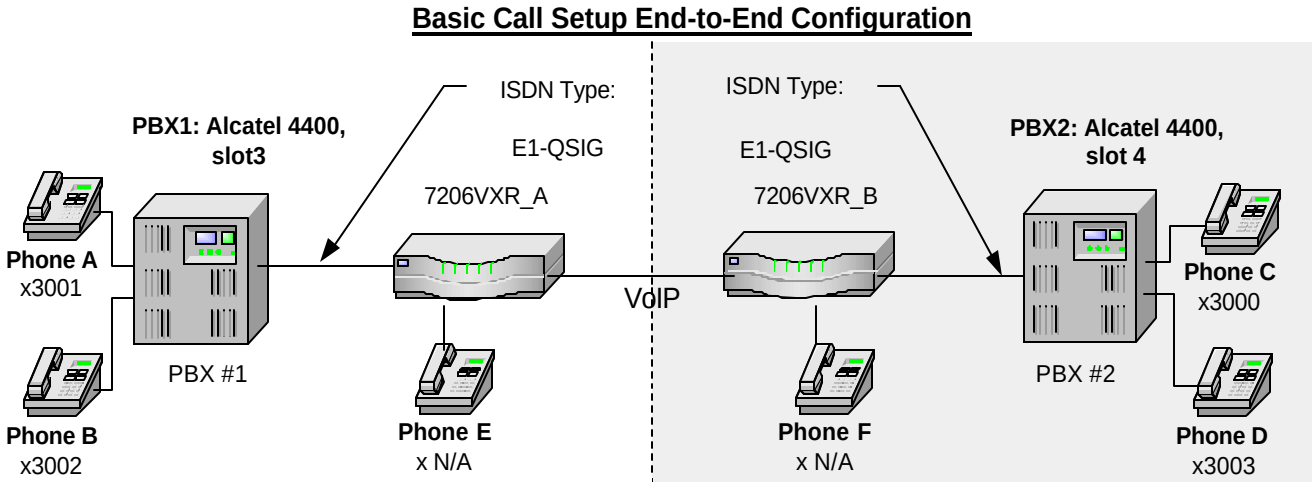

Figure 1 represents the configuration used for testing: an Alcatel 4400PBX connected to a Cisco 7206VXR voice gateway via an E1-QSIG connection.

Set Up Notes

- The Cisco 7206 router with ISDN switch type setting of **primary-qsig** supports both protocol sides by using the "isdn protocol-emulate network/user" command.
- The Alcatel 4400 supports both "USER" (slave) and "NETWORK" (master) protocol sides.
- The following options are of particular interest:
  - 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**.
  - **Q931 variant** determines **Protocol type. ABC-F is Alcatel proprietary.**

Alcatel PBX Configuration

Alcatel PBX Version Information

- Software: Version R3.2
- Hardware: PRA2, 3BA23076.

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
```

Alcatel PBX Sample Configuration

See the following sections for sample configuration information:

- Trunk Cards Were Configured the Same
- Digital Access Options
- Trunk Group
- Trunk Detail

Trunk Cards Were Configured the Same

Interface type must be set to **PRA2.**

```
\compidea\Shelf::0\Board::4

          Board Address                          4
          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                  Default
          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
```

Digital Access Options

Network mode must be set to **Yes** for Master/Network or **No** for Slave/User.
Access Type must be set to **T2**.

```
                \compidea\Shelf::0\Board::4\Digital Access::0

          T0/T2 Access No.                 0
          Access Type                      T2
          Synchronisation Priority         255
          Network Mode                     NO
          Max Nb Of Used B Channels        30
          Max_Nb_Of_Compressed_B_Channels   0
          TieLine Mode                     NO
          With Alarm                       NO
          Reserved1                        NO
          Reserved2                        NO
          Network Date Time Update         NO
          CRC4                             YES
```

Trunk Group

Q931 variant is used to determine Protocol type. ABC-F is Alcatel proprietary.

```
\compidea\Trunk Groups::0

          Trunk Group Id                    0
          Trunk Group Type                  T2
          Trunk Group Name                  PRA2-QSIG
          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                 ABC-F
          Number Compatible With              1
          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::1\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                   18
          Nb of digits unused (ISDN)          4
          B Channel Choice                    NO
          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 7206VXR Gateway Configuration

The following is the configuration of the Cisco 7206VXR voice gateway connected to the Alcatel 4400 ISDN PRI E1 QSIG signaling interface.

- Cisco 7206VXR Voice Gateway Version Information
- Cisco 7206VXR Voice Gateway Sample Configuration

Cisco 7206VXR Voice Gateway Version Information

- Cisco IOS™ (C7200-JS-M), Version 12.2(1).
- Cisco 7206VXR (NPE400) processor (revision A) with 114688K/16384K bytes of memory.

```
7206VXR#sh ver
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-A3JS-M), Version 12.2(1a), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2001 by Cisco Systems, Inc.
Compiled Sat 26-May-01 15:44 by pwade
Image text-base: 0x60008960, data-base: 0x61830000

ROM: System Bootstrap, Version 12.1(20000710:044039) [nlaw-121E_npeb 117], DEVEL
OPMENT SOFTWARE
BOOTFLASH: 7200 Software (C7200-KBOOT-M), Version 12.1(3a)E5, EARLY DEPLOYMENT R
ELEASE SOFTWARE (fc1)

7206VXR uptime is 1 hour, 31 minutes
System returned to ROM by power-on
System image file is "disk0:c7200-a3js-mz.122-1a.bin"

cisco 7206VXR (NPE400) processor (revision A) with 114688K/16384K bytes of memor
y.
Processor board ID 23656935
R7000 CPU at 350Mhz, Implementation 39, Rev 3.2, 256KB L2, 4096KB L3 Cache
6 slot VXR midplane, Version 2.1

Last reset from power-on
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.
Channelized E1, Version 1.0.
2 FastEthernet/IEEE 802.3 interface(s)
31 Serial network interface(s)
2 Channelized E1/PRI port(s)
2 Voice resource(s)
125K bytes of non-volatile configuration memory.

46976K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
8192K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x102

7206VXR#
```

Cisco 7206VXR Voice Gateway Sample Configuration

The following is a sample configuration of the Cisco 7206VXR series router directly connected to Alcatel 4400 PBX, slot 3 ISDN PRI interface.

```
7206VXR#sh diag
Slot 0:
        Dual FastEthernet (RJ-45) I/O Card Port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time 01:31:20 ago
        EEPROM contents at hardware discovery:
        Hardware Revision        : 1.2
        Top Assy. Part Number    : 800-07114-04
        Part Number              : 73-5003-04
        Board Revision           : A0
        PCB Serial Number        : 23998864
        RMA History              : 00
        Fab Version              : 02
        Fab Part Number          : 28-3455-02
        Product Number           : C7200-I/O-2FE/E
        Board Revision           :
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 02 15 41 01 02 C0 46 03 20 00 1B CA 04
          0x10: 82 49 13 8B 04 42 41 30 C1 8B 32 33 39 39 38 38
          0x20: 36 34 00 00 00 04 00 02 02 85 1C 0D 7F 02 CB 8F
          0x30: 43 37 32 30 30 2D 49 2F 4F 2D 32 46 45 2F 45 42
          0x40: 00 00 0C 02 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 FF
          0x60: FF 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 FF

Slot 1:
        VXC-2TE1+ Port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time 01:31:20 ago
        EEPROM contents at hardware discovery:
        Hardware Revision        : 0.2
        PCB Serial Number        : MIC05012P3T
        Part Number              : 73-5340-03
        Board Revision           : A0
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Deviation Number         : 0-0
        Product Number           : PA-VXC-2T1E1+
        Top Assy. Part Number    : 8034-08469-01
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 02 11 41 00 02 C1 8B 4D 49 43 30 35 30
          0x10: 31 32 50 33 54 82 49 14 DC 03 42 41 30 03 00 81
          0x20: 00 00 00 00 04 00 80 00 00 00 00 CB 94 50 41 2D
          0x30: 56 58 43 2D 32 54 31 45 31 2B 20 20 20 20 20 20
          0x40: 20 C0 46 1F 62 00 21 15 01 FF FF FF FF FF FF FF
          0x50: FF 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 FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

Slot 5:
        VXC-2TE1+ Port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time 01:31:20 ago
        EEPROM contents at hardware discovery:
        Hardware Revision        : 0.2
        PCB Serial Number        : MIC043626H6
        Part Number              : 73-5340-03
        Board Revision           : A0
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Deviation Number         : 0-0
```

```
        Product Number           : PA-VXC-2T1E1+
        Top Assy. Part Number    : 8034-08469-01
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 02 11 41 00 02 C1 8B 4D 49 43 30 34 33
          0x10: 36 32 36 48 36 82 49 14 DC 03 42 41 30 03 00 81
          0x20: 00 00 00 00 04 00 80 00 00 00 00 CB 94 50 41 2D
          0x30: 56 58 43 2D 32 54 31 45 31 2B 20 20 20 20 20 20
          0x40: 20 C0 46 1F 62 00 21 15 01 FF FF FF FF FF FF FF
          0x50: FF 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 FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

7206VXR#
```

```
7206VXR#sh controllers e1 1/0
E1 1/0 is up.
  Applique type is Channelized E1 - balanced
  No alarms detected.
  alarm-trigger is not set
  Framing is CRC4, Line Code is HDB3, Clock Source is Line.
  International Bit: 1, National Bits: 11111
  Active xconns: 0
  Data in current interval (51 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
7206VXR#
```

```
7206VXR#sh conf
Using 1761 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 7206VXR
!
card type e1 1
logging rate-limit console 10 except errors
enable secret 5 $1$/v5Z$CkMtCbclv8yLndS/drpXg/
enable password cisco
!
dspint DSPfarm1/0
!
dspint DSPfarm5/0
!
ip subnet-zero
!
!
no ip finger
no ip domain-lookup
!
no ip dhcp-client network-discovery
isdn switch-type primary-qsig
call rsvp-sync
!
!
!
!
!
!
!
controller E1 1/0
 pri-group timeslots 1-31
!
controller E1 1/1
!
!
interface FastEthernet0/0
```

```
 ip address 10.1.1.249 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 ip address 1.1.1.1 255.255.255.0
 duplex full
 speed auto
!
interface Serial1/0:15
 no ip address
 no logging event link-status
 isdn switch-type primary-qsig
 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
!
!
!
!
!
!
!
!
!
snmp-server packetsize 4096
snmp-server manager
!
!
voice-port 1/0:15
!
dial-peer voice 1 pots
 destination-pattern 3001
 direct-inward-dial
 port 1/0:15
 prefix 3001
!
dial-peer voice 2 voip
 destination-pattern 3000
 progress_ind setup enable 1
 session target ipv4:1.1.1.2
!
dial-peer voice 3 pots
 destination-pattern 3002
 direct-inward-dial
 port 1/0:15
 prefix 3002
!
dial-peer voice 4 voip
 destination-pattern 3003
 progress_ind setup enable 1
 session target ipv4:1.1.1.2
!
!
gatekeeper
 shutdown
!
!
line con 0
 transport input none
line aux 0
```

```
line vty 0 3
 exec-timeout 0 0
 password cisco
 login
line vty 4
 no exec
 exec-timeout 0 0
 login
line vty 5 15
 login
!
end

7206VXR#
```

Caveats

- Calling/Called Number is not shown on Alcatel phone display (one line display phone show Name only) due to limitation on one line display phone.