



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

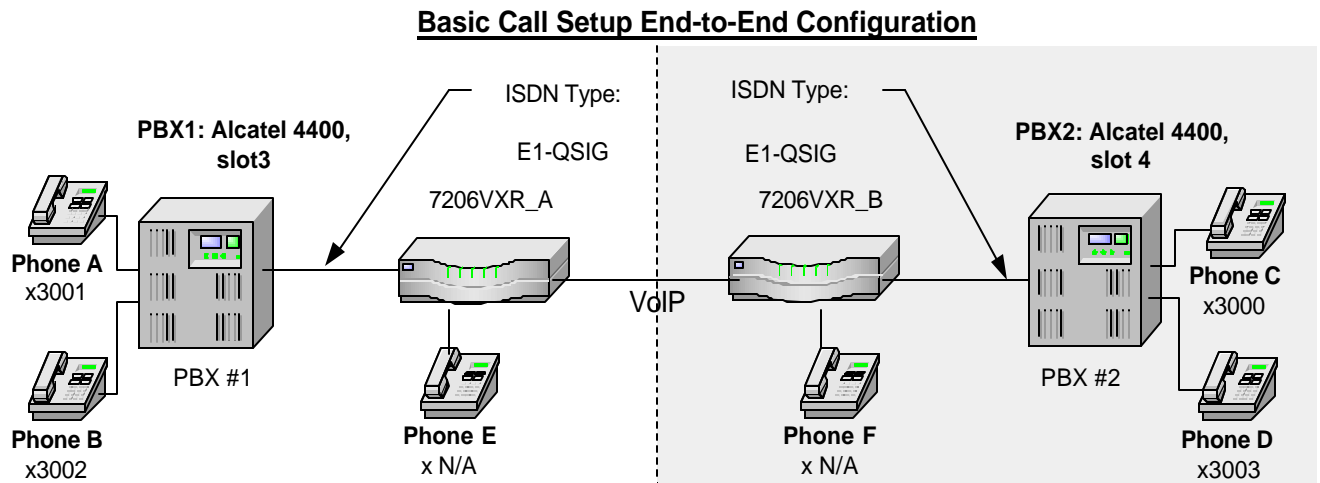


Figure 1 represents the configuration used for testing: an Alcatel 4400PBX connected to a Cisco 7206VXR voice gateway via an E1-QSIG connection.

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
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 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
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

```

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.