



Cisco 7206 Series Router-PBX Interoperability: Lucent Definity G3r PBX and VXC-2TE1+ Port Adapter Card with E1 ISDN PRI Signaling

This document describes the interoperability and configuration of a Cisco 7200 series router with a Lucent Definity G3r PBX using E1 ISDN PRI signaling. It includes the following sections:

- System Components
- Configuration Tasks
- Caveats

System Components

PBX Model	Lucent Definity G3r
PBX Release	G3V7i.01.0.343.7
Telephony Signaling	E1 ISDN PRI
Voice Gateway	Cisco 7206 Series Routers
Gateway Release	Cisco IOS™ (C7200-JS-M), Version 12.2(1)
VoX Protocol	H.323

Configuration Tasks

See the following sections for configuration tasks for this feature:

- Set Up
- Lucent Definity G3r PBX Configuration
- Cisco 7206 Series Router Configuration

Set Up

This section includes the following information:

- Connectivity Diagrams
- Set Up Notes

Connectivity Diagrams

Figure 1: Test Configuration

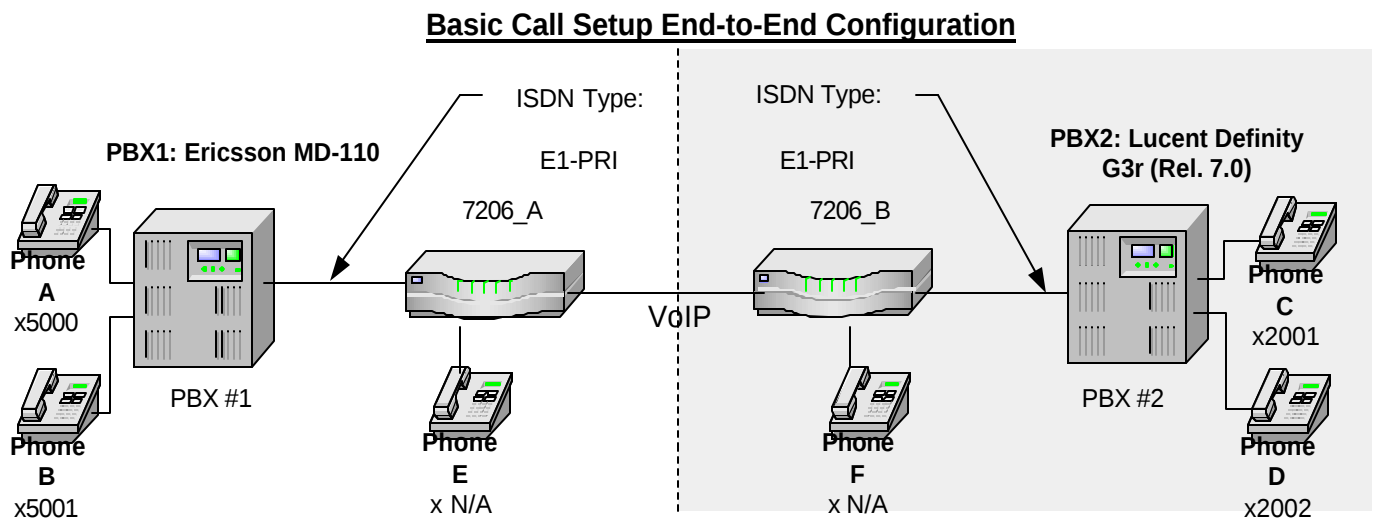


Figure 1 represents the configuration used for testing: a Cisco 7206 series router was connected to a Lucent Definity G3r PBX via ISDN E1 link.

Set Up Notes

- The Cisco 7206 series router with ISDN switch type setting of **primary-net5** supports both protocol sides by using the “**isdn protocol-emulate network/user**” command.
- The Lucent Definity G3r, supports both “USER” (peer-slave) and “NETWORK” (peer-master) protocol sides by using **change ds1 a12** command.
- The Lucent Definity G3r PBX configuration screen for the E1 trunk interface is reached using **change ds1 a12** command, setting the E1 physical layer parameters.

Lucent Definity G3r PBX Configuration

Lucent Definity G3r PBX Version Information

- Software: Version G3V7i.01.0.343.7
- Hardware: G3siV7.

Lucent Definity G3r PBX Sample Configuration

The following screens display the sample configuration of the Lucent Definity G3r PBX. Use these screens to configure the Lucent Definity G3r PBX.

Figure 2: Dial Plan Record

DEFINITY Site Administration - Lucent Test PBX GEDI

File Edit View Tools Window Help

Lucent Test PBX

change dialplan send (rtm) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1

DIAL PLAN RECORD

Local Node Number: 1

ETA Node Number:

ETA Routing Pattern:

Uniform Dialing Plan: 4-digit

UDP Extension Search Order: udp-table-first

FIRST DIGIT TABLE

First

Digit	1	2	3	Length	4	5	6
1:							
2:				extension			
3:				extension			
4:							
5:							
6:			dac				
7:							
8:	fac						
9:	fac						
0:	attd						
*							
#:							

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

Ready

Figure 3: Pattern Number

DEFINITY Site Administration - Lucent Test PBX GEDI

File Edit View Tools Window Help

Lucent Test PBX

change route-pattern 254 send (rtm) help (f5) cancel (esc) enter (f3) schedule (f9) next (f7) previous (f8)

1

Pattern Number: 254

Grp. No.	FRL	NPA	Pfx	Hop	Toll	No. Del	Inserted	IXC
			Mrk	Lmt	List	Digits	Digits	
1:	7	0	404	1			3	user
2:								user
3:								user
4:								user
5:								user
6:								user

BCC	VALUE	TSC	CA-TSC	ITC	BCIE	Service/Feature	Numbering	LAR
0	1	2	3	4	W	Request	Format	
1:	u	u	u	u	u	rest		none
2:	u	u	u	u	u	rest		none
3:	u	u	u	u	u	rest		none
4:	u	u	u	u	u	rest		none
5:	u	u	u	u	u	rest		none
6:	u	u	u	u	u	rest		none

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

Ready

Figure 4: DS1 Circuit Pack

The screenshot displays the 'DEFINTY Site Administration - Lucent Test PBX GEDI' application window. The 'Lucent Test PBX GEDI' sub-window is active, showing the 'DS1 CIRCUIT PACK' configuration. The interface includes a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with icons for file operations. The configuration fields are as follows:

Field	Value
Location	01A12
Bit Rate	2.048
Name	isdn
Line Coding	hdb3
Signaling Mode	isdn-pri
Connect	network
Country Protocol	etsi
Protocol Version	a
CRC?	y
Interface Companding	alaw
Idle Code	11111111
DCP/Analog Bearer Capability	3.1kHz
Slip Detection?	y
Near-end CSU Type	other

At the bottom of the window, there is a status bar with the text 'Rightclick in a field to see a list of valid entries or help text' and a 'Ready' indicator.

Figure 5: Signaling Group

The screenshot shows a software window titled "DEFINTY Site Administration - [Lucent Test PBX GEDI]". The window has a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with various icons. Below the toolbar is a status bar with the text "add signaling-group 3" and several function keys: "send (ftr)", "help (f5)", "cancel (esc)", "enter (f3)", "schedule (f9)", "next (f7)", and "previous (f8)".

The main area of the window is titled "SIGNALING GROUP". It displays the following configuration for "Group Number: 3":

- Associated Signaling?
- Primary D-Channel:
- Max number of NCA TSC:
- Max number of CA TSC:
- Trunk Group for NCA TSC:
- Trunk Group for Channel Selection:
- Supplementary Service Protocol:

At the bottom of the window, there is a status bar with the text "Right-click in a field to see a list of valid entries or help text" and "Ready". On the right side of the status bar, there is a button labeled "NUM" and a small icon.

Figure 6: Trunk Group

The screenshot displays the 'DEFINTY Site Administration - Lucent Test PBX GEDI' window. The 'Lucent Test PBX GEDI' sub-window is active, showing the configuration for 'change trunk-group 7'. The interface includes a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with icons for file operations and a dropdown menu set to 'Lucent Test PBX'. Below the toolbar is a row of buttons: 'send (y)', 'help (f5)', 'cancel (esc)', 'enter (f3)', 'schedule (f9)', 'next (f7)', and 'previous (f8)'. A numeric keypad (1-10) is visible. The main configuration area is titled 'TRUNK GROUP' and contains the following fields:

- Group Number: 7
- Group Type: isdn
- CDR Reports: ☒
- Group Name: ISDN-E1-PRI
- COR: 1
- TN: 1
- TAC: 668
- Direction: two-way
- Outgoing Display? ☒
- Dial Access? ☒
- Busy Threshold: 99
- Night Service: ☐
- Queue Length: 0
- Service Type: tie
- Auth Code? ☒
- TestCall ITC: rest
- Far End Test Line No:
- TestCall BCC: 4

Below these fields is the 'TRUNK PARAMETERS' section:

- Codeset to Send Display: 0
- Codeset to Send TCM Lookahead: 7
- Max Message Size to Send: 260
- Charge Advice: none
- Supplementary Service Protocol: d
- Digit Handling (in/out): enbloc/enbloc
- Trunk Hunt: ascend
- Connected to Toll? ☒
- SIT Loss: normal
- DTT to DCO Loss: normal
- Calling Number - Delete: ☐
- Insert:
- Numbering Format:
- Bit Rate: 1200
- Synchronization: async
- Duplex: full
- Disconnect Supervision - In? ☒ Out? ☒
- Answer Supervision Timeout: 0

At the bottom of the window, there is a status bar with 'Ready' on the left and 'NUM' on the right. A small text box at the bottom left of the main area says 'Right-click in a field to see a list of valid entries or help text'.

Figure 7: Trunk Features

The screenshot shows the 'DEFINTY Site Administration - Lucent Test PBX GEDI' window. The title bar includes 'File', 'Edit', 'View', 'Tools', 'Window', and 'Help' menus. Below the title bar is a toolbar with icons for file operations and a dropdown menu showing 'Lucent Test PBX'. The main window has a tab labeled 'Lucent Test PBX GEDI' and a status bar at the bottom showing 'Ready' and a 'NUM' button. The main content area is titled 'TRUNK FEATURES' and contains various configuration options with checkboxes and text fields. The options are: 'ACA Assignment?' (checked), 'Measured:' (none), 'Wideband Support?' (unchecked), 'Maintenance Tests?' (checked), 'Data Restriction?' (unchecked), 'NCA-TSC Trunk Member:' (unchecked), 'Send Name:' (checked), 'Send Calling Number:' (checked), 'Used for DCS?' (unchecked), 'Hop Dgt?' (unchecked), 'Numbering Format:' (public), 'Suppress # Outpulsing?' (unchecked), 'Outgoing Channel ID Encoding:' (preferred), 'UUI IE Treatment:' (service-provider), 'Send Connected Number:' (checked), 'Send UCID?' (checked), and 'Send Codeset 6/7 LAI IE?' (checked). A note at the bottom states: 'Right-click in a field to see a list of valid entries or help text.'

DEFINTY Site Administration - Lucent Test PBX GEDI

File Edit View Tools Window Help

Lucent Test PBX

Lucent Test PBX GEDI

change trunk-group? cond (/t) help (H) cancel (esc) enter (/) schedule (S) next (N) previous (P)

1 2 3 4 5 6 7 8 9 10

TRUNK FEATURES

ACA Assignment? ☒ Measured: none Wideband Support? ☐

Maintenance Tests? ☒

Data Restriction? ☐ NCA-TSC Trunk Member: ☐

Send Name: ☒ Send Calling Number: ☒

Used for DCS? ☐ Hop Dgt? ☐

Numbering Format: public

Suppress # Outpulsing? ☐ Outgoing Channel ID Encoding: preferred UUI IE Treatment: service-provider

Send Connected Number: ☒

Send UCID? ☒

Send Codeset 6/7 LAI IE? ☒

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

Ready NUM

Figure 8: Group Member Assignments Tab 4

DEFINITY Site Administration - Lucent Test PBX GEDI

File Edit View Tools Window Help

Lucent Test PBX

Change trunk group? help (F5) cancel (esc) enter (F3) schedule (F5) 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 NUM

Figure 9: Group Member Assignments Tab 5

DEFINITY Site Administration - Lucent Test PBX GEDI

File Edit View Tools Window Help

Lucent Test PBX

Lucent Test PBX GEDI

change trunk group? cancel (esc) help (F5) enter (F3) schedule (F5) next (F7) previous (F6)

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 NUM

Figure 10: Optional Features Tab 1

The screenshot shows a window titled "DEFINITY Site Administration - Lucent Test PBX GEDI". The window has a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar. Below the toolbar is a tab labeled "Lucent Test PBX GEDI". The main area displays the "OPTIONAL FEATURES" tab. The features are listed in two columns, each with a "y" or "n" value. The features are: G3 Version: 07, Location: 1, Maximum Ports: 200, Abbreviated Dialing Enhanced List? y, Access Security Gateway (ASG)? n, Analog Trunk Incoming Call ID? y, A/D Grp/Sys List Dialing Start at 01? y, Answer Supervision by Call Classifier? y, ARS? y, ARS/AR Partitioning? y, ARS/AR Shortcut Dialing? y, ASAI Interface? n, ASAI Proprietary Adjunct Links? n, Async. Transfer Mode (ATM) Trunking? n, Audible Message Waiting? y, Authorization Codes? y, CAS Branch? n, CAS Main? n, Cug Off Calls Redirected Off-net? n, DCS (Basic)? n, DCS Call Coverage? n, DCS with Rerouting? n, DEFINITY Network Admin? n, DS1 MSP? n, Emergency Access to Attendant? y, Extended Cug/Fwd Admin? n, External Device Alarm Admin? y, Flexible Billing? n, Forced Entry of Account Codes? y, Global Call Classification? y, Hospitality (Basic)? y, Hospitality (G3U3 Enhancements)? y. A note at the bottom states: (NOTE: You must logoff & login to effect the permission changes.)

DEFINITY Site Administration - Lucent Test PBX GEDI

File Edit View Tools Window Help

Lucent Test PBX

Lucent Test PBX GEDI

display system parameters (ctrl+F) help (F5) cancel (esc) ok (enter) edit (ctrl+E) next (F7) previous (F6)

1 2 3 4

OPTIONAL FEATURES

G3 Version: 07 Maximum Ports: 200

Location: 1

Abbreviated Dialing Enhanced List? y CAS Main? n

Access Security Gateway (ASG)? n Cug Off Calls Redirected Off-net? n

Analog Trunk Incoming Call ID? y DCS (Basic)? n

A/D Grp/Sys List Dialing Start at 01? y DCS Call Coverage? n

Answer Supervision by Call Classifier? y DCS with Rerouting? n

ARS? y DEFINITY Network Admin? n

ARS/AR Partitioning? y DS1 MSP? n

ARS/AR Shortcut Dialing? y Emergency Access to Attendant? y

ASAI Interface? n Extended Cug/Fwd Admin? n

ASAI Proprietary Adjunct Links? n External Device Alarm Admin? y

Flexible Billing? n

Async. Transfer Mode (ATM) Trunking? n Forced Entry of Account Codes? y

ATMS? y Global Call Classification? y

Audible Message Waiting? y Hospitality (Basic)? y

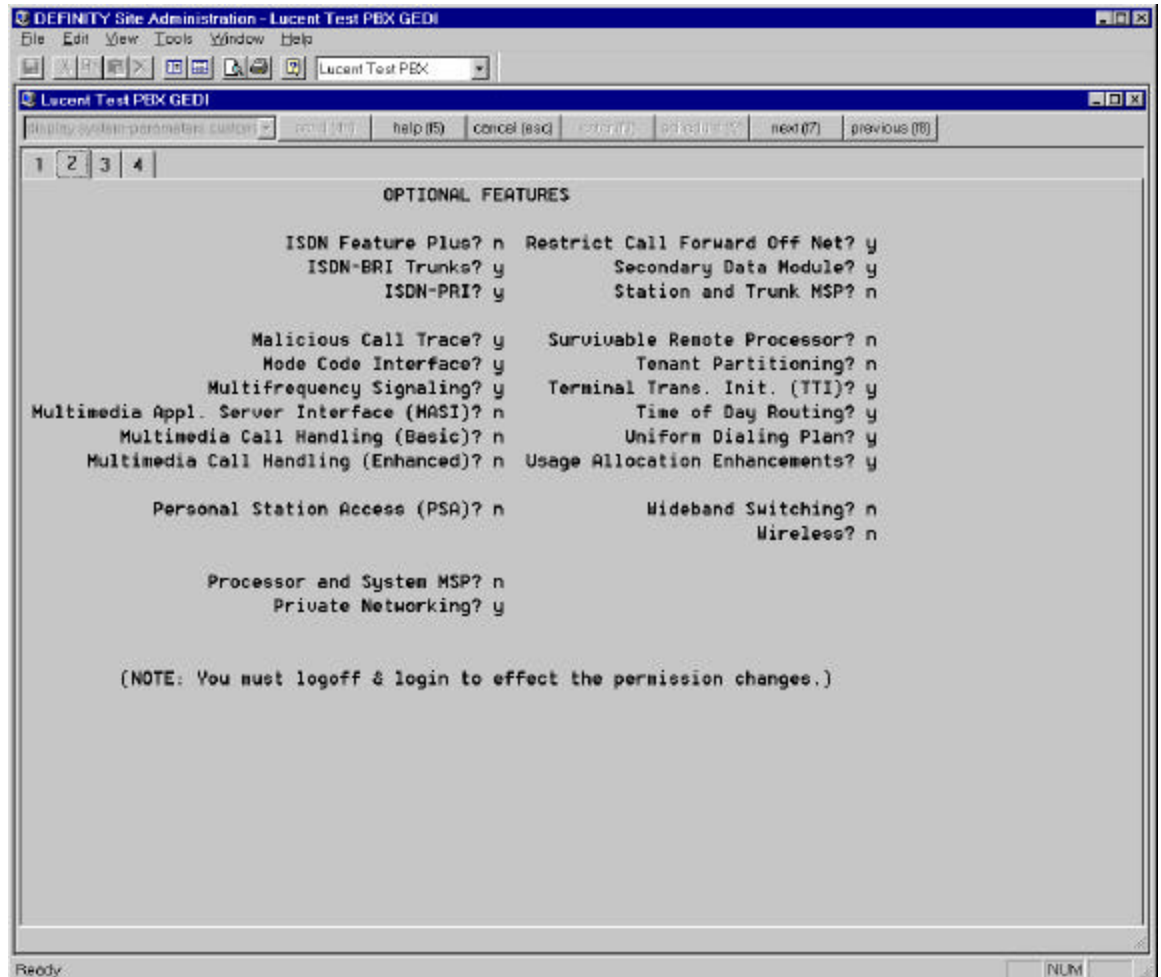
Authorization Codes? y Hospitality (G3U3 Enhancements)? y

CAS Branch? n

(NOTE: You must logoff & login to effect the permission changes.)

Ready NUM

Figure 11: Optional Features Tab 2



Cisco 7206 Series Router Configuration

The following is the configuration of the Cisco 7206 series router connected to the Lucent Definity G3r PBX E1 ISDN PRI interface.

Cisco 7206 Series Router Version Information

- Cisco IOS™ (C7200-JS-M), Version 12.2(1).
- Cisco 7206VXR (NPE300) processor (revision D) with 122880K/40960K bytes of memory.

Cisco 7206 Series Router Sample Configuration

The following is the configuration of the Cisco 7206 series router directly connected to Lucent Definity G3r PBX ISDN PRI interface.

```
7206VXR#sh ver
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-JS-M), Version 12.2(1), RELEASE SOFTWARE
Copyright (c) 1986-2001 by Cisco Systems, Inc.
Compiled Thu 26-Apr-01 22:10 by cmong
Image text-base: 0x60008960, data-base: 0x616B0000

ROM: System Bootstrap, Version 12.0(19990210:195103) [12.0XE 105], DEVELOPMENT SOFTWARE

7206VXR uptime is 5 hours, 4 minutes
System returned to ROM by power-on
System image file is "slot0:c7200-js-mz.122-1"

Cisco 7206VXR (NPE300) processor (revision D) with 122880K/40960K bytes of memory.
Processor board ID 18282879
R7000 CPU at 262Mhz, Implementation 39, Rev 1.0, 256KB L2, 2048KB L3 Cache
6 slot VXR midplane, Version 2.0

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.
1 FastEthernet/IEEE 802.3 interface(s)
31 Serial network interface(s)
2 Channelized E1/PRI port(s)
1 Voice resource(s)
125K bytes of non-volatile configuration memory.
16384K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
4096K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0

7206VXR#
-----
7206VXR#sh diag
Slot 0:
Fast-ethernet on C7200 I/O card with MII or RJ45 Port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time 05:04:06 ago
EEPROM contents at hardware discovery:
Hardware revision 2.1          Board revision B0
Serial number 18517759        Part number 73-4092-03
Test history 0x0              RMA number 00-00-00
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 83 02 01 01 1A 8E FF 49 0F FC 03 00 00 00 00
0x30: 58 00 00 00 00 04 16 00 00 00 FF FF FF FF FF

Slot 1:
VXC-2TE1+ Port adapter, 2 ports
Port adapter is analyzed
Port adapter insertion time 05:04:05 ago
EEPROM contents at hardware discovery:
Hardware Revision      : 0.2
PCB Serial Number     : MIC05022QA2
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: 32 32 51 41 32 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
```

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 (32 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 1266 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
!
frame-clock-select 1 E1 1/0
dspint DSPfarm1/0
!
ip subnet-zero
!
!
no ip finger
!
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
  shutdown
!
!
interface FastEthernet0/0
  ip address 18.0.0.2 255.255.255.0
  no ip mroute-cache
```

```
duplex full
fair-queue
!
interface Serial1/0:15
no ip address
no logging event link-status
isdn switch-type primary-net5
isdn overlap-receiving
isdn protocol-emulate network
isdn incoming-voice modem
isdn guard-timer 3000
isdn T203 30000
isdn T310 60000
isdn bchan-number-order ascending
no cdp enable
!
ip kerberos source-interface any
ip classless
no ip http server
!
!
!
voice-port 1/0:15
!
dial-peer voice 1 pots
destination-pattern 2...
direct-inward-dial
port 1/0:15
prefix 2
!
dial-peer voice 2 voip
destination-pattern 5...
session target ipv4:18.0.0.1
!
!
gatekeeper
shutdown
!
!
line con 0
transport input none
line aux 0
line vty 0 4
login
line vty 5 15
login
!
end

7206VXR#
```

Caveats

- None.