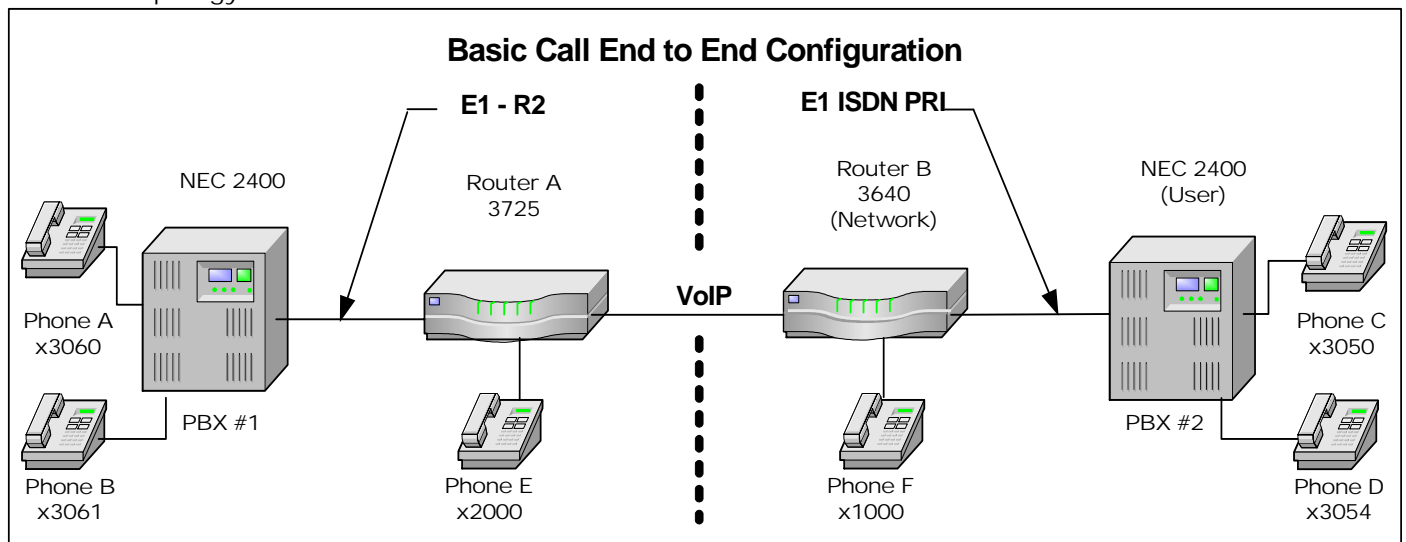


Cisco 3640 Gateway - PBX Interoperability: NEC 2400 PBX using E1 PRI Interfaces with H.323

Introduction

This Application Note describes the basic interoperability of the Cisco 3640 gateway and the NEC 2400 PBX using E1-PRI interfaces. Though the NEC 2400 ICS can be configured as either NETWORK (Master) or USER (Slave) side for E1 ISDN PRI, configuration as NETWORK is not recommended. The NEC TAC center will not resolve a case presented with NEC set as the NETWORK side. The network topology diagram shows the end-to-end interoperability.

Network Topology



Limitations

NEC PBX

NEC supports only user side. Though the NEC 2400 ICS can be configured as either network (master) or user (slave) side, configuration as network is not recommended. The NEC TAC center will not resolve a case presented with NEC set as the network side.

NEC supports E1-R2 digital compelled.

NEC does not support E1-R2 analog.

NEC does not support Overlap sending for ISDN PRI.

System Components

Hardware Requirements

Cisco 3640 Router with NM-HDV and 1MFT-E1 Port

NEC 2400 ICS PBX, PA-30PRTB Circuit Card

– PA-4MFC Circuit Card



Software Requirements

Cisco IOS Release 12.2.(12.12T)

NEC ICS 2400 PBX Software Release J 5.8.

DISS	02/05/10	16:06	CISCO TEST FACILITY
MM			
VERSION	ISSUE	DATE	
J	05.80	00/06/20	Generic
MM			
VERSION	ISSUE	DATE	
F_	01.00		
	96/04/26	Boot	ROM

Features Supported

Calling Number (ANI)

Connected Number

Configuration

Configuring the NEC 2400 ICS PBX

The NEC PBX requires a substantial amount of programming and circuit card switch settings to properly install. It is beyond the scope of this document to provide the entire configuration; therefore, the NEC information below is mostly helpful for NEC techs. The switch settings and software references assume a familiarity with the NEC 2400, and it is highly recommended to have a NEC ISDN certified technician setup the NEC portion. Refer to the NEC 2400 PBX documentation for complete configuration information.

Step 1. Install the NEC circuit card PA-30PRTB and set the switches.

Switch	Position	Description	Setting
SW00		Make Busy	Down
SW01	0	All Channel Make Busy	Off
	1	External Loop Back	Off
	2	Internal Loop Back	Off
	3	Dch Handler Make Busy	Off
SW02 (SENSE - Rotary)		1 = AT&T 2 = Australia 3 = NTT Japan 4 = NEC/ETSI 5 = AT&T 6 = INS A = Q.SIG	4
SW10	Jumper	Off = Coax On = Twisted Pair	On
SW11	Jumper	Off = Coax On = Twisted Pair	On
SW12	Jumper	Off = Coax On = Twisted Pair	On
SW13	1	On = PAD ROM Special Version	Off



Switch	Position	Description	Setting
		Off = PAD ROM Standard Version	
	2	On = ISDN BUS Not Used Off = ISDN BUS Used	On
	3	Not Used	Off
	4	Not Used	Off
SW14	1	On = CCITT Signaling Off = CEPT Signaling	On
	2	On = Alarm Release: 2sec (Aus) Off = Alarm Release 15 Sec.	On
	3	PAD	On
	4	PAD	On
	5	PAD	On
	6	PAD	On
	7	PAD	On
	8	Fixed Off	Off
SW15	1	Loopback Pattern Off = Loopback inhibited	Off
	2	Loopback Pattern Off = Loopback inhibited	Off
	3	Loopback Pattern Off = Loopback inhibited	Off
	4	Loopback Pattern Off = Loopback inhibited	Off
	5	TS16 Control: On = Data Through (CCIS/ISDN) Off = Signaling	On
	6	On = No CRC4 Off = CRC4	Off
	7	Firmware (CCITT/China/Thailand/Aux)	On
	8	Firmware (CCITT/China/Thailand/Aux)	On
SW16	1	Fixed Off	Off
	2	Fixed Off	Off
	3	All "1" Supervision On = To be controlled Off = Not to be controlled	Off
	4	On = Dch User Side Off = Dch Network Side	On
	5	On = Dch Negative Logic Off = Dch Positive Logic	Off
	6	On = Dch Packet Service On Off = Dch Packet Service Off	Off
	7	Fixed Off	Off
	8	Fixed Off	Off



Step 2. Configure the route (ARTD). Below are the route settings found in ARTD. Route 14 is the B channel, and Route 15 is the D channel. Setting the NEC to emulate the network side is not supported by NEC. However, one may have limited success emulating Network side. CDN 64 must remain set to 0, or the calling number will not be passed.

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```

* ROUTE CLASS DATA LIST *
----- R O U T E N U M B E R -----
CDN FUNCTION 11 12 13 14 15
1 OSGS 7 0 0 0 0
2 ONSG 3 2 0 2 2
3 ISGS 7 0 0 0 0
4 INSG 3 2 0 2 2
5 TF 3 3 3 3 3

6 TCL 4 4 4 4 4
7 L/T 1 1 1 1 1
8 RLP 2 2 0 2 0
9 TQ 0 0 0 0 0
10 SMDR 0 1 1 1 1

11 TD 0 0 0 0 0
12 DR 0 0 0 0 0
13 AC 1 1 0 1 0
14 TNT 0 0 0 0 0
15 LSG 5 12 13 12 13

16 SMDR2 0 0 0 0 0
17 H/M 0 0 0 0 0
18 MC 0 0 0 0 0
19 ANI 0 0 0 0 0
20 D 0 0 0 0 0

21 MSB 0 0 0 0 0
22 MSW 0 0 0 0 0
23 TR 0 0 0 0 0
24 OC 0 0 0 0 0
25 R/L 0 0 0 0 0

26 RVSD 0 0 0 0 0
27 TL 0 0 0 0 0
28 ANS 0 1 1 1 1
29 TELP 0 0 0 0 0
30 PAD 0 4 7 4 7

31 OGRL 0 1 1 1 1
32 ICRL 0 1 1 1 1
33 HD 0 0 0 0 0
34 GUARD 0 1 1 1 1
35 WINK 0 0 0 0 0

36 VAD 0 0 0 0 0
37 CLD 0 0 0 0 0
38 FA 0 0 0 0 0

```

[LRTD]



* ROUTE CLASS DATA LIST *

CDN	FUNCTION	R O U T E N U M B E R				
		11	12	13	14	15
39	BC	0	0	0	0	0
40	TCM	0	0	0	0	0
41	TDMQ	0	0	0	0	0
42	TRSC	0	0	0	0	0
43	BT	0	1	0	1	1
44	PRV	0	0	0	0	0
45	A/D	0	1	1	1	1
46	CW	0	0	0	0	0
47	TPQ	0	0	0	0	0
48	BL	0	0	0	0	0
49	TRKS	0	1	1	0	0
50	DPLY	0	1	1	1	1
51	ACD	0	0	0	0	0
52	2W/4W	1	0	0	0	0
53	FAAT	0	0	0	0	0
54	GW	0	0	0	0	0
55	TCMA	0	0	0	0	0
56	SMDR3	0	0	0	0	0
57	HDT	0	0	0	0	0
58	CD	0	0	0	0	0
59	CCH	0	0	0	0	0
60	TC/EC	0	0	0	0	0
61	IRE	0	0	0	0	0
62	SCR	0	0	0	0	0
63	LYER1	0	1	1	1	1
64	NET	0	1	0	0	0
65	INT	0	4	4	4	4
66	DC	0	4	4	4	4
67	HKS	0	0	0	0	0
68	SCF	0	0	0	0	0
69	SMDR4	0	0	0	0	0



Configuring the Cisco 3640 Router

The following sample output shows the router configuration for interoperability with the PBX:

```
Router# show running-config
Building configuration...

Current configuration : 1584 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 3640_A
!
boot system slot0:
logging buffered 1000000 debugging
no logging console
!
voice-card 3
!
ip subnet-zero
!
!
no ip domain lookup
!
isdn switch-type primary-qsig
!
!
!
!
!
!
!
!
!
mta receive maximum-recipients 0
!
controller E1 3/0
clock source internal
ds0-group 1 timeslots 1-15,17-31 type r2-digital r2-compelled ani
ds0 busyout 31 soft
!
!
!
!
interface Ethernet0/0
 ip address 10.1.1.23 255.255.255.0
 no ip mroute-cache
 half-duplex
!
interface Ethernet0/1
 no ip address
 no ip mroute-cache
 shutdown
 half-duplex
!
ip classless
no ip http server
ip pim bidir-enable
```



```
!  
!  
!  
call rsvp-sync  
!  
voice-port 2/0/0  
!  
voice-port 2/0/1  
!  
voice-port 2/1/0  
!  
voice-port 2/1/1  
--More--  
voice-port 3/0:1  
!  
!  
mgcp profile default  
!  
!  
!  
dial-peer cor custom  
!  
!  
!  
dial-peer voice 1000 pots  
  destination-pattern 1000  
  port 2/0/0  
!  
dial-peer voice 1001 pots  
  destination-pattern 1001  
  port 2/0/1  
!  
dial-peer voice 3060 voip  
  destination-pattern 306.  
  session target ipv4:10.1.1.21  
!  
dial-peer voice 4 pots  
  destination-pattern 9999  
  direct-inward-dial  
  forward-digits all  
!  
dial-peer voice 3000 pots  
  destination-pattern 305.  
  direct-inward-dial  
  forward-digits all  
!  
dial-peer voice 5000 pots  
  destination-pattern 50..  
  direct-inward-dial  
  forward-digits all  
!  
dial-peer voice 2000 pots  
  destination-pattern 2000  
  direct-inward-dial  
  port 3/0:1  
  forward-digits 0  
!  
!  
line con 0  
  exec-timeout 0 0  
line aux 0  
line vty 0 4  
  password cisco  
  login
```



!
!
end

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